

APPENDIX J:  
Wetland Delineation Report

## MEMORANDUM

Date: October 25, 2022

Re: **Lake Wilson Solar Project Wetland Delineation**  
File 0012861.02

To: Craig Christensen, Murray County SWCD [CChristensen@co.murray.mn.us](mailto:CChristensen@co.murray.mn.us)  
USACE Murray County Project Manager [usace\\_requests\\_mn@usace.army.mil](mailto:usace_requests_mn@usace.army.mil)

Cc: Michelle Phillips, Senior Associate, Invenergy

From: Matthew Vollbrecht, Environmental Permitting Lead

Please find enclosed the Joint Application Form for Activities Affecting Water Resources in Minnesota with Attachment A and the Wetland Delineation Report for the Lake Wilson Solar Project located in Murray County, Minnesota. With this submittal, the Applicant is requesting agency concurrence from the WCA LGU and USACE that the extent of aquatic resources have been accurately identified in the Delineation Area.

This Report documents the wetland boundary determinations in conformance with the United States Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory, Waterways Experiment Station, 1987), the Regional Supplement to the 1987 USACE Wetland Delineation Manual: Midwest Regional Supplement (US Army Engineer Research and Development Center, 2010), and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013). As required under the Minnesota Wetland Conservation Act (WCA) to receive wetland boundary confirmation, the Joint Application Form for Activities Affecting Water Resources in Minnesota (with completed Sections One, Two, Five and Attachment A) is included with this cover memo to the Report.

Please contact me at (320) 229-2311 with any questions.

# Joint Application Form for Activities Affecting Water Resources in Minnesota

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

## Regulatory Review Structure

### Federal

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

### State

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

## Required Information

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

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

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

## Submission Instructions

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

U.S Army Corps of Engineers. Applications may be sent directly to the appropriate Corps Office. For a current listing of areas of responsibilities and contact information, visit the St. Paul District's website at:

<http://www.mvp.usace.army.mil/Missions/Regulatory.aspx> and select "Minnesota" from the contact Information box.

Alternatively, applications may be sent directly to the St. Paul District Headquarters and the Corps will forward them to the appropriate field office.

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

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

**DNR Public Waters Permitting:** In 2014 the DNR will begin using the Minnesota DNR Permitting and Reporting System (MPARS) for submission of Public Waters permit applications (<https://webapps11.dnr.state.mn.us/mpars/public/authentication/login>).

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

## PART ONE: Applicant Information

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

Applicant/Landowner Name: Lake Wilson Solar Energy LLC, Attn: Dan Litchfield  
Mailing Address: One South Wacker Drive, Suite 1800,  
Chicago, IL 60606  
Phone: 773-318-1289  
E-mail Address: dlitchfield@invenenergy.com

Authorized Contact (do not complete if same as above):

Mailing Address:  
Phone:  
E-mail Address:

Agent Name: Matthew Vollbrecht, Westwood Professional Services, Inc.  
Mailing Address: 12701 Whitewater Drive, Suite 300  
Minnetonka, MN 55343  
Phone: 320-229-2311  
E-mail Address: matt.vollbrecht@westwoodps.com

## PART TWO: Site Location Information

County: Murray City/Township: Leeds Townships  
Parcel ID and/or Address: N/A  
Legal Description (Section, Township, Range):

Township	Range	Sections
T106N	R42W	15, 16, 17, 20, 21, 22, 27

Lat/Long (decimal degrees): 43.969920, -95.880360

Attach a map showing the location of the site in relation to local streets, roads, highways. See Exhibit 1

Approximate size of site (acres) or if a linear project, length (feet): Approximately 2,681 acres

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

[http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform\\_4345\\_2012oct.pdf](http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf)

## PART THREE: General Project/Site Information

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

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

## PART FOUR: Aquatic Resource Impact<sup>1</sup> Summary

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

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

<sup>1</sup>If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".

<sup>2</sup>Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).

<sup>3</sup>This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".

<sup>4</sup>Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3<sup>rd</sup> Ed. as modified in MN Rules 8420.0405 Subp. 2.

<sup>5</sup>Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

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

## PART FIVE: Applicant Signature

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

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

Signature:  Date: 10/31/2022

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



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

## Attachment A

# Request for Delineation Review, Wetland Type Determination, or Jurisdictional Determination

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

☒ Wetland Type Confirmation

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

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

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

In order for the Corps and LGU to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013).

