Aquatic Resources Delineation Report

Project Bluestem

Township of Tonganoxie

Leavenworth County, Kansas

Prepared for:

Sarah Allen
Western Meadowlark ProjectCo, LLC

Prepared by:

Kimley-Horn and Associates, Inc.
570 East Lake Cook Road
Deerfield, IL 60015

August 2026

FINAL

Kimley»Horn

Table of Contents

Executive Summary iii
1 Introduction 1
2 Project Description 1
3 Statement of Qualifications 1
4 Regulatory Requirements 2
4.1 State and Federal Regulations 2
4.2 Local Regulations 2
5 Mapping and Background Information 3
5.1 Topography 3
5.2 National Wetlands Inventory 3
5.3 National Hydrography Dataset 3
5.4 Soil Survey 3
5.5 Federal Emergency Management Agency Floodplain 4
5.6 Aerial/Satellite Imagery Review 4
5.7 Climactic Conditions 4
6 Field Investigation 5
7 Summary of Results 6
8 Report Preparation 7
9 Conclusion 7
10 Disclaimer 7
References 8

List of Tables

Table 1: Linear Features Delineation Summary..... 6

List of Figures

Figure 1: Project Location

Figure 2: USGS Topographic Map

Figure 3: NWI, NHD, 2-ft Contours

Figure 4. Hydric Soils Rating

Figure 5. FEMA 100-Year Floodplain

Figure 6. Delineation Summary

Appendices

Appendix A: Hydric Soils Information

Appendix B: Historic Aerial Review

Appendix C: Precipitation Data

Appendix D: Field Data Sheets

Appendix E: Photos

Executive Summary

Wetland scientists, Theo Robinson and Lexi Daniels, with Kimley-Horn and Associates, Inc. conducted a wetland and surface waters investigation and field delineation for Western Meadowlark ProjectCo, LLC and Project Bluestem in the township of Tonganoxie, Leavenworth County, Kansas (Section 21, Township 11S, Range 21E). According to the Leavenworth County, Kansas Integrity Parcel Viewer, the wetland and surface waters investigation and delineation included parcel number 1952100000004010 (the "study area") encompassing approximately 9.7 acres bounded to the west by 222nd Street, located north of Hemphill Road, south of Business Park Drive, and west of 214th Street. A routine level 2 (onsite) wetland delineation, as outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (January 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)* occurred on July 22nd, 2026.

In total 1 ephemeral stream was delineated and is described in **Table 1**.

1 Introduction

Wetland scientists Theo Robinson and Lexi Daniels with Kimley-Horn and Associates, Inc. (Kimley-Horn) conducted a wetland and surface waters investigation and field delineation for Western Meadowlark ProjectCo, LLC and Project Bluestem in the township of Tonganoxie, Leavenworth County, Illinois (Section 21, Township 11S, Range 21E). The limits of the wetland and surface waters investigation and delineation was contained within parcel number 1952100000004010 (the "study area") encompassing approximately 9.7 acres. The study area is bounded to the west by 222nd Street, located north of Hemphill Road, south of Business Park Drive, and west of 214th Street. The study area is depicted in **Figure 1.** Existing land cover within the study area includes pasture/hay, developed, open space, and developed, low intensity. The study area lies in the Pony Creek-Ninemile Creek Sub Watershed (Hydrologic Unit Code [HUC] 102701040406), sub watersheds of the Kansas Watershed (HUC 10270104).

A routine level 2 (onsite) wetland delineation, as outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)* of the *1987 Corps of Engineers Wetlands Delineation Manual (January 1987)* and the *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (Final Version 2025),* was conducted on July 22nd, 2026. The purpose of this delineation was to identify the extent of wetlands and surface waters within the study area. The information will be used to facilitate project design and determine if aquatic resource impacts are avoidable and/or if minimization of impacts can result from design modifications.

2 Project Description

Western Meadowlark ProjectCo, LLC is proposing to develop the parcel.

3 Statement of Qualifications

Kimley-Horn has extensive experience completing wetland investigations and delineations across the United States. Kimley-Horn's personnel has been trained to use the *1987 Corps of Engineers Wetlands Delineation Manual (USACE, 1987)* along with the applicable regional supplements. Kimley-Horn has experience completing off-site hydrology analysis, historic aerial reviews, and difficult or atypical situation delineations.

Michael Jochheim has over 12 years of experience in wetland delineation in the Midwest and Great Lakes regions. He holds a B.S. in Conservation Biology and an A.S. in Environmental Science and has completed 40-hour delineation training. Michael specializes in preparing environmental permit applications and documentation for both public and private sector clients, providing practical and reliable solutions for sustainable development.

Theo Robinson holds a Bachelor of Science in Environmental Sciences, Policy, and Management from the University of Minnesota. Theo specializes in wetland delineations, permitting, GIS mapping, and threatened and endangered species due diligence. He has completed delineations throughout the Midwest, with a focus in agricultural fields, roadway corridors, and herbaceous land. Theo has completed delineations and permitting for both public and private sector clients.

Lexi Daniels earned a Bachelor of Arts degree in Environmental Studies from St. Olaf College. She specializes in wetland delineation, environmental permitting, GIS mapping, and threatened and endangered species due diligence. Lexi has experience conducting wetland delineations along roadway corridors, in agricultural fields, and forested areas throughout the Midwest.

Beth Mowry earned a Bachelor of Science in Environmental Conservation and Forest Resource Management from Virginia Tech. She specializes in GIS mapping, wetland delineation, and environmental permitting. Beth has experience working in both the public and private sectors and has conducted fieldwork and environmental assessments in Illinois, Indiana, Minnesota, and Virginia. Beth is proficient in using ArcGIS to develop mapping products and supports a variety of environmental compliance and permitting efforts.

4 Regulatory Requirements

A summary of the permit requirements that may pertain to the project is provided below. Any activity planned within areas identified as wetland must be coordinated with and approved by the appropriate agencies prior to commencement of such activities.

4.1 State and Federal Regulations

The regulatory authority of the U.S. Army Corps of Engineers (USACE) covers Waters of the United States (WOTUS) in accordance with Section 404 of the Clean Water Act (CWA). Generally, the USACE reviews delineations to determine whether wetlands are jurisdictional (i.e., WOTUS). On March 12, 2025, the U.S. Environmental Protection Agency (EPA) and Department of the Army ("the agencies") announced a joint memorandum issuing guidance to field staff on implementation of the continuous surface connection requirement under the CWA. The final ruling is pending as of the date of this report.

Based on the March 2025 ruling, the Clean Waters Act's use of "waters" encompasses only relatively permanent, standing, or continuously flowing bodies, ordinarily called streams, oceans, rivers, and lakes. Wetlands qualify as WOTUS only if "indistinguishable from waters of the United States," having a continuous surface connection to bodies that are waters of the United States in their own right, with no clear division between waters and wetlands. USACE retains the authority to make final decisions regarding federal jurisdiction of aquatic resources. Obtaining a jurisdictional determination (JD) from the USACE clarifies the scope of federal jurisdiction over delineated aquatic resources and identifies which resources are subject to CWA regulations.

Section 10 of the Rivers and Harbors Act requires that regulated activities conducted below the ordinary high-water mark elevation of navigable Waters of the U.S. or mean high water mark for tidal waters be approved/permitted by the USACE. Regulated activities include the placement/removal of structures, work involving dredging, disposal of dredged material, filling, excavation, or any other disturbance of soils/sediments or modification of a navigable waterway. Navigable Waters of the U.S. are those waters that are subject to the ebb and flow of the tide shoreward to the mean high-water mark and/or are presently used or have been used in the past or may be susceptible to use to transport interstate or foreign commerce.

At this time, Kansas does not regulate wetlands beyond Section 404 of the CWA and does not require setback buffers for wetlands on private land.

4.2 Local Regulations

At this time, based on publicly available information, the township of Tonganoxie and Leavenworth County do not regulate wetlands or require setback buffers for wetlands.

5 Mapping and Background Information

Prior to field reconnaissance, potential wetland areas within the project study area were identified through a desktop review of United States Geological Survey (USGS) topographic maps, National Wetlands Inventory (NWI), National Hydrography Dataset (NHD), LiDAR data, the National Resources Conservation Service's (NRCS) soil survey for Leavenworth County, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), aerial photography, and antecedent precipitation data for a location near the study area. The selected resources are described below:

5.1 Topography

The Tonganoxie 7.5-minute USGS topographic map and 2-foot contours derived from a digital elevation model (DEM) from USGS were reviewed for the study area. According to the USGS topographic map (see **Figure 2**), the study area is primarily undeveloped with four structures located in the western portion of the study area. Additionally, two ponds are depicted within the vicinity of the study area, one directly to the north and one directly to the south of the study area. The 2-foot contour data depicts the study area as topographically complex but generally sloping towards the south and west. The study area ranges from 910 feet (above mean sea level) to 956 feet, see **Figure 3**.

5.2 National Wetlands Inventory

NWI mapping, available from the U.S. Fish and Wildlife Service (USFWS) Wetland Mapper, depicts potential wetland areas and waterbodies based on stereoscopic analysis of high altitude and aerial photographs. Wetland and surface waters are classified according to the Cowardin system by examining vegetation, hydrology, and geographic features. The USFWS notes that using aerial photographs for wetland delineation can have a margin of error. Consequently, boundaries defined by this method may be adjusted through on-the-ground surveys or historical site analysis. According to NWI mapping, there are no wetland features located within the study area. The NWI map depicts several wetland features within the vicinity of the study area, including two Palustrine, Aquatic Bottom, Semi permanently Flooded, Diked/Impounded (PABFh) wetlands, one located approximately 215 feet to the north and one located approximately 163 feet to the south, see **Figure 3**.

5.3 National Hydrography Dataset

The NHD, available from USGS, depicts drainage networks and related features, including rivers, streams, canals, lakes, and ponds. The NHD dataset is not field verified. According to NHD mapping, there are no identified waterbodies or drainage features located within the study area. There are two identified waterbodies located within the vicinity of the study area, one depicted approximately 300 feet to the north and one depicted approximately 148 feet to the south of the study area. The mapped NHD features generally align with those features mapped by the NWI, see **Figure 3**.

5.4 Soil Survey

The NRCS *National Hydric Soil List* provides a hydric rating for soils and indicates the component representative percentage of map units that meet the criteria for hydric soils. The NRCS *Web Soil Survey* categorizes soils by hydric rating for each soil unit within the study area. The *Web Soil Survey* categorizes soils by hydric rating into five classes: zero percent, one to 32 percent, 33 to 65 percent, 66 to 99 percent, and 100 percent. According to the web soil survey reviewed for Leavenworth County, there are two soil mapping units within the study area which are generally silty clay loams with some clay loam. Approximately 100% of the study area was mapped as containing hydric inclusions that represent zero to one percent of the soil type. These soils have a very low likelihood of being hydric within the specific landforms listed in the web soil survey report. Maps and information obtained from the NRCS online web soil survey are included in **Figure 4** and **Appendix A**.

5.5 Federal Emergency Management Agency Floodplain

The *FEMA Flood Insurance Rate Map* (FIRM) illustrates various flood risk zones and provides vital information about the likelihood of flooding. This map highlights Special Flood Hazard Areas (SFHAs).

The FEMA FIRM was reviewed for the study area. According to FEMA, the study area is located in Zone X of panel 20103C0325G (effective July 16, 2015), which is outside the designated 100-year floodplain zones, see **Figure 5**.

5.6 Aerial/Satellite Imagery Review

Kimley-Horn reviewed available aerial/satellite imagery acquired from the National Agricultural Imagery Program (NAIP) to identify the potential presence of surface water and/or wetland habitats occurring in the study area. Numerous aerial/satellite images from NAIP were reviewed between 2006 and 2023, with selected imagery available in **Appendix B**. These aerial/satellite images were used to determine the potential presence of wetland hydrology or other potential surface waters and wetland habitat signatures (e.g., signs of inundation and saturation).

Review of aerial imagery identified two aquatic resources potentially present within the study area. All areas evaluated during the aerial/satellite review were assessed during the field investigation.

5.7 Climactic Conditions

The USACE Antecedent Precipitation Tool (APT) analyzes and evaluates precipitation conditions leading up to the date of a field investigation. This tool was developed to ensure accurate hydrological assessments, which are crucial for identifying wetlands. The APT works by collecting historical precipitation data through Wetland Evaluation Technical Support (WETS) tables, from local weather stations over a pre-defined period, typically 30 days prior to the site visit. It calculates the average daily precipitation and compares it to long-term historical averages, using quantile analysis to categorize conditions as above normal, average, or below normal.

Precipitation data for the study area were obtained from the APT. Antecedent precipitation conditions were normal for the July 22, 2026, delineation. The antecedent precipitation analysis is provided in **Appendix C.**

6 Field Investigation

A routine level 2 (onsite) wetland delineation, as outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)* of the *1987 Corps of Engineers Wetlands Delineation Manual (January 1987)* and the *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (Final Version 2025)* was conducted on July 22nd, 2026.

During the field delineation, vegetation, soils, and current hydrologic characteristics were evaluated at each area of investigation identified within the study area. The sample point locations and aquatic resources are shown in **Figure 6**.

In addition to wetlands that were investigated, non-wetland aquatic features were delineated. Non-wetland aquatic features are defined based on the observation of the following characteristics:

- Flow
    - Perennial: contains water at all times of the year except during extreme drought
    - Intermittent: contains water occasionally or seasonally
    - Ephemeral: contains water only during and immediately after periods of rainfall or snowmelt
- Ordinary High Water Mark (OHWM): The limit line on the shore established by the fluctuation of the water surface. It is shown by such things as a clear line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, the presence of litter and debris, or other features influenced by the surrounding area
- Bank Shape
    - Undercut: banks that overhang the stream channel
    - Steep: bank slope of approximately greater than 30 degrees
    - Gradual: bank slope of approximately 30 degrees or less

Sample points were completed for all potential wetlands. The field data sheets are included in **Appendix D**. Study area photos and a photo locations map can be found in **Appendix E**.

7 Summary of Results

Table 1: Linear Features Delineation Summary

Resource ID	Size (linear feet)[1]	Photo ID	NOTES
Linear Features			
Ephemeral Stream 1	377	2-4	Ephemeral Stream 1 is located in the southern portion of the study area. Based on the observed topography and channel morphology, water is interpreted to flow from east to west and discharge offsite during, and shortly following, precipitation events.

[1] Size of non-wetland, linear features provided in linear feet within the study area.

8 Report Preparation

The procedures followed for this wetland delineation are in accordance with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010) of the *Corps of Engineers Wetlands Delineation Manual: Midwest Region (Version 2.0) (August 2010).*

This report describes study area conditions for a specific date in time and is generally valid for a period of five years from the date of the final field investigation and delineation, which was July 22nd, 2026.

9 Conclusion

The field delineation identified 1 ephemeral stream within the study area. The delineated resources are described in **Table 1**. Based on Kimley-Horn's best professional opinion, Ephemeral Stream 1 is not anticipated to be USACE-jurisdictional. The USACE makes all final jurisdictional determinations. Any work that includes dredge or fill of wetlands or surface waters, or significantly alters drainage, may require a permit from the USACE.

10 Disclaimer

Kimley-Horn has prepared this document based on limited field observations and our interpretation, as scientists, of applicable regulations and agency guidance. While Kimley-Horn believes our interpretation to be accurate, final authority to interpret the regulations lies with the appropriate regulatory agencies. Regulatory agencies occasionally issue guidance that changes the interpretation of published regulations. Guidance issued after the date of this report has the potential to invalidate our conclusions and/or recommendations and may cause a need to reevaluate our conclusions and/or recommendations.

Because Kimley-Horn has no regulatory authority, the Client understands that proceeding based solely upon this document does not protect the Client from potential sanction or fines from the applicable regulatory agencies. The Client acknowledges that they have the opportunity to submit documentation to the regulatory agencies for concurrence prior to proceeding with any work. If the Client elects not to do so, then the Client proceeds at their sole risk.

References

ESRI, Maxar, Earthstar Geographics, and the GIS User Community. *Imagery Map Hybrid*. Available at https://www.arcgis.com/home/item.html?id=86265e5a4bbb4187a59719cf134e0018, accessed August 2026.

Federal Emergency Management Agency. *Flood Insurance Rate Maps*. Available at https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd, accessed August 2026.

Leavenworth County. *Code of Ordinances*. Accessed at https://library.municode.com/ks/leavenworth/codes/code_of_ordinances, accessed August 2026.

Leavenworth County. *Leavenworth County, KS GIS.* Accessed at https://leavenworthgis.integritygis.com/H5/Index.html?viewer=leavenworth, accessed August 2026.

Natural Resources Conservation Service, U.S. Department of Agriculture. *Web Soil Survey*. Available at http://websoilsurvey.nrcs.usda.gov, accessed August 2026.

NearMap US Inc., MapBrowser. Available at https://www.nearmap.com/us/en, accessed August 2026.

U.S. Army Corps of Engineers. *Antecedent Precipitation Tool*. Available at https://www.epa.gov/wotus/antecedent-precipitation-tool-apt, accessed August 2026.

U.S. Army Corps of Engineers. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. January 1987. Available at http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/1987%20Manual.pdf.

U.S. Army Corps of Engineers. *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Final Version (January 2025).* Available at https://erdc-library.erdc.dren.mil/items/76c61f8f-6d75-4a35-aaf3-39aa64918afb

U.S. Army Corps of Engineers. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)*. Available at http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/.

U.S. Department of Agriculture Natural Resources Conservation Service. *NRCS Online Climate Data Retrieval System Wets Tables*. Available at https://agacis.rcc-acis.org, accessed August 2026.

