Alliant Energy
4902 North Biltmore Lane
P.O. Box 77007
Madison, WI 53707-1007

1-800-ALLIANT (800-255-4268)
alliantenergy.com

March 2, 2022

Dan Prunuske, Land Use Administrator
Town of Beaver Dam Land Use Department
P.O. Box 293, Beaver Dam, WI 53916

RE: Conditional Use Permit Application for the Portion of Alliant Energy's Proposed Beaver Dam Solar generation facility within the Town of Beaver Dam, Dodge County, Wisconsin

Dear Mr. Prunuske,

Wisconsin Power and Light (WPL), a subsidiary of Alliant Energy, Inc., and on behalf of the participating landowners is pleased to submit this application for a Conditional Use Permit (CUP) as required under the Town of Beaver Dam Code of Ordinance for the Beaver Dam Solar project (Project). The Project is a 50 Megawatt alternating current solar electric generating facility, a portion of which is to be located in the Town of Beaver Dam, Dodge County, Wisconsin. Please find enclosed ten (10) hard copies of the Beaver Dam Solar CUP application with appendices and the Town of Beaver Dam Conditional Use Permit Application form. The CUP application fee is being sent via mail to the Town Hall attention the Town Treasurer Nicole Banes.

WPL is at your disposal for any additional requirements and questions regarding this CUP application and looks forward to working with the Town of Beaver Dam through the permitting process for the Beaver Dam Solar Project.

Sincerely,

Andy Ehlert

Andy Ehlert, PE
Resource Development Project Manager

Enclosures

Conditional Use Permit Application

Applicant (Agent) WISCONSIN POWER & LIGHT (WPL)
Street Address 4902 N BILTMORE LANE
City, State, Zip Code MADISON, WI 53718-2148
Phone Number 608-458-3311 Email

Property Owner (If different from applicant) MULTIPLE
Street Address MULTIPLE
City, State, Zip Code ~
Phone Number ~ Email ~

Parcel Identification Number (PIN) 004121424430000, 004121424420000,
~~Site Address~~ 004121424413001, ~~004121424430004,~~ CONTINUED BELOW
Zoning AG2
Present Use of Property AG
Proposed Use of Property LARGE SCALE (UTILITY) SOLAR PWR GENERATION
Zoning Ordinance Section Number

Certificate

I hereby certify that I am the owner and/or authorized agent of the property and that all the above statements and attachments submitted are true and correct to the best of my knowledge and belief. I hereby authorize members of the Town of Beaver Dam Plan Commission to enter the above described property for purposes of obtaining information pertinent to my CUP request.

Signature of owner or authorized agent Cindy Elst
Date 12/21/2021 Contact number 262 352 8504

PIN #'s CONTINUED: 004121424120000, 004121424110000,
004121424130000, 004121424140000,
004121424410000, 004121424440000,
004121424230000, 004121424240000,
004121424320000, 004121424310000

Disposition (For office use only)

Plan Commission Meeting Date: _____

The CUP is (denied/granted/granted in part) subject to the following conditions:

_____

_____

_____

_____

_____

Permit is hereby issued with the understanding that all work performed be in accordance with the application and in compliance with the Town of Beaver Dam Zoning Ordinance and relevant Laws of the State of Wisconsin and subject to the conditions stated above.

Signed _____ Date _____
Land Use Administrator

Application for Conditional Use Permit
For the Beaver Dam Solar Project
Wisconsin Power and Light Company
Town of Beaver Dam, Wisconsin

November 2021

Contents

List of Tables

LIST OF APPENDICES

Abbreviations

AGL	above ground level
ATI	Array Technologies, Inc.
Al	Aluminum
ATC	American Transmission Company, LLC.
BMP	Best Management Practice
CA	Certificate of Authority
CUP	Conditional Use Permit
CTH	County Trunk Highway
dBA	Decibel
EPC	Engineering, Procurement and Construction
ECSWMP	Erosion Control and Storm Water Management Plan
ECP	Environmental Control Program
ER	Endangered Resources

FAA	Federal Aviation Administration
GA	Ground Attenuation
GIS	Geographic Information System
GPS	Global Positioning System
kV	kilovolt
lbs	pounds
LGU	Local Governing Unit
MPT	Main Power Transformer
MW	Megawatts
MW_{AC}	megawatt alternating current
Msl	Mean Sea Level
NESC	National Electric Safety Code
NSA	Noise-sensitive Area
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
POI	Point of Interconnection
Project	Beaver Dam Solar Project
PSC	Public Service Commission (of Wisconsin)
PV	photovoltaic
ROW	Right-of-Way
STH	State Trunk Highway
STP	Shovel Test Pit
USACE	United States Army Corp of Engineers
W	Watt
Wis-DOT	Wisconsin Department of Transportation
WHPD	Wisconsin Historic Preservation Database
WRAPP	Water Resource Application for Project Permits

1. NAME AND CONTACT INFORMATION OF THE APPLICANT, OWNER, AND INSTALLER

This section 1 introduces the property owner for Beaver Dam Solar Project (Project) for the Conditional Use Permit (CUP) application required under Sec. 62-92 (1), Code of the Town of Beaver Dam, Wisconsin.

Applicant and Owner:

Name: Wisconsin Power and Light Company (WPL)

Address: 4902 N Biltmore Ln, Madison, WI, 53718-2148

Phone: (608) 458-3311

Representative: Ben Lipari

Email: BenLipari@alliantenergy.com

The CUP applicant is WPL, which is developing and will own and operate the Beaver Dam Project. WPL, a subsidiary of Alliant Energy Inc., (Alliant Energy) is a public utility which provides electric power and natural gas supply services to its customers in central and southern Wisconsin. WPL distributes electricity to 459,000 customers and natural gas to 180,000 customers in Wisconsin. WPL has 1,900 Megawatts (MWs) of generating capacity from interests in fossil-fueled, nuclear, and hydroelectric power plants. Currently, WPL owns and operates approximately 462MW of existing renewable energy capacity. The total energy produced in megawatt-hours (MWh) from WPL's renewable energy assets in calendar year 2019 were as follows[1]:

- Hydroelectric: 301,175 MWh
- Wind: 246,471 MWh
- Biomass - Landfill Gas: 25,396 MWh
- Biomass- Biogas: 9,917 MWh
- Solar Photovoltaic: 493 MWh

Installer

An installer for the Beaver Dam Solar Project has not yet been selected at this time. Selection will occur during the final design stages of the Project. WPL will update the status of installer engagement when it becomes available if required by the Town of Beaver Dam as part of the CUP approval process.

2. PROJECT INTRODUCTION AND DESCRIPTION

This Section 2 provides an introduction of the Project for the CUP application required under Sec.62-92(4), Code of the Town of Beaver Dam, Wisconsin.

WPL submits the following information as part of its application for a CUP to construct, own, and operate the proposed Project, a 50 MW alternating current (MW_{AC}) solar electric generating facility to be located in

[1] *See In Re Electric Provider Renewable Portfolio Standard Compliance for 2019*, Docket No. 05-RF-2019, *WPL's RPS Compliance Response* (Apr. 15, 2020) (PSC REF#: 387512), *available at* https://apps.psc.wi.gov/pages/viewdoc.htm?docid=387512 (Table 1 in excel file embedded in .pdf).

the City of Beaver Dam and the Towns of Beaver Dam and Burnett, Dodge County, Wisconsin. WPL provides discussion of the entire Project within this application to provide context for the purpose of reviewing the Project. WPL further identifies the location of facilities and existing conditions specifically within the Town of Beaver Dam.

Proposed Project developments, including ancillary facilities, will consist of solar panels, racking and tracking systems, access roads, operations and maintenance (O&M) structures, a Project substation, underground collector cables, inverters, and junction boxes. The Project will also include a 1.4-mile, 69 kilovolt (kV) Generation Tie (Gen-Tie) line within a 100-foot wide right of way (ROW) to be located in the City of Beaver Dam. The Gen-Tie line will connect the Project substation to the existing ATC North Beaver Dam Substation, which will also require modifications at the Project's Point of Interconnection (POI).

The information presented in this application is considered the Project's conceptual plan and based on information known to WPL at this time and is subject to change as Project development proceeds and the Project design is finalized.

2.1 PROJECT AREA

This Section 2 provides an introduction of the Project for the CUP application required under Sec.62-92(2), Code of the Town of Beaver Dam, Wisconsin.

The proposed Project is located in the Towns of Beaver Dam and Burnett in Dodge County, Wisconsin. The Project substation which is located in the Town of Beaver Dam is electrically connected to the ATC North Beaver Dam substation by the Project's Gen-Tie line which passes through the City of Beaver Dam. The Project includes a 50 MW_{AC} primary array area (Primary Facility Area) and an alternate array area that can accommodate up to 25 percent of the Project's AC nameplate capacity (Alternate Facility Area). The intent of the Alternate Facility Area acreage is to establish 25% additional land control in case design, costs, economic, environmental or constructability issues associated with the Primary Facility Area arise during design or construction. Table 2.1-1 identifies the location of the Primary Facility Area and Alternate Facility Area.

Table 2.1-1: Project Location

County	Primary Facility Area		Alternate Facility Area		Generator Tie Line (including Project Substation)	
	Township Name	Sections	Township Name	Sections	Township Name	Section
Dodge	Beaver Dam Burnett	24 19	Beaver Dam Burnett	24 19	Beaver Dam (both Town of and City of)	23, 26, 27, and 28

The Project Area boundary is shown on Figure 2.1-1 in Appendix A and encompasses an area of approximately 572 acres. The Solar Array Area for the Primary Facility Area encompasses approximately 352 acres of land, and the Solar Array Area for the Alternate Facility Area encompasses approximately 76 acres of land. Areas disturbed by construction activities are described in section 3.3, existing land cover. Figure 2.1-1 provided in Appendix A depicts the general Project location within the state of Wisconsin and Figure 2.1-2 in Appendix A shows the total Project Area with an aerial photography base-map. Figure 2.1-3 in Appendix A is a detailed map of the proposed Project facilities.

2.2 PARTICIPATING PARCELS

This Section 2.2 provides CUP information required under Sec.62-92(3), Code of the Town of Beaver Dam, Wisconsin.

Table 2.2-1 provided below identifies all Project site land agreements within the Solar Facility Area. The Gen-Tie line will be developed within a 100-foot wide ROW under easement agreement and will be entirely within the Town of Beaver Dam. The easements and memorandum of lease agreements indicating the landowners' participation are available upon request.

Table 2.2-1: Status of Lease Agreements Within the Solar Facility Area

Primary owner name	Parcel ID	Type	Status	Acreage (rounded)
Solar Array Area				
Butterbrodt, Sue	006-1215-1932-000 006-1215-1933-000 004-1214-2413-001[1] 004-1214-2442-000[1] 004-1214-2443-000[1] 004-1214-2443-004[1]	Solar Energy Lease Agreement	Participating	180
Butterbrodt Family Trust	006-1215-1931-000 006-1215-1934-000 006-1214-2412-000[1] 004-1214-2411-000[1] 004-1214-2413-000[1] 004-1214-2414-000[1] 004-1214-2444-000[1] 004-1214-2441-000[1]	Solar Energy Lease Agreement	Participating	291
Endres, William & Deborah	004-1214-2423-000[1] 004-1214-2424-000[1] 004-1214-2432-000[1] 004-1214-2431-000[1]	Solar Energy Lease Agreement	Participating	120
Hammer, Charles & Nancy Kavazanjian	004-1214-2622-002	Purchase Option	Participating	39
Collector Lines and Gen-Tie Line				
ATC in ROW	TBD	Pole Attachment Agreement	TBD	TBD
Beaver Dam, City of	206-1214-2712-002	Generator Tie Line Easement	TBD	TBD
Ferron, Maxine & James	206-1214-2711-005 206-1213-2714-000 206-1213-2714-002	Generator Tie Line Easement	Participating	TBD
K&M Investments of Beaver Dam, LLC	206-1214-2711-007 206-1214-2711-00	Generator Tie Line Easement	Participating	TBD
Maunesha Real Estate LLC	206-1214-2714-004	Generator Tie Line Easement	Participating	TBD

Zimmerman, Michael	004-1214-2314-000[1] 004-1214-2341-000[1] 004-1214-2342-000[1] 004-1214-2343-000[1] 004-1214-2334-000[1] 004-1214-2621-000[1]	Collector Tie Line Easement	Participating	TBD

[1] Parcels that are within the Town of Beaver Dam. All other parcels are within the Town of Burnett or City of Beaver Dam.

Note 1: The total of lease land in the Table exceeds the Project Area Boundary described elsewhere in this document. Some of the land contained in certain parcels is located south of CTH B and is not included in the Project.

2.3 PROPERTY OWNERS WITHIN THE 300 FEET

This Section 2 provides an introduction of the Project for the CUP application required under Sec.62-92(1), Code of the Town of Beaver Dam, Wisconsin.

Table 2.3-1 identifies the names and addresses of the property owners within 300 feet of the project in Town of Beaver Dam.

Table 2.3-1: List of Property Owners within 300 feet

Primary Owner	Secondary Owner	Full Mailing Address	Full Physical Address
BUTTERBRODT FAMILY REVOCABLE LIVING TRUST	<Null>	713 HILLCREST CT, BEAVER DAM, WI, 53916	<Null>
CURTIS R & ELAINE L BENING TRUST AGREEMENT	<Null>	N8483 BASSWOOD RD, BEAVER DAM, WI, 53916	N8483 BASSWOOD ROAD
DONALD R MARKHARDT	<Null>	N8662 JUNIPER RD, BEAVER DAM, WI, 53916	<Null>
DSDG LIVING TRUST DATED APRIL 6 2017	JANICE M SCHYVINCK	1122 CIRCLE DR W, BEAVER DAM, WI, 53916	N8120 COUNTY ROAD W
EARL R STUTZ	GRETA S STUTZ	N8152 COUNTY ROAD A, BEAVER DAM, WI, 53916	<Null>
ERIC J GUETZLAFF	TRACY L GUETZLAFF	W8046 COUNTY ROAD B, BEAVER DAM, WI, 53916	W8046 COUNTY ROAD B
GANSKE PROPERTIES LLC	<Null>	N9334 COUNTY ROAD A, BEAVER DAM, WI, 53916	<Null>
JAMES J FERRON	MAXINE FERRON	W7653 BREEZY POINT RD, BEAVER DAM, WI, 53916	<Null>
JOSEPH N & MONNA M MEYER FAMILY REVOCABLE TRUST DATED FEBRUARY 29 2008	<Null>	N7682 COUNTY ROAD A, BEAVER DAM, WI, 53916	<Null>
KIT-TELL FARMS LLC	<Null>	N8076 BUTTERNUT RD, BURNETT, WI, 53922	W7558 COUNTY ROAD B
LOTTO FAMILY REVOCABLE TRUST	<Null>	W7998 COUNTY ROAD B, BEAVER DAM, WI, 53916	W7998 COUNTY ROAD B
MICHAEL J ZIMMERMAN	DEBRA ZIMMERMAN	N6490 US HIGHWAY 151 S, BEAVER DAM, WI, 53916	<Null>
MISCHLER REAL ESTATE LLC	<Null>	N8131 KELLOM RD, BEAVER DAM, WI, 53916	N8131 KELLOM ROAD
SUECAROL A BUTTERBRODT	<Null>	W7258 COUNTY ROAD B, BURNETT, WI, 53922	W7258 COUNTY ROAD B

RICHARD C & BARBARA J KOCH FAMILY REVOCABLE TRUST	<Null>	N8198 N CRYSTAL LAKE RD, BEAVER DAM, WI, 53916	N8198 N CRYSTAL LAKE ROAD
ROBERT L GANSKE	CAROL A GANSKE	W7823 HEMLOCK RD, BEAVER DAM, WI, 53916	<Null>
STEVEN P FANSHAW	LAURIE G FANSHAW	N7976 N CRYSTAL LAKE RD, BEAVER DAM, WI, 53916	N7976 N CRYSTAL LAKE ROAD
T FLETCHER & SONS INC	<Null>	N8000 WHITETAIL RD, BURNETT, WI, 53922	N8236 COUNTY ROAD A
TERRY R DIBERT	ANN KOLOCEK DIBERT	W7318 COUNTY ROAD B, BURNETT, WI, 53922	W7318 COUNTY ROAD B
VICTOR L SUNDERLAND	KATHLEEN SUNDERLAND	W7337 HEMLOCK RD, BEAVER DAM, WI, 53916	W7337 HEMLOCK ROAD
WAYNE W PRIBNOW	RAEMARIE PRIBNOW	W7432 COUNTY ROAD B, BURNETT, WI, 53922	W7432 COUNTY ROAD B
WILLIAM G ENDRES	DEBORAH M ENDRES	ATTN: CHARLES J & DARLENE K ENDRES, 5953 POELMA DR, WAUNAKEE, WI, 53597	N8285 BASSWOOD ROAD
WILLIAM T MISCHLER JR	<Null>	W7485 COUNTY ROAD B, BEAVER DAM, WI, 53916	W7485 COUNTY ROAD B
WISCONSIN POWER & LIGHT CO	<Null>	C/O ALLIANT ENERGY REAL ESTATE DEPT, 4902 N BILTMORE LN, MADISON, WI, 53718-2132	W8503 COUNTY ROAD B
WISCONSIN POWER & LIGHT COMPANY	<Null>	ATTN: REAL ESTATE DEPT, PO BOX 77007, MADISON, WI, 53707-1007	N8320 BASSWOOD ROAD

2.4 EXPECTED PROJECT LIFESPAN

The design life for the Project is 30 years. The solar photo-voltaic (PV) panels' production efficiency is expected to decline by approximately 0.5 percent annually, therefore the operating condition of the panels in 30 years will be approximately 85 percent of the first year of operation. Depending on the need for electricity generation in the market, community support, landowner interest, and other factors, there may be an opportunity to extend the Project life beyond 30 years.

2.5 REQUIRED PERMITS AND APPROVALS

The expected local, State and Federal permits required for the construction and operation of the proposed Project are listed in Table 2.4-1. The necessary permits and approvals will be obtained before commencing construction activities.

Table 2.5-1: List of Potential Permits and Approvals

Agency	Interest or Permit	Contact
U.S. Army Corps of Engineers St. Paul District - Regulatory (USACE)	Section 404 Wetland Permit	USACE_Requests_WI@usace.army.mil 651-290-5525
U.S. Fish and Wildlife	Federal ESA	Dawn S. Marsh

Service (USFWS)	Coordination	(952) 252-0092
Federal Aviation Administration (FAA)	Navigable Airspace Review (14CFR77.13(a))	Deb Bartell (847) 294-7335
Public Service Commission of Wisconsin (PSC)	Certificate of Authority (CA) for construction of energy generation facility less than 100MW	Adam Ingwell Adam.Ingwell@wisconsin.gov (608) 266-1124
WDNR	Wisconsin Pollutant Discharge Elimination System (WPDES)/ Stormwater Runoff Permit (NR216)	Samantha Whitens samantha.whitens@wisconsin.gov (608) 301-6110
WDNR	Section 401 of the CWA, Water Quality Certification and State-Regulated Wetlands (Isolated Wetland Permit WDNR_GP3_2018)	Geri Radermacher Geri.Radermacher@wisconsin.gov (262) 574-2153
WDNR	Wisconsin Endangered Species Law (s. 29.604, Wis. Stats.)	Stacy Rowe Stacy.Rowe@wisconsin.gov (608) 266-7012
WDNR	Wisconsin Navigable Waters, Harbors and Navigation (Chapter 30)	Geri Radermacher Geri.Radermacher@wisconsin.gov (262) 574-2153
WDNR	Request for a Well Number if installation of a well is required to serve an O&M building. Wisconsin Stats. 281.34(3)	Deborah Lyons-Roehl Deborah.LyonsRoehl@wisconsin.gov (608) 267-9350
Wisconsin State Historical Society Historic Preservation Office	Cultural Resources (historical and archaeological) under Section 106 of the National Historic Preservation Act	Chip Brown chip.brown@wisconsinhistory.org (608) 264-6508
Wisconsin Department of Transportation (WisDOT) SW Region	Access (Driveway) Permit s. 86.07(2) Wis. Stats. & Ch. Trans 231 Wis. Adm. Code	Wendy Braun Wendy.braun@dot.wi.gov (608) 246-3837
WisDOT – SW Region	Utility permit to construct, operate or	Mark Goggin mark.goggin@dot.wi.gov

	maintain a utility facility on state trunk highway (STH) right of way.	dotdtsdswutilitypermits@dot.wi.gov (608) 792-1366
WisDOT Bureau of Highway Maintenance	Heavy and oversized load permits	Oversizepermits.dmv@dot.wi.gov (608) 266-7320
State of Wisconsin, Division of Safety and Buildings (or Town depending on scope of building)	Building Permit if an O&M Building is included for the Project. Wisconsin Stats. 101.63, 101.73	web@dsps.wi.gov (608) 266-2112
Dodge County Land Resources and Parks Department	Building Site Permit, and/or Land Use Permit	landresources@co.dodge.wi.us (920) 386-3700 x2
Dodge County Land Resources and Parks Department	Shoreland Zoning	landresources@co.dodge.wi.us (920) 386-3700 x2
Dodge County Highway Commission	Permit to Construct, Maintain or Repair Utilities within Highway Right-Of-Way (aka; Utility Accommodation Permit)	Brian Field bfield@co.dodge.wi.us (920) 386-3650
Dodge County Highway Commission	County Highway Entrance Permit	Brian Field bfield@co.dodge.wi.us (920) 386-3650
Dodge County Highway Commission	Oversize-Overweight Permit	Brian Field bfield@co.dodge.wi.us (920) 386-3650
Dodge County Land Resources and Parks Department	Sanitary Permit	landresources@co.dodge.wi.us (920) 386-3700 x2
Dodge County Drainage Board	Drainage Permit	TBD
Town of Burnett	Conditional Use Permit	Timothy Fletcher, Town board Chair (920) 392-2846
Town of Burnett	Land Use Permit	Timothy Fletcher, Town board Chair (920) 392-2846
Town of Beaver Dam	Land Use Permit	Dan Prunuske, Land use administrator 920-887-0791 ext. 15.
Town of Beaver Dam	Building Permit	(608) 745-4070
Town of Beaver Dam	Driveway Permit	Dan Prunuske, Land use administrator 920-887-0791 ext. 15.

WPL will continue to correspond with permitting agencies throughout the project's development, construction, and operational phases to ensure permit acquisition and compliance.

2.5 PROJECT COMPLIANCE WITH THE TOWN OF BEAVER DAM COMPREHENSIVE PLAN

The Project, as proposed, is consistent with the goals and policies laid out in Town of Beaver Dam Comprehensive Plan (Town Comprehensive Plan) adopted in March 2012, demonstrated as follows:

Utilities and Community Facilities

Section 4.18 under the Town Comprehensive Plan stated the goal to ***"[m]ake sure modern and adequate utilities provided for residential and commercial use and encourage public utilities to be provided according to long-range needs and in proper locations with adequate space for the future[e]***". As a way of converting the sun's energy into electrical energy, solar panels make use of the single most sustainable resource- the light of the sun. Thanks to the continuous and modern advancements of PV technology, solar power has become the most cost-effective electric generation method in the US. With the decreasing costs of solar power, this electrical power generation method will be part of WPL's suite of electrical power generation types as WPL moves its capacity towards a modern, sustainable and reliable carbon-free capacity. Furthermore, during the siting and the development stage of the Project, the economic and natural effects on the local community and landscape have been thoroughly considered to make sure the Project is to be installed in a location so as to prevent ***"[n]egative impacts on agriculture[e]***", as stated as a utilities policy under Section 4.19 of the Town Comprehensive Plan.

The Project will temporarily consume agricultural land (approximately 0.15% of Dodge County's agricultural land), however upon Project completion, these lands can be returned back to cash crop agricultural production if the landowners desire. Additionally, the temporary change from cash crop to solar production will allow these agricultural lands to rest and recover with 30+ years of annual growing cycles converting the proposed vegetative cover to quality topsoil through natural processes. Additionally, the temporary removal of the lands from cash crop production will help to improve the water quality of the local surface water bodies through lowering of nitrogen levels in surface water runoff. The Project will help to meet the Town and its residents' sustainable long-term needs through generating electricity from renewable resources.

Agricultural, Natural, and Cultural Resources

Section 5 of the Town Comprehensive Plan emphasized the importance of air quality and pointed out the pollutant generation from power plants and air conditioning due to the warm weather. Solar energy systems do not produce air pollution or greenhouse gases and will result in a beneficial effect on the environment as it reduces the use of other power generation fuel sources such as fossil fuels. The Project is compliant with the requirement as the utilization of sustainable solar energy will help the Town be an integral part of addressing air pollution concerns in the long term.

Economic Development

The Project is consistent with the goals and policies outlined in the Economic Development section of the Town Comprehensive Plan. One of the statements under the Economic Development section acknowledges the importance of "[***i]nvesting in an infrastructure for innovation[n***]". Such a statement indicates the Town's goal to encourage economic development with an emphasis on bringing innovation to the community. Furthermore, the participating landowners, the local governmental units (LGU's), and the Town of Beaver Dam residents would benefit from the Project, as the Town of Beaver Dam and Dodge County will receive annual revenue stipends through the State of Wisconsin's Utility Shared Revenue program, which can support local services and benefit the Town's residents. Participating landowners within the Project Area will receive stable lease income over the life of the Project. When solar projects are hosted on agricultural land, local farmers benefit from steady income diversification. Combining traditional agriculture production with stable solar lease payments makes farms more resilient to shifts in crop prices and yields. The Project will **not** have any of the impacts commonly associated with

commercial and industrial development, such as increased pollution, increased groundwater water use, permanent conversion of land, and the use of toxic and/or hazardous chemicals that are not managed, controlled, and registered per applicable codes.

Land Use

The Town Comprehensive Plan has goals to ***"[e]ncourage planned growth that enhances the local economy, while protecting natural resources, recreational opportunities, and the rural character of the tow[n]."*** The Project will preserve and benefit farmland and ensure that the Town of Beaver Dam maintains its rural atmosphere for decades into the future. The anticipated Project life of approximately 30 years represents a ***temporary*** land use and will not result in a permanent loss of farmland that may otherwise occur through commercial developments as the population grows and expands beyond the City of Beaver Dam City limits. The land in the Project area will be seeded with a vegetative cover for the duration of the Project. As stated in section 2.5, the 30 years of annual growth cycles will benefit long-term soil health by improving soil tilth through the incorporation of organic matter through its rooting structure and will stabilize the soil from erosive forces and improve retention of water and soil nutrients. The vegetative cover will also encourage the growth of native plant species and support pollinator-friendly habitats. This could greatly benefit surrounding agricultural properties that grow pollinator-dependent crops.

The Project will span over multiple decades, therefore the properties participating in the Project will not be susceptible to conversion to, commercially or industry-intensive and irreversible development. As stated above, the Project Area can be transitioned back into agricultural use after the Project is decommissioned. These Project features help preserve and protect Town of Beaver Dam's mix of forested and farmland areas, and rural atmosphere.

3. PROJECT SITE PLAN

This Section 3 addressed the site plan requirements for the CUP application required under Code of the Town of Beaver Dam, Wisconsin.

3.1 PROPOSED USE

This Section 3.1 addresses the requirements of proposed operation, use of structure, and employee number in section Sec.62-92(1), Code of the Town of Beaver Dam, Wisconsin.

The proposed use of the project land is to construct and operate a 50 MW_{AC} solar electric generating facility. The Project is anticipated to be placed in service in Q4 of 2023.

The Project will also require the construction of a Project substation and Gen-Tie line within the City of Beaver Dam. The Conceptual PV Layout drawing schematic is included in Appendix B.

Size of the Proposed Project

Currently, under land control, the Project Area boundary shown on Conceptual PV Layout drawing schematic is 572 acres. The Solar Array Area for the Primary Facility Area encompasses approximately 352 acres of land, of which 314.7 acres are within the Town of Beaver Dam. The Solar Array Area for the Alternate Facility Area encompasses approximately 76 acres of land, of which 46.7 acres are within the Town of Beaver Dam.

Once operational, the full Project nameplate capacity of 50 MW_{AC} can be achieved with the single-axis tracking system proposed for the Project. The conceptual design for the Solar Array Area associated with the Facility Area will generate 50.4 MW_{AC} (65.5 MW_{DC}).

WPL used the Eagle 72HM G3 400-watt (W) bifacial half-cell monocrystalline solar panel manufactured by JinkoSolar, for the conceptual Project design. The dimension of the panel is 77.96 x 39.69 x 1.57

inches. PV modules produced by a wide range of manufacturers are under consideration for the Project. At the time of construction, several PV module offerings from different suppliers will be evaluated and a selection will be made based on meeting Project PV panel specifications and the most cost-effective option.

Number of Panel Sites Proposed for the Project and the Number of Alternate Panel Sites

The Primary Facility Area is designed for approximately 163,748 individual PV panels with a total direct current (DC) generating capacity of 65.5 MW_{DC}. For a designed 1.3 DC-to-AC ratio, this is enough capacity to meet a nameplate generating capacity of 50.4 MW_{AC} power. The portion of the Primary Facility Area within the Town of Beaver Dam is designed for approximately 142,844 panels with a generating capacity of 57.138 MW of DC power.

The Alternate Facility Area is designed for approximately 38,688 individual PV panels with a total DC generating capacity of 15.5 MW_{DC}. For a designed 1.2 DC-to-AC ratio, this is enough capacity to meet a nameplate generating capacity of 12.6 MW_{AC} power, which is approximately 25 percent of the Primary Facility Area generating capacity. The portion of the Alternate Facility Area within the Town of Beaver Dam is designed for approximately 21,840 panels with a generating capacity of 8.761 MW of DC power.

Project Substation

A preliminary physical layout showing the approximate orientation of the Project substation on the Project area is provided in Appendix B. Pending final design work, the Project substation is expected to have a fenced footprint of approximately 1.5 acres (250 feet by 250 feet.) and will be located within the City of Beaver Dam.

Workforce

During construction, the work force will be primarily comprised of delivery drivers, laborers, electricians, equipment operators, and management personnel. Once construction is complete and the solar facility is in commercial operation, it will be staffed for ongoing O&M which will mobilize from the WPL Beaver Dam Operation center. The solar facility O&M staff will have specific training and expertise to operate a solar facility, potentially including the Project substation. When possible, these jobs will be sourced from surrounding communities.

3.2 EXISTING ENVIRONMENT (TOPOGRAPHY, WETLANDS, WATERWAYS, FLOODPLAIN, AND PARCEL BOUNDARIES)

This Section 3.2 addresses the requirements under Sec.62-92, Code of the Town of Beaver Dam, Wisconsin.

Topography

The surface topography of the Project Area has gently rolling topography across much of its extent. Topography generally slopes to a depression that runs north to south through the center of the Solar Facility Area. Topographic highs within the Solar Facility Area of approximately 988 feet above mean sea level (msl) are found in the west-central portion of the site, and topographic lows are in the southwest, center, and eastern portions of approximately 928 feet msl. The Solar Facility Area is bordered by agricultural land and some residential homes. Within the Gen-Tie Line Area, the Project substation parcel, and the collection corridor area, the topographic high was 961 feet msl and the low was 894 feet msl. The eastern half of the Gen-Tie Line Area is a mix of agricultural land and light commercial land. The western half of the Gen-Tie Line Area is bordered by light commercial areas along the County Trunk Highway (CTH) Road B.

The prevailing topography of the Project Area will not be substantially changed by construction activities including installation of the foundations for the tracking systems and trenching for the collection system. It

is anticipated that panel arrays will be designed and constructed to conform to the existing topography to avoid the need for significant grading. However, some localized grading will be necessary to meet racking tolerances and to construct other Project facilities such as the Project substation. Access roads will be constructed as close to existing grade as possible, maintaining preconstruction hydrologic flow patterns. Upon completion of construction activities, the areas temporarily impacted due to construction activities will be returned to their pre-construction topography.

The Topographic Maps are included in Figure 3.2-1 and Figure 3.2-2 in Appendix A.

Wetlands

The Project was designed to avoid wetlands to the extent practicable and the wetland maps are included in Figure 3.2-3 in Appendix A. A total of six (6) wetlands were identified within the Solar Facility Area boundary and four (4) wetlands were identified in the Ge Tie-Line Area boundary. Delineated wetlands W1, W2, W3, W4, and W5, and W6 are located within the Primary Solar Facility Area boundary and wetland W5 is also present within the Alternate Solar Facility Area boundary. Wetlands (GT-W3, GT-W4, GT-W7, and GT-W8) are located within the Gen-Tie-Line Area boundary.

Within the Solar Facility Area boundary, approximately 595,414 square feet of temporary construction matting may be placed in wetlands for installation of the solar arrays and fences. The preliminary project design proposes a total of 8.612 square feet of construction matting placed in wetlands within the Gen-Tie Line Area. Approximately two aboveground utility poles for the Gen-Tie Line will be placed in wetland GT-W3 and GT-W4.

No wetland impacts are anticipated for construction of collector lines associated with the Project. The Gen-Tie Line will span over wetlands and will be designed and constructed to minimize wetland impacts where practicable, however the installation of approximately two (2) aboveground utility poles will be required in wetlands GT-W3 and GT-W4. No wetland impacts are anticipated for construction of permanent access roads and no culverts are proposed for the Project. No permanent wetland impacts are anticipated for construction of fence installation. No grading or leveling in wetlands is anticipated for the installation of arrays or associated supports. No vegetation removal/tree clearing is anticipated within wetlands for the Project. No wetland impacts, including open-cut trenching or directional boring, are anticipated for construction of collector lines associated with the Project.

Further details regarding wetland characteristics within the Project Area are discussed in Section 3.3 (Existing Landcover)

Waterways

The Project was designed to avoid waterways to the extent practicable. Therefore, no waterway impacts are anticipated from Project construction.

Two WDNR 24K flowlines identified as intermittent waterways are mapped within the Project Area boundary (WBIC's 872500 and 834000), of which WBIC 872500 is located in the Town of Burnett and WBIC 834000 is located in the Town of Beaver Dam. No defined channel was observed at either of these locations during the field investigations. WBIC 834000 (Crystal Creek) is WDNR 24K mapped within the Gen-Tie Line Area was field delineated as Wetland GT-W4 as fresh wet meadow and shallow marsh. The WDNR provided a navigability determination for waterways within the Project Area on July 7, 2021. Waterway WBIC 834000 (Crystal Creek) is considered navigable by the WDNR, therefore, WPL will consult further with WDNR regarding Project design and waterway permitting for the Project. WBIC 872500 (Spring Brook) has been avoided by the Project and will not be impacted.

Lot Lines Location

The Land Ownership Maps, minimum scale 1:10,000, extent to 1.0 mile from the project boundary are included in Figure 3.2-4 in Appendix A. The lot lines are depicted in the maps.

Floodplain

The Project Area is not located within a regulatory floodplain including the portion within the Town of Beaver Dam. The nearest floodplain to the Gen-Tie Line is an unnamed waterway and is located approximately 1,080 feet to the west of the western terminus of the Gen-Tie Line. The map is included in Figure 3.2-Topographic Maps are included in Figure 3.2-5 in Appendix A.

3.3 EXISTING LANDCOVER

This Section 3.3 addresses the requirements under Sec.62-93(3), Code of the Town of Beaver Dam, Wisconsin.

The Project is located in a predominantly agricultural rural landscape. Agricultural crops consist of alfalfa, soy beans and corn Non-agricultural upland within the Project Area consists primarily of untilled edges of active agricultural fields, roads and roadside, and a small area of upland grassland. Table 3.3-1 and Figure 3.3-1 in Appendix A provides an overview of the land cover existing within the Project Area.

The vegetative communities within the Project Area were evaluated by a combination of aerial photographic review and field visits during 2020 and 2021. A summary of the vegetative communities follows.

Table 3.3-1: Total Land Cover

Land Cover Classification		Solar Facility Area (acres)[2]	Generator Tie Line (acres)	Project Substation Parcel (acres)[3]	Collection Corridor Area (acres)[4]	Total (acres)
Agriculture	Cropland	451.4	0.6	25	10.6	487.5[5]
	Specialty Crops	0.0	0.0	0.0	0.0	0.0
Non-Agricultural Upland	Grassland	15.6	9.9	0.5	0.1	26.2
	Upland Wooded	2.3	0.0	0.8	0.0	3.1
	Fallow Field	0.0	0.0	0.0	0.0	0.0
Wetlands/ Waterbodies	Forested Wetland	5.0	0.0	0.0	0.0	5.0
	Non-Forested Wetland	26.5	1.2	12.4	0.0	40.1
	Open Water	0.0	<0.1	0.0	0.0	<0.1
Developed Land	Residential	2.3	0.0	0.2	0.0	2.5
	Developed/Urban	4.3	3.1	0.5	0.1	8.0
Project Area Total		507.4	14.8	39.4	10.8	572/4

[2] Both solar panel and above ground and underground collector line portions outside of the Project are included in the Project Area used to calculate land cover acres.
[3] The Project substation parcel acreage represents the acreage of the entire parcel on which the Project substation will be located, not just the substation footprint.
[4] The Collection Corridor Area represents the corridor between the Solar Facility Area and the Project Substation.
[5] Difference due to rounding.

Agricultural

The dominant vegetation is comprised of actively cropped agricultural land. Crops within the agricultural areas consist of alfalfa, soybeans and corn. No pastured lands exist in the Project Area. Approximately 99 percent of the Primary and Alternate Facility Area within the Town of Beaver Dam is comprised of agricultural cropland.

Non-Agricultural Upland

Non-agricultural upland within the Project Area consisted primarily of the untilled edges of agricultural fields, roadside, and a small area of upland grassland.

The upland grassland area was dominated by common milkweed (*Asclepias syriaca*), smooth brome (*Bromus inermis*), common dandelion (*Taraxacum officinale*), and Kentucky bluegrass (*Poa pratensis*) with scattered black walnut (*Juglans nigra*) saplings, and a few mature red pines (*Pinus resinosa*).

Approximately 1.4 acres of upland forested land is proposed to be cleared for this Project. Clearing will occur within and up to the fenceline for Primary Arrays B1 and B2 (1.4 acres) prior to the start of construction. Additional details are provided in the Vegetation Management Plan in Appendix C.

Wetlands (Eggers and Reed classification type)

Six (6) wetlands were identified within the Solar Facility Area, and four (4) wetlands were identified within the GenTie Line Area. The field-delineated wetlands located with the Project Area consist of low-quality farmed, fresh (wet) meadow, shallow marsh, and hardwood swamp wetlands.

Fresh (wet) meadow wetlands located within the roadside ditch are considered degraded due to past grading/construction practices and the presence of invasive plant species. Typical farmed wetland vegetation in the Project Area includes varying degrees of herbaceous agricultural weed coverage and stunted crops depending on degree of ponded conditions. Dominant species in the shallow marsh areas delineated within the Generator Tie Line Area include reed canary grass and hybrid cattail river bulrush.

Developed Land

Developed land within the Project Area includes roadways, residential and commercial/industrial areas. Maintained gravel, paved, or lawn areas surrounding buildings are considered developed and are included in the total acreage of developed land. The Gen-Tie Line Area includes approximately 3.1 acres of developed land. The Solar Facility Area includes approximately 6.6 acres of developed land. No residential land is located within the Project Area within the Town of Beaver Dam.

3.4 ENGINEERING DESIGN

This Section 3.4 introduces the engineering design of the Project for the CUP application required under the Conditional Use Permit Application Form.

A preliminary Project engineering schematic can be found in the Appendix B.

3.4.1 Technical Characteristics of Panels

The preliminary layout for the Project included Jinko Eagle 72HM G3 400W bifacial mono-crystalline panels (79.96 x 39.69 x 1.57 in) with tempered glass and an anti-reflective coating. Each panel weighs 51.31 pounds (lbs). The PV modules will be connected in series for up to 1500-volt operation and will be mounted on a tracker system in-line, in portrait orientation on racking, which tracks east to west to follow the angle of the sun throughout the day. The datasheets for the currently proposed PV modules are provided in Appendix B.

The maximum height of the solar panels will be 10 to 13 feet aboveground. Therefore, panel heights, in combination with setback distances are designed to maintain a low profile to minimize blocking horizon lines to the extent practicable.

3.4.2 Technical Characteristics of Panel Supports

The supports and racking will be constructed of galvanized steel. Based on the preliminary design, the Array Technologies, Inc. (ATI) single-axis tracking system is proposed for this Project. Single-axis tracking systems are oriented in a north-south direction which enables the panels to track the sun's position from east to west. If more suitable or technologically advanced tracker systems are developed after the PSC issues a CA order, WPL may select a different tracking system.

WPL anticipates that the spacing between solar panel rows, as measured from the panel posts, is 20 feet, and the spacing between solar panel rows, as measured from the edge of the panels, is 13 feet. Access roads will be up to 16 feet wide with a minimum of 10 feet of clearance to the panels and array equipment. Fences are set back a minimum of 20 feet to arrays or other equipment.

3.4.3 Technical Characteristics of Inverters

The Sungrow SG3150U inverter (117.8 x 114 x 96 in) was used for the conceptual Project design, and a total of 16 inverters are expected to be used in the final Project layout. Each inverter weighs 15,211.9 lbs. A total of fourteen inverters are proposed within the Primary Array area and two inverters are proposed within the Alternate Array area within the Town of Beaver Dam. A manufacturer specification sheet of the inverter used in the preliminary Project design is provided in Appendix B.

3.4.4 Technical Characteristics of Collector Circuits

Based on the preliminary Project design, the Project will contain approximately 5.8 miles of collector circuit runs within the Primary area, approximately 1.13 miles of collector circuit runs in the Alternate Facility Area, and approximately 1.12 miles outside of the PV array areas between the PV array areas and the Project substation.. All collector circuit runs are proposed to be below ground. However, if it is determined during final engineering that the use of overhead collector circuits is advantageous, WPL will share this information. The collector circuit voltage is 34.5 kV.

The collector conductors will be Aluminum (Al). There will be up to 4 collector circuits run in open-cut trenches within upland areas. Directional boring will be used at the road crossings and existing distribution line crossings. No wetland or waterway collector circuit crossings are proposed for the Project. Figure 2.1-3 in Appendix A shows the collector circuit routes, and drawings provided in Appendix B show the typical collector circuit design for the Project.

The typical burial depth for collector circuits is 36 inches. The width of the trench is dependent upon the number of circuits. Typical trench widths are as follows:

- Single Feeder trench width: 12 to 18 inches
- Two Feeder trench: three (3)-foot spacing and three (3) to six-(6) foot trench width
- Four Feeder trench: three (3)-foot spacing and 15-foot to 16-foot trench width

3.4.5 Substation

A preliminary Project substation layout schematic can be found in Appendix B. The Project substation is located in the City of Beaver Dam. The Project substation will require approximately 1.5 acres of land, which is included on a 39.4-acre parcel that is currently under purchase option within the City of Beaver Dam. The Project substation design will be completed during detailed engineering. The substation will include 138kv breakers, disconnect switches, control house, a main power transformer (MPT), metering, lightning arrestors, dead-end, etc. The Project substation will be an electrically grounded fence according to the National Electrical Code (NEC) and NESC. . The Project substation will also have safety lighting and may have security cameras mounted at fence gates.

3.4.6 Transmission and Distribution Interconnection

The Project will have an approximately 1.4-mile over-head Gen-Tie line. A 69-kv Gen-Tie line will connect the Project substation to the existing North Beaver Dam substation. Approximately 0.7 mile of the Gen-Tie line will be constructed as a double circuit line on rebuilt ATC structures associated with the existing ATC X-78 138kV circuit. The remaining 0.7 miles will be new, single-circuit 69kV line. Poles are anticipated to be either direct-embedded steel monopoles or constructed on a concrete pier foundation. The Gen-Tie line structures are anticipated to be approximately 75 feet tall.

3.4.7 Operations and Maintenance (O&M) Facility

The purpose of the O&M structures is to maintain an on-site location for employee use and meeting space for mobilized maintenance staff, and storage for spare parts and equipment. WPL will use its existing resources (operation centers or other facilities in the area) for some storage needs and will dispatch maintenance staff from those facilities to service the Project. WPL is not proposing to construct an O&M building for this Project. Instead, WPL plans to use three CONEX boxes (i.e., storage containers) to satisfy any storage needs for the Project and to establish a secure workspace for maintenance staff. WPL proposes to locate these CONEX boxes to the west of Basswood Road in Array A-3, within the Town of Beaver Dam. A stormwater management pond is proposed adjacent to the proposed O&M structures.

Each O&M structure is typically about 400 square feet (10 feet by 40 feet). A typical diagram is included in Appendix B. The proposed combined footprint of the O&M structures will be roughly 1,200 square feet.

3.4.8 Access Road

Existing public roadways will be used to access the Project. No external temporary roads or temporary widening of existing permanent roads during construction are planned at this time. Permanent internal access roads within the Primary Facility Area are expected to be approximately 2.52 miles in total length, while the permanent internal access roads within the Alternate Facility Area are expected to be approximately 0.72 miles in total length. A total of 2.56 miles of access road is proposed within the Town of Beaver Dam portion of the Project Area. The internal access roads will primarily be located within the secured fenced areas and will not be available for use by landowners. The access roads will be designed to provide access to power conversion equipment within the panel arrays and to solar equipment, and to accommodate ongoing maintenance of the Project components.

WPL does not anticipate constructing temporary access roads constructed within the Project arrays at this time. Permanent access roads will consist of either an improved aggregate base or the existing compacted, vegetated soil surface. Permanent aggregate base access roads will be constructed by first removing the topsoil and organic material, compacting the subgrade, and constructing the road according to civil design requirements. A layer of road base will then be added and compacted. Road aggregate or fill will be a local pit run aggregate material that meets WisDOT specifications. Upon completion of detailed engineering, the aggregate specifications will be available for construction quality assurance. The 16 feet wide permanent access roads will be maintained for the life of the Project.

3.5 GRADING PLAN

This Section 3.5 addresses the requirements under Sec.62-94 (4), Code of the Town of Beaver Dam, Wisconsin.

The majority of the Project Area is currently in agricultural production. Prior to the start of construction (anticipated to be Q2 2022), WPL will coordinate with participating landowners to determine the types of crops that may be present within the Project Area and the timeframe of removal. Once crops are removed, the construction surface will be primarily bare soil with crop remnants which will be re-seeded if

necessary for soil stabilization during construction and in accordance with the Erosion Control and Storm water Management Plan (ECSWMP) and WDNR requirements.

Micro-grading or site leveling will likely be necessary for the installation of access roads before array installation. It is estimated that micro-grading or site leveling will occur on roughly 40-60 acres at one time, using construction blocks, minimizing the acreage of exposed soils at any given time, to the extent practicable. Appropriate Best Management Practices (BMPs) will be installed before these grading activities.

Other than grading requirements for the Project substation and other localized areas, no significant grading is anticipated.

3.6 LANDSCAPING PLAN

This Section 3.6 introduces the conceptual landscaping plan of the Project as required under Sec.62-92 (3),Sec.62-94, Sec. 62-98 (g)(3), and Sec. 62-98 (g)(4) Code of the Town of Beaver Dam, Wisconsin.

The Project will be a compatible use with the surrounding agricultural and rural uses. Tree-lines will be maintained to the extent practicable to provide natural, existing visual buffers. Vegetation immediately adjacent to and within the fenced area is intended to blend-in with the surrounding backdrop and natural vegetation.

All project areas will require vegetative maintenance to establish and maintain desirable and planned vegetation that is compatible with solar array areas and Project operations. Maintenance is expected to be most intensive in the vegetation establishment phase, or approximately two to three years following seeding as desirable species germinate, grow, and mature. In general, native species take longer to mature than non-native species. Monitoring will occur to confirm the compatibility of vegetation with facility goals concurrently with routine vegetation maintenance activities.

Stabilization and revegetation of disturbed areas will occur in stages as construction of the solar blocks and ancillary areas progresses. The bare ground will be re-seeded if necessary and in accordance with the ECSWMP and WDNR requirements. Once the Project is constructed, the site will be revegetated with plantings that will provide similar visual aesthetics to the surrounding area's current use. Further, the Project has vegetation monitoring and management protocols as described below for subsequent years during project operation.

Vegetation Management Plan

The Project's Vegetation Management Plan is included in Appendix C. Additional details about vegetation removal, timing, and installation and maintenance equipment can be found in the Vegetation Management Plan. A description of the mixes and installation location is provided below. Proposed seeding locations are dependent on the final design (e.g., distance between panels, fence placement, etc.). Three permanent seed mixes are proposed for the Project:

1. Low-growth native / non-native graminoid seed mix for PV panel areas
2. Pollinator refuge prairie seed mix for select buffer areas
3. Wetland buffer seed mix for select buffer areas

Screening

In accordance with the Zoning Ordinance Section Section 62.98 (g) which requires visual screening associated with large solar projects in the Town of Beaver Dam, WPL will work with the adjacent landowners to create a landowner-specific visual buffer plan per the following: WPL shall meet with all landowners with an inhabited dwelling within approximately 500 feet of any PV panels of the Beaver Dam Solar's final commercial operational footprint and within 650 feet of the Project substation. The meeting with individual landowners will include an evaluation of existing visual buffers that may include, but not

limited to existing wooded areas, trees, tree-lines, shrubs, outbuildings, solid fencing, and any offsite structures to determine additional visual barrier needs. From this evaluation WPL and the landowners will work to create a landowner-specific. individual visual vegetative buffer plan.

Fencing

The Project Area will have a perimeter fence with secured gates for site access. Array fencing will consist of seven to eight-foot-high woven wire or deer exclusion fence with wood fenceposts. The design of the fencing is included in the schematics in Appendix B. Only WPL and local emergency personnel will have access to the Project beyond the secured gated areas.