<http://www.mvp.usace.army.mil/Missions/Regulatory/DelineationJDGuidance.aspx>

## Minnesota Wetland Conservation Act Notice of Decision

<b>Local Government Unit:</b> Murray SWCD	<b>County:</b> Murray
<b>Applicant Name:</b> Lake Wilson Solar Energy LLC	<b>Applicant Representative:</b> Dan Litchfield
<b>Project Name:</b> Lake Wilson Solar Project	<b>LGU Project No. (if any):</b>
<b>Date Complete Application Received by LGU:</b> 11/3/22	
<b>Date of LGU Decision:</b> 8/9/23	
<b>Date this Notice was Sent:</b> 8/9/23	

**WCA Decision Type - check all that apply**

<input checked="" type="checkbox"/> Wetland Boundary/Type	<input type="checkbox"/> Sequencing	<input type="checkbox"/> Replacement Plan	<input type="checkbox"/> Bank Plan (not credit purchase)
<input type="checkbox"/> No-Loss (8420.0415)	<input type="checkbox"/> Exemption (8420.0420)		
Part: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F <input type="checkbox"/> G <input type="checkbox"/> H		Subpart: <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9	

**Replacement Plan Impacts (replacement plan decisions only)**

<b>Total WCA Wetland Impact Area:</b>
Wetland Replacement Type: <input type="checkbox"/> Project Specific Credits: <input type="checkbox"/> Bank Credits:
Bank Account Number(s):

**Technical Evaluation Panel Findings and Recommendations (attach if any)**

<input checked="" type="checkbox"/> Approve <input type="checkbox"/> Approve w/Conditions <input type="checkbox"/> Deny <input type="checkbox"/> No TEP Recommendation
--

**LGU Decision**

<input type="checkbox"/> Approved with Conditions (specify below) <sup>1</sup> List Conditions:	<input checked="" type="checkbox"/> Approved <sup>1</sup>	<input type="checkbox"/> Denied
<b>Decision-Maker for this Application:</b> <input type="checkbox"/> Staff <input type="checkbox"/> Governing Board/Council <input type="checkbox"/> Other:		
<b>Decision is valid for:</b> <input type="checkbox"/> 5 years (default) <input type="checkbox"/> Other (specify):		

<sup>1</sup> *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<sup>1</sup>.**

<input type="checkbox"/> Attachment(s) (specify): <input checked="" type="checkbox"/> Summary: <b>Application was received and reviewed 11/2022. After the TEP expressed concern in a couple areas, a site visit was completed in May of 2023. The wetland boundary for WB-120 increased and WB-131 was added after the site visit. The revised wetland boundaries are reflected in the attached report hyperlink.</b>
---

<sup>1</sup> Findings must consider any TEP recommendations.

**Attached Project Documents**



☒ Site Location Map   ☒ Project Plan(s)/Descriptions/Reports (specify):  [https://westwoodps-my.sharepoint.com/:b:/p/matthew\\_vollbrecht/ERKzlh7cuwxAsTMelDgRw6gBrpo5npOROs\\_7kIU9mg-1w?e=EKXvpN](https://westwoodps-my.sharepoint.com/:b:/p/matthew_vollbrecht/ERKzlh7cuwxAsTMelDgRw6gBrpo5npOROs_7kIU9mg-1w?e=EKXvpN)

### 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](mailto:travis.germundson@state.mn.us)

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

☐ Yes<sup>1</sup>      ☒ No

<sup>1</sup>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)

--

### Notice Distribution (include name)

*Required on all notices:*

<input checked="" type="checkbox"/> SWCD TEP Member: Devin Ryan	<input checked="" type="checkbox"/> BWSR TEP Member: John Hansel
<input checked="" type="checkbox"/> LGU TEP Member (if different than LGU contact): Sarah Soderholm	
<input checked="" type="checkbox"/> DNR Representative: Tom Kresko	
<input type="checkbox"/> Watershed District or Watershed Mgmt. Org.:	
<input checked="" type="checkbox"/> Applicant: Dan Litchfield	<input checked="" type="checkbox"/> Agent/Consultant: Matthew Vollbrecht

*Optional or As Applicable:*

<input type="checkbox"/> Corps of Engineers:	
<input type="checkbox"/> BWSR Wetland Mitigation Coordinator (required for bank plan applications only):	
<input type="checkbox"/> Members of the Public (notice only):	<input type="checkbox"/> Other:

<b>Signature:</b> 	<b>Date:</b> 8-9-23
--	------------------------

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.



WETLAND AND WATERWAY DELINEATION REPORT

# Lake Wilson Solar Project

Murray County, Minnesota

OCTOBER 25, 2022

PREPARED FOR:

Lake Wilson Solar Energy LLC  
One South Wacker Drive, Suite 1800  
Chicago, IL 60606

PREPARED BY:

**Westwood**

Wetland and Waterway Delineation Report

# Lake Wilson Solar Project

Prepared for:

Lake Wilson Solar Energy LLC  
One South Wacker Drive, Suite 1800  
Chicago, IL 60606

Prepared by:

Westwood Professional Services, Inc.  
12701 Whitewater Drive, Suite 300  
Minnetonka, MN 55343  
(952) 937-5150