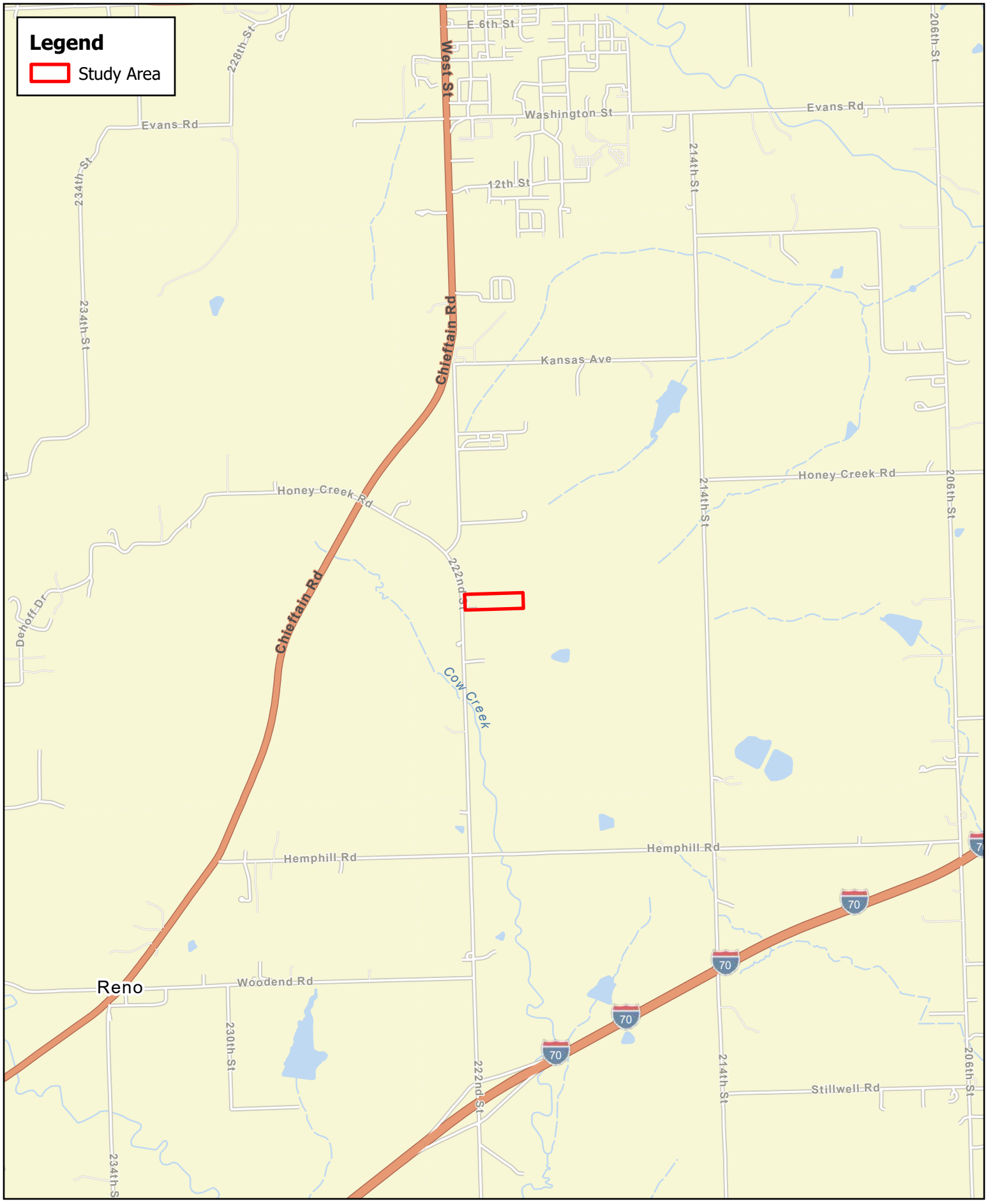
U.S. Fish and Wildlife Service. *Wetlands Online Mapper*. National Wetland Inventory mapping. Available at http://www.fws.gov/wetlands/Data/Mapper.html, accessed August 2026.

U.S. Geological Survey. *LiDAR Data*. Acquired via *The National Map*, accessed August 2026.

U.S. Geological Survey. *National Hydrography Dataset*. Acquired via The National Map at https://apps.nationalmap.gov/downloader/#/, accessed August 2026.

U.S. Geological Survey. *Topographical Map*. Accessed via ESRI at http://www.arcgis.com/home/item.html?id=30e5fe3149c34df1ba922e6f5bbf808f and via Topo View at https://ngmdb.usgs.gov/topoview/viewer/#4/40.01/-100.06, accessed August 2026.

Figures



Kimley»Horn

Figure 1. Project Location
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo, LLC

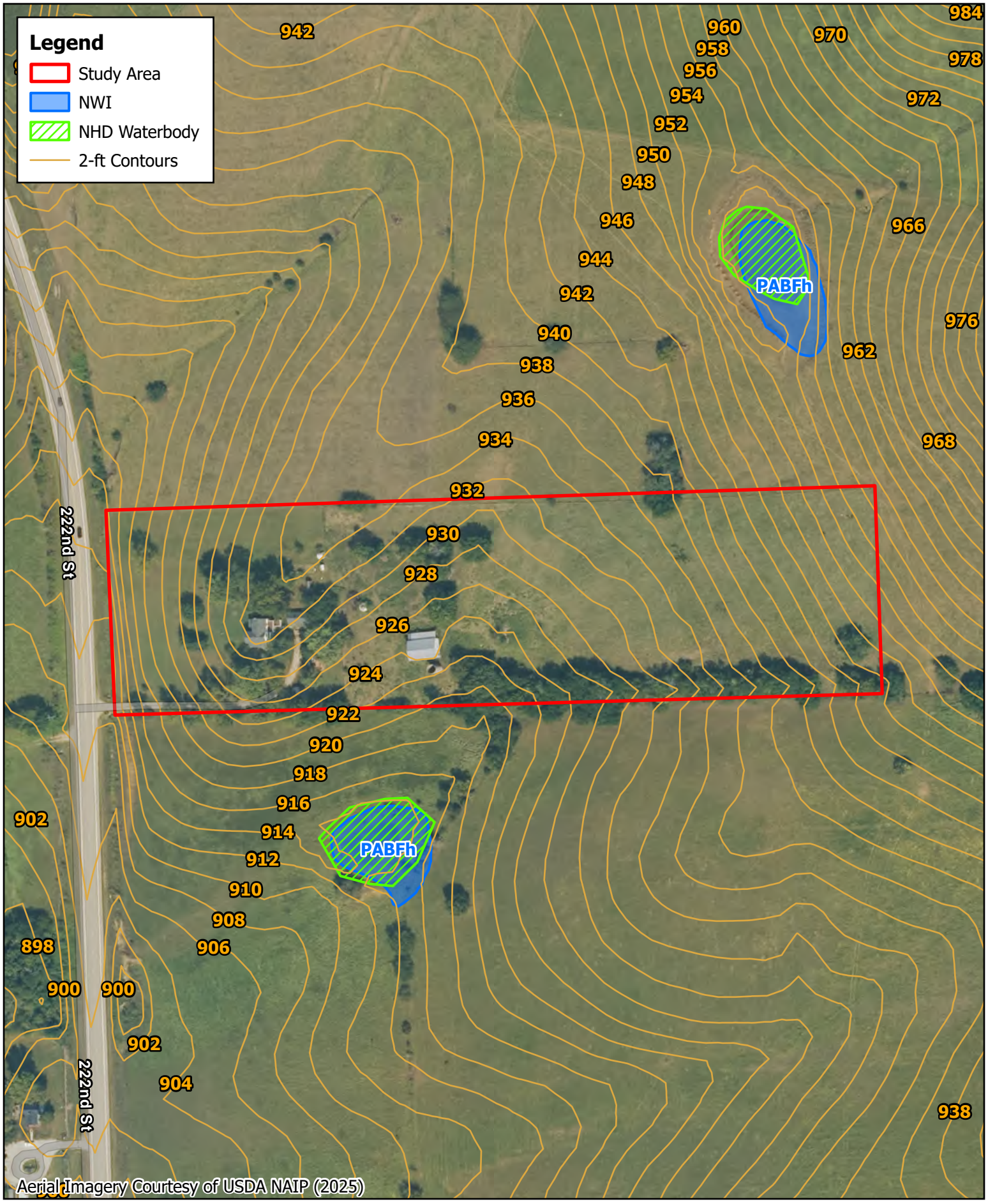


Kimley»Horn

0 200 400 US Feet

N

Figure 2. USGS Topographic Map
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo, LLC

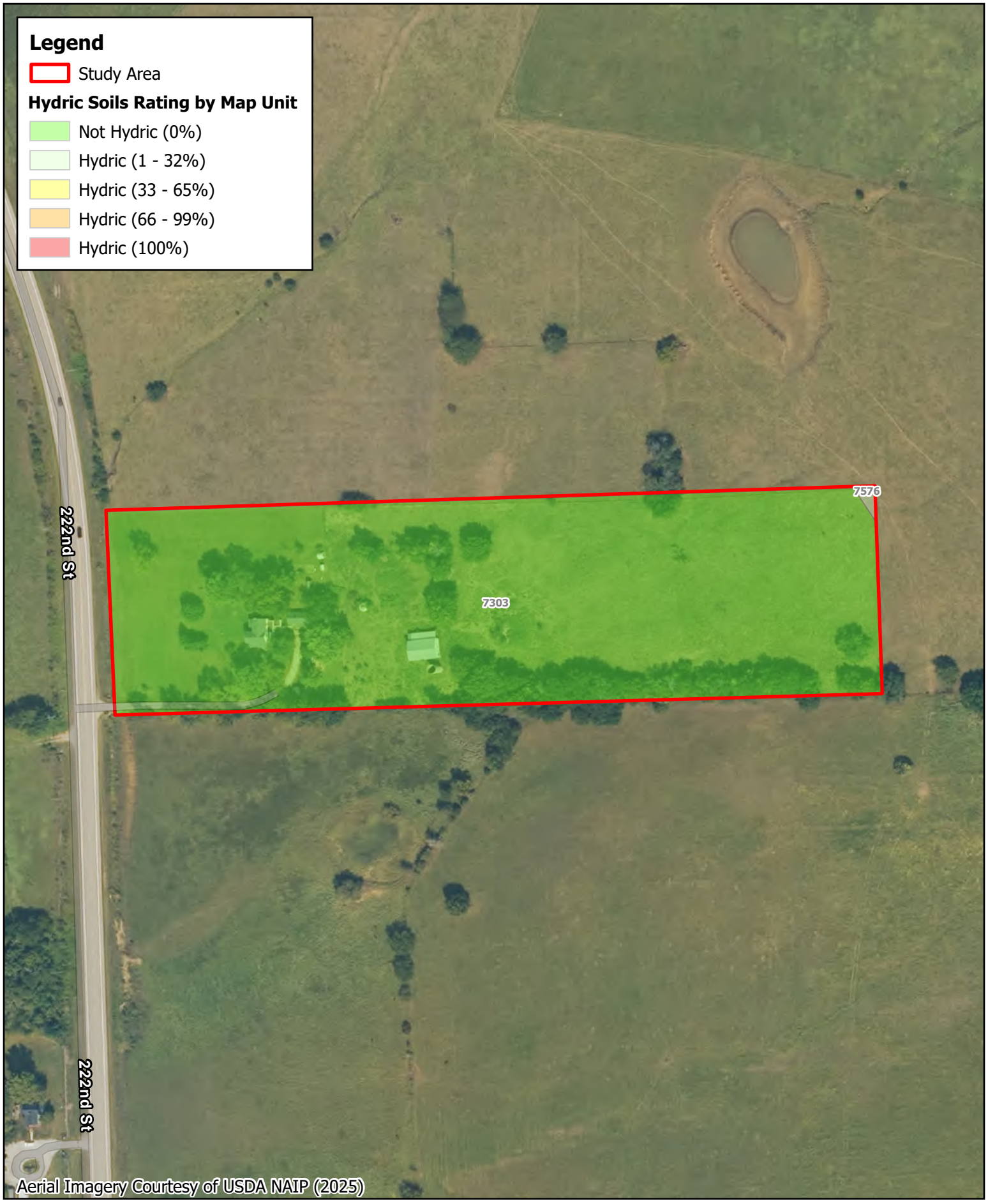


Kimley»Horn

0 100 200 US Feet

N

Figure 3. NWI, NHD, 2-ft Contours
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo, LLC

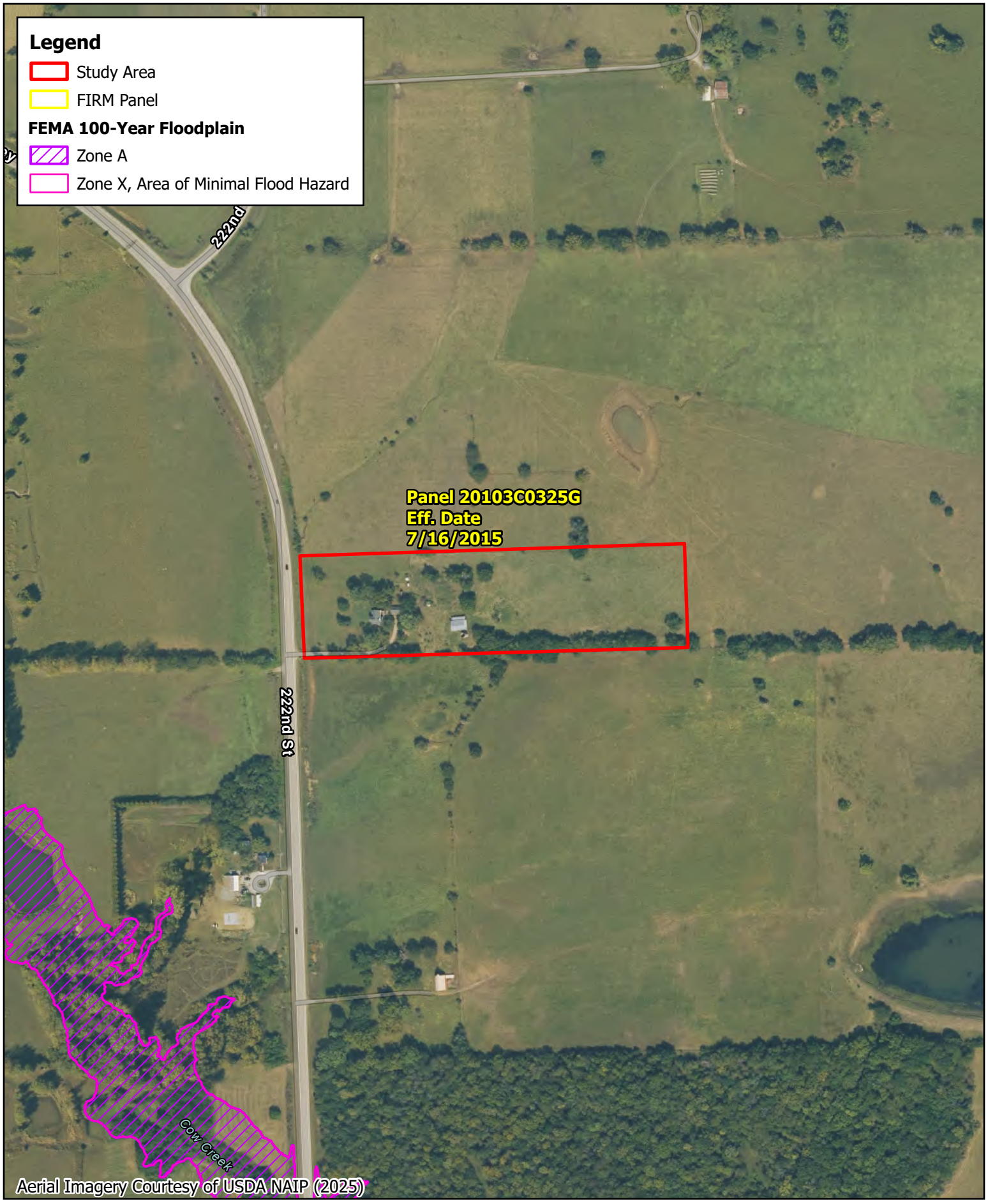


Kimley»Horn

0 100 200 US Feet

N

Figure 4. Hydric Soils Rating
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo, LLC

