APPENDIX K
Wetland Delineation Report

Castle Rock Solar Project
January 2025
IP7137/GS-24-267

BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit: Castle Rock Township	**County:** Dakota
Applicant Name: Castle Rock Solar LLC, Derek Hasek **Applicant Representative:** Stantec, Jennifer Kamm	
Project Name: Castle Rock Solar	**LGU Project No. (if any):** SWCD #24-CAS-141
Date Complete Application Received by LGU: 08/28/24	
Date of LGU Decision: 12/26/24	
Date this Notice was Sent: 12/26/24	

WCA Decision Type - check all that apply

☒ Wetland Boundary/Type ☐ Sequencing ☐ Replacement Plan ☐ Bank Plan (not credit purchase)
☐ No-Loss (8420.0415) ☐ Exemption (8420.0420)
Part: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H Subpart: ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits: ☐ Bank Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☐ Approve ☐ Approve w/Conditions ☐ Deny ☒ No TEP Recommendation

LGU Decision

☒ Approved with Conditions (specify below)[1] ☐ Approved[1] ☐ Denied
List Conditions: The area for AWS-40 was removed from this decision boundary approval as wetland status cannot be confirmed outside the growing season during frozen conditions.

Decision-Maker for this Application: ☒ Staff ☐ Governing Board/Council ☐ Other:

Decision is valid for: ☒ 5 years (default) ☐ Other (specify):

[1] *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision[1].

☐ Attachment(s) (specify):
☒ Summary: The Notice of Application was sent out August 28, 2024 and the decision was due October 27. An extension was issued to allow additional time to complete the field review and revised delineation report and the comment period ended on September 27, 2024. No written comments were received. The SWCD, BWSR, DNR and VRWJPO conducted a field review of the project area on October 2 and December 18, 2024 and verified the boundary and type of 22 wetlands (see Table 3) and 6 waterways present in the project area (see Table 4). Waterway S1 is a DNR Public Water and the South Branch of the Vermillion River. Area AWS-40 was not included during the initial off-site review and later submitted after the growing season with the offsite results determining a field review was required to confirm wetland status. The area for AWS-40 was removed

from this decision boundary approval as wetland status cannot be confirmed outside the growing season during frozen conditions (see Figure 6 on Page 13).

[1] *Findings must consider any TEP recommendations.*

Attached Project Documents

☒ Site Location Map ☐ Project Plan(s)/Descriptions/Reports (specify): Click here to enter text.

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☒ Yes[1] ☐ No

[1] *If yes, all appeals must first be considered via the local appeals process.*

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Send petition within 30 calendar days of date receive notice and $TBD fee to: Castle Rock Township, 2537 240th Street West, Farmington, MN 55024

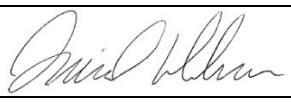
Notice Distribution (include name)

Required on all notices:

☒ SWCD TEP Member: **David Holmen**	☒ BWSR TEP Member: **Jed Chesnut**
☒ LGU TEP Member (if different than LGU contact): **Clerk, Castle Rock Township**	
☒ DNR Representative: **Tim Pharis**	
☒ Watershed District or Watershed Mgmt. Org.: **Kelly Perrine, Vermillion River Watershed JPO**	
☒ Applicant (notice only): **Derek Hasek, Castle Rock Solar LLC**	
☒ Agent/Consultant (notice only): **Jennifer Kamm, Stantec**	

Optional or As Applicable:

☐ Corps of Engineers: **usace_requests_mn@usace.army.mil**	
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):	
☐ Members of the Public (notice only):	☐ Other:

Signature: 	**Date:** 12/26/24

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.

Table 3. Summary of Wetlands Identified within the Study Area

Wetland ID	Wetland Type*	Adjacent Surface Waters	Area in Study Area (acres)	Latitude	Longitude
W1	Degraded Wet Meadow	KH-ES2, KH-W5	0.61	44.616053	-93.102030
W2	Hardwood Swamp, Farmed Wetland, Degraded Wet Meadow, Sedge Meadow, Shrub-Carr	Vermillion River, South Branch (M-049-005)	42.06	44.61319	-93.102333
W3	Degraded Wet Meadow	---	0.50	44.614192	-93.099512
W4	Degraded Wet Meadow	---	0.64	44.603061	-93.102429
W5	Farmed Wetland, Degraded Wet Meadow	---	0.02	44.616016	-93.089334
W6	Farmed Wetland, Degraded Wet Meadow	S2	0.31	44.61807	-93.087626
W7	Hardwood Swamp, Degraded Wet Meadow	S2	1.15	44.616523	-93.086045
W8	Hardwood Swamp, Farmed Wetland, Degraded Wet Meadow	S3, S4	13.61	44.607854	-93.111032
W9	Hardwood Swamp, Floodplain Forest, Degraded Wet Meadow, Sedge Meadow, Shallow Marsh, Shrub-Carr	Vermillion River, South Branch (M-049-005)	39.31	44.608531	-93.093644
W10	Hardwood Swamp, Farmed Wetland, Degraded Wet Meadow, Shrub-Carr	---	4.99	44.614164	-93.092036
W11	Farmed Wetland	---	0.86	44.616328	-93.091237
W15	Floodplain Forest, Shrub-Carr	Vermillion River, South Branch (M-049-005)	14.84	44.616897	-93.063227
W16	Degraded Wet Meadow	OW1	1.47	44.622384	-93.063439

Wetland ID	Wetland Type*	Adjacent Surface Waters	Area in Study Area (acres)	Latitude	Longitude
W18	Floodplain Forest, Farmed Wetland, Wet Meadow	---	3.32	44.625181	-93.06566
KH-W1	Degraded Wet Meadow, Shallow Marsh	Vermillion River, South Branch (M-049-005)	4.60	44.61641	-93.114541
KH-W2	Farmed Wetland	---	0.24	44.617363	-93.106975
KH-W3	Degraded Wet Meadow, Shallow Marsh, Shrub Swamp	KH-ES1, KH-ES2	1.54	44.617137	-93.105185
KH-W4	Farmed Wetland	---	0.60	44.616557	-93.103640
KH-W5	Degraded Wet Meadow, Shrub Swamp	---	4.04	44.616778	-93.098866
KH-W6	Farmed Wetland	---	0.44	44.619886	-93.106784
KH-W7	Farmed Wetland	---	1.32	44.622956	-93.110839
KH-W8	Farmed Wetland	---	0.64	44.621017	-93.109584
		TOTAL	**137.10 acres**		

*Wetland type based on Eggers & Reed, 2015; the mapped NWI wetland may or may not correspond to field observed wetland type.

3.3.1 Vegetation

Hardwood Swamp

Five hardwood swamp wetland communities (W2, W7, W8, W9, W10) were delineated within the Study Area during the field surveys. Dominant species included silver maple (*Acer saccharinum*, FACW), boxelder (*Acer negundo,* FAC), red maple (*Acer rubrum*, FAC), and eastern cottonwood (*Populus deltoides*, FAC) in the overstory, and dominant shrub and herbaceous species included red-osier dogwood (*Cornus sericea*, FACW), common buckthorn (*Rhamnus cathartica,* FAC), sandbar willow (*Salix interior*, FACW), stinging nettle (*Urtica dioica*, FACW) and reed canary grass (*Phalaris arundinacea*, FACW).

Kimley-Horn did not delineate any wetlands with hardwood swamp wetland communities.

Table 4. Summary of Waterways Identified within Study Area

Waterway ID	PWI ID	Flow Class	OHWM Width/Height (feet)	Bank Width/Height (feet)	Length In Study Area (linear feet)
S1	Vermillion River, South Branch (M-049-005)	Perennial	18 ft, 3 ft	20 ft, 1-2 ft	5,948
S2	--	Perennial	4 ft, 3 ft	10 ft, 4 ft	643
S3	--	Perennial	3.5 ft, 0.60 ft	5 ft, 4 ft	3,442
S4	--	Perennial	2.5 ft, 0.75 ft	10 ft, 5 ft	1,485
KH-ES1	--	Ephemeral	2 ft, 1 ft	--	597
KH-ES2	--	Ephemeral	2 ft, 1 ft	--	154
				Total	**12,269**

3.6 OTHER ENVIRONMENTAL CONSIDERATIONS

This report is limited to the identification of state and/or federally regulated wetlands and waterways within the Study Area. However, there may be other regulated features within the Study Area, including, but not limited to, historical or archeological features, endangered or threatened species, navigable waters, shoreland zones, and/or floodplains, etc. Federal, state, and local units of government and regional planning organizations may have regulatory authority to control or restrict land uses within or in close proximity to these features.

Figure No.
1

Title
Project Location Map

Client/Project 193709215
Castle Rock Solar LLC
Castle Rock Solar Project

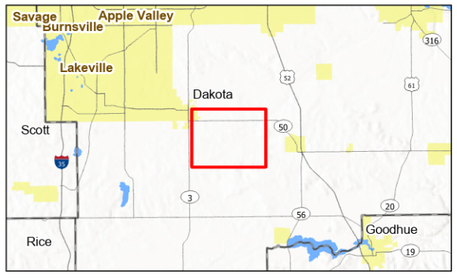
Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

0 1,000 2,000 Feet
(At original document size of 11x17)
1:24,000

Legend
Project Boundary



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: USGS 7.5' Topographic Quadrangles