The 50-MW_{AC} Primary Facility Area is comprised of four fenced areas and the 12.5-MW_{AC} Alternate Facility Area is comprised of two fenced areas.

4. SELECTED REQUIREMENTS FROM THE CODE OF THE TOWN OF BEAVER DAM, WISCONSIN

This Section 4 addresses the Conditional Use Standards other than the site plan requirements under Code of the Town of Beaver Dam, Wisconsin.

4.1 SPECIFIED SEWAGE DISPOSAL AND WATER SUPPLY FACILITIES

Sewer requirements

Currently there are no plans for permanent onsite sanitary sewer lines or septic systems at the Solar facility. If deemed necessary in the future, a septic system may be constructed to provide sanitary service to the O&M structures. All required state and local permitting would be obtained prior to any associated construction.

Supplies of water

Currently there are no plans for permanent onsite potable water at the Solar facility. If deemed necessary in the future, a water supply well may be constructed to serve the O&M structures. All required state and local permitting would be obtained prior to any water well construction.

4.2 INCREASED SETBACK AND YARDS

This Section 4.2 addresses the setback requirements under Sec.62-94 and Sec. 62-98(G)(2)Code of the Town of Beaver Dam, Wisconsin.

WPL designed the facilities to maintain minimum solar panel setbacks from residences, property lines, and other features. The Project does not require easements from non-participating landowners to accommodate the setbacks utilized. Table 4.3-1 provides the setbacks used for the Project.

Table 4.3-1: Design Setbacks

Type	Setback/ Constraint	Setback	Clarification
Structures	Inhabitable Structures - Building Edge (non-participating)	250 feet (from building footprint)	As measured to edge of panel. Does NOT apply to access roads and fences
Structures	Inhabitable Structures -	250 feet	As measured to edge of panel.

	Building Edge (participating)	(from building footprint)	Does NOT apply to access roads and fences
Structures	Inhabitable Structures - Building Edge with Waiver	Per waiver	
Structures	Noninhabitable Structures	50 feet (from building footprint)	As measured to edge of PV panel or any above ground solar asset (not including project fencing)
Property Lines	Rear and Sideyard Property Lines, non-participating	50 feet from property live to PV generation asset	As measured to PV generation asset, does not apply to access roads or fencing;
Property Lines	Rear and Sideyard Property Lines, participating	No setback	No Setback to property lines shared by participating landowners;
Property Lines	Project PV array area Fence Line Setback, non-participating	10 feet from property line to Project fence	No fenceline setback to property lines shared by participating landowners;
Existing Infrastructure	Public Roads	Varies depending on class of road	Streets and Town Roads (urbanized), 60 ft from centerline, 27 ft from right-of-way Streets and Town Roads (not urbanized), 75 ft from centerline, 42 ft from right-of-way Federal, State, or county highways: 100 feet from centerline, 67 feet from right-of-way Expressways and Freeways: 67 ft from right-of-way
Existing Infrastructure	Pipelines	12.5 ft buffer on each side of pipeline for a 25 ft right-of-way	
Wetlands		50 feet	Does not include farmed wetlands.
Navigable Waterways		75 feet	As measured to PV generation asset, does not apply to access roads or fencing unless local shoreland zoning requires otherwise

4.3 HOURS OF OPERATION AND OPERATIONAL CONTROL

This Section 4.3 addresses the operation requirements under Sec.62-94, Code of the Town of Beaver Dam, Wisconsin.

During construction, the work force will be primarily comprised of delivery drivers, laborers, equipment operators, and management personnel. The equipment operators will operate civil equipment, pile drivers, cranes, boring or directional drilling machinery, and material-handling equipment. Most of the personnel required to construct the Project will be laborers that install racking systems and place modules. At the peak of construction, the workforce will be approximately 100 to 200 workers to construct the Project.

Once construction is complete, and when commercial operation commences the Project facility will be staffed for ongoing O&M which will mobilize from the WPL Beaver Dam Operations center. The Solar facility O&M staff (s) will have specific training and expertise to operate a solar facility, including the Project substation. The maintenance activities include but not be limited to mowing, vegetation management, and panel maintenance and washing. The Project facility will be monitored remotely 24/7.

WPL and its contractor will implement an Environmental Control Program (ECP) consisting of environmental training, regularly scheduled inspections, and tools, such as permit matrices, to ensure ongoing compliance with all applicable environmental rules and regulations. Under the ECP, the environmental lead will provide environmental training to all the contractor's managers and the foreman prior to construction. Thereafter, the contractor will ensure that any employee who works at the site is trained in accordance with the ECP. During construction, the environmental lead will conduct weekly meetings at the site and will conduct regular inspections to ensure all environmental regulations and conditions are being implemented.

4.4 LOCATION OF PARKING AND SIGNS

This Section 4.4 addresses the requirements under Sec.62-94, Code of the Town of Beaver Dam, Wisconsin.

Temporary parking for construction activities will be provided at the primary Project laydown area and near the O&M structures. Permanent parking is planned near the O&M structures. Figure 2.1-3 provided in Appendix A shows the location of parking at the laydown area and the O&M structures.

4.5 SAFETY SIGNAGE

This Section 4.5 provides information regarding the safety signage required under Sec.62-94, Code of the Town of Beaver Dam, Wisconsin.

During the construction, the contractor shall provide safety signs for high noise areas requiring hearing protection, arc flash hazards, and other items needed to meet Occupational Safety and Health Administration (OSHA) regulations and otherwise ensure minimal risk to personnel health and safety while at the Project Area. Further, local routes to the Project will have construction signage notifying deliveries and workers to reduce traffic. Signage will be posted to inform the general public of the additional construction traffic.

4.6 FACILITY DECOMMISSIONING/ SURETY

This Section 4.6 provides facility decommissioning/ surety information required under Sec.62-98 (g)(5), Code of the Town of Beaver Dam, Wisconsin.

Decommissioning activities will begin within 12 months of the Project ceasing operation and are anticipated to be completed within 12 months. Restoration of the Project may extend beyond 12 months as more time may be required to monitor for revegetation and restoration to ensure its success.

The anticipated sequence of decommissioning and removal is described below; however, the overlap of activities is expected, and the more detailed decommissioning plan is provided in Appendix D.

- Reinforce access roads, if needed, and prepare site for component removal;
- Install temporary silt fence and other BMPs to protect sensitive resources and control erosion;
- De-energize solar arrays;
- Remove panels and above ground wiring;
- Remove tracking systems and piles;
- Remove inverters/transformers, all concrete pads and support piers or piles;
- Remove electrical cables less than three feet (36 inches) below the surface;
- Remove access and internal roads, as needed or agreed upon in landowner leases;
- Remove substation, if decommissioned;
- Remove Gen-Tie line and Gen-Tie Line-specific structures, if decommissioned (ATC double-circuit structures not included).
- De-compact subsoils (if required), restore and revegetate disturbed land to pre-construction conditions to the extent practicable

As the Beaver Dam solar project is currently under review with the PSC and therefore is currently considered in a proposed status, WPL has not established/executed sureties with the Town of Beaver Dam for the purposes of the CUP application submittal and approval. WPL will furnish required sureties for the project as required by Town of Beaver Dam.

5. CONSTRUCTION OF PROJECT

This Section 5 provides the supplemental construction information for the Project CUP application under the Code of the Town of Beaver Dam, Wisconsin.

5.1 TYPES OF CONSTRUCTION EQUIPMENT/DELIVERY VEHICLES

The Project will require different equipment types depending on the phase of construction. The first phase consisting of civil work and road building will require dozers, motor graders, and rollers. The pile driving phase will utilize pile drivers. After pile driving, the installation of racking and panels will be supported mainly by skid steers and telehandlers. Directional drilling equipment will be mobilized to the site on low-profile flatbed trailers. For the Project substation, a multi-axle, low-boy trailer will be used for delivery of the MPT and a large truck crane will be needed to set the MPT and other heavy equipment. For other Project substation components, small cranes, bucket trucks, and forklifts will be used to place equipment.

5.2 PROBABLE ROUTES FOR DELIVERY OF EQUIPMENT/ HEAVY AND OVERSIZED EQUIPMENT

Area infrastructure was reviewed for compatibility with large construction vehicles and delivery trucks and a summary of the findings is included in the Road Condition Report in Appendix E. The most suitable transportation route for oversized equipment is US 151 to CTH B to the Project Area. Heavy and

oversized equipment and materials will be delivered to the lay-down yard using this route or an alternate haul route from east of the Project using Interstate 41 (I-41) and then STH 33 and STH 26 to the Project Area.

5.3 ROADS MOST LIKELY TO BE AFFECTED BY CONSTRUCTION AND MATERIALS DELIVERY

Deliveries of equipment and materials from the north, south or west will likely use US 151 and CTH B, with deliveries from the east arriving via I-41, STH 33 and STH 26. During construction, between 100 and 200 construction workers are expected to travel to and from the Project. Minor local traffic congestion may occur from Monday to Friday, twice a day, coinciding with workers arriving or leaving the site.

The Project will receive an average of approximately ten to twelve box trucks per day transporting modules or flatbed trucks transporting inverters, piles and other equipment. These various delivery trucks are expected to be legal-load flatbed and box trucks. The MPT will likely require a special delivery vehicle, and due to its weight (estimated at 200,000 pounds), will require state road permits for its delivery. The delivery of the MPT utilizing a specialized multi-axle, low-boy trailer may require police traffic control along local roadways and possibly be limited to off-peak road use times of the day. This traffic control will only be required during the delivery of the MPT.

Local routes to the Project will have construction signage notifying deliveries and workers to reduce traffic. With construction access points constituting the most significant safety concern for the Project, where possible, trucks entering and leaving the roadway at these points will be required to use warning signage and lights to alert other drivers to their presence. Signage will be posted to inform the general public of the additional construction traffic. The most likely affected roads are listed in Table 5.3-1 below.

Table 5.3-1 List of roads most likely to be affected by construction and materials delivery

Affected Roads
Interstate 41
United States Highway 151
STH 33
STH 26
CTH B
Basswood Road
Hemlock Road
Fir Road

WPL acknowledges that due to construction work, the integrity of local Town and County roads adjacent to and leading towards the Project area to be to be used as construction access routes may be compromised. Therefore, WPL will ensure that the conditions of the local Town and County roads proposed to be used for construction access will be restored to, as good, if not better condition than of preconstruction baseline levels.

Pre-construction conditions of the roads proposed as construction access roads (“haul roads”) will be determined through a coordinated effort between a 3rd party engineering firm, the Town of Beaver Dam and Dodge County to establish a road condition baseline. During construction if roads require repair, either WPL, the Town of Beaver Dam, or Dodge County will repair the damage. If either the Town of

Beaver Dam or Dodge County crews perform the repairs, WPL will reimburse either agency for the repair effort. At the completion of construction, post-construction conditions of the roads used as construction haul roads will be determined by a coordinated effort between the same 3rd party engineering firm, the Town of Beaver Dam, and Dodge County. From this post-construction assessment, either WPL, the Town of Beaver Dam or Dodge County will make the required repairs to bring the integrity to baseline or better conditions. If performed by either the Town of Beaver Dam or Dodge County, WPL will reimburse either agency for the effort.

5.4 DURATION OF TYPICAL TRAFFIC DISTURBANCE/ TIME OF DAY

A small traffic increase will likely occur twice a day during the work week (Monday through Friday) when construction workers are traveling to and from the Project. This increase will consist of the personal vehicles owned by the workers. Deliveries of equipment will also be traveling to the Project during the work week. Material deliveries will generally be scheduled throughout the day versus during hours when residents are also commuting.

5.5 LAYDOWN AREAS

Staging and lay-down areas will be developed to receive and store construction materials and equipment. A primary lay-down area will also contain construction trailers and parking for personnel and construction-related vehicles. The primary 4-acre laydown area will be constructed west of Basswood Road, between CTH B and Hemlock Road within the Town of Beaver Dam. This area consists of entirely agricultural land and is shown on Figure 2.1-3 in Appendix A. During construction, temporary laydown areas will be established in upland agricultural areas within the Primary Facility Area. These laydown areas will be transient and will move as construction progresses. In the event laydown areas need to be sited outside of the Primary Facility Area, they will be established within the Alternate Facility Area with landowner permission and will be located so as to not adversely impact wetlands or environmentally sensitive areas. The specific location of the temporary laydown areas within the Project Area will be established during the final engineering design and construction planning for the Project.

As discussed in Section 4.4, the temporary parking for construction activities will be provided at the primary Project laydown area and adjacent to the O&M structures in the Town of Beaver Dam. Permanent parking is planned near the O&M structures. Figure 2.1-3 in Appendix A shows the location of parking at the laydown area and the O&M structures.

5.6 PRELIMINARY CONSTRUCTION SEQUENCE

The estimated construction schedule is provided in Table 5.6-1 below. The site work is planned to begin Q2 of 2022. The actual construction start date will be contingent on receipt of regulatory approvals. A more refined schedule will be prepared as the permitting and engineering processes proceed.

Table 5.6-1: Estimated Project Construction Schedule

Activity	Start	End
Start of Construction	Q2 2022	
Site Preparation (Erosion Control and ongoing maintenance)	Q2 2022	
Vegetation Removal and Temporary Seeding	Q2 2022	Q3 2022
Staging and Lay-down Areas	Q2 2022	Q2 2022
Construct Project Substation	Q3 2022	Q2 2023

Construct Generator Tie Line	Q3 2022	Q2 2023
Access Roads	Q2 2022	Q1 2023
Drive Posts	Q2 2022	Q4 2022
Install Racks	Q2 2022	Q1 2023
Install Inverter Pads	Q4 2022	Q2 2023
Install Solar Modules	Q4 2022	Q3 2023
Backfeed	Q3 2023	Q3 2023
Commissioning	Q4 2023	Q4 2023
In-Service Date		Q4 2023

5.7 OPERATIONS AND MAINTENANCE

Section 3.4.6 provided the purpose and the preliminary design of the O&M structures. The sections below provide additional details regarding the proposed CONEX boxes.

Security plans for the property

The O&M structures will be located within the secure fenced area of the Project west of Basswood Road in the Town of Beaver Dam. Gates and doors to the O&M structures will be secured using computerized card readers.

Parking lots

A parking lot with space for approximately 10 vehicles will be constructed next to the O&M structures in the Town of Beaver Dam.

Sheds or storage buildings

No sheds or additional storage buildings are planned for this Project. The O&M structures will have sufficient space for storage of equipment and materials. Other storage may be utilized on a temporary basis during construction or decommissioning.

Stormwater management facilities

Permanent stormwater management facilities will be constructed to manage and treat stormwater associated with the new Project substation in the Town of Beaver Dam. A detention pond will be located roughly 20 feet to the west of the substation fence and nearby grades will be constructed to ensure water is properly routed to the pond via overland sheet flow and/or vegetated swales. The detention pond will have an emergency overflow weir designed to safely route excess flow from a 100-year-or-above storm event.

6. ECONOMIC IMPACTS

This Section 6 provides the supplemental economic impacts analysis for the CUP application under the Code of the Town of Beaver Dam, Wisconsin.

6.1 PROJECT EFFECTS ON LOCAL GOVERNMENT UNITS

Wisconsin's Shared Revenue Utility Aid Program provides payments to be distributed annually to the communities hosting an electric generator. WPL's proposed 50-MW Beaver Dam Solar Project is eligible for two components of the Shared Revenue Utility Aid Program: the MW-based payment and the Incentive payment.

In aggregate, the Beaver Dam Solar Project will generate approximately $200,000 in annual payments through the above-referenced Shared Revenue Utility Aid Program. Modern PV solar facilities are expected to have useful lives in excess of 30 years. A conservative estimate of 25 years of shared revenue would result in almost $5 million to the county and townships hosting the Project.

Based on the per MW payments, a 50-MW project would annually contribute approximately $83,334 combined total to the Towns of Beaver Dam and Burnett, and $116,667 to Dodge County.[6] The estimated Utility Payment breakdown for Town and County is summarized below in Table 6.1-1.

Table 6.1-1: Estimate of Annual Revenue for 50-MW Project

Payment Type	Town of Beaver Dam & Town of Burnett, Total	Dodge County
MW-based Payment	$33,334	$66,667
Incentive Payment	$50,000	$50,000
Total	$83,334	$116,667

Benefits to the community and surrounding area include the possible hiring of local construction, commissioning, operations, and maintenance contractors. Approximately 100 to 200 construction workers will be employed to build the Project. In addition to construction labor, the Project will require skilled electricians, operations staff, and maintenance workers during commercial operations. When possible, these jobs will be sourced from surrounding communities.

Additional benefits include significant revenues and financial stability to area landowners who are participating in the Project (as both land sellers or grantors of leases or easements), and a potential increase in local employment opportunities to support the Project. Other economic benefits include ancillary jobs and local support positions in areas such as food service, lodging, fuel, sanitation, gravel, asphalt, and other service providers that commonly experience an uptick in business during construction projects.

6.2 PROJECT EFFECTS ON LOCAL PROPERTY VALUES

Property values can be influenced by a complex interaction of factors specific to individual parcels. These factors can include but are not limited to, property condition, improvements, acreage, or neighborhood characteristics, as well as proximity to schools, parks, and other amenities. As municipalities, cities, and states continue to adopt more renewable energy to meet cleaner energy mandates, the presence of a utility-scale PV electric generation facility would also become one of many interacting factors affecting a

[6] As discussed in Section 1.1, the Project will be located in both the Town of Beaver Dam and the Town of Burnett, Therefore, the MW-based payment and incentive payment will be divided between the two towns based on the net book value of that portion of the plant located in each municipality as of the date the plant is operational. *See* Wis. Stat. §§ 79.04(6)(c)2., 79.04(7)(d). Given that final engineering has yet to be completed on the Project, WPL is unable to calculate at this time how these payments would be allocated between the two towns.

property's value. A study[7] conducted by Kirkland Appraisals, LLC in 2016 conducted across Illinois determined that there is no impact in home values due to the adjacency to the solar farm as well as no impact to adjacent vacant residential or agricultural land. Similarly, an analysis performed by CohnReznick[8] in five counties in Indiana also indicated that no consistent negative impact has occurred to adjacent property with respect to unit sale prices or other influential market indicators that could be attributed to proximity to the adjacent solar farm. Several factors that may contribute to avoiding decreases in property values are:

- Solar facilities once operational are a passive form of land use and do not produce byproducts, waste, or odor and are nearly silent.
- During operation, solar facilities do not attract high volumes of additional traffic due to low operational maintenance requirements.
- Solar facilities maintain a consistent, long-term land-use in rural areas that may be otherwise susceptible to construction common to urban-sprawl development. A solar facility limits these changes in a passive manner.

Due to the relative infancy of the utility-scale solar power industry in the United States and in particular Wisconsin, there have not been significant comprehensive property values studies performed to date pertaining to utility-scale solar development. The few studies available indicate that not only have there been no decreased property values observed associated with solar facilities, but property values adjacent to solar facilities have increased.

7. ENVIRONMENTAL STUDIES

This Section 7 provides the supplemental environmental studies for the CUP application for the CUP application under the Code of the Town of Beaver Dam, Wisconsin.

7.1 WETLAND AND WATERWAY STUDIES

A wetland determination and delineation of the Project Solar Facility site was conducted in the spring and winter of 2020 and spring and summer of 2021. The purpose and objective of the wetland determination and delineation was to identify the extent and spatial arrangement of wetlands, as well as to identify potentially jurisdictional waterways, within the Project Area.

Four wetlands were identified and delineated within the Project Area in accordance with state and federal guidelines and were subsequently surveyed with Global Positioning System (GPS) and mapped using Geographic Information System (GIS) software. There are a combined total of 31.59 acres of wetlands within the Project Area. Wetlands were composed of fresh wet meadow, farmed wetland, and hardwood swamp. Uplands within the Project Area were primarily composed of agricultural fields with a small amount of grassland.

WDNR Surface Water Data Viewer (SWDV) was also reviewed to determine if any waterways or waterbodies within the Project Area have been mapped by the WDNR. Two WDNR 24K flowlines identified as intermittent waterways are mapped within the Project Area boundary (WBIC's 872500 and 834000), of which WBIC 872500 is located in the Town of Burnett and WBIC 834000a is located in the Town of Beaver Dam. WBIC 834000 (Crystal Creek) is WDNR 24K mapped within the Gen-Tie Line Area was field delineated as Wetland GT-W4 as fresh wet meadow and shallow marsh.

The WDNR provided a concurrence for the Beaver Dam solar area Wetland Delineation Report on June 28, 2021. On October 8, 2021, WPL submitted a separate Wetland Delineation Report for the Gen-Tie

[7] Kirkland Appraisals Grandy Solar Impact Study (southripleysolar.com)
[8] Microsoft PowerPoint - CohnReznick Presentation - CCR Slide Deck - General - July.pdf (mcleancountyil.gov)

Line, Project substation and the collector line connecting the PV arrays to the Project substation. WPL received WDNR concurrence of the separate Wetland Delineation Report on November 16, 2021.

7.2 CULTURAL RESOURCES

A cultural resource review was conducted for the project, which included an initial cultural resources database review, creation of an archaeological site probability model, and field investigations to identify any cultural resources present within the Project Area boundary. The results of the cultural resources database review identified one previously conducted archaeological survey within the Solar Facility Area and two previously conducted archaeological surveys within the Gen-Tie line area. One previously identified archaeological site is present in the Solar Facility Area, while two previously identified archaeological sites, both also prehistoric Native American burial sites, are present in the Gen -Tie Line Area. No active or historic cemeteries are present in either the Solar Facility or Gen-Tie Line Areas. No

historic structures are present within the Solar Facility area or within 0.25-mile of the Solar Facility area.

Archaeological site location modeling was used to identify 9.22 acres of high probability for archaeological sites. Archaeologists conducted a pedestrian and shovel test pit (STP) survey of 7.56 acres and visual review of 0.04 acres, for a total survey area of 7.60 acres of high prehistoric Native American and Historic period Euro-American archaeological site potential for the Solar Facility Area. An additional 1.62 acres were avoided due to presence of uncatalogued burial sites. The survey resulted in the identification of two Historic period sites. Both sites are located in the Town of Beaver Dam and neither site appears to retain deposits or structural remain that could yield information important to the history of Wisconsin.

7.3 ENDANGERED SPECIES

An Endangered Resources (ER) Review was conducted for the Project to identify whether any state or federally-listed rare species, natural communities, or other natural features with element-occurrence records may occur within one mile of the Project Area boundary. Certified ER Reviews were submitted to the WDNR for the Solar Facility Area on October 9, 2020, and for the Gen-Tie line area on March 4, 2021. The WDNR approved the Solar Facility Area ER Review and provided concurrence and recommendations on October 9, 2020 (ER Log #20-746). The WDNR approved the Gen-Tie Line Area ER Review and provided concurrence and recommendations on March 8, 2021 (ER Log #21-145). Because there were changes to the NHI data base for the area surrounding the Project, the certified ER Review was renewed for the Solar Facility Area and the Gen-Tie Line Area on August 4, 2021. The WDNR approved the Solar Facility Area and the Gen-Tie Line Area ER Reviews and provided concurrence on August 8, 2021. The certified ER Review was renewed again for the Gen-Tie Line Area, the Project Substation Parcel, and the Collection Corridor Area on September 4, 2021 due to changes in the Project area and scope. The WDNR approved the Gen-Tie Line Area, Project Substation Parcel, and Collection Corridor Area ER Review and provided concurrence on September 14, 2021. The final ER Reviews listed no required or recommended actions for wildlife species.

7.4 EROSION CONTROL AND STORM WATER MANAGEMENT PLAN

Once the Project is authorized by the PSC, WPL will submit a Water Resource Application for Project Permits (WRAPP) to the WDNR in accordance with Wis. Admin. Code ch. NR 216. The application will include a site-specific ECSWMP. The Plan will include technical drawings and descriptions of the Erosion Control BMPs that will be followed in compliance with WDNR technical standards. The ECSWMP will address soil and slope stabilization; seeding, mulching and establishment of vegetation; matting, tracking pads, silt fences, and stockpile protection; channel protection and other associated strategies to minimize site erosion.

7.5 SUMMARY OF GLARE STUDY

Glare can occur from the reflection of sunlight on the PV solar panels of utility-scale solar-powered electric generating facilities. While PV solar panels absorb direct sunlight, some reflection can occur when the panels are not directly facing the sun which predominately occurs during sunset and sunrise when the incidence angle of the panels is highest. Therefore, a web-based ForgeSolar glare hazard analysis program was used by WPL's environmental consultant to analyze the potential for glare impacts to drivers, residential dwellings and piloted (aerial) receptors associated with the Project.

The vehicular glare analysis was completed at two heights for roadways: 5-ft (cars and small trucks) and 9-ft (semi-trucks) viewing heights. The results of the ForgeSolar analysis determined that glare from the Project is not predicted to occur for drivers of vehicles on five roadways adjacent to the Project. All routes and residential dwellings were analyzed using 5-ft, 9-ft and 12-ft panel heights to document a full range of potential panel heights to endeavor to address the worst-case scenario that can be reasonably anticipated. Glare is not predicted for the 48 residences that were analyzed in proximity to the Project area.

The glare study also analyzed potential glare for pilots of planes landing at two airports, a seaplane base, and helicopter pilots hovering 500-ft above ground level (AGL) above three heliports located within 10 miles of the Project area. Based on the solar array parameters and the current site design, glare is not predicted from the Project for pilots landing at two airports located within 10 miles of the Project area, a seaplane base located approximately 3.5 miles west of the Project area, or for helicopter pilots hovering at 500 feet (ft) over three heliports that are located within 10 miles of the Project area.

7.6 SUMMARY OF SOUND STUDY

While PV solar facilities generate very little observable noise at the Project's perimeter fence-line, some equipment components such as inverters and MPTs generate low level noise. And while these pieces of equipment are strategically positioned to the inside of the array areas as well as away from residential dwellings to minimize detectable noise, a pre-construction/post construction sound survey program was initiated by WPL's environmental consultant to analyze the effects of noise associated with the Beaver Dam Solar facility. The City of Beaver Dam, Town of Beaver Dam, and Town of Burnett have public nuisance ordinances, but they do not explicitly address noise. In the absence of existing pertinent regulations, and under the guidance of the PSC, the rules for monitoring followed the PSC document titled "Measurement Protocol for Sound and Vibration Assessment of Proposed and Existing Electric Power Plants". A pre-construction ambient sound survey of the substation and solar array areas for the Project to quantify the existing acoustical environment was conducted in January 2021 and September 2021.

The sound generated due to operation of the facility will be from the substation transformer and the inverters located throughout the Project Area. Sound analyses were completed for both an inverter skid and the substation MPT based on information provided by the equipment manufacturers. The estimated expected sound at the nearest residence to a solar inverter was calculated to be 42.3 decibels (dBA) and the estimated expected sound from the substation MPT was at a residence and was calculated to be 37.0 dBA. Computer modeling of the expected overall Project impact on a residence was calculated to be 42.3 dBA, assuming a ground attenuation (GA) of 0.5 (representative of the surrounding landscape). Sound levels from the proposed Project do not exceed 50 dBA during daytime hours or 45 dBA during nighttime hours, as defined by the PSC Standard. When operational, the combined impact of the inverters and substation on nearby residences is not predicted to exceed these levels during normal operating conditions.

A post-construction sound analysis and report will be completed following construction of the Project and commencement of operations. The purpose of the analysis will be to verify the findings and conclusions of this noise analysis.

As the design of the facility progresses, WPL will reevaluate the sound impact assessment and will update the report to verify compliance should any of the following occur:

- Equipment sound level specifications for the invertor skid or transformer increase from the levels utilized in this analysis,
- The minimum distance from an inverter skid to a residence decreases to less than 500 feet, or
- The minimum distance from the substation MPT to the nearest Noise-sensitive Area (NSA) decreases to less than 1500 feet.

WPL will work to maintain equipment and conduct repairs in a timely manner to avoid excessive sound. As determined by the Sound Study, sound resulting from the operation of the solar facility is anticipated to have minimal impact on nearby residences. If the Project receives sound complaints from local residents, WPL will implement mitigation measures, if appropriate, to resolve the complaint.

APPENDIX A

FIGURES

Figure No.

2.1-1

Title

Project Location

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

N

0 1.25 2.5 Miles

(At original document size of 11x17)
1:158,400

Legend

- Project Area
- 10-Mile Buffer
- County Boundary
- Municipal Boundary

Notes

1. Coordinate System: NAD 1983 HARN Wisconsin TM
2. Data Sources: Stantec, WPL, WisDOT, WDNR, Esri
3. Background: ESRI World Street Map

Stantec

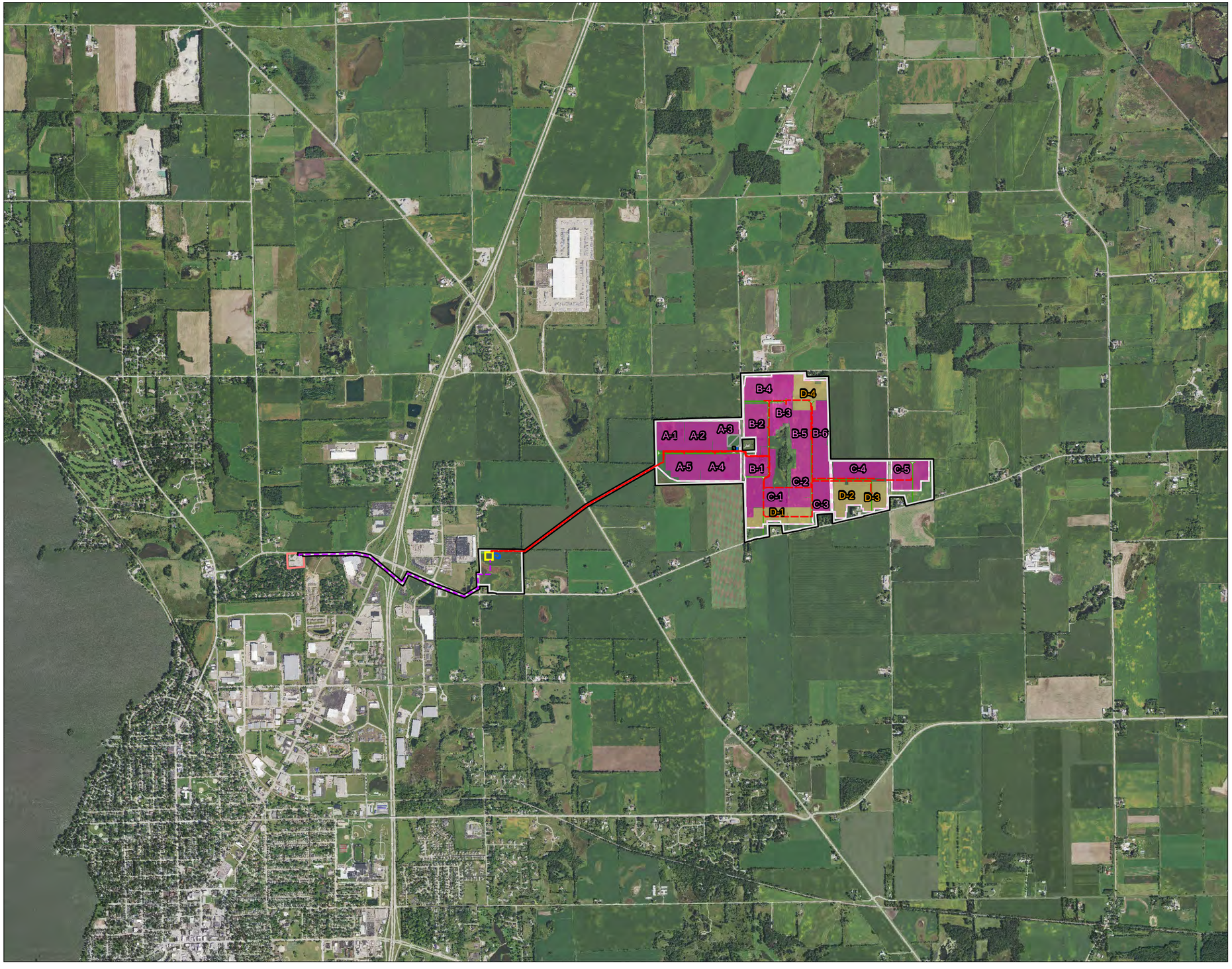


Figure No.

2.1-2

Title

General Project Area

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett,
Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

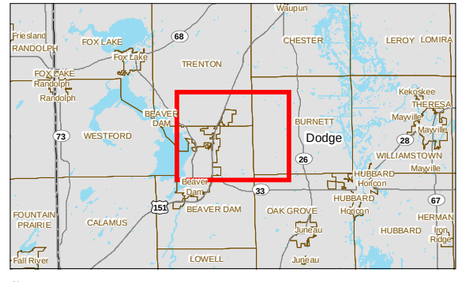
N

0 1,500 3,000 Feet

(At original document size of 11x17)
1:36,000

Legend

- Project Area
- Generator Tie Line
- Collection System
- Access Road
- Boundary Fence
- Solar PV Array Area - Primary
- Solar PV Array Area - Alternate
- Project Substation
- Substation
- O&M Structure
- Stormwater Basin
- Lay-down Yard



Notes

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2. Data Sources: Stantec, WPL, WisDOT, WDNR
3. Orthophotography: 2020 NAIP

Stantec

SYSTEM DESCRIPTION	
POI CAPACITY (AC)	50 MW
SOLAR CAPACITY (DC)	64.42 MW
DC:AC RATIO @ POI	1.29
AC COLLECTION SYSTEM VOLTAGE	34.5 kV
NUMBER OF ISAs	14

RACKING PARAMETERS	
GROUND COVER RATIO	31.28%
RACKING	SINGLE AXIS TRACKER (1P)
TILT ANGLE	+/- 52°
ROW TO ROW SPACING	25.00'
AVERAGE AZIMUTH ANGLE	0
NO. OF 3-STRING TRACKER ROWS (TRINA)	1,180
NO. OF 4-STRING TRACKER ROWS (RISEN)	34

INVERTER PARAMETERS	
MAKE	POWER ELECTRONICS
MODEL #	FS4010M
SKID POWER RATING UP TO 40°C (DESIGN TEMP)	4010 KVA
AC VOLTAGE	630 V
MAX DC VOLTAGE	1,500 V

540 W MODULE PARAMETERS	
MAKE	TRINA SOLAR VERTEX
MODEL #	TSM-DEG19C.20
POWER RATING	540 W
TOTAL MODULES	116,820
MODULES PER STRING	33
MAX DC VOLTAGE	1,500 V

380 W MODULE PARAMETERS	
MAKE	RISEN SOLAR TECHNOLOGY
MODEL #	RSM144-6-380BMDG
POWER RATING	380 W
TOTAL MODULES	3,536
MODULES PER STRING	26
MAX DC VOLTAGE	1,500 V

LEGEND:

- PROPERTY LINE
- BUILDABLE SOLAR AREA
- FENCE
- SOLAR SETBACK
- 3 - STRING TRACKER (TRINA)
- 4 - STRING TRACKER (RISEN)

N

0 400' 800'

SCALE IN FEET

Note:
This revised layout received by the Town 3/10/22

TB:V9.0.1.03
Plotted: $DATE$
File: $FILE$

BURNS McDONNELL

9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
Firm License No. 1308-11

BMCD 129466
CONTRACT 8410

NO.	DATE	REVISION	BY	CHK'D	APV'D
D	01-12-2022	ISSUED FOR REVIEW	TAS	GGR	MGJ
C	01-11-2022	ISSUED FOR REVIEW	TAS	GGR	MJG
B	12-07-2021	ISSUED FOR REVIEW	TAS	GGR	MJG
A	10-19-2021	ISSUED FOR REVIEW	TAS	GGR	MJG

Alliant Energy.

WISCONSIN POWER AND LIGHT COMPANY
DODGE COUNTY, WI

BEAVER DAM SOLAR
OVERALL SITE PLAN

SCALE: AS NOTED

DWG. NO. EC-003

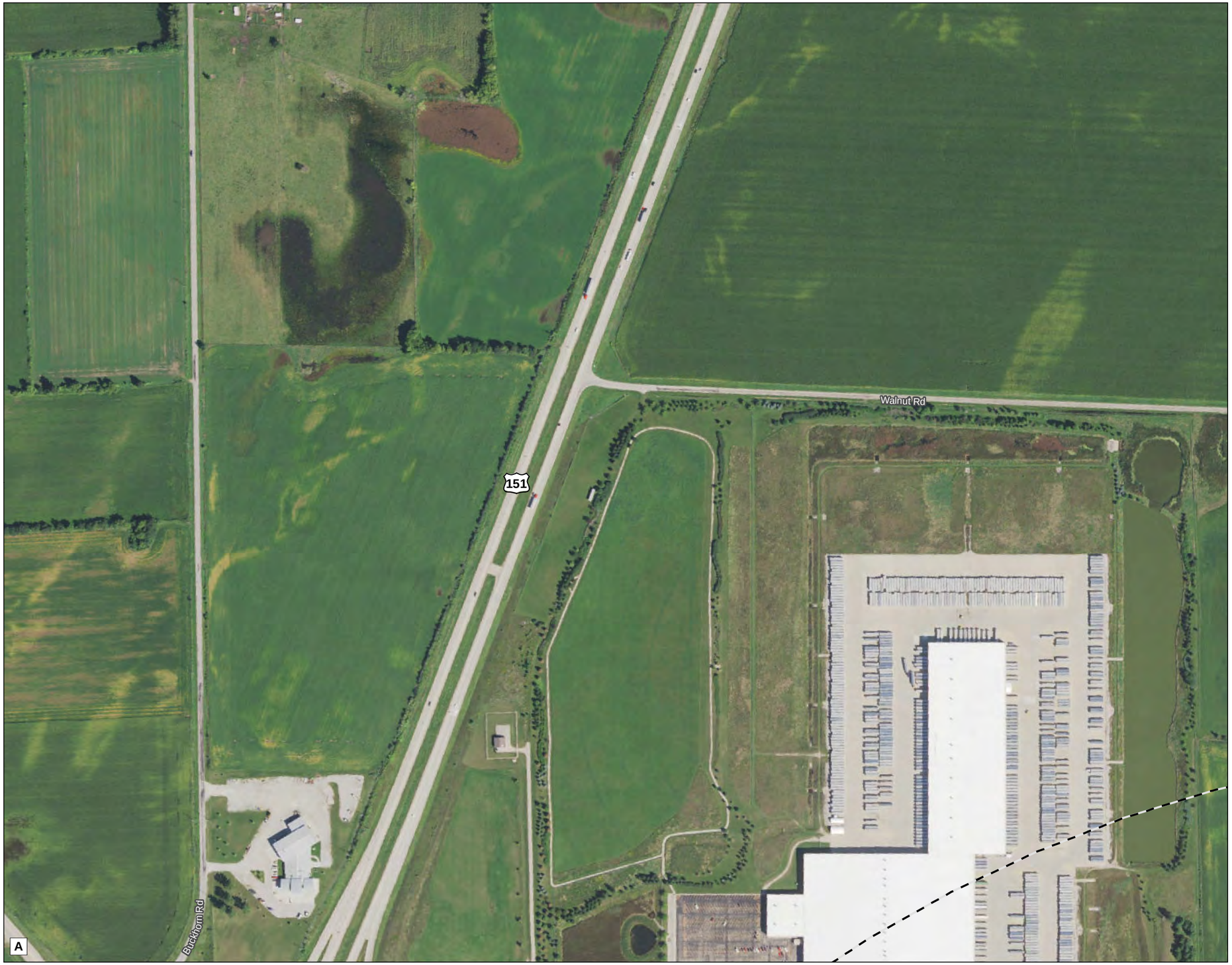


Figure No.
2.1-3

Title
Detailed Project Area

Client/Project 193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

N

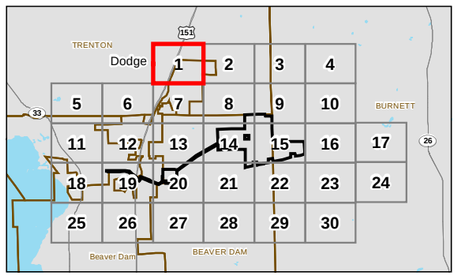
0 200 400 Feet
(At original document size of 11x17)
1:4,800

Legend

- Project Area
- 1 Mile Buffer
- Inverter
- Generator Tie Line
- Collection System
- Access Road
- Boundary Fence
- Solar PV Array Area-Primary
- Solar PV Array Area-Alternate
- Project Substation
- Substation
- O&M Structure
- Stormwater Basin
- Lay-down Yard
- Electric Transmission Line
- Overhead Electric Distribution Line
- Gas Transmission Pipeline

Sensitive Receptor

- Residential - Home
- Residential - Apartment
- Agricultural - Concentrated Animal Feeding Operation (CAFO)
- Agricultural - Small Commercial Confined Animal Building
- Agricultural - Small Non-Commercial Confined Animal Building
- Agricultural - Other
- Industrial/Commercial
- Healthcare Facility
- Place of Worship
- Daycare/School
- Cemetery
- Other



Notes
1. Coordinate System: NAD 1983 HARN Wisconsin TM
2. Data Sources: Stantec, WPL, WisDOT, WDNR, Penwell, NPMS
3. Orthophotography: 2020 NAIP

Stantec

Figure No.

2.1-3

Title

Detailed Project Area

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

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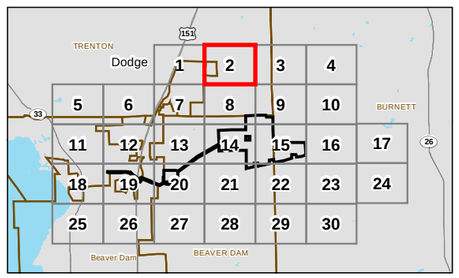

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3. Orthophotography: 2020 NAIP

Stantec

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Figure No.
2.1-3

Title
Detailed Project Area

Client/Project 193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

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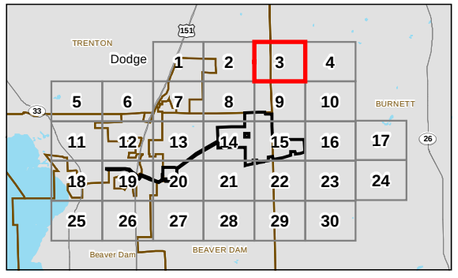

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3. Orthophotography: 2020 NAIP

Stantec

Figure No.

2.1-3

Title

Detailed Project Area

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

N

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Legend

- Project Area
- 1 Mile Buffer
- Inverter
- Generator Tie Line
- Collection System
- Access Road
- Boundary Fence
- Solar PV Array Area-Primary
- Solar PV Array Area-Alternate
- Project Substation
- Substation
- O&M Structure
- Stormwater Basin
- Lay-down Yard
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- Overhead Electric Distribution Line
- Gas Transmission Pipeline

Sensitive Receptor

- Residential - Home
- Residential - Apartment
- Agricultural - Concentrated Animal Feeding Operation (CAFO)
- Agricultural - Small Commercial Confined Animal Building
- Agricultural - Small Non-Commercial Confined Animal Building
- Agricultural - Other
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- Place of Worship
- Daycare/School
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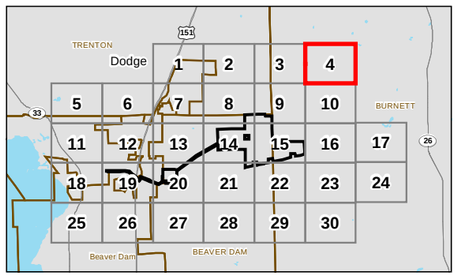

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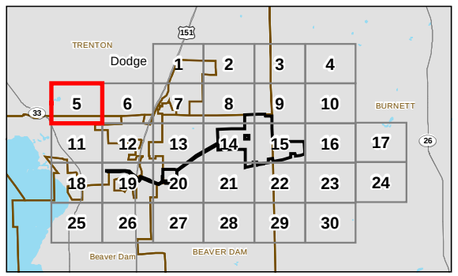

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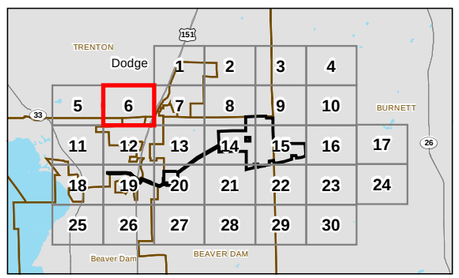

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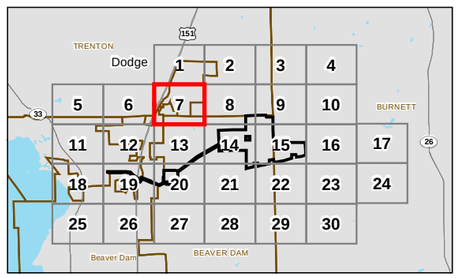

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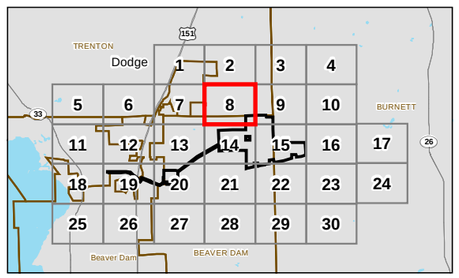

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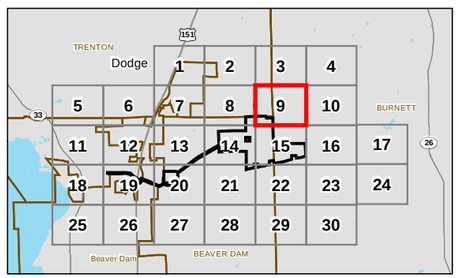

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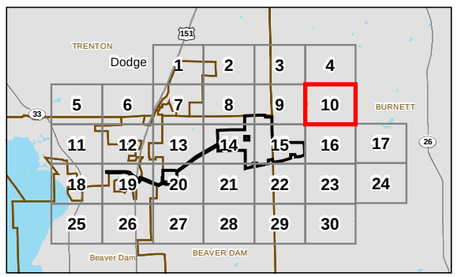

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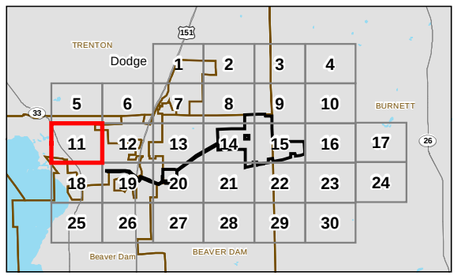

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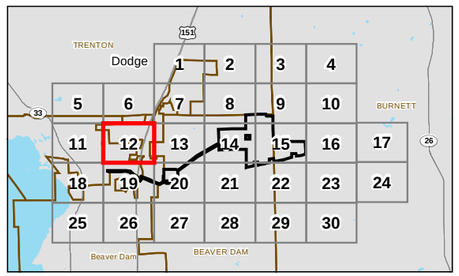

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Stantec

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Figure No.