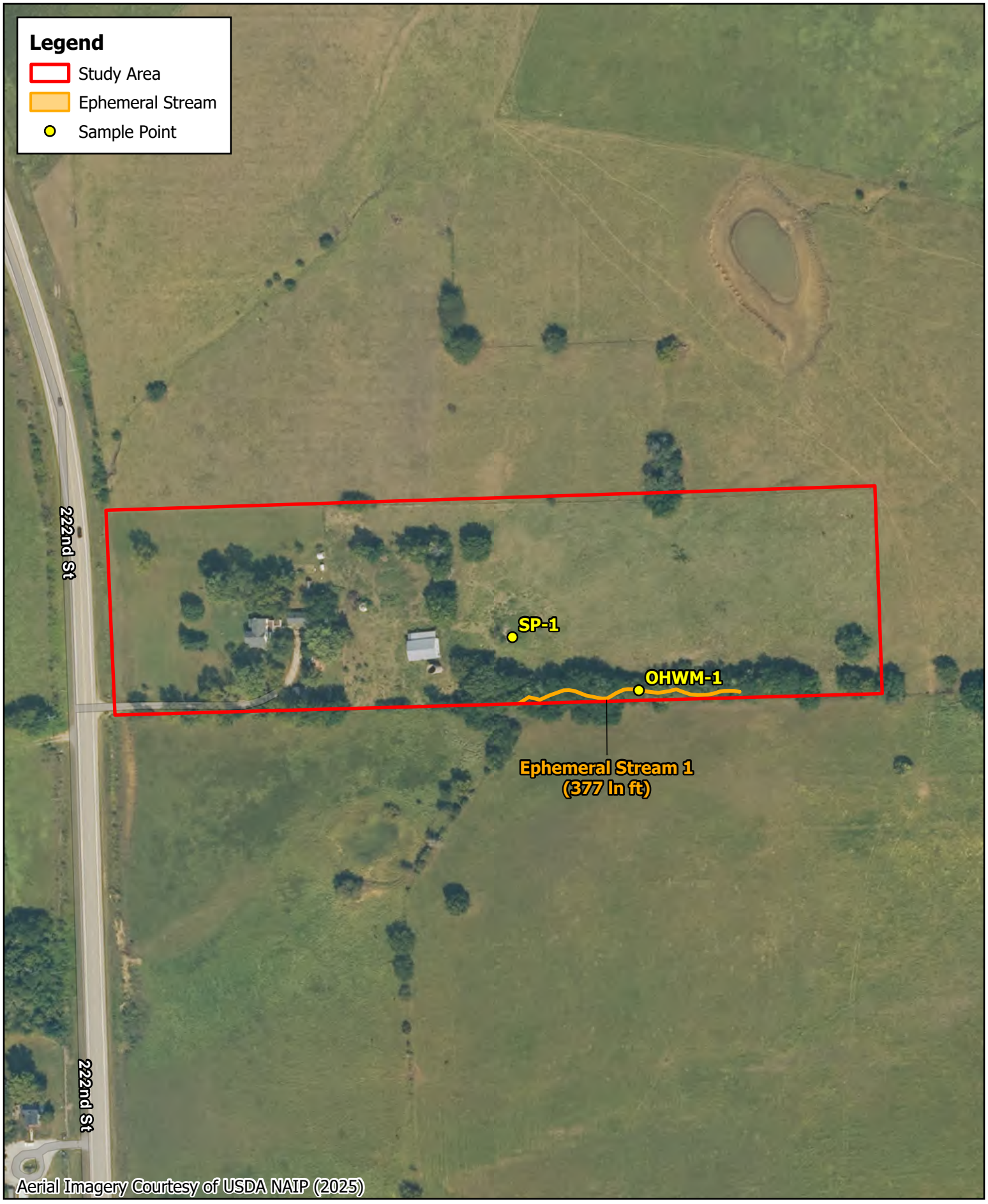


Kimley»Horn

0 200 400 US Feet

N

Figure 5. FEMA 100-Year Floodplain
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo, LLC



Kimley»Horn

0 100 200 US Feet

N

Figure 6. Delineation Summary
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo, LLC

Appendix A: Hydric Soils Information

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Leavenworth County, Kansas



July 30, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
Soil Information for All Uses.....5
Suitabilities and Limitations for Use.....5
Land Classifications.....5
Hydric Rating by Map Unit.....5

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Rating by Map Unit

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

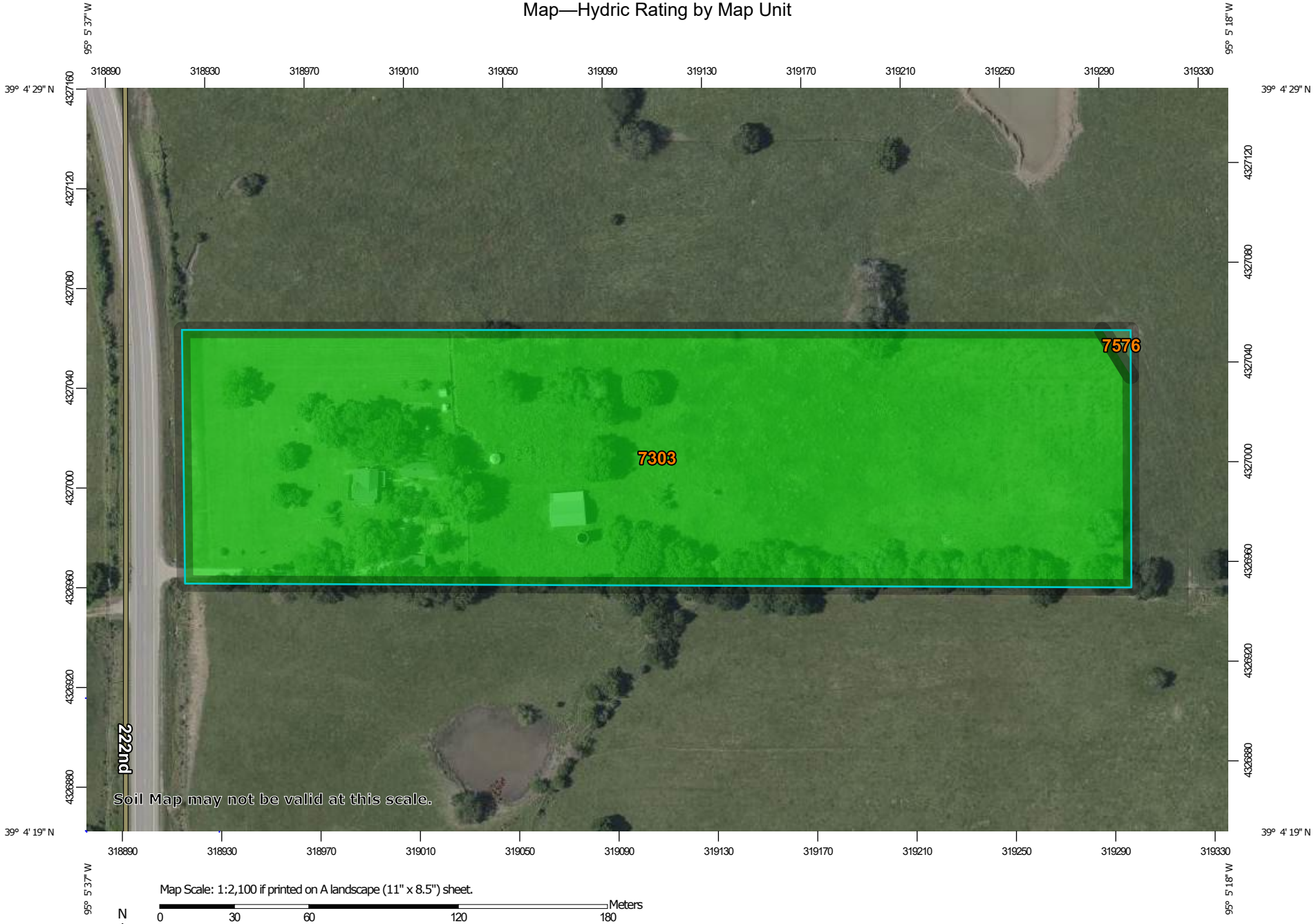
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Custom Soil Resource Report
Map—Hydric Rating by Map Unit



Map Scale: 1:2,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Leavenworth County, Kansas
Survey Area Data: Version 20, Aug 27, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7303	Martin silty clay loam, 3 to 7 percent slopes, eroded	0	9.7	99.7%
7576	Shelby clay loam, 8 to 12 percent slopes, eroded	1	0.0	0.3%
Totals for Area of Interest			**9.7**	**100.0%**

Rating Options—Hydric Rating by Map Unit

Aggregation Method: Percent Present

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Percent Present" returns the cumulative percent composition of all components of a map unit for which a certain condition is true. For example, attribute "Hydric Rating by Map Unit" returns the cumulative percent composition of all components of a map unit where the corresponding hydric rating is "Yes". Conditions may be simple or complex. At runtime, the user may be able to specify all, some or none of the conditions in question.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Appendix B: Historic Aerial Review



Kimley»Horn

0 100 200 US Feet

N

Historic Aerial - June 2006 (Dry Year)
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo, LLC



Kimley»Horn

0 100 200 US Feet

N

Historic Aerial - June 2012 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo, LLC



Kimley»Horn

0 100 200 US Feet

N

Historic Aerial - June 2014 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo, LLC



Kimley»Horn

0 100 200 US Feet

N

Historic Aerial - June 2015 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo, LLC



Kimley»Horn

0 100 200 US Feet

N

Historic Aerial - August 2017 (Wet Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo, LLC



Kimley»Horn

0 100 200 US Feet

N

Historic Aerial - July 2019 (Wet Year)
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo, LLC



Kimley»Horn

0 100 200 US Feet

N

Historic Aerial - June 2021 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo, LLC



Kimley»Horn

0 100 200 US Feet

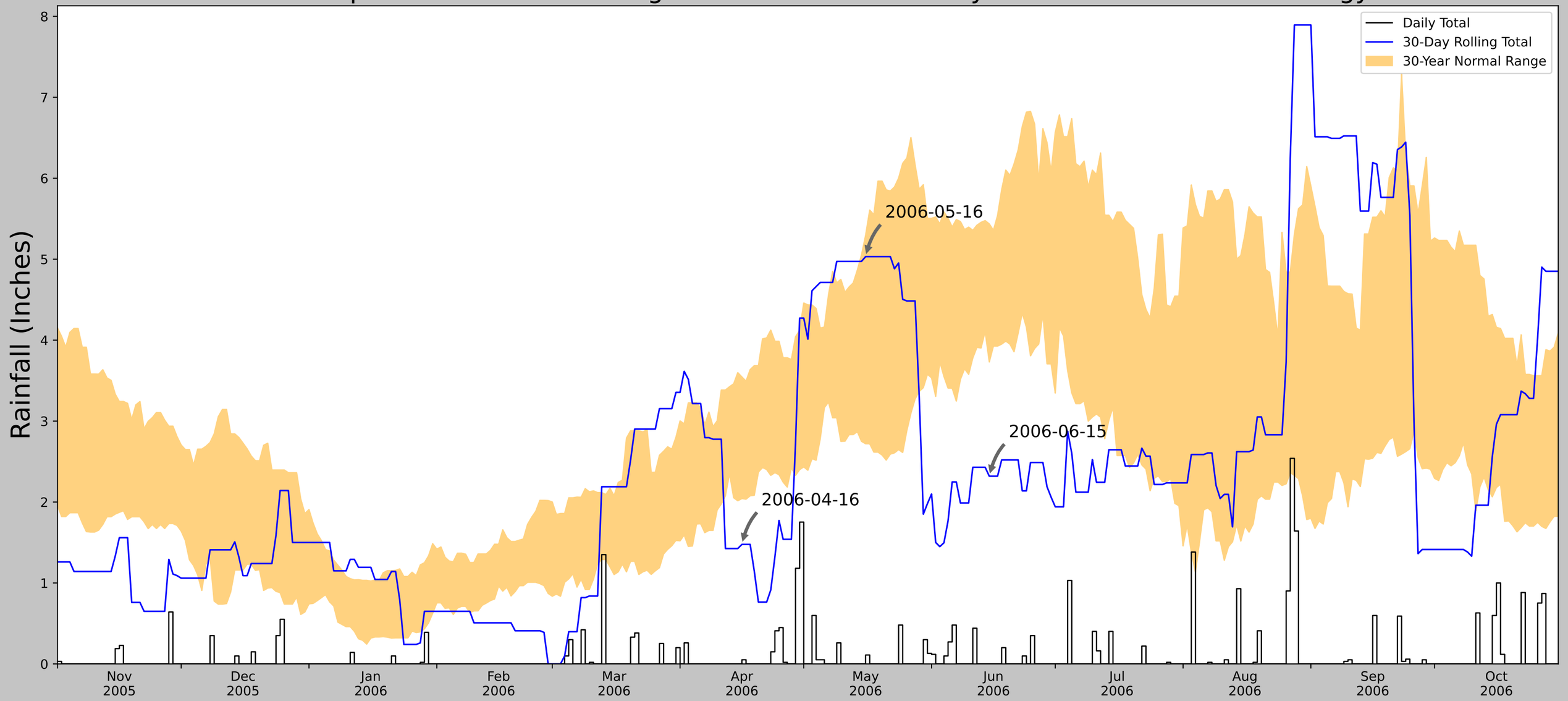
N

Historic Aerial - September 2023 (Dry Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo, LLC

Appendix C: Precipitation Data



Coordinates	39.0732, -95.091
Observation Date	2006-06-15
Elevation (ft)	923.121
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2006-06-15	3.730315	5.435433	2.318898	Dry	1	3	3
2006-05-16	2.719685	5.294488	5.031496	Normal	2	2	4
2006-04-16	2.04252	3.544882	1.476378	Dry	1	1	1
Result							Drier than Normal - 8

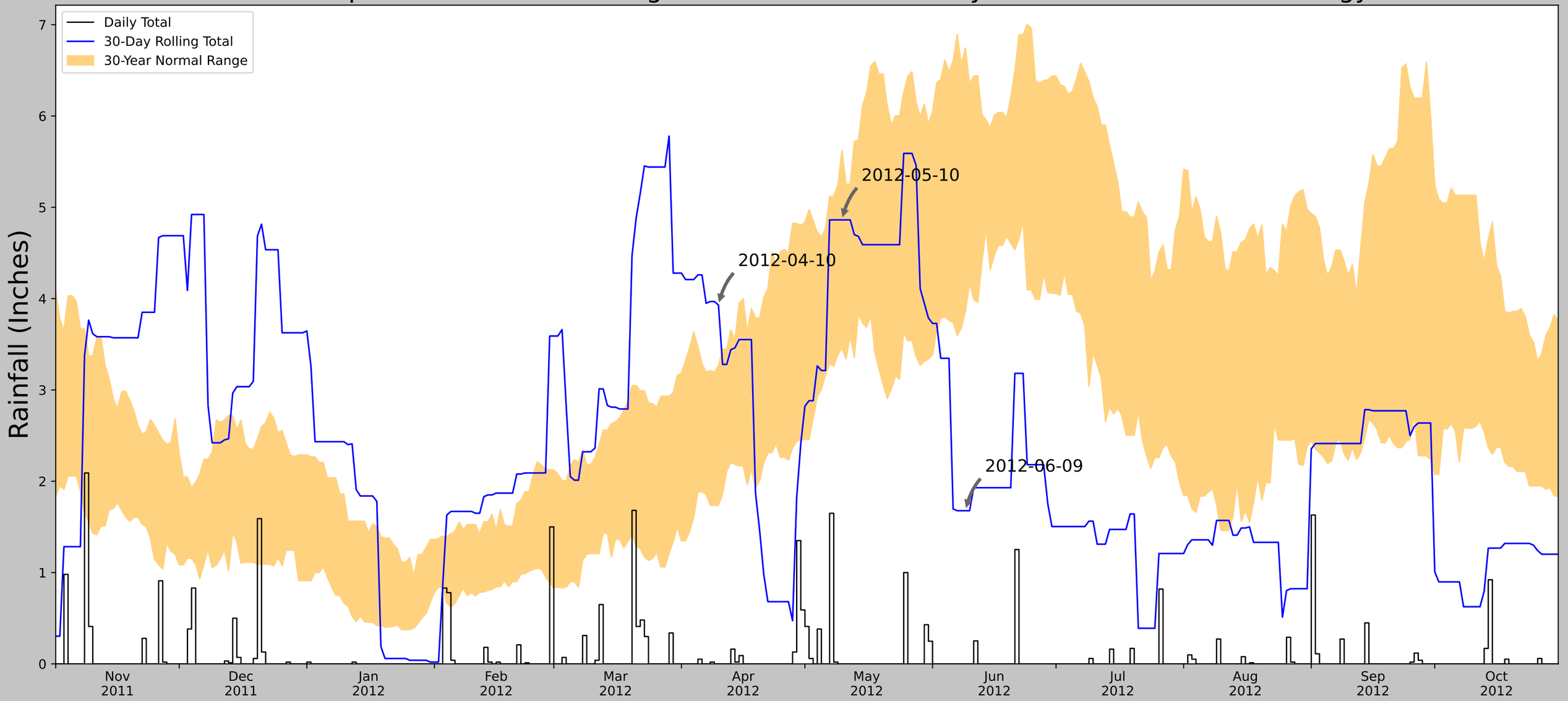
Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
BONNER SPRINGS	39.0636, -94.8961	850.066	10.476	73.055	5.48	11298	90
EDWARDSVILLE 3 NNW	39.1, -94.8333	959.974	4.204	109.908	2.354	26	0
TONGANOXIE 5SE	39.0314, -95.0522	830.053	8.667	20.013	4.074	29	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0732, -95.091
Observation Date	2012-06-09
Elevation (ft)	923.121
Drought Index (PDSI)	Moderate drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2012-06-09	3.854725	6.746457	1.677165	Dry	1	3	3
2012-05-10	3.46063	5.62126	4.862205	Normal	2	2	4
2012-04-10	1.738189	3.264961	3.929134	Wet	3	1	3
Result							Normal Conditions - 10