Stantec

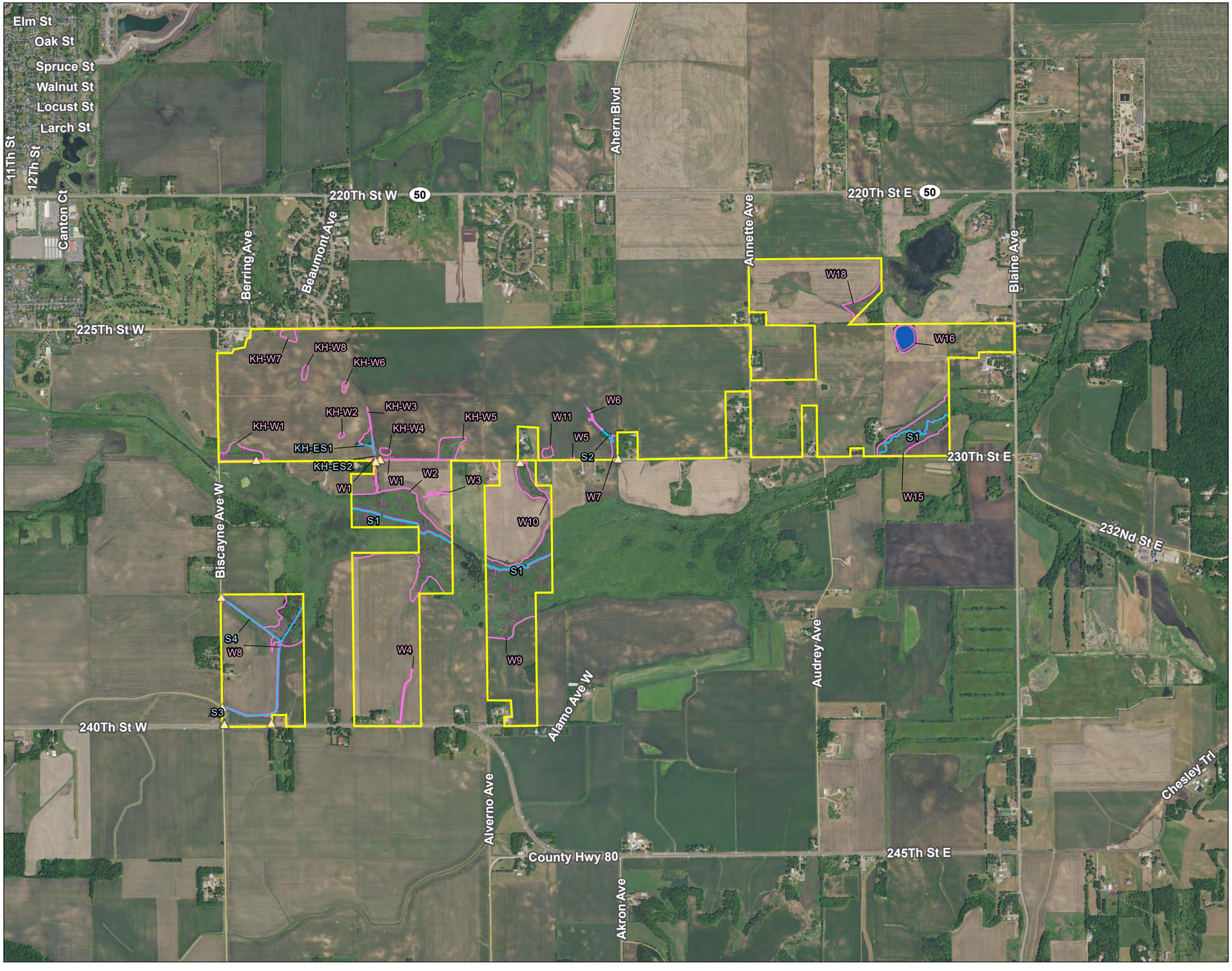


Figure No.
5

Title
Field Collected Data Overview

Client/Project 193709215
Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

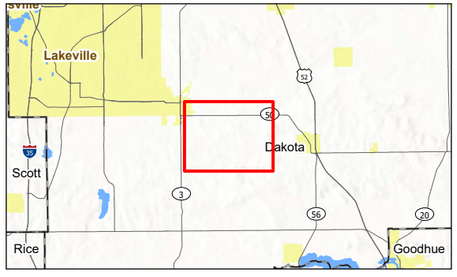
Prepared by KJM on 2024-10-23
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

0 1,000 2,000 Feet
(At original document size of 11x17)
1:24,000

Legend
- Project Boundary
- Culvert
- Field Delineated Waterway
- Field Delineated Open Water Area
- Field Delineated Wetland Area

*No features within data frame



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

V:\193709215\data\gis_cad\gis\mxds\Wetland_Delineation\Wetland_Delineation.aprx Revised: 2024-12-23 By: kimueller

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

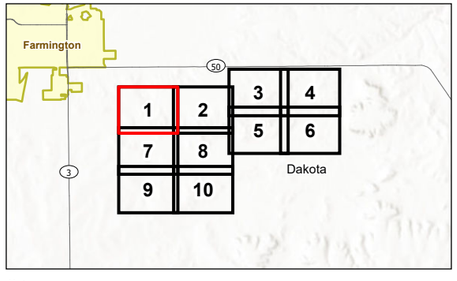
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes

1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

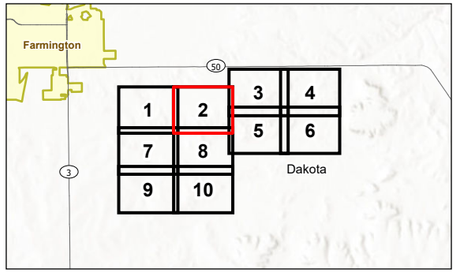
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.
6

Title
Field Collected Data

Client/Project 193709215
Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

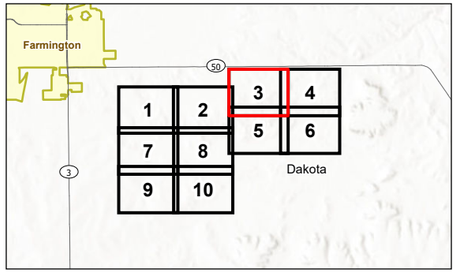
N

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

Legend
- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type
- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.
6

Title
Field Collected Data

Client/Project
193709215
Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

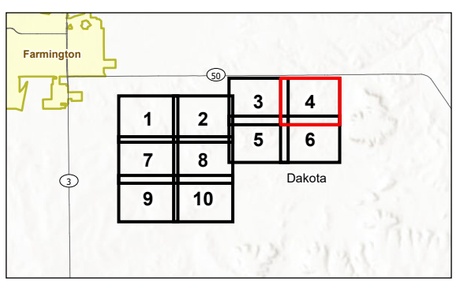
N

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

Legend
- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type
- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.
6

Title
Field Collected Data

Client/Project
Castle Rock Solar LLC
Castle Rock Solar Project

193709215

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

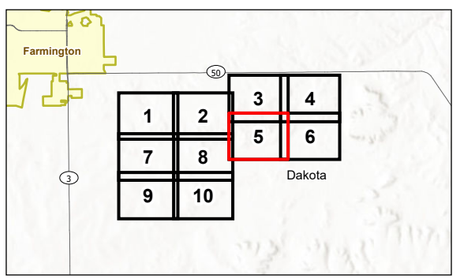
N

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

Legend
- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type
- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

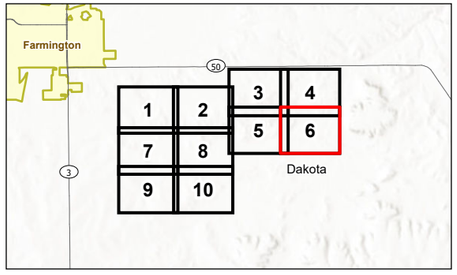
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow
- *Area not field verified by TEP*



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

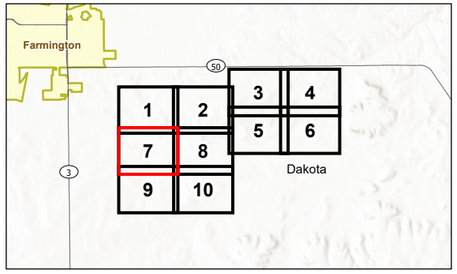
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

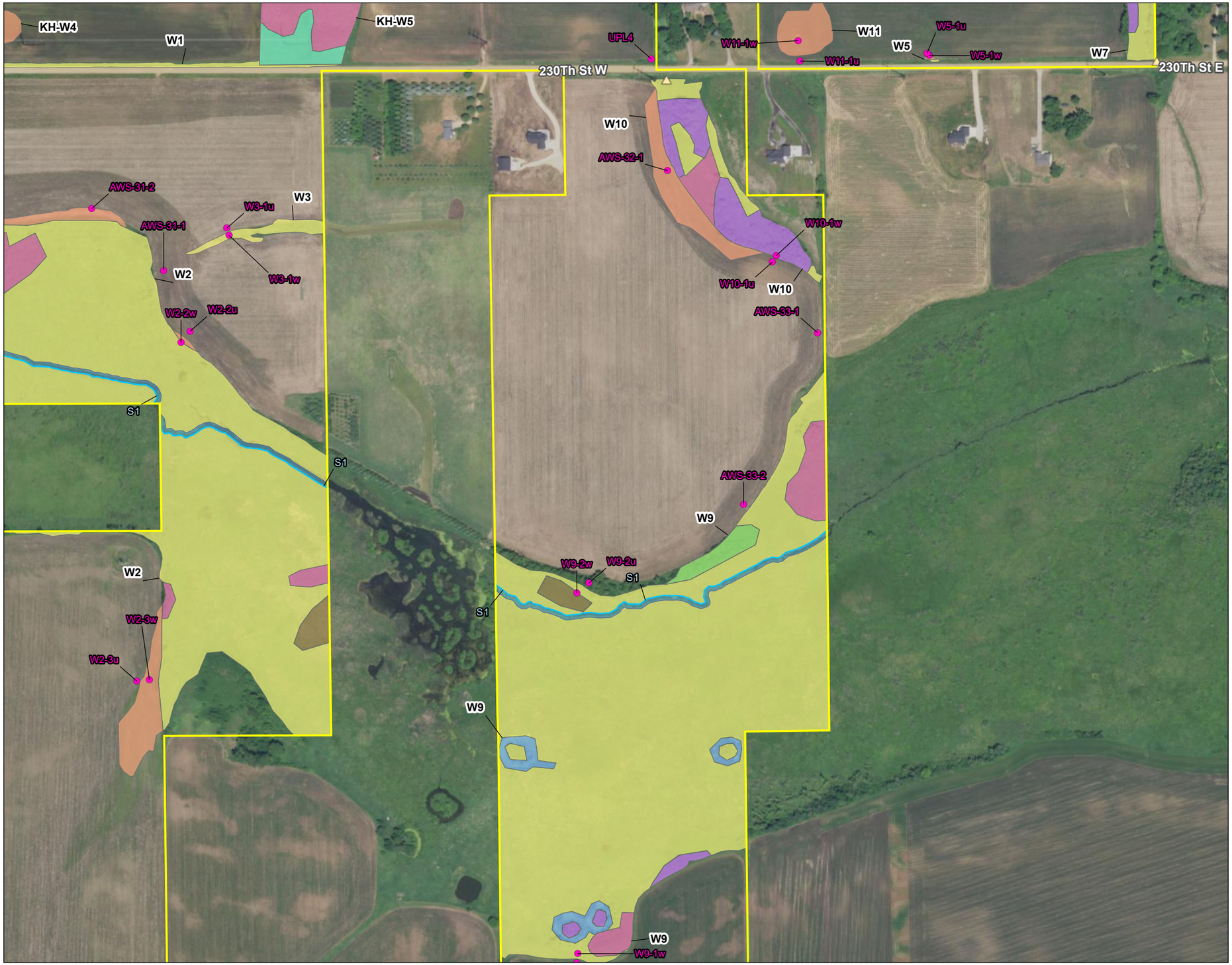


Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

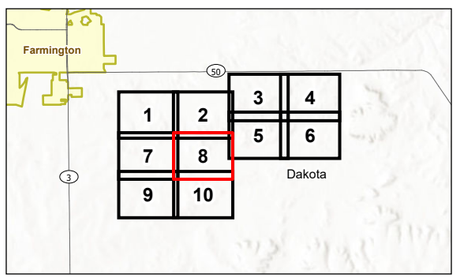
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