2.1-3

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Detailed Project Area

Client/Project

193707481

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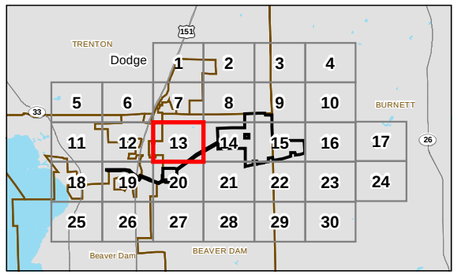

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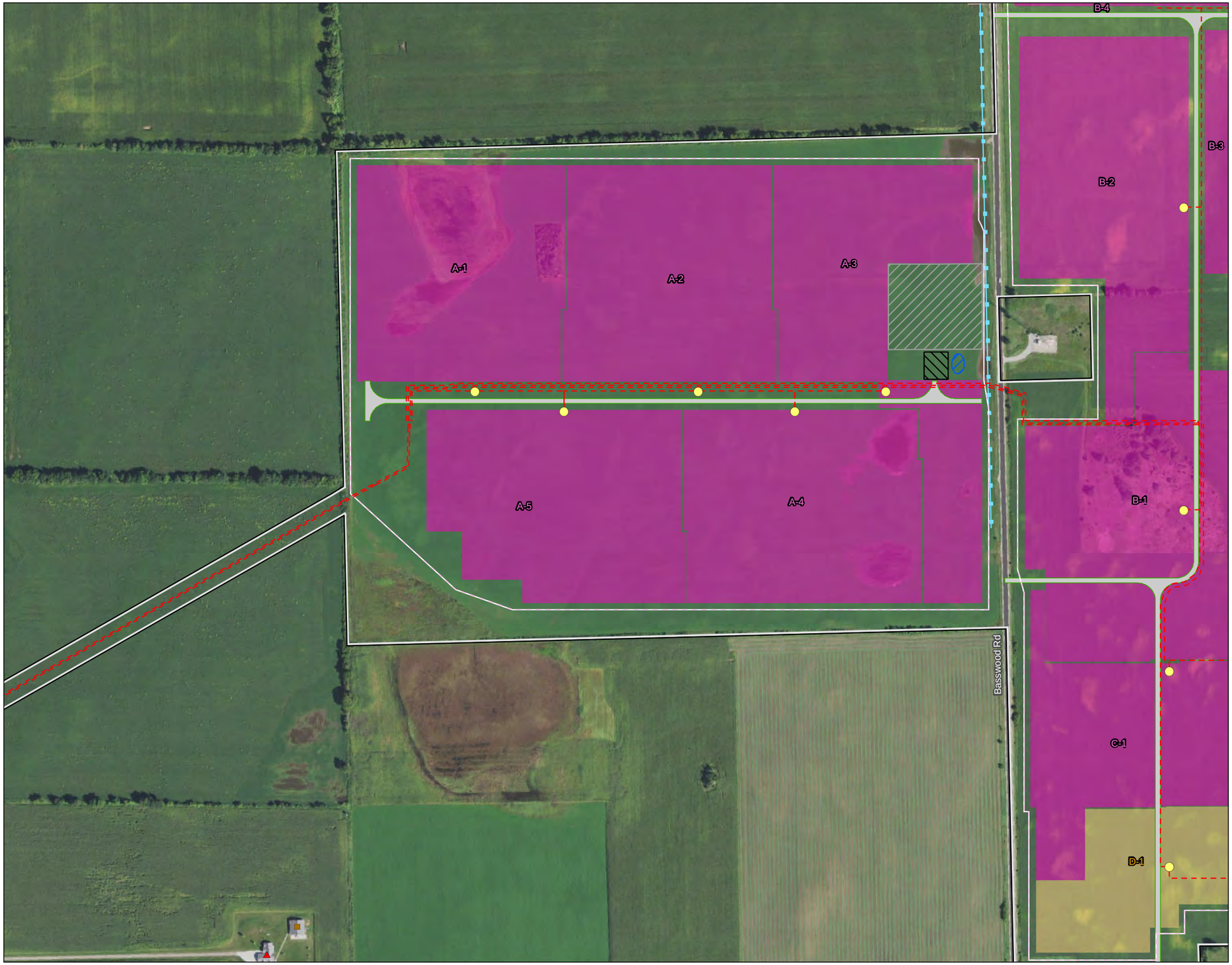

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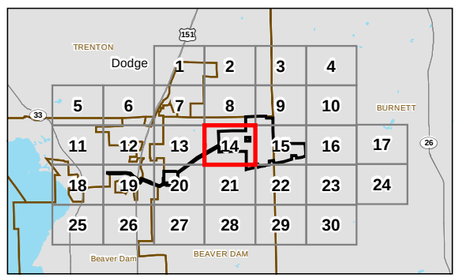

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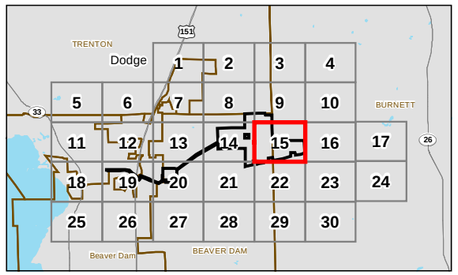

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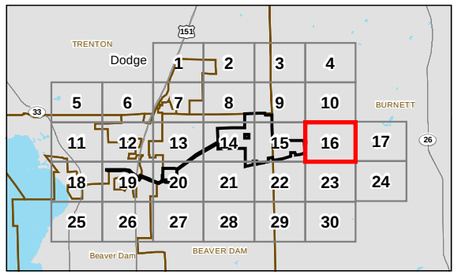

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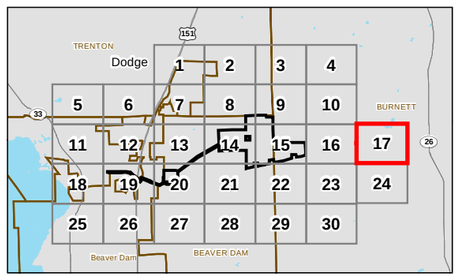

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Sensitive Receptor

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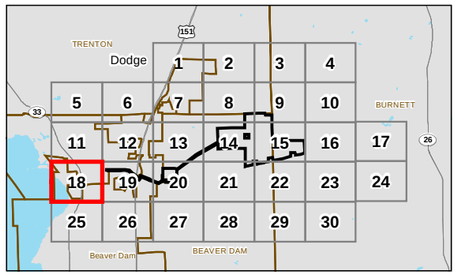

Notes
1. Coordinate System: NAD 1983 HARN Wisconsin TM
2. Data Sources: Stantec, WPL, WisDOT, WDNR, Penwell, NPMS
3. Orthophotography: 2020 NAIP

Stantec

Figure No.

2.1-3

Title

Detailed Project Area

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

N

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(At original document size of 11x17)
1:4,800

Legend

- Project Area
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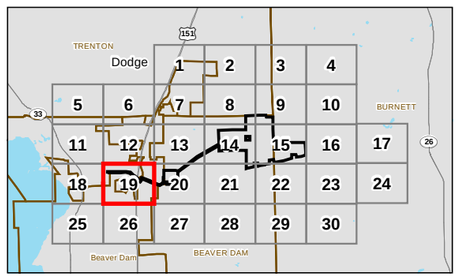

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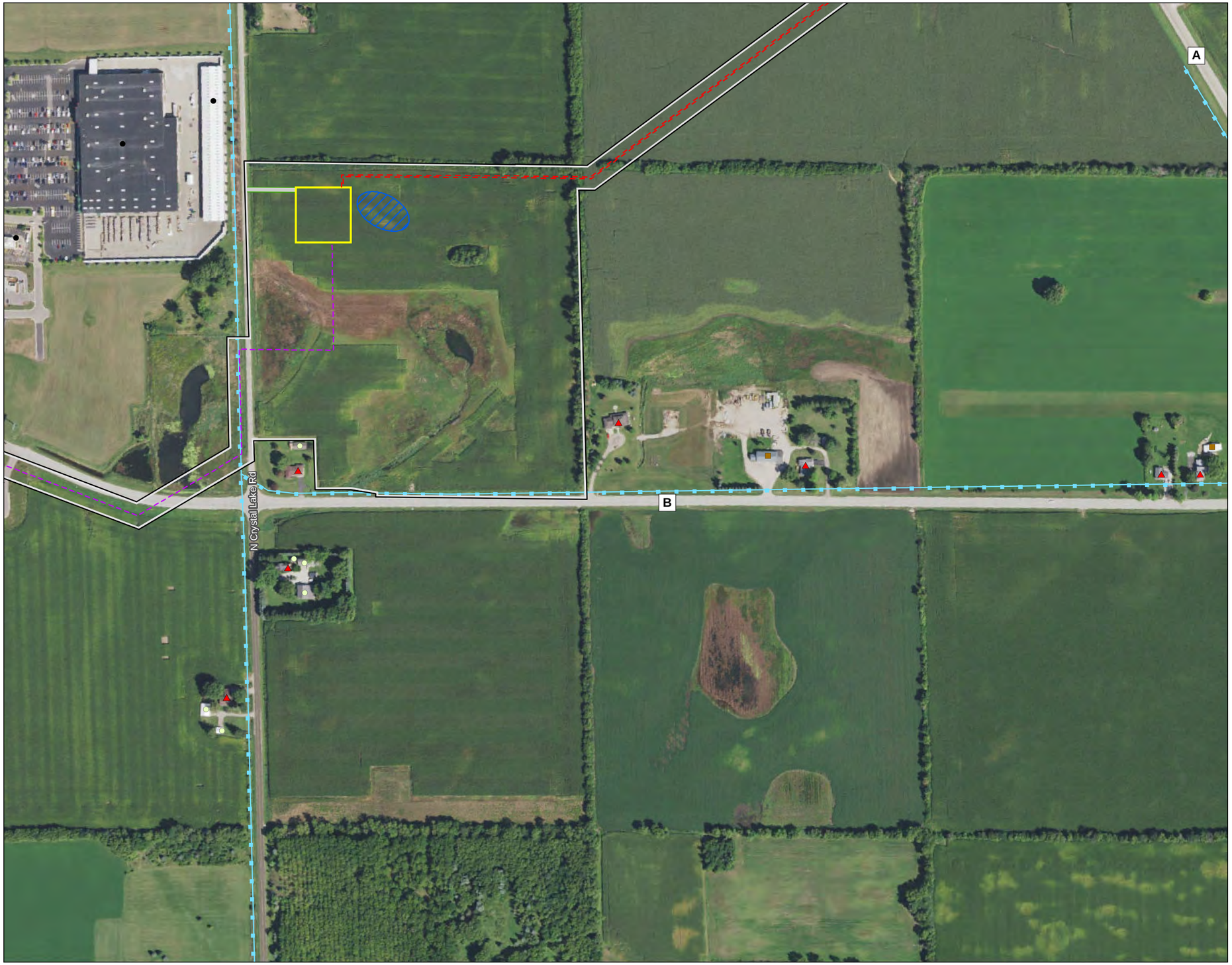

Figure No.
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Title
Detailed Project Area

Client/Project
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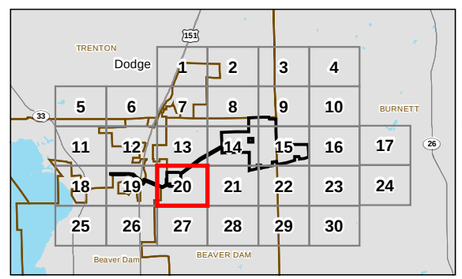

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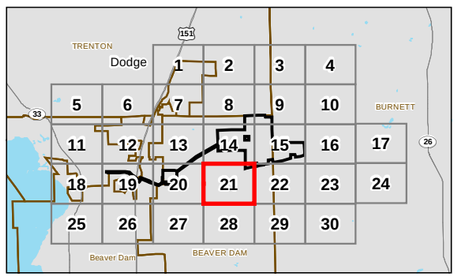

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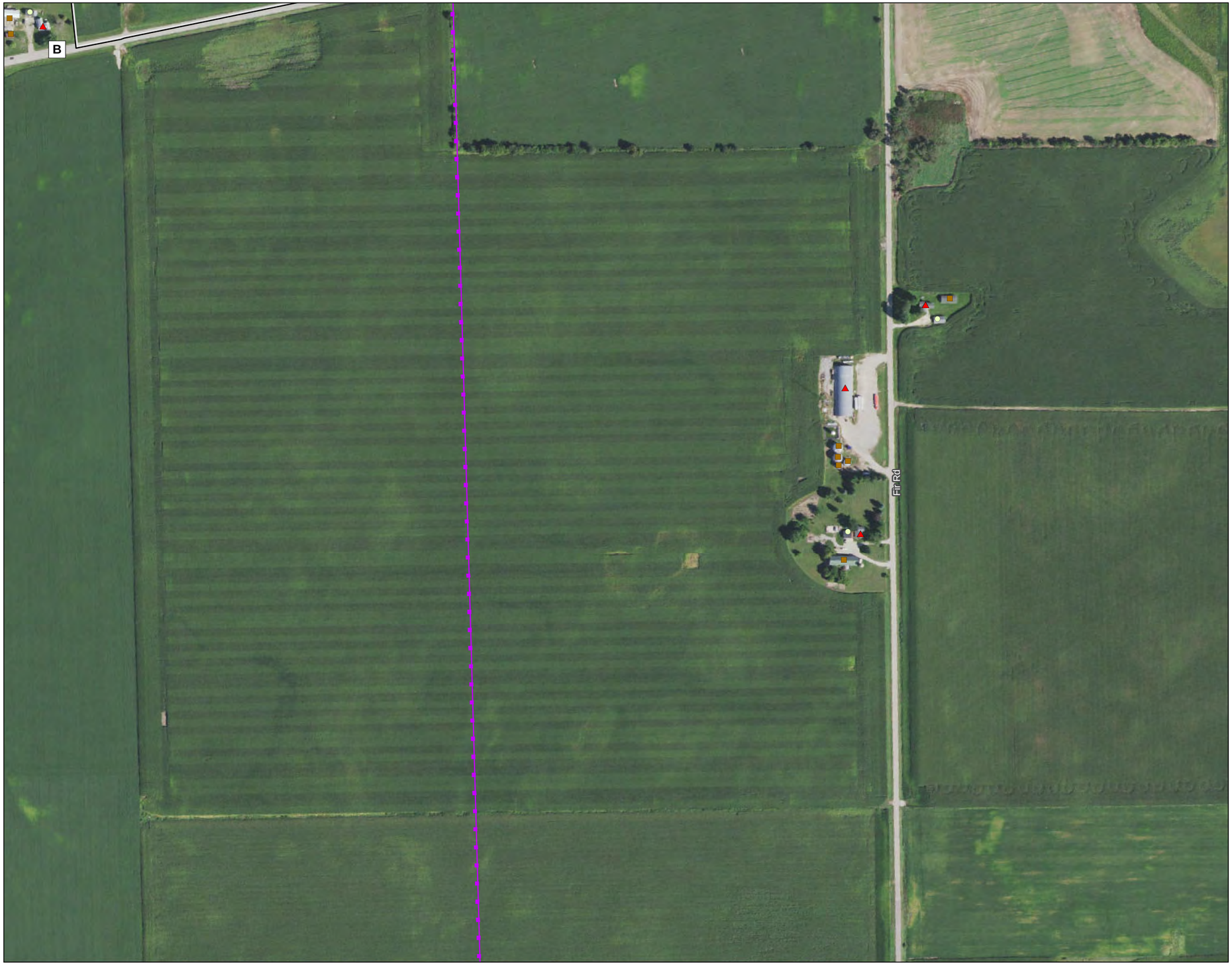

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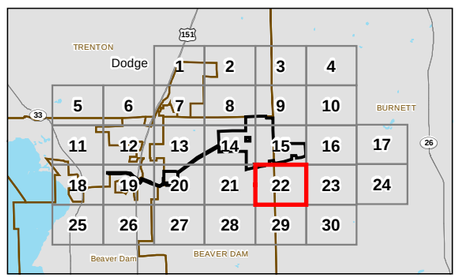

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Stantec

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Figure No.

2.1-3

Title

Detailed Project Area

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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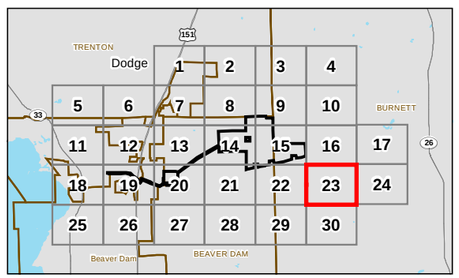

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Figure No.
2.1-3

Title
Detailed Project Area

Client/Project 193707481
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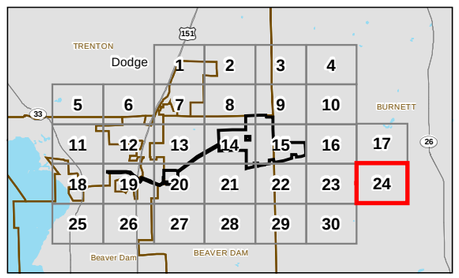

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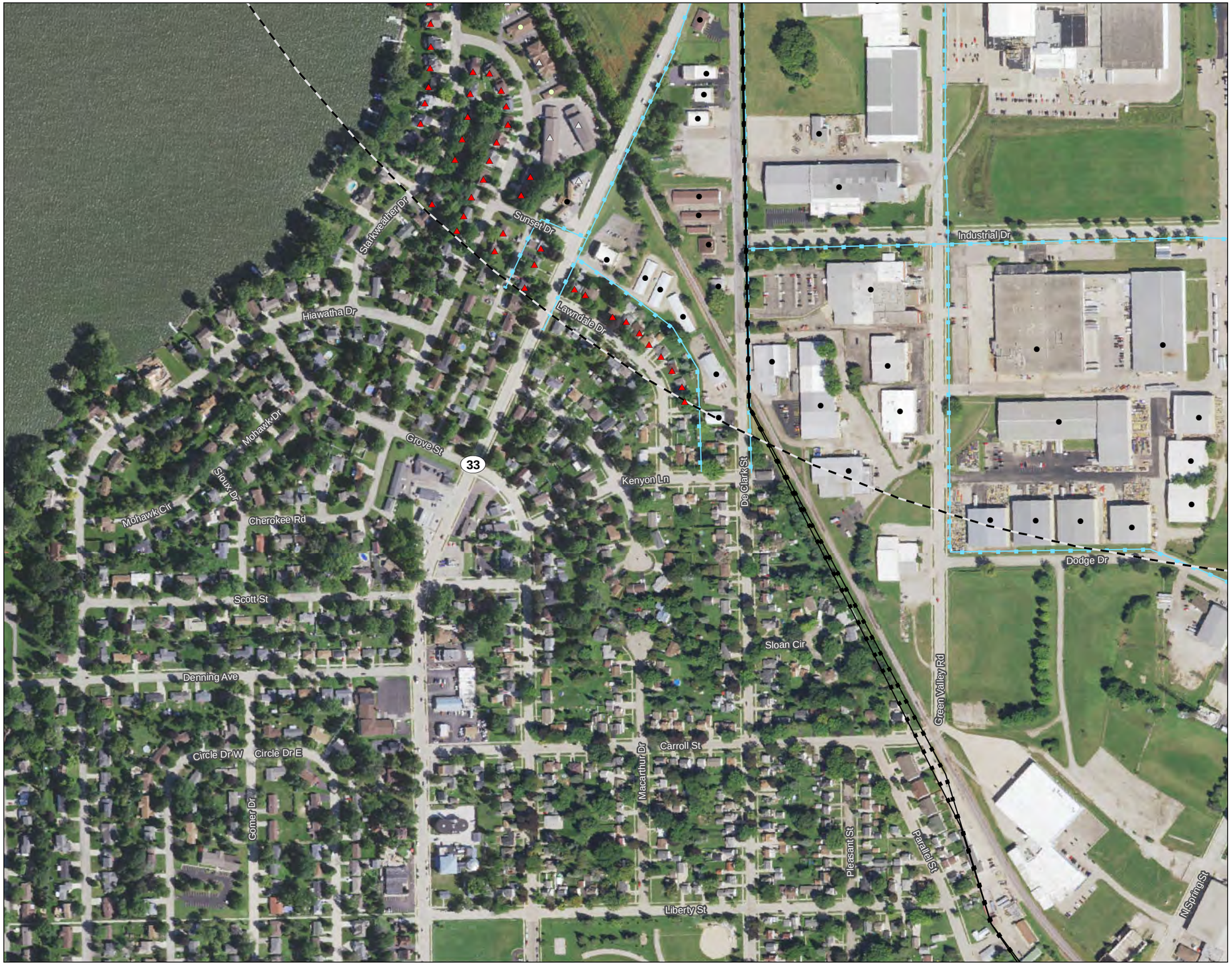

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Client/Project 193707481

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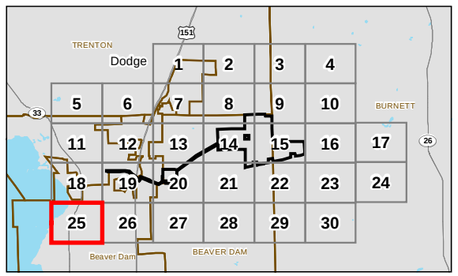

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Stantec

Figure No.
2.1-3

Title
Detailed Project Area

Client/Project
193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

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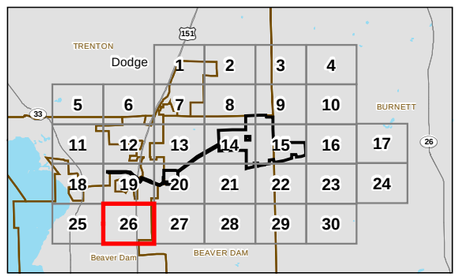

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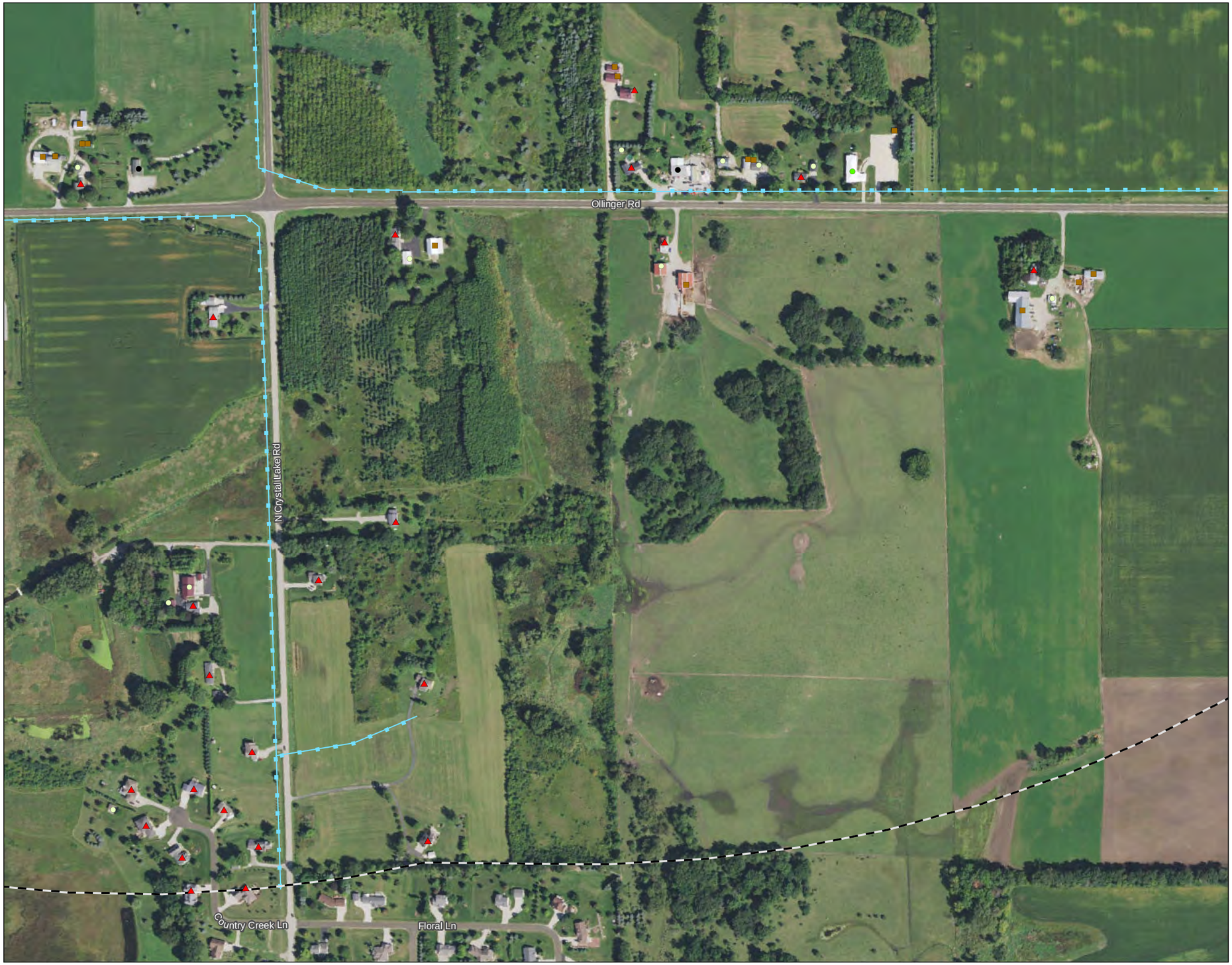

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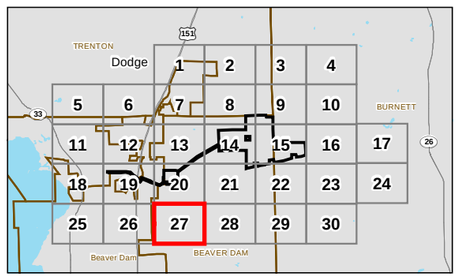

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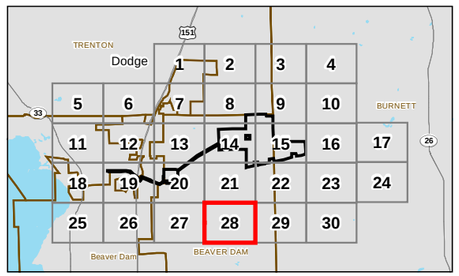

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Figure No.
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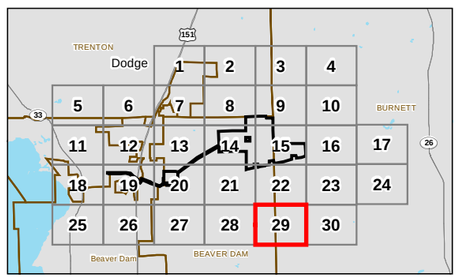

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Stantec

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2.1-3

Title
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Client/Project
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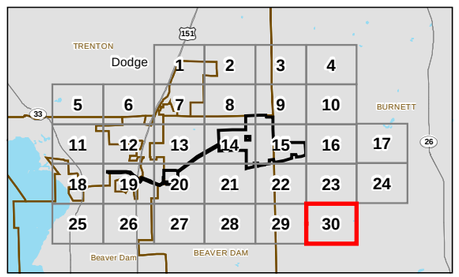

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Stantec

Figure No.
3.2-1

Title
Topographic Map

Client/Project
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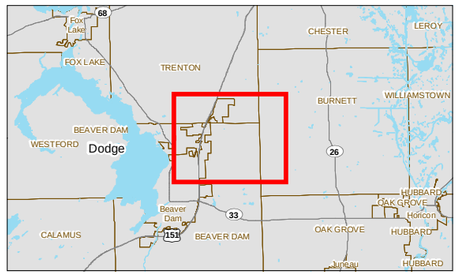

Notes
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3. Background: USGS 7.5' Topographic Quadrangle

Stantec

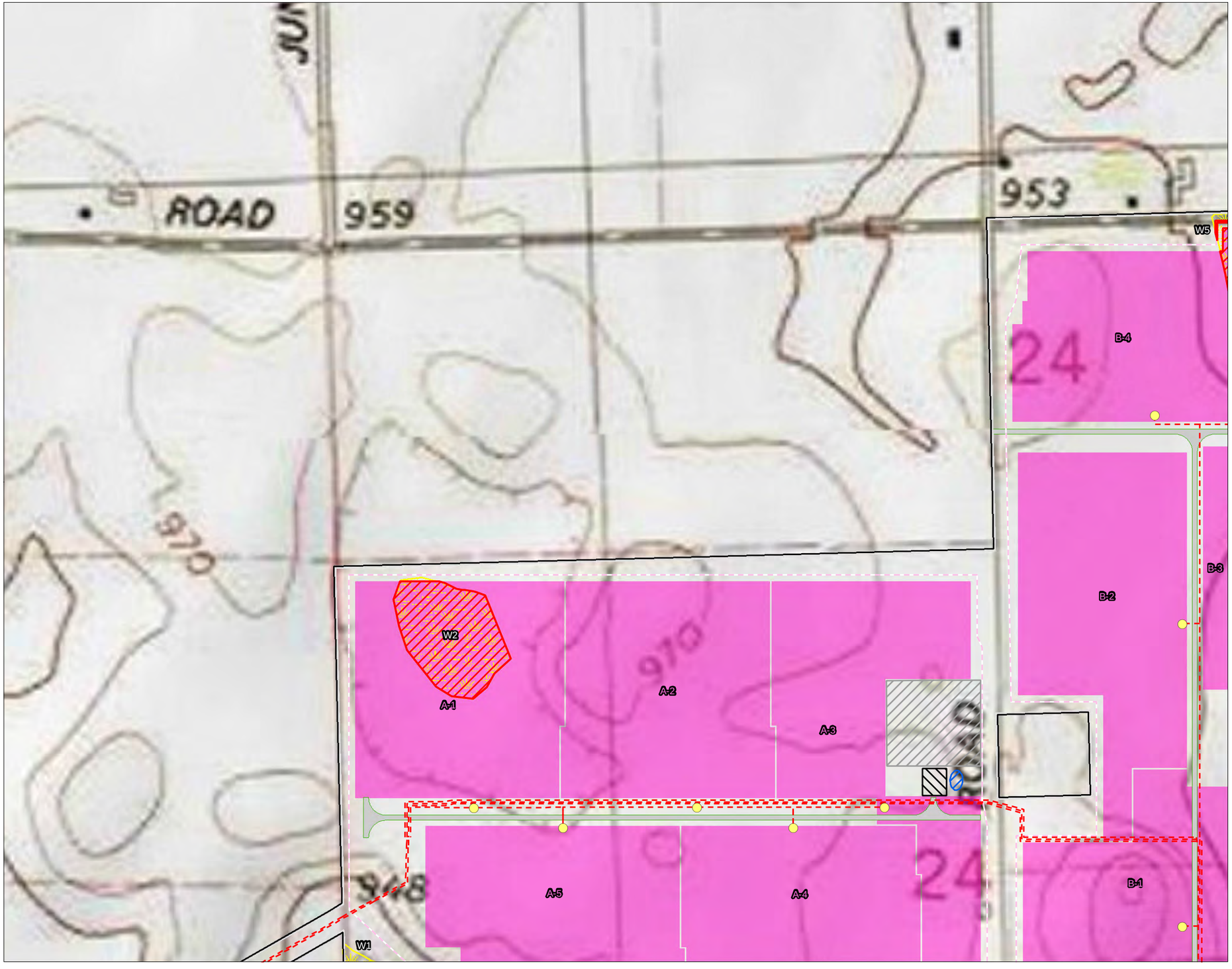


Figure No.
3.2-2

Title
Wetland and Waterway Crossings and Topography

Client/Project 193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

N

0 200 400 Feet
(At original document size of 11x17)
1:4,800

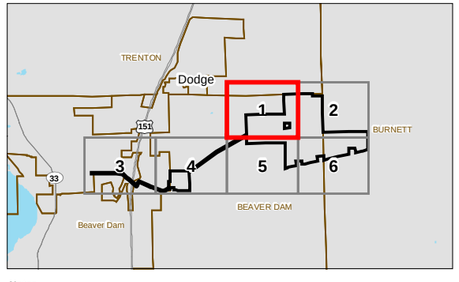
Legend

- Project Area
- Inverter
- Generator Tie Line
- Collection System
- Access Road
- Boundary Fence
- Solar PV Array Area - Primary
- Solar PV Array Area - Alternate
- Project Substation
- Substation
- O&M Structure
- Stormwater Basin
- Lay-down Yard
- Field Delineated Waterway
- Field Delineated Open Water
- Proposed Structure in Wetland
- Wetland Impact Area

Field Delineated Wetland
- Farmed Wetland
- Fresh Wet Meadow
- Hardwood Swamp
- Shallow Marsh

DNR 24k Hydrography
- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



Notes
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2. Data Sources: Stantec, WPL, WisDOT, WDNR
3. Background: USGS 7.5' Topographic Quadrangle

Stantec

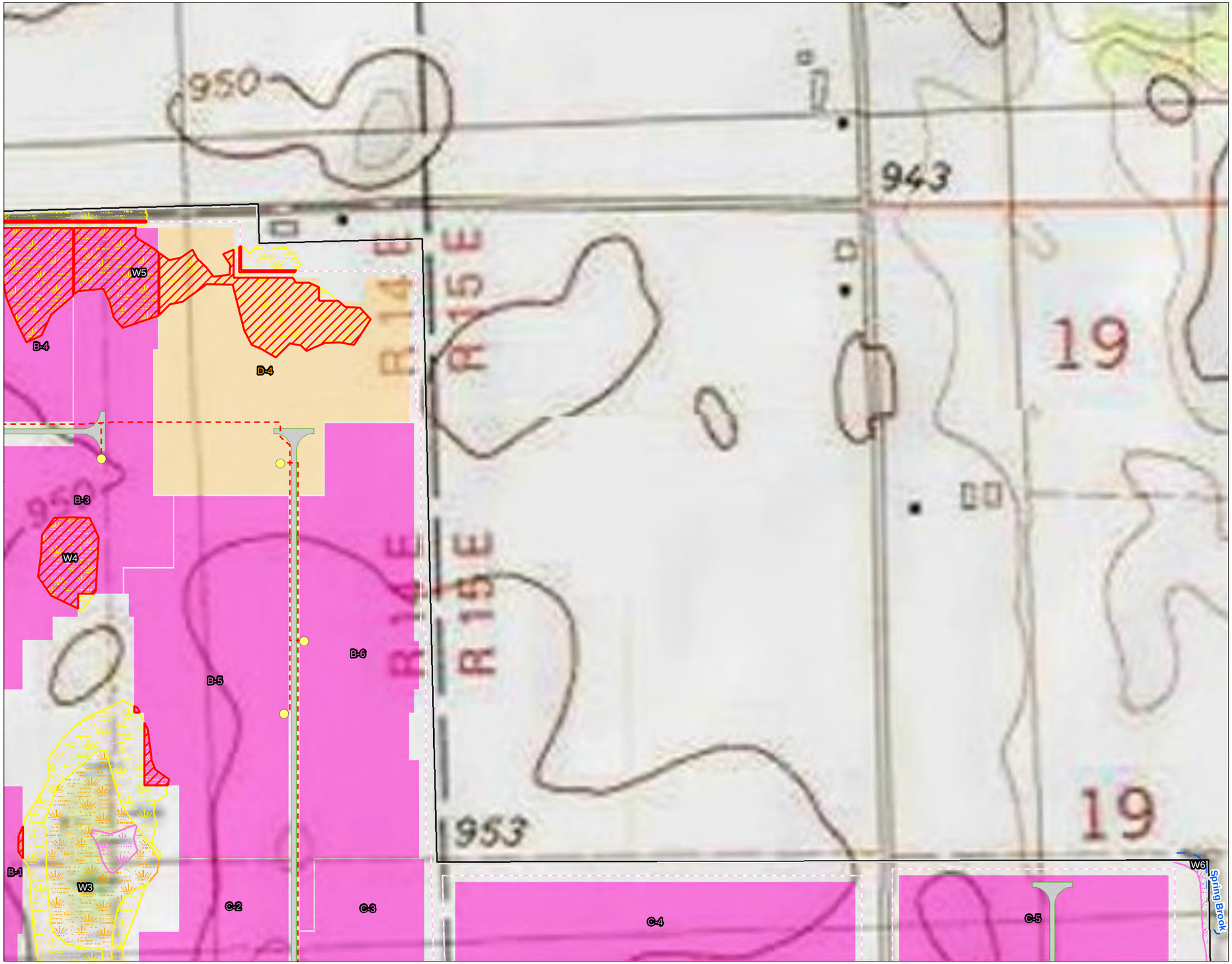

Figure No.

3.2-2

Title

Wetland and Waterway Crossings and Topography

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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DNR 24k Hydrography

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- Waterbody*

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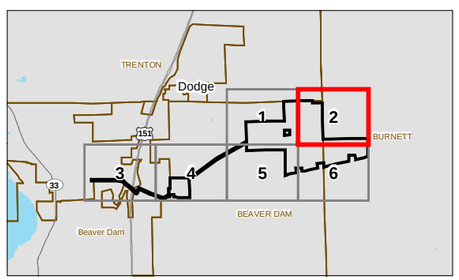

Notes

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Stantec

Figure No.

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Client/Project 193707481

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DNR 24k Hydrography

- Perennial Stream*
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- Waterbody*

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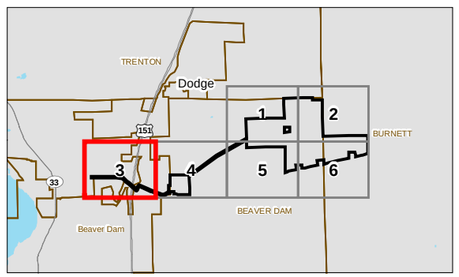

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Stantec

Figure No.
3.2-2

Title
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Client/Project 193707481
Wisconsin Power and Light Company
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Project Location
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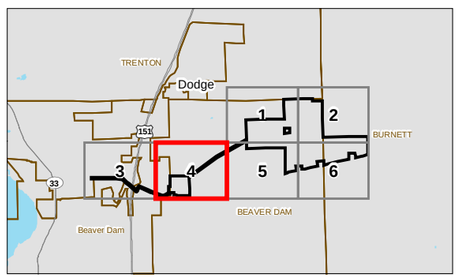
- Hardwood Swamp
- Shallow Marsh

DNR 24k Hydrography
- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



Notes
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2. Data Sources: Stantec, WPL, WisDOT, WDNR
3. Background: USGS 7.5' Topographic Quadrangle

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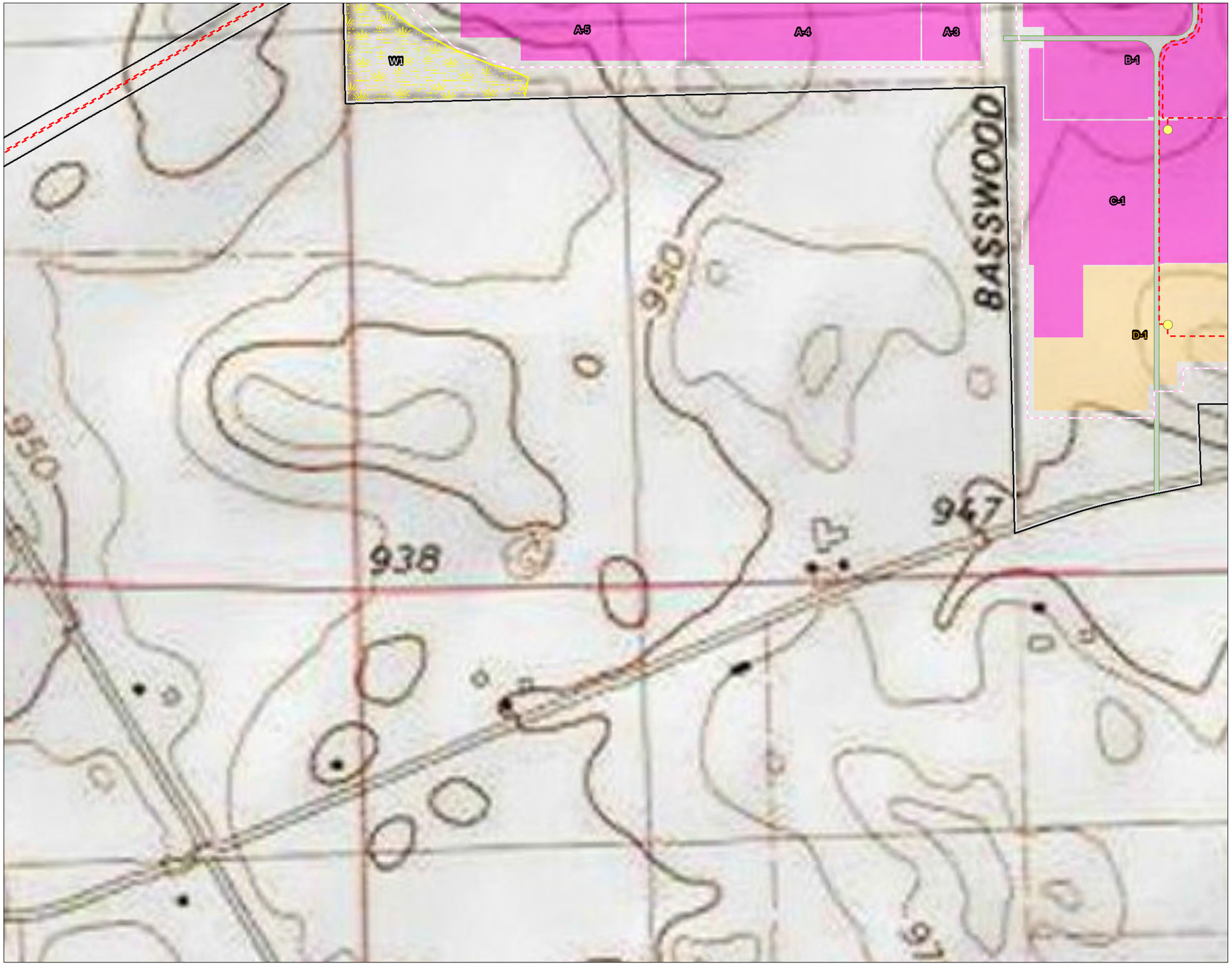

Figure No.

3.2-2

Title

Wetland and Waterway Crossings and Topography

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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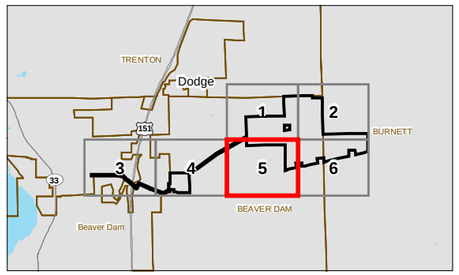
- Shallow Marsh

DNR 24k Hydrography

- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



Notes

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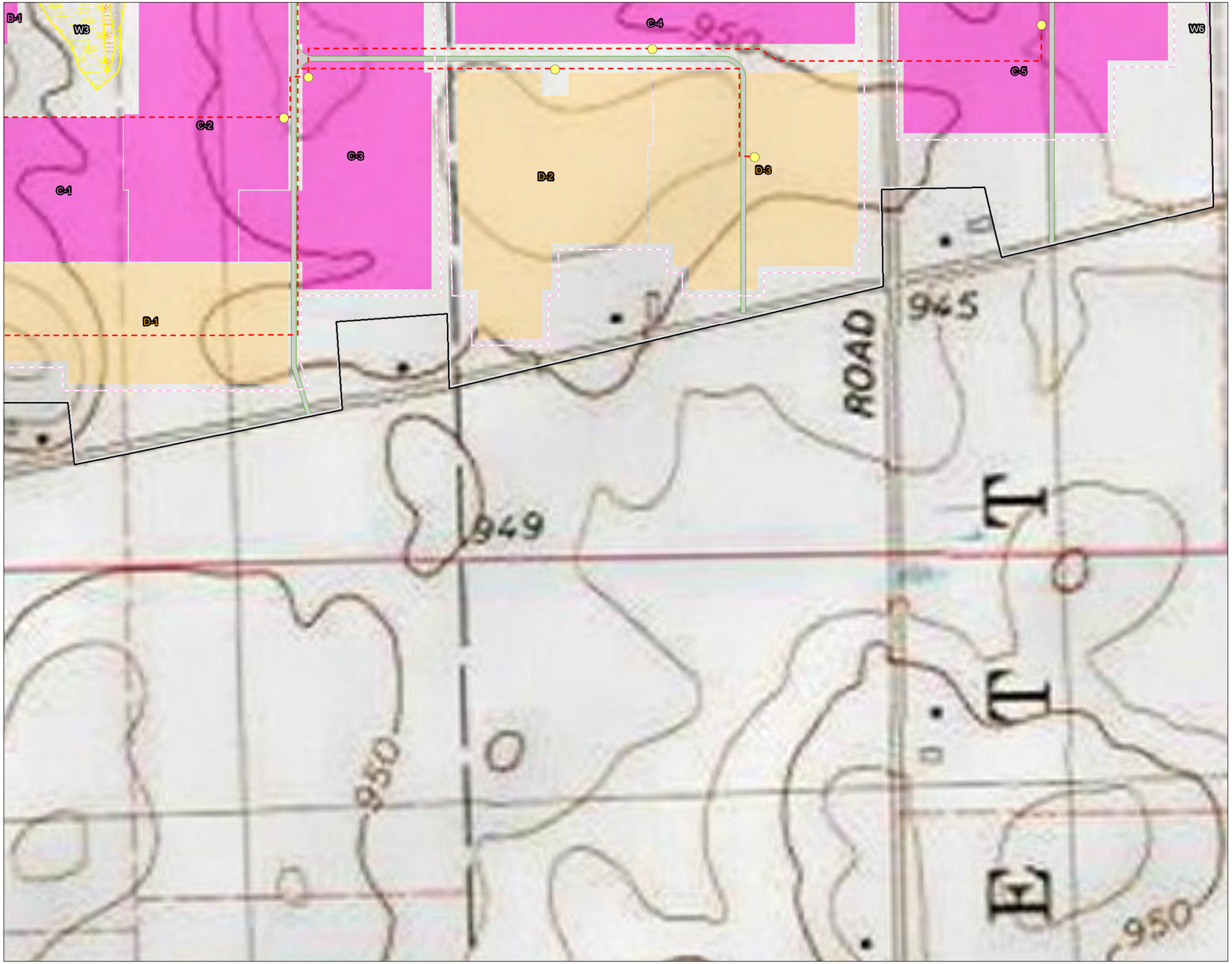

Figure No.
3.2-2

Title
Wetland and Waterway Crossings and Topography

Client/Project 193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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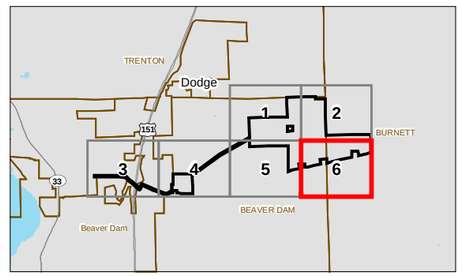
- Shallow Marsh

DNR 24k Hydrography
- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources: Stantec, WPL, WisDOT, WDNR
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Stantec

Figure No.
3.2-3

Title
Wetlands Map

Client/Project 193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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DNR 24k Hydrography

- Perennial Stream*
- Intermittent Stream
- Waterbody*

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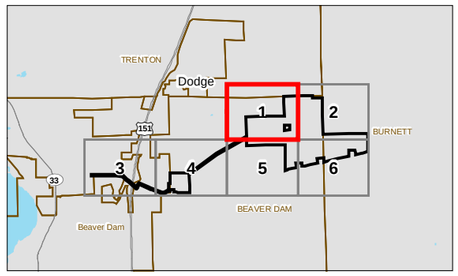

Notes
1. Coordinate System: NAD 1983 HARN Wisconsin TM
2. Data Sources: Stantec, WPL, WisDOT, WDNR
3. Orthophotography: 2020 NAIP

Stantec

Figure No.
3.2-3

Title
Wetlands Map

Client/Project 193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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DNR 24k Hydrography

- Perennial Stream*
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- Waterbody*

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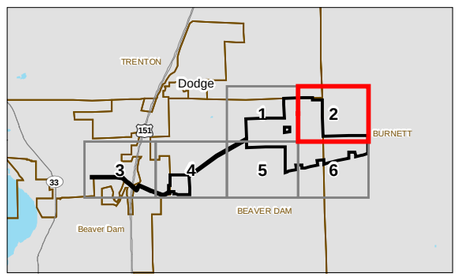

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Stantec

Figure No.
3.2-3

Title
Wetlands Map

Client/Project 193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

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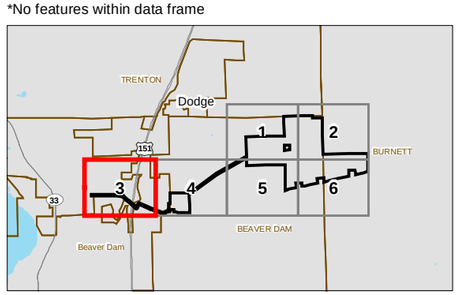
DNR 24k Hydrography

- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



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3. Orthophotography: 2020 NAIP

Stantec

Figure No.