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

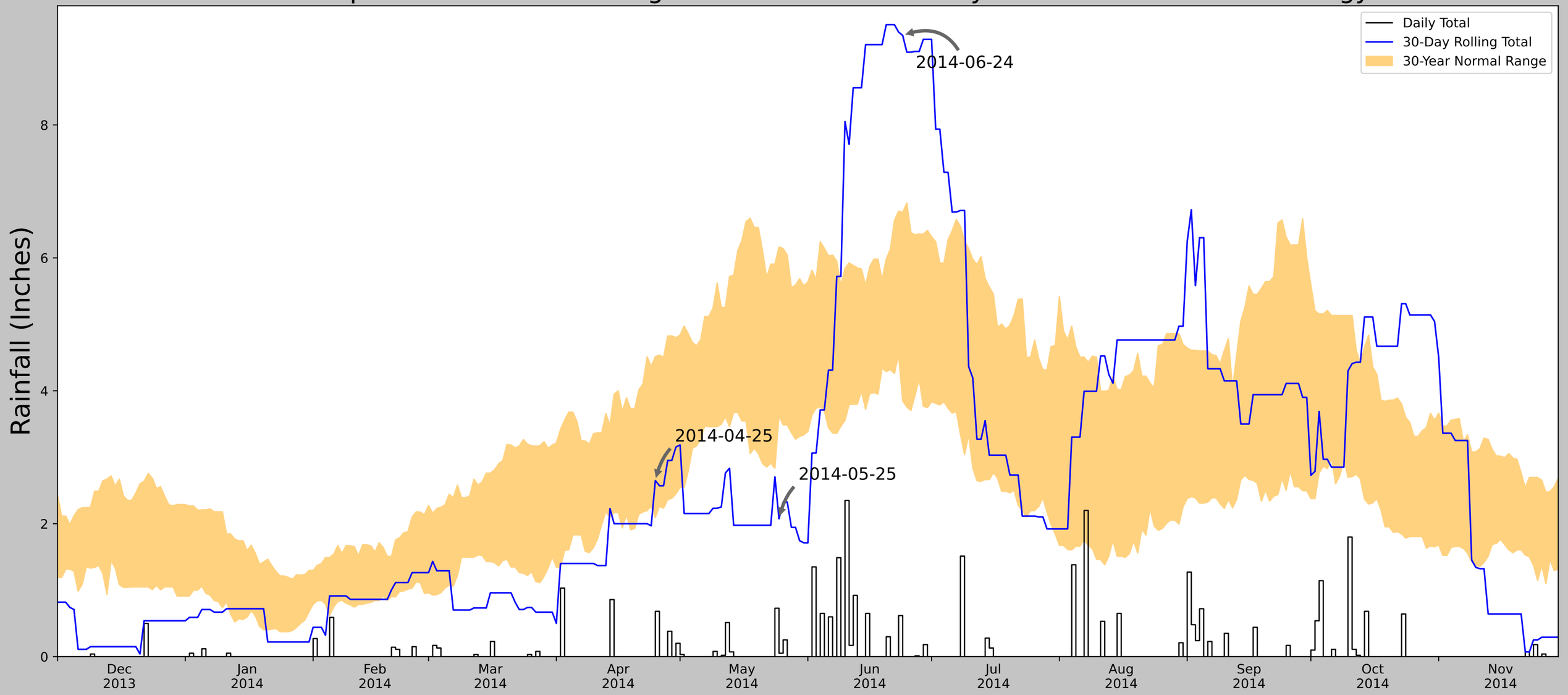
US Army Corps of Engineers

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.56	93.068	1.933	11290	90
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0732, -95.091
Observation Date	2014-06-24
Elevation (ft)	923.121
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2014-06-24	3.845276	6.685433	9.346457	Wet	3	3	9
2014-05-25	3.626378	6.163386	2.074803	Dry	1	2	2
2014-04-25	2.091732	4.51378	2.649606	Normal	2	1	2
Result							Normal Conditions - 13

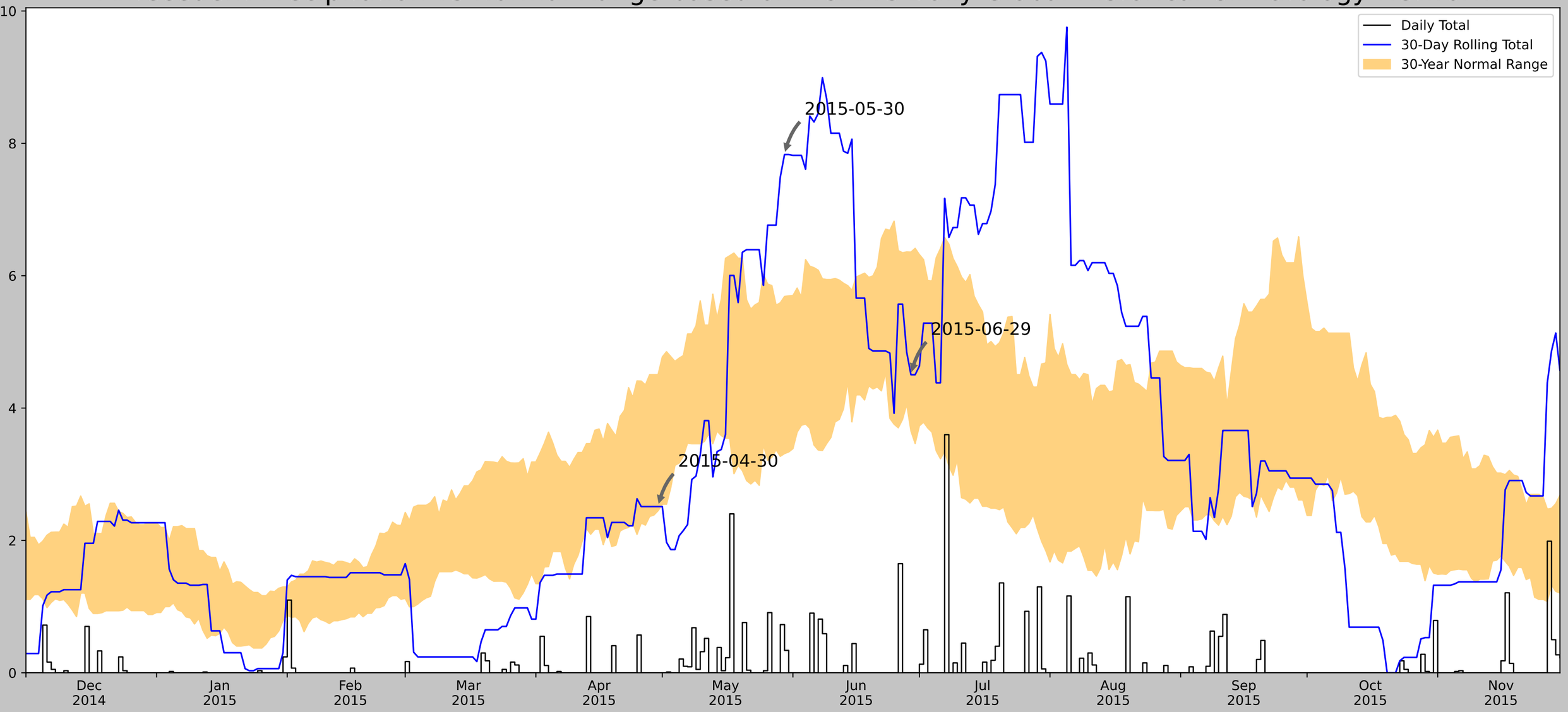
Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.56	93.068	1.933	11289	90
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	2	0
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	1	0



Coordinates	39.0732, -95.091
Observation Date	2015-06-29
Elevation (ft)	923.121
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2015-06-29	3.654725	6.357087	4.503937	Normal	2	3	6
2015-05-30	3.312205	5.686221	7.830709	Wet	3	2	6
2015-04-30	2.449213	4.504725	2.511811	Normal	2	1	2
Result							Normal Conditions - 14

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

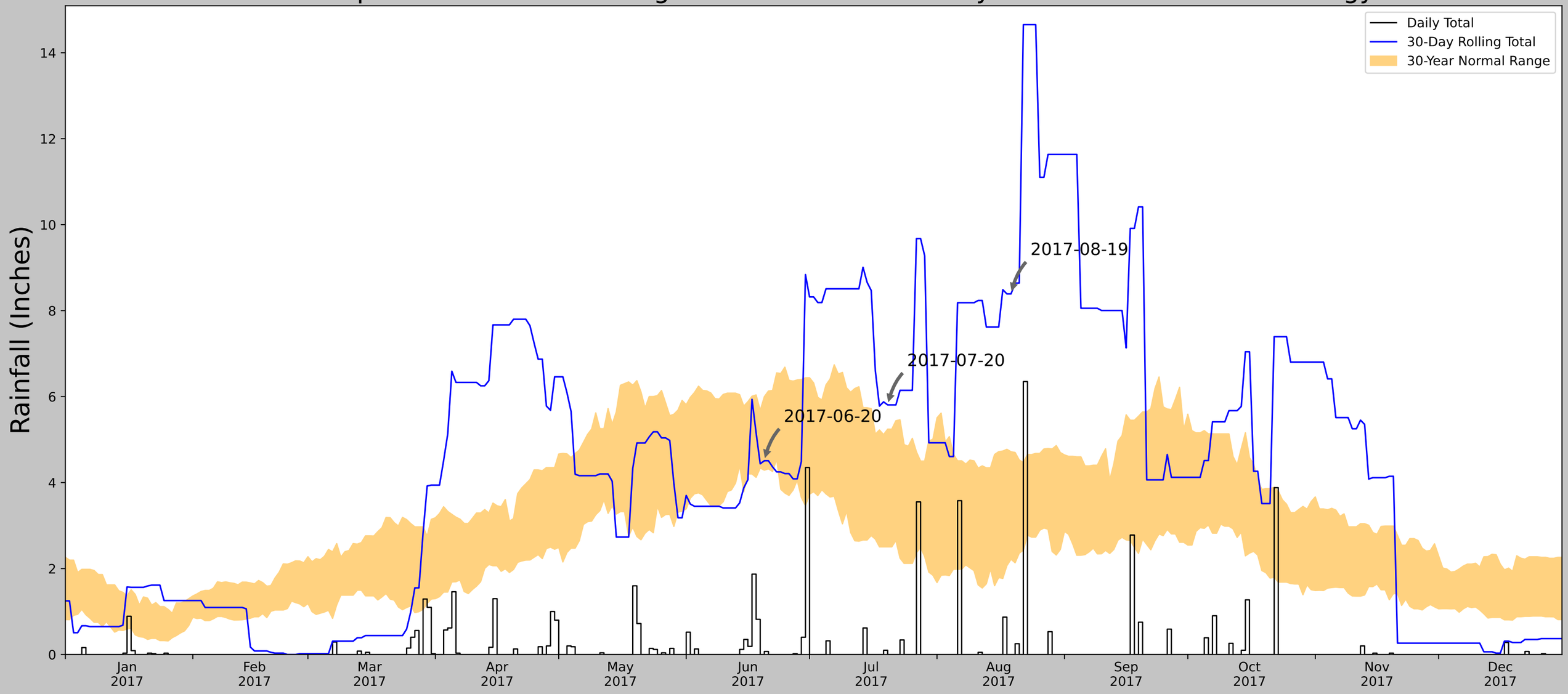
US Army Corps of Engineers

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.56	93.068	1.933	11289	90
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	2	0
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0732, -95.091
Observation Date	2017-08-19
Elevation (ft)	938.32
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2017-08-19	2.216536	4.717717	8.389764	Wet	3	3	9
2017-07-20	2.504331	5.243307	5.807087	Wet	3	2	6
2017-06-20	4.28937	5.998032	4.507874	Normal	2	1	2
Result							Wetter than Normal - 17

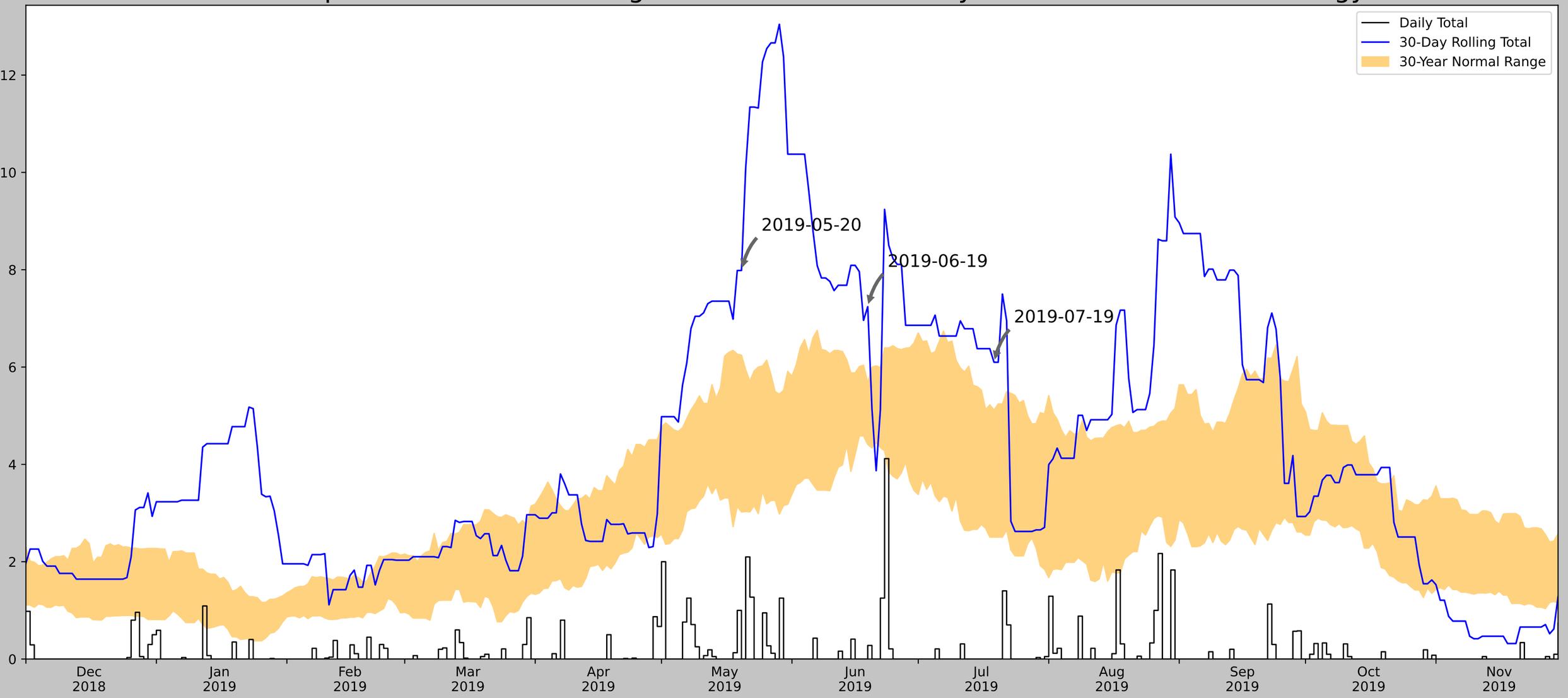
Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.56	108.267	1.988	11289	90
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	2	0
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0732, -95.091
Observation Date	2019-07-19
Elevation (ft)	938.32
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2019-07-19	2.504331	5.116536	6.098425	Wet	3	3	9
2019-06-19	4.409843	5.677953	7.240158	Wet	3	2	6
2019-05-20	3.022047	6.246851	7.984252	Wet	3	1	3
Result							Wetter than Normal - 18

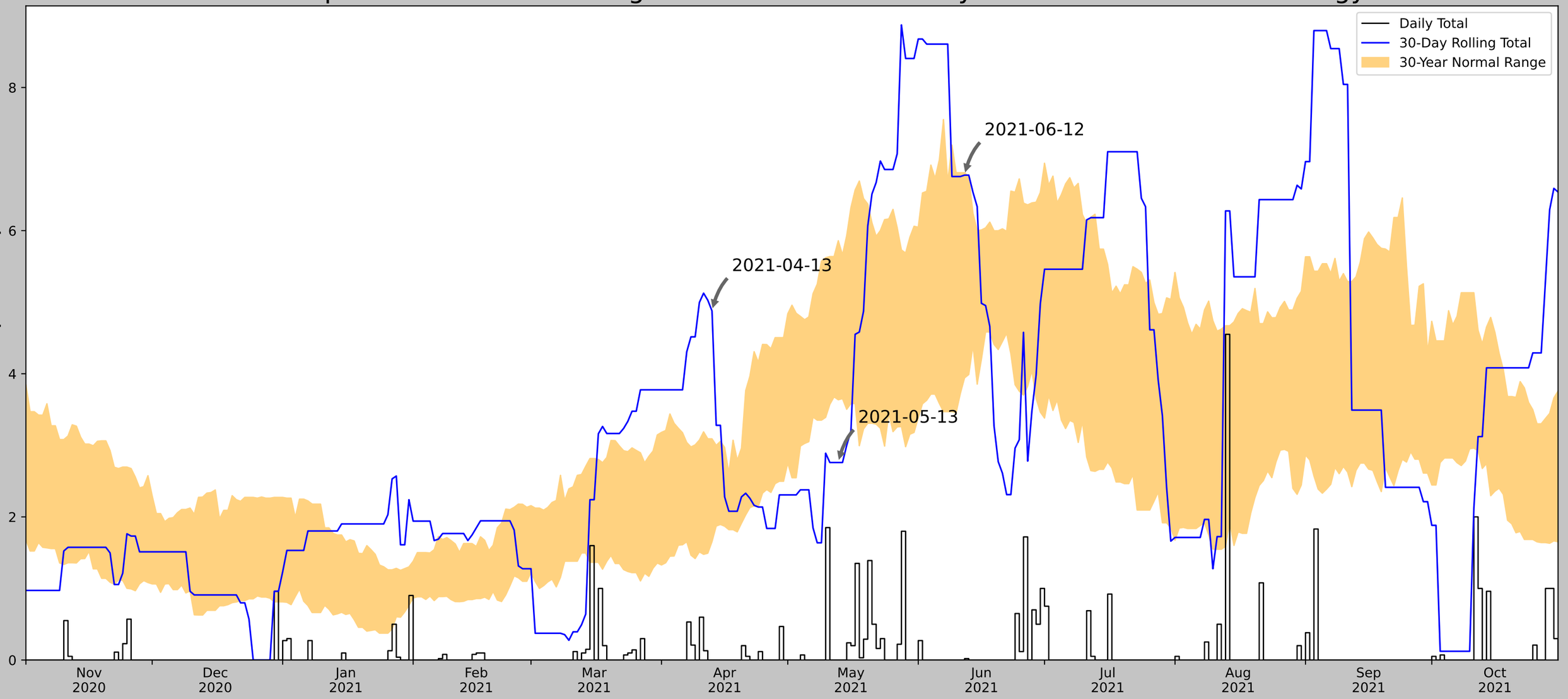
Figures and tables made by the Antecedent Precipitation Tool Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.56	108.267	1.988	11288	88
TONGANOXIE 4.9 SSW	39.0445, -95.119	833.99	3.697	3.937	1.678	1	0
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	2	0
TONGANOXIE 6.3 SSW	39.0295, -95.1391	955.053	4.666	125.0	2.683	1	0
EUDORA 1S	38.9311, -95.1017	876.969	7.423	46.916	3.689	0	2
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0732, -95.091
Observation Date	2021-06-12
Elevation (ft)	923.121
Drought Index (PDSI)	Normal
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-06-12	3.94252	6.809449	6.775591	Normal	2	3	6
2021-05-13	3.636221	5.859449	2.759843	Dry	1	2	2
2021-04-13	1.653937	3.090945	4.877953	Wet	3	1	3
Result							Normal Conditions - 11