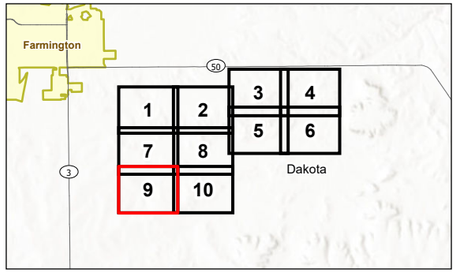
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.
6

Title
Field Collected Data

Client/Project
Castle Rock Solar LLC
Castle Rock Solar Project

193709215

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

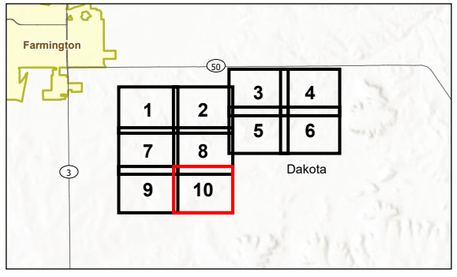
N

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

Legend
- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type
- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Wetland Delineation Report

Castle Rock Solar Project

Dakota County, MN

Stantec Project #:193709215

December 23, 2024

Prepared for:

Castle Rock Solar LLC
3316 Highland Ave
Wayzata, MN 55391

Prepared by:

Stantec Consulting Services Inc.
2080 Wooddale Drive, Suite 100
Woodbury, MN 55125
Phone: (612) 357-2309

Table of Contents

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) performed a wetland and waterway determination and delineation of the proposed Castle Rock Solar Project (the "Study Area") on behalf of Castle Rock Solar LLC. The Castle Rock Solar Project is a proposed development of a 150-megawatt solar energy generation facility. The Study Area is approximately 1,314.7 acres in size and located in Castle Rock Township in Dakota County, Minnesota (**Table 1**). The Study Area is located southeast of the City of Farmington and west of the City of Hampton. The Study Area is west of U.S. Highway 52 and bisected by 230th St (**Appendix A, Figure 1**).

Table 1. Townships, Ranges, and Sections Intersected by the Study Area

Township Name	Township, Range	Sections
Castle Rock	T113N, R19W	2-4, 9,10

The purpose and objective of this field effort was to identify the extent and spatial arrangement of wetlands and waterways within the Study Area. The field investigations were performed October 17-21, 2022, and October 11-12, 2023.

The northwest corner of the Study Area has a previously approved wetland delineation which was completed by Kimley-Horn and Associates in October 2023. The Notice of Decision (NOD) was issued for the delineation of 314 acres of Section 4 in Township 113 North, Range 19 West by the Local Government Unit (LGU) on February 23, 2024. The NOD and associated wetland figures are included in **Appendix F**.

Wetlands and waterways that are considered Waters of the U.S. (WOTUS) are subject to regulation under Section 404 of the Clean Water Act (CWA) and the jurisdictional regulatory authority lies with the U.S. Army Corps of Engineers (USACE). The Minnesota Department of Natural Resources (MNDNR) has regulatory authority over certain wetlands, navigable waters, and adjacent lands under Statute 103G and Rule 6115.0250. All wetlands are protected under the Wetland Conservation Act Rules Chapter 8420 and administered by an LGU. LGUs can be a City, County, Watershed District or Soil and Water Conservation District (SWCD) depending on the project location. The LGU for this Study Area is the Dakota County SWCD. Stantec recommends this report be submitted to the LGU and USACE for a preliminary jurisdictional review and concurrence.

2.0 METHODS

2.1 WETLANDS

Wetland delineations were based on the criteria and methods outlined in the *Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1 (1987) and subsequent guidance documents (USACE 1991a, 1991b, 1992), and applicable Regional Supplements to the *Corps of Engineers Wetland Delineation Manual*.

The wetland delineation involved the use of available resources to assist in the assessment such as U.S. Geological Survey (USGS) topographic maps, U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) soil survey, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping, MNDNR Minnesota NWI Update mapping, MNDNR Protected/Public Waters mapping, and aerial photography.

On-site wetland delineations were made using the three criteria (vegetation, soil, and hydrology) and technical approach defined in the USACE 1987 Manual and applicable Regional Supplement. According to procedures described in the 1987 Manual and applicable Regional Supplement, areas that under normal circumstances reflect a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology (e.g., inundated or saturated soils) are considered wetlands.

A review of U.S. Department of Agriculture Farm Service Agency (FSA), National Agriculture Imagery Program (NAIP) aerial imagery, and other available aerial imagery was conducted for the farmed areas within the Study Area. This effort was conducted to assist in the delineation of farmed wetlands as these areas lack natural vegetation, and often have altered hydrology from artificial drainage.

Wetland signatures are characteristics viewed in aerial imagery that correlate with the presence of wetland hydrology. Wetland signatures may vary based on the type and seasonal date of the aerial imagery. Commonly recognized signatures in aerial imagery as described in *Guidance for Offsite Hydrology/Wetland Determinations* (USACE, BWSR 2016) are detailed below:

1. Crop Stress (CS) – differences in vigor of planted crops compared to surrounding conditions due to wetness. Often seen as a different color compared to surrounding vegetation of the same type.

2. Drowned Out (DO) – areas that appear to have been tilled/planted, but the crop has been drowned out.

3. Not Cropped (NC) – areas within or adjacent to a cropped field that appear to be bare or in natural vegetation rather than cropped.

4. Standing Water (SW) – areas where surface water is visible, usually appear black or white in aerial imagery.

5. Altered Pattern (AP) – areas with differences in cropping patterns because of delayed planting during the early part of the growing season due to wetness.

6. Soil Wetness Signature (SS) – areas where the soils are darker in color due to saturation; standing water may also be present.

7. Wetland Signature (WS) – areas that have greener vegetation during dry conditions. Also, the presence of a wetland in non-cropped areas based on vegetative cover.

8. Normal Vegetative Cover (NV) or No Soil Wetness (NSS) – areas of potential wetland seen in other imagery that cannot be readily distinguished from known adjacent upland areas or an area that is distinguishable from the adjacent upland for factors other than wetness (i.e., droughty conditions).

Antecedent precipitation was determined for each photo date utilizing the USACE Antecedent Precipitation Tool (APT). The tool compares precipitation totals from the three months prior to the date of the image with 30-year normal amounts, calculating a weighted multi-month score and determining the climate conditions (dry, normal, wet). Stantec reviewed the most recently available aerial images and utilized the five most recent images determined to be under normal antecedent precipitation conditions. Typically, aerial imagery review should include no less than five normal years. If aerial imagery from five normal years is not available, an equal number of wet and dry years are analyzed. A summary of the precipitation analysis used for the offsite review and the field investigations is provided in **Appendix D**.

Additionally, the presence of mapped poorly and somewhat poorly drained soils, NWI mapping, and topography within the Study Area were reviewed in conjunction with an analysis of available aerial imagery for wetland signatures in these areas. Areas within agricultural fields are typically identified as wetland if they contain a combination of hydric soils, show the wetland signatures observed on aerial photographs taken in the five (or more) most recent normal precipitation normal years, and/or exhibit other hydrology indicators, as detailed in USACE/BWSR guidance (2016). During the field review, areas that contained mapped poorly and somewhat poorly drained soils, all NWI mapped wetlands, and all areas that exhibited wetland characteristics during the on-site investigation were sampled, regardless of the results of the aerial imagery review, and the final wetland determination was made based on the field sample points.

The uppermost wetland boundary and sampling points were identified and surveyed with a Global Positioning System (GPS) capable of sub-meter accuracy and mapped using Geographical Information System (GIS) software.

2.2 WATERWAYS AND WATERBODIES

Waterways, waterbodies, culverts, and/or other connections to off-site wetland or aquatic features that may be under federal or state authority were surveyed using a GPS and mapped using GIS software. However, review of waterway characteristics and determination of navigability and jurisdiction was beyond the scope of the investigation.

3.0 RESULTS

3.1 SITE DESCRIPTION

The Study Area is comprised primarily of active agricultural fields, one prairie, several wetlands, and a few small, forested areas. The Study Area also contains one named waterway and three tributaries which function as agricultural ditches. The Study Area is used primarily for agriculture; agricultural land in the Study Area was planted with field corn and soybeans. The Study Area is relatively flat and generally averaged between 876 and 960 feet above mean sea level (msl) with occasional gently rolling terrain. An existing transmission line exists just south of the Study Area.

NRCS mapped soils present within the Study Area and their hydric status are summarized in **Table 2** and mapped in **Appendix A, Figure 2**. During Stantec's field delineation, it was found that a large portion of the site contained clayey soils, particularly in the farmed areas.

Table 2. Summary of Soils Identified within the Study Area

Soil Symbol	Soil Unit Name	Acreage	% of Study Area	Hydric Soil Rating
39B	Wadena loam, 2 to 6 percent slopes	242.82	18.47%	0
378	Maxfield silty clay loam	120.99	9.20%	95
611C	Hawick gravelly sandy loam, 6 to 12 percent slopes	114.76	8.73%	0
2B	Ostrander loam, 1 to 6 percent slopes	101.59	7.73%	0
213B	Klinger silt loam, 1 to 5 percent slopes	81.71	6.22%	5
415B	Kanaranzi loam, 2 to 6 percent slopes	87.76	6.68%	0
411B	Waukegan silt loam, 1 to 6 percent slopes	77.09	5.86%	0
1896B	Ostrander-Carmi loams, 2 to 6 percent slopes	67.77	5.16%	0
539	Klossner muck, 0 to 1 percent slopes	56.59	4.30%	100
301B	Lindstrom silt loam, 1 to 4 percent slopes	46.11	3.51%	0
41B	Estherville sandy loam, 2 to 6 percent slopes	30.91	2.35%	1
129	Cylinder loam, 0 to 2 percent slopes	28.25	2.15%	15
2C	Ostrander loam, 6 to 12 percent slopes	28.21	2.15%	0
1894B	Winnebago loam, 2 to 6 percent slopes	26.45	2.01%	0
81C	Boone loamy fine sand, 6 to 12 percent slopes	24.85	1.89%	0

Soil Symbol	Soil Unit Name	Acreage	% of Study Area	Hydric Soil Rating
1055	Aquolls and Histosols, ponded	24.43	1.86%	100
98	Colo silt loam, occasionally flooded	17.33	1.32%	95
27B	Dickinson sandy loam, 2 to 6 percent slopes	15.76	1.20%	0
611D	Hawick gravelly sandy loam, 12 to 20 percent slopes	13.57	1.03%	0
409B	Etter fine sandy loam, 2 to 6 percent slopes	13.01	0.99%	0
495	Zumbro fine sandy loam	9.86	0.75%	0
81B	Boone loamy fine sand, 2 to 6 percent slopes	7.99	0.61%	0
1895B	Carmi loam, 2 to 8 percent slopes	7.10	0.54%	5
151D	Burkhardt sandy loam, 12 to 18 percent slopes	7.06	0.54%	0
151C	Burkhardt sandy loam, 6 to 12 percent slopes	6.54	0.50%	0
252	Marshan silty clay loam	6.25	0.48%	90
409C	Etter fine sandy loam, 6 to 12 percent slopes	6.02	0.46%	0
250	Kennebec silt loam	5.94	0.45%	0
208	Kato silty clay loam	5.59	0.43%	95
299B	Rockton loam, 2 to 6 percent slopes	5.54	0.42%	0
283B	Plainfield loamy sand, 2 to 6 percent slopes	4.86	0.37%	0
39C	Wadena loam, 6 to 12 percent slopes	4.80	0.37%	0
313	Spillville loam, 0 to 2 percent slopes, occasionally flooded	4.61	0.35%	10
415C	Kanaranzi loam, 6 to 12 percent slopes	3.22	0.24%	0
283A	Plainfield loamy sand, 0 to 2 percent slopes	2.67	0.20%	0
411C	Waukegan silt loam, 6 to 12 percent slopes	2.40	0.18%	0
W	Water	1.91	0.15%	0
1078	Anthroportic Udorthents, 2 to 9 percent slopes	1.70	0.13%	0
176	Garwin silty clay loam	0.56	0.04%	95

The MNDNR Protected/Public Waters map identified one DNR protected watercourse, Vermillion River South Branch (M-049-005), within the Study Area (**Appendix A, Figure 3**). The Vermillion River South Branch generally flows west to northeast through the entire Study Area.