3.2-3

Title

Wetlands Map

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett,
Dodge County, WI

Prepared by RA on 2021-08-31
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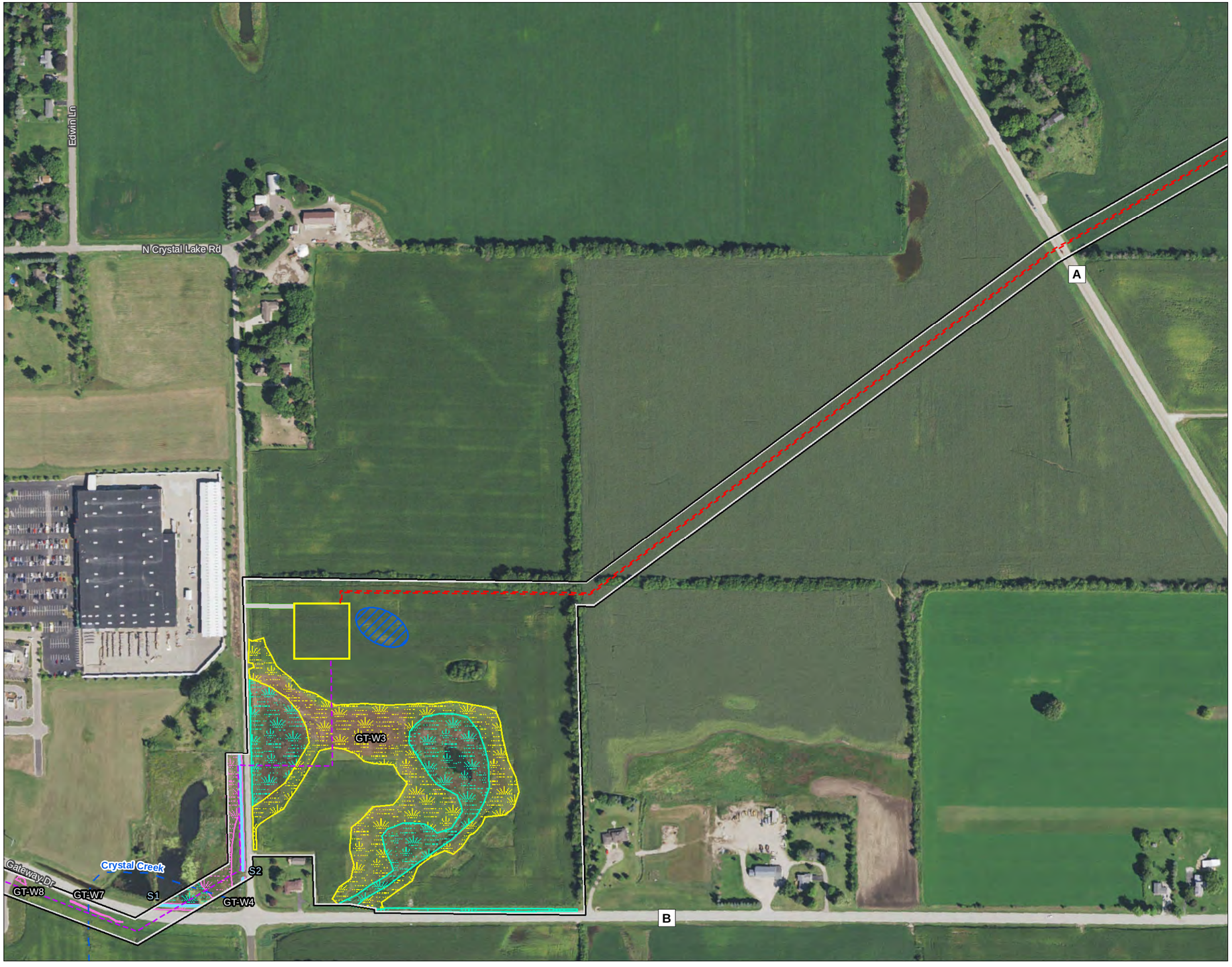

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Legend

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DNR 24k Hydrography

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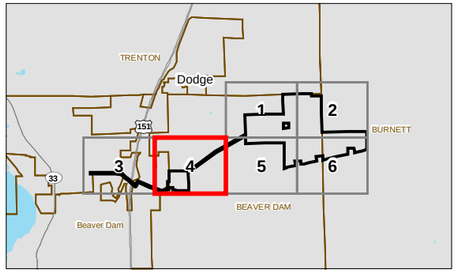

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Stantec

Figure No.
3.2-3

Title
Wetlands Map

Client/Project 193707481
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Beaver Dam Solar Project

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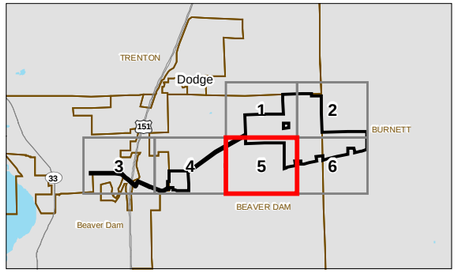

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Figure No.
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Wetlands Map

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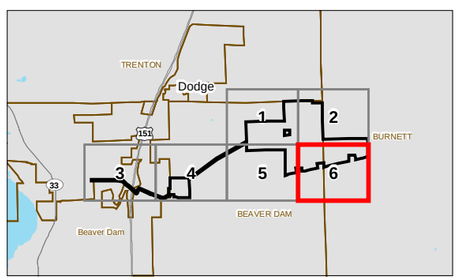

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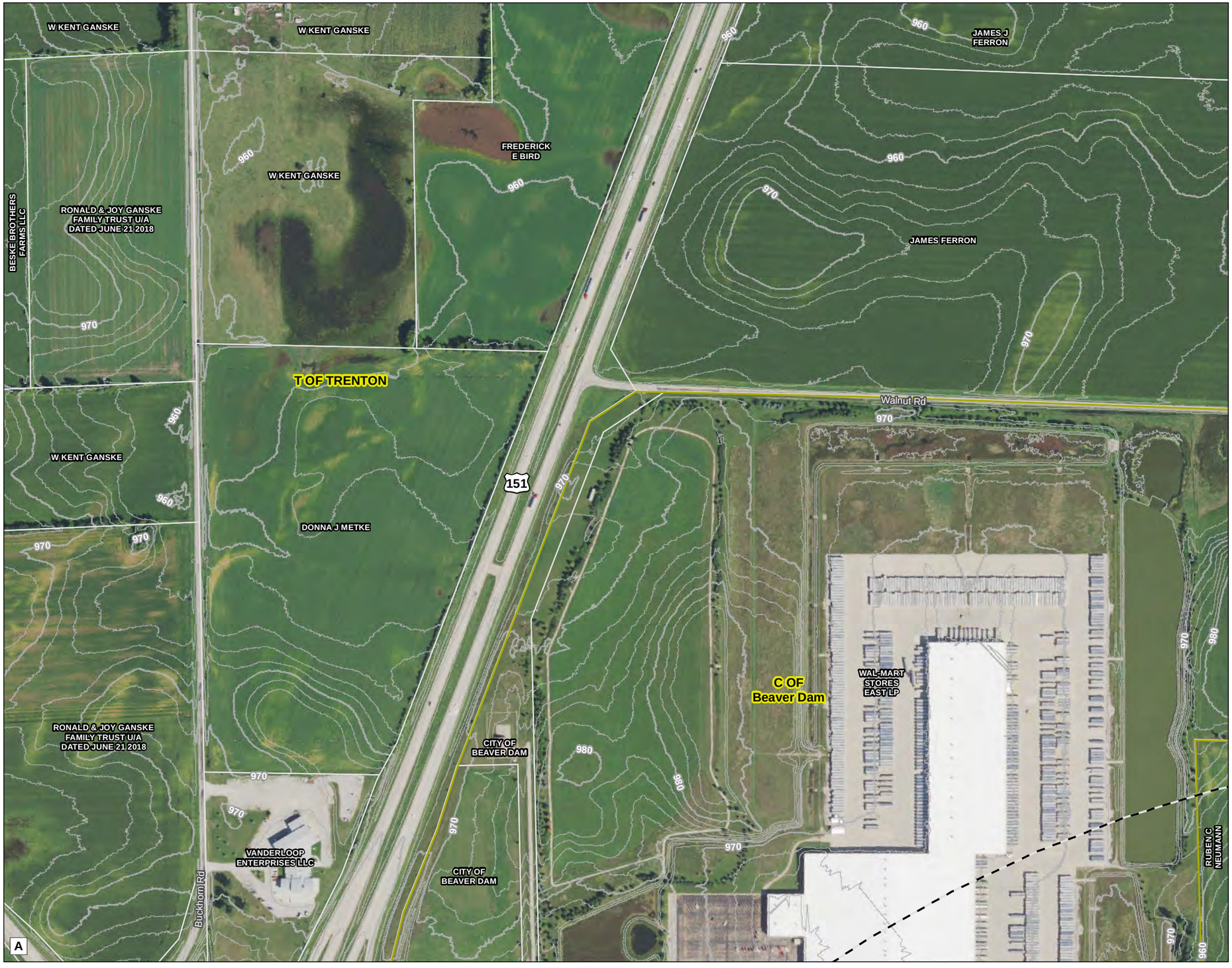

Figure No.

3.2-4

Title

Detailed Land Ownership

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
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IR by CB on 2021-09-01

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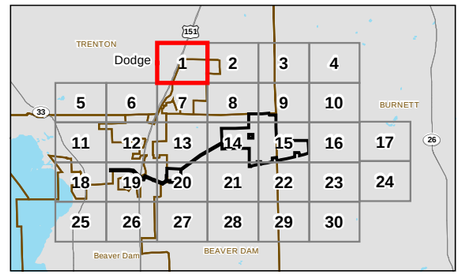
Legend

- Project Area
- 1 Mile Buffer
- Inverter
- Generator Tie Line
- Collection System
- Access Road
- Boundary Fence
- Solar PV Array Area - Primary
- Solar PV Array Area - Alternate
- Project Substation
- Substation
- O&M Structure
- Stormwater Basin
- Lay-down Yard
- Parcel Boundary
- Municipal Boundary
- 10ft Elevation Contour
- 2ft Elevation Contour

DNR 24k Hydrography

- Perennial Stream
- Intermittent Stream
- Waterbody



Notes
1. Coordinate System: NAD 1983 HARN Wisconsin TM
2. Data Sources: Stantec, WPL, WisDOT, WDNR, SCO
3. Orthophotography: 2020 NAIP

Stantec

Figure No.

3.2-4

Title

Detailed Land Ownership

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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DNR 24k Hydrography

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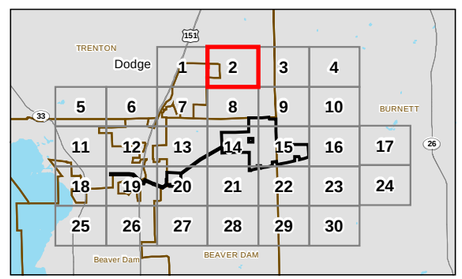

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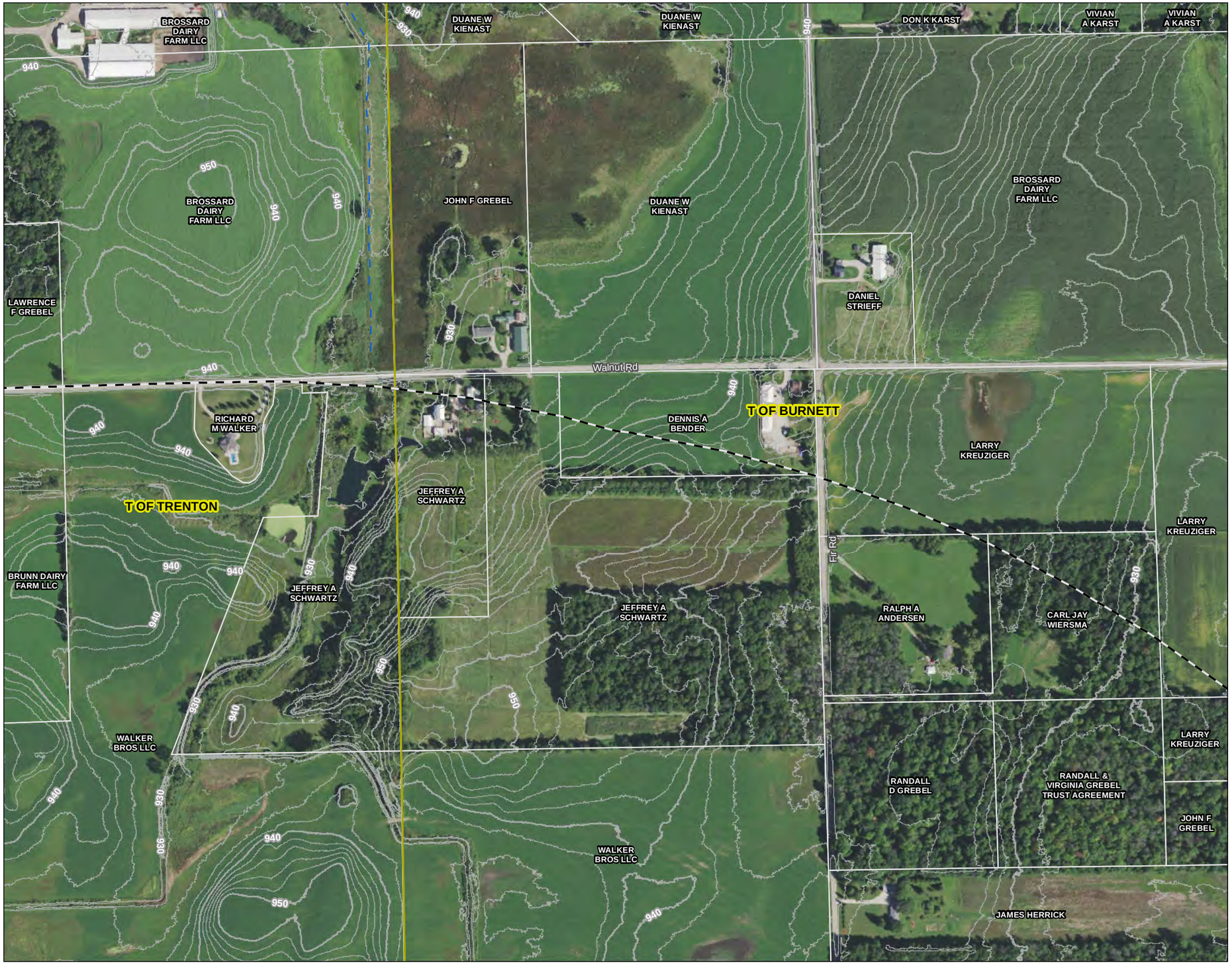

Figure No.

3.2-4

Title

Detailed Land Ownership

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

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DNR 24k Hydrography

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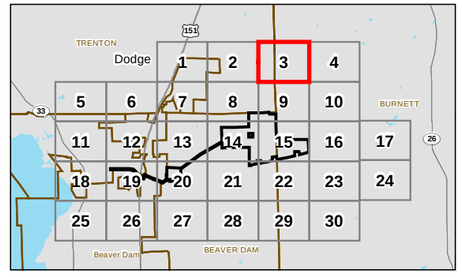

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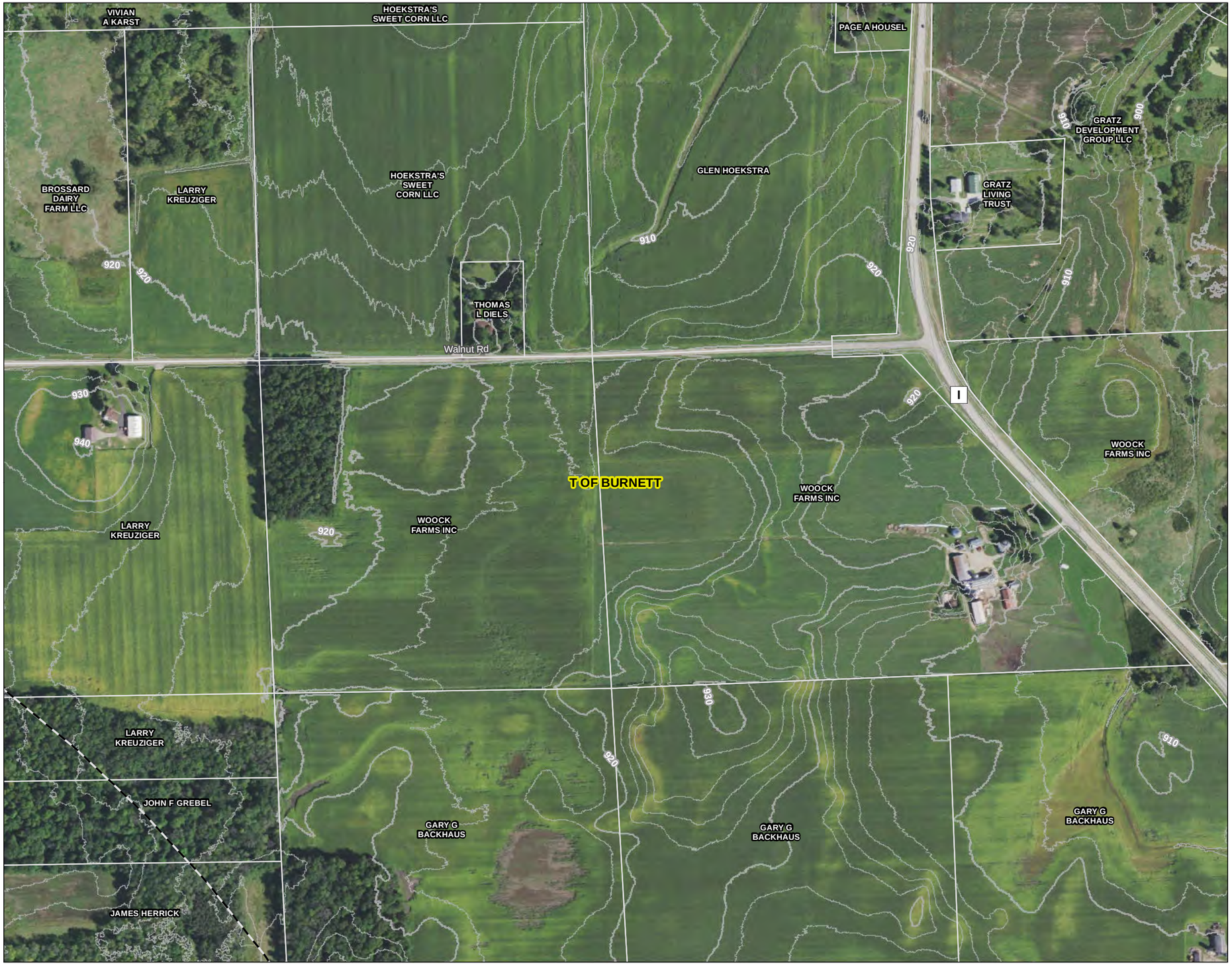

Figure No.

3.2-4

Title

Detailed Land Ownership

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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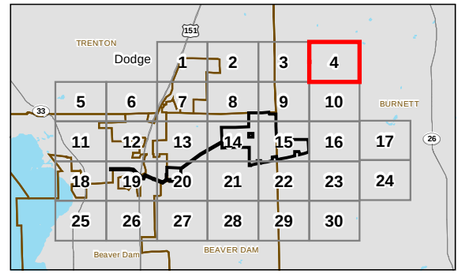

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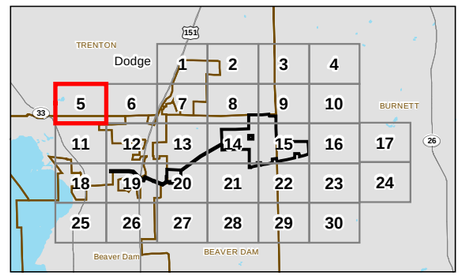

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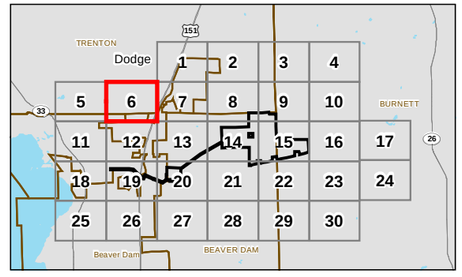

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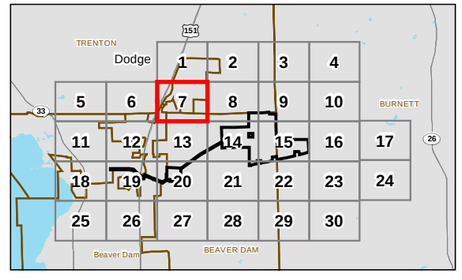

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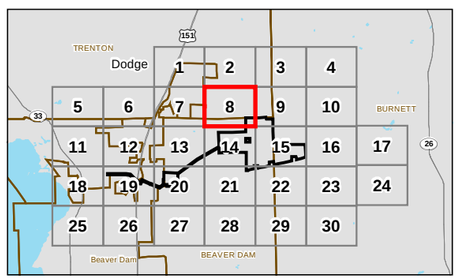

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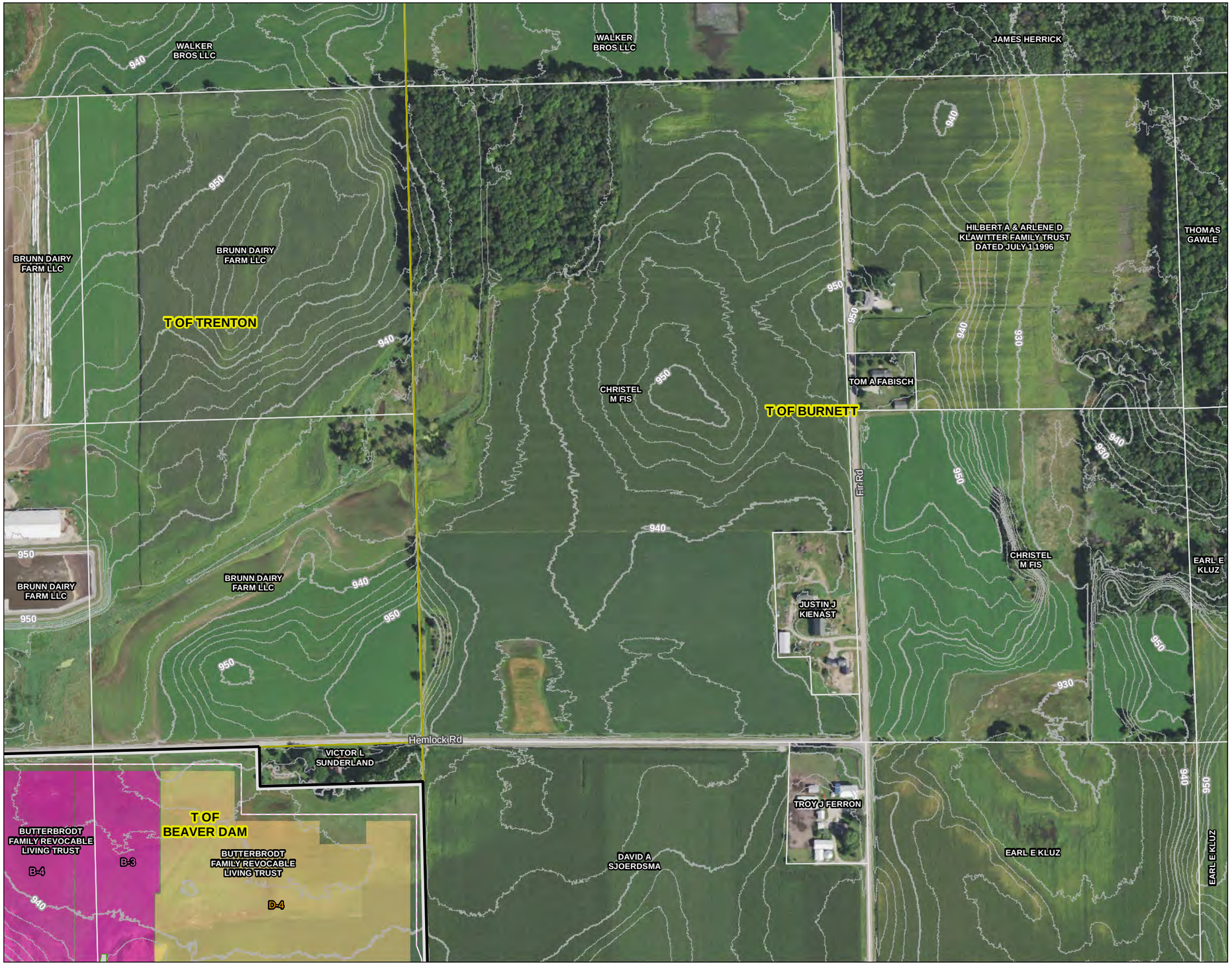

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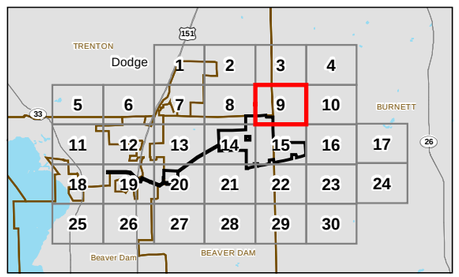

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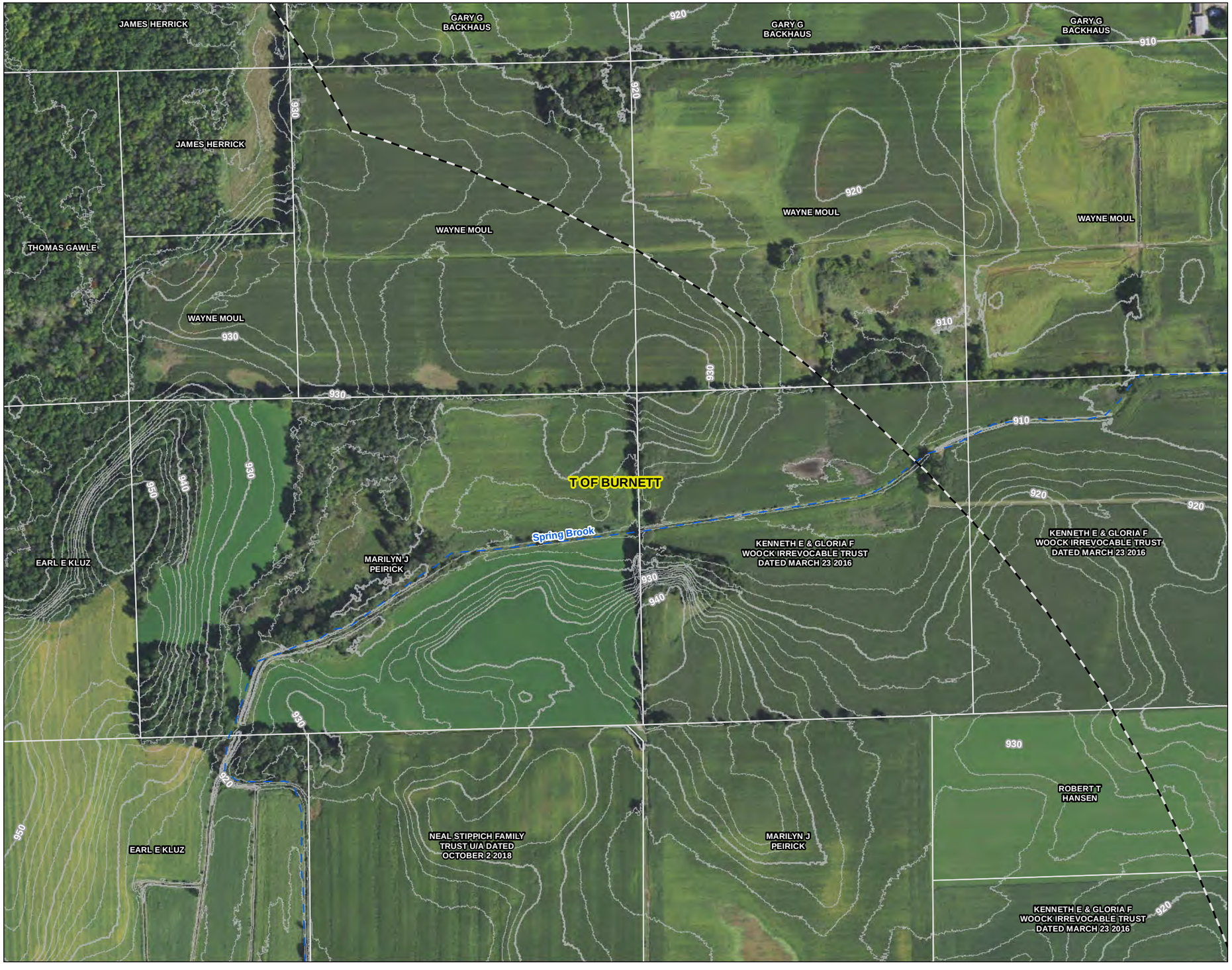

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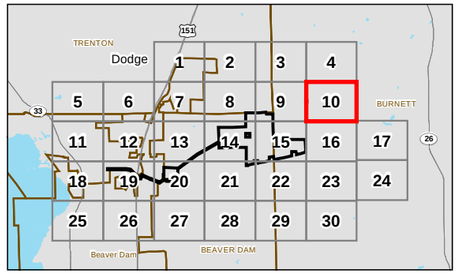

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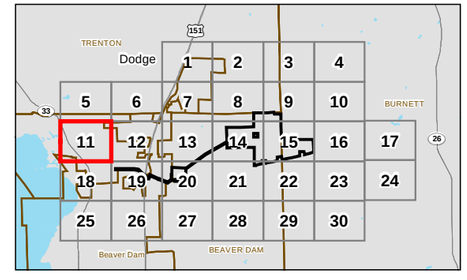

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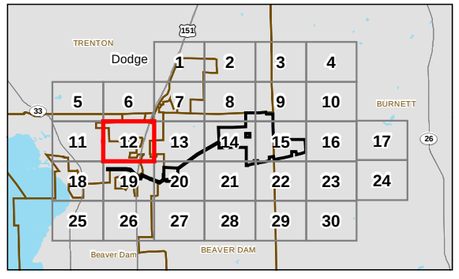

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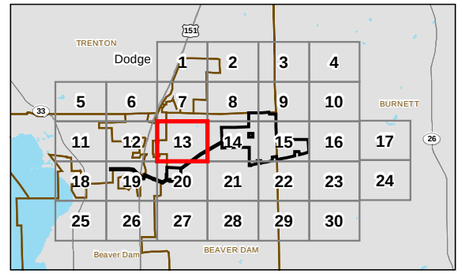

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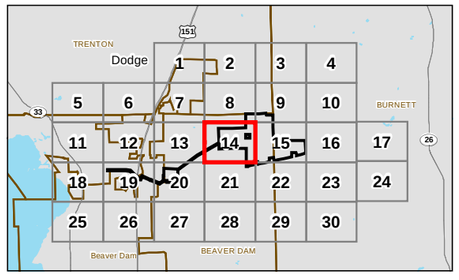

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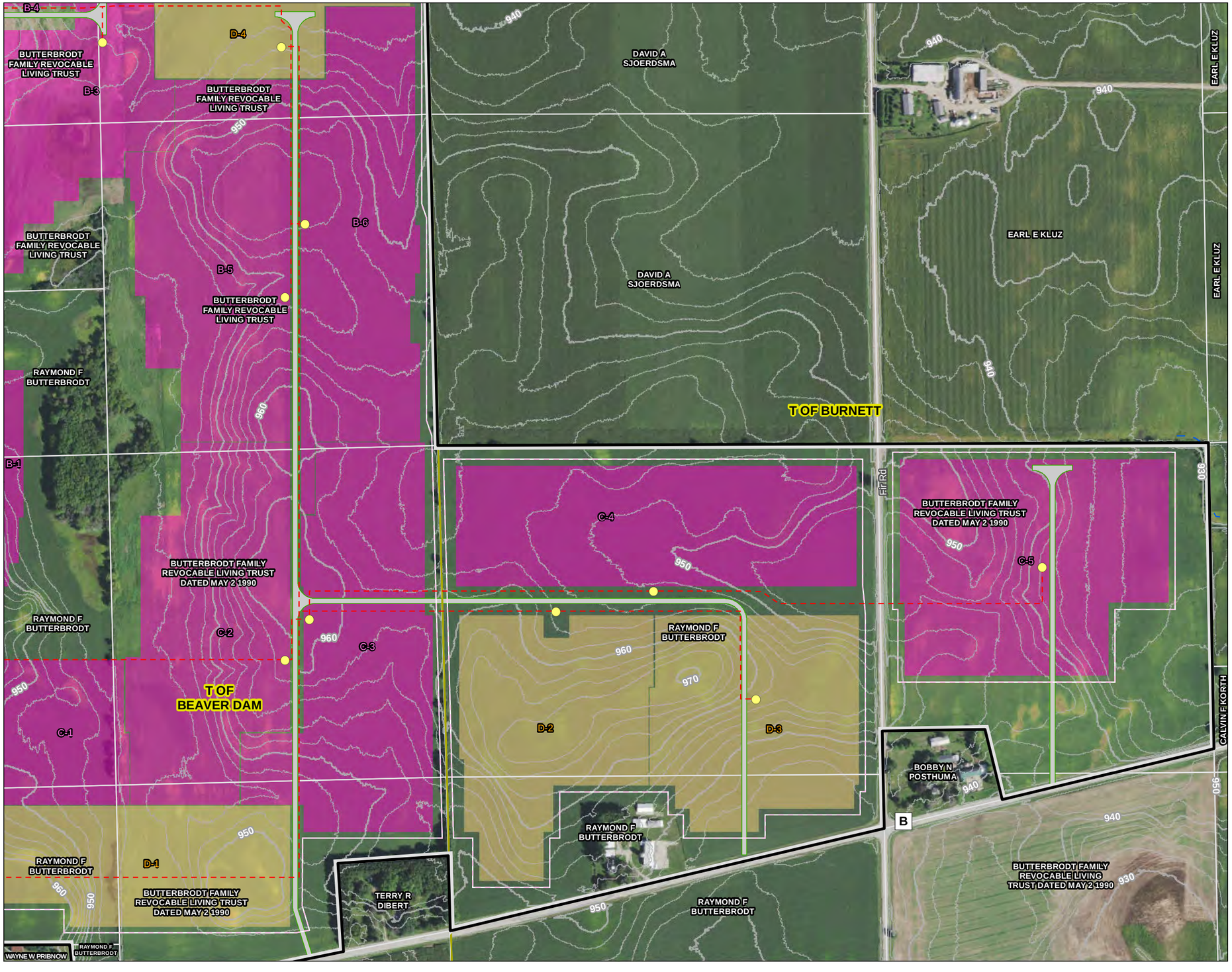

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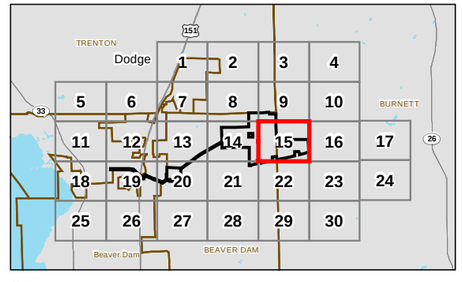

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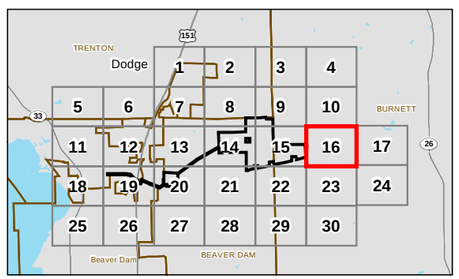

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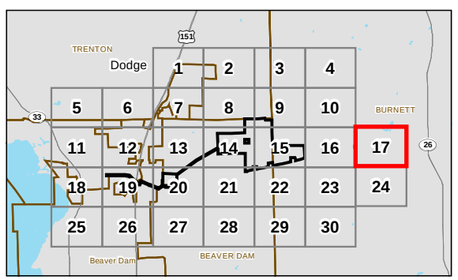

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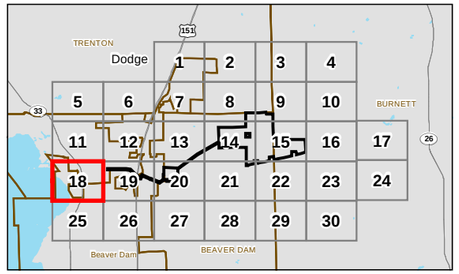

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Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

N

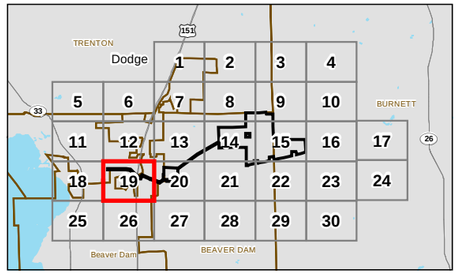
0 200 400 Feet
(At original document size of 11x17)
1:4,800

Legend

- Project Area
- 1 Mile Buffer
- Inverter
- Generator Tie Line
- Collection System
- Access Road
- Boundary Fence
- Solar PV Array Area - Primary
- Solar PV Array Area - Alternate
- Project Substation
- Substation
- O&M Structure
- Stormwater Basin
- Lay-down Yard
- Parcel Boundary
- Municipal Boundary
- 10ft Elevation Contour
- 2ft Elevation Contour

DNR 24k Hydrography

- Perennial Stream
- Intermittent Stream
- Waterbody



Notes

1. Coordinate System: NAD 1983 HARN Wisconsin TM
2. Data Sources: Stantec, WPL, WisDOT, WDNR, SCO
3. Orthophotography: 2020 NAIP

Stantec

Figure No.

3.2-4

Title

Detailed Land Ownership

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

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DNR 24k Hydrography

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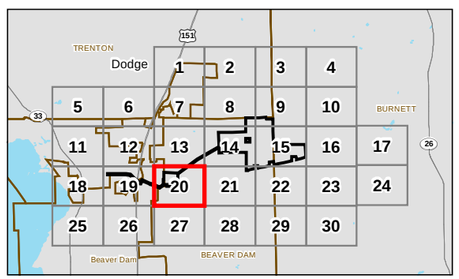

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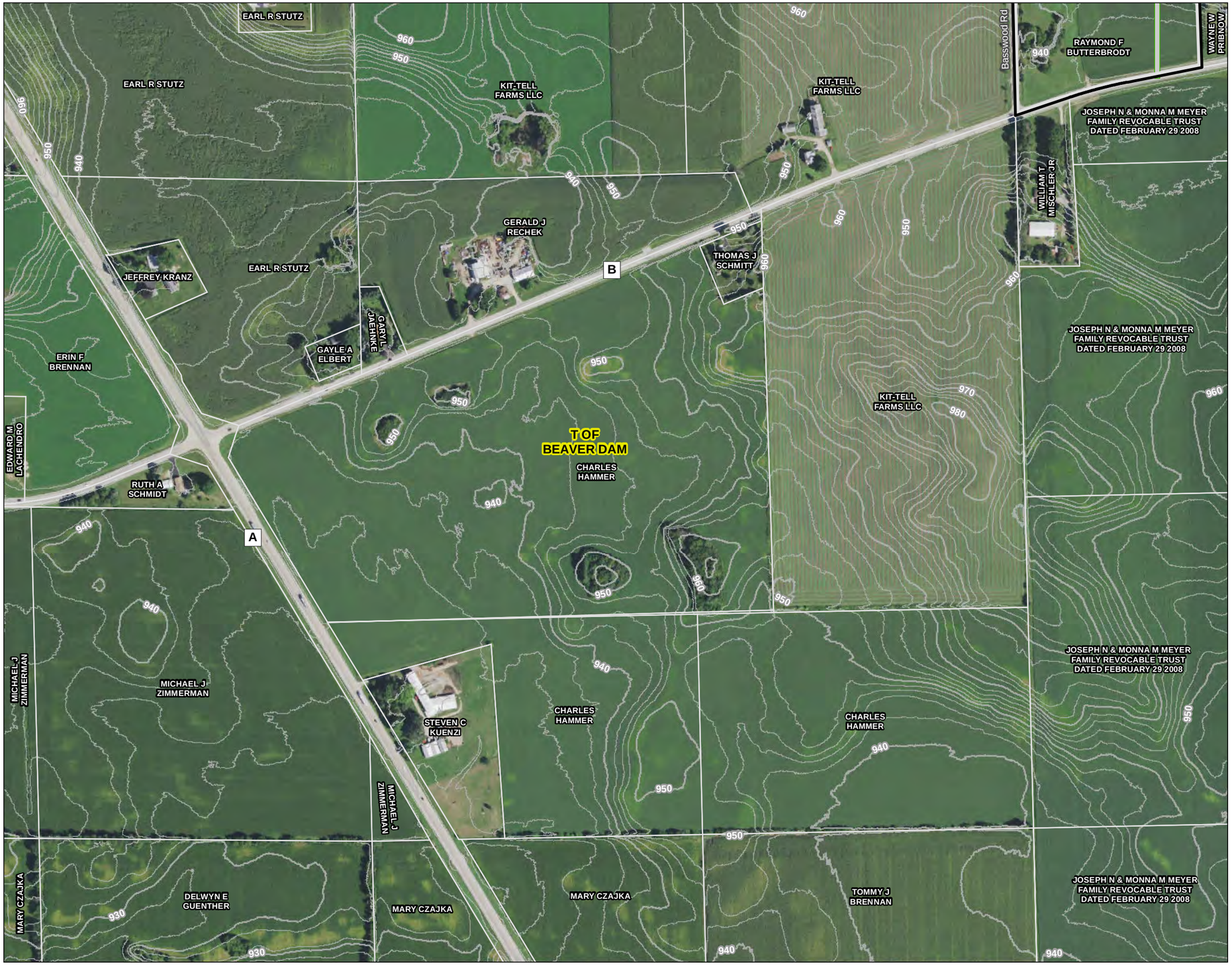

Figure No.

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Title

Detailed Land Ownership

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Wisconsin Power and Light Company
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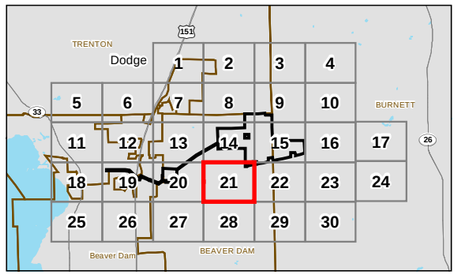

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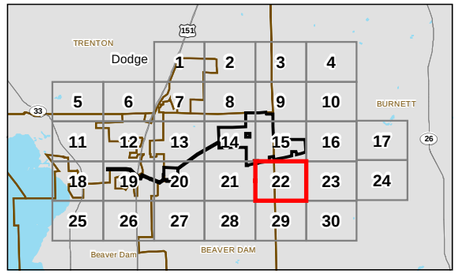

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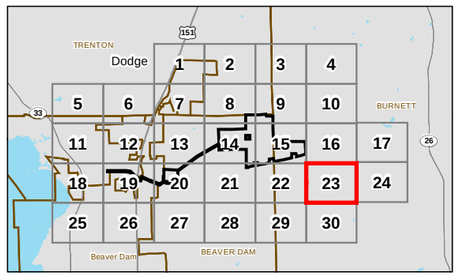

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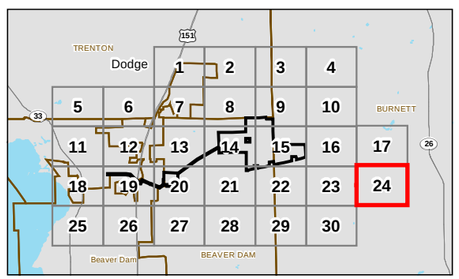

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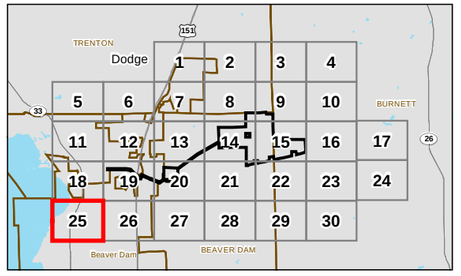

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Client/Project

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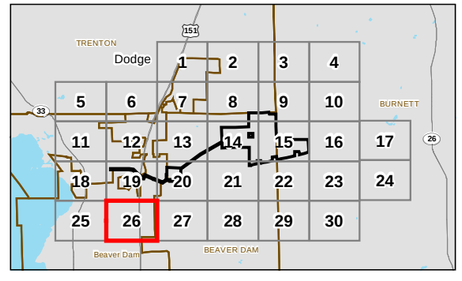

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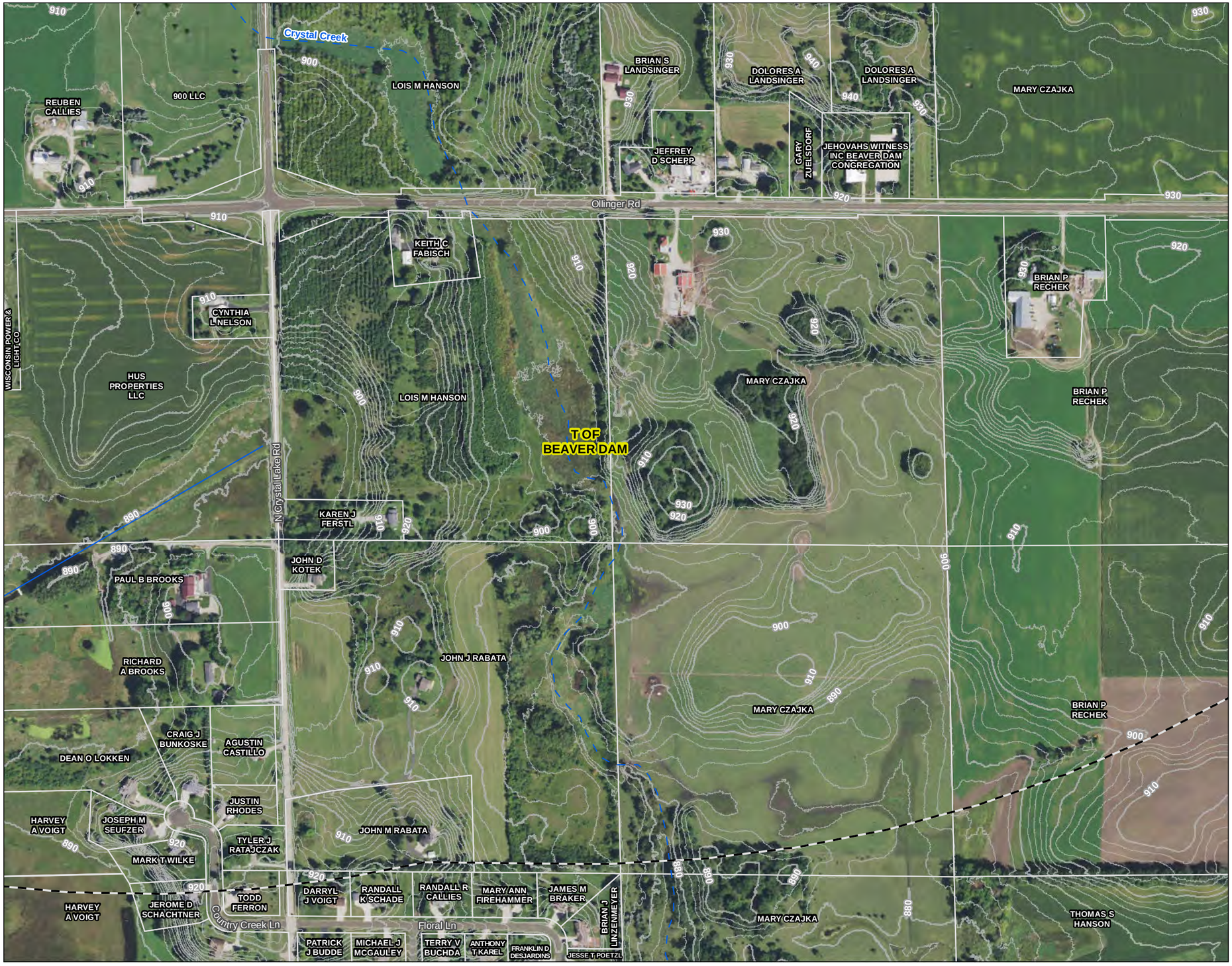

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Title

Detailed Land Ownership

Client/Project 193707481

Wisconsin Power and Light Company
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DNR 24k Hydrography

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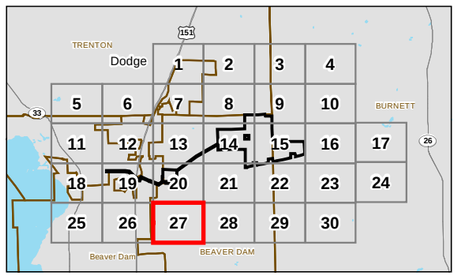

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Figure No.
3.2-4

Title
Detailed Land Ownership

Client/Project
Wisconsin Power and Light Company
Beaver Dam Solar Project

193707481

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DNR 24k Hydrography

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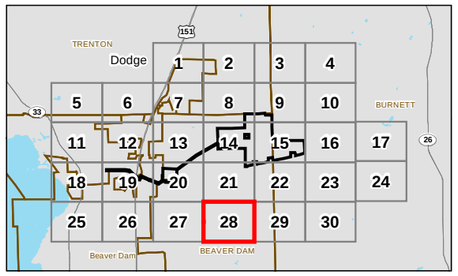

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Figure No.

3.2-4

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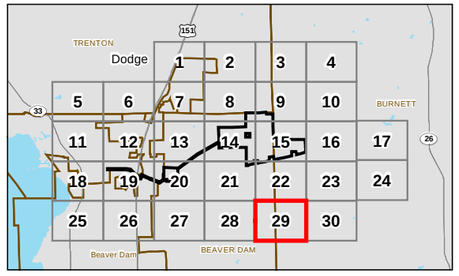

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Figure No.

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DNR 24k Hydrography

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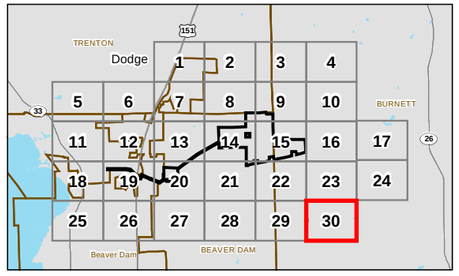

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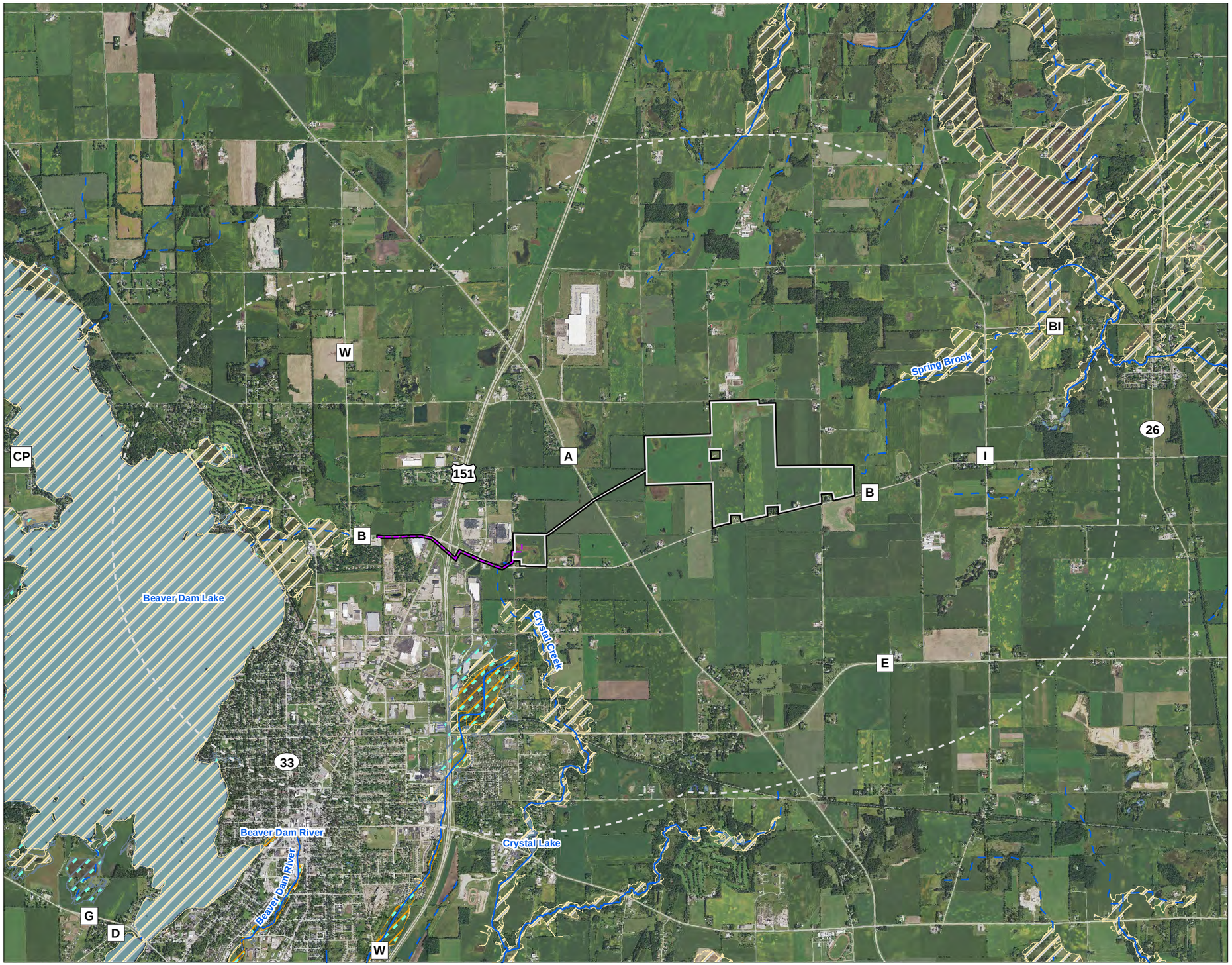

Figure No.