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

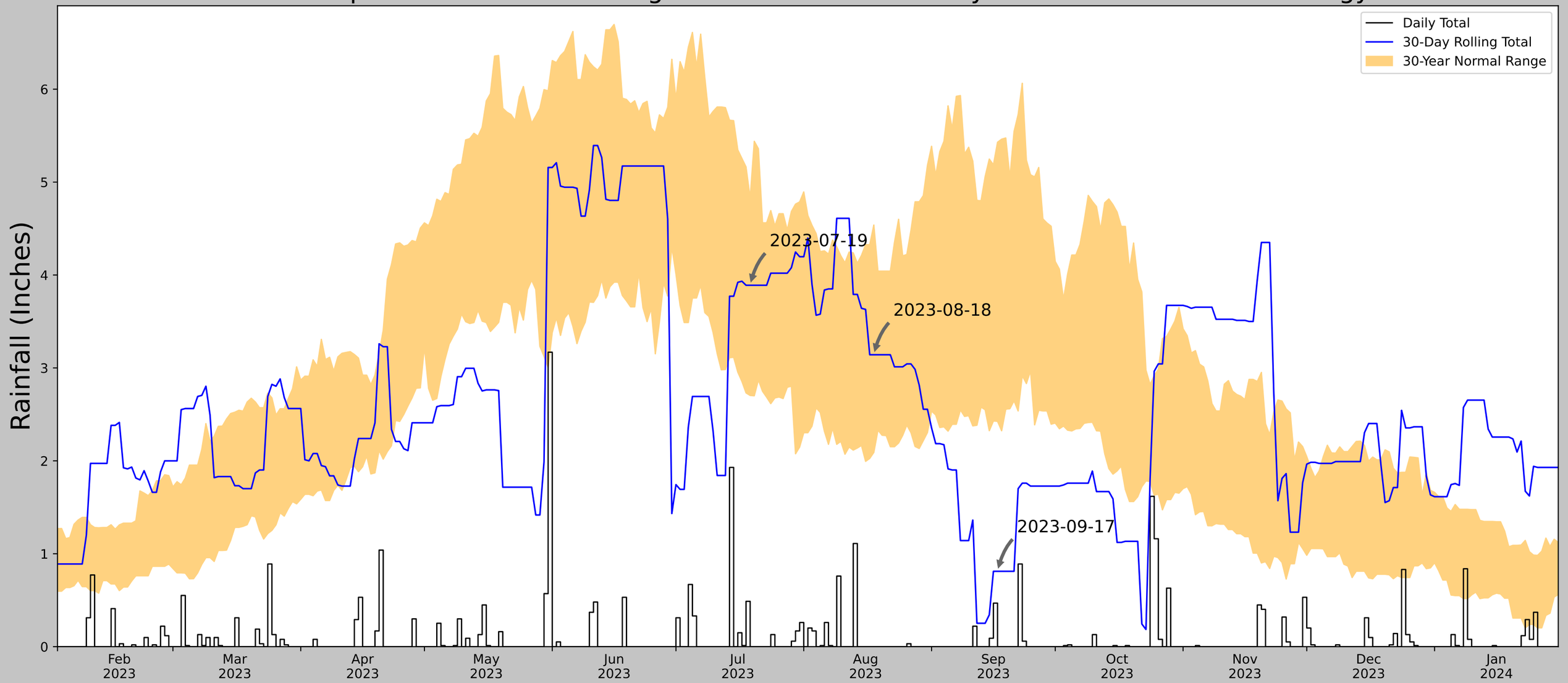
US Army Corps of Engineers.

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.56	93.068	1.933	11234	90
TONGANOXIE 4.9 SSW	39.0445, -95.119	833.99	3.697	3.937	1.678	12	0
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	12	0
TONGANOXIE 6.3 SSW	39.0295, -95.1391	955.053	4.666	125.0	2.683	6	0
EUDORA 1S	38.9311, -95.1017	876.969	7.423	46.916	3.689	28	0
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0732, -95.091
Observation Date	2023-09-17
Elevation (ft)	923.121
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-09-17	2.425197	5.429134	0.811024	Dry	1	3	3
2023-08-18	2.090945	4.538189	3.141732	Normal	2	2	4
2023-07-19	2.703543	4.827166	3.889764	Normal	2	1	2
Result							Drier than Normal - 9

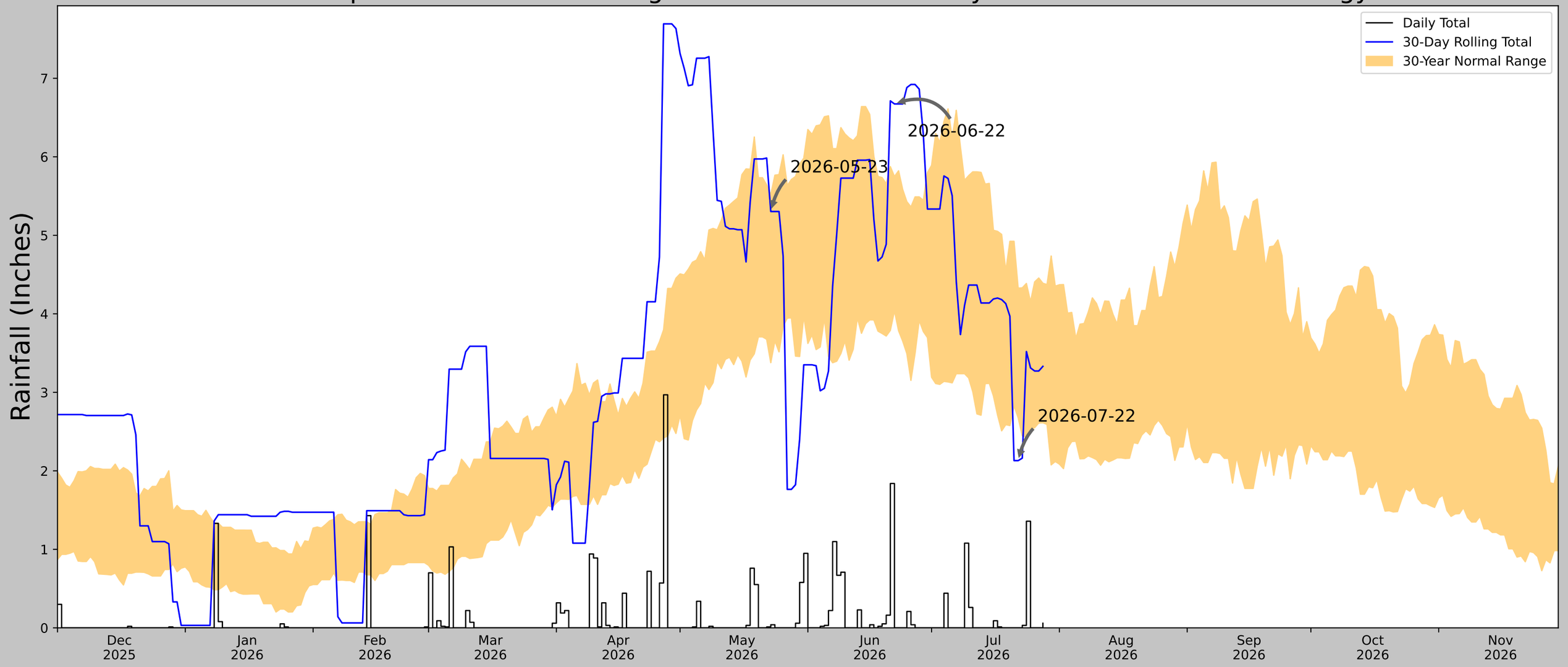
Figures and tables made by the Antecedent Precipitation Tool Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
LAWRENCE ASOS	39.0078, -95.2114	827.1	7.885	96.021	4.305	8780	90
LAWRENCE 1.8 NNW	38.9873, -95.2647	859.908	3.193	32.808	1.542	3	0
LAWRENCE 1.5 E	38.9649, -95.228	928.15	3.095	101.05	1.705	1	0
LAWRENCE 1.6 ESE	38.9543, -95.228	834.974	3.803	7.874	1.741	4	0
LAWRENCE	38.9569, -95.2483	1046.916	4.037	219.816	2.704	2504	0
TONGANOXIE 5SE	39.0314, -95.0522	830.053	8.7	2.953	3.941	61	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.07324441, -95.09095019
Observation Date	2026-07-22
Elevation (ft)	923.99
Drought Index (PDSI)	Incipient wetness (2026-06)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2026-07-22	2.676378	4.327559	2.129921	Dry	1	3	3
2026-06-22	4.038583	5.748425	6.673229	Wet	3	2	6
2026-05-23	3.377165	5.515355	5.30315	Normal	2	1	2
Result							Normal Conditions - 11

Figures and tables made by the Antecedent Precipitation Tool Version 3.0

US Army Corps of Engineers.

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
LAWRENCE ASOS	39.0078, -95.2114	827.1	7.889	96.89	4.314	9865	86
LAWRENCE 1.2 N	38.9803, -95.2542	854.003	2.982	26.903	1.422	6	0
LAWRENCE 1.8 NNW	38.9873, -95.2647	859.908	3.193	32.808	1.542	3	0
LAWRENCE 1.5 E	38.9649, -95.228	928.15	3.095	101.05	1.705	2	0
LAWRENCE 1.6 ESE	38.9543, -95.228	834.974	3.803	7.874	1.741	8	0
LAWRENCE 2.1 ESE	38.9522, -95.2195	854.003	3.866	26.903	1.844	0	3
KU-FIELD STN	39.0478, -95.1928	1089.895	2.939	262.795	2.095	0	1
LAWRENCE	38.9569, -95.2483	1046.916	4.037	219.816	2.704	1441	0
TONGANOXIE 5SE	39.0314, -95.0522	830.053	8.7	2.953	3.941	28	0

Appendix D: Field Data Sheets

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Project Bluestem City/County: Leavenworth County Sampling Date: 2026-07-22
Applicant/Owner: Western Meadowlark ProjectCo, LLC State: Kansas Sampling Point: SP-1
Investigator(s): Theo Robinson, Lexi Daniels Section, Township, Range: S21 T11S R21E
Landform (hillside, terrace, etc.): Slope Local relief (concave, convex, none): Undulating
Slope (%): 2 Lat: 39.07324441 Long: -95.09095019 Datum: WGS 84
Soil Map Unit Name: 7303 - Martin silty clay loam, 3 to 7 percent slopes, eroded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ____ No ✔
Hydric Soil Present? Yes ✔ No ____
Wetland Hydrology Present? Yes ____ No ✔

Is the Sampled Area within a Wetland? Yes ____ No ✔

Remarks:
The sample point is located on a slope dominated by giant ragweed. The USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Ambrosia trifida	50	✔	FAC
2. Galium aparine	20	✔	FACU
3. Bromus inermis	15		FACU
4. Desmodium canadense	15		FACU
5. Daucus carota	5		UPL
6.			
7.			
8.			
9.			
10.			
	105 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	5	x 5 =	25
Column Totals:	105 (A)		375 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 2/1	98	7.5YR 4/4	2	C	M	Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

Form Approved -
OMB No. 0710-0025
Expires: 01-31-2025

AGENCY DISCLOSURE NOTICE

The public reporting burden for this collection of information, 0710-OHWM, is estimated to average 30 **minutes** per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: Project Bluestem	Site Name: OHWM-1	Date and Time: 2026-07-23
Location (lat/long): 39.07301211, -95.09026215	Investigator(s): Theo Robinson, Lexi Daniels	

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- ☐ gage data
- ☑ LiDAR
- ☐ geologic maps
- ☑ climatic data
- ☐ satellite imagery
- ☐ land use maps
- ☑ aerial photos
- ☑ topographic maps
- ☐ Other: _____

Describe land use and flow conditions from online resources. Were there any recent extreme events (floods or drought)?

The land surrounding OHMW-01 is undeveloped woodland and grassland. No extreme recent precipitation events have occurred.

Step 2 Site conditions during field assessment. First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

The channel is approximately one-two feet wide and one foot tall. The OHWM was observed approximately 0.6 inches above the bed of the stream. The substrate consisted of mud with some scattered rock and was unvegetated. Overhanging Osage Orange trees lined the stream banks. Drift deposits such as leaf litter and sticks were stacked on obstacles in the stream including fences and roots. Mudcracks were observed throughout the stream bed.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- ☑ **Break in slope:**
  - ☑ *on the bank:*
  - ☐ *undercut bank:*
  - ☐ *valley bottom:*
  - ☐ Other: _____
- ☐ **Shelving:**
  - ☐ *shelf at top of bank:*
  - ☐ *natural levee:*
  - ☐ *man-made berms or levees:*
  - ☐ *other berms:* _____
- ☐ **Channel bar:**
  - ☐ *shelving (berms) on bar:*
  - ☐ *unvegetated:*
  - ☐ *vegetation transition (go to veg. indicators)*
  - ☐ *sediment transition (go to sed. indicators)*
  - ☐ *upper limit of deposition on bar:*
- ☑ **Instream bedforms and other bedload transport evidence:**
  - ☐ *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - ☐ *bedforms (e.g., pools, riffles, steps, etc.):*
- ☑ *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- ☐ **Secondary channels:**

Sediment indicators

- ☐ **Soil development:**
- ☐ **Changes in character of soil:**
- ☑ **Mudcracks:** X
- ☐ **Changes in particle-sized distribution:**
  - ☐ *transition from* _____ to _____
  - ☐ *upper limit of sand-sized particles*
  - ☐ *silt deposits:*

Vegetation Indicators

- ☑ **Change in vegetation type and/or density:** X

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - ☑ *vegetation absent to:* deciduous trees
  - ☐ *moss to:*
  - ☐ *forbs to:*
  - ☐ *graminoids to:*
  - ☐ *woody shrubs to:*
  - ☐ *deciduous trees to:*
  - ☐ *coniferous trees to:*
- ☐ **Vegetation matted down and/or bent:**
- ☐ **Exposed roots below intact soil layer:**

Ancillary indicators

- ☑ **Wracking/presence of organic litter:**
- ☐ **Presence of large wood:**
- ☑ **Leaf litter disturbed or washed away:**
- ☐ **Water staining:**
- ☐ **Weathered clasts or bedrock:**

Other observed indicators? Describe:

Project ID #: Project Bluestem

Step 4 Is additional information needed to support this determination? ☐ Yes ☑ No If yes, describe and attach information to datasheet:

Step 5 Describe rationale for location of OHWM

The OHWM was observed where vegetation on the bank started to establish. Below the OHWM, little to no vegetation was established.

Additional observations or notes

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☐ Yes ☑ No If no, explain why not: Included in wetland report.

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description

Appendix E: Photos



Kimley»Horn

0 100 200 US Feet

N

Appendix E. Photo Locations Map

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo, LLC



Photo 1: Facing north, near SP-1.



Photo 2: Facing west over Ephemeral Stream 1, near OHWM-1.



Photo 3: Facing west over Ephemeral Stream 1, towards offsite.



Photo 4: Facing east over Ephemeral Stream 1.



Photo 5: Facing north, site overview.



Photo 6: Facing north, site overview.



Photo 7: Facing west, site overview.



Photo 8: Facing east, site overview.



Photo 9: Facing south, site overview.

Aquatic Resources Delineation Report

Project Bluestem

Townships of Tonganoxie and Stranger

Leavenworth County, Kansas

Prepared for:

Sarah Allen
Western Meadowlark ProjectCo, LLC

Prepared by:

Kimley-Horn and Associates, Inc.
570 East Lake Cook Road
Deerfield, IL 60015

July 2026

Kimley»Horn

Table of Contents

1 Introduction 1
2 Project Description 1
3 Statement of Qualifications 1
4 Regulatory Requirements 2
4.1 State and Federal Regulations 2
4.2 Local Regulations 2
5 Mapping and Background Information 3
5.1 Topography 3
5.2 National Wetlands Inventory 3
5.3 National Hydrography Dataset 4
5.4 Soil Survey 4
5.5 Federal Emergency Management Agency Floodplain 4
5.6 Aerial/Satellite Imagery Review 5
5.7 Climactic Conditions 5
6 Field Investigation 5
7 Summary of Results 7
8 Report Preparation 15
9 Conclusion 15
10 Disclaimer 15
References 16

List of Tables

Table 1: Wetland Delineation Summary 7
Table 2: Surface Waters Delineation Summary 13
Table 3: Ephemeral Streams Delineation Summary 14

List of Figures

Figure 1: Project Location
Figure 2: USGS Topographic Map
Figure 3: NWI, NHD, 2-ft Contours
Figure 4. Hydric Soils Rating
Figure 5. FEMA 100-Year Floodplain
Figure 6. Delineation Summary

Appendices

Appendix A: Hydric Soils Information
Appendix B: Historic Aerial Review
Appendix C: Precipitation Data
Appendix D: Field Data Sheets
Appendix E: Photos

1 Introduction

Wetland scientists, Michael Jochheim, Ford Kern and Parker Evans with Kimley-Horn and Associates, Inc. (Kimley-Horn) conducted an aquatic resource investigation and field delineation for Western Meadowlark ProjectCo, LLC (Client) and the Project Bluestem Project in the townships of Tonganoxie and Stranger, Leavenworth County, Kansas (Sections 21, 22, 27, and 28, Township 11S, Range 21E).