Project Number: 0012861.02

Date: October 25, 2022



## Table of Contents

1.0	PURPOSE.....	1
2.0	SITE LOCATION AND DESCRIPTION .....	1
3.0	WETLAND DELINEATION METHODOLOGY .....	1
	3.1 Desktop Mapping.....	1
	3.2 Offsite Hydrology Review.....	2
	3.3 Field Work.....	2
4.0	RESULTS .....	3
	4.1 Desktop Mapping.....	3
	4.2 Antecedent Precipitation.....	5
	4.3 Offsite Hydrology Review.....	6
	4.4 Field Investigation .....	6
5.0	CONCLUSIONS .....	11
6.0	CERTIFICATION .....	12
7.0	LITERATURE CITED.....	13

## Tables

Table 2.0 – Project Area Section, Township, and Range.....	1
Table 4.1 – Soils Mapped within Project Area.....	3
Table 4.2 – Precipitation Documentation Worksheet .....	5
Table 4.3 – Precipitation Documentation Worksheet .....	5
Table 4.4 – Precipitation Documentation Worksheet .....	6
Table 4.5 – Precipitation Documentation Worksheet .....	6
Table 4.4.1 – Wetland Summary Table.....	7
Table 4.4.3 – Non-Wetland Sample Point Summary Table .....	9
Table 4.4.4 – Watercourse Summary Table .....	11

## Exhibits

Exhibit 1: Project Area & USGS Topography  
 Exhibit Set 2: Water Resources  
 Exhibit Set 3: Soils  
 Exhibit Set 4: Suspect Areas & Lidar Contours  
 Exhibit Set 5: Delineated Water Features

## Appendices

Appendix A: Wetland Data Forms and Non-Wetland Data forms  
 Appendix B: Wetland, Watercourse and Non-Wetland Photographs  
 Appendix C: Watercourse Data Forms  
 Appendix D: Offsite Hydrology Review

## 1.0 PURPOSE

This report and the attached exhibits and appendices constitute the wetland and waterway delineation report for the Lake Wilson Solar Project (Project), which covers approximately 2,621 acres (4.1 square miles) (Project Area) of agricultural land in Murray County, Minnesota (Exhibit 1). Murray Soil and Water Conservation District (SWCD) is the Local Governmental Unit (LGU) that administers the Minnesota Wetland Conservation Act (WCA) in the Project Area.

This Report documents the wetland boundary determinations in conformance with the United States Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory, Waterways Experiment Station, 1987), the Regional Supplement to the 1987 USACE Wetland Delineation Manual: Midwest Regional Supplement (US Army Engineer Research and Development Center, 2010), and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013). As required under the Minnesota Wetland Conservation Act (WCA) to receive wetland boundary confirmation, the Joint Application Form for Activities Affecting Water Resources in Minnesota (with completed Sections One, Two, Five and Attachment A) is included with the cover memo to this report. This report also meets the requirements of the Public Water Works Permit Program as administered by the Minnesota Department of Natural Resources (MN DNR) to identify state jurisdictional Public Water Waterbodies and Watercourses.

## 2.0 SITE LOCATION AND DESCRIPTION

The Project Area is located less than one-half mile south of the town of Lake Wilson in Leeds Township, Murray County, Minnesota (Exhibit 1). See Table 2.0 for a detailed description of the Project Area location.

Table 2.0 – Project Area Section, Township, and Range

Township	Range	Sections
T106N	R42W	15, 16, 17, 20, 21, 22, 27

The Project Area is predominantly composed of agricultural land. The landscape is generally flat with some rolling hills. Elevations range from 1,620 feet above mean sea level (amsl), which coincides with surface water drainage ditch systems bisecting the Project Area, to 1,784 feet amsl on the east edge of the Project Area.

## 3.0 WETLAND DELINEATION METHODOLOGY

### 3.1 Desktop Mapping

Prior to reviewing the Project Area in the field, Westwood reviewed the following sources to identify potential wetlands and waterbodies within the Project Area: National Wetlands Inventory (NWI) mapping, the National Hydrography Dataset (NHD) and the Minnesota Department of Natural Resources (MNDNR) Public Waters Inventory (PWI) (Exhibit 2).

Westwood also reviewed the Natural Resource Conservation Service (NRCS) Soil Survey Geographic database (SSURGO2) for Murray County (Exhibit 3).

### 3.2 Offsite Hydrology Review

Westwood reviewed historical aerial photography to identify potential wetlands in cropped portions of the property using the July 1, 2016 Minnesota Board of Water and Soil Resources (BWSR)/USACE-accepted protocol for conducting off-site wetland determinations, *Guidance for Offsite Hydrology/Wetland Determinations* (Exhibit 4). Up to 14 different aerial photographs were reviewed for years between 1991 and 2021. Suspect Areas were evaluated in the offsite review by reviewing wetland signatures against antecedent precipitation in multiple years of aerial photography. In addition, "Desktop Wetlands" were desktop-delineated in areas outside of active agricultural areas (Exhibit 4) and used to guide field delineation efforts. Desktop Wetlands were primarily identified from mapping resources (NWI, NHD, NRCS Soil Survey) and to a lesser degree, from aerial signatures.