The National Wetland Inventory (NWI) map identified a number of wetlands and wetland complexes within the Study Area, as shown in **Appendix A, Figure 4**. Wetlands identified by the NWI include emergent, forested/shrub, riverine, and freshwater pond wetlands.

3.2 CLIMATIC CONDITIONS

Precipitation was analyzed for October 17-21, 2022, and October 11-12, 2023, each day field surveys were conducted, using the USACE APT which compares precipitation totals from the three months prior to the date of the survey with 30-year normal amounts, calculating a weighted multi-month score and determining the climate conditions (dry, normal, wet), as described in Section 2.1. Antecedent precipitation conditions were considered *drier than normal* prior to the site visits conducted October 17-21, 2022, and were considered *normal* prior to the site visits conducted October 11-12, 2023, as shown in the APT figures and tables in **Appendix D**.

3.3 WETLANDS

Fourteen wetlands were identified and delineated within the Study Area during the Stantec field efforts. Wetland determination data forms were completed for sample points along transects through the wetlands and adjacent uplands and are included in **Appendix B**. The wetlands are summarized in **Table 3** below and described in detail in the following sections. Photographs of the wetlands and adjacent lands are included in **Appendix C**. The wetland boundaries and sample point locations are shown in **Appendix A, Figures 5-6**.

Eight wetlands were delineated by Kimley-Horn in the northwest portion of the Study Area in 2023 and approved by the LGU. These wetlands are denoted by the KH prefix in **Table 3** and shown in **Appendix A, Figures 5-6**. More detail regarding the Kimley-Horn delineation is provided in **Appendix F**.

Table 3. Summary of Wetlands Identified within the Study Area

Wetland ID	Wetland Type*	Adjacent Surface Waters	Area in Study Area (acres)	Latitude	Longitude
W1	Degraded Wet Meadow	KH-ES2, KH-W5	0.61	44.616053	-93.102030
W2	Hardwood Swamp, Farmed Wetland, Degraded Wet Meadow, Sedge Meadow, Shrub-Carr	Vermillion River, South Branch (M-049-005)	42.06	44.61319	-93.102333
W3	Degraded Wet Meadow	---	0.50	44.614192	-93.099512
W4	Degraded Wet Meadow	---	0.64	44.603061	-93.102429
W5	Farmed Wetland, Degraded Wet Meadow	---	0.02	44.616016	-93.089334
W6	Farmed Wetland, Degraded Wet Meadow	S2	0.31	44.61807	-93.087626
W7	Hardwood Swamp, Degraded Wet Meadow	S2	1.15	44.616523	-93.086045
W8	Hardwood Swamp, Farmed Wetland, Degraded Wet Meadow	S3, S4	13.61	44.607854	-93.111032
W9	Hardwood Swamp, Floodplain Forest, Degraded Wet Meadow, Sedge Meadow, Shallow Marsh, Shrub-Carr	Vermillion River, South Branch (M-049-005)	39.31	44.608531	-93.093644
W10	Hardwood Swamp, Farmed Wetland, Degraded Wet Meadow, Shrub-Carr	---	4.99	44.614164	-93.092036
W11	Farmed Wetland	---	0.86	44.616328	-93.091237
W15	Floodplain Forest, Shrub-Carr	Vermillion River, South Branch (M-049-005)	14.84	44.616897	-93.063227
W16	Degraded Wet Meadow	OW1	1.47	44.622384	-93.063439

Wetland ID	Wetland Type*	Adjacent Surface Waters	Area in Study Area (acres)	Latitude	Longitude
W18	Floodplain Forest, Farmed Wetland, Wet Meadow	---	3.32	44.625181	-93.06566
KH-W1	Degraded Wet Meadow, Shallow Marsh	Vermillion River, South Branch (M-049-005)	4.60	44.61641	-93.114541
KH-W2	Farmed Wetland	---	0.24	44.617363	-93.106975
KH-W3	Degraded Wet Meadow, Shallow Marsh, Shrub-Carr	KH-ES1, KH-ES2	1.54	44.617137	-93.105185
KH-W4	Farmed Wetland	---	0.60	44.616557	-93.103640
KH-W5	Degraded Wet Meadow, Shrub-Carr	---	4.04	44.616778	-93.098866
KH-W6	Farmed Wetland	---	0.44	44.619886	-93.106784
KH-W7	Farmed Wetland	---	1.32	44.622956	-93.110839
KH-W8	Farmed Wetland	---	0.64	44.621017	-93.109584
		TOTAL	**137.10 acres**		

*Wetland type based on Eggers & Reed, 2015; the mapped NWI wetland may or may not correspond to field observed wetland type.

3.3.1 Vegetation

Hardwood Swamp

Five hardwood swamp wetland communities (W2, W7, W8, W9, W10) were delineated within the Study Area during the field surveys. Dominant species included silver maple (*Acer saccharinum*, FACW), boxelder (*Acer negundo,* FAC), red maple (*Acer rubrum*, FAC), and eastern cottonwood (*Populus deltoides*, FAC) in the overstory, and dominant shrub and herbaceous species included red-osier dogwood (*Cornus sericea*, FACW), common buckthorn (*Rhamnus cathartica,* FAC), sandbar willow (*Salix interior*, FACW), stinging nettle (*Urtica dioica*, FACW) and reed canary grass (*Phalaris arundinacea*, FACW).

Kimley-Horn did not delineate any wetlands with hardwood swamp wetland communities.

Floodplain Forest

Three floodplain forest wetland communities (W9, W15, W18) were delineated within the Study Area during the field surveys. Dominant species included silver maple, boxelder, and eastern cottonwood in the overstory, and dominant shrub and herbaceous species included black willow (*Salix nigra*, OBL), sandbar willow, red-osier dogwood, common buckthorn, reed canary grass, and wild red raspberry (*Rubus idaeus*, FACU).

Kimley-Horn did not delineate any wetlands with floodplain forest wetland communities.

Farmed Wetland

Seven farmed wetland communities (W2, W5, W6, W8, W10, W11, W18) were delineated within the Study Area during the field surveys. The vegetation in these wetlands was typically disturbed by row cropping with corn or soybeans. Of the volunteer vegetation present, it was often dominated by reed canary grass, fall panic grass (*Panicum dichotomiflorum,* FACW), witchgrass (*Panicum capillare*, FAC), and yellow nutsedge (*Cyperus esculentus,* FACW).

Kimley-Horn delineated five wetlands (KH-W2, KH-W4, KH-W6, KH-W7, KH-W8) with farmed (seasonally flooded basin) wetland communities.

Degraded Wet Meadow

Eleven degraded wet meadow wetland communities (W1-W10, W16) were delineated within the Study Area during the field survey. The vegetation in these wetlands was typically disturbed and dominated by the invasive reed canary grass. Other present vegetation included yellow nutsedge and hybrid cattail (*Typha x glauca*, OBL).

Kimley-Horn delineated three wetlands (KH-W1, KH-W3, KH-W5) with degraded wetland communities.

Wet Meadow

One wet meadow wetland community (W18) was delineated within the Study Area during the field survey. Dominant species included the following species in the herbaceous layer: reed canary grass, fall panic grass, and stinging nettle. In the shrub layer red-osier dogwood was present in lesser amounts (less than 50%).

Kimley-Horn did not delineate any wetlands with degraded wet meadow wetland communities.

Sedge Meadow

Two sedge meadow wetland communities (W2, W9) were delineated within the Study Area during the field survey. Dominant species included tussock sedge (*Carex stricta*, OBL), lake sedge (*Carex lacustris*, OBL), and Canada bluejoint (*Calamagrostis canadensis*, OBL).

Kimley-Horn did not delineate any wetlands with sedge meadow wetland communities.

Shallow Marsh

One shallow marsh wetland community (W9) was delineated within the Study Area during the field survey. Dominant species include hybrid cattail and American reed manna grass (*Glyceria grandis*, OBL).

Kimley-Horn delineated two wetlands (KH-W1, KH-W3) with shallow marsh wetland communities.

Shrub-Carr

Four shrub-carr wetland communities (W2, W9, W10, W15) were delineated within the Study Area during the field surveys. Dominant species in the shrub layer included red-osier dogwood, common buckthorn, and sandbar willow, and herbaceous layer species included giant goldenrod (*Solidago gigantea,* FACW), stinging nettle, tussock sedge, reed canary grass, and hybrid cattail.

Kimley-Horn delineated two wetlands (KH-W3, KH-W5) with degraded wetland communities.

3.3.2 Soils

Mapped soils within the Study Area are shown in **Appendix A, Figure 2**. The Minnesota Soil Survey is an ongoing effort by the Board of Water and Soil Resources (BWSR) in cooperation with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) collecting and mapping soils data in each county of the state.

Soil profiles documented during the field investigation are provided on the data forms in **Appendix B**. The most common NRCS field indicators of hydric soil identified during the wetland delineation in order of frequency were Redox Dark Surface (F6), Thick Dark Surface (A12), and Other.

3.3.3 Hydrology

A variety of wetland hydrology indicators were observed at wetlands within the Study Area. Primary indicators of hydrology included Saturation (A3). Secondary indicators of hydrology observed at the wetlands were Geomorphic Position (D2), a positive FAC-Neutral Test (D5), Saturation Visible on Aerial Imagery (C9), Drainage Patterns (B10), Dry-Season Water Table (C2), and Surface Soil Cracks (B6). For a complete description of hydrology indicators observed at each wetland, refer to the data forms presented in **Appendix B**.