3.2-5

Title

Flood Insurance Rate Map

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
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IR by CB on 2021-09-01

N

0 2,000 4,000 Feet

(At original document size of 11x17)
1:48,000

Legend

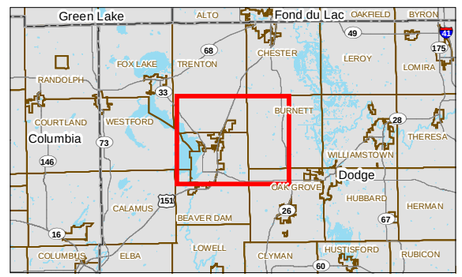
- Project Area
- 2 Mile Buffer
- Generator Tie Line

FEMA Special Flood Hazard Area

- 100-Year Flood Zone
- 100-Year Floodway
- 500-Year Flood Zone

DNR 24k Hydrography

- Perennial Stream
- Intermittent Stream
- Waterbody



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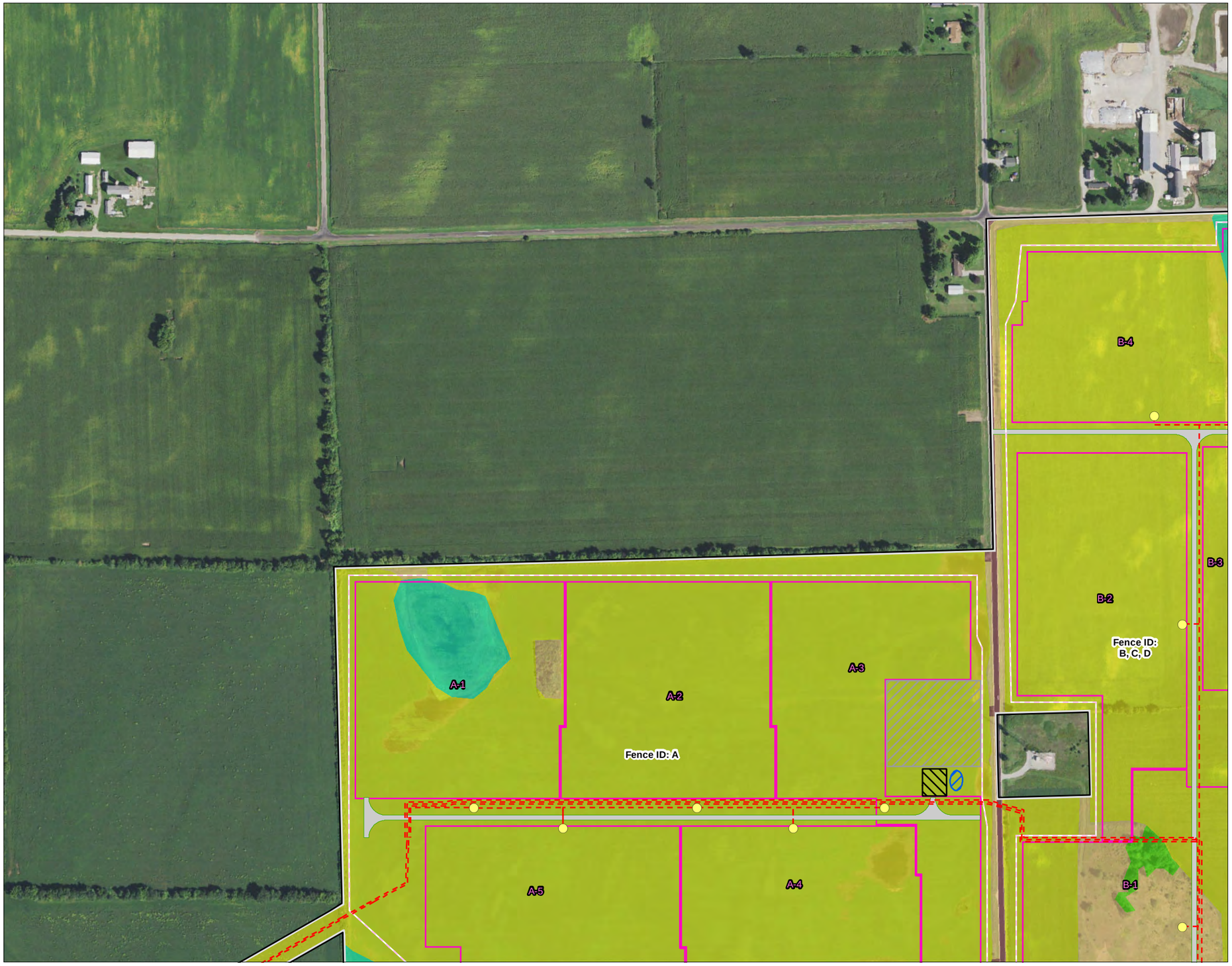

Figure No.
3.3-1

Title
Land Cover

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- Lay-down Yard

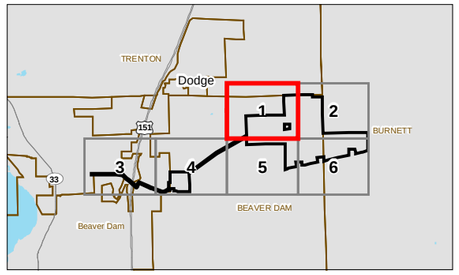
Land Cover

- Cropland
- Specialty Agriculture*
- Grassland
- Upland Forest
- Forested Wetland
- Non-Forested Wetland
- Open Water
- Developed (Non-Residential)
- Developed (Residential)

DNR 24k Hydrography

- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



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Stantec

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Figure No.
3.3-1

Title
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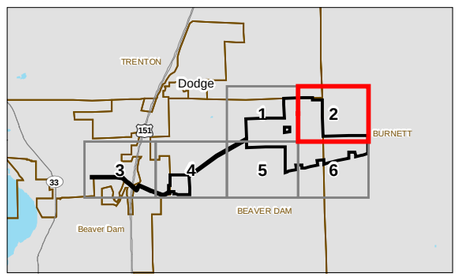

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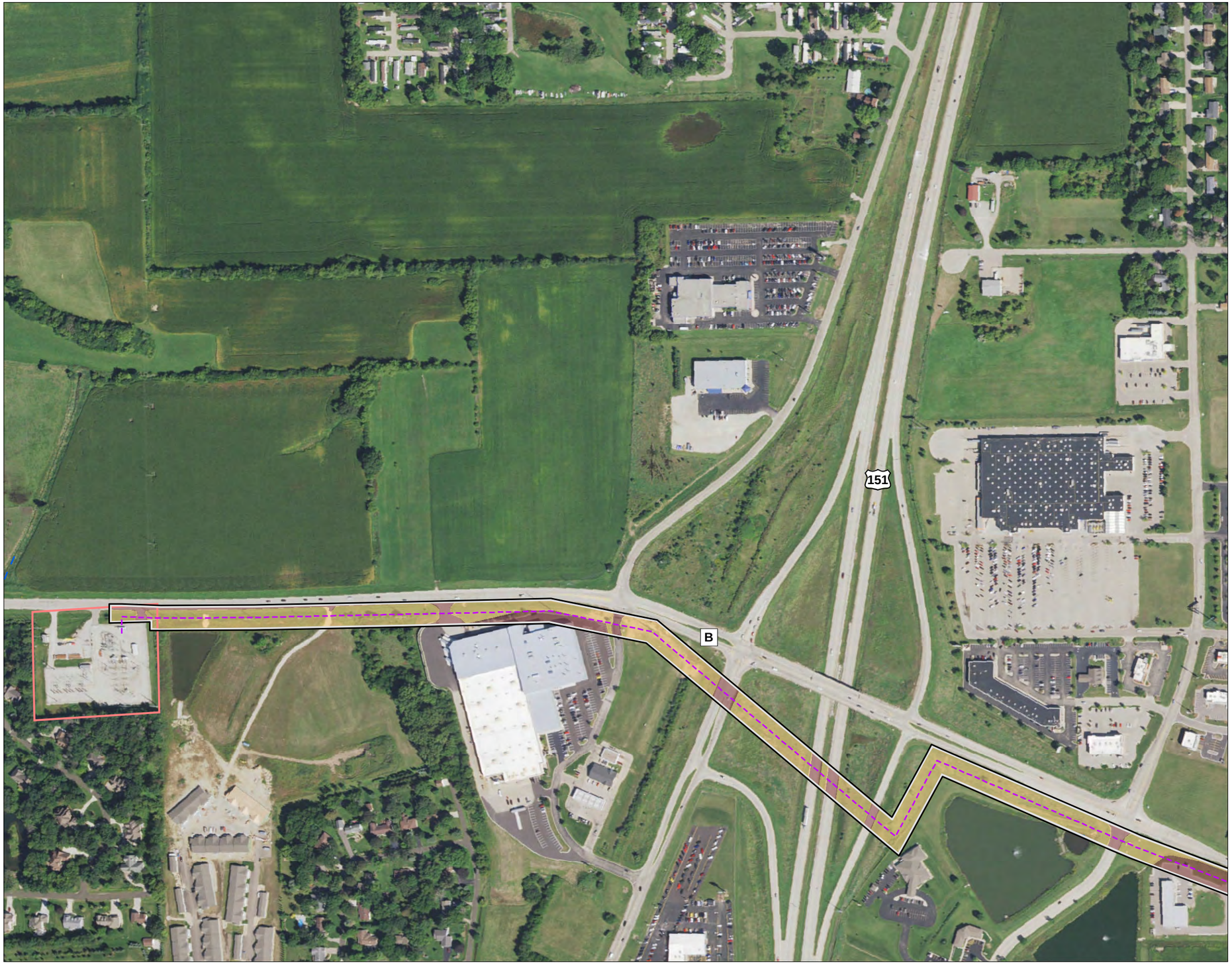

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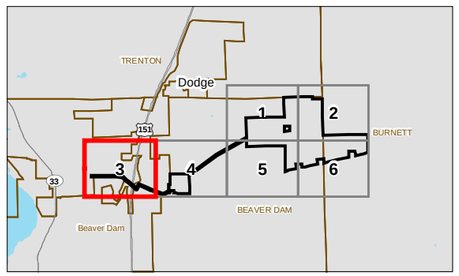
- Developed (Residential)

DNR 24k Hydrography

- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



Notes
1. Coordinate System: NAD 1983 HARN Wisconsin TM
2. Data Sources: Stantec, WPL, WisDOT, WDNR
3. Orthophotography: 2020 NAIP

Stantec

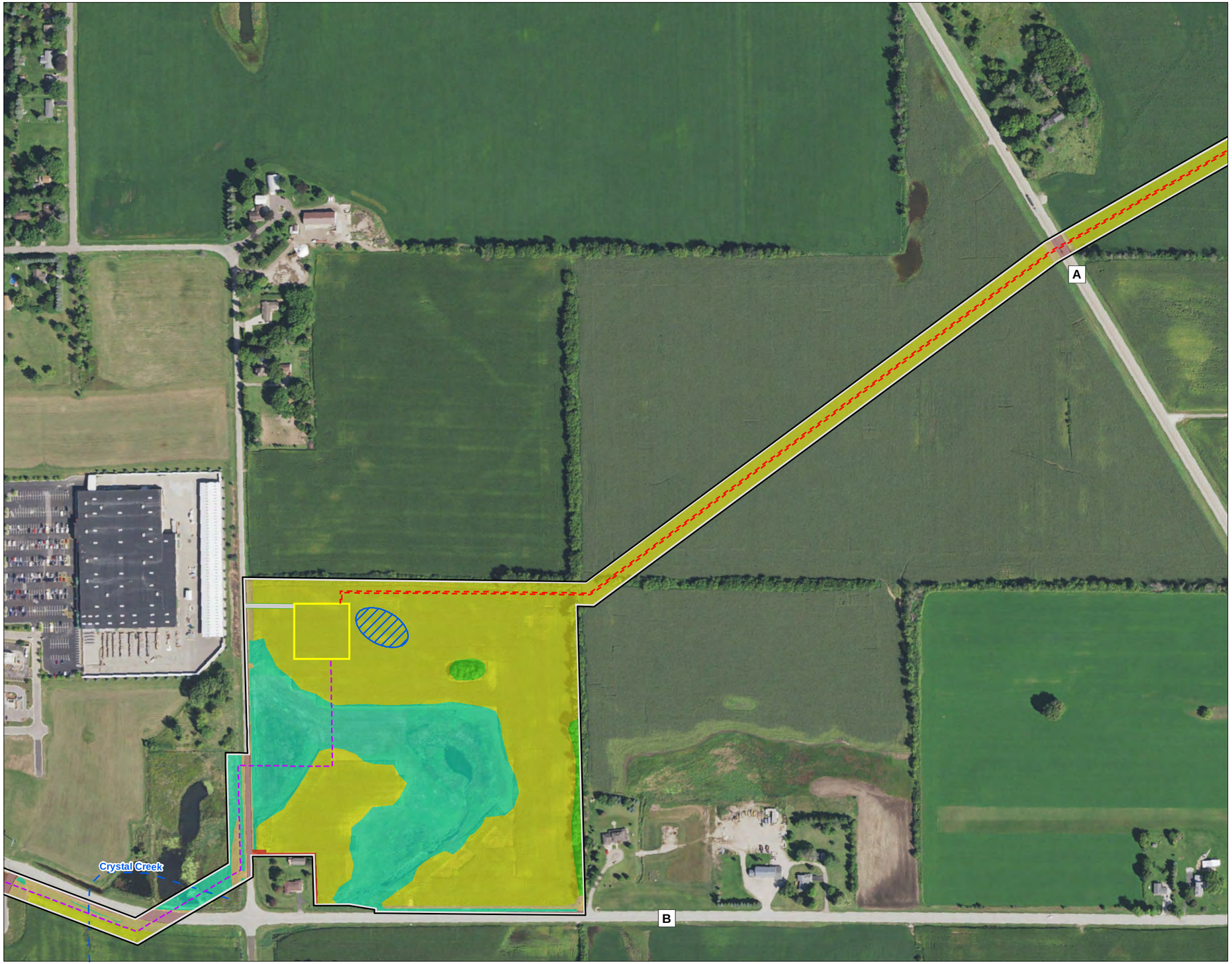


Figure No.
3.3-1

Title
Land Cover

Client/Project 193707481
Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett, Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

N

0 200 400 Feet
(At original document size of 11x17)
1:4,800

Legend

- Project Area
- Inverter
- Generator Tie Line
- Collection System
- Access Road
- Boundary Fence
- Solar PV Array Area - Primary
- Solar PV Array Area - Alternate
- Project Substation
- Substation
- O&M Structure
- Stormwater Basin
- Lay-down Yard

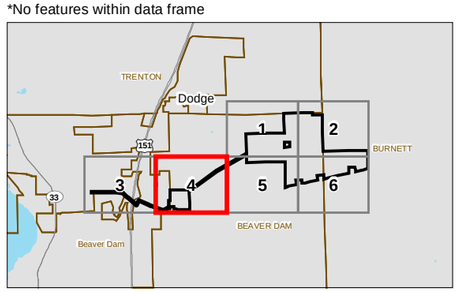
Land Cover

- Cropland
- Specialty Agriculture*
- Grassland
- Upland Forest
- Forested Wetland
- Non-Forested Wetland
- Open Water
- Developed (Non-Residential)
- Developed (Residential)

DNR 24k Hydrography

- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



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2. Data Sources: Stantec, WPL, WisDOT, WDNR
3. Orthophotography: 2020 NAIP

Stantec

Figure No.
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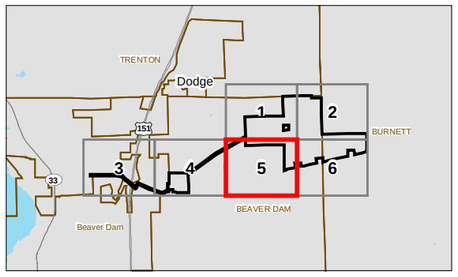
*No features within data frame



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Stantec

Figure No.
3.3-1

Title
Land Cover

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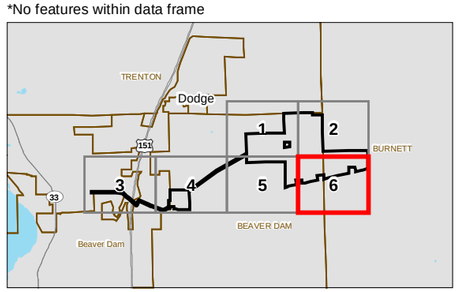
- Perennial Stream*
- Intermittent Stream
- Waterbody*

*No features within data frame



Notes
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2. Data Sources: Stantec, WPL, WisDOT, WDNR
3. Orthophotography: 2020 NAIP

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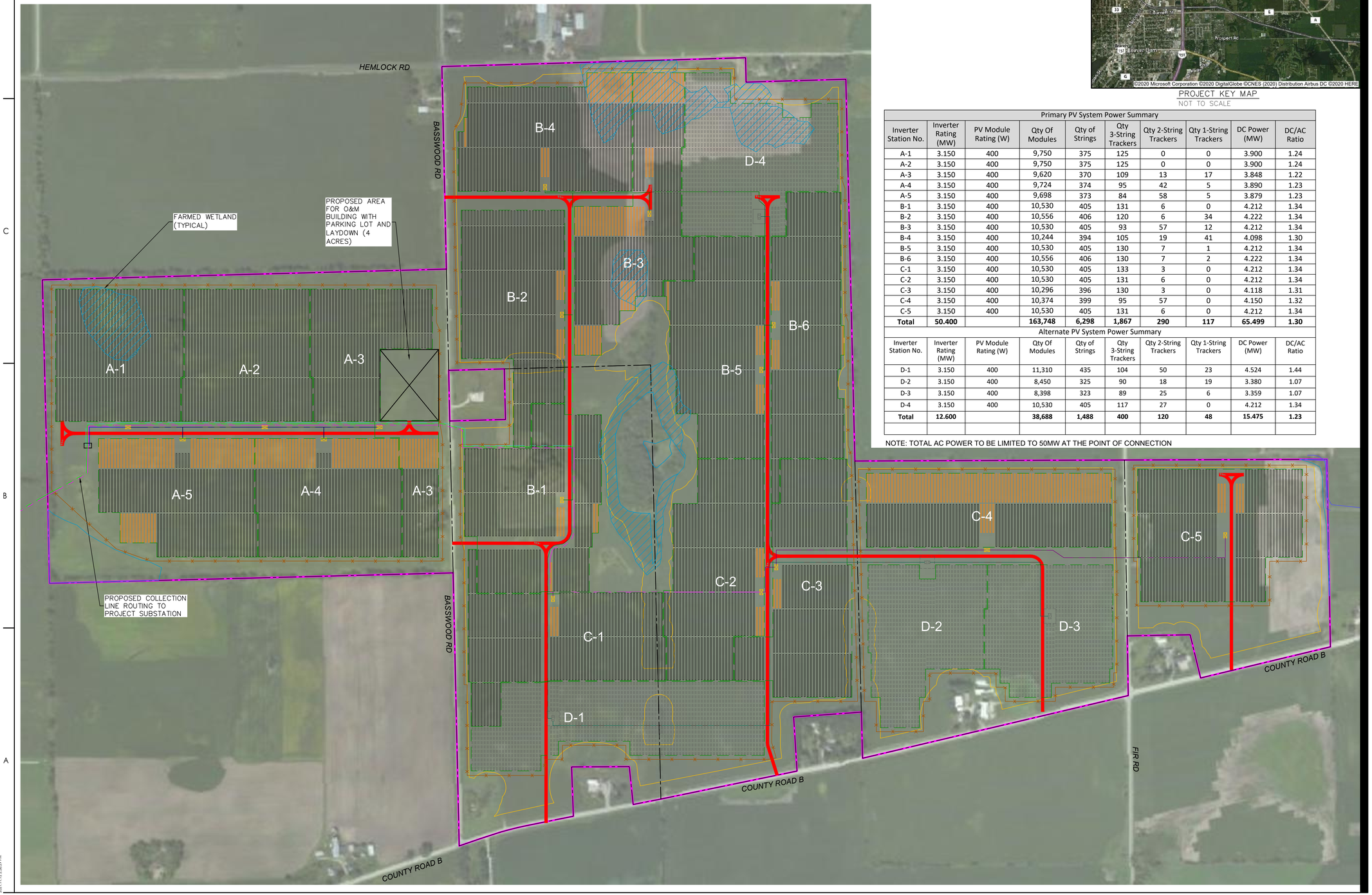
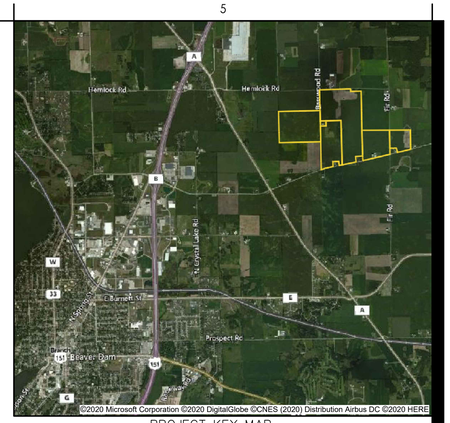
Appendix B - Beaver Dam Engineering Schematics





PROJECT KEY MAP
NOT TO SCALE

Primary PV System Power Summary									
Inverter Station No.	Inverter Rating (MW)	PV Module Rating (W)	Qty Of Modules	Qty of Strings	Qty 3-String Trackers	Qty 2-String Trackers	Qty 1-String Trackers	DC Power (MW)	DC/AC Ratio
A-1	3.150	400	9,750	375	125	0	0	3.900	1.24
A-2	3.150	400	9,750	375	125	0	0	3.900	1.24
A-3	3.150	400	9,620	370	109	13	17	3.848	1.22
A-4	3.150	400	9,724	374	95	42	5	3.890	1.23
A-5	3.150	400	9,698	373	84	58	5	3.879	1.23
B-1	3.150	400	10,530	405	131	6	0	4.212	1.34
B-2	3.150	400	10,556	406	120	6	34	4.222	1.34
B-3	3.150	400	10,530	405	93	57	12	4.212	1.34
B-4	3.150	400	10,244	394	105	19	41	4.098	1.30
B-5	3.150	400	10,530	405	130	7	1	4.212	1.34
B-6	3.150	400	10,556	406	130	7	2	4.222	1.34
C-1	3.150	400	10,530	405	133	3	0	4.212	1.34
C-2	3.150	400	10,530	405	131	6	0	4.212	1.34
C-3	3.150	400	10,296	396	130	3	0	4.118	1.31
C-4	3.150	400	10,374	399	95	57	0	4.150	1.32
C-5	3.150	400	10,530	405	131	6	0	4.212	1.34
Total	**50.400**		**163,748**	**6,298**	**1,867**	**290**	**117**	**65.499**	**1.30**
Alternate PV System Power Summary									
Inverter Station No.	Inverter Rating (MW)	PV Module Rating (W)	Qty Of Modules	Qty of Strings	Qty 3-String Trackers	Qty 2-String Trackers	Qty 1-String Trackers	DC Power (MW)	DC/AC Ratio
D-1	3.150	400	11,310	435	104	50	23	4.524	1.44
D-2	3.150	400	8,450	325	90	18	19	3.380	1.07
D-3	3.150	400	8,398	323	89	25	6	3.359	1.07
D-4	3.150	400	10,530	405	117	27	0	4.212	1.34
Total	**12.600**		**38,688**	**1,488**	**400**	**120**	**48**	**15.475**	**1.23**

NOTE: TOTAL AC POWER TO BE LIMITED TO 50MW AT THE POINT OF CONNECTION

Stantec

Stantec Consulting Ltd.
100-300 Hagey Boulevard
Waterloo ON N2L 0A4
Tel: (519) 579-4410
www.stantec.com

Notes

1. AERIAL IMAGERY OBTAIN FROM GOOGLE EARTH, COPYRIGHT GOOGLE 2020.
2. BASE MAPPING PROVIDED BY STANTEC FROM GIS SOURCES.
3. THE TRACKER LAYOUT AND POWER SUMMARY SHOWN IS INDICATIVE ONLY. THE BLOCKS OF TRACKERS SHOWN IN BLACK AND ORANGE MEET THE NAMEPLATE RATING FOR THE PROJECT. TRACKERS IN GRAY REPRESENT ADDITIONAL LOCATIONS THAT MAY BE AVAILABLE FOR USE WITHIN THE PROJECT BOUNDARY. CONTRACTOR SHALL RECOMMEND A FINAL DESIGN LAYOUT THAT MEETS PROJECT REQUIREMENTS WHILE ACHIEVING EFFICIENCIES AND REDUCING COSTS.

Legend

- 16ft WIDE ACCESS ROAD (40ft CLEARANCE ALLOWED IN DESIGN NOT SHOWN)
- PERIMETER FENCE
- PROPERTY LINE
- PROJECT BOUNDARY
- INVERTER STATION: 1 x 3~4MVA INVERTER 1 x 34.5kV STEP-UP TRANSFORMER
- PV TRACKER – 3 STRINGS (3 TRACKERS SHOWN)
- PV TRACKER – 2 STRINGS (3 TRACKERS SHOWN)
- PV TRACKER – 1 STRING (3 TRACKERS SHOWN)
- PROJECT O&M AREA WITH PARKING LOT (AS LABELED)
- 34.5kV UNDERGROUND COLLECTOR CIRCUIT
- A-5 INVERTER DC BLOCK A = 34.5kV CIRCUIT A 5 = INVERTER 5

5	REVISED COLLECTION	CMA	CMA	2021.11.12
4	REVISED LAYOUT	CMA	CMA	2021.02.10
3	REVISED WETLANDS	CMA	CMA	2021.01.12
2	REVISED LAYOUT	CMA	CMA	2020.12.02
1	REVISED LAYOUT	CMA	CMA	2020.11.20
0	ISSUED FOR BID	MC	AR	2020.05.05
Revision		By	Appd	YYYY.MM.DD
File Name: 193707481_BEAVER_DAM_E-SP		CT	CT	AR	2020.03.12
		Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

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Client/Project Logo

Client/Project
ALLIANT ENERGY

BEAVER DAM SOLAR PROJECT
50MW AC GROUND MOUNT SOLAR
Dodge County, WI

Title
CONCEPTUAL PV LAYOUT

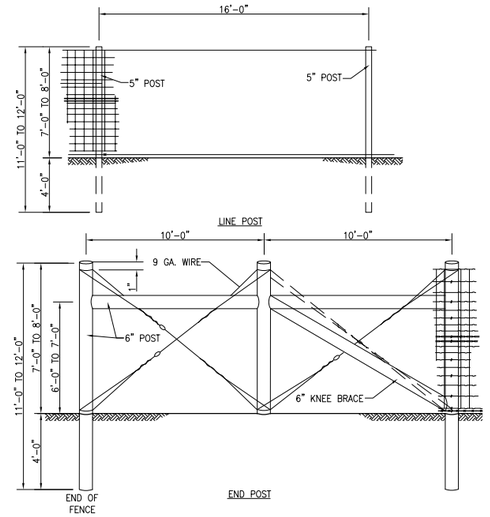
Project No.
193707481

Scale
1" = 300'

Revision
5

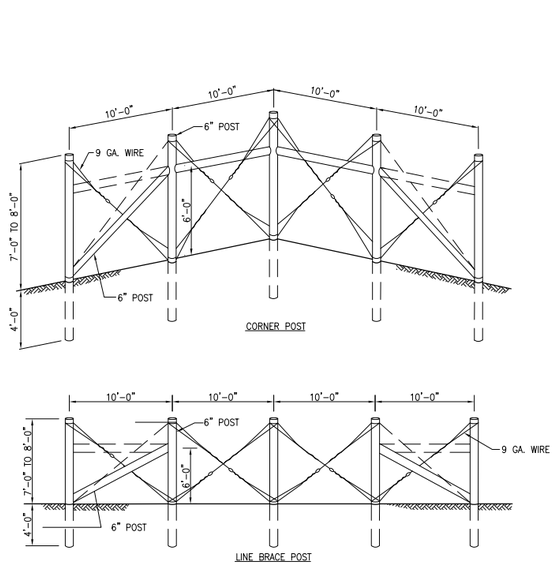
Sheet
1 of 1

Drawing No.
SKE-1



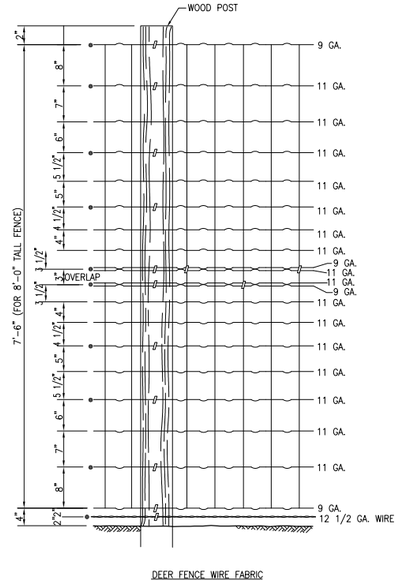
A NTS

TYPICAL DEER FENCE LINE & END POST DETAILS



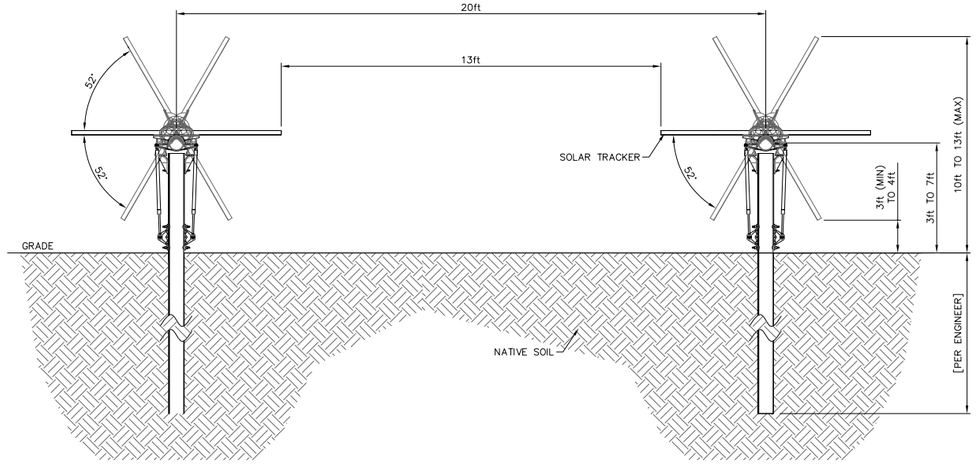
B NTS

TYPICAL DEER FENCE LINE BRACE POST DETAILS



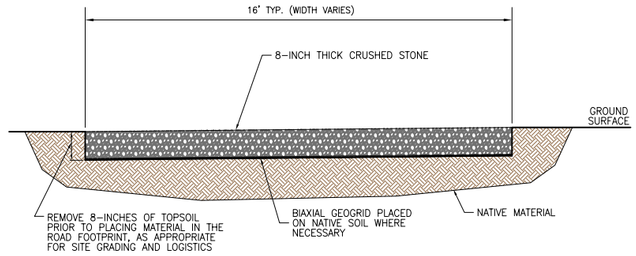
C NTS

TYPICAL DEER FENCE WIRE FABRIC FENCE DETAIL



D NTS

EAST-WEST SINGLE AXIS SELF-POWERED TRACKER (ROW TO ROW SPACING)



E NTS

TYPICAL ACCESS ROAD DETAIL (WHERE AGGREGATE ROADS ARE USED)

TYPICAL ENGINEERING DIAGRAMS – CA II PROJECTS	
TYPICAL DEER FENCE DETAILS EAST-WEST SINGLE AXIS SELF-POWERS TRACKER TYPICAL ACCESS ROAD DETAIL	Sheet 1
SUBSTATION LAYOUT MAIN TRANSFORMER FOUNDATION DETAILS	Sheet 2
TYPICAL PIER FOUNDATIONS DIRECTIONAL BORED WATERCOURSE CROSSING	Sheet 3
CIRCUIT BURY DETAILS INVERTER SKID DETAILS CONEX DETAILS	Sheet 4
MAIN TRANSFORMER OUTLINE DIAGRAM	Sheet 5
MAIN TRANSFORMER NAMEPLATE CONNECTION DIAGRAM	Sheet 6
(TYPICAL) 69kV DELTA BRACED LINE POST - LD STEEL POLE/DIRECT EMBEDDED (TYPICAL) 69/138kV 2-CIRCUIT DELTA BRACED LINE POST - LD STEEL POLE/DIRECT EMBEDDED	Sheet 7
(TYPICAL) 69kV VERTICAL DEADEND - CUSTOM STEEL POLE/CONCRETE PIER	Sheet 8
EAGLE 72HM G3 PANEL CUT SHEET	Sheet 9 & 10
SUNGROW SG3150U/SG2500U	Sheet 11

Stantec
209 Commerce Parkway, PO Box 128
Cottage Grove, WI 53527-8955
Tel. 608.839.1998
www.stantec.com

Notes

Legend

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Permit-Seal

PRELIMINARY NOT FOR CONSTRUCTION

Client/Project
WISCONSIN POWER AND LIGHT COMPANY

CA II PROJECTS
BEAVER DAM SOLAR PROJECT

Title
TYPICAL ENGINEERING DIAGRAMS

Project No. | Scale: AS NOTED | Drawing No. | Sheet | Revision

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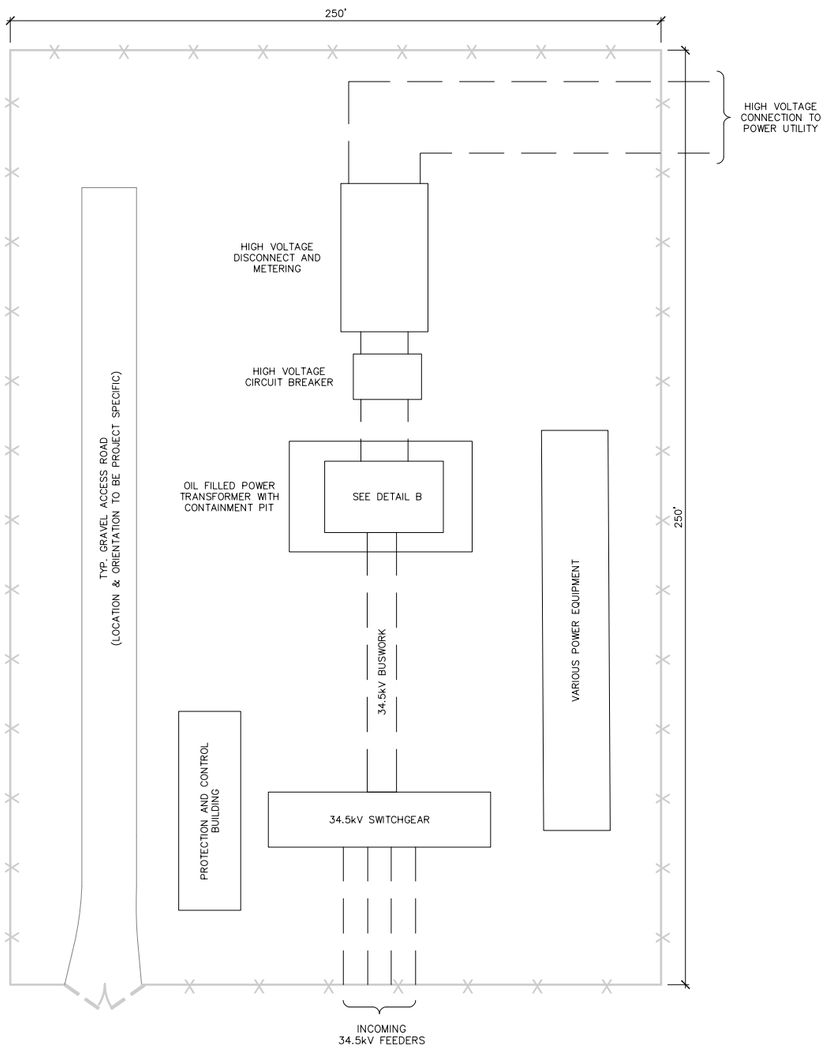
2021.03.17 9:29 AM By: Moring, Christian

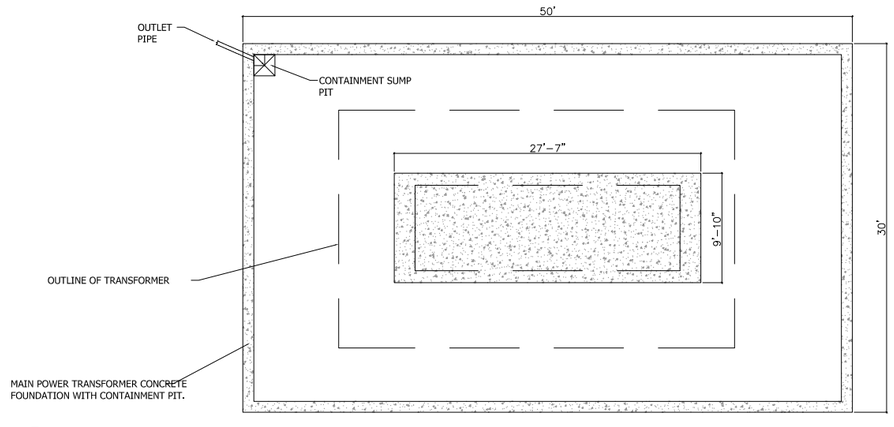
ORIGINAL SHEET - ARCH D

OVERALL ORIENTATION TO BE PROJECT SPECIFIC



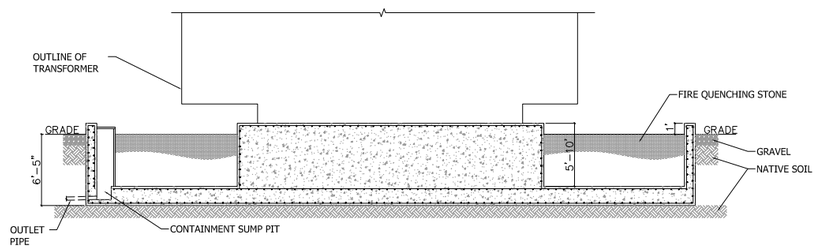
A NTS

SUBSTATION LAYOUT



B NTS

MAIN TRANSFORMER FOUNDATION PLAN



C NTS

MAIN TRANSFORMER FOUNDATION ELEVATION

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WISCONSIN POWER AND LIGHT COMPANY

CA II PROJECTS
BEAVER DAM SOLAR PROJECT

Title
TYPICAL ENGINEERING DIAGRAMS

Project No.	Scale	
	AS NOTED	
Drawing No.	Sheet	Revision

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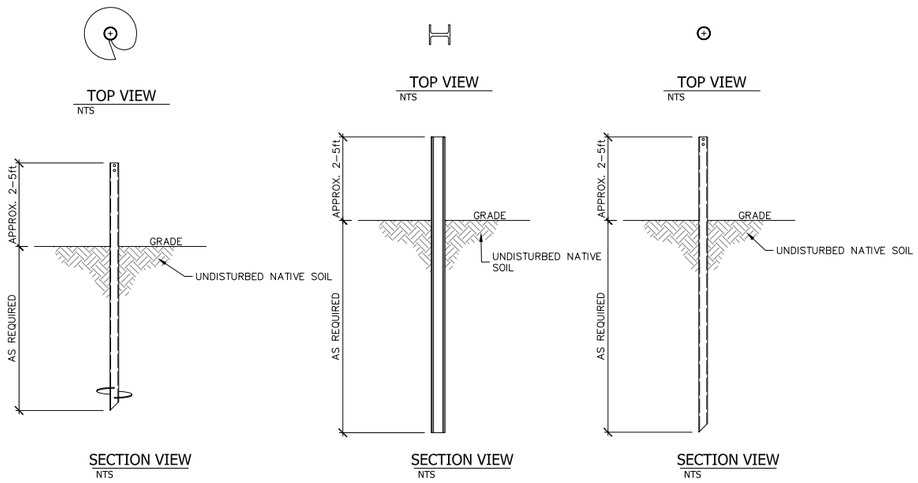
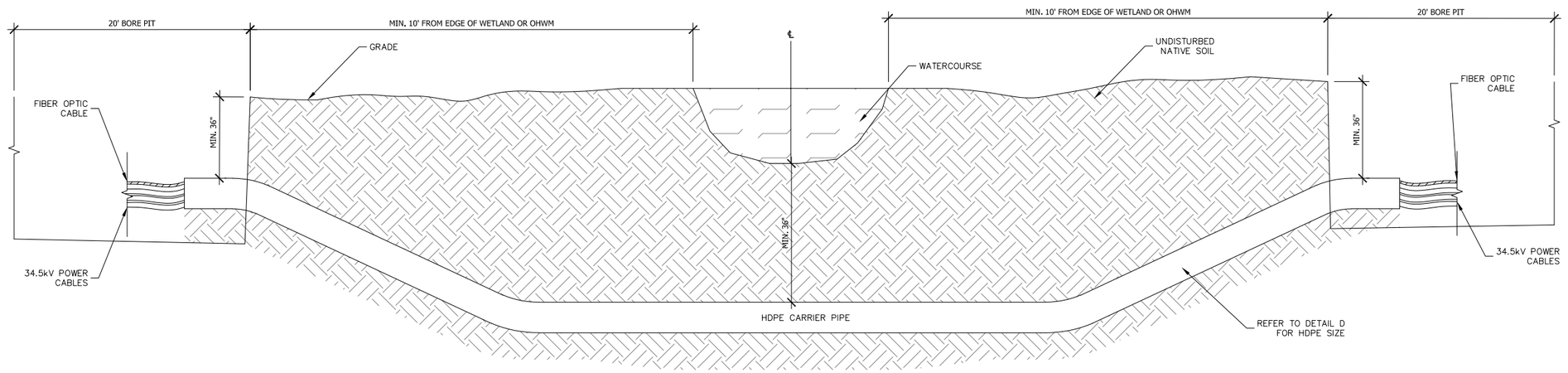


A NTS TYPICAL PIER FOUNDATIONS



B NTS DIRECTIONAL BORED WATERCOURSE CROSSING (PROFILE VIEW)

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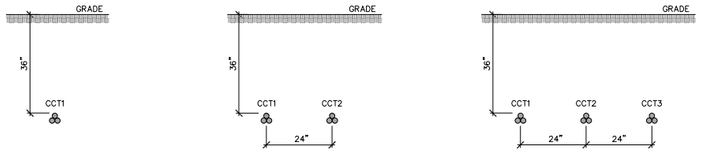
WISCONSIN POWER AND LIGHT COMPANY

CA II PROJECTS
BEAVER DAM SOLAR PROJECT

Title
TYPICAL ENGINEERING DIAGRAMS

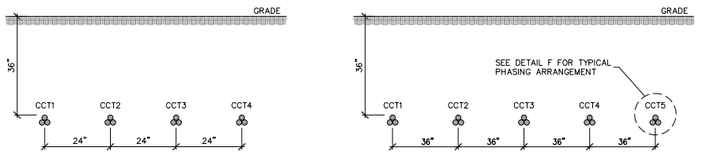
Project No. | Scale: AS NOTED
Drawing No. | Sheet | Revision



A ONE CIRCUIT DIRECT BURIED
N.T.S.

B TWO CIRCUITS DIRECT BURIED
N.T.S.

C THREE CIRCUITS DIRECT BURIED
N.T.S.



D FOUR CIRCUITS DIRECT BURIED
N.T.S.

E FIVE CIRCUITS DIRECT BURIED
N.T.S.

F TYPICAL PHASE ORIENTATION
N.T.S.