### 3.3 Field Work

From October 17 - 20, 2017; July 12 - 15, 2021; October 11, 2021; and July 25-27, 2022 a certified wetland delineator from Westwood conducted a field review using a level two routine determination method set forth in the USACE Wetlands Delineation Manual and the supplemental methods set forth in the Regional Supplement to the USACE Wetland Delineation Manual: Midwest Region. Soils, vegetation, and hydrology data were recorded on data forms and are included in Appendix A and Appendix C of this report. Photographs from the delineation are included in Appendix B and Appendix C.

Wetlands were classified according to Wetlands of the United States (U.S. Fish and Wildlife Service Circular 39; Shaw and Fredine; 1971) and Wetlands and Deepwater Habitats of the United States (FWS/OBS Publication 79/31; Cowardin et. al. 1979). Westwood delineated wetlands and waterways for the Project using the current U.S. Environmental Protection Agency (USEPA) and the USACE definition of Waters of the U.S. (WOTUS) in accordance with the U.S. District Court for the District of Arizona's August 30, 2021, order vacating and remanding the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. In light of this order, the USEPA and USACE have halted implementation of the Navigable Waters Protection Rule (NWPR) nationwide and are interpreting WOTUS consistent with the pre-2015 regulatory wetland/waterway definition until further notice. The pre-2015 definition applies to this report. Common names and scientific names for vegetation identified in this report and on the attached data forms generally correspond with the nomenclature used in the 2018 National Wetland Plant List (USACE 2020; USACE 2021). Field data was located using a Trimble GPS unit capable of sub-meter accuracy.

Watercourses within the Project Area were delineated as non-wetland Waters of the U.S. (WOTUS), as they did not exhibit all parameters required for wetlands (i.e., predominance of hydrophytes, hydric soils, and jurisdictional hydrology). Accordingly, their boundaries were delineated in the field by documenting their Ordinary High-Water Marks (OHWMs) as

determined according to the USACE Regulatory Guidance Letter No. 05-05 (U.S. Army Corps of Engineers 2005). USACE regulations set forth at 33 CFR 328.3(e) defines the OHWM for purposes of Clean Water Act (CWA) lateral jurisdiction. The term OHWM means that line on the shore established by the fluctuations of water and indicated by physical characteristics (including the following):

- Natural line impressed on the bank
- Changes in the character of soil
- Presence of litter and debris
- Vegetation matted down, bent, or absent
- Leaf litter disturbed or washed away
- Deposition
- Bed and banks
- Change in plant community
- Shelving
- Destruction of terrestrial vegetation
- Wracking
- Sediment sorting
- Scour
- Multiple flow events
- Water staining

## 4.0 RESULTS

### 4.1 Desktop Mapping

Exhibit 2 depicts the water resources mapped within the Project Area. A total of 39 NWI-mapped wetlands were identified within the Project Area, including 25 freshwater emergent wetlands, 12 riverine wetlands, one freshwater pond, and one freshwater forested/shrub wetland. Thirteen NHD flowlines, including one named watercourse (Judicial Ditch Number 14), and one NHD water basin were also mapped within the Project Area. Two PWI watercourses segments, both portions of Judicial Ditch Number 14, extend into the Project Area.

The NRCS SSURGO2 for Murray County indicates that the soils listed in Table 4.1 are mapped within the Project Area (Exhibit 3). Based on the NRCS Web Soil Survey Hydric Rating, there are three all-hydric soil units mapped within the Project Area, including the Quam silty clay loam, depressional, 0 to 1 percent slopes (J17A), Parnell silty clay loam, depressional, 0 to 1 percent slopes (J1A), and Bigstone silty clay loam, depressional, 0 to 1 percent slopes (J32A). All other soil units mapped within the Project Area are rated as predominantly hydric, predominantly non-hydric, or non-hydric.

*Table 4.1 – Soils Mapped within Project Area*

Map Symbol	Map Unit Name <sup>2</sup>	Rating <sup>2</sup>	Percent Hydric Soil <sup>3</sup>
M-W	Water, miscellaneous	Non-hydric	0
J96C2	Barnes-Buse complex, 6 to 12 percent slopes, moderately eroded	Non-hydric	0
J95F	Buse, stony-Wilno complex, 25 to 40 percent slopes	Non-hydric	0
J8B	Egeland sandy loam, 2 to 6 percent slopes	Non-hydric	0
J7B	Sverdrup sandy loam, 2 to 6 percent slopes	Predominantly non-hydric	2