3.3.4 Wetland Boundary

In general, wetland boundaries of non-farmed wetlands were determined based on distinct differences in vegetation, hydrology, soils, and topography consisting of the following: 1) transition from a wetland plant community to upland meadow or forest; 2) transition from areas that had wetland hydrology indicators to areas that lacked wetland hydrology indicators; 3) transition from soils that had field indicators of hydric soil to soils that lacked hydric soil field indicators (though hydric soils were observed on both sides of many

wetland boundaries); 4) topographic break; and 5) location of wetland signatures from the aerial imagery review in normal precipitation years.

For farmed areas, a USACE APT analysis was conducted for the years of historic aerial imagery that were used in the aerial imagery review and precipitation data was obtained for the Study Area. From this analysis it was determined that the images from July 2008, July 2010, September 2015, August 2017, and July 2019 were taken under “normal” precipitation conditions. The historical precipitation analysis is documented in **Appendix E**. An additional four normal year photos (Spring 2016, Spring 2017, October 2018, and September 2021) from the Dakota County historical aerial photographs were reviewed for nine specific areas of concern (AWS-31 through AWS-39) at the request of the Technical Evaluation Panel (TEP). The historical precipitation analysis for the additional aerial photos is documented in **Appendix E2.**

In the aerial review, wetland hydrology “signatures” including altered pattern, wetland signature, not cropped, soil wetness signature, drowned out, standing water, and crop stress expressed as a difference in vegetative cover or color were identified within the evaluation areas. Seventeen areas had a wetland signature in at least one out of five normal years and are identified on the aerial photos (**Figures 7-13**) in **Appendix E** as Areas AWS-1 through AWS-10, AWS-12, AWS-13, AWS-25, AWS-26, and AWS-28 through AWS-30. Of these seventeen areas, fourteen were located within mapped hydric soil units and nine were identified within mapped NWI wetlands.

In the nine additional areas of review, seven areas had a wetland signature in at least one of the six normal years and are identified on the aerial photos (**Figures 14-21**) in **Appendix E2** as Areas AWS-31 through AWS-33, AWS-36 through AWS-39). Based on offsite aerial review, one area was determined to be not wetland, and eight areas were either determined to be wetlands or determined to be wetlands if other hydrology indicators are determined to be present in the field.

During the field investigation, a conservative approach was used and sample points were taken in each original offsite evaluation area to confirm the presence or absence of wetlands within the farmed portions of the Study Area. Hydrology determinations and wetland criteria evaluations for each evaluation area are located within the tables in **Appendix E and E2** and the sample point data sheets located in **Appendix B**.

Many of the areas identified as possible wetlands during the offsite review were determined to be upland. These areas generally had hydric soils, but no hydrophytic vegetation or hydrology indicators. Many of the areas had tile inlets present in the lowest area of the area of interest, indicating that the areas are effectively drained. During the field investigation, wetlands were determined to be present in locations within fourteen of the evaluation areas. When field verified, areas AWS-2 and AWS-29 did not meet hydric soil or hydrology indicators and AWS-30 did not meet hydrology indicators, therefore, these areas were determined to be upland for not meeting all three wetland criteria. **Figures 7-13**, located in **Appendix E**, illustrate the evaluation areas overlayed on each year of imagery reviewed.

During the TEP field reviews on October 2 and 29, 2024, the nine additional areas were field verified with the presence of the TEP members. Wetlands were determined to be present in six of the areas of interest. Areas AWS-33, AWS-34, and AWS-39 were determined to be upland for the areas did not meet hydrology or hydric soil indicators. Field verification for areas AWS-35, AWS-36, and AWS-39 were completed along

with TEP members. Soil samples were taken in each of the areas of interest. At areas AWS-35 and AWS-36 wetland hydrology was determined to be met based on the presence of secondary hydrology indicators Surface Soil Cracks (B6) and Geomorphic Position (D2). Hydrophytic vegetation at the two areas included blue monkeyflower (*Mimulus ringens*, OBL), bog yellow cress (*Rorippa palustris*, OBL), and witchgrass (*Panicum capillare*, FAC). Area AWS-39 was determined to be a hay crop field that did not meet hydrophytic vegetation or hydrology indicators and was therefore not considered wetland.

The boundaries for the farmed wetlands were determined based on minor differences in vegetation including the presence/absence of hydrophytic volunteer vegetation, crop stress or drown out areas, healthy crops versus dried out crops, as well as minor topographic changes, and in some cases, lack of hydrology and/or hydric soil indicators.

3.4 UPLANDS

Uplands within the Study Area consisted of cultivated cropland, prairie, grassland, and upland forest. Agricultural crops planted within the Study Area included field corn and soybeans.

Tree species in upland areas were dominated by jack pine (*Pinus banksiana,* FACU), black cherry (*Prunus serotina*, FACU), eastern cottonwood, Siberian elm (*Ulmus pumila*, UPL), boxelder, silver maple, red maple, and white pine (*Pinus strobus*, FACU). Shrubs in upland areas included Tartarian honeysuckle (*Lonicera tatarica*, FACU), smooth sumac (*Rhus glabra,* UPL), and common buckthorn. Herbaceous vegetation found in uplands within the Study Area included smooth brome (*Bromus inermis*, UPL), Kentucky bluegrass (*Poa pratensis*, FAC), orchard grass (*Dactylis glomerata*, FACU), Canada goldenrod (*Solidago canadensis*, FACU), Canada thistle (*Cirsium arvense*, FACU), wild bergamot (*Monarda fistulosa*, FACU), black-eyed Susan (*Rudbeckia hirta,* FACU), yellow foxtail (*Setaria pumila,* FAC), common burdock (*Arctium minus,* FACU), fall panic grass, white sweet clover (*Meliotus alba*, UPL), Canada wild rye (*Elymus canadensis*, FACU), white snakeroot (*Ageratina altissima*, FACU), and alfalfa (*Medicago sativa*, FACU).

3.5 WATERWAYS AND WATERBODIES

A total of four waterways and one waterbody were identified and delineated within the Study Area by Stantec. The MNDNR Protected/Public Waters Inventory (PWI) includes one DNR protected watercourse, South Branch Vermillion River (M-049-005), within the Study Area (**Appendix A, Figure 3**), which corresponds with the field delineated Waterway S1, and generally crosses west to northeast through the Study Area. Waterway S3, which corresponds with Tributary No. 5 to South Branch Vermillion River, flows from the south and crosses through the southwestern portion of the Study Area before joining with the Vermillion River South Branch. Waterways S2 and S4 are currently utilized as agricultural ditches. Waterway S4 has been channelized to connect with S3. The one waterbody (OW1) is an open water feature totaling 3.25 acres. W16 forms a wetland fringe around the edge of OW1.

Two ephemeral waterways were delineated by Kimley-Horn in 2023. Both KH-ES1 and KH-ES2 are associated with KH-W3.

The waterways are summarized in **Table 4** below. Locations of the waterways and waterbody are shown in **Appendix A, Figure 5-6.** Representative photographs are included in **Appendix C**.

Table 4. Summary of Waterways Identified within Study Area

Waterway ID	PWI ID	Flow Class	OHWM Width/Height (feet)	Bank Width/Height (feet)	Length In Study Area (linear feet)
S1	Vermillion River, South Branch (M-049-005)	Perennial	18 ft, 3 ft	20 ft, 1-2 ft	5,948
S2	--	Perennial	4 ft, 3 ft	10 ft, 4 ft	643
S3	--	Perennial	3.5 ft, 0.60 ft	5 ft, 4 ft	3,442
S4	--	Perennial	2.5 ft, 0.75 ft	10 ft, 5 ft	1,485
KH-ES1	--	Ephemeral	2 ft, 1 ft	--	597
KH-ES2	--	Ephemeral	2 ft, 1 ft	--	154
				Total	**12,269**

3.6 OTHER ENVIRONMENTAL CONSIDERATIONS

This report is limited to the identification of state and/or federally regulated wetlands and waterways within the Study Area. However, there may be other regulated features within the Study Area, including, but not limited to, historical or archeological features, endangered or threatened species, navigable waters, shoreland zones, and/or floodplains, etc. Federal, state, and local units of government and regional planning organizations may have regulatory authority to control or restrict land uses within or in close proximity to these features.

4.0 CONCLUSION

Stantec performed a wetland and waterway determination and delineation of the proposed Castle Rock Solar Project on behalf of Castle Rock Solar LLC. The Study Area is 1314.70 acres in size and located in Sections 2-4, 9, and 10, Township 113 North, Range 19 West, Castle Rock Township, in Dakota County, Minnesota. The purpose and objective of this field effort was to identify the extent and spatial arrangement of wetlands and potentially jurisdictional waterways within the Study Area.

During the field efforts, the boundaries of **fourteen wetlands, four waterways, and one waterbody** were identified and delineated within the Study Area by Stantec in accordance with state and federal guidelines and were subsequently surveyed with GPS and mapped using GIS software. There was a total of **123.70 acres** of wetlands, **11,518 linear feet** of waterways, and **3.25 acres** of a waterbody delineated within the Study Area by Stantec. Wetlands were composed of hardwood swamp, floodplain forest, farmed wetland, degraded wet meadow, wet meadow, sedge meadow, shallow marsh, and shrub-carr wetland communities. An additional eight wetlands and two waterways were previously delineated by Kimley-Horn (**Appendix F**). Uplands within the Study Area were primarily composed of cultivated cropland, with some grassland and upland forest also present.

The USACE has regulatory authority over Waters of the U.S. including adjacent wetlands, and the MNDNR has regulatory authority over certain wetlands, navigable waters, and adjacent lands under Statute 103G and Rule 6115.0250. All wetlands are protected under the Wetland Conservation Act Rules Chapter 8420 and administered by a LGU. LGUs can be a City, County, Watershed District or SWCD depending on project location. Stantec recommends this report be submitted to the LGU and USACE for final jurisdictional review and concurrence. Finally, counties, townships, and municipalities may have local zoning authority over certain types of wetlands and waterways.

Prior to beginning work at this site or disturbing or altering wetlands, waterways, or adjacent lands in any way, Stantec recommends that the owner obtain the necessary permits or other agency regulatory review and concurrence with regard to the proposed work to comply with applicable regulations. Stantec can assist with identification and/or assessment of additional regulated resources at your request.

The information provided by Stantec regarding wetland boundaries is a scientific-based analysis of the wetland and upland conditions present in the Study Area at the time of the fieldwork. The delineation was performed by experienced and qualified professionals using standard practices and sound professional judgment. The ultimate decision on wetland boundaries rests with the USACE and LGU, in some cases, the MNDNR as well. As a result, there may be adjustments to boundaries based upon review by a regulatory agency. An agency determination can vary from time to time depending on various factors including, but not limited to, recent precipitation patterns and the season of the year. In addition, the physical characteristics of the Study Area can change over time, depending on the weather, vegetation patterns, drainage activities on adjacent parcels, or other events. Any of these factors can change the nature and extent of wetlands on the site. This wetland delineation report and the associated wetland boundaries are not considered finalized until they are approved by the U.S. Army Corps of Engineers and the LGU administering the Wetland Conservation Act.