CABLE AMPACITY VALUES		
CIRCUITS	CABLE SIZE	AMPACITY PER CIRCUIT
1 CIRCUIT	35kV - 1000kcmil AL	570 A
2 CIRCUITS	35kV - 1000kcmil AL	502 A
3 CIRCUITS	35kV - 1000kcmil AL	458 A
4 CIRCUITS	35kV - 1000kcmil AL	438 A
5 CIRCUITS	35kV - 1000kcmil AL	421 A

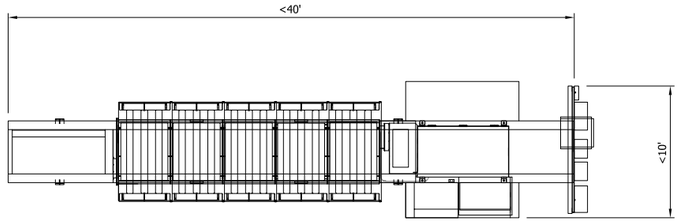
Legend

DIRECT BURIED 35kV CABLE

NATIVE SOIL

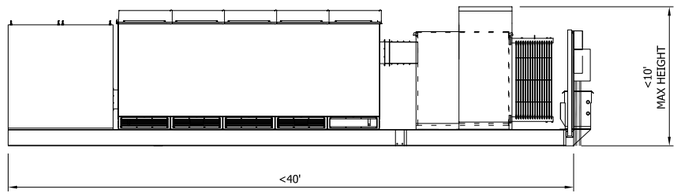
Notes

1. CABLE AMPACITY VALUES ARE ASSUMED USING MAXIMUM LOADING AND MAXIMUM CABLE SIZING. FINAL AMPACITY VALUES TO BE DETERMINED



NOTES:
1. TYPICAL INVERTER PRELIMINARY AND NOT FOR CONSTRUCTION
2. ACTUAL DIMENSIONS MAY CHANGE IN FIELD

B TYPICAL INVERTER SKID DETAIL - TOP VIEW
NTS



NOTES:
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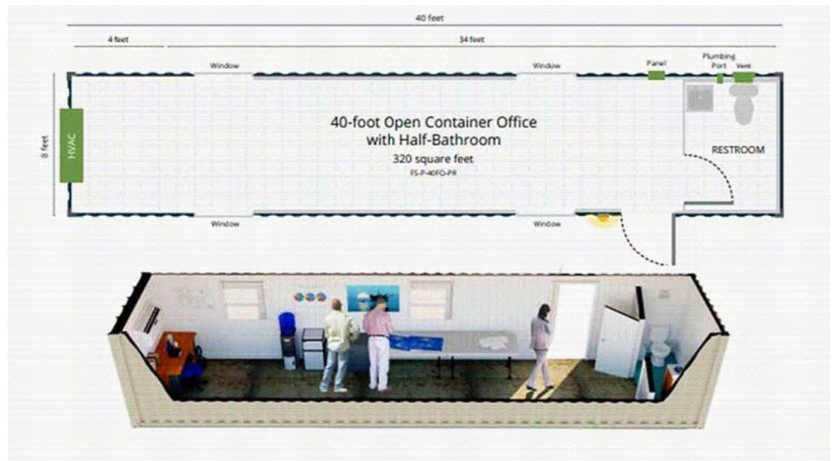
C TYPICAL INVERTER SKID DETAIL - SIDE VIEW
NTS



A CONEX DETAILS (IMAGES)
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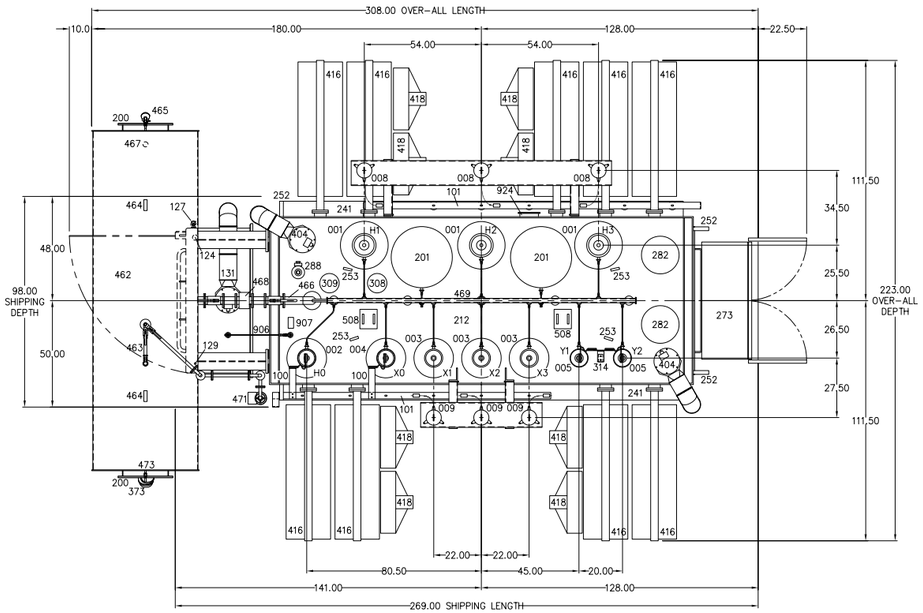
PRELIMINARY NOT FOR CONSTRUCTION

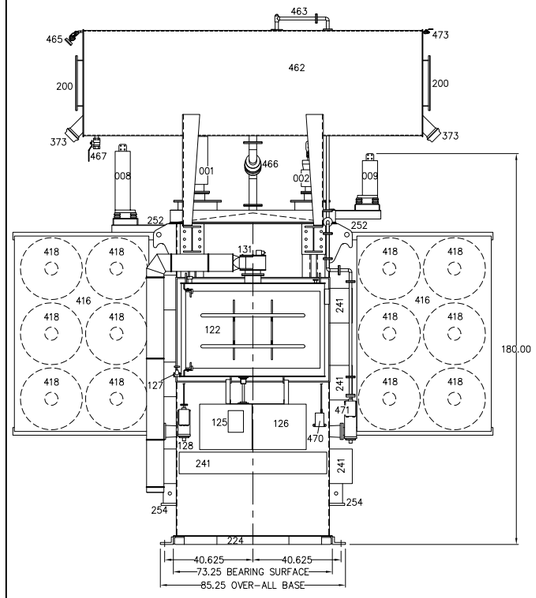
Client/Project
WISCONSIN POWER AND LIGHT COMPANY

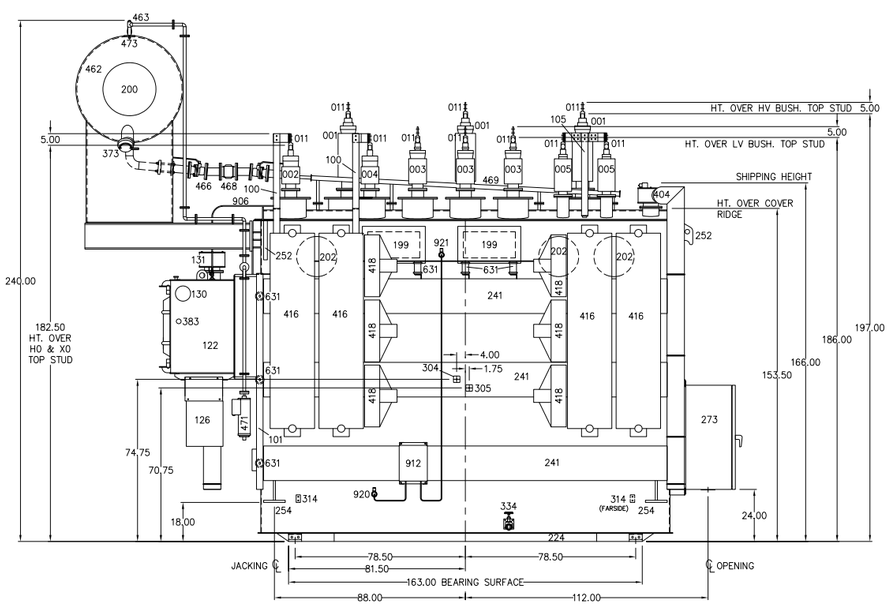
CA II PROJECTS
BEAVER DAM SOLAR PROJECT

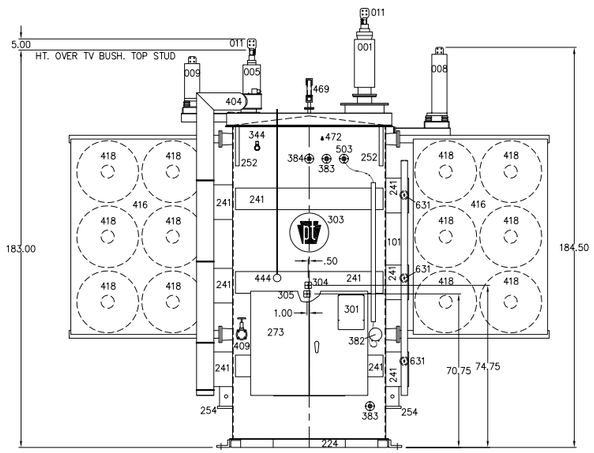
Title
TYPICAL ENGINEERING DIAGRAMS

Project No. | Scale: AS NOTED | Drawing No. | Sheet | Revision









A
NTS

MAIN TRANSFORMER OUTLINE DIAGRAM

Stantec
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Cottage Grove, WI 53527-8955
Tel. 608.839.1998
www.stantec.com

Notes

Legend

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PRELIMINARY NOT FOR CONSTRUCTION

Client/Project
WISCONSIN POWER AND LIGHT COMPANY

CA II PROJECTS
BEAVER DAM SOLAR PROJECT

Title
TYPICAL ENGINEERING DIAGRAMS

Project No. | Scale: AS NOTED
Drawing No. | Sheet | Revision

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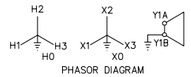
3 PHASE, 60 HERTZ
GENERATOR STEP UP
TRANSFORMER
CLASS ONAN/ONAF/ONAF
FULL LOAD CONTINUOUSLY
38000/50000/63000 kVA 65°C. RISE
13300/17500/22050 kVA 65°C. RISE TV
69000 GrdY/39837 – 34500 GrdY/19919 VOLTS
13800 VOLTS DELTA TV BURIED

Pennsylvania Transformer Technology, Inc.



PHASOR DIAGRAM

SPEC. 20396
SERIAL
DATE OF MFG.

READ INSTRUCTION BOOK BEFORE INSTALLING OR OPERATING.

% IMPEDANCE @ 69000Y/39837–34500Y/19919 VOLTS AT 38000 KVA

TESTED SOUND PRESSURE LEVEL

LIQUID LEVEL BELOW TOP SURFACE OF HIGHEST POINT OF MANHOLE FLANGE AT 25°C. 31.75 INCHES ±0.3"
LIQUID LEVEL CHANGE PER 10°C. LIQUID TEMPERATURE CHANGE. 3 INCHES
MAIN TANK DESIGNED FOR 15 PSI VACUUM FILLING.
SEE INSTRUCTIONS FOR RATINGS OF OTHER PARTS.
CONSERVATOR IS DESIGNED FOR FULL VACUUM
TRANSFORMER IS FILLED WITH MINERAL OIL, WHICH CONTAINS .3% BY WEIGHT OF DBPC INHIBITOR.
THE INSULATING LIQUID IN THIS EQUIPMENT CONTAINS NO PCB'S AS OF DATE OF MANUFACTURE.

APPROXIMATE WEIGHT IN POUNDS

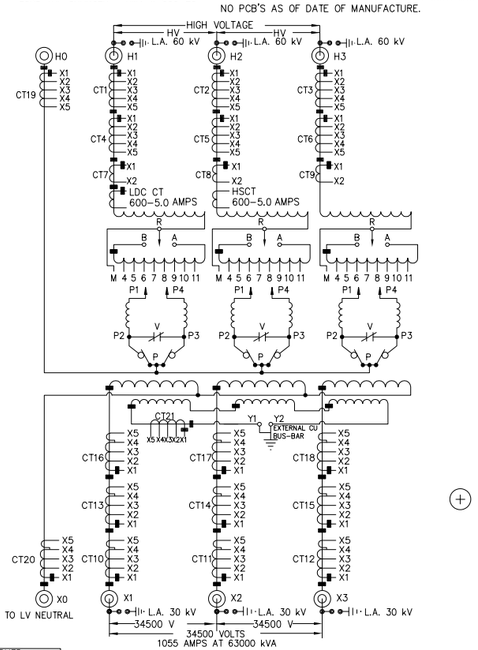
CORE AND COILS			98,550 lb
TANK AND FITTINGS			26,545 lb
LTC MECHANISM (RMV–II 600–25)			2,750 lb
DETACHABLE RADIATORS			17,640 lb
CONSERVATOR AND SUPPORT			2,380 lb
OIL	6,549 GALS	GALLONS IN MAIN TANK	49,120 lb
OIL	268 GALS	GALLONS IN LTC COMPARTMENT	2,010 lb
OIL	603 GALS	GALLONS IN RADIATORS	4,525 lb
OIL	425 GALS	GALLONS IN CONSERVATOR	3,190 lb
TOTAL WEIGHT			206,710 lb
UNTANKING WEIGHT (HEAVIEST PIECE)			98,550 lb

FULL WAVE IMPULSE LEVEL:

	WINDING	BUSHING
HIGH VOLTAGE	350 kV	350 kV
HV WDG. NEUTRAL	150 kV	150 kV
LOW VOLTAGE	200 kV	200 kV
LV WDG. NEUTRAL	150 kV	150 kV
TV VOLTAGE	110 kV	200 kV

ALL WINDING MATERIAL: COPPER
LOAD TAP CHANGER – RMV–II–600–25

HV WINDING ON LOAD TAP CHANGER							
	TAP POSITION	CONNECTS ON EACH PHASE P1 TO	P4 TO R TO		ACTUAL VOLTS L–L	AMPS AT 63 MVA
RAISE	16	11	11	B	75900	479
	15	10	11	B	75469	482
	14	10	10	B	75038	485
	13	9	10	B	74606	488
	12	9	9	B	74175	490
	11	8	9	B	73744	493
	10	8	8	B	73313	496
	9	7	8	B	72881	499
	8	7	7	B	72450	502
	7	6	7	B	72019	505
	6	6	6	B	71588	508
	5	5	6	B	71156	511
	4	5	5	B	70725	514
	3	4	5	B	70294	517
	2	4	4	B	69863	521
	1	M	4	B	69431	524
	N	M	M	B	69000	527
LOWER	1	11	M	A	68569	530
	2	11	11	A	68138	534
	3	10	11	A	67706	537
	4	10	10	A	67275	541
	5	9	10	A	66844	544
	6	9	9	A	66413	548
	7	8	9	A	65981	551
	8	8	8	A	65550	555
	9	7	8	A	65119	559
	10	7	7	A	64688	562
	11	6	7	A	64256	566
	12	6	6	A	63825	570
	13	5	6	A	63394	574
	14	5	5	A	62963	578
	15	4	5	A	62531	582
	16	4	4	A	62100	586



PLAN VIEW FACING LOW VOLTAGE

CT7, CT8, CT9 – – 300–5 AMPERES SINGLE–RATIO, 1.5B1.8

CURRENT TRANSFORMER MULTI–RATIO TYPE 600:5 AMPS, THERMAL FACTOR: 2, CT1–3 & CT19 C400						
RATIO	TURNS	TAPS	RATIO	TURNS	TAPS	
50:5	10	X2–X3	300:5	60	X2–X4	
100:5	20	X1–X2	400:5	80	X1–X4	
150:5	30	X1–X3	450:5	90	X3–X5	
200:5	40	X4–X5	500:5	100	X2–X5	
250:5	50	X3–X4	600:5	120	X1–X5	

CURRENT TRANSFORMER MULTI–RATIO TYPE 1200:5 AMPS, THERMAL FACTOR: 2, CT4–6, CT10–18, CT20–21 C800								
RATIO	TURNS	TAPS	RATIO	TURNS	TAPS	RATIO	TURNS	TAPS
100:5	20	X2–X3	600:5	120	X2–X4			
200:5	40	X1–X2	800:5	160	X1–X4			
300:5	60	X1–X3	900:5	180	X3–X5			
400:5	80	X4–X5	1000:5	200	X2–X5			
500:5	100	X3–X4	1200:5	240	X1–X5			

L.A. SURGE ARRESTERS
H.V. HUBBELL CAT. NO. – #EVP004800–3001
H.V. MCOV RATING – – 48 kV
H.V. VOLTAGE – – – – 60 kV
L.V. HUBBELL CAT. NO. – #EVP002400–3001
L.V. MCOV RATING – – – 24.4 kV
L.V. VOLTAGE – – – – 30 kV

PART NO. C0929651011C MADE IN U.S.A. MANUFACTURED AT CANONSBURG, PA

A NAMEPLATE CONNECTION DIAGRAM
NTS

16.000
15.688

MAT'L:
22 GA. 316 STAINLESS STEEL

FINISH:
POLISHED W/PROTECTIVE COATING

DIMENSIONS IN INCHES
SIZE: 12 X 16
AREA: 192 SQUARE INCHES
MTG. HOLE SIZE: .313 DIA.
HOLE CENTERS: 11.375 X 11.375

Stantec
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Client/Project
WISCONSIN POWER AND LIGHT COMPANY

CA II PROJECTS
BEAVER DAM SOLAR PROJECT

Title
TYPICAL ENGINEERING DIAGRAMS

Project No. | Scale AS NOTED
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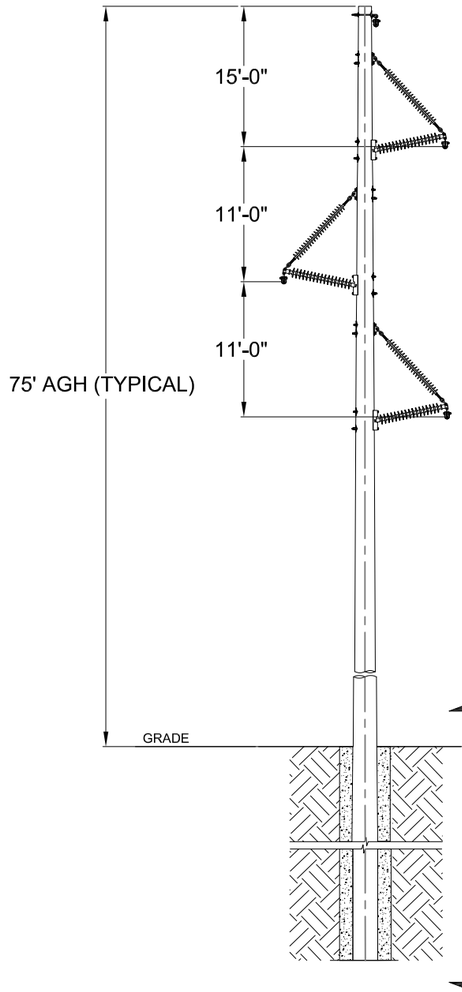
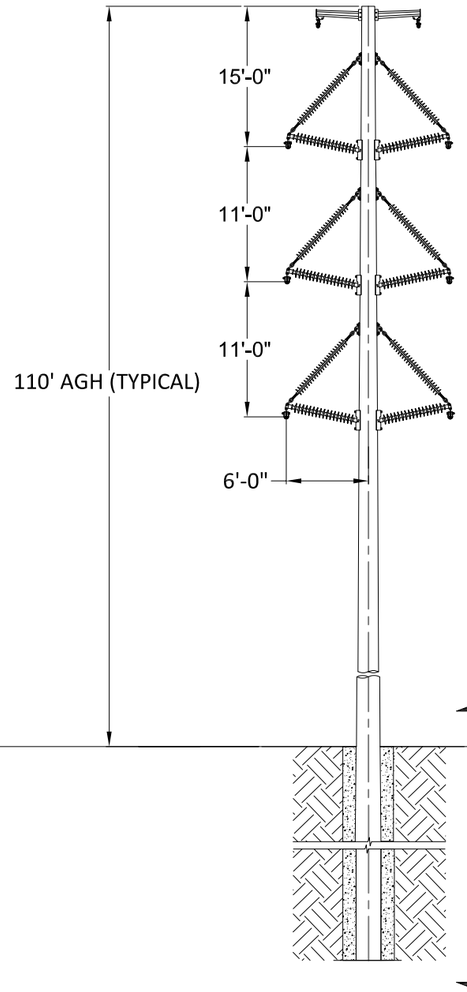
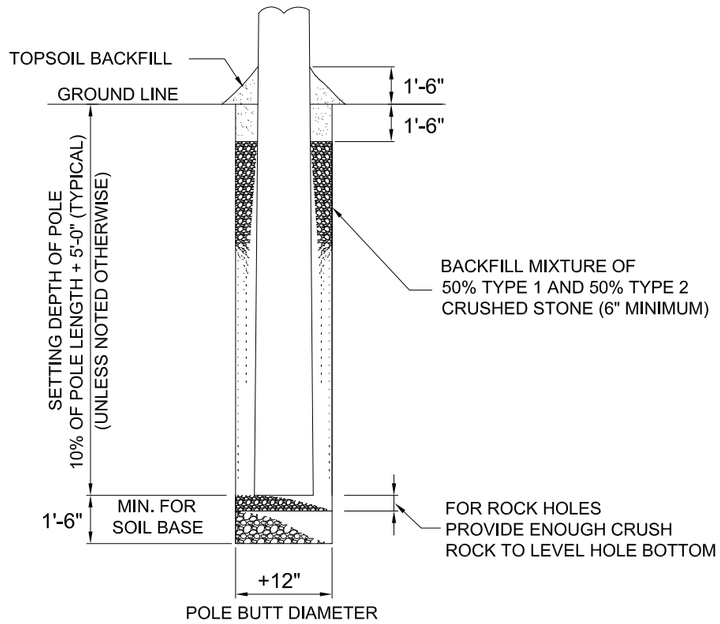


(TYPICAL) 69kV DELTA BRACED LINE POST
LD STEEL POLE/DIRECT EMBEDDED



(TYPICAL) 69/138kV 2-CIRCUIT BRACED LINE POST
LD STEEL POLE/DIRECT EMBEDDED



SECTION A-A
(TYPICAL) LD STEEL POLE
DIRECT EMBEDMENT DETAIL

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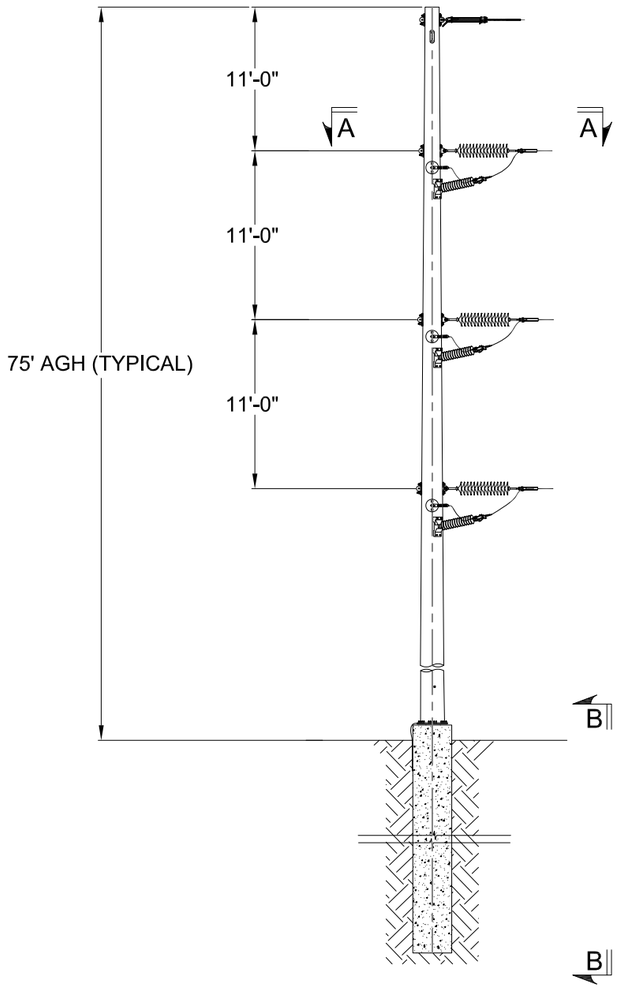
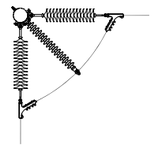
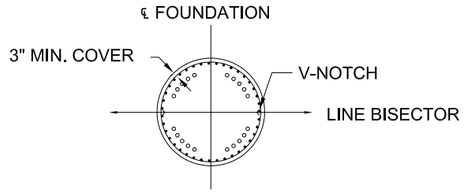


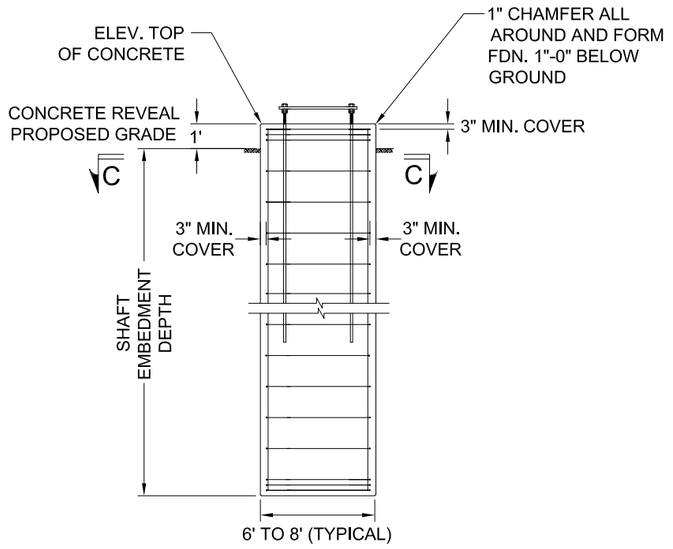
(TYPICAL) 69kV VERTICAL DEADEND
CUSTOM STEEL POLE/CONCRETE PIER



SECTION A-A PLAN VIEW
(TYPICAL) 69kV VERTICAL DEADEND



SECTION C-C



SECTION B-B
(TYPICAL) CUSTOM STEEL POLE
CONCRETE PIER DETAIL

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ORIGINAL SHEET - ARCH D

EAGLE
MODULES

THE MOST DEPENDABLE SOLAR BRAND

EAGLE 72HM G3

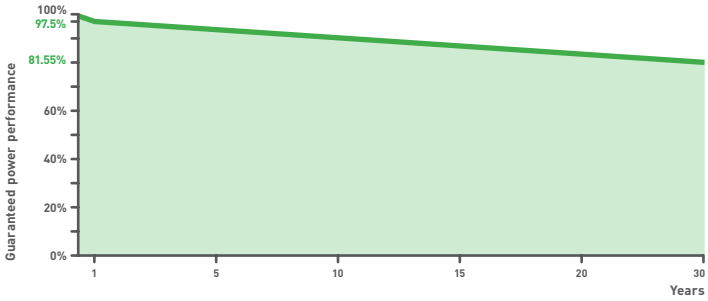
385-405 WATT
BIFACIAL HALF CELL MONO PERC MODULE

Positive power tolerance of 0~+3%

- NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- Best-selling module globally for last 3 years
- Top performance in the strictest 3rd party labs
- 99.9% on-time delivery to the installer
- Automated manufacturing utilizing artificial intelligence
- Vertically integrated, tight controls on quality
- Premium solar panel factories in USA and Malaysia

LINEAR PERFORMANCE WARRANTY

30-Year Performance Warranty



Nomenclature:
JKM405M-72HL-TV

Code	Cell	Code	Cell	Code	Certification
null	Full	null	Normal	T	Transparent backsheet
H	Half	L	Diamond		

- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- IEC61215,IEC61730 certified products
- OHSAS18001 Occupational Health & Safety Standards
- UL1703/61730 certified products

KEY FEATURES

Diamond Half Cell Technology
World-record breaking mono PERC bifacial half cut solar cells deliver high power in a small footprint.

Bifacial Power Gain
Bifacial cell architecture allows backside bonus and more lifetime power yield.

Transparent Backsheet
Easier installation and lower balance of system cost than dual glass solution.

Designed for Long Life
Uses the same DuPont protective film as the Space Station, Mars Lander, and jetliners. 30-year warranty.

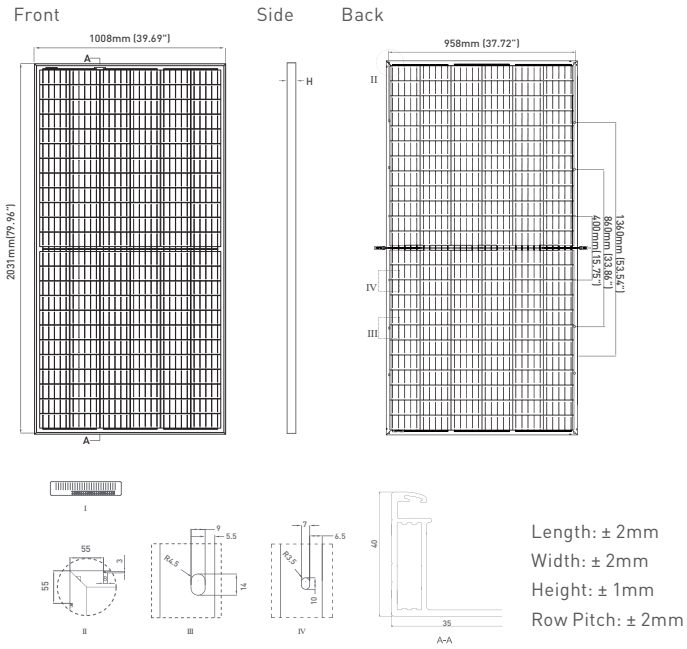
Shade Tolerant
Twin array design allows continued performance even with shading by trees or debris.

Protected Against All Environments
Certified to withstand humidity, heat, rain, marine environments, wind, hailstorms, and packed snow.

BUILDING YOUR TRUST IN SOLAR. JINKOSOLAR.US

Jinko Solar

ENGINEERING DRAWINGS



MECHANICAL CHARACTERISTICS

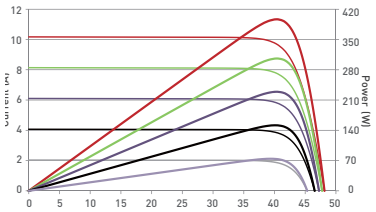
Cells	Mono PERC Diamond Cell (158.75x158.75mm)
No. of Half Cells	144 (2x72)
Dimensions	2031×1008×40mm (79.96×39.69×1.57in)
Weight	23.3kg (51.3lbs)
Front Glass	3.2mm, Anti-Reflection Coating High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP67 Rated
Output Cables	12 AWG, 1400mm (55.12in) or Customized Length
Fire Type	Type 1
Pressure Rating	5400Pa (Snow) & 2400Pa (Wind)
Hailstone Test	45mm Hailstones at 29m/s

TEMPERATURE CHARACTERISTICS

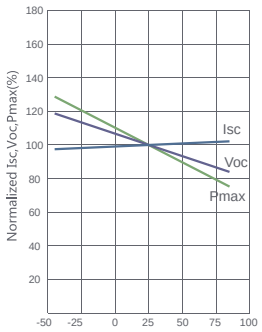
Temperature Coefficients of Pmax	-0.35%/°C
Temperature Coefficients of Voc	-0.29%/°C
Temperature Coefficients of Isc	0.048%/°C
Nominal Operating Cell Temperature (NOCT)	45±2°C
Refer. Bifacial Factor	70±5%

ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE

Current-Voltage & Power-Voltage Curves (405W)



Temperature Dependence of Isc, Voc, Pmax



MAXIMUM RATINGS

Operating Temperature (°C)	-40°C~+85°C
Maximum System Voltage	1500VDC (UL and IEC)
Maximum Series Fuse Rating	25A

PACKAGING CONFIGURATION

(Two pallets = One stack)

27pcs/pallet, 54pcs/stack, 594pcs/40'HQ Container

BIFACIAL OUTPUT-REAR SIDE POWER GAIN

5%	Maximum Power (Pmax)	404Wp	410Wp	415Wp	420Wp	425Wp
	Module Efficiency (%)	19.75%	20.00%	20.26%	20.52%	20.77%
15%	Maximum Power (Pmax)	443Wp	449Wp	454Wp	460Wp	466Wp
	Module Efficiency (%)	21.63%	21.91%	22.19%	22.47%	22.75%
25%	Maximum Power (Pmax)	481Wp	488Wp	494Wp	500Wp	506Wp
	Module Efficiency (%)	23.51%	23.81%	24.12%	24.42%	24.73%

ELECTRICAL CHARACTERISTICS

Module Type	JKM385M-72HL-TV		JKM390M-72HL-TV		JKM395M-72HL-TV		JKM400M-72HL-TV		JKM405M-72HL-TV	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	385Wp	286Wp	390Wp	290Wp	395Wp	293Wp	400Wp	297Wp	405Wp	301Wp
Maximum Power Voltage (Vmp)	39.50V	36.88V	39.62V	37.22V	39.83V	37.55V	40.01V	37.64V	40.19V	37.77V
Maximum Power Current (Imp)	9.76A	7.75A	9.84A	7.78A	9.92A	7.81A	10.00A	7.89A	10.08A	7.96A
Open-circuit Voltage (Voc)	48.10V	45.30V	48.14V	45.34V	48.26V	45.45V	48.35V	45.54V	48.45V	45.63V
Short-circuit Current (Isc)	10.08A	8.14A	10.17A	8.21A	10.23A	8.26A	10.32A	8.34A	10.42A	8.41A
Module Efficiency STC (%)	18.81%		19.05%		19.29%		19.54%		19.78%	

***STC:** Irradiance 1000W/m² Cell Temperature 25°C AM = 1.5

NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM = 1.5 Wind Speed 1m/s

*Power measurement tolerance: ±3%

SG3150U/SG2500U New

Turnkey Station for North America 1500 Vdc System

SUNGROW
Clean power for all

HIGH YIELD

- Advanced three-level technology, max. efficiency 98.8%, CEC efficiency 98.5 %
- Max. DC/AC ratio more than 1.5

EASY O&M

- Integrated current and voltage monitoring function for online analysis and fast trouble shooting
- Modular design, easy for maintenance
- Convenient external LCD

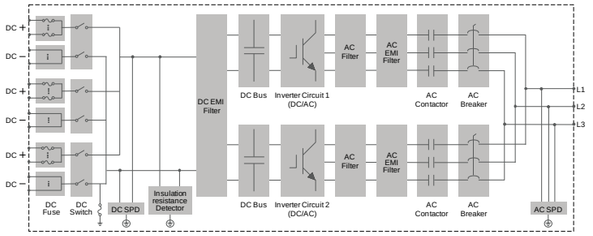
SAVED INVESTMENT

- Low transportation and installation cost due to 10-foot container design
- 1500V DC system, low system cost
- Integrated LV auxiliary power supply

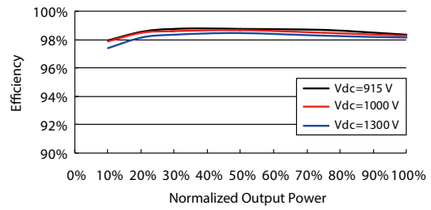
GRID SUPPORT

- Complies with UL 1741, UL 1741 SA, IEEE 1547, Rule 21 and NEC 2014/2017
- Grid support including L/HVRT, L/HFRT, power ramp rate control, active and reactive power support

CIRCUIT DIAGRAM



EFFICIENCY CURVE (SG3150U)



Type designation	SG3150U		SG2500U
Input (DC)			
Max. PV input voltage	1500V		
Min. PV input voltage / Startup input voltage	915 V / 955 V		800 V / 840 V
MPP voltage range for nominal power	940 – 1300 V		800 – 1300 V
No. of independent MPP inputs	1		
No. of DC inputs	18 – 24		18 – 21
Max. PV input current	3420 A		3508 A
Max. DC short-circuit current	4800 A		
Output (AC)			
AC output power	3150 kVA @ 45 ℃ (113 ℉)		2750 kVA @ 45 ℃ (113 ℉) / 2500 kVA @ 50 ℃ (122 ℉)
Max. AC output current	2886 A		
Nominal AC voltage	630 V		550 V
AC voltage range	554 - 690 V	554 - 690 V	484 - 605 V
Nominal grid frequency / Grid frequency range	60 Hz / 55 – 65 Hz		
THD	< 3 % (at nominal power)		
DC current injection	< 0.5 % of nominal output current		
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging		
Feed-in phases / Connection phases	3 / 3		
Efficiency			
Max. efficiency	98.8%		
CEC efficiency	98.5 %		
Protection			
DC input protection	Load break switch + fuse		
AC output protection	Circuit breaker		
Overvoltage protection	DC Type II / AC Type II		
Grid monitoring / Ground fault monitoring	Yes / Yes		
Insulation monitoring	Optional		
Q at night function	Optional		
Overheat protection	Yes		
General Data			
Dimensions (W*H*D)	2991*2896*2438 mm (117.8''*114.0''*96.0'')		
Weight	6.9 T (15211.9 lbs)		
Isolation method	Transformerless		
Degree of protection	NEMA 3R		
Auxiliary power supply	120 Vac, 5 kVA / Optional: 480 Vac, 30 kVA		
Operating ambient temperature range	-30 to 60 ℃ (> 45 ℃ derating) (-22 to 140 ℉ (> 113 ℉ derating))		-30 to 60 ℃ (> 50 ℃ derating) (-22 to 140 ℉ (> 122 ℉ derating))
Allowable relative humidity range (non-condensing)	0 – 95 %		
Cooling method	Temperature controlled forced air cooling		
Max. operating altitude	4000 m (> 2000 m derating) (13123 ft (> 6561 ft derating))		
Display	Touch screen		
Communication	Standard: RS485, Ethernet; Optional: optical fiber		
Compliance	UL 1741, IEEE 1547, UL1741 SA, NEC 2014 / 2017, CSA C22.2 No.107.1-01		
Grid support	L/HVRT, L/HFRT, active & reactive power control and power ramp rate control, Volt-var, Frequency-watt		

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APPENDIX C

VEGETATION MANAGEMENT PLAN

Vegetation Management Plan

Beaver Dam Solar Project

Dodge County, Wisconsin

Stantec Project No: 193707481

Match 18, 2021; rev. October 25, 2021

Prepared for:

Wisconsin Power and Light Company
4902 North Biltmore Lane
Madison, WI 53718

Prepared by:

Stantec Consulting Services Inc.
209 Commerce Parkway
Cottage Grove, WI 53527
Phone: (608) 839-1998
Fax: (608) 839-1995

This document entitled Vegetation Management Plan was prepared by Stantec Consulting Services Inc. for Wisconsin Power and Light Company (WPL) which owns the Beaver Dam Solar Project, a proposed 50 MW solar project to be located in the Towns of Beaver Dam and Burnett, Dodge County, Wisconsin. WPL acknowledges it will implement this Vegetation Management Plan as commitment to the long-term maintenance of the Project.

_____

(signature and date)

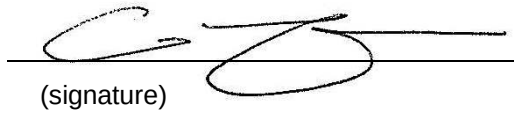
Brad Kulka, Wisconsin Power and Light Company

This document entitled Vegetation Management Plan was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of Wisconsin Power and Light Company (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment considering the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others.

Prepared by 

(signature)

Stephen Thomforde, Restoration Ecologist

Reviewed by 

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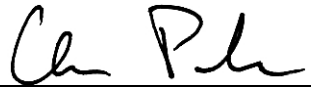
Aaron Feggestad, Senior Ecologist

Reviewed by 

(signature)

Chris Pekar, Principal

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Executive Summary

Wisconsin Power and Light Company (WPL) is proposing to construct and operate the Beaver Dam Solar Project (the “Project”) which is a 50-megawatt (MW) alternating current (AC) photovoltaic (PV) solar project in the Towns of Beaver Dam and Burnett, Dodge County, Wisconsin. Proposed Project developments, including ancillary facilities, will consist of solar panels and tracking systems, access roads, a Project substation, underground collector cables, inverters, and junction boxes. A generator tie line is also part of the Project and is located in the Town and City of Beaver Dam.

This Vegetation Management Plan (Plan) is intended for use alongside an Erosion Control and Stormwater Management Plan (ECSWMP) and provides further guidance on site seeding preparation, custom site-specific seed mixes, seed installation, and vegetation management activities over the 30-year lifespan of the facility. Site preparation typically consists of soil amendments, such as discing to reduce soil compaction from solar construction activities and create a seedbed to facilitates robust germination of compatible vegetation. Management of noxious and invasive plant species, if any, and other weedy species may also be conducted to reduce competition and improve establishment of permanent seed mixes. Temporary seed mixes consist of annual grasses for soil erosion control during or immediately after construction. Permanent seed mixes compatible with Project vegetation objectives and suitable to local environmental conditions are installed after construction and site preparation, and include:

- Low growing graminoids (native and non-native grasses and grass-like plants) and flowers (a native wildflower) to be planted in the solar array areas and other areas outside fences and
- Pollinator-friendly vegetation to be planted in select but, as of yet undetermined buffer areas.

Following permanent seeding, ongoing management of regulated noxious and invasive plant species, and other weedy species may be required for compliance with local weed ordinances and to maintain Project compatibility. Vegetation management activities typically consist of cutting (mowing) and targeted herbicide applications over the 30-year window. The custom designed seed mixes are also suitable for small ruminant grazing, (e.g. sheep), which is emerging as an alternative to mowing.

1.0 PROJECT OVERVIEW

Wisconsin Power and Light Company (WPL) is proposing the Beaver Dam Solar Project in the Towns of Beaver Dam and Burnett, Dodge County, Wisconsin. The Project is a 50-megawatt (MW) alternating current (AC) solar project that includes solar array blocks containing PV panels attached to a single-axis tracking system mounted to steel piles. The PV panels will track the sun during the day. Direct current (DC) electricity from the PV panels will be routed underground through collection wiring to inverters located throughout the PV array areas. Each PV array area will be fenced and have gated access at the road entrances. Constructed access roads will be gravel and approximately 12 to 20 feet wide. Construction is anticipated to begin Q2 of 2022 with the Commercial Operation Date (COD) projected in Q4 2023.

The Solar Facility portion of the Project Area is approximately 507 acres. Areas that are disturbed for Project purposes will be re-vegetated per the Erosion Control and Stormwater Management Plan (ECSWMP) that will be prepared prior to construction once the Project design is finalized. This Plan will supplement and does not replace the guidance provided in the ECSWMP.

The typical minimum leading-edge height between the PV panels and the ground is 18 inches. Post-to-post spacing between rows is approximately 27 feet. Final spacing within the arrays will be determined once equipment selection is finalized and the detailed engineering plan is complete. The installation of low-growing plant species and performance of vegetation management practices within the PV panel areas will be conducted to minimize vegetation touching and overshadowing PV panels.

1.2 TOPOGRAPHY, SOILS, SHADE AND CURRENT VEGETATION

1.2.1 Topography

Project area topography consists of relatively level uplands. Most of the Project area consists of 0% to 6% slopes. Project area slope precents are as follows:

- Project Area at 0% - 6% slopes = 89%
- Project Area at 7% - 12% slopes = 11%

1.2.2 Soils

Project area soils, based on United States Department of Agriculture-Natural Resource Conservation Service (USDA-NRCS) soil maps and interpretations, are primarily well drained, high-water holding, fertile silt-loams conducive for vegetation establishment and cover. Disadvantages of these soil characteristics are their propensity for soil compaction, erosion, and high nutrient values that may facilitate weed growth. USDA-NRCS soil maps indicate 99% of Project area soils consist of:

- 2% Ackmore silt loams: Poorly drained and very high-water holding capacity
- 5.5% Elburn silt loams: Poorly drained and high-water holding capacity
- 2% Juneau silt loams: Well drained and very-high water holding capacity
- 1.5% Leroy silt loams: Well drained and moderate water holding capacity
- 10% Markesan silt loams: Well drained and moderate water holding capacity
- 26% Mendota silt loams: Well drained and high water holding capacity
- 53% Plano silt loams: Well drained and high water holding capacity

The primary soil hydrology associated with the Project area constrains vegetation selection to species suitable for mesic (medium) to moist soils. Likewise, compaction during solar construction decreases drainage efficiency while increasing water holding capacity that favors species adapted to higher moisture

conditions.

Soil matrices composed of silt loams and glacial loess increases the risk for severe erosion. All soil work, including grading and tilling, requires immediate soil stabilization to minimize the potential for severe soil erosion. Soil stabilization includes planting temporary cover crop, planting cover crop and permanent seed mixes, or covering bare soils with straw mulch. Severe erosion will compromise Project construction efficiency and long-term maintenance.

1.2.3 Shade

Project area solar intensities at ground layer are currently in full sun. Solar array construction will create shade under the PV solar panels while full sun conditions will continue in areas outside PV panels. Hence, following construction, solar intensities at the ground layer will range between full sun, to partial shade, to full shade.

1.2.4 Current Vegetation

Project area vegetation is currently comprised of agricultural crops including corn (*Zea mays*), soybean (Glycine *max*), and alfalfa (*Medicago sativa*). Agricultural crop fields provide a good medium for planting solar project-compatible vegetation. However, agricultural crop field fertility has the potential to facilitate excessive weed growth. We have listed different preconstruction soil preparation strategies for each agricultural crop type in Section 3. Noxious weed management strategies and tactics are also described in Section 3.

1.3 SITE PREPARATION

Site preparation for permanent vegetation requires a minimum of noxious weed suppression and soil tillage for a suitable seedbed. Weed suppression efforts increase with time following agriculture abandonment. The sooner site preparation activities occur following agriculture abandonment the less effort required to suppress weeds. Soil tillage to prepare a seedbed should occur immediately prior to seeding. Tilled soils are susceptible to erosion; therefore, soils should be planted immediately following seedbed preparation. Site preparation activities and schedules are covered in detail in section 3.

1.4 VEGETATION INSTALLATION

There are two preferred seeding time periods. The best seeding time occurs from spring through early summer. A second seeding time period occurs in September. For best results, construction activities should facilitate seeding during these time periods. Different seeding procedures are recommended for seeding within the solar array field and seeding outside the solar array field. Vegetation installation activities and schedules are covered in Section 4.

1.5 SEED MIXES

Seed mixes are constrained by site specific environmental attributes, including soil hydrological characteristics, soil compaction, and shade. Species selection is further constrained by Project height compatibility requirements and low maintenance objectives. These constraints limit vegetation selection to species that are low growing, thrive in mesic and moist-mesic soils, and are tolerant to a variety of solar intensities. Seed mix details are covered in section 4.

1.6 MONITORING AND MAINTENANCE

Properly timed mowing and spot herbicide treatments can reduce overall maintenance costs during the

Project life cycle. Monitoring establishing vegetation during this period will facilitate proper timing and treatment activities to ensure early problems do not become larger issues. Vegetation monitoring and maintenance activities and schedules are discussed in Section 5.

2.0 PLAN GOALS

Specific goals of this Plan include the following:

- Compatibility, adaptability and compliance with the Project ECSWMP once that is written;
- Maintaining compliance with NR216 requirements regarding revegetation after construction of the Project;
- Maintaining soil health so that Project lands may potentially be returned to productive agricultural land use after Project decommissioning;
- Managing populations of existing noxious and invasive species within the Project Development Area, as feasible;
- Develop and install permanent seed mixes that supports the following objectives:
    - Low growth, quickly established, low maintenance species that can tolerate routine mowing and traffic,
    - A mix of species adaptable to the wide range of environmental parameters (soils, drainage, sun and shade, and local climate) that are expected to develop in paneled areas,
    - Compatible with engineering objectives including height restrictions as well as capacity to form continuous, dense vegetation stands; and
    - Use of native species, including pollinator-friendly, in select areas.
- Preparing seed beds and employ seed installation methods suitable for temporary and permanent seed.
- Maintaining vegetation for the Project Development Area through the anticipated 30-year life span of the facility.

3.0 SITE PREPARATION

Section 3 describes site preparation tasks, including soil preparation and herbicide work, for both temporary cover crop and permanent seed mixes and for both pre-construction and post construction project phases. This information is designed to increase compatible vegetation establishment, long-term vegetation management objectives, and overall Project construction efficiency. Site preparation suggestions are summarized in Table 1 at the end of Section 3.

3.1 PRE-CONSTRUCTION SOIL PREPARATION

3.1.1 Current Existing Vegetation / Site Preparation Considerations

Existing field crops, including corn (*Zea mays*), soybean (*Glycine max*), and alfalfa (*Medicago sativa*), require different preconstruction treatments prior to solar construction and temporary cover crop installation. These recommendations are meant to increase overall Project construction and vegetation management. Soybean fields, small-grain fields (e.g. oat, wheat, cereal rye), and forage crop fields (e.g. alfalfa and corn silage) provide low crop residue soil surfaces and non-compacted soils conducive to both vegetation and construction objectives. Cornfields, grown for grain, create excessive crop residue and compacted soils that impede both vegetation establishment, management and solar construction. For these reasons, we advise working with current land managers to help determine final crops planted before solar construction begins. Our advice for final crops prior to solar construction are, from best to worst, soybeans, small grains, forage crops (e.g. hay, alfalfa, or corn silage), and in the worst-case, grain-corn.

3.1.2 Temporary Cover Crop Consideration

The following information provides guidance for installing preconstruction temporary cover crops into existing crop fields conditions. Temporary cover crop types, and associated planting schedules are found in Appendix A, Tables. It is recommended that temporary cover crops should be installed if soils are idled for periods greater than 14 days or overwintered prior to solar construction. Idled agricultural fields, for extended periods of time, can be severely impacted by erosion and noxious weeds. Both soil erosion and noxious weeds will hinder vegetation establishment, management, and solar construction. The greatest potential for severe erosion in occurs in late winter / early spring when surface soils thaw while subsoils remain frozen, and rain occurs. Under these conditions, severe gully formation on associated unprotected soils and slopes, is rapid. Seeding cover crops into idled agriculture fields will help prevent erosion, maintain soil nutrients, provide competition against noxious weeds, reduce soil compaction, and help increase solar construction efficiency.

Existing field crops, such as soybeans, small grains, forage crops and corn, require different site preparation treatments prior to temporary cover crop installation. Excessive field crop residue and associated soil compaction will hinder cover crop installation, and ongoing vegetation and construction activities. The following information provides guidance for final field crop preparation that provide good conditions for cover crop installation and future vegetation management and solar construction.

3.1.3 Soybean Fields

Soybean fields are harvested in late-September through early-October. Harvested soybean fields provide good conditions for seeding temporary cover crops, permanent seed, and ongoing solar construction. Harvested soybean fields on sloping silt loam soils are susceptible to severe erosion that will impede ongoing vegetation management and solar construction. Therefore, soybean fields should not stand bare for more than 14 days and should not go bare over winter. Harvested soybean fields, not scheduled for fall solar construction, should be stabilized seeded with temporary cover-crop before winter, preferably

before mid-October.

Temporary cover crops, and when applicable permanent seed can be directly no-till drill seeded into soybean stubble. Temporary cover crop seed can also be broadcast seeded if followed by a packer (e.g. Brillion seeder, cultipacker or roller). Unharvested soybean fields should be mowed short or treated with glyphosate with glyphosate before seeding and solar construction.

3.1.4 Small Grain Fields (Oats, Wheat, Cereal Rye)

Small grains are harvested in mid-August. Harvested small grain crop fields require surface residue reduction via straw baling to provide good conditions for seeding temporary cover crops, permanent seed, and ongoing solar construction activities. Without straw baling, excessive crop residue will impede seeding and solar construction. Small grain crop fields are more resilient to erosion and can stand bare for longer periods than soybean fields. However, small grain crop fields, not scheduled for fall solar construction, should be stabilized with temporary cover crops before winter, preferably before mid-October, to avoid severe spring erosion.

Following straw baling, temporary cover crops, and when applicable permanent seed can be directly no-till drill seeded into small grain stubble. Temporary cover crop seed can also be broadcast seeded, but this seeding method requires a shallow discing prior to broadcast seeding and a packing procedure following broadcast seeding. Unharvested small grain fields should be mowed short or treated with glyphosate before seeding and solar construction. Small grains, treated with glyphosate, require biomass reduction, such as mowing before additional vegetation management of solar construction continues.

3.1.5 Forage Crop Fields

Forage crop fields, such as alfalfa-hay, are harvested throughout the year. Forage crop fields require some additional site preparation to provide good conditions for seeding temporary cover crops, permanent seed, and ongoing solar construction. Final site preparation includes a harvest (i.e. haying) to remove excess residue and a herbicide treatment to suppress existing vegetation and potential weeds. Herbicide application should occur approximately 20 – 30 days following haying, to allow remaining vegetation time to recover and regreen. Vegetation should reach 3” to 5” inches in height before herbicide is applied. Forage crop fields, prior to herbicide treatment, are resistant to erosion. Following herbicide treatment, soil erosion resistance decays, and forage crop fields should be seeded within 30 days following herbicide treatment.

Following herbicide treatment, and based on herbicide manufacturer’s recommendations, temporary cover crops, and when applicable permanent seed, can be directly no-till drill seeded into forage crop stubble. Temporary cover crop seed can also be broadcast seeded, but this seeding method requires a shallow discing prior to broadcast seeding and a packing procedure following broadcast seeding.

3.1.6 Cornfields (Corn Silage and Grain Corn)

Regionally, corn is grown for either silage or grain. Corn harvested for silage provides good conditions for seeding temporary cover crops, permanent seed, and ongoing solar construction. Temporary cover crops, and when applicable permanent seed can be directly no-till drill seeded into corn silage stubble. Temporary cover crop seed can also be broadcast seeded, but this seeding method requires a shallow discing prior to broadcast seeding and a packing procedure following broadcast seeding.

Corn grown for grain produces excessive crop residue and severe soil compaction that makes ongoing site preparation and solar construction difficult. Excessive crop residue in combination with soil compaction decreases both evaporation and drainage, and in wet periods, ponding, mud, and rutting conditions persist. These conditions exacerbate vegetation management and solar construction.

Adequate seedbed preparation for grain corn fields begins with mowing corn stubble, baling and removing plant residue, and discing soils prior to seeding.

Grain corn is the last regional crop to be harvested, usually in November, and often too late for cover crop germination. To avoid muddy compacted soils during solar construction, we advise grain cornfields be mowed and baled in the fall immediately following harvest. Unless solar construction begins immediately following harvest, we advise cover crops to be installed before winter freezes soils. Winter cover crops will germinate in early spring. Cover crops will help mitigate drainage and compaction issues associated with grain cornfields, plus provide protection against erosion and nutrient sloughing. Cover crop installation requires corn stubble to be mowed, residue baled and removed, and soils lightly disced prior to seeding.