According to the Leavenworth County, Kansas Integrity Parcel Viewer, the aquatic resource investigation and delineation included portions of parcel numbers 1982800000003000, 1952200000004000, 1982700000002000, and 1982800000001000 encompassing approximately 1,136 acres (the "study area"). For the purposes of this report, parcel groupings are referenced herein as "sections," with the southern section bounded to the west by 222nd Street and the south by Hemphill Road, the central section bounded to the west by 222nd Street and north by Honey Creek Road, and the eastern section bounded to the north by Honey Creek Road and east by 206th Street. The study area is depicted in **Figure 1.** Existing land cover within the study area includes pasture/hay, livestock grazing, deciduous forest corridors, open water, and riparian areas. The study area lies in the Pony Creek-Ninemile Creek Watershed (Hydrologic Unit Code [HUC] 102701040406), Sarcoxie School-Stranger Creek Watershed (Hydrologic Unit Code [HUC] 102701040407), and the Tonganoxie Creek Watershed (Hydrologic Unit Code [HUC] 102701040404), sub watersheds of the Kansas Watershed (HUC 10270104).

A routine level 2 (onsite) aquatic resource delineation, as outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)* of the *1987 Corps of Engineers Wetlands Delineation Manual* (*January 1987*) and the *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (Final Version 2025),* was conducted for the central section on December 17 and 18, 2025. Additional mobilizations for the southern and eastern sections occurred on May 11-13, 2026, and July15, 2026.

The purpose of this delineation was to identify the extent of wetlands and surface waters within the study area. The information will be used to facilitate project design and determine if aquatic resource impacts are avoidable and/or if minimization of impacts can result from design modifications.

2 Project Description

Western Meadowlark ProjectCo, LLC is proposing to develop an existing agricultural and livestock ranch.

3 Statement of Qualifications

Kimley-Horn has extensive experience completing wetland investigations and delineations across the United States. Kimley-Horn's personnel has been trained to use the *1987 Corps of Engineers Wetlands Delineation Manual (USACE, 1987)* along with the applicable regional supplements. Kimley-Horn has experience completing off-site hydrology analysis, historic aerial reviews, and difficult or atypical situation delineations.

Michael Jochheim has over 12 years of experience in wetland delineation in the Midwest and Great Lakes regions. He holds a B.S. in Conservation Biology and an A.S. in Environmental Science and has completed 40-hour delineation training. Michael specializes in preparing environmental permit applications and documentation for both public and private sector clients, providing practical and reliable solutions for sustainable development.

Ian Van Wazer earned a Bachelor of Science Degree in Natural Resources and Environmental Science from Purdue University and a Professional Certificate in Geographic Information Systems from Harper College. He is an environmental scientist who specializes in wetland delineation, geographic information

systems mapping, NEPA, and tree surveys. He has assisted in the delineation of agricultural fields, roadway corridors, and undeveloped areas for future development and transit projects. He is proficient using ArcGIS to produce client specific exhibits for various project types.

Parker Evans earned a Bachelor of Science in Biology from Colorado State University. He is an environmental analyst who specializes in wetland delineation and habitat assessments. Parker is a trained wetland scientist through The Wetland Training Institute, and has experience with GIS software, Section 7 ESA permitting, and Clean Water Act permitting in multiple states.

Ford Kern earned a Bachelor of Science in Ecosystem Science and Policy from the University of Miami. He is an environmental analyst who specializes in performing Phase I Environmental Site Assessments. Ford has experience working with environmental site assessments, GIS mapping, tree surveys, and wetland delineations in 8 states across the Midwest, Southeast, and Great Plains regions. He is proficient in creating reports to support environmental risk and compliance analysis.

4 Regulatory Requirements

A summary of the permit requirements that may pertain to the project is provided below. Any activity planned within areas identified as wetland must be coordinated with and approved by the appropriate agencies prior to commencement of such activities.

4.1 State and Federal Regulations

The regulatory authority of the U.S. Army Corps of Engineers (USACE) covers Waters of the United States (WOTUS) in accordance with Section 404 of the Clean Water Act (CWA). Generally, the USACE reviews delineations to determine whether wetlands are jurisdictional (i.e., WOTUS). On March 12, 2025, the U.S. Environmental Protection Agency (EPA) and Department of the Army (“the agencies”) announced a joint memorandum issuing guidance to field staff on implementation of the continuous surface connection requirement under the CWA. The final ruling is pending as of the date of this report.

Based on the March 2025 ruling, the Clean Waters Act’s use of “waters” encompasses only relatively permanent, standing, or continuously flowing bodies, ordinarily called streams, oceans, rivers, and lakes. Wetlands qualify as WOTUS only if “indistinguishable from waters of the United States,” having a continuous surface connection to bodies that are waters of the United States in their own right, with no clear division between waters and wetlands. USACE retains the authority to make final decisions regarding federal jurisdiction of aquatic resources. Obtaining a jurisdictional determination (JD) from the USACE clarifies the scope of federal jurisdiction over delineated aquatic resources and identifies which resources are subject to CWA regulations.

Section 10 of the Rivers and Harbors Act requires that regulated activities conducted below the ordinary high-water mark elevation of navigable Waters of the U.S. or mean high water mark for tidal waters be approved/permitted by the USACE. Regulated activities include the placement/removal of structures, work involving dredging, disposal of dredged material, filling, excavation, or any other disturbance of soils/sediments or modification of a navigable waterway. Navigable Waters of the U.S. are those waters that are subject to the ebb and flow of the tide shoreward to the mean high-water mark and/or are presently used or have been used in the past or may be susceptible to use to transport interstate or foreign commerce.

At this time, Kansas does not regulate wetlands beyond Section 404 of the CWA and does not require setback buffers for wetlands on private land.

4.2 Local Regulations

At this time, based on publicly available information, the townships of Tonganoxie and Stranger and Leavenworth County do not regulate wetlands or require setback buffers for wetlands.

5 Mapping and Background Information

Prior to field reconnaissance, potential wetland areas within the project study area were identified through a desktop review of United States Geological Survey (USGS) topographic maps, National Wetlands Inventory (NWI), National Hydrography Dataset (NHD), LiDAR data, the National Resources Conservation Service's (NRCS) soil survey for Leavenworth County, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), aerial photography, and antecedent precipitation data. The selected resources are described below.

5.1 Topography

The Tonganoxie 7.5-minute USGS topographic map and 2-foot contours derived from a digital elevation model (DEM) from USGS were reviewed for the study area. According to the USGS topographic map (**Figure 2**), the central section study area is depicted as undeveloped, partially wooded land with an unnamed road depicted in the northwestern portion and eight ponds depicted throughout the study area. Three intermittent streams, two located in the northern portion and one located in the southeastern portion, are depicted within the study area. A wetland area is depicted in the southern portion of the study area. The 2-foot contour data depict the study area as topographically complex but generally sloping away from a raised area in the northcentral portion of the study area towards the southwest. The study area ranges from 896 feet (above mean sea level) to 1010 feet (**Figure 3**).

The USGS topographic map depicted the eastern and southern sections of the study area as partially pastureland and partially wooded land with numerous structures throughout. 11 ponds are also depicted throughout the study areas. Four unnamed intermittent streams, three located in the eastern section and one located in the southern section, are depicted within the study area. Additionally, Cow Creek is depicted in the southwestern portion of the southern section study area. The 2-foot contour data depicts these study areas as topographically complex but generally sloping away from a raised area in the northeastern portion of the southern section and generally sloping away from the central portion of the eastern section north and south. These study areas range from 858 feet (above mean sea level) to 994 feet.

5.2 National Wetlands Inventory

NWI mapping, available from the U.S. Fish and Wildlife Service (USFWS) Wetland Mapper, depicts potential wetland areas and waterbodies based on stereoscopic analysis of high altitude and aerial photographs. Wetland and surface waters are classified according to the Cowardin system by examining vegetation, hydrology, and geographic features. The USFWS notes that using aerial photographs for wetland delineation can have a margin of error. Consequently, boundaries defined by this method may be adjusted through on-the-ground surveys or historical site analysis.

The NWI map depicts 15 wetland features within the central section study area, including seven Palustrine, Aquatic Bottom, Semipermanently Flooded, Diked/Impounded (PADBFh) wetlands, four Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC) wetlands, two Palustrine, Emergent, Persistent, Semipermanently Flooded, Diked/Impounded (PEM1FH) wetlands, one Palustrine, Emergent, Persistent, Seasonally Flooded, Diked/Impounded (PEM1Ch) wetland, and one Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded (R5UBH) wetland (**Figure 3**).

The NWI map depicts 24 wetland features within the eastern and southern section study areas, including 12 Palustrine, Aquatic Bottom, Semipermanently Flooded, Diked/Impounded (PADBFh) wetlands, six Riverine, Intermittent, Streambed, Seasonally Flooded (R4SBC) wetlands, one Palustrine, Emergent, Persistent, Semipermanently Flooded, Diked/Impounded (PEM1FH) wetlands, one Palustrine, Emergent, Persistent, Seasonally Flooded, Diked/Impounded (PEM1Ch) wetland, one Palustrine, Emergent, Persistent, Temporarily Flooded wetland (PEM1A), and two Palustrine, Forested, Temporarily Flooded wetlands (PFOA).

5.3 National Hydrography Dataset

The NHD, available from USGS, depicts drainage networks and related features, including rivers, streams, canals, lakes, and ponds. The NHD dataset is not field verified.

According to NHD mapping, there are eight identified waterbodies and two identified drainage features located within the central section study area. These mapped NHD features generally align with those features mapped by the NWI for the central section (**Figure 3**).

According to NHD mapping, there are twelve identified waterbodies and two identified drainage features located within the eastern and southern study areas. These mapped NHD features generally align with those features mapped by the NWI for the eastern and southern sections.

5.4 Soil Survey

The NRCS *National Hydric Soil List* provides a hydric rating for soils and indicates the component representative percentage of map units that meet the criteria for hydric soils. The NRCS *Web Soil Survey* categorizes soils by hydric rating for each soil unit within the study area. The *Web Soil Survey* categorizes soils by hydric rating into five classes: zero percent, one to 32 percent, 33 to 65 percent, 66 to 99 percent, and 100 percent.

According to the web soil survey reviewed for Leavenworth County, there are eight soil mapping units within the central section study area, which are generally clay loams with some silt loam and silty clay loam. Approximately 41.5% of the study area was mapped as containing hydric inclusions that represent zero percent of the soil type. These soils have a very low likelihood of being hydric within the specific landforms listed in the web soil survey report. Approximately 58.5% of the study area was mapped as containing hydric inclusions that represent one to 32 percent of the soil type. These soils have a low likelihood of being hydric within the specific landforms listed in the web soil survey report.

There are 15 soil mapping units within the eastern and southern section study area, which are generally clay loams with some silt loam, silty clay loam, and loam. Approximately 61.6% of the study area was mapped as containing hydric inclusions that represent zero percent of the soil type. These soils have a very low likelihood of being hydric within the specific landforms listed in the web soil survey report. Approximately 38.4% of the study area was mapped as containing hydric inclusions that represent one to 32 percent of the soil type. These soils have a low likelihood of being hydric within the specific landforms listed in the web soil survey report.

Maps and information obtained from the NRCS online web soil survey are included in **Figure 4** and **Appendix A**.

5.5 Federal Emergency Management Agency Floodplain

The *FEMA Flood Insurance Rate Map* (FIRM) illustrates various flood risk zones and provides vital information about the likelihood of flooding. This map highlights Special Flood Hazard Areas (SFHAs).

According to FEMA, the central section study area is located in Zone X of panel 20103C0325G (effective July 16, 2015), which is outside the designated 100-year floodplain zones (**Figure 5**).

The entirety of the eastern and southern section study areas fall within flood panel 20103C0325G (effective July 16, 2015). The eastern section and the the vast majority of the southern section study area is located in Zone X, which is outside the designated 100-year floodplain zones. The southwestern portions of the southern study area are located in Zone A of panel 20103C0325G, which is within a designated 100-year floodplain zone. These flood areas are generally associated with Cow Creek.

5.6 Aerial/Satellite Imagery Review

Kimley-Horn reviewed available aerial/satellite imagery acquired from Google Earth to identify the potential presence of surface water and/or wetland habitats occurring in the study areas. Numerous aerial/satellite images from Google Earth were reviewed between 1991 and 2022, with selected imagery available in **Appendix B**. These aerial/satellite images were used to determine the potential presence of wetland hydrology or other potential surface waters and wetland habitat signatures (e.g., signs of inundation and saturation).

Review of aerial imagery identified several aquatic resources potentially present within the study areas. All areas evaluated during the aerial/satellite review were assessed during the field investigation. All ponds, intermittent streams, and perennial streams were delineated as Surface Waters. All other aquatic resources were delineated as Wetlands or Ephemeral Streams.

5.7 Climactic Conditions

The USACE Antecedent Precipitation Tool (APT) analyzes and evaluates precipitation conditions leading up to the date of a field investigation. This tool was developed to ensure accurate hydrological assessments, which are crucial for identifying wetlands. The APT works by collecting historical precipitation data through Wetland Evaluation Technical Support (WETS) tables, from local weather stations over a pre-defined period, typically 30 days prior to the site visit. It calculates the average daily precipitation and compares it to long-term historical averages, using quantile analysis to categorize conditions as above normal, average, or below normal.

Precipitation data for the study area were obtained from the APT. Antecedent precipitation conditions were within normal range during the December 17 and 18, 2025 delineations. Antecedent precipitation conditions were wetter than normal during the May 11-13, 2026 and July15, 2026 delineations. The antecedent precipitation analysis is provided in **Appendix C**.

6 Field Investigation

A routine level 2 (onsite) aquatic resource delineation, as outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)* of the *1987 Corps of Engineers Wetlands Delineation Manual* (*January 1987*) and the *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (Final Version 2025),* was conducted for the central section on December 17 and 18, 2025. Additional mobilizations for the southern and eastern sections occurred on May 11-13, 2026, and July15, 2026

During the field delineation, vegetation, soils, and current hydrologic characteristics were evaluated at each wetland area and area of investigation identified within the study area. Wetland boundaries were digitally recorded with a GPS with sub-meter accuracy until one or more of the three criteria were no longer present. The sample point locations, wetland boundaries, and aquatic resources are shown in **Figure 6**.

In addition to wetlands that were investigated and delineated, non-wetland aquatic features were delineated. Non-wetland aquatic features are defined based on the observation of the following characteristics:

- Flow
    - Perennial: contains water at all times of the year except during extreme drought
    - Intermittent: contains water occasionally or seasonally
    - Ephemeral: contains water only during and immediately after periods of rainfall or snowmelt
- Ordinary High Water Mark (OHWM): The limit line on the shore established by the fluctuation of the water surface. It is shown by such things as a clear line impressed on the bank, shelving,

changes in soil character, destruction of terrestrial vegetation, the presence of litter and debris, or other features influenced by the surrounding area

- Bank Shape
    - Undercut: banks that overhang the stream channel
    - Steep: bank slope of approximately greater than 30 degrees
    - Gradual: bank slope of approximately 30 degrees or less

Sample points were completed for all observed wetlands. The field data sheets are included in **Appendix D**. Study area photos and a photo locations map can be found in **Appendix E**.

7 Summary of Results

Table 1: Wetland Delineation Summary

Resource ID	Wetland Plant Community	Cowardin Classification	Size (acres)	NWI?	Hydric Soils?	Photo ID	Associated Sample Points	NOTES	Regulatory Status[1]
Wetlands									
Wetland 1	Seasonally Flooded Basin	PABFh	0.10	Yes	No	1, 2	Sample Point (SP)-1 (Wet) SP-2 (Up)	Wetland 1, located in a depression within the northern portion of the central section study area, is a seasonally flooded basin. The wetland collects runoff from the surrounding landscape and drains north. The wetland boundary was based on the change in topography and hydrophytic vegetation dominance.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a Traditionally Navigable Water (TNW) or Relatively Permanent Water (RPW).
Wetland 2	Seasonally Flooded Basin	PEM1Fh/ PABFh	0.17	Yes	No	12, 13	SP-4 (Wet) SP-5 (Up)	Wetland 2, located in a depression within the northern portion of the central section study area, is a seasonally flooded basin. The wetland collects runoff from the surrounding landscape and drains north. The wetland boundary was based on the change in topography and hydrophytic vegetation dominance.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Wetland 3	Seasonally Flooded Basin	PABFh/ PEM1Fh	0.20	Yes	No	25, 26, 27, 28	SP-8 (Wet), SP-11 (Wet) SP-9 (Up), SP-10 (Up)	Wetland 3, located in a depression along the eastern portion of the central section study area, is a seasonally flooded basin. The wetland collects runoff from the surrounding landscape and Ephemeral Stream 2 and drains northeast. The wetland boundary was based on the change in topography, presence of hydric soil, and hydrophytic vegetation dominance.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Wetland 4	Seasonally Flooded Basin	R5UBH	0.26	Yes	No	30, 32	SP-12 (Wet) SP-13 (Up)	Wetland 4, located in a depression along the northeastern portion of the central section study area, is a seasonally flooded basin. The wetland collects runoff from the surrounding landscape and drains north into Ephemeral Stream 2. The wetland boundary was based on the change in topography, presence of hydric soil, and hydrophytic vegetation dominance.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Wetland 5	Seasonally Flooded Basin	PABFh	0.73	Yes	No	33, 34	SP-14 (Wet) SP-15 (Up)	Wetland 5, located in a depression along the southeastern portion of the central section study area, is a seasonally flooded basin. The wetland collects runoff from the surrounding landscape and drains northeast. The wetland boundary was based on the change in topography	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.

[1] Regulatory Status is based on best professional judgment and has not been verified with agency staff.