Map Symbol	Map Unit Name <sup>2</sup>	Rating <sup>2</sup>	Percent Hydric Soil <sup>3</sup>
J77A	Lamoure silty clay loam, 0 to 2 percent slopes, frequently flooded	Predominantly hydric	95
J75B	Renshaw-Fordville loams, coteau, 2 to 6 percent slopes	Non-hydric	0
J75A	Fordville loam, coteau, 0 to 2 percent slopes	Non-hydric	0
J57A	Balaton loam, 1 to 3 percent slopes	Predominantly non-hydric	3
J42C	Sandberg-Arvilla complex, 6 to 12 percent slopes	Non-hydric	0
J32A	Bigstone silty clay loam, depressional, 0 to 1 percent slopes	Hydric	100
J31B	Arvilla-Sandberg complex, 2 to 6 percent slopes	Non-hydric	0
J26B	Darnen loam, 2 to 6 percent slopes	Predominantly non-hydric	5
J23A	Lamoure silty clay loam, 0 to 2 percent slopes, occasionally flooded	Predominantly hydric	95
J235C2	Buse-Barnes-Arvilla complex, 6 to 12 percent slopes, moderately eroded	Non-hydric	0
J232B	Barnes-Buse-Arvilla complex, 2 to 6 percent slopes	Non-hydric	0
J227D2	Buse, moderately eroded-Sandberg complex, 12 to 18 percent slopes	Non-hydric	0
J1A	Parnell silty clay loam, depressional, 0 to 1 percent slopes	Hydric	100
J199A	Fulda silty clay, 0 to 2 percent slopes	Predominantly hydric	85
J195B	Poinsett-Waubay silty clay loams, 1 to 6 percent slopes	Predominantly non-hydric	2
J17A	Quam silty clay loam, depressional, 0 to 1 percent slopes	Hydric	100
J12A	Marysland loam, 0 to 2 percent slopes	Predominantly hydric	98
J11A	Vallers clay loam, 0 to 2 percent slopes	Predominantly hydric	95
J107A	Lakepark-Roliss-Parnell, depressional, complex, 0 to 3 percent slopes	Predominantly hydric	85
J106B	Barnes-Buse-Svea complex, 1 to 6 percent slopes	Predominantly non-hydric	1
J105A	Arvilla sandy loam, Till Prairie, 0 to 2 percent slopes	Predominantly non-hydric	2
J104A	Svea loam, 1 to 3 percent slopes	Predominantly non-hydric	10
J101B	Hokans-Svea complex, 1 to 4 percent slopes	Predominantly non-hydric	5
J100D2	Buse, eroded-Wilno complex, 12 to 18 percent slopes	Non-hydric	0
<sup>1</sup> – Soils determined using GIS geospatial query clipping the NRCS Soil Survey Geographic (SSURGO2) spatial data by Project boundaries. <sup>2</sup> – As indicated in the SSURGO2 database. <sup>3</sup> – Where percentages are small (e.g., < 15 %) the hydric soil is likely an inclusion that is not recognized in the map unit name. The absence of a value does not necessarily indicate the absence of hydric soils, but that the relative percentages of included minor soils have not been determined.			



## 4.2 Antecedent Precipitation

Antecedent precipitation data was evaluated for the 3 months prior to each of the site visits using the *Wetland Delineation Precipitation Data Retrieval from a Gridded Database* tool. Results from these data indicate antecedent precipitation was normal prior to the field reviews in 2017 and 2022, drier than normal prior to the July 2021 field review, and wetter than normal in the October 2021 field review. Tables 4.2, 4.3, 4.4, and 4.5 constitute the "NRCS Method/3-Month Prior Method" to determine antecedent precipitation using the Precipitation Documentation Worksheet from the Minnesota Climatology Working Group.

*Table 4.2 – Precipitation Documentation Worksheet  
(Score using 1981-2010 normal period) – October 2017 Field Review*

values are in inches An 'R' following a monthly total indicates a provisional value derived from <u>radar-based estimates</u> .	first prior month: September 2017	second prior month: August 2017	third prior month: July 2017
estimated precipitation total for this location:	2.47	7.11	2.38
there is a 30% chance this location will have less than:	1.59	2.18	2.15
there is a 30% chance this location will have more than:	4.00	4.38	4.31
type of month: dry normal wet	normal	wet	normal
monthly score:	$3 * 2 = 6$	$2 * 3 = 6$	$1 * 2 = 2$
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	14 (normal)		

*Table 4.3 – Precipitation Documentation Worksheet  
(Score using 1981-2010 normal period) – July 2021 Field Review*

values are in inches An 'R' following a monthly total indicates a provisional value derived from <u>radar-based estimates</u> .	first prior month: June 2021	second prior month: May 2021	third prior month: April 2021
estimated precipitation total for this location:	1.50	1.85	2.02 R
there is a 30% chance this location will have less than:	3.11	2.25	2.13
there is a 30% chance this location will have more than:	5.14	4.06	3.68
type of month: dry normal wet	dry	dry	dry
monthly score:	$3 * 1 = 3$	$2 * 1 = 2$	$1 * 1 = 1$
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	6 (dry)		