5.0 REFERENCES

Cowardin, L.M., V. Carter V., F.C. Golet, E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service Report No. FWS/OBS/-79/31.Washington, D.C.

Eggers, S. D., & D. M. Reed. 2015. *Wetland Plants and Plant Communities of Minnesota and Wisconsin* (V. 3.2). U.S. Army Corps of Engineers, Regulatory Branch, St. Paul, MN District. Available at: https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2801/

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Minnesota Department of Natural Resources. 1985. Final Designation of Protected (Public) Waters and Wetlands. http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/download_lists.html

Shaw, S. P., and C. G. Fredine. 1956. Wetlands of the United States: Their extent and values to Waterfowl and other wildlife. Washington D. C. Department of the Interior, Fish and Wildlife Service, Office of River Basin Studies. Circular 39.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database. Available online at http://websoilsurvey.nrcs.usda.gov/ or http://datagateway.nrcs.usda.gov/.

USACE. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station (U.S.) United States. Army. Corps of Engineers Wetlands Research Program (U.S.).

USACE. 2005. Regulatory guidance letter – Ordinary high water mark identification. Available at: https://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl05-05.pdf.

USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USACE. 2020. Antecedent Precipitation Tool, Version 1.0. U.S. Army Corps of Engineers. Written by: Jason Deters. https://www.epa.gov/wotus/antecedent-precipitation-tool-apt

USACE and Minnesota Board of Water and Soil Resources (BWSR). 2015. Guidance for submittal of Delineation Reports to the St. Paul District Army Corps of Engineers and Wetland Conservation Act Local Governmental Units in Minnesota, (Version 2).

USACE St. Paul District and BWSR. 2016. Guidance for Offsite Hydrology/Wetland Determinations, ed C. Koniskson and J. Jaschke. Available online at: http://www.bwsr.state.mn.us/wetlands/delineation/Guidance_for_Offsite_Hydrology_and_Wetland_Determinations.pdf

USACE. 2022. National Wetland Plant List, version 3.6. Available at: http://wetland-plants.usace.army.mil/.

USDA - FSA. Undated. NAIP Imagery. Available at: https://www.fsa.usda.gov/programs-and-services/aerial-photography/imagery-programs/naip-imagery/.

U.S. Department of Agriculture, Natural Resource Conservation Service (USDA, NRCS). 2018. *Field Indicators of Hydric Soils in the United States*, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils.

USFWS. Undated. NWI. Available at: https://fwspublicservices.wim.usgs.gov/server/rest/services/Wetlands/MapServer.

USGS. Undated. NHD. Available at: https://hydro.nationalmap.gov/arcgis/rest/services/nhd/MapServer.

United States Geological Survey (USGS). *Minnesota 7.5 Minute Series (Topographic) Maps.* 1:24,000. Reston, VA: United States Department of the Interior, USGS.

Appendix A FIGURES

Figure No.

1

Title

Project Location Map

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

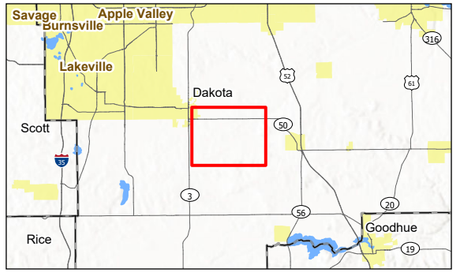
N

0 1,000 2,000 Feet

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

Legend

Project Boundary



Notes

1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: USGS 7.5' Topographic Quadrangles

Stantec

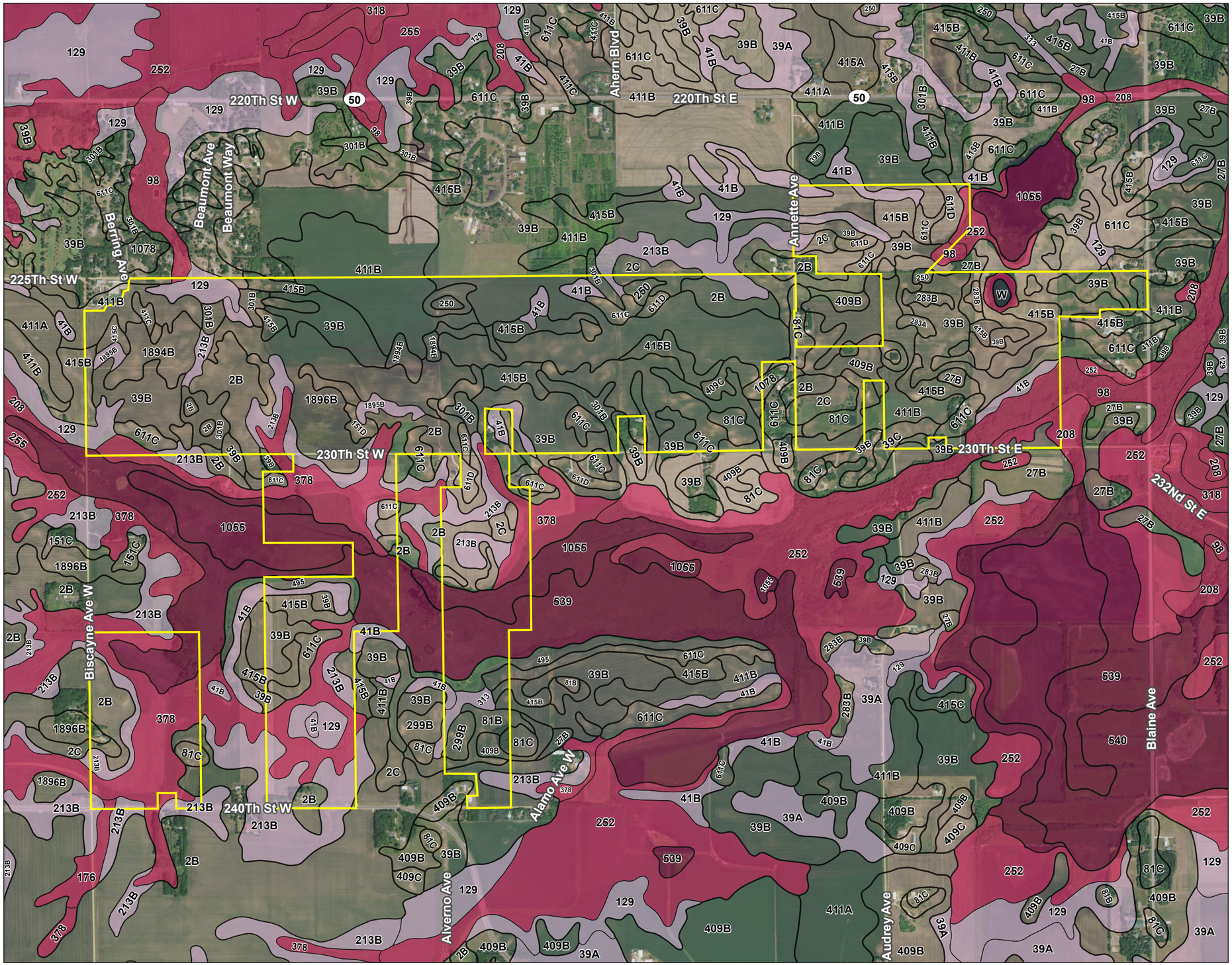


Figure No.
2

Title
NRCS Soil Survey Data Hydric Ratings

Client/Project 193709215
Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

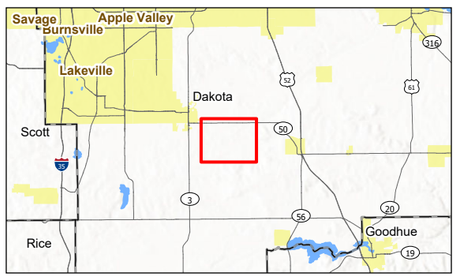
N

0 750 1,500 Feet
(At original document size of 11x17)
1:18,000

Legend
- Project Boundary

NRCS Soil Survey Data
Hydric Soil Rating
- Hydric
- Predominantly Hydric
- Partially Hydric*
- Predominantly Non-Hydric
- Non-Hydric

*No features within data frame



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS, NRCS
3. Background: NAIP 2021