Harvested grain corn fields are resistant to erosion; however, severe soil compaction prohibits water infiltration and therefore exacerbates downslope erosion.

3.1.7 Temporary Cover Crop Termination

Temporary cover crops can produce excessive crop residue that impede ongoing vegetation management and solar construction. Therefore, temporary cover crop installation requires planning for terminating cover crops before they produce excessive residue or how to deal with the excessive residue once its produced. Cover crops planted with permanent seed are terminated with regular ongoing management mowing.

Fall installed temporary cover crops, consisting of winter wheat (*Triticum aestivum*) (Table A.1-A), can be treated with glyphosate or mowed short in the mid-spring before ongoing solar construction and vegetation management procedures proceed. Chemical and mowing cover crop termination should occur when cover crop has achieved 6” in height but is less than 12” tall.

Spring installed temporary cover crops, consisting of oats (*Avena sativa*) (Table A.1-C), can be treated with glyphosate or mowed short in the early-summer before ongoing solar construction and vegetation management procedures proceed. Chemical and mowing cover crop termination should occur when cover crop has achieved 6” in height but is less than 12” tall.

An alternative to mowing or treating cover crops with glyphosate is haying. Haying has the advantage of leaving behind a clean soil surface that is highly desirable to ongoing solar construction and vegetation management. Haying also has the advantage of reducing excess soil nitrogen; therefore, reducing the potential for noxious weed recruitment. The haying procedure allows the temporary cover crop to reach the beginning stages of flowering (boot stage). The cover crop is cut green and harvested for silage or hay. Green cover crops provide local farmers a quality forage crop.

3.2 POST-CONSTRUCTION SOIL REPARATION

Most Project soils will be impacted by solar construction and require post-construction soil preparation to develop a seedbed suitable for robust germination and compatible cover while providing a smooth surface for long-term vegetation management. Severe soil compaction caused by solar construction and tight spaces between panels makes post-construction seedbed preparation challenging. Soil preparation will require a minimum one deep tilling with an off-set disc, chisel plow or soil-ripper to fracture compacted soils. Following deep tillage, soils will require at least one pass with a drag harrow to create a smooth, firm, and friable seedbed that offers good germination and recruitment potentials. All seeded areas require a final packing to increase seed germination and reduce erosion potentials.

Table 1. Soil Preparation Procedures Based on Existing Vegetation and Project Construction Phase

Existing Conditions	Erosion Potential	Pre-seeding Preparation	Suitable for No-till Drill Seeding	Suitable for Broadcast seeding	Post-seeding Preparation Work
Harvested Soybean Field	High	None	Yes	Yes	Pack soils following seeding
Harvested Small Grain Field	Low	Reduce crop residue (e.g. bale straw) Shallow disc soils before broadcast seeding	Yes	Yes	Pack soils following seeding
Standing Forage Hay Field	Low	Final harvest to reduce biomass Herbicide treat forage Shallow disc soils before broadcast seeding	Yes	Yes	Pack soils following seeding
Harvested Corn Silage Field	Moderate	Shallow disc soils before broadcast seeding	Yes Disc soils prior to drilling seeding	Yes	Pack soils following seeding
Harvested Corn Grain Field	Moderate	Mow corn stubble. Bale corn residue Disc soils	No Disc soils prior to drilling seed	Yes	Pack soils following seeding
Post Solar Construction Bare Soils Within array field	High	Disc or chisel plow to reduce soil compaction (1-2 passes) Drag soils smooth firm Seed immediately	No Drill seeding not recommended in array field, inadequate seed coverage	Yes	Pack soils following seeding
Post Solar Construction Outside array field	Low	Disc or chisel plow to reduce soil compaction (1-2 passes) Drag soils smooth firm Seed immediately	Yes	Yes Increase seeding rates by 20%	Pack soils following seeding
Post Construction Noxious Weeds Within array field	Moderate	Treat weeds with appropriate herbicide Disc or chisel plow to reduce soil compaction (1-2 passes) Drag soils smooth firm Seed immediately	No Drill seeding not recommended in array field, inadequate seed coverage	Yes Follow herbicide label for seeding post herbicide treatment	Pack soils following seeding

Existing Conditions	Erosion Potential	Pre-seeding Preparation	Suitable for No-till Drill Seeding	Suitable for Broadcast seeding	Post-seeding Preparation Work
Post Construction Noxious Weeds Outside array field	Moderate	Treat weeds with appropriate herbicide Disc or chisel plow to reduce soil compaction (1-2 passes) Drag soils smooth firm Seed immediately	Yes Follow herbicide label for seeding post herbicide treatment	Yes Follow herbicide label for seeding post herbicide treatment	Pack soils following seeding

3.2.1 Soil Seedbed Preparation

A primary failure to establish compatible vegetation between and under PV panels is inadequate seedbed preparation. One reason is soil compaction that occurs during solar construction. Site preparation objectives seek to fracture soils to a minimum of 2.5” inches. This requires a minimum of one pass with either a heavy duty off-set disk or chisel plow (aka soil ripper / subsoiler). Following discing or chisel plowing, soils should be drag-harrowed to create smooth, firm, and friable soils suitable for seeding. Soil harrowing requires a minimum of one pass. Soil fracturing and harrowing is not possible completely under PV panels; however, seed rates and species selection can be designed to mitigate the lack of seed bed preparation in these areas.

3.2.2 Develop Contingencies for Erosion

Excessive post-construction soil compaction coupled to extensive PV panel dripline, creates the potential for rill and gully erosion during the soil preparation and early seed establishment phases. For these reasons, contractors and subcontractors should have in place plans and resources to correct. This might include filling in washouts, reworking soils to prepare an adequate seed bed, and over seeding impacted areas.

3.2.3 Invasive and Weed Species Management

Despite the clean appearance of recently harvested agricultural fields, several noxious weeds, such as Canada thistle (*Cirsium arvense*) and giant ragweed (*Ambrosia trifida*) can persist and thrive in abandon agriculture fields. When ceasing agricultural activities, noxious weeds are released and can quickly come to dominate large areas. These weeds can compromise Project vegetation compatibility objectives and State and / or local Noxious weed laws.

For this Plan, invasive and weed species are defined under the following two categories:

1. Compliance - includes species covered under State of Wisconsin Noxious Weeds law (Chapter 66.0407) and the Wisconsin NR 40 Invasive Species Rule. These species will be referred to as ‘noxious weeds.’
2. Compatibility – includes species that are not legally defined as noxious or ‘invasive’ but may interfere with the solar panels due to plant height, may interfere with ecological goals and the establishment of native species, or may pose vegetation management concerns. These species will be referred to as ‘weeds.’

Invasive and weed species management will be conducted as needed to:

- Minimize the spread of noxious weeds from existing populations, if present,
- Prepare the seeding areas for permanent vegetation to reduce competition and improve

establishment and success of the permanent seed mixes, and

- Reduce vegetation impacts to the PV panels and solar facility infrastructure. Flowering non-native species that are not considered noxious and do not have heights that interfere with the Project operations will not be actively managed.

Noxious weed species management may consist of spot cutting, mowing, and herbicide treatments.

3.2.4 Cutting and Mowing

Vegetation cutting shall be appropriately timed to assist with control of invasive and weedy species (e.g., mow biennial species during flowering but prior to seed production) and to remove vegetation to assist with site seedbed preparation. Methods will be selected based on aerial extent of vegetation and site accessibility.

3.2.5 Herbicides

3.2.5.1 Purpose

Herbicide treatments are recommended for management of perennial noxious species, as mowing alone is not typically sufficient for adequate control. Ongoing management of invasive species may be required for compliance with existing invasive plant species regulations. Herbicides are also used to remove undesirable vegetation to prepare seeding areas for permanent seed installation. No insecticides will be used during vegetation establishment or long term maintenance.

3.2.5.2 Herbicide Types

There are three general types of herbicides that are applicable for use within the Project: 1. Non-selective, 2. Broadleaf-selective, and 3. grass-selective.

Non-Selective Herbicides

Non-selective herbicides injure or kill all types of vegetation, including broadleaves, grasses, sedges, rushes, and woody plants. Glyphosate is commonly used to remove all vegetation to prepare areas for permanent seeding.

Broadleaf-Selective Herbicides

Broadleaf-selective herbicides are intended to injure or kill only broadleaf plants. There are many types of broadleaf herbicides. Two types commonly used in natural settings include 2,4-D and triclopyr. Both 2,4-D and triclopyr are used to remove broadleaf plants from grass-stands and turf lawns. Some broadleaf herbicides are highly selective, for example, the active ingredient clopyralid is very effective for controlling noxious Canada thistle (*Cirsium arvense*), giant ragweed (*Ambrosia trifida*) and weedy legumes (Fabaceae). These herbicides are all appropriate for controlling invasive broadleaf weeds within the PV panel arrays where only graminoid (grass and grass-like plants such as sedges and rushes) species will be installed. Extra caution should be taken to avoid injury to desirable graminoid species by waiting to apply herbicides after graminoid seedlings have matured for at least 90 days or have flowered at least once.

Grass-Selective Herbicides

Grass-selective herbicides are intended to injure or kill only grasses. The most common grass- selective herbicide is clethodim. It is used to selectively target undesirable grasses growing among desirable broadleaf plants. These herbicides may be appropriate for controlling certain invasive grasses in areas with pollinator-friendly vegetation.

3.2.5.3 Herbicide Application Methods and Timing

There are two primary methods to apply herbicides: low volume/spot applications and broadcast applications. Methods and timing should be based on a site-specific evaluation of target species, vegetation composition, and sensitivity of adjacent areas to herbicide applications.

Low Volume/Spot Applications

This method utilizes a hand-held sprayer mounted to small (3.5 to 25 gallon) tanks to selectively deliver herbicide to individual plants or small clumps of plants. Backpack sprayers are suitable for small areas while pistol sprayers mounted to an all-terrain vehicle or utility terrain vehicle (UTV) are suitable for larger areas or large clumps of vegetation. Wicks may also be used for ultra-low volume delivery of herbicide to undesirable plants growing in sensitive ecological areas. This method may be appropriate for managing discrete populations of weedy and invasive species before and during construction.

Broadcast Applications

This method utilizes a boom or boomless sprayer tanks mounted to a UTV or tractor to broadcast herbicide to large areas. This method is appropriate for large-scale site preparation to remove weedy and invasive vegetation from large areas using a non-selective herbicide.

3.2.5.4 Proposed Herbicides

The herbicides that may be used in the Project are listed below in Table 1. These herbicides are frequently used in natural area settings to assist with management of species that would be expected to occur in the Project area. These herbicides have a relatively short half-life and moderate to very unlikely potential to reach shallow groundwater.

Table 2. Environmental Information for Proposed Herbicides

Active Ingredient	Herbicide Type	Potential Uses	Rate (Ounces/ Acre)	Environmental Fate[1,2]			
				Water Solubility	Soil Half- life	Mineral Soil Sorption Coefficient KOC / FAO Mobility Classification 3	Groundwater Ubiquity Score (GUS)[4] / Potential to Reach Shallow Groundwater
Glyphosate	Non-selective systemic foliar	Non-selective treatment of grasses and broadleaf plants	64 - 96	Very soluble	3.6 days	33,025 in sandy soils / Hardly mobile	-0.29 in sandy soils / Very unlikely
2,4-D	Broadleaf systemic foliar	Selective treatment of weedy and invasive broadleaf plants	48 – 80	Moderately soluble	2.9 days	73 in sandy soils / Mobile	0.99 in sandy soils / Unlikely
Aminopyralid	Broadleaf selective foliar Species selective	Specific noxious and invasive weeds	5 - 9	Very soluble	81.5 days -	2.33 in	6.94 in
Clopyralid	Broadleaf selective foliar Species selective	Specific noxious and invasive weeds Asters and legumes	9 - 12	Very soluble	12.8 days	12.9 in sandy soils / Mobile[5]	3.96 in silt loam / Likely[5]
Clethodim	Grass-selective systemic foliar	Selective treatment of weedy and invasive grasses	12 - 16	Very soluble	3 days in unknown soil	137.5 in unknown soil / Moderately mobile	0.89 in unknown soil / Unlikely

[1] Information from Herbicide Properties Tool at the National Pesticide Information Center – Oregon State University. Accessed online on 10/28/2020 at http://npic.orst.edu/HPT/#.

[2] Reported for sandy soils unless otherwise stated in the Herbicide Properties Tool search results.

[3] Based on FAO Mobility Classification in *Guidance for Reporting on the Environmental Fate and Transport of the Stressor Concern in Problem Formulations*. Accessed online on 10/28/2020 at https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/guidance-reporting-environmental-fate-and-transport#II_C.

[4] Potential to Reach Shallow Groundwater based on discussion in the Herbicide Properties Tool search results.

[5] Appropriate for low volume foliar herbicide applications targeting individual plants or clumps of plants.

3.2.5.5 Herbicide Adjuvants

Adjuvants are typically added to herbicide mixes to improve herbicide performance. Adjuvants typically used for natural areas management include hard water treatment additives, surfactants, and penetrants. Herbicide labels should be consulted for recommendations on the types of adjuvants to add to a mix. In general, aquatic-approved adjuvants should be used to minimize potential impacts on wildlife, including pollinators. Aquatic-approved adjuvants should always be used in and near areas of standing water.

3.2.5.6 Herbicide Standard Industry Practices

Herbicides are a valuable vegetation management tool when used according to manufacturer's instructions and following standard industry practices. The following practices are recommended when using herbicides to manage undesirable vegetation:

1. Vegetation managers should apply principles of integrated vegetation management. Herbicides will be used as one of several available 'tools in the toolbox' to manage vegetation and habitats in an ecologically sensitive manner, in addition to cutting, engineering controls, and cultural controls.
2. Herbicide labels and Safety Data Sheets should be read prior to mixing, loading, and application.
3. The appropriate volume of herbicides and adjuvants necessary to complete a vegetation management task should be utilized. This includes targeted application techniques when practicable and use of properly calibrated equipment to minimize environmental effects.
4. The appropriate concentrations of herbicides and adjuvants as recommended by product labels are used to achieve intended outcomes. Applying herbicide lower than recommended rates might result in herbicide resistance. Applying herbicides above recommended rates may result in "top-killing" the plant before the herbicide translocations through the root system killing the entire plant instead of only the above ground structure.
5. Selective herbicides are used to limit effects on non-target plants.
6. Persistent noxious weeds typically require several treatments, such as a spring, fall, spring treatment regime.
7. Herbicide applications should be conducted during favorable weather conditions to maximize herbicide efficiency and minimize off-site drift and run-off. These weather conditions include:
    a. Ambient air temperatures are below 78^0 degrees Fahrenheit (26^0 Celsius) and above 38^0 Fahrenheit (3^0 Celsius)
    b. Average weather conditions have prevailed for a minimum of two weeks prior to herbicide application (e.g. avoid herbicide application during persistent heat, drought, freezing or wet conditions).
8. Herbicide should be applied to plants when plants are most physiologically prone to injury by active ingredients. Plants are most prone to herbicide injury when they are actively growing. Plant life cycles targetable for herbicide application include the flower bud-stage and the cool season photosynthesizing rosette stage. Plants that have senesced following flowering or are inactive due to high heat or drought should not be treated.

Additional practices may be developed, as needed, based on Project area conditions.

3.2.5.7 Herbicide Permitting

Herbicide treatments shall be performed by individuals with a current Commercial Pesticide Applicator certification and license issued through Wisconsin Department of Agricultural, Trade, and Consumer Protection, and in accordance with all applicable laws, regulations, and herbicide label instructions.

4.0 VEGETATION INSTALLATION

4.1 SEEDING PLAN

Section 4 provides information on custom seed mixes and planting methods. Seed mix information covers both temporary and permanent seed mixes. Planting methods includes final seedbed preparation, seeding methods (e.g. drilled and broadcast seeded) and post seeding procedures (e.g. packing) for temporary and permanent seed mixes. This information is designed to increase compatible vegetation establishment, long-term vegetation management objectives, and overall Project construction efficiency. All site seeding activities maintain compliance with the ECSWMP.

4.1.1 General Seed Mix Information

Knowledge of site environmental constraints coupled to Project vegetation compatible goals allows us to design custom site-specific mixes for both temporary and permanent seed. These seed mixes are customized to meet the environmental constraints that develop following PV panel installation. Seed mixes consist of fast to establish, low-growing species that thrive in mesic and moist-mesic soil conditions under a variety of sunlight levels This multi-species seed mix and corresponding seeding rates allows robust coverage and rapid establishment for a variety of site-specific environmental parameters throughout the Project area.

Seed mix specifications for temporary cover crops are found in Appendix A, Table A.1-A – Table A.1-D. Seed mix specifications for permanent vegetation is found in Appendix A, Table A.2 – A.4. A list of regional seed mix vendors is found in Appendix B.

4.1.2 General Seed Installation (Seeding) Information

Seed installation for both preconstruction and post-construction Project phases are described in this section. Preconstruction seeding primarily involves installation of temporary cover crops, and when appropriate, permanent seed mixes. Preconstruction seed installation methods are dependent upon preexisting conditions and timing. For example, some preexisting conditions, such as soybean fields, are suitable for direct no-till seeding. Other preexisting conditions, such as small grain crops (oats, wheat, rye, barley) corn silage, forage crops, and grain corn require additional site preparation prior to seeding. Site preparation for different preexisting conditions is detailed in Section 3 and summarized in Table 1.

There are two primary seed installation methods: drill seeding and broadcast seeding. Appendix C, Table 1.C provides a comparison summary of proposed seeding methods. Drill seeding requires less soil preparation and less seed. However, drill seeding is difficult in tight spaces and lacks the ability to spread seed under solar panels. Broadcast seeding requires greater soil preparation, increased seed amounts (e.g. >20%), and post-seeding packing to ensure adequate soil to seed contact and germination.

Differences between drill and broadcast seed installation dictates which method is preferable under pre-construction and post construction Project phases. Drill seeding is the preferred method to install preconstruction temporary cover crops and, when applicable, permanent seed mixes, across the entire Project area. Drill seeding is also the preferred method in larger post-construction areas (e.g. > 1 acre) outside the PV panel arrays, including designated perimeter, pollinator refuge, and buffer areas.

Broadcast seeding is the preferred method to install post-construction temporary and permanent seed mixes between PV panels. It is important to note, that while broadcast seeding covers more acres per hour, it requires two additional procedures, including pre-seeding soil tilling and post seeding packing to ensure adequate germination and establishment.

Packing soils following broadcast seeding is required to achieve good soil to seed contact. Although drill seeders do not require soil packing post seed installation, drilled seed still benefits from packing. In all cases, packing soils following seeding ensures good soil to seed contact, smoother soil surfaces, and reduction in potential erosion. We recommend packing soils following all seeding.

4.1.2.1 Seed Depth

Seed depth is another important general consideration. A primarily failure in seed recruitment is planting too deep. This is especially true when soils are shallow disced prior to seeding. The key term in shallow discing is shallow. In the best-case scenario, all seed should be incorporated into the soils between 1/16th and 1/4 inches deep. Large seed, such as cover crop seed can be seeded deeper, up to ½ inch deep. The permanent seed mixes are dominated by small-seed species that should be seeded between 1/16th and 1/4 inches deep. Some permanent seed species are very small and perform best when left on the surface. We have included very small seed species that are shade tolerant for under PV panels where soil preparation is impossible. The best way to ensure seed is not installed too deep is to drag-harrow or pack soils following soil fracturing and before seeding. Drag harrowing or packing soils prior to seeding creates a firm friable seedbed that prevents seed from being planted too deep.

4.1.2.2 Fertilizer

No fertilizer will be applied to soils before, during or following seeding of both temporary cover crops and permanent seed mixes. Soils in the Project area have been cropped with nitrogen fixing legumes, including soybeans and alfalfa, and augmented with nitrogen fertilizer for corn. Therefore, Project soils provide adequate fertility to establish robust Project compatible vegetation.

For sites developed on infertile soils, or on highly disturbed soils, the addition of legumes in cover crops can enhance fertility for permanent seed mixes. As such, legumes included in cover crops are not necessary for this Project..

4.1.2.3 Seed Mix Vendors

Seed should be purchased from local vendors that supply quality local sourced seed, or at a minimum, seed that has proven successful in local environmental parameters. All seed, including temporary cover crop and permanent seed mixes, require seed tags that indicate seed weight, pure live seed, region of origin, and noxious weed content. Native seed, used in Pollinator Refuge Areas, require seed source tags that indicate genetic origin not greater than 250 miles from the project site. We have included a list of regional qualified seed vendors in Appendix B, Table 1. Several listed vendors specialize in custom seed mix orders and carry both native and non-native species.

4.2 TEMPORARY SEED COVER CROPS

Temporary seeding of cover crops is employed to stabilize soils following removal from agriculture production and soils disturbed by Project construction that are not ready for permanent seed and will be idled for time periods greater than 14 days, over winter, or as otherwise specified in the ECSWMP.

Temporary cover crops are replaced by permanent vegetation following installation of PV panels. Temporary cover crop seeding rates (e.g. seeds per square foot) are higher when permanent seed is not installed to provide adequate vegetative cover and protection from soil erosion. Cover crop seed mixes are designed to meet two primary objectives:

1. Compliance with the ECSWMP and
2. Stabilization of soils to assist with establishment of permanent vegetation.

Cover crops are composed of annual grasses that establish quickly, provide erosion control, establish

residue for later permanent seedings, build soil organic matter, maintain soil nutrients, reduce soil compaction, and assist with weed suppression. Two annual grasses – winter wheat (*Triticum aestivum*) andseed oats (*Avena sativa*) are utilized, depending on installation timing. Each of these species is listed on the Wisconsin Department of Natural Resources (WDNR) Technical Standard 1059 – Seeding for Construction Site Erosion Control and each species has a relatively wide tolerance of soil conditions.

Specific species and installation rates are selected based on installation timing, mechanism (drilled versus broadcast seeded), and whether cover crops are installed with or without permanent seed. Cover crop mixes, rates, and timings are provided in Tables A.1-A through A.1-D (Appendix A). Final cover crop seed selection will occur when tentative seeding dates are known, and actual species composition and rates will be based on availability at the time of procurement

4.2.1.1 Solar Production Area

The solar production area is comprised of areas under and between the PV panel arrays. Temporary seeding in this area is completed in phases, starting concurrently with site preparation, and as follows:

- Phase 1 Fall (late-September to mid-November).: Temporary cover crop seeding occurs following final crop harvest. The temporary fall cover crop seed mix (Table A.1-A) is installed to establish vegetation cover that will overwinter and provide residue for additional temporary seeding in the 2022 growing season. Installation by drilling into exposed soils is the preferred method for seed establishment, but broadcast seeding is also acceptable method; however, broadcast seeding will increase the amount of seed needed by 20% and broadcasted seed needs to be incorporated into the soils via either a shallow drag-harrow or cultipacker.
- Phase 2 – Spring (mid-April-June). The temporary cover crop seeding occurs in early spring to early summer. Cover crops for this time period are listed in (Table A.1-C).
- Phase 3 – Spring-fall (mid-April-September). Aforementioned cover crop seed mixes (Tables A.1-A and A.1-C) will be installed, as needed, to revegetate areas disturbed by construction activities.

4.3 PERMANENT SEED

Two permanent seed mixes are proposed for the Project area as follows:

1. Low Grow Native / Non-Native Graminoid Seed Mix for PV Panel and Perimeter Areas (Table A.2)
2. Pollinator Refuge Native Prairie Seed Mix – Select Perimeter Areas (Table A.3)

General descriptions of both seed mixes are described in greater detail below. Recommended species for both seed mixes are listed in Appendix A, Tables A.2 and A.3. Final seed mix design will occur when tentative seeding dates are known, and actual species composition and rates will be based on availability at the time of procurement. An alternate Pollinator Refuge Native Wetland seed mix (Table A.4) is provided for low-lying buffer areas. Installation and maintenance for this mix is comparable to that of the Pollinator Refuge Native Prairie seed mix.

4.3.1 Low Grow Native / Non-Native Graminoid Seed Mix for PV Panel and Perimeter Areas (Table A.2)

This seed mix is intended to provide a cost-effective permanent low maintenance, low stature, ECSWMP compliant, Project compatible vegetation over a variety of environmental conditions throughout the Project area. This mix blends both native and non-native graminoids. Non-native cool-season grass species in this mix, such as fescue grass (*Festuca* spp.) act as surrogates for historic native cool season species, and are intended to provide competition against cool-season invasive and weedy species. Together, the proposed species ensemble is adapted to compacted soils, moist soils, well drained soils, wet and

drought conditions, sun and shade, cool and warm seasons, and cold and hot weather. Once established, this mix will provide multiple ecosystem services. Immediate ecological benefits include reductions in soil erosion, run off, nutrient sloughing, and soil compaction. Long term benefits include increase in soil health, nutrient regulation, water infiltration, water purification, biodiversity, pollinator habitat, and wildlife habitat including nesting habitat for grassland birds. None of the species are considered invasive or noxious under State of Wisconsin Noxious Weeds law (Chapter 66.0407) or the Wisconsin NR 40 Invasive Species Rule.

4.3.2 Pollinator Refuge Native Prairie Seed Mix – Select Perimeter Areas (Table A.3)

This mix contains native grasses, sedges, rushes, and wildflowers. The mix is intended to promote a diversity of wildflowers, with flowering occurring over each of the three blooming periods (spring, summer, and fall), along with native grasses and sedges that provide benefits to pollinators and other wildlife. The seed mix is intended to be cost-effective, provide short to medium stature native plant cover and diversity, and improve long-term soil health. None of the species are considered invasive or noxious under State of Wisconsin Noxious Weeds law (Chapter 66.0407) or the Wisconsin NR 40 Invasive Species Rule.

The Pollinator Refuge Native Prairie Mix is designed to be installed in select portions of the perimeter areas. Areas intended for pollinator refuge mixes should be at least 0.5 acres in size and not to exceed 3:1 ratio between length and width to reduce surface area. Pollinator refuge areas also require occasional mowing and other management services, so these areas should be accessible by small tractors and skid-steers. More precise pollinator areas will be defined after the final site design is complete.

The two proposed custom permanent seed mixes are compared in Table 4 below.

Table 4. **Permanent Seed Mix Comparison**

Attributes	Low Grow Native / Non-Native Graminoid Mix (Table A.2)	Pollinator Refuge Native Prairie Mix (Table A.3)
Dominated by non-native species	**No**	**No**
Dominated by native species	**No**	**Yes**
Growth height below 30 inches	**Yes**	**Yes**
Wildflowers / multi-season blooms	**No**	**Yes**
Pollinator habitat	**Yes**	**Yes**
Wildlife habitat	**Yes**	**Yes**
For moderately to poorly drained soils	**Yes**	**Yes**
For well drained soils	**Yes**	**Yes**
Shade tolerant	**Yes**	**No**
Sun tolerant	**Yes**	**Yes**
ECSWMP Compliant	**Yes**	**Yes**
Project Compatible	**Yes**	**Yes**

Attributes	Low Grow Native / Non-Native Graminoid Mix (Table A.2)	Pollinator Refuge Native Prairie Mix (Table A.3)
Contributes to Soil Health	**Yes**	**Yes**

4.3.3 Permanent Seed Installation

Permanent seed will be installed following construction and seedbed preparation. During solar construction, soils are frequently compacted, rutted, and soil erosion can occur. Therefore, prior to permanent seed installation, soils typically require additional soil preparation procedures as described in Section 3. Permanent seed installation should occur immediately following final soil preparation.

Seeding can be accomplished by either a drill seeder, broadcast seeder, or packer seeder (e.g. Brillion seeder). There are positives and negatives associated with each seeding method, as described earlier in Section 4, and summarized in Appendix C, Table 1.

Ultimately, based on the ability to install seed under PV panels and seed in tight spaces, permanent seeding between PV panels may occur via broadcast seeding. All broadcast seeding should be followed by packing or at minimum a shallow drag-harrowing, to help increase germination rates, decrease soil erosion potentials, and provide a smooth level soil surface conducive to long term management.

Native plantings, such as Pollinator Refuge seed mixes, can be either drill-seeded or broadcast seeded. Drill seeding native mixes requires a specialized drill designed to plant native seed (e.g. Truax Drill). Native seed can also be seeded via broadcast seeding, but this method requires soils be shallow disced, followed by firming with a drag harrow or packer, and then seeded, and then finished by an additional packing or light drag-harrowing.

The most efficient method for seeding larger areas (> 1 acre) outside the solar array areas is by drill seeding. These areas might include buffer and perimeter areas and Pollinator Refuge areas.

Post-seeding packing by a cultipacker or roller benefits both drill and broadcast seeding. These benefits include: 1. Increase soil to seed contact, 2. Increase germination rates, 3. Decreases erosion potential, 4. Provides a finished soil surface conducive to on-going vegetation maintenance and management.

4.3.3.1 Timing

Permanent Low Grow Native / Non-Native Graminoid Seed Mixes for PV Panel and Perimeter Areas (Table A.2) can be seeded anytime between April 10th and September 30. There are preferred seeding dates within this contextual period, based on historic precipitation/evaporation ratios. The preferred dates for seeding permanent seed mixes is during the spring, between April 10 - July15, and again in late summer between August 15 – September 30. Dormant season seeding in late fall through winter is not recommended for Permanent Low Grow Native / Non-Native PV Panel seed mixes. Associated compacted soils can encounter severe rill erosion during winter rains or rapid snow melt that can wash seed away. These areas can be difficult and expensive to re-seed and repair especially in between PV panels. For best results, seed should be planted during times that facilitates seed germination. The sooner the seed germinates, the less washing occurs, the more successful results. If dormant season seeding is the only option, permanent seed rates should be increased by 20%, a dormant season cover crop should be installed (Table A.1-B), and a contingency for over-seeding bare areas should be agreed upon between the contractor and service provider.

The Pollinator Refuge Seed Mix (Table A.3) is best installed in spring through early summer approximately between April 30 – July 15, and again in late summer between August 15 – September 15.

Pollinator Refuge seed mixes can also be installed during the dormant season via frost seeding between October 30 to snow cover or during a period of light snow cover in the winter. Dormant season seeding seed rates should be increased by 20%. Areas with highly compacted soils should not be dormant season seeded to avoid washing.

Cover crop seed mixes should be installed with the permanent seed. If permanent seed is installed during fall through winter, the cover crop should consist of winter wheat and annual ryegrass (Table A.1-B). If permanent seeding occurs in the spring through early summer, the cover crop should consist of oats and annual ryegrass (Table A.1-D). Cover crop is installed at a lower rate when combined with permanent seed.

5.0 MONITORING AND MAINTENANCE PLAN

Section 5 provides information on post seed installation monitoring and maintenance that promotes the establishment of a desirable vegetation compatible with Project objectives. Monitoring and maintenance activities seek to establish and maintain compliance with the ECSWMP.

All areas will require ongoing maintenance to establish and maintain desirable vegetation that is compatible with PV panels, Project objectives, and in compliance with noxious weed laws. Maintenance is expected to be most intensive in the establishment phase, or approximately the first two growing seasons following seeding as desirable species germinate, grow, and mature. In general, native species take longer to mature than non-native species. Vegetation cutting and herbicide applications are typical management activities as discussed below. Monitoring will occur to confirm compatibility of vegetation with Project goals concurrently with routine vegetation maintenance activities.

5.1 VEGETATION CUTTING

Cutting, by mowing or hand-trimming, is the primary management tool used to aid in the establishment of desirable vegetation. Cutting is employed to reduce height, reduce flowering of undesirable vegetation, and maintain sunlight at the ground surface to encourage germination and growth of desirable species. Mowing using a deck mower is applicable in areas that are accessible with a small tractor and mower. Flail mowers are preferred but rotary mowers are acceptable if significant clumping of grass clippings is minimized. A 3-point side-mounted trimmer mower attached to a small tractor may also be used to cut vegetation around steel piles and under panels if areas are accessible with equipment.

5.1.1 Mowing Frequency and Timing

Establishment Phase
Frequent cutting is required in all seeding areas during the establishment phase (post-seeding years 1 and 2) to reduce fast-growing (annual and biennial) weeds, minimize vegetation height under the PV panels, and assist growth of desirable species. Following permanent seeding, anticipate establishment mowing to occur 4 weeks following seeding and about every 4-6 weeks thereafter from mid-spring to mid-fall. A minimum of three mowings should occur during the first establishment year and a minimum of 2 mowings should occur during the second establishment year.

Transition Phase
By the third growing season, desirable vegetation should be established. Years 3-5 represent a transition phase where desirable vegetation becomes increasingly established but remains susceptible to weed invasion. The frequency of cutting is reduced, and in the best-case scenario, mowing targets only specific areas of weed growth and to reduce incompatible height of vegetation under the PV panels.

Ground-nesting birds and animals could be impacted by vegetation management at the facilities after construction is complete. During operation, and after initial ground vegetation establishment, management of array vegetation should avoid mowing from May 15 through August 1 of each year. WPL will schedule mowing activities outside this avoidance period to the extent feasible. If mowing is required during the avoidance period, personnel will be trained to look for sensitive wildlife before engaging in such activities to avoid impacts.

As per discussion with WDNR staff, WPL and its contractors are exempt from following these mowing restrictions during the establishment and transition phases of vegetation establishment in the Project Area. This will encompass a period up to the first 5 years after seeding the Project is completed.

Long-Term Maintenance

Over the long-term (years 6-30), mowing should occur on an annual or biennial basis. Annual or biennial mows should preferably occur during the dormant season (late fall or early spring), or, if necessary, in mid-summer. The goal of annual / biennial mows is to reduce thatch, encourage lateral growth, encourage root development, and minimize the establishment of woody vegetation. Actual mowing frequency is dependent upon soil moisture; wet areas and wet weather requires more frequent mowing while dry areas and dry weather reduces mowing frequency. Mowing will occur at a frequency of once every 2-3 years as site conditions allow.

Ground-nesting birds and animals could be impacted by vegetation management at the facilities after construction is complete. During operation, and after initial ground vegetation establishment, management of array vegetation should avoid mowing from May 15 through August 1 of each year. WPL will schedule mowing activities outside this avoidance period to the extent feasible. If mowing is required during the avoidance period, personnel will be trained to look for sensitive wildlife before engaging in such activities to avoid impacts.

5.1.2 Mowing Height

Specific recommendations for mowing height vary by seed mix.

Low Grow Native / Non-Native Graminoid Seed Mix for PV Panel and Perimeter Areas (Table A.2)
During the establishment phase (post-seeding years 1 and 2), areas seeded with this mix should be mowed when vegetation reaches a height of 8-12 inches and be cut back to a height of 4-6 inches. Installed species within this mix will likely stay below 18 inches in height (typically 8-12 inches) at maturity. Mowing this mix to the height of 4-6 inches will help invigorate the grasses and clover while discouraging weeds and trees.

Pollinator Refuge Native Prairie Seed Mix – Select Perimeter Areas (Table A.3)
In general, areas planted with the Pollinator Refuge Mix should be mowed when vegetation reaches a height of 8-12 inches. Vegetation in Pollinator Refuge Mix plantings should be cut to a height of 6-8 inches during the first growing season.

During the second growing season, Pollinator Refuge plantings should be mowed to a height of 6-8 inches.

During the third growing season (Transition Phase), as native plants mature, mowing height should be raised to 10-12 inches.

Long-term maintenance mowing should be conducted on an annual or biennial basis, during the dormant season, March-April, and September–November, and vegetation should be cut back to 8-10 inches. Targetd summer mowing can be conducted to maintain Project vegetation compatibility if necessary. Summer mowing should maintain8-10 inch mower height, and not exceed one mowing per-growing season.

5.2 HERBICIDE APPLICATIONS

Herbicides may be used for long-term maintenance of areas planted with each seed mix. Herbicide type and method of application are highly dependent on target species and vegetation maintenance goals. Low volume / spot applications are appropriate for use in all areas during the establishment period (years 1 and 2) to spot treat invasive and incompatible species. Beyond the establishment period, this method is also appropriate for use in areas planted in pollinator-friendly seed mixes to minimize impacts on desirable vegetation and wildlife. Broadcast applications are generally not appropriate in areas planted with the native species and near PV panels. A combination of herbicides and application techniques is typically required to manage large areas. Herbicide use will be minimized to the extent practicable and will be conducted by trained and licensed personnel in accordance with label directions and standard industry practices.

6.0 PRELIMINARY SCHEDULE OF ACTIVITIES

The table below provides a preliminary schedule of activities that will occur up to permanent seed installation.

Table 1. Preliminary Schedule of Vegetation Management Activities

Activity	Timeframe[1]
Start of construction	Q2 2022
Initial temporary cover-crop seed installation following vegetation removal, grading, and as-needed seed bed preparation (Table A. 1-C)	Q2-Q3 2022
Initial temporary cover-crop seed installation following vegetation removal, grading, and as-needed seed bed preparation (Table A. 1-A)	Q3 - Q4 2022
As needed, install secondary temporary cover-crop seed for construction areas.	Q2 2023
Install permanent native seed mixes (Mixed Native & Non- Native Graminoid Seed Mix, and Upland Pollinator-friendly Seed Mix). Dormant season seeding rates should be increased by 20%. Dormant season cover crops are installed with permanent seed (Table A.1-B)	Q4 2022
Install permanent native seed mixes (Mixed Native & Non- Native Graminoid Seed Mix, and Upland Pollinator-friendly Seed Mix). Cover crop for permanent seed and seeding during the growing season is found in (Table 1 A. 1-C).	Q2 2023 – Q3 2023
Project COD, start of 30-year facility life period	Q3 2023
Maintain permanent vegetation	Q2 2023 – Q3 2053

[1] Timing for vegetation management activities may be based on construction sequencing. Actual schedules for temporary seed installation, seed bed preparation, and permanent seeding may be based on construction timing within each array area.

7.0 SUMMARY

This Plan was prepared to outline vegetation removal at the start of construction and revegetation tasks after construction of the Project area. This plan also provides guidance to WPL on 30 years of maintenance following the installation of permanent vegetation at the Beaver Dam Solar Project. The Plan includes the installation of two permanent seed mixes:

1. Low Grow Native / Non-Native Graminoid and Flower Seed Mix for installation under and between the PV panels. This mix is anticipated to be compatible with minimum leading-edge height of 18 inches and shading from the panels, as well as provide low maintenance and hardy vegetative cover. This mix will also be planted in the bulk of the perimeter areas.
2. Pollinator Refuge Prairie Seed Mix in select portions of the perimeter areas, where feasible, that includes pollinator-friendly wildflowers, bunch grasses, and sedges.

The implementation and maintenance tasks provided in this Plan will assist WPL in maintaining compliance with agency requirements for Project revegetation. It is anticipated that the planting plan will result in improved plant species diversity and soil health compared to the pre-construction agricultural land use conditions.

APPENDIX A: SEED MIX TABLES

Table A.1-A – Table A.1-D. Temporary Cover Crop Seed Mixes*

Table A.1-A Temporary Fall (Late August – Early November) Project Area Cover Crop Seed Mix without Permanent Seed*	
Scientific Name	**Common Name**
Triticum aestivum	Winter Wheat

Table A.1-B Temporary Fall (Late August – Early November) Project Area Cover Crop Seed Mix with Permanent Seed*	
Scientific Name	**Common Name**
Triticum aestivum	Winter Wheat

Table A.1-C Temporary Spring-Summer (Mid-April – Mid-August) Project Area Cover Crop Seed Mix without Permanent Seed*	
Scientific Name	**Common Name**
Avena sativa	Seed Oats

Table A.1-D Spring-Summer and Early Fall (Mid-April – Mid-August) Project Area Cover Crop Seed Mix with Permanent Seed*	
Scientific Name	**Common Name**
Avena sativa	Seed Oats

* WPL anticipates further discussion with Stacy Rowe at WDNR regarding specifics of the seed mix and overall vegetation management plan during that construction planning period. Final cover crop seed selection will occur when tentative seeding dates are known, and actual species composition and rates will be based on availability at the time of procurement.

All seed mixes calculated at Pure Live Seed (PLS). Seeding rates are designed for drilling seed in spring through summer. Broadcasting seed and seeding during the dormant season will require 20% increase in PLS rates. Broadcast seed should be packed or harrowed into the soils.

Table A.2 Low Grow Native / Non-Native Graminoid and Flower Seed Mix for PV Panel and Perimeter Area*

Scientific Name	Common Name
Agropyron smithii (Pascopyrum smithii)	Western Wheat Grass
Agrostis perennans	Upland bent
Bouteloua curtipendula	Side-oats Grama
Carex vulpinoidea	Brown Fox Sedge
Deschampsia cespitosa	Tufted Hair Grass
Elymus trachycaulus	Slender Wheat Grass
Elymus villosus	Silky Wildrye
Festuca brevipila	Hard Fescue
Festuca rubra	Red Fescue
Poa palustris	Meadow Bluegrass
Poa trivialis	Woodland Bluegrass
Schizachyrium scoparium	Little Bluestem
Forbs	
Blephilia hirsuta	Wood Mint
Chamaecrista fasciculata	Partridge Pea
Trifolium pratense	Red Clover
Trifolium repans	White Clover

*WPL anticipates further discussion with Stacy Rowe at WDNR regarding specifics of the seed mix and overall vegetation management plan during that construction planning period. Final seed mix design will occur when tentative seeding dates are known, and actual species composition and rates will be based on availability at the time of procurement.

Table A.3 Pollinator Refuge Prairie Seed Mix – Select Perimeter Areas*

Scientific Name	Common Name
Grasses and Sedges	
Agropyron smithiii	Western Wheat Grass
Agrostis perennans	Upland bent
Bouteloua curtipendula	Side oats Grama
Bromus kalmii	Prairie Brome
Calamagrostis canadensis	Blue Joint Grass
Carex annectens	Yellow-headed Fox Sedge
Carex bicknellii	Bicknell's Oval Sedge
Carex scoparia	Lance-fruited Oval Sedge
Deschampsia cespitosa	Tufted Hair Grass
Elymus trachycaulus	Slender Wheat Grass
Juncus dudleyi	Dudley's Rush
Muhlenbergia mexicana	Leafy Satin Grass
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed
Forbs	
Allium cernuum	Nodding onion
Amorpha canescans	Lead Plant
Anemone canadensis	Canada Anemone
Anemone cylindrica	Thimbleweed
Aquilegia canadensis	Columbine
Artemisia ludoviciana	Sage
Asclepias incarnata	Marsh Milkweed
Asclepias tuberosa	Butterflyweed
Asclepias verticillata	Whorled milkweed
Astragalus canadensis	Canadian Milk Vetch
Baptisia alba	White Wild Indigo
Chaemecrista fasciculata	Partridge Pea
Coreopsis palmata	Prairie Coreopsis
Drymocallis arguta	Prairie Cinquefoil
Echinacea pallida	Pale Purple Coneflower

Table A.3 (cont.) Pollinator Refuge Prairie Seed Mix – Select Perimeter Areas*

Scientific Name	Common Name
Forbs	
Eryngium yuccifolium	Rattlesnake Master
Gentiana andrewsii	Bottle Gentian
Geum aleppicum	Yellow Avens
Heuchera rischardsonii	Prairie Alumroot
Monarda fistulosa	Wild Bergamot
Penstemon digitalis	Foxglove Beardtongue
Pycnanthemum virginianum	Mountain Mint
Rosa blanda	Meadow Rose
Rudbeckia hirta	Black-eyed Susan
Solidago rigida	Stiff Goldenrod
Symphyotrichum ericoides	Heath Aster
Symphyotrichum laeve	Smooth Blue Aster
Symphyotrichum oolantangiense	Sky Blue Aster
Teucrium canadense	Germander
Tradescantia ohiensis	Ohio Spiderwort
Zizia aurea	Golden Alexander

*WPL anticipates further discussion with Stacy Rowe at WDNR regarding specifics of the seed mix and overall vegetation management plan during that construction planning period. Final seed mix design will occur when tentative seeding dates are known, and actual species composition and rates will be based on availability at the time of procurement.

Table A.4 Pollinator Refuge Wetland Seed Mix – Wetland Buffer Areas*

Scientific Name	Common Name
Grasses and Sedges	
Agropyron smithiii	Western Wheat Grass
Bromus kalmia	Prairie Brome
Calamagrostis canadensis	Blue Joint Grass
Carex bicknellii	Bicknell's Sedge
Carex cristatella	Crested Oval Sedge
Carex scoparia	Lance-fruited Oval Sedge
Carex stipata	Common Fox Sedge
Carex vulpinoidea	Brown Fox Sedge
Deschampsia cespitosa	Tufted Hair Grass
Eleocharis obtusa	Bald Spikerush
Glyceria striata	Fowl Manna Grass
Juncus dudleyi	Dudley's Rush
Poa palustris	Meadow Bluegrass
Scirpus pendulus	Red Bulrush
Forbs	
Anemone canadensis	Canada Anemone
Asclepias incarnata	Marsh Milkweed
Astragalus canadensis	Canadian Milk Vetch
Bidens cernua	Nodding Bur Marigold
Boltonia asteroides	False Aster
Eupatorium perfoliatum	Boneset
Geum aleppicum	Yellow Avens
Gentiana andrewsii	Bottle Gentian
Liatris spicata	Marsh Blazing Star
Lobelia siphilitica	Blue Lobelia
Ludwigia alternifolia	Seedbox
Monarda fistulosa	Wild Bergamot
Pedicularis lanceolata	Marsh Betony
Penstemon digitalis	Foxglove Beardtongue
Penthorum sedoides	Ditch Stonecrop
Polemonium reptans	Jacob's Ladder
Pycnanthemum virginianum	Mountain Mint

Scientific Name	Common Name
Rudbeckia hirta	Black-eyed Susan
Solidago riddellii	Riddell's Goldenrod
Zizia aurea	Golden Alexanders

* WPL anticipates further discussion with Stacy Rowe at WDNR regarding specifics of the seed mix and overall vegetation management plan during that construction planning period. Final seed mix design will occur when tentative seeding dates are known, and actual species composition and rates will be based on availability at the time of procurement.

APPENDIX B: SEED VENDORS

Agassiz Seed
Phone: (651) 287-3400
https://www.agassizseed.com/
Native and Non-native Seed Mixes

Agrecol Corporation
Phone: (608) 226-2544
http://www.agrecol.com/SeedMixes
Native and Non-native Seed Mixes

Cardno
Phone: (574) 586-2412
https://www.cardnonativeplantnursery.com/seed/
Native Seed Mixes

Prairie Moon Nursery
Phone: (866) 417-8156
https://www.prairiemoon.com/
Native Seed Mixes

Shooting Star Seed Mixes
Phone: (608) 497-0655
https://www.shootingstarnativeseed.com/
Native and Non-native Seed Mixes

Taylor Creek Restoration Nurseries
Phone: (608) 897-8641
https://restorationnurseries.com/
Native Seed Mixes

Table B.1 Approved Regional Seed Vendors

Company	Phone	Web-site	Specialty
Agassiz Seed	(651) 287-3400	https://www.agassizseed.com/	Native and non-native seed mixes
Agrecol Corporation	(608) 226-2544	http://www.agrecol.com/SeedMixes	Native and non-native seed mixes
Cardno	(574) 586-2412	https://www.cardnonativeplantnursery.com/seed/	Native seed mixes
Prairie Moon Nursery	(866) 417-8156	https://www.shootingstarnativeseed.com/	Native seed mixes
Shooting Star Seed Mixes	(608) 497-0655	https://www.shootingstarnativeseed.com/	Native and non-native Seed mixes
Taylor Creek Restoration Nurseries	(608) 897-8641	https://restorationnurseries.com/	Native seed mixes

APPENDIX C: COMPARISON OF SEEDING METHODS

Table C.1 Comparison Summary Between Drill and Broadcast Seeding Methods

Circumstance	Drill Seeding	Broadcast Seeding	Post Seeding Packing
Soil to Seed Contact	High	Low	Increase soil seed contact
Germination Efficiency	High	Low	Increase germination rates
Extra Seed Required to Achieve Compatibility	No	$\geq$ 20%	No extra seed required
Seedbed Preparation	Low	High	Decreases soil preparation
Soil Finishing (packing or rolling)	Low	High	N.A.
Efficiency in Tight Spaces	Low	High	Low
Ability to Seed Under PV Panels	No	High	No
Impact on Erosion Potential	Decrease	Increase	Decreases erosion potentials
Harvested Soybean Field	Yes	Yes	Increase germination rates
Harvested Corn Field (followed by mowing, baling, and light discing)	Yes	Yes	Increase germination rates
Harvested Forage (hay or silage) Field	Yes	Yes	Increase germination rates
Post-construction Seeding Within Array Field	Not advised	Advised	Advised
Potential for Second Seeding Event	Low	High	Decreases

Appendix D - Beaver Dam Decommissioning Plan (Rev 1)

Wisconsin Power and Light Company

Decommissioning Plan – Beaver Dam Solar Project

Dodge County, Wisconsin

September 16, 2021

Prepared for:

Wisconsin Power and Light Company

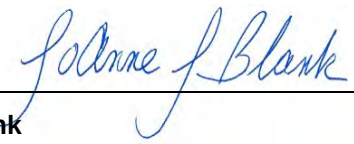
Prepared by:

Stantec Consulting Services, Inc.
209 Commerce Parkway
Cottage Grove, WI 53527

Project No. 193707481

This document entitled Decommissioning Plan – Beaver Dam Solar Project was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of Wisconsin Power and Light Company (the "Client" or "WPL"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Carl Broberg
Civil Engineer



JoAnne J. Blank
Associate

Matthew Clementi
Registration No. **29864**
State **Wisconsin**

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1.0 INTRODUCTION

Wisconsin Power and Light Company (WPL) is proposing to construct the Beaver Dam Solar Project (Project), a solar electric generation facility, in Dodge County, Wisconsin. The proposed Project is to be located in the City of Beaver Dam, Beaver Dam Township, and Burnett Township, Wisconsin (Figure 1) within approximately 572 acres of predominantly agricultural land. The Project will have a maximum nameplate generating capacity of up to 50 megawatts (MW) alternating current (AC). Project generating facilities, as proposed, will be located within approximately 352 acres of land bounded by perimeter fence. An approximately 1.4-mile generator tie line will also extend into the City of Beaver Dam.