Resource ID	Wetland Plant Community	Cowardin Classification	Size (acres)	NWI?	Hydric Soils?	Photo ID	Associated Sample Points	NOTES	Regulatory Status[1]
								and hydrophytic vegetation dominance.	
Wetland 6	Seasonally Flooded Basin	PABFh/ PEM1Ch	5.45	Yes	No	16, 17	SP-6 (Wet) SP-7 (Up)	Wetland 6, located in a depression along the southern portion of the central section study area, is a seasonally flooded basin. The wetland collects runoff from the surrounding landscape and drains southwest into Ephemeral Stream 3 through Culvert 4. The wetland boundary was based on the change in topography, presence of hydric soil, and hydrophytic vegetation dominance.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Wetland 7	Seasonally Flooded Basin	PABFh	0.35	Yes	No	39, 40	SP-16 (Wet) SP-17 (Up)	Wetland 7, located in a depression along the western portion of the central section study area, is a seasonally flooded basin. The wetland collects runoff from the surrounding landscape and drains southwest. The wetland boundary was based on the change in topography and hydrophytic vegetation dominance.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Wetland 8	Seasonally Flooded Basin	PABFh	0.89	Yes	No	42, 43	SP-18 (Wet) SP-19 (Up)	Wetland 8, located in a depression along the western portion of the central section study area, is a seasonally flooded basin. The wetland collects runoff from the surrounding landscape and drains southwest. The wetland boundary was based on the change in topography, presence of hydric soil, and hydrophytic vegetation dominance.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Wetland 9	Seasonally Flooded Swale/	PEM1C	0.58	Yes	Yes	50, 88	SP-21 (Wet) SP-22 (Up)	Wetland 9 is located in a swale along the eastern portion of the south section study area. The wetland collects runoff from the . surrounding landscape and drains southwest into Surface Water 9. The wetland boundary was based on the change in topography, presence of hydric soils, and the change in vegetation.	USACE Jurisdictional: Wetland 9 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Wetland 10	Seasonally Flooded Depression	PEM1Af	0.47	No	Yes	53	SP-23 (Wet) SP-24 (Up)	Wetland 10, located in a depression and swale along the eastern portion of the south section study area. The wetland collects runoff from the surrounding landscape and drains east through Culvert 7. The wetland boundary was based on the change in topography, presence of hydric soils, and the change in vegetation..	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.

Resource ID	Wetland Plant Community	Cowardin Classification	Size (acres)	NWI?	Hydric Soils?	Photo ID	Associated Sample Points	NOTES	Regulatory Status[1]
Wetland 11	Seasonally Flooded Depression	PEM1Af	0.36	No	Yes	54	SP-25 (Wet) SP-26 (Up)	Wetland 11 is located in a depression along the eastern portion of the south section study area and is north of Wetland 10. The wetland collects runoff from the surrounding landscape. The wetland boundary was based on the change in topography, presence of hydric soil, and the change in vegetation.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Wetland 12	Seasonally Flooded Swale	PEM1C/PSS1C	1.09	No	No	56,58	SP-27 (Wet) SP-28 (Up) SP-29 (Wet)	Wetland 12 is located in a swale along the southern portion of the south section study area. The wetland collects runoff from the surrounding landscape and drains southwest into Surface Water 10. The wetland boundary was based on the change in topography, presence of hydric soil, and the change in vegetation.	USACE Jurisdictional: Wetland 12 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Wetland 13	Seasonally Flooded Depression	PEM1Af	0.07	No	Yes	61	SP-30 (Dry), SP-31 (Wet)	Wetland 13 is located in a depression in the eastern portion of the eastern section study area. The wetland collects runoff from the surrounding landscape. The wetland boundary was based on the change in topography, presence of hydric soil, and the change in vegetation.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Wetland 14	Seasonally Flooded Depression	PEM1C	0.03	Yes	No	62	SP-32 (Wet) SP-33 (Up)	Wetland 14 is located in a depression in the southern portion of the south section of the study area. The wetland is fringe supported by Surface Water 16 and Surface Water 2 through Culverts 9 and10 to the north and Surface Waters 10 from the east. The wetland boundary was based on the change in topography, presence of hydric soil, and the change in vegetation.	USACE Jurisdictional: Wetland 14 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.

Table 2: Surface Water Delineation Summary

Resource ID	Cowardin Code	Size (Acres)	NWI?	Photo ID	Associated Sample Points	NOTES	Regulatory Status[2]
Surface Waters							
Surface Water 1	PABFh	0.84	Yes	64	OHWM point, (OHWM)-6.	Surface Water 1 is a pond located in the northern portion of the south section study area. The resource receives runoff from Ephemeral Stream 11 to the east. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Surface Water 2	RS4BC	2.58	Yes	75, 102	OHWM-17	Surface Water 2 is a pond located in the southern portion of the south section study area. Surface Water 2 receives flow from Surface Water 17 and Ephemeral Streams 8 and 13. Surface Water 2 drains south through Culvert 10 to Surface Water 16. Based on the presence of persistent flowing surface water and defined bed and banks, the feature was identified as a surface water.	USACE Jurisdictional: Surface Water 2 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW
Surface Water 3	PABFh	0.85	Yes	73	OHWM-15	Surface Water 3 is a pond located in the eastern portion of the east section study area. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Surface Water 4	PABFh	0.75	Yes	74	OHWM-16	Surface Water 4 is a pond located in the northern portion of the east section study area. The resource overflows into Ephemeral Stream 6 to the north. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Surface Water 5	PABFh	0.43	Yes	65	OHWM-7	Surface Water 5 is a pond in the northwestern portion of the east section study area. Surface Water 5 collects water from the surrounding landscape and receives runoff from Ephemeral Stream 2 through Culvert 1. Surface Water 5 flows east into Surface Water 13. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Surface Water 6	PABFh	1.08	Yes	66	OHWM-8	Surface Water 6 is a pond in the south-central portion of the east section study area. Surface Water 6 receives runoff from the surrounding landscape. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water. Surface Water 6 was not formally delineated at the time of the site investigation due to restricted access. The boundaries of Surface Water 6 were approximated using site photographs, historic aerial imagery, a digital elevation model (DEM), and 2-foot contour data.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.

[2] Regulatory Status is based on best professional judgment and has not been verified with agency staff.

Resource ID	Cowardin Code	Size (Acres)	NWI?	Photo ID	Associated Sample Points	NOTES	Regulatory Status[2]
Surface Water 7	PABFh	0.40	Yes	67	OHWM-9	Surface Water 7 is a pond located in the southern portion of the east section study area. Surface Water 7 receives runoff from the surrounding landscape Based on the observation of persistent surface water and a defined bank of the basin; the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Surface Water 8	PABFh/PEM1Fh	0.51	Yes	N/A	N/A	Surface Water 8 is a pond in the northeastern portion of the east section study area. Surface water within the pond appeared stagnant during the investigation. Surface Water 8 receives runoff from the surrounding landscape. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water. Surface Water 8 was not formally delineated at the time of the site investigation due to restricted access. The boundaries of Surface Water 8 were approximated using historic aerial imagery, a digital elevation model (DEM), and 2-foot contour data.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.
Surface Water 9	PABFh	1.13	Yes	76	OHWM-18	Surface Water 9 is a flow-through pond located in the northeastern portion of the south section study area. The feature receive flow from Wetland 9 from the northeast and drains southwest to Surface Water 17. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water.	USACE Jurisdictional: Surface Water 9 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Surface Water 10	PABFh	2.56	Yes	77,56,57, 58	OHWM-19	Surface Water 10 is a flow-through pond located in the southern portion of the south section study area. The feature appears to receive flow from Wetland 12 from the northeast and drains southwest through Culvert 9 to Surface Water 16. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water.	USACE Jurisdictional: Surface Water 10 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Surface Water 11	R4SBC	0.02	Yes	85	OHWM-27	Surface Water 11 is a flow-through pond located in the southern portion of the south section study area. The feature receives flow from Surface Water 2 via Culvert 10 and drains south to Surface Water 16. Based on the observation of persistent surface water and a defined bank of the basin, the feature was identified as a surface water.	USACE Jurisdictional: Surface Water 11 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Surface Water 12	R4SBC	0.01	Yes	70,113	OHWM-12	Surface Water 12 is an intermittent stream located in the western portion of the east section study area. The feature receives flow from Ephemeral Stream 2 and Culvert 1 and drains eastward into Surface Water 13. Based on the presence of persistent surface water and a defined bank structure, the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.

Resource ID	Cowardin Code	Size (Acres)	NWI?	Photo ID	Associated Sample Points	NOTES	Regulatory Status[2]
Surface Water 13	R4SBC	0.01	No	72,104	OHWM-14	Surface Water 13 is an intermittent stream located in the western portion of the east section study area. Surface Water 13 receives flow from Surface Water 5 and drains east to Surface Water 21. Based on the presence of persistent surface water and defined bank structure, the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW
Surface Water 14	R4SBC	0.10	No	68	OHWM-10	Surface Water 14 is an intermittent stream located in the southwestern portion of the east section study area. Based on the presence of persistent surface water and defined bank structure, the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW
Surface Water 15	R4SBC	0.44	No	69,109	OHWM-11	Surface Water 15 is an intermittent stream located in the southern portion of the east section study area. Surface Water 15 receives flow from offsite run-off from the west and drains east outside of the study area. Based on the presence of persistent surface water and defined bank structure, the feature was identified as a surface water.	USACE Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW
Surface Water 16	R4SBC	0.21	Yes	81,86,91	OHWM-23 and OHWM-26	Surface Water 16 is an intermittent stream located in the southern portion of the south section study area. Surface Water 16 receives flow from Surface Water 10 to the east via Culvert 13 and 14 and from Surface Water 2 and Surface Water 11 to the north via Culvert 10. The feature continues offsite to the south where it connects with Cow Creek. Based on the presence of persistent surface water and defined bank structure, the feature was identified as a surface water.	USACE Jurisdictional: Surface Water 16 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Surface Water 17	R4SBC	0.91	Yes	82,92,94	OHWM-24	Surface Water 17 is an intermittent stream located in the central portion of the south section study area. Surface Water 17 receives flow from Surface Water 9 and Ephemeral Stream 13 to the north and drains into Surface Water 2 to the south. Based on the observation of persistent surface water and defined bank structure, the feature was identified as a surface water.	USACE Jurisdictional: Surface Water 17 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Surface Water 18	R4SBC	0.13	No	80	OHWM-22	Surface Water 18 is an intermittent stream located in the northwestern portion of the south section study area. Surface Water 18 receives flow from the surrounding landscape and drains southwest into Cow Creek. Based on persistent surface water and defined bank structure, the feature was identified as a surface water.	USACE Jurisdictional: Surface Water 18 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Surface Water 19	R4SBC	0.74	No	84,100	OHWM-25	Surface Water 19 is an intermittent stream located in the western portion of the south section study area. Surface Water 19 receives flow from Surface Water 20 to the north and drains southwest to Cow Creek. Based on the presence of persistent surface water and defined bank structure,	USACE Jurisdictional: Surface Water 19 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.

Resource ID	Cowardin Code	Size (Acres)	NWI?	Photo ID	Associated Sample Points	NOTES	Regulatory Status[2]
						the feature was identified as a surface water.	
Surface Water 20	R4SBC	0.14	No	N/A	OHWM-3	Surface Water 20 is an intermittent stream located in the northern portion south section study area. Surface Water 20 receives flow from the surrounding landscape and drains southwest into Surface Water 19. Based on the presence of persistent surface water and defined bank structure, the feature was identified as a surface water.	USACE Jurisdictional: Surface Water 20 appears to have a continuous surface connection to Cow Creek, an RPW, which drains into the Kansas River, a TNW.
Surface Water 21	PEM1A	0.33	Yes	71,105,114	OHWM-13	Surface Water 21 is an intermittent stream located in the northern portion of the east section study area. The feature receives flow from Surface Water 13 from the west and drains northeast outside of the study area via Culvert 12. Based on the presence of persistent surface water, observable ponding, and bank structure, the feature was identified as a surface water.	Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW
Cow Creek	R4SBC	2.90	Yes	78,79,87, 95,96,97	OHWM-20, OHWM-21	Cow Creek is located in the western portion of the south study area. Cow Creek receives run-off from the surrounding landscape and adjacent wetlands and surface waters. Due to the observation of persistent surface water and defined bank structure, Cow Creek was identified as a surface water.	USACE Jurisdictional: Cow Creek appears to have a continuous surface connection to Stranger Creek, an RPW, which drains into the Kansas River, a TNW.
Surface Water 23	PABFh	0.45	Yes	N/A	N/A	Surface Water 23 is a pond located in the southeastern portion of the south section study area. Surface Water 23 was not delineated on the site visit due to restricted access. The boundaries of Surface Water 23 were approximated using historic aerial imagery, a digital elevation model (DEM), and 2-foot contour data. Surface Water 23 appears to collect run-off from the surrounding area.	Non-Jurisdictional: The resource does not appear to have a continuous surficial connection to a TNW or RPW.

Table 3: Ephemeral Streams Delineation Summary

Resource ID	Size (linear feet)[3]	Photo ID	NOTES
Ephemeral Streams			
Ephemeral Stream 1	1,808	3-10	Ephemeral Stream 1 flows south to northeast through the northwestern portion of the study area. The stream collects drainage from adjacent uplands and drains offsite.
Ephemeral Stream 2	1,229	21-24, 27, 29	Ephemeral Stream 2 flows south to northeast through the western portion of the study area. The stream collects drainage from adjacent uplands and Wetlands 3 and 4 and runoff from 214th St. via Culvert 2. The stream drains northeast toward an offsite wetland located on the adjacent property to the east.
Ephemeral Stream 3	94	14, 15	Ephemeral Stream 3 flows north to southwest through the southern portion of the study area. The stream collects drainage from adjacent uplands and a culvert at the northern extent of the stream and drains offsite.
Ephemeral Stream 4	442	108	Ephemeral Stream 4 is located in the southern portion of the northern portion of the east section study area. Based on the observed topography and channel morphology, surface wat er is interpreted to flow from south to north and discharge into Surface Water 15 during and shortly following precipitation events
Ephemeral Stream 5	990	111	Ephemeral Stream 5 is located in the central portion of the east section of the study area. Based on the observed topography and channel morphology, surface water is interpreted to flow from northwest to southeast during and shortly following precipitation events.
Ephemeral Stream 6	708	106	Ephemeral Stream 6 is located along a backslope in the northern portion of the east section study area. Based on the observed change in topography and channel morphology, surface water is interpreted to flow from Surface Water 4 in the south and discharge into Surface Water 21 in the north during and shortly following precipitation events.
Ephemeral Stream 7	394	110	Ephemeral Stream 7 is located within the southwestern portion of the east section study area. Based on the observed change in topography and channel morphology, surface water is interpreted to flow from northwest to southeast during and shortly following precipitation events.
Ephemeral Stream 8	387	93	Ephemeral Stream 8 is located in the central portion of the south section study area. Based on the observed change in topography and channel morphology, surface water is interpreted to flow from north to south and discharge into Surface Water 17 during and shortly following precipitation events.
Ephemeral Stream 9	848	98	Ephemeral Stream 9 is located along a backslope in the western portion of the south section study area. Based on the observed change in topography and channel morphology, surface water is interpreted to flow east to west and discharge into Cow Creek during and shortly following precipitation events.
Ephemeral Stream 10	41	107	Ephemeral Stream 10 is located in the southern portion of the east section study area. Based on the observed change in topography and channel morphology, surface water in interpreted to flow southwest to northeast and discharge into Surface Water 15 during and shortly following precipitation events.
Ephemeral Stream 11	336	101,112	Ephemeral Stream 11 is located along a head slope in the northern portion of the south section study area. Based on the observed change in topography and channel morphology, surface water is interpreted to flow east to west and discharge into Surface Water 1 during and shortly following precipitation events.
Ephemeral Stream 12	330	59	Ephemeral Stream 12 is located along a backslope in the northeast corner of the east sectio study area. Based on the change in topography and channel morphology, surface water is interpreted to flow southeast to northwest during and shortly following precipitation events.
Ephemeral Stream 13	144	83	Ephemeral Stream 13 is located in the central portion of the south section study area. Based on the change in topography and channel morphology, surface water is interpreted to flow north to south and discharging into Surface Water 17 following precipitation events.

[3] Size of non-wetland, linear features provided in linear feet within the study area.

8 Report Preparation

The procedures followed for this wetland delineation are in accordance with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010) of the *Corps of Engineers Wetlands Delineation Manual: Midwest Region (Version 2.0) (August 2010).*

This report describes study area conditions for a specific date in time and is generally valid for a period of five years from the date of the final field investigation and delineation, which was May 11-13, 2026, and July15, 2026.

9 Conclusion

The field delineation identified 14 wetlands, 23 surface waters, and 13 ephemeral streams within the study areas. Each of the delineated resources are described in **Tables 1-3**. Based on Kimley-Horn's best professional opinion, three of the wetlands and ten of the surface waters are anticipated to be USACE-jurisdictional. The USACE makes all final jurisdictional determinations. Any work that includes dredge or fill of wetlands or surface waters, or significantly alters drainage, may require a permit from the USACE.

10 Disclaimer

Kimley-Horn has prepared this document based on limited field observations and our interpretation, as scientists, of applicable regulations and agency guidance. While Kimley-Horn believes our interpretation to be accurate, final authority to interpret the regulations lies with the appropriate regulatory agencies. Regulatory agencies occasionally issue guidance that changes the interpretation of published regulations. Guidance issued after the date of this report has the potential to invalidate our conclusions and/or recommendations and may cause a need to reevaluate our conclusions and/or recommendations.

Because Kimley-Horn has no regulatory authority, the Client understands that proceeding based solely upon this document does not protect the Client from potential sanction or fines from the applicable regulatory agencies. The Client acknowledges that they have the opportunity to submit documentation to the regulatory agencies for concurrence prior to proceeding with any work. If the Client elects not to do so, then the Client proceeds at their sole risk.