Stantec

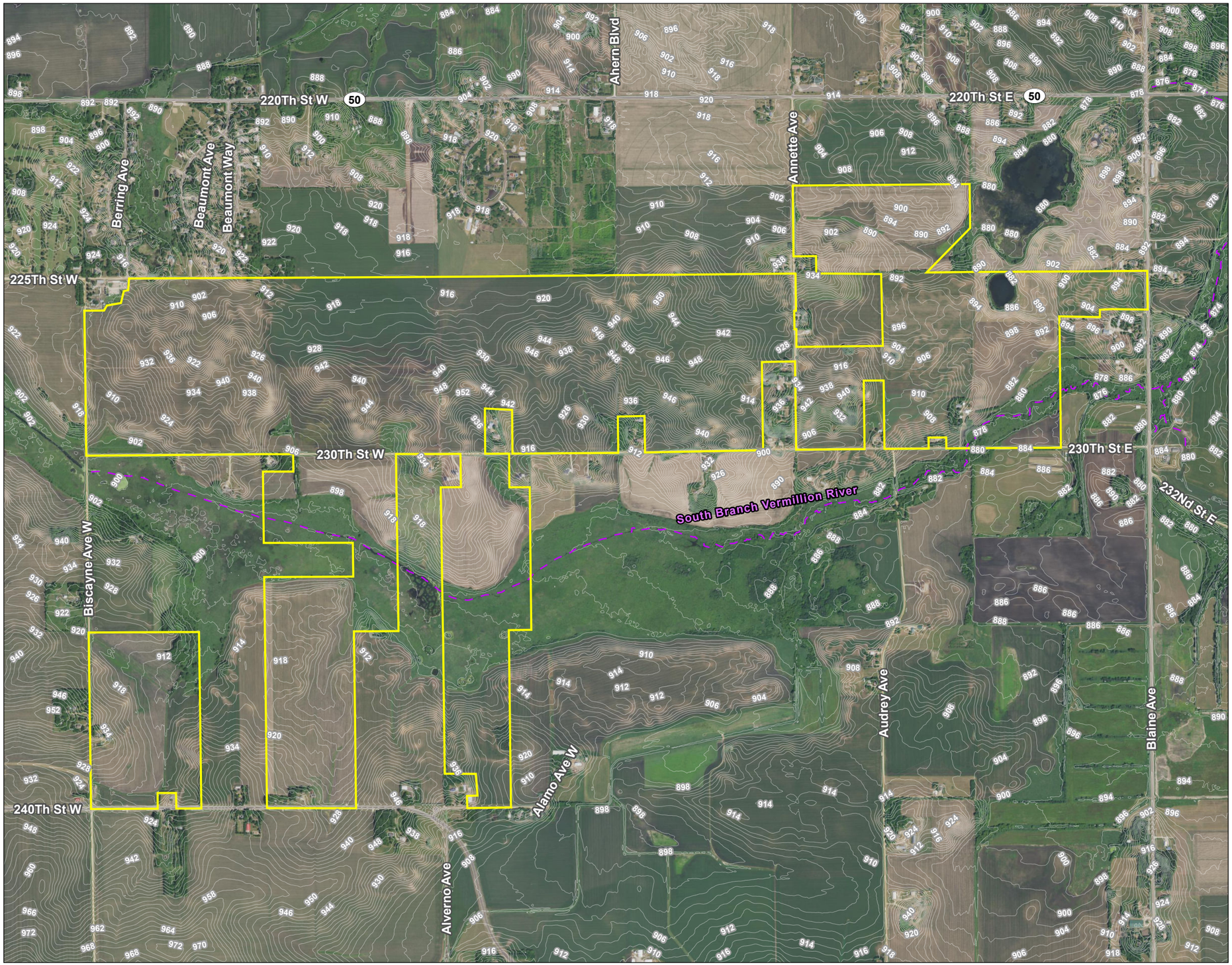


Figure No.
3

Title
MN Protected/Public Waters Map

Client/Project
Castle Rock Solar LLC
Castle Rock Solar Project

193709215

Project Location
T. of Castle Rock
Dakota Co., MN

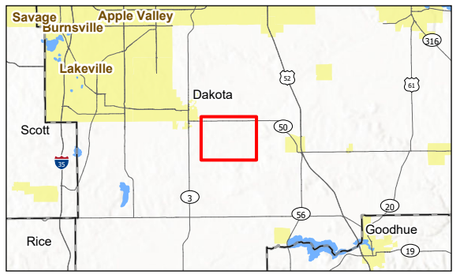
Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

0 750 1,500 Feet
(At original document size of 11x17)
1:18,000

Legend
- Project Boundary
- 2 Ft Elevation Contour
- MN DNR Protected Watercourse
- MN DNR Protected Water*
- MN DNR Protected Wetland*

*No features within data frame



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS, MNDNR
3. Background: NAIP 2021

Stantec

V:\193709215\active\193709215103_data\gis_cad\gis\mxds\Wetland_Delineation\Wetland_Delineation.aprx Revised: 2024-12-23 By: kjmueller

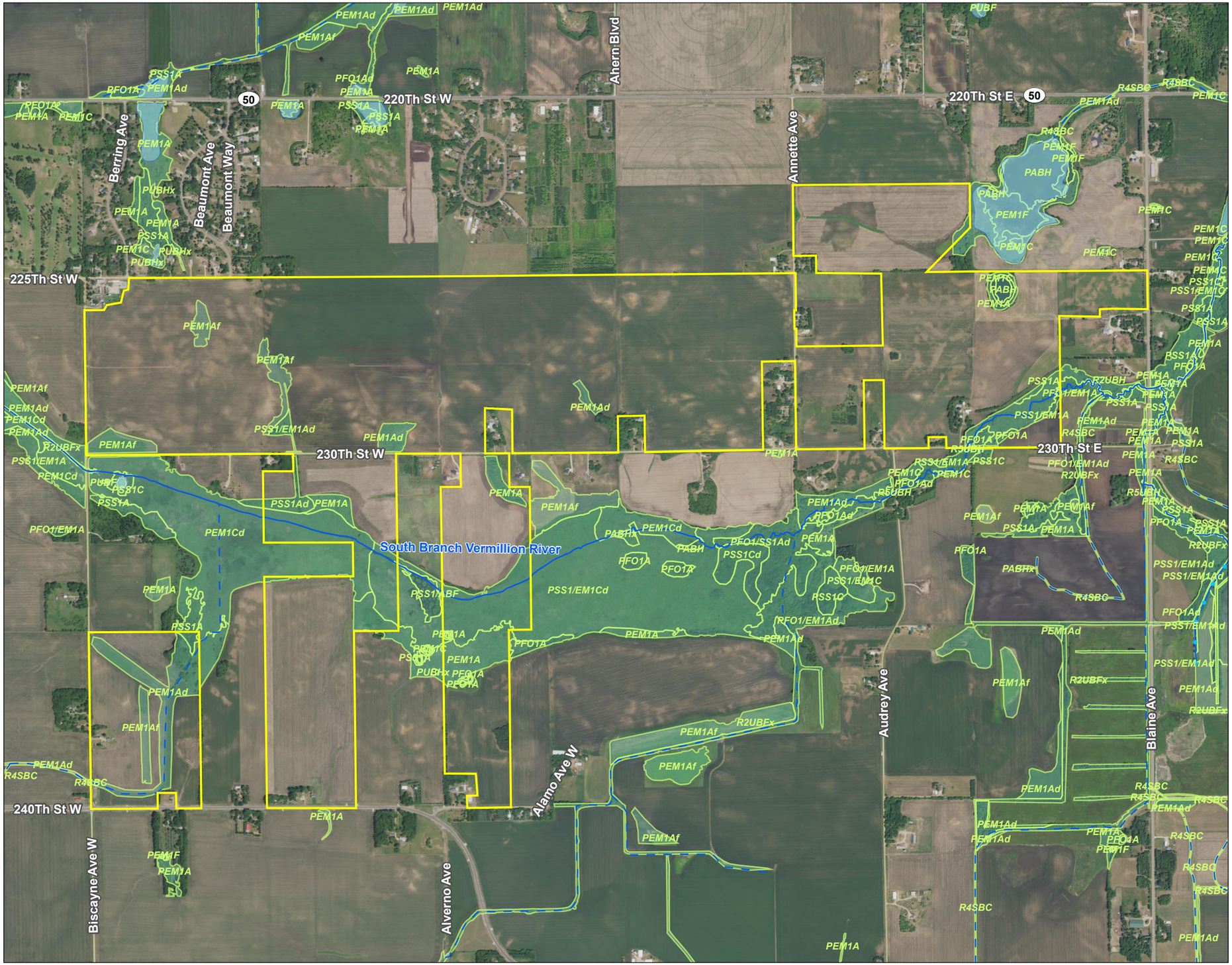


Figure No.
4

Title
NWI & NHD Map

Client/Project 193709215
Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

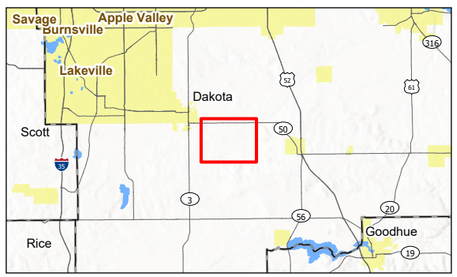
N

0 750 1,500 Feet
(At original document size of 11x17)
1:18,000

Legend
- Project Boundary
- National Wetlands Inventory Feature

National Hydrography Dataset
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream*
- Canal/Ditch*
- Waterbody

*No features within data frame



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS, USFWS
3. Background: NAIP 2021

Stantec

V:\1937\Active\193709215\03_data\gis_cad\gis\mxds\Wetland_Delineation\Wetland_Delineation.aprx Revised: 2024-12-23 By: kjmueller

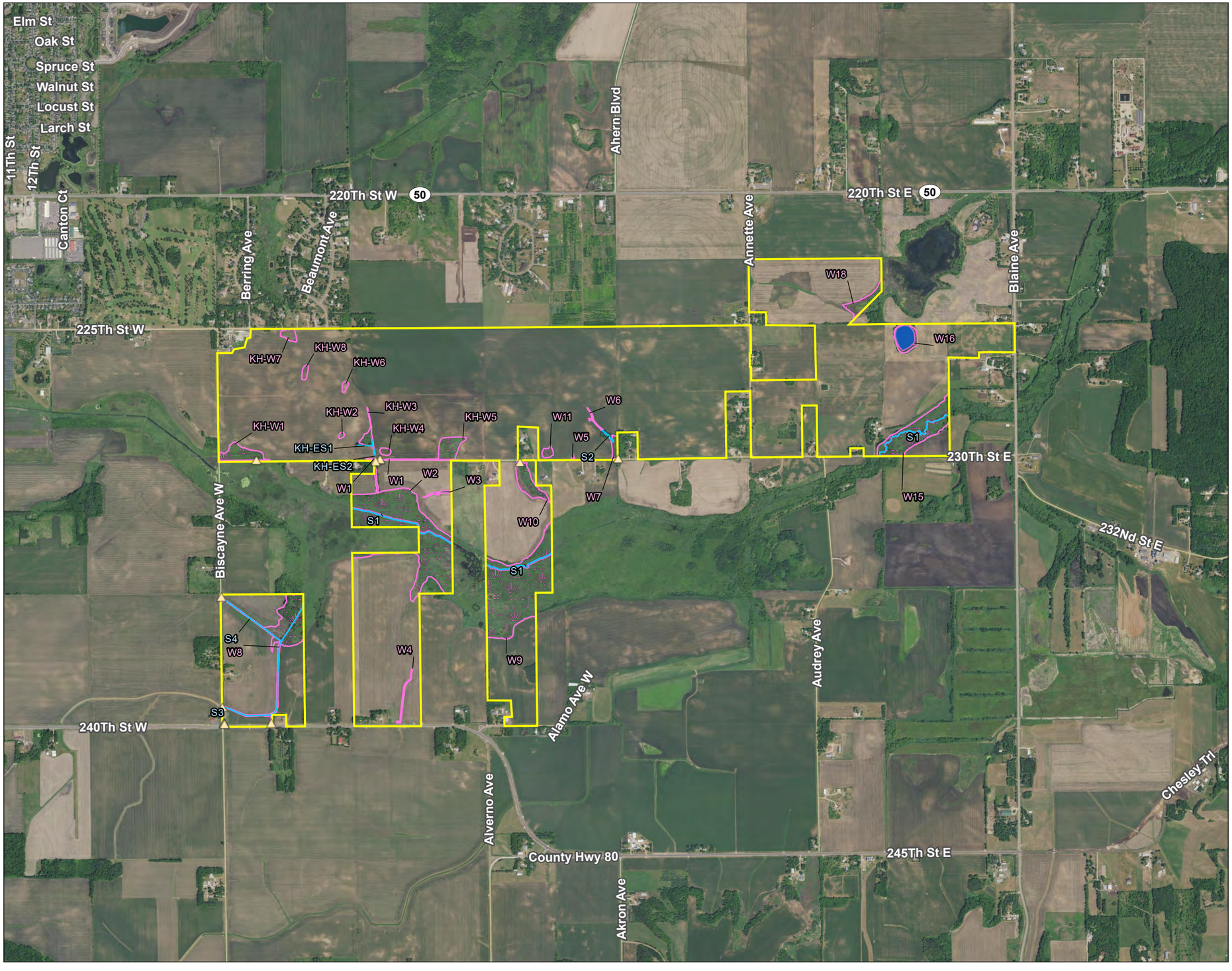


Figure No.
5

Title
Field Collected Data Overview

Client/Project 193709215
Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

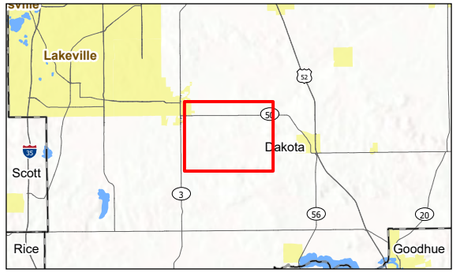
Prepared by KJM on 2024-10-23
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