**Table 4.4 – Precipitation Documentation Worksheet**  
 (Score using 1981-2010 normal period) – October 2021 Field Review

values are in inches An 'R' following a monthly total indicates a provisional value derived from <u>radar-based estimates</u> .	first prior month: September 2021	second prior month: August 2021	third prior month: July 2021
estimated precipitation total for this location:	4.09	6.83	3.26
there is a 30% chance this location will have less than:	1.57	2.18	2.25
there is a 30% chance this location will have more than:	3.92	4.33	4.23
type of month: dry normal wet	wet	wet	normal
monthly score:	3 * 3 = 9	2 * 3 = 6	1 * 1 = 1
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	16 (wet)		

**Table 4.5 – Precipitation Documentation Worksheet**  
 (Score using 1981-2010 normal period) – July 2022 Field Review

values are in inches An 'R' following a monthly total indicates a provisional value derived from <u>radar-based estimates</u> .	first prior month: June 2022	second prior month: May 2022	third prior month: April 2022
estimated precipitation total for this location:	0.99	3.69	4.48
there is a 30% chance this location will have less than:	2.15	3.43	2.65
there is a 30% chance this location will have more than:	4.34	5.37	3.98
type of month: dry normal wet	dry	normal	wet
monthly score:	3 * 1 = 3	2 * 2 = 4	1 * 3 = 3
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	10 (normal)		

### 4.3 Offsite Hydrology Review

A total of 58 suspect wetland areas were identified using the methods in section 3.2 above within cropped portions of the Project Area and reviewed against various years of aerial imagery prior to the field determination (Exhibit set 4; Appendix D). These areas were sampled during either the 2017, 2021, or 2022 site visits and documented in the enclosed data sheets (Appendix A).

### 4.4 Field Investigation

From October 17 - 20, 2017; July 12 - 15, 2021; October 11, 2021; and July 25-27, 2022, a certified wetland delineator from Westwood delineated 36 wetland areas (Exhibit 5). Paired data forms consisting of an upland sample point and a wetland sample point were collected for each wetland. Delineated wetlands are summarized in the Wetland Summary Table (Table 4.4.1). Detailed data forms are provided in Appendix A and photographs in Appendix B.

The boundaries of all wetlands followed distinct changes in topography and/or plant communities between the upland and wetland sample locations.

*Table 4.4.1 – Wetland Summary Table*

Wetland ID	Ac. (Onsite)	Sq. Ft. (Onsite)	NWI	NHD Flowline	Plant Community	Mapbook Page
October 2017 Delineation						
WB-01-E	1.68	73,365	No	No	PEM1A/PSS1A Seasonally Flooded Basin/Scrub Shrub Swamp Type 1/6	A1, A2
WB-02-E	2.49	108,363	Yes	Yes	PEM1Af/PEM1B Seasonally Flooded Basin/Fresh(wet)Meadow Type 1/2	A1, B1
WB-03-E	0.64	28,002	Yes	Yes	PEM1Af Seasonally Flooded Basin Type 1	B1
WB-04-E	0.35	15,396	No	No	PEM1B/C Wet Meadow/Shallow Marsh Type 2/3	A1
WB-05-E	0.29	12,427	Yes	Yes	PEM1B Wet Meadow Type 2	A1
WB-06-E	4.19	182,338	Yes	No	PEM1Af Seasonally Flooded Basin Type 1	B1
WB-09-E	0.47	20,677	No	No	PEM1Af Seasonally Flooded Basin Type 1	C1
WB-10-E	0.55	23,865	Yes	No	PEM1Af Seasonally Flooded Basin Type 1	A1, B1
WB-11-E	1.45	63,233	Yes	No	PEM1Af Seasonally Flooded Basin Type 1	A1
July 2021 Delineation						
WB-101	0.40	17,446	No	No	PEM1A Seasonally Flooded Basin Type 1	B2
WB-104	0.04	1,863	No	No	PEM1B Wet Meadow Type 2	B2
WB-105	0.06	2,400	No	No	PEM1B Wet Meadow Type 2	B2
WB-106	0.25	10,786	No	No	PEM1Af Seasonally Flooded Basin Type 1	B2
WB-107	1.42	61,841	Yes	No	PEM1B/C Wet Meadow/Shallow Marsh Type 2/3	A2