This Decommissioning Plan (Plan) provides a description of the decommissioning and restoration of Project facilities. Start-of-construction is planned for second quarter of 2022, with a projected Commercial Operation Date in the fourth quarter of 2023. The Project will consist of the installation of the perimeter fencing; solar arrays and associated trackers, foundations, and steel piles; inverter/transformer stations; access and internal roads; electrical collection system; and a Project substation.

This Plan includes an overview of the primary decommissioning Project activities, removal of facilities, and restoration of land. A summary of estimated costs associated with decommissioning the Project is also included in Section 4.0. Summary statistics and estimated costs are provided for a 50-MW Project array design.

1.1 SOLAR FARM COMPONENTS

The main components of the Project include:

- Solar panels.
- Single-axis tracking system (module mounting structure).
- Driven steel pile foundations.
- Inverter stations with transformers.
- Electrical cabling.
- Perimeter fencing.
- Site access and internal roads.
- Operations and maintenance (O&M) structures.
- Project substation with main power transformer (MPT).
- Generator tie-in line transmission line.

1.2 TRIGGERING EVENTS AND EXPECTED LIFETIME OF PROJECT

Project decommissioning may be triggered by events, such as: abandonment during Project construction, interruption of minimum generation requirements as defined by the Decommissioning Agreement, or when the Project reaches the end of its operational life.

The expected lifetime of a utility-scale solar panel is approximately 30 years, with an opportunity for a project lifetime of 40 years or more with equipment replacement and repowering. Depending on market conditions and project viability, the solar arrays may be retrofitted with updated components (e.g., panels, frame, tracking system, etc.) to extend the life of the Project. In the event that the modules are not retrofitted, or at the end of the Project's useful life, the panels and associated components will be decommissioned and removed from the Project site and the Project site will be restored in accordance with this Plan or an updated decommissioning plan agreed to between the Project and applicable regulatory bodies at the time of decommissioning.

Components of the solar facility that have resale value may be sold in the wholesale market. Components with no wholesale value will be salvaged and sold as scrap for recycling or disposed of at an approved offsite licensed solid waste disposal facility (landfill). The estimates provided in this Plan are based on the salvage value of the removed facilities. Decommissioning activities will include removal of the arrays and associated components as listed in Section 1.1 and described in Section 2.

1.3 DECOMMISSIONING SEQUENCES

Decommissioning activities will begin within 12 months of the Project ceasing operation and are anticipated to be completed within 12 months. Restoration of the Project may extend beyond 12 months as more time may be required to monitor for revegetation and restoration to ensure its success. The anticipated sequence of decommissioning and removal is described below; however, overlap of activities is expected.

- Reinforce access roads, if needed, and prepare site for component removal;
- Install temporary silt fence and other best management practices (BMPs) to protect sensitive resources and control erosion;
- De-energize solar arrays;
- Remove panels and above ground wiring;
- Remove tracking and piles;
- Remove inverters/transformers, along with support piers or piles;
- Remove electrical cables less than three feet (36 inches) below the surface;
- Remove access and internal roads, as needed or agreed upon in landowner leases;
- Remove substation, if decommissioned;
- Remove generator tie-in transmission line and structures, if decommissioned.

- De-compact subsoils (if required), restore and revegetate disturbed land to pre-construction conditions to the extent practicable.

2.0 PROJECT COMPONENTS AND DECOMMISSIONING ACTIVITIES

The solar facility components and decommissioning activities necessary to restore the Project area are further described within this section.

2.1 OVERVIEW OF SOLAR FACILITY SYSTEM

Beaver Dam Solar anticipates utilizing approximately 163,748 Jinko Solar Bifacial 400-watt modules or other similar solar modules, with a total nameplate generating capacity of up to 50 $MW_{[AC]}$. Statistics and cost estimates provided in this Plan are based on decommissioning a 50-MW facility. The Beaver Dam Solar generating facilities will have a footprint of approximately 352 acres of land within the Project fencelines. The proposed locations of the arrays are shown on Figure 1. The land within the Project footprint is predominantly agricultural land.

Collection cabling will be installed below the surface at a depth of at least three feet (36 inches) to remain in compliance with National Electrical Code. Foundations, steel piles, and electric cabling less than three feet (36 inches) below the soil surface will be removed. Components and cabling at a depth of 36 inches or greater below the surface will be abandoned in place, except where specific contracts with landowners require removal to a greater depth. Access roads may be left in place if requested and/or agreed to by the landowner. Public roads damaged or modified during the decommissioning and reclamation process will be repaired upon completion of the decommissioning phase.

Estimated quantities of materials to be removed and salvaged or disposed of are included in this section. Most of the materials described have salvage value; although, there are some components that will likely have none at the time of decommissioning. All recyclable materials, salvaged and non-salvage, will be recycled to the furthest extent possible. All other non-recyclable waste materials will be disposed of in accordance with state and federal law in an approved licensed solid waste facility. Solar panels may have value in a resale market, depending on their condition at the end of the Project life. For purposes of this report, salvage values only, not resale, were considered, as this is the more conservative estimate strategy.

Table 1 presents a summary of the primary components of the Project included in this decommissioning plan.

Table 1 Primary Components of Solar Farm to be Decommissioned

Component	Quantity	Unit of Measure
Solar Modules (approximate)	163,748	Each
Tracking System (equivalent trackers)	2,100	Each
Steel Piles (including trackers and inverter stations)	23,292	Each

Component	Quantity	Unit of Measure
Inverters and Transformers	16	Each
Electrical Cables (approximate, left in place at 36-inch or greater depth)	32,057	Lineal Foot (estimated)
Perimeter Fencing	32,032	Lineal Foot
Internal Access Roads (approximate)	16,916	Lineal Foot
Operations and Maintenance Facilities	3	Each
Substation	1	Each
Generator tie-in transmission line and structures	1.4	Miles

2.2 SOLAR MODULES

Beaver Dam Solar is considering the Eagle 72HM G3 bifacial perc monocrystalline panel (400 watt) from Jinko Solar, or similar model, for the Project. Each module assembly (with frame) has a total weight of approximately 51.4 pounds (23.3 kg). The modules will be approximately 39.7 inches by 80.0 inches in size and are mainly comprised of non-metallic materials such as silicon, glass, composite film, plastic, and epoxies, with an anodized aluminum frame.

At the time of decommissioning, module components in working condition may be refurbished and sold in a secondary market yielding greater revenue than selling as salvage material.

2.3 TRACKING SYSTEM AND SUPPORT

The solar modules will be mounted in single module portrait orientation, on a single-axis tracking system, such as those manufactured by Array Technologies. Each full-sized tracker is approximately 84 meters (277 feet) in length and will support approximately 78 solar modules. Smaller trackers will be employed at the edges of the layout or near inverters, to efficiently utilize available space. The tracking system is mainly comprised of galvanized and stainless steel; steel piles that support the system are assumed to be comprised of structural steel.

The solar arrays will be deactivated from the surrounding electrical system and made safe for disassembly. Liquid wastes, including oils and hydraulic fluids will be collected and properly disposed of or recycled according to regulations current at the time of decommissioning. Electronic components, and internal electrical wiring will be removed and salvaged. The steel piles will be completely removed from the ground during decommissioning.

The steel foundations, and steel components from the tracking system can be salvaged and sold to provide revenue to offset the decommissioning costs.

2.4 INVERTERS AND TRANSFORMERS

Inverters and transformers generally sit on small concrete footings or steel piles within the array. The inverters and transformers will be deactivated, disassembled, and removed. Depending on condition, the equipment may be sold for refurbishment and re-use. If not re-used, they will be salvaged or disposed of at an approved solid waste management facility. All oils and lubricants will be collected and disposed of at a licensed facility.

2.5 ELECTRICAL CABLING

The Project's medium voltage electrical collection system will be installed below ground. For direct buried cables, the minimum cover shall be 36 inches (three feet) from top of cable to finished grade. Cabling that is less than three feet in depth will be removed and salvaged, while cable at a depth of three feet or greater may be abandoned in place, except where specific contracts with landowners require removal to a greater depth. The abandoned cable will not interfere with future farming activities because of the depth.

2.6 PROJECT SUBSTATION AND OVERHEAD GENERATOR TIE-IN TRANSMISSION LINE

Beaver Dam Solar will include a Project substation as shown on the attached figures. The substation footprint will be approximately 1.1 acres and will contain within its perimeter fencing, an aggregate pad stabilized with GroundGrid geocell grid, switches, SF6 gas breakers, the MPT buss' and buss support structures, a control house, (including communications equipment, electronics, SCADA equipment), dead-end transmission line structures, lightening masts, yard lighting structures, and associated foundations and footings. The substation will service Beaver Dam Solar and although it may be retained at the end of the Project life, an estimated decommissioning cost has been included in this Plan.

An approximately 1.4-mile-long overhead generator tie-in transmission line connects the Project substation to a larger regional substation. Approximately 0.7 miles of the tie-in line will be new build, with 0.7 miles double-circuited with an existing transmission line. Unless an alternate use for the transmission line is determined, the line and dedicated structures will be removed, and the land restored to pre-construction conditions to the extent practicable.

2.7 OPERATIONS AND MAINTENANCE FACILITIES

Beaver Dam Solar will utilize three O&M structures within the Project site. The structures will be of self-contained modular steel container-type construction. They will be installed on gravel pads with connections to electrical or other services, as needed. The structures will be in conformance with all local and state building codes and will be removed during the decommissioning process, unless otherwise directed.

2.8 PERIMETER FENCING, SITE ACCESS AND INTERNAL ROADS

The Project will include a seven to eight-foot-high deer fence around the perimeter of each array site. The perimeter fence will be removed from the Project site during decommissioning.

Site access roads will allow access to the substation and solar facility from local roads. Internal roads will be located within the array to allow access to the equipment. The access drives and internal roads will be up to 20 feet wide and total approximately 16,916 lineal feet (3.2 miles). Access and internal road lengths may change with final Project design. It is assumed 0.5 miles of access road near the entrances and substation will be constructed of 8 inches of aggregate. The estimated quantity of aggregate is provided in Table 2. The remainder of the internal roads will consist of compacted native soils. This decommissioning estimate assumes that aggregate from the access roads is removed and restored with topsoil, and both access and internal roads will be de-compacted if necessary.

Table 2 Typical Access Road Construction Materials

Component	Quantity	Unit of Measure
Aggregate Base Course, 8-inch depth	990	Cubic Yards

Site access roads will be decommissioned by removing the aggregate; de-compacted with a deep ripper or chisel plow (ripped to 18 inches), as required; backfilled with topsoil; and graded to restore contours as near as practicable to preconstruction conditions. It is assumed that six (6) inches of topsoil will be added to the existing soil on the access roads.

Internal roads, consisting of native soil, will be de-compacted with a deep ripper or chisel plow (ripped to 18 inches), as required; backfilled with topsoil, if needed; and graded to restore contours as near as practicable to preconstruction conditions. It is conservatively assumed that four (4) inches of topsoil will be added to the existing soil on the internal roads.

Upon completion of site grading, access and internal roads will be revegetated with perennial vegetation or returned to agricultural land use.

3.0 LAND USE AND ENVIRONMENT

3.1 SOILS AND FARMLAND

The proposed solar facility is predominantly located on land currently utilized for agricultural purposes. Areas of the Project that were previously utilized for agricultural purposes will be restored to their preconstruction condition and land use. Areas will be revegetated in consultation with the current landowner and in compliance with regulations in place at the time of decommissioning.

3.2 RESTORATION AND REVEGETATION

Project areas that have been excavated and backfilled will be graded as previously described to restore land as required by the landowner commitments. Soils compacted during decommissioning activities will be de-compacted, as necessary, to restore the land to pre-construction conditions. Disturbed areas will be seeded with appropriate vegetation or returned to crop production. If present, drain tiles that have been damaged will be restored to pre-construction condition. Work will be completed to comply with the conditions agreed upon by WPL and Dodge County, the City of Beaver Dam, or the Towns of Beaver Dam or Burnett, or as directed by other federal, state, and local regulations in effect at the time of decommissioning.

3.3 SURFACE WATER DRAINAGE AND CONTROL

As previously described, the proposed Project area is predominantly located in actively drained agricultural land. The terrain varies and consists of rolling hills. The Project facilities are being sited to avoid wetlands, waterways, and drainage ditches to the extent practicable.

Surface water conditions at the Project site will be reassessed prior to the decommissioning phase. Required permits, including construction stormwater permits, will be obtained in accordance with state or local requirements in effect at the time. BMPs may include: construction entrances, temporary seeding, permanent seeding, mulching (in non-agricultural areas), erosion control matting, silt fence, filter berms, and filter socks.

3.4 MAJOR EQUIPMENT REQUIRED FOR DECOMMISSIONING

The activities involved in decommissioning the Project include removal of the above ground components of the Project: solar modules, racking, tracking system, foundations and piles (pulled out or cut and removed to a minimum depth of three feet below the surface), inverters, transformers, access roads, perimeter fencing, Project substation, and electrical cabling (to a minimum depth of three feet below the surface). Restoration activities include de-compaction of subsoils and re-grading Project areas that have been excavated or back-filled.

Equipment required for the decommissioning activities is similar to what is needed to construct the solar facility and may include, but is not limited to: small cranes, low ground pressure (LGP) track mounted excavators, backhoes, LGP track bulldozers, LGP off-road end-dump trucks, front-end loaders, deep rippers, water trucks, disc plows and tractors to restore subgrade conditions, and ancillary equipment. Standard dump trucks will be required to transport material removed from the site to disposal facilities.

4.0 DECOMMISSIONING COST ESTIMATE SUMMARY

Expenses associated with decommissioning the Project will be dependent on labor costs at the time of decommissioning. For the purposes of this report, late 2020 to early 2021 average market values were used to estimate labor expenses. Fluctuation and inflation of the labor costs were not factored into the estimates.

4.1 DECOMMISSIONING EXPENSES

Project decommissioning will incur costs associated with disposal of components not sold for salvage, including materials which will be disposed of at a licensed facility, as required. Table 3 summarizes the estimates for activities associated with the major components of the Project. The total estimated decommissioning cost in Table 3 also covers costs for backfilling, grading, and restoration as described in Section 2.

Table 3 Estimated Decommissioning Expenses – 50 MW Solar Array

Activity	Unit	Number	Cost per Unit	Total
Overhead and management (includes estimated permitting required)	Lump Sum	1	$300,000	$300,000
Solar modules; disassembly and removal *	Each	163,748	$4.00	$654,992
Tracking system disassembly and removal (equivalent full trackers) *	Each	2,100	$620	$1,302,000
Steel pile/post removal	Each	23,292	$9.50	$221,274
Transformers and inverters	Each	16	$1,100	$17,600
Access road excavation and removal	Lump Sum	1	$8,019	$8,019
Topsoil replacement of access and internal roads, and rehabilitation of site	Lump Sum	1	$207,700	$207,700
Perimeter fence removal	Linear Feet	32,032	$2.80	$89,690
Public road repairs	Lump Sum	1	$79,000	$79,000
O&M facilities	Lump Sum	3	$5,000	$15,000
Project substation	Lump Sum	1	$300,000	$300,000
Overhead transmission line, (averaged of new line and under-build – three-mile total length)	Lump Sum	1	$139,000	$139,000
Total estimated decommissioning cost				**$3,334,275**

*Cost of equipment removal would be higher if retaining for resale rather than salvage; however, the increased revenue would offset the added costs.

4.2 DECOMMISSIONING REVENUES

Revenue from decommissioning the Project will be realized through the sale of the solar facility components and construction materials. As previously described, the value of the decommissioned components will be higher in the early stages of the Project and decline over time. Resale of components such as solar modules is expected to be greater than salvage (i.e., scrap) value for most of the life of the Project.

Modules, the substation and other solar plant components may be sold within a secondary market for re-use. A current sampling of reused solar panels indicates a wide range of pricing depending on age and condition ($0.10 to $0.40 per watt). Future pricing of solar panels is difficult to predict at this time, due to the relatively young age of the market, changes to solar panel technology, and the ever-increasing product demand. A conservative estimation of the value of solar panels at $0.10 per watt would yield $6,550,000. Increased costs of removal, for resale versus salvage, would be expected in order to preserve the integrity of the panels; however, the net revenue would be substantially higher than the estimated salvage value.

The resale value of components such as trackers, may decline more quickly; however, the salvage value of the steel that makes up a large portion of the tracker is expected to stay at or above the value used in this report.

The market value of steel and other materials fluctuates daily and has varied widely over the past five years. Salvage value estimates were based on an approximate five-year-average price of steel and copper derived from sources including on-line recycling companies and United States Geological Survey (USGS) commodity summaries. The price used to value the steel used in this report is $240 per metric ton; aluminum at $0.40 per pound; silicon at $0.40 per pound and glass at $0.05 per pound. The main component of the tracking system and piles is assumed to be salvageable steel.

Solar panels are estimated to contain approximately 75 percent glass, 8 percent aluminum and 5 percent silicon. A 50 percent recovery rate was assumed for aluminum and all panel components, due to the processing required to separate the panel components. Alternative and more efficient methods of recycling solar panels are anticipated before this Project is decommissioned, given the large number of solar facilities that are currently being developed. Table 4 summarizes the potential salvage value for the solar array components and construction materials.

Table 4 Estimated Decommissioning Revenues (Salvage Value Only)

Item	Unit	Salvage Price per Unit	Units per Item	Total Salvage Price per Item	Number of Items	Total
Solar Array Components						
Panels - Silicon	Pounds per Panel (Item)	$0.40	1.3	$0.520	163,748	$85,149
Panels - Aluminum	Pounds per Panel (Item)	$0.40	2.1	$0.840	163,748	$137,548

Item	Unit	Salvage Price per Unit	Units per Item	Total Salvage Price per Item	Number of Items	Total
Panels - Glass	Pounds per Panel (Item)	$0.05	19.3	$0.965	163,748	$158,017
Tracking System and Posts	Tons per $MW_{[AC]}$	$240	50	$12,000	50	$600,000
Project Substation						
Substation Components (steel and transformers)	Total	$50,000	1	$50,000	1	$50,000
Total Potential Revenue						**$1,030,714**

* Revenue based on salvage value only. Revenue from used panels at $0.10 per watt could raise $6,550,000 as resale versus the estimated salvage revenue.

4.3 DECOMMISSIONING COST SUMMARY

Table 5 is a summary of the net estimated cost to decommission the Project, using the information detailed in Sections 4.1 and 4.2. Estimates are based on late-2020 to early 2021 prices, with no market fluctuations or inflation considered.

Table 5 Net Decommissioning Summary

Item	Cost/Revenue
Decommissioning Expenses	**$3,334,275**
Potential Revenue – salvage value of panel components and recoverable materials	**$1,030,714**
Net Decommissioning Cost	**$2,303,561**

e

Figure 1 Project Facility Map

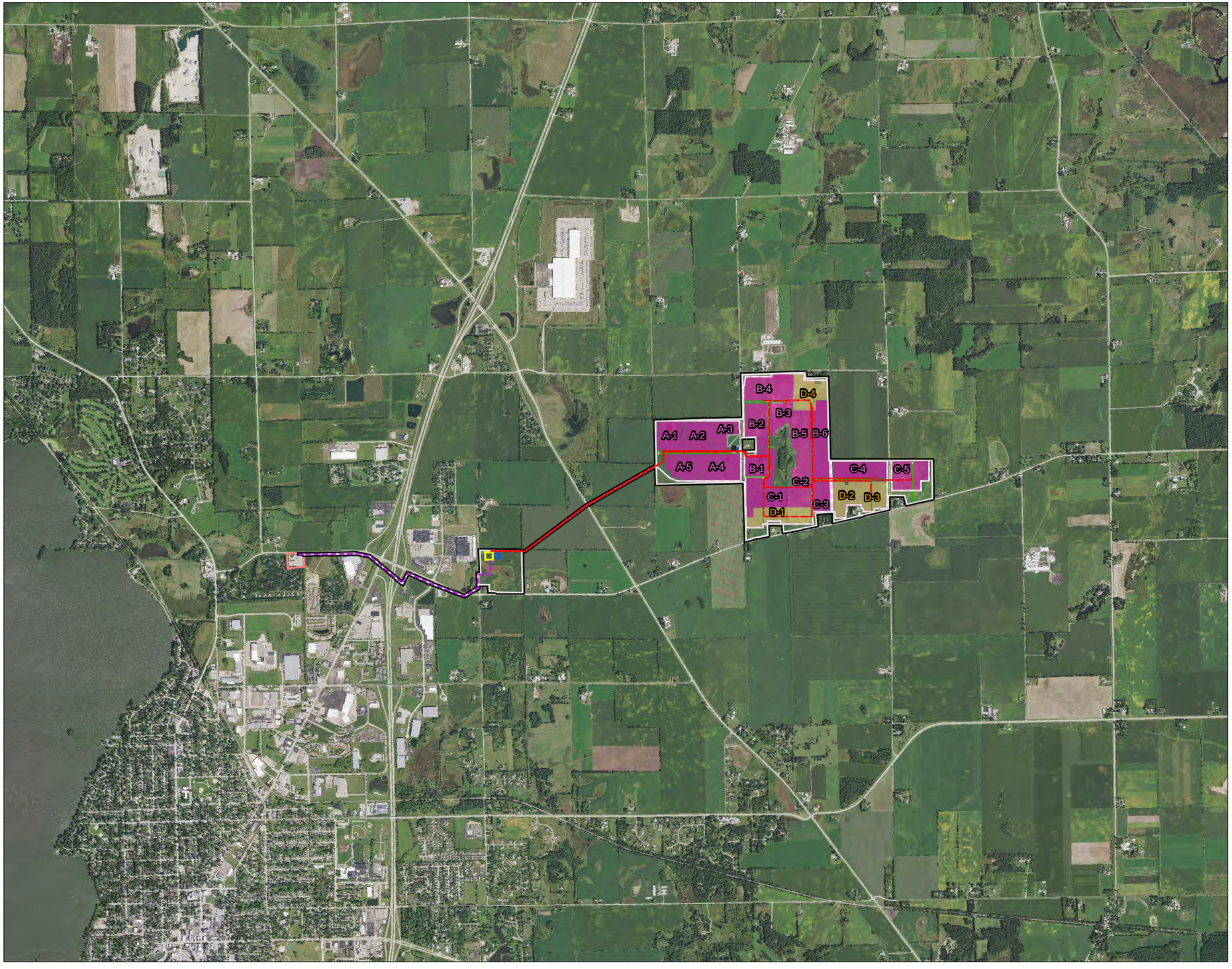


Figure No.

1

Title

General Project Area

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
C. of Beaver Dam, T. of Beaver Dam, & T. of Burnett,
Dodge County, WI

Prepared by RA on 2021-08-31
TR by MMP on 2021-08-31
IR by CB on 2021-09-01

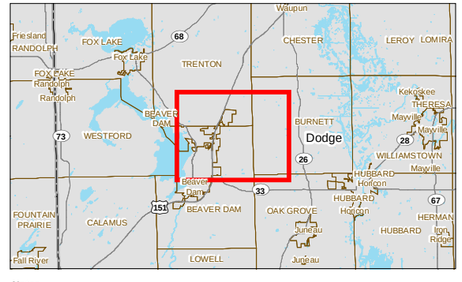
N

0 1,500 3,000 Feet

(At original document size of 11x17)
1:36,000

Legend

- Project Area
- Generator Tie Line
- Collection System
- Access Road
- Boundary Fence
- Solar PV Array Area - Primary
- Solar PV Array Area - Alternate
- Project Substation
- Substation
- O&M Structure
- Stormwater Basin
- Lay-down Yard



Notes

1. Coordinate System: NAD 1983 HARN Wisconsin TM
2. Data Sources: Stantec, WPL, WisDOT, WDNR
3. Orthophotography: 2020 NAIP

Stantec

Appendix E - Beaver Dam Road Condition Report (Rev 1)

Road Condition Report

Summary of Roadway Conditions
Beaver Dam Solar Project
Dodge County, Wisconsin.
Stantec Project #: 193707481

September 20, 2021

Prepared for:

Wisconsin Power and Light Company
4902 North Biltmore Lane
Madison, WI 53718

Prepared by:

Matthew A Clementi, PE
Stantec Consulting Services Inc.

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LIST OF APPENDICES

1.0 INTRODUCTION

Wisconsin Power and Light Company (WPL) is proposing to construct and operate the Beaver Dam Solar Project consisting of a 50-megawatt (MW) solar energy generation facility and substation (the Project) in Dodge County, Wisconsin. The Beaver Dam Solar Project (Project) will be located on approximately 572 acres of land currently utilized as agricultural fields. The major components of the Project will include solar modules, inverters, collection lines, access roads, a substation, temporary laydown yards, and an Operation and Maintenance (O&M) structure. The construction of a 69-kV generation tie line is also required for this project.

The Project will be located within the City of Beaver Dam and the Towns of Beaver Dam and Burnett in Dodge County, Wisconsin. The Town of Trenton adjoins the northern Project boundary. The solar photovoltaic (PV) array will be built northeast of the City of Beaver Dam on the north side of County Trunk Highway B (CTH B). The solar array will connect via an underground collection system to a Project Substation and then by an overhead generator tie line to an existing substation approximately two miles west of the Project, just west of United States Highway 151 (US 151). The approximate Project Area and adjacent roadways are shown on Figure A-1 included in Appendix A.

Construction of the Beaver Dam Solar Project is planned to begin Fall 2022 or later with a Commercial Operations Date (COD) anticipated in Fall 2023 or later. Temporary workspaces for Project construction will include staging areas for vehicles and equipment, and laydown areas for Project components. Permanent Project workspaces include areas proposed for the placement of solar arrays, power conversion units, and inverters; an O&M structure; and gravel roads required to access and maintain the solar arrays.

WPL retained the services of Stantec Consulting Services Inc. (Stantec) to compile data and perform visual inspections on public roadways and infrastructure. Stantec will consider roadways within the limits of the Project and along access routes to the Project location. Stantec will also evaluate the suitability of that infrastructure to support the expected construction traffic as well as on-going O&M vehicles.

2.0 METHODOLOGY

2.1 DESKTOP REVIEW

Stantec reviewed maps of proposed facility locations to identify roads internal to the Project and potential roads to be used during construction. Aerial maps of the roadways and street-level photography were studied for road conditions, existing driveway locations, pavement materials, shoulder materials and surrounding uses. Potential complications and concerns were noted and are discussed in Section 3.3.

Stantec acquired traffic count information from the Wisconsin Department of Transportation (WisDOT) Roadrunner Geographic Information System (GIS) website for the nearby State Trunk Highways and County Trunk Highways.

Connecting Interstate Highways were not reviewed in detail for this report, as they are constructed to accommodate large and heavy loads. The Dodge County Highway Department maintains US 151 highways to Federal Highway Administration standards, which, for the purpose of this analysis, is deemed to be suitable for traffic associated with this Project.

Roadway and land-use data from the Dodge County Comprehensive Land Use Plans were also acquired and reviewed.

2.2 AGENCY INTERVIEWS

Roads within the Project boundary fall under the jurisdiction of three agencies, the Dodge County Highway Department and the Townships of Beaver Dam and Burnett for snowplowing, maintenance, and normal upkeep. Stantec contacted these agencies for basic information about the roadways under their jurisdiction.

- On November 25, 2020, Stantec interviewed Nathan Kempke, Assistant Highway Commissioner for Dodge County Highway Department, to discuss the conditions of State and County Highways as well as Town Roads within the Project Area. Mr. Kempke provided a detailed description of the maintenance concerns, road ratings, bridge locations, culvert crossings, and typical road and shoulder widths for CTH B, CTH A, and US 151 which are under his jurisdiction (US 151 jurisdiction for maintenance only).

- On December 3, 2020, Stantec interviewed John Kuzniewicz, Chairman of the Town of Beaver Dam, to discuss the conditions of the Town Roads under his jurisdiction. Chairman Kuzniewicz provided a detailed description of the maintenance concerns, road ratings, bridge locations, culvert crossings, and typical road and shoulder widths for roads under his jurisdiction. All of the Town Roads in the Town of Beaver Dam are subject to a 10-ton weight limit.

- On December 3, 2020, Stantec interviewed Tim Fletcher, Chairman of the Town of Burnett, to discuss the conditions of the Town Roads within his jurisdiction. Chairman Fletcher provided a detailed description of the maintenance concerns, road ratings, bridge locations, culvert crossings, and typical road and shoulder widths for roads under his jurisdiction. All of the Town Roads in the Town of Burnett are subject to a 10-ton weight limit.

- On December 3, 2020, Stantec interviewed Russell Kottke, Chairman of the Town of Trenton, to discuss the conditions of the Town Roads within his jurisdiction. Chairman Kottke provided a detailed description of the maintenance concerns, road ratings, of a portion of Hemlock Road. All of the Town Roads in the Town of Trenton are subject to a 10-ton weight limit.

2.3 IN PERSON FIELD REVIEW

Prior to the agency interviews, Stantec completed desktop reviews of the area roadways and visited the Project to complete an onsite evaluation of the roadways that are: (1) within the Project Area, (2) adjacent to the Project, or (3) provide a direct link to accessing the Project from US 151. Roads linking the Project Area to the adjacent Federal Highway and within the Project Area were also driven to verify the conditions and materials that had been noted in desktop portions of the investigations. During the onsite evaluation, Stantec also collected the photographs included on the photolog provided in Appendix B.

3.0 ROADS AND INFRASTRUCTURE

3.1 EXISTING ROAD INFRASTRUCTURE

The Project footprint lays north of CTH B approximately 2 miles east of US 151 northeast of the City of Beaver Dam. A new electric substation will be constructed and connected via a new transmission line to an existing substation approximately one mile west of US 151. The array access points are proposed off of Town or County Roads. Appropriate permits will be required from the County and the Townships for new access points and new utility installations in the highway rights-of-way.

Existing road conditions can be described using the Pavement Surface Evaluation and Rating (PASER) scale. PASER is a 1-10-point rating system for road pavement condition developed by the University of Wisconsin-Madison Transportation Information Center. PASER uses visual inspection to evaluate pavement surface conditions. A rating of 10 indicates a road is in excellent condition, and rating of 1 indicates a road has failed and requires reconstruction.

3.1.1 Town Roads

All Town Roads in the Project Area are subject to a 10-ton weight limit. An exception to these limits is available to the construction vehicles working on or delivering materials to the Project Area as long as the most direct route is taken from a County highway to the destination. This means that trucks delivering supplies, equipment, and other items to the Project Area will be allowed to carry up to the Class A load limits when traveling directly from a State or County highway to the Project Area, but they will not be allowed to utilize Town Roads when avoidable for circulation or convenience.

The City of Beaver Dam has jurisdiction over a portion of N Crystal Lake Road adjacent to the Project Substation. Despite its ownership, it was originally constructed as a rural road (with shoulders and ditches and lacking curb and gutter) and is listed with other rural roads under the jurisdiction of the townships.

The Town Roads with PASER ratings are described below:

Beaver Dam Township

Within Beaver Dam Township, a number of access points are proposed for the Town Roads within the Project Area. Like other Townships, the Town of Beaver Dam reviews the condition of roadways at least yearly and publishes its findings on a public database.

- Basswood Road runs north-south through the center of the Project Area. Basswood Road is “cold-mix” asphalt pavement measuring approximately 20 feet wide with 3-foot grass shoulders and is rated 5 on the PASER scale.
- N Crystal Lake Road runs north-south along the west edge of the Project Substation Area. The

first 136 feet north of CTH B is under the jurisdiction of the Town and is a 20-foot wide asphalt road with 2-foot gravel shoulders and is rated 5 on the PASER scale.

- Hemlock Road runs east-west along the north edge of the Project Area. This portion of the road is under the jurisdiction of the Town of Trenton (see discussion below).

City of Beaver Dam

The Project Substation will be constructed approximately 0.7 mile west of the Solar Facility Area. Access to the substation will be via N Crystal Lake Road, a portion of which is under the jurisdiction of the City of Beaver Dam.

- N Crystal Lake Road runs north-south extending from the portion of N Crystal Lake Road which is within the Town of Beaver Dam. This roadway is a 20-foot wide asphalt road with 2-foot gravel shoulders and is rated 5 on the PASER scale. However, this portion of this road is in significantly worse condition than the portion within the Town of Beaver Dam (possible PASER rating 2-3).

Burnett Township

Approximately 20% of the Project Area is within the Town of Burnett, directly east of the Town of Beaver Dam. Within Burnett Township, a small number of access points are proposed for Fir Road.

- Fir Road runs north-south through the eastern portion of the Project Area. Fir Road is asphalt pavement measuring approximately 20 feet wide with 3-foot grass shoulders and is rated 6 on the PASER scale.
- A small portion of Hemlock Road extends into the Town of Burnett from the Town of Beaver Dam. The eastern end of Hemlock Road is a “cold-mix” asphalt road measuring 18-20 feet wide with 3-foot grass shoulders and is rated 6 on the PASER scale.

Trenton Township

Although none of the Project Area is within the Town of Trenton (directly north of the Town of Beaver Dam), a small number of access points are proposed for the portion of Hemlock Road under Trenton Township’s jurisdiction.

- Hemlock Road north of the Project Area is an asphalt road measuring 24 feet wide with 3-foot grass shoulders and is rated 6 on the PASER scale.

3.1.2 State and County Highways

One County highway which provides internal access to the Project Area is listed below.

- CTH B runs east-west along the south edge of the Project Area. CTH B an asphalt road, has a PASER rating of 4, and an average width of 24 feet with 5-foot aggregate shoulders. CTH B is classified as a Rural Minor Collector and the current traffic count west of the Project Area is listed as 3,200 Vehicles per Day (VPD) on the online Wisconsin Information System for Local Roads database.

Other roads in the vicinity include CTH A, STH 26, and STH 33. CTH A, just west of the Project Area is classified as a Rural Major Collector and has traffic counts of 4,400 VPD just north of and 5,100 VPD just south of the Project Area. STH 26 and STH 33 are within 2-5 miles of the Project Area and are along the alternate haul route from Interstate 41 (I-41) from the east.

The recommended haul route is from US 151 to CTH B to the Project Area.

3.1.3 Culverts

Culverts within the Project Area were reported to be in good condition by County and Town representatives. A representative sample of culverts has received a cursory review for severely damaged or structurally compromised features. All culverts in the Project Area appear to be in good condition.

There are no culverts within the Project Area or along the highways leading to the Project Area which are listed on the State of Wisconsin Highway Structures Information System (HSI) database.

The smaller (unrated) culverts within the Project Area appear to be in good or better condition and do not appear to show signs of weakness or failure. None of the culverts within the Project Area appear to require replacement or enhancement if standard weight vehicles are utilized for construction.

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

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

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

During the approximately 12- to 15-month construction phase of the Project, large and heavy vehicles will be required more frequently. Heavy and large loads associated with the construction stage of this Project are described in the following sections.

3.2.1 Types of Heavy Loads

The heaviest loads will be associated with the step-up transformer to be located within the substation yard approximately 0.7 mile west of the Solar Facility Area, north of CTH B. The transformer will be transported on a low-boy trailer and will require a crane for installation. Since this load will exceed not only normal highway load limits, but also the more restrictive Town limits, a special overweight load permit will be required. Overweight permitting will be through the agencies which oversee the roadways: WisDOT for the State Trunk Highways, Dodge County for CTH B, and Beaver Dam, Burnett, and Trenton Townships for any Town roads which may be affected by oversized or overweight loads.

Truckloads of aggregate and other materials for installation of the Project infrastructure, including permanent gravel access roads, will also be delivered to the Project Area. The aggregate trucks and other materials are not expected to exceed standard weight limits although weight class restrictions are to be observed when using the Town roads (see section 3.1.1).

3.2.2 Types of Large Loads

Electrical poles for placement near the substation are proposed to be either steel poles in sections or wood, depending on the purpose of the pole (i.e., angle structures, in-line structures, span over wetlands, etc.). Oversize trucks are often needed to deliver taller poles. The poles for this Project are anticipated to require only standard-length trucks.

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

3.2.3 Methods – Large and Heavy Loads

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

In some locations, it may be necessary to utilize low strength or deficient highways for the delivery of equipment or machinery. Mitigation techniques should be employed to minimize damage to the extent practicable. Mitigation techniques may include:

- Decrease in vehicle speed;
- Increase vehicle turning radius;
- Split large loads into smaller loads to decrease truck weight;
- Construction of deceleration lanes, additional asphalt lifts, paved shoulders or wider driveway widths;
- Utilize vehicles with additional axles or special weight-distribution features;
- Use protective mats or temporary asphalt lifts for heavy load crossings.

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

3.2.4 Construction Materials and Equipment Transport

Construction materials and equipment will be delivered by a variety of truck types. A total of approximately 1,800 truck trips are anticipated for construction support items over the 9 to 12-month construction period. This is an average of 10 to 12 trucks per day over the construction period. Construction support trips can be expected to include the following major items (an approximate count is given per trip type; the actual count will vary depending on final bid and equipment selection):

- The removal of trees and brush in limited portions of the Project Area. Approximately 1 truck moving tree removal equipment onto the site and 5 trucks of trees and brush removed from the site including waste and scrap materials.
- Mobilization/demobilization of construction equipment including excavators, bulldozers, graders, water trucks, concrete pumps, cranes, forklifts, trailers, plows, trenchers, etc. – 60 total trucks during the construction phase of 25 to 35 weeks.
- Delivery of road aggregate with dump trucks – 750 total trucks during an 8- to 10-week internal road construction period.
- Delivery of ready-mixed concrete with traditional ready-mix trucks – 300 truck deliveries during the approximate 10- to 12-week foundation construction period. The majority of the concrete trucks will be for foundations associated with the substation and O&M structure.
- Delivery of skid mounted inverters including transformers on low-boy semis – 15 trucks during the 10-week electrical construction period.

- Delivery of electrical conductor and fiber optic spools and other equipment and supplies on lowboy semis – 25 trucks during the 20- to 25-week electrical construction period.
- Delivery of solar panels and tracker parts on semis – 425 delivery trucks and 100 dunnage removal trucks during the 20- to 25-week electrical construction period.
- Delivery of miscellaneous Items (fencing, landscaping, meteorological station, culverts, tools and consumables, office trailers, etc.) – 75 trucks over the entire construction phase.
- For the connection between the Project Substation and the Transmission Line Point of Interconnection (POI), electrical poles composed of wood or steel will be delivered on 30 semi-trucks.

3.2.5 Potential for Road Damage and Compensation for Damage

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

The greatest potential for roadway pavement damage will typically appear at the construction driveway access points due to the starting, stopping, and turning of heavy vehicles. Additionally, roadway edges are often the first part of an otherwise adequate roadway to show signs of failure. If roadway edges are damaged, then just the outside 3 to 4 feet of the roadway can be reconstructed, cutting down the costs of pavement rehabilitation.

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

3.3 PREFERRED ACCESS HIGHWAYS

Materials and equipment arriving onsite from the north, south, or west will likely utilize US 151 to access the Project Area. Shipments arriving from the east will likely utilize I-41 to access the region. The following section describes potential trucking routes.

3.3.1 Vehicles Arriving from the North, South, and West

The most suitable access route for vehicles arriving from the north, south, and west will be from US 151 to CTH B. This route will go through a 2-way stop intersection at CTH A which is relatively busy, especially at shift changes for the Wal-Mart Distribution Center 2 miles north of CTH B.

3.3.2 Vehicles Arriving from the East

From east of the Project area, the most suitable access route will be to utilize I-41 and then STH 33 and STH 26 for access to the Project Area. This route will bring traffic through small communities at Allenton, Addison, and Horicon along the way.

3.3.3 Possible Road Modification Locations

Road width or turning radius modifications are not expected to be required for Project deliveries. If internal array road access points are constructed sufficiently wide (18 to 22 feet) at culvert locations, other modifications should not be necessary.

3.3.4 Roads to be Avoided

Discussions with the County and Township road personnel revealed that many of the Town roads are cold-mix asphalt and not up to Class A road standards. These roads are significantly lighter grade than state and county highways. In order to limit damage, loads on Town Roads should be limited to 60 percent of a typical weight limit and deliveries should be timed to avoid the spring thaw period (late-March to mid-April) when transporting heavy loads.

Due to 10-ton weight restrictions on all Town roads in the Project Area, deliveries that exceed these limits must travel directly from non-restricted roadways by the shortest path.

3.4 SAFETY CONCERNS

Access on and off existing roadways presents the largest safety concern for roads proposed to be utilized during Project construction and operation. Adherence to speed limits is an important factor in reducing accidents. Speed limits on many of the roads within the Project Area are not posted and can be assumed to be 45 miles per hour on Town roads and 55 miles per hour on CTH B. When possible, a lower speed for loaded trucks is recommended. Speed limits on STH 33 and STH 26 are 55 miles per hour.

The intersection of CTH B and CTH A just west of the project site is a 2-way stop (no stop for CTH A) and has a high accident occurrence. This intersection was noted to be problematic by all of the County and Town personnel contacted for this study.

3.4.1 Safety During Construction

Construction access points will be the most significant safety concern for this project. Whether it is a direct access point on the County or local roads or a nearby intersection, trucks entering and leaving the roadway should use warning signage and lights when possible to alert other drivers to their presence.

3.4.2 Safety During Permanent Maintenance Operations

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

4.0 CONCLUSION

Stantec performed a Roadway Condition Report for the Beaver Dam Solar Project on behalf of WPL. Results of the assessment include the following:

- Permanent access drives may be placed on the nearest convenient roadways without creating a significant safety hazard subject to permitting requirements of Dodge County, and the Towns of Beaver Dam, Burnett, and Trenton.
- The recommended access route from US 151 to the Project Area is via CTH B.
- Significant culvert damage is not expected based on the existing condition of the infrastructure and the small number of overweight vehicles expected for this Project.
- Significant pavement damage may be expected on most roadways based on the existing condition of the infrastructure. Localized damage might also be noted at turn-offs to Project access drives. These locations may be improved prior to the start of the Project or after damage occurs.

APPENDIX A LOCATION MAP

APPENDIX A LOCATION MAP

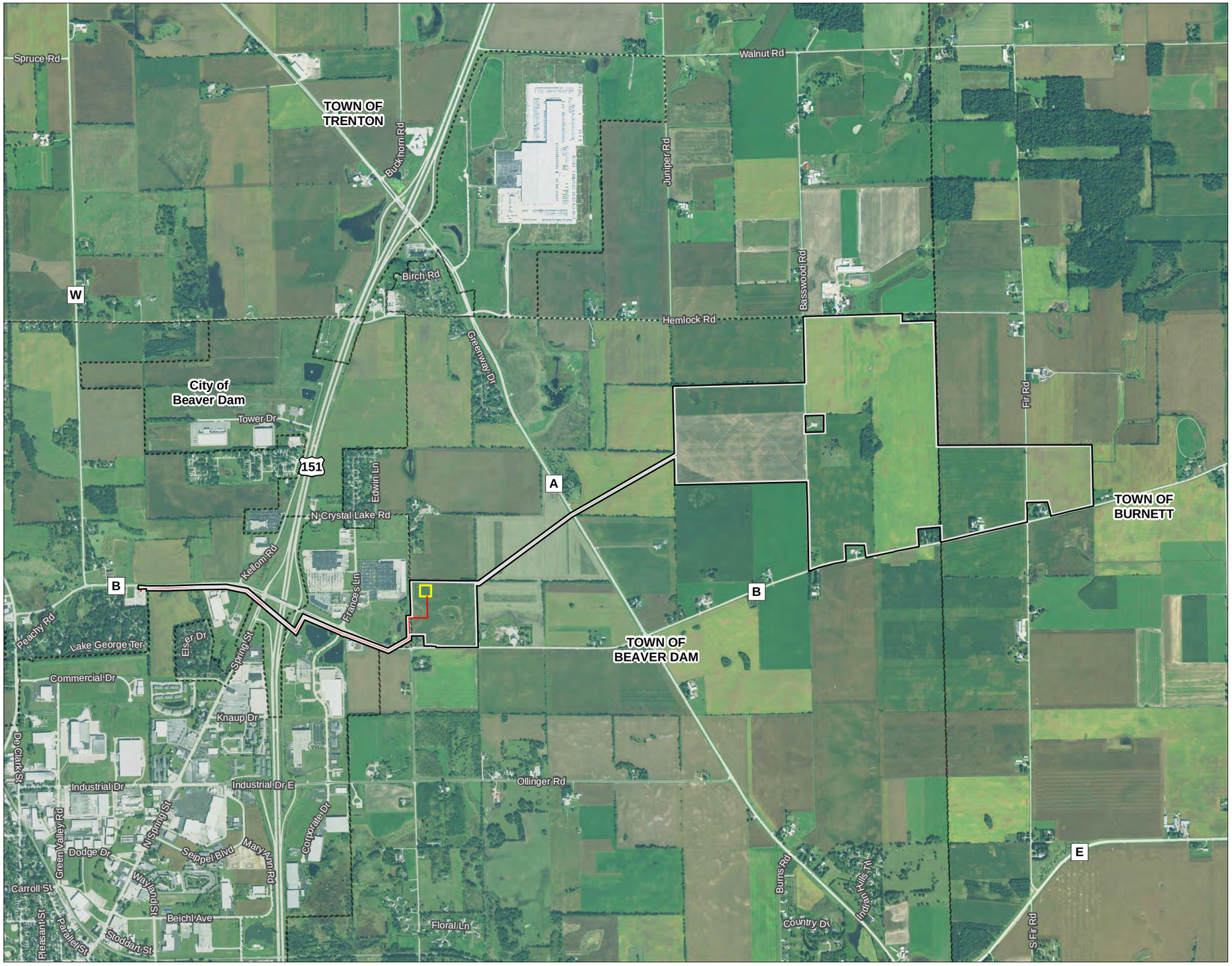


Figure No.

A1

Title

Location Map

Client/Project 193707481

Wisconsin Power and Light Company
Beaver Dam Solar Project

Project Location
T. of Beaver Dam & Burnett,
Dodge Co., WI

Prepared by MP on 2021-09-16
TR by RA on 2021-09-16
IR by CB on 2021-09-16

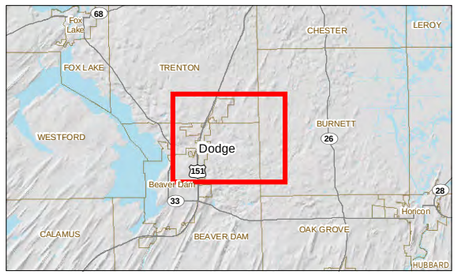
N

0 1,000 2,000 Feet

(At original document size of 11x17)
1:24,000

Legend

- Project Area
- Generator Tie Line
- Project Substation
- Municipality Boundary



Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources: Stantec, WPLC, WisDOT, WDNR, SCO
3. Background: NAIP 2018

Stantec

APPENDIX B PHOTO LOG

Photo 1. CTH B, At Point of Interconnect, view east

Photo 2. CTH B, West of I-41 Interchange, view east

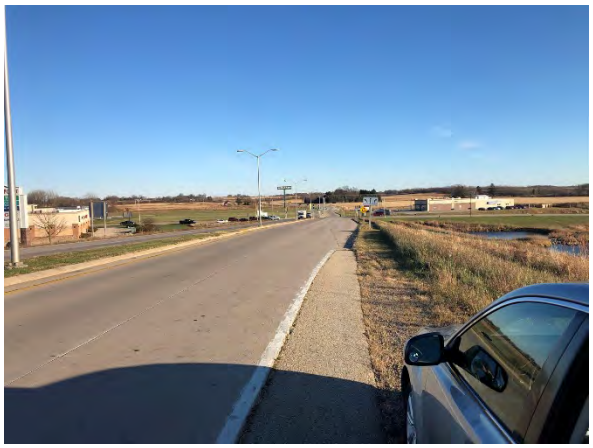


Photo 3. CTH B, East of I-41 Interchange, view east

Photo 4. CTH B, East of I-41 Interchange, view east

Photo 5. CTH B, Just east of CTH A Intersection, view west

Photo 6. CTH B, Just east of CTH A Intersection, view east

Photo 7. CTH B, at Basswood Rd Intersection, view west

Photo 8. CTH B, at Basswood Rd Intersection, view north

Photo 9. CTH B, at Fir Rd Intersection, view south

Photo 10. CTH B, at Fir Rd Intersection, view north

Photo 11. Fir Rd, north of CTH B, view south

Photo 12. Fir Rd, north of CTH B, view north

Photo 13. Fir Rd, at Hemlock Rd Intersection, view west

Photo 14. Fir Rd, at Hemlock Rd Intersection, view north

Photo 15. Hemlock Rd, west of Fir Rd, view east

Photo 16. Hemlock Rd, west of Fir Rd, view west

Photo 17. Hemlock Rd, at Basswood Rd Intersection, view east

Photo 18. Hemlock Rd, at Basswood Rd Intersection, view south

Photo 19. Basswood Rd, south of Hemlock Rd, view north

Photo 20. Basswood Rd, south of Hemlock Rd, view south

Photo 21. Basswood Rd, north of CTH B, view north

Photo 22. Basswood Rd, north of CTH B, view south