0 1,000 2,000 Feet
(At original document size of 11x17)
1:24,000

Legend
- Project Boundary
- Culvert
- Field Delineated Waterway
- Field Delineated Open Water Area
- Field Delineated Wetland Area

*No features within data frame



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

V:\193709215\data\gis_cad\gis\mxds\Wetland_Delineation\Wetland_Delineation.aprx Revised: 2024-12-23 By: kimueller

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

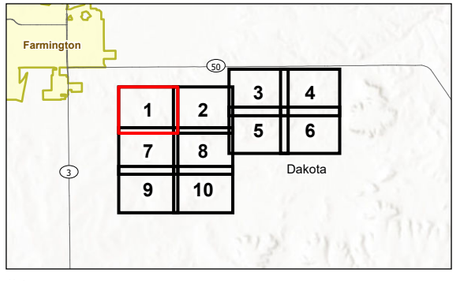
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes

1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

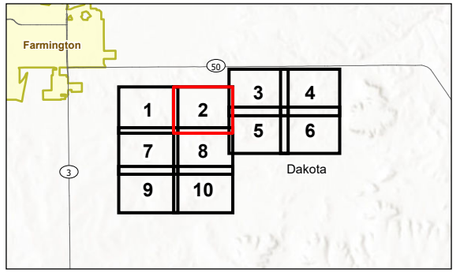
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.
6

Title
Field Collected Data

Client/Project 193709215
Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

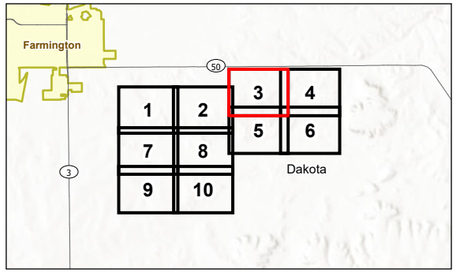
N

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

Legend
- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type
- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.
6

Title
Field Collected Data

Client/Project
193709215
Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

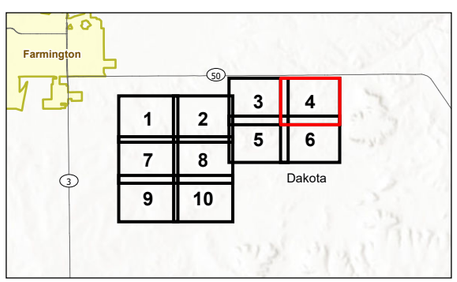
N

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

Legend
- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type
- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.
6

Title
Field Collected Data

Client/Project
Castle Rock Solar LLC
Castle Rock Solar Project

193709215

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

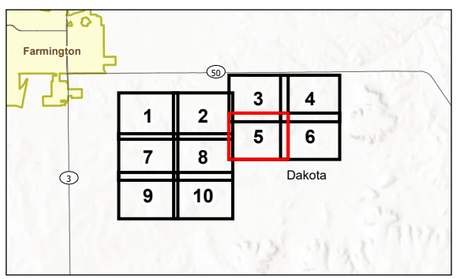
N

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

Legend
- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type
- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

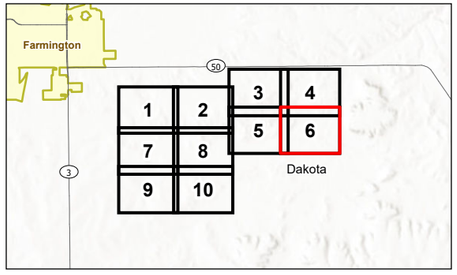
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow
- *Area not field verified by TEP*



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

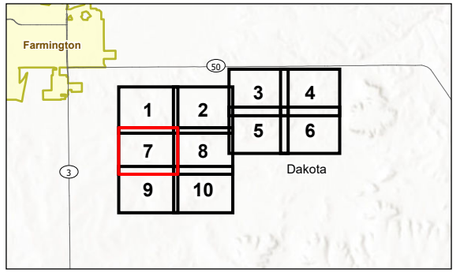
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

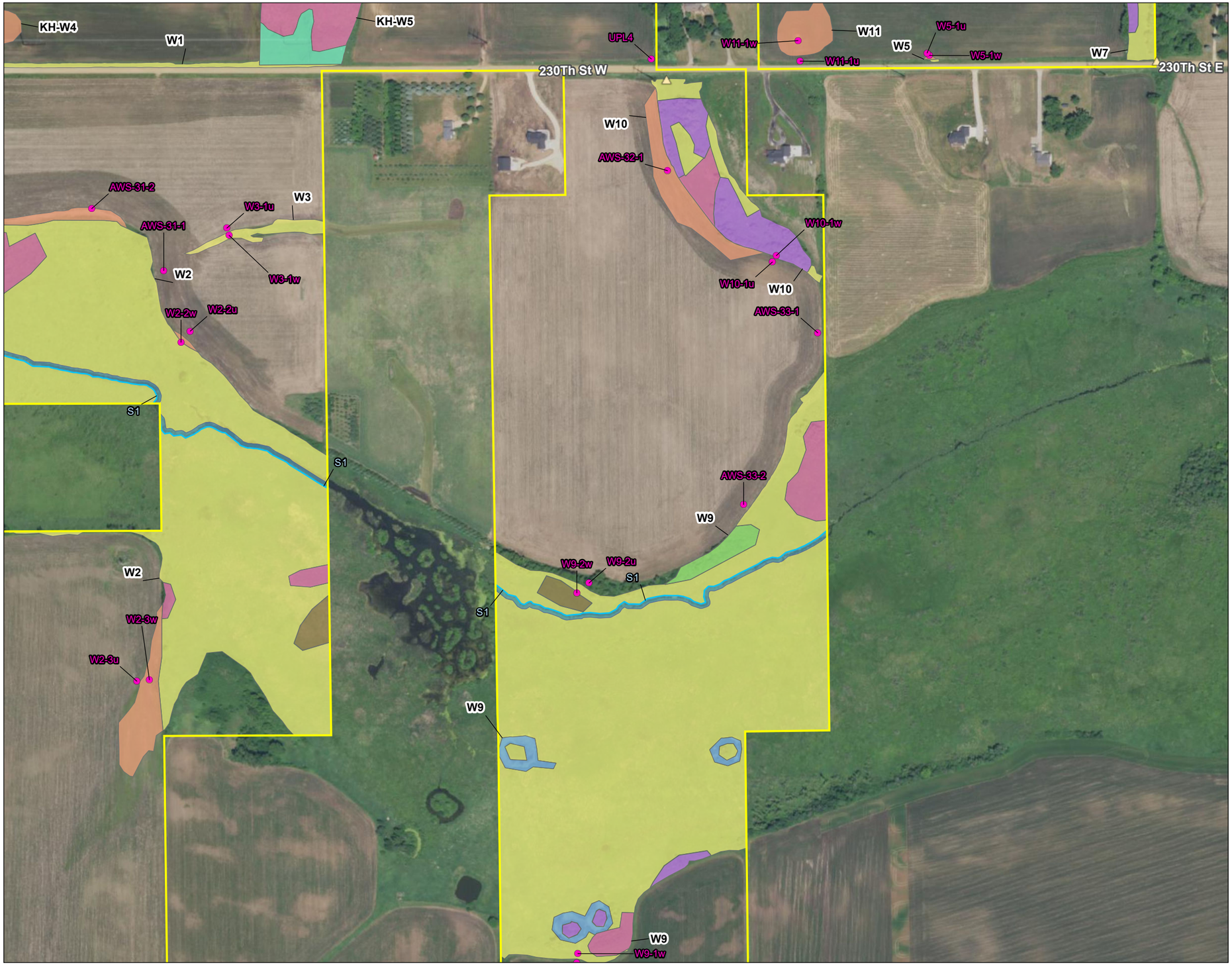


Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

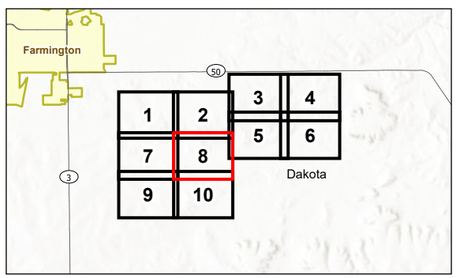
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.

6

Title

Field Collected Data

Client/Project 193709215

Castle Rock Solar LLC
Castle Rock Solar Project

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

N

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

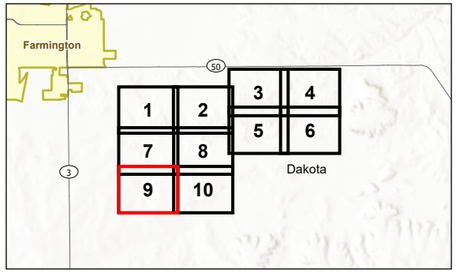
Legend

- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type

- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec

Figure No.
6

Title
Field Collected Data

Client/Project
Castle Rock Solar LLC
Castle Rock Solar Project

193709215

Project Location
T. of Castle Rock
Dakota Co., MN

Prepared by JDS on 2024-01-29
TR by SP on 2024-01-30
IR by JK on 2024-03-18

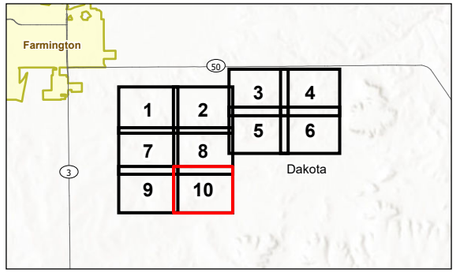
N

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

Legend
- Project Boundary
- Culvert
- Sample Point
- Field Delineated Waterway
- Field Delineated Waterway Area
- Field Delineated Open Water Area

Field Delineated Wetland Area

Wetland Community Type
- Degraded Wet Meadow
- Farmed Wetland
- Floodplain Forest
- Hardwood Swamp
- Sedge Meadow
- Shallow Marsh
- Shrub-Carr
- Wet Meadow



Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources: Stantec, Castle Rock Solar LLC, NADS, USGS
3. Background: NAIP 2021

Stantec