Wetland ID	Ac. (Onsite)	Sq. Ft. (Onsite)	NWI	NHD Flowline	Plant Community	Mapbook Page
WB-108	0.39	17,092	Yes	No	PEM1A/PUBGx Seasonally Flooded Basin/Shall. O. Water Type 1/5	B2
WB-109	0.78	34,096	No	No	PEM1Af Seasonally Flooded Basin Type 1	C2
WB-110	0.81	35,477	No	No	PEM1A/PEM1B/PSS1C Seasonally Flooded Basin/Wet Meadow/SS Swamp Type 1/3/6	B1, B2
WB-111	0.97	42,246	Yes	Yes	PEM1A/PEM1B/PEM1C S. Flooded Basin/Wet Meadow/Shallow Marsh Type 1/2/3	B2
WB-112	0.04	1,774	No	No	PEM1Af Seasonally Flooded Basin Type 1	B2
WB-117	0.79	34,333	Yes	Yes	PEM1B Wet Meadow Type 2	B1
WB-118	0.31	13,460	No	No	PEM1A Seasonally Flooded Basin Type 1	B1
WB-119	2.46	107,316	Yes	No	PEM1A Seasonally Flooded Basin Type 1	B1, C1
October 2021 Delineation						
WB-120	10.44	454,909	Yes	Yes	PEM1B Wet Meadow Type 2	C1
WB-121	0.28	12,280	Yes	Yes	PEM1B Wet Meadow Type 2	C2, C2
WB-122	0.15	6,699	Yes	No	PEM1A Seasonally Flooded Basin Type 1	C2
WB-123	0.23	9,925	Yes	No	PUBGx Shallow Open Water Type 5	C2
WB-124	0.82	35,875	Yes	No	PEM1A Seasonally Flooded Basin Type 1	B1, B2
WB-125	0.95	41,178	Yes	No	PEM1A Seasonally Flooded Basin Type 1	B1, B2
WB-126	2.45	106,836	Yes	No	PEM1B/PEM1C Wet Meadow/Shallow Marsh Type 2/3	B1, B2
WB-127	0.16	6,934	Yes	No	PEM1A Seasonally Flooded Basin Type 1	B1

Wetland ID	Ac. (Onsite)	Sq. Ft. (Onsite)	NWI	NHD Flowline	Plant Community	Mapbook Page
WB-128	0.18	7,830	No	No	PEM1A Seasonally Flooded Basin Type 1	A2
WB-129	0.57	24,827	Yes	No	PEM1A Seasonally Flooded Basin Type 1	A2
WB-130	0.47	20,426	Yes	No	PEM1A Seasonally Flooded Basin Type 1	A2
July 2022 Delineation						
WB-A-01	0.71	30,753	Yes	No	PEM1A Seasonally Flooded Basin Type 1	B2
WB-A-02	0.01	550	No	No	PEM1A Seasonally Flooded Basin Type 1	C2
WB-A-03	<0.01	291	No	No	PEM1C Shallow Marsh Type 3	C2

Along with the 36 delineated wetlands, an additional 52 areas were reviewed in the field and determined to be non-wetland. These were suspect areas identified in the Off-Site Hydrology Review that warranted a field visit for confirmation. This was due to signatures in at least 30 percent of years with normal antecedent precipitation or presence of mapped NWI wetlands. These areas were sampled during the 2017, 2021, or 2022 site visits and documented on upland data sheets (Appendix A). Photographs of these areas are included in Appendix B. See Table 4.4.2 for a summary of all non-wetland sample points taken during the field investigation.

*Table 4.4.3 – Non-Wetland Sample Point Summary Table*

Non-Wetland ID	NWI	NHD Flowline	PWI Water Basin	Mapbook Page
October 2017 Delineation				
NW-03-E	No	No	No	A1
NW-09-E	Yes	Yes	No	B1
NW-10-E	No	No	No	B1
NW-12-E	Yes	No	No	B1
NW-13-E	Yes	No	No	B1
NW-15-E	Yes	Yes	No	A1
NW-16-E	Yes	No	No	B1
July 2021 Delineation				
NW-101	No	No	No	B2
NW-102	No	No	No	B2
NW-103	No	No	No	B2
NW-104	No	No	No	B2
NW-105	Yes	Yes	No	C1, C2

Non-Wetland ID	NWI	NHD Flowline	PWI Water Basin	Mapbook Page
NW-106	Yes	Yes	No	C1, C2
NW-107	No	No	No	C2
NW-108	Yes	Yes	No	C1, C2
NW-109	Yes	Yes	No	B2
NW-110	No	No	No	B2
NW-111	No	No	No	B1, B2
NW-112	No	No	No	B2
NW-113	No	No	No	B2
NW-114	Yes	No	No	B1
NW-115	Yes	Yes	No	B1
NW-116	No	No	No	B1
NW-117	Yes	No	No	C2
NW-118	No	No	No	B1
NW-119	No	No	No	C2
NW-120	No	No	No	B2, C2
NW-121	No	No	No	C2
October 2021 Delineation				
NW-122	Yes	Yes	No	B1
NW-123	No	No	No	A2
NW-124	No	No	No	A2, B2
NW-126	No	No	No	A2
NW-127	No	No	No	A2
July 2022 Delineation				
NWB-A-01	Yes	No	No	B2
NWB-A-02	No	No	No	B2
NWB-A-03	No	No	No	C2
NWB-A-04	No	No	No	B2, C2
NWB-A-05	No	No	No	C2
NWB-A-06	No	No	No	B2
NWB-A-07	Yes	No	No	C1
NWB-A-08	No	No	No	C1
NWB-A-09	No	No	No	C1
NWB-A-10	No	No	No	B2
NWB-A-11	No	No	No	B2
NWB-A-12	No	No	No	B2
NWB-A-13	No	No	No	B2, C2
NWB-A-14	No	No	No	C2
NWB-A-15	No	No	No	B2
NWB-A-16	No	No	No	C1
NWB-A-17	No	No	No	B1, C1
NWB-A-18	No	No	No	C1

Non-Wetland ID	NWI	NHD Flowline	PWI Water Basin	Mapbook Page
NWB-A-19	No	No	No	C1

In addition to the 36 wetlands delineated, Westwood also delineated six watercourses within the Project Area (Exhibit 5). All of these features exhibited OHWM characteristics and corresponded with NWI and/or NHD flowline mapping. A summary of delineated watercourses is provided in Table 4.4.4. Datasheets and photographs of these areas are included in Appendix D.

*Table 4.4.4 – Watercourse Summary Table*

Watercourse ID	Stream Type	Acres	Linear Ft.	Mapbook Page
October 2017 Delineation				
WC-01-E	Ephemeral	0.02	234	B1, C1
WC-01-W	Perennial	2.7	2,777	B1
July 2021 Delineation				
WC-101	Ephemeral	<0.01	11	B2
WC-102	Ephemeral	0.01	89	C1
WC-103	Ephemeral	0.03	489	B2
July 2022 Delineation				
WC-A-01	Ephemeral	0.02	329	B2

## 5.0 CONCLUSIONS

Westwood reviewed the Project Area associated with the Lake Wilson Solar Project in Murray County, Minnesota to determine the boundaries for the presence of wetlands and watercourses during field visits in 2017, 2021, and 2022. The field investigation identified 36 wetlands and six (6) watercourses within the Project Area. Lake Wilson Solar Energy LLC respectfully requests that the USACE and the Murray County SWCD, as the WCA LGU, review and process this report and enclosed Joint Application Form and provide written concurrence that the extent of aquatic resources within the Project Area have been accurately identified. Please consider this report a formal Wetland Boundary request pursuant to Minn. Rules 8420.0305, 8420.0310 and 8420.0405 and the requirements of the CWA.

## 6.0 CERTIFICATION

I certify that, to the best of my knowledge and belief, the wetland delineation completed for this Project Area is consistent with current wetland delineation practices and guidelines. I have the specific qualifications, education, training, and experience to complete wetland delineations and determinations in accordance with federal and state requirements.

Sincerely,

WESTWOOD PROFESSIONAL SERVICES, INC.



David Kuhlmann  
Senior Wildlife Biologist  
MN Certified Wetland Delineator No. 1315



Matthew Vollbrecht  
Environmental Permitting Lead  
Professional Wetland Scientist (PWS) No. 2115  
MN Certified Wetland Delineator No. 1101



Audrey McTaggart  
Wetland Scientist  
MN Certified Wetland Delineator No. 1383



## 7.0 LITERATURE CITED

- Cowardin, L.M. , V.M. Carter , F.C. Golet , and E.T. LaRoe . 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Biological Services Program, Washington, DC, USA. FWS/OBS-79/31. 103pp.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. *Phytoneuron* 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.
- Minnesota Department of Natural Resources LakeFinder website.  
<https://www.dnr.state.mn.us/lakefind/index.html>. Accessed August 2022.
- Shaw, S.P. and C.G. Fredine. 1971. Wetlands of the United States. U.S. Fish and Wildlife Circular 39. U.S. Department of the Interior, Washington, D.C. 67 pp.
- U. S. Army Corps of Engineers. 2022. Antecedent Precipitation Tool V1.0. Joseph L. Gutenson and Jason C. Deters. <https://erdc-library.erdc.dren.mil/jspui/bitstream/11681/43160/3/ERDC-TN%20WRAP-22-1.pdf>
- U.S. Army Corps of Engineers. 2020. 2018 National List of Vascular Plant Species that Occur in Wetlands.  
[http://www.usace.army.mil/CECW/Documents/cecwo/reg/plants/196\\_intro.pdf](http://www.usace.army.mil/CECW/Documents/cecwo/reg/plants/196_intro.pdf)
- U.S. Army Corps of Engineers. 2021. 2020 Update of National Wetland Plant List (NWPL)  
[https://cwbi-app.sec.usace.army.mil/nwpl\\_static/data/DOC/lists\\_2020/National/National\\_2020v1.pdf](https://cwbi-app.sec.usace.army.mil/nwpl_static/data/DOC/lists_2020/National/National_2020v1.pdf)
- U. S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, 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.
- U.S. Army Corps of Engineers, St. Paul District and Minnesota Board of Water and Soil Resources. 2016. *Guidance for Offsite Hydrology/Wetland Determinations*.
- United States Department of Agriculture, Natural Resources Conservation Service, 2010. Field Indicators of Hydric Soils in the United States, Version 7.0. C.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA NRCS, in cooperation with the National Technical Committee for Hydric Soils.