References

ESRI, Maxar, Earthstar Geographics, and the GIS User Community. *Imagery Map Hybrid*. Available at https://www.arcgis.com/home/item.html?id=86265e5a4bbb4187a59719cf134e0018, accessed July 2026.

Federal Emergency Management Agency. *Flood Insurance Rate Maps*. Available at https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd, accessed July 2026.

Leavenworth County. *Code of Ordinances*. Accessed at https://library.municode.com/ks/leavenworth/codes/code_of_ordinances, accessed July 2026.

Leavenworth County. *Leavenworth County, KS GIS.* Accessed at https://leavenworthgis.integritygis.com/H5/Index.html?viewer=leavenworth, accessed January 2026.

Natural Resources Conservation Service, U.S. Department of Agriculture. *Web Soil Survey*. Available at http://websoilsurvey.nrcs.usda.gov, accessed July 2026.

NearMap US Inc., MapBrowser. Available at https://www.nearmap.com/us/en, accessed July 2026.

U.S. Army Corps of Engineers. *Antecedent Precipitation Tool*. Available at https://www.epa.gov/wotus/antecedent-precipitation-tool-apt, accessed July 2026.

U.S. Army Corps of Engineers. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. January 1987. Available at http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/1987%20Manual.pdf.

U.S. Army Corps of Engineers. *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Final Version (January 2025).* Available at https://erdc-library.erdc.dren.mil/items/76c61f8f-6d75-4a35-aaf3-39aa64918afb

U.S. Army Corps of Engineers. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (August 2010)*. Available at http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/.

U.S. Department of Agriculture Natural Resources Conservation Service. *NRCS Online Climate Data Retrieval System Wets Tables*. Available at https://agacis.rcc-acis.org, accessed July 2026.

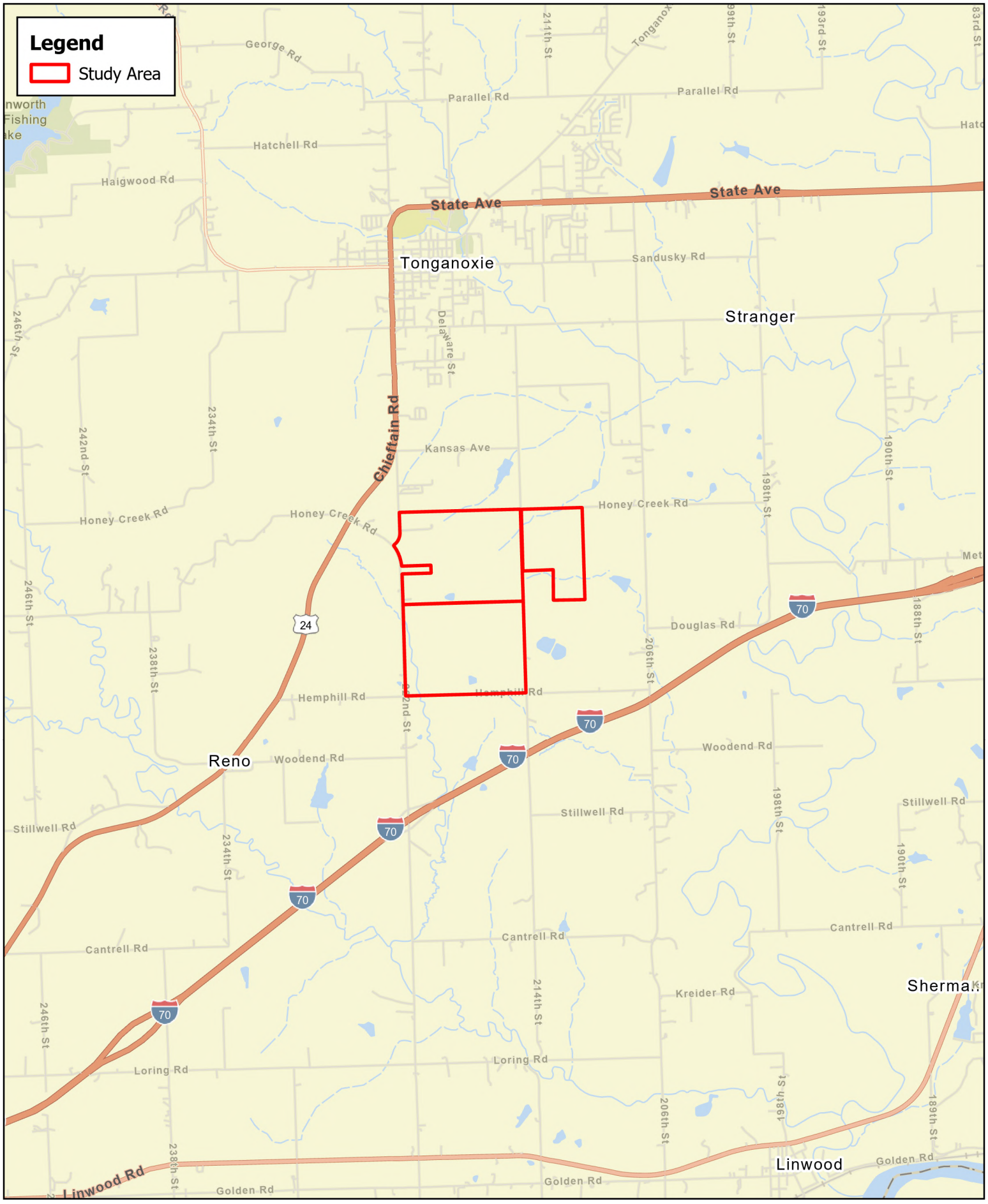
U.S. Fish and Wildlife Service. *Wetlands Online Mapper*. National Wetland Inventory mapping. Available at http://www.fws.gov/wetlands/Data/Mapper.html, accessed July 2026.

U.S. Geological Survey. *LiDAR Data*. Acquired via *The National Map*, accessed July 2026.

U.S. Geological Survey. *National Hydrography Dataset*. Acquired via The National Map at https://apps.nationalmap.gov/downloader/#/, accessed July 2026.

U.S. Geological Survey. *Topographical Map*. Accessed via ESRI at http://www.arcgis.com/home/item.html?id=30e5fe3149c34df1ba922e6f5bbf808f and via Topo View at https://ngmdb.usgs.gov/topoview/viewer/#4/40.01/-100.06, accessed July 2026.

Figures

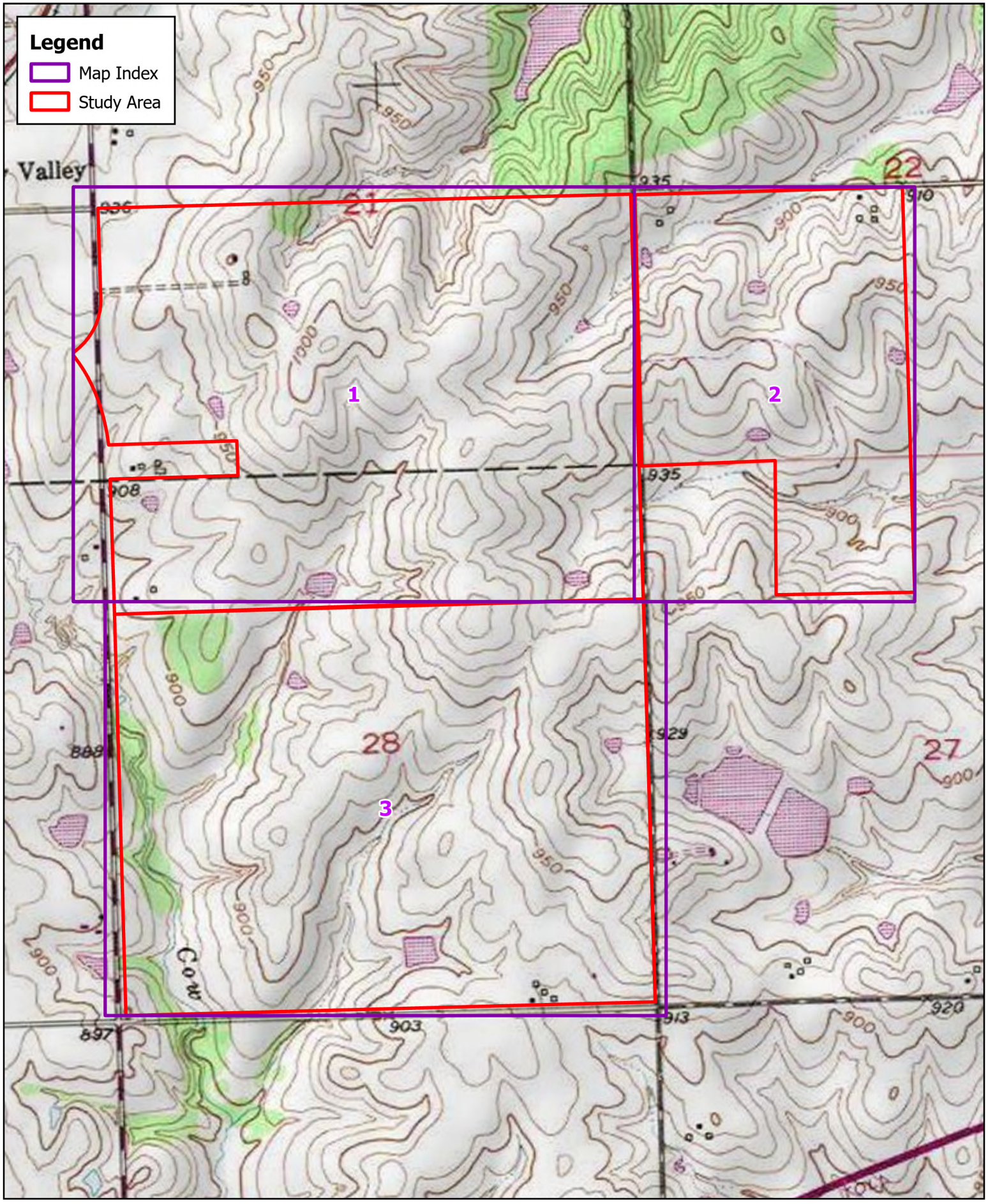


Kimley»Horn

0 0.5 1 Miles

N

Figure 1. Project Location
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



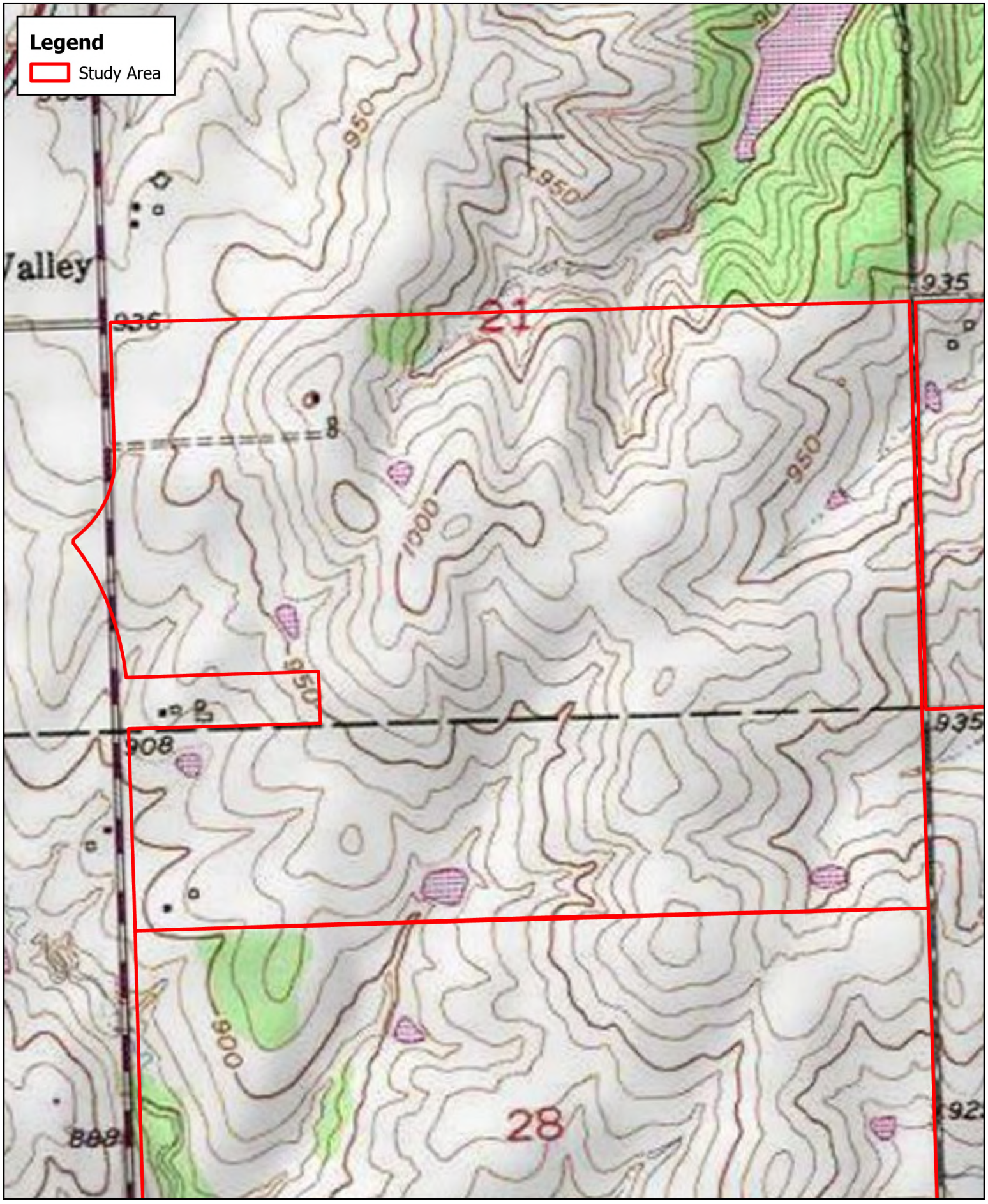
Kimley»Horn

0 600 1,200 US Feet

N

Figure 2 USGS Topographic Map - Overview

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

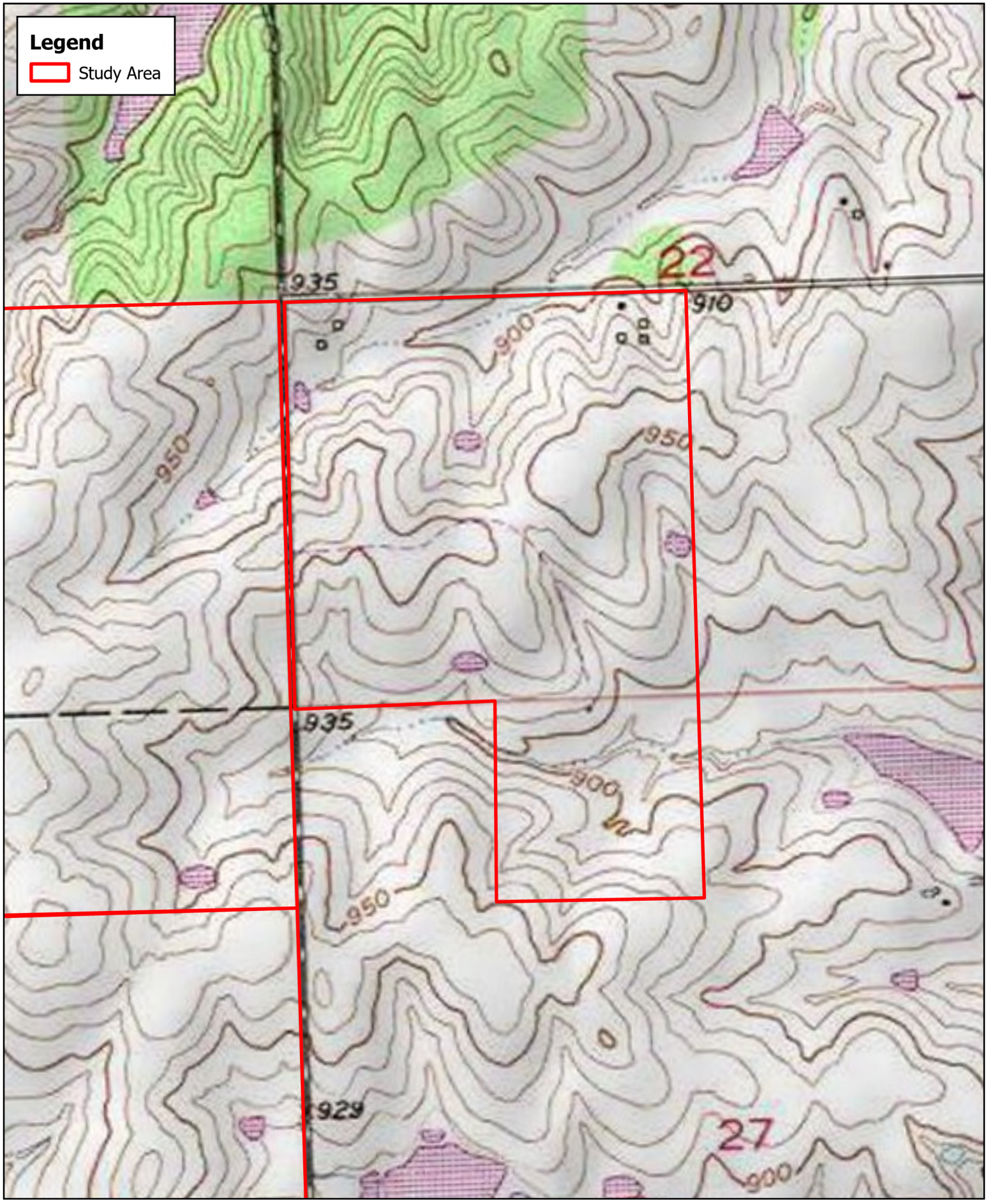


Kimley»Horn

0 400 800 US Feet

N

Figure 2.1 USGS Topographic Map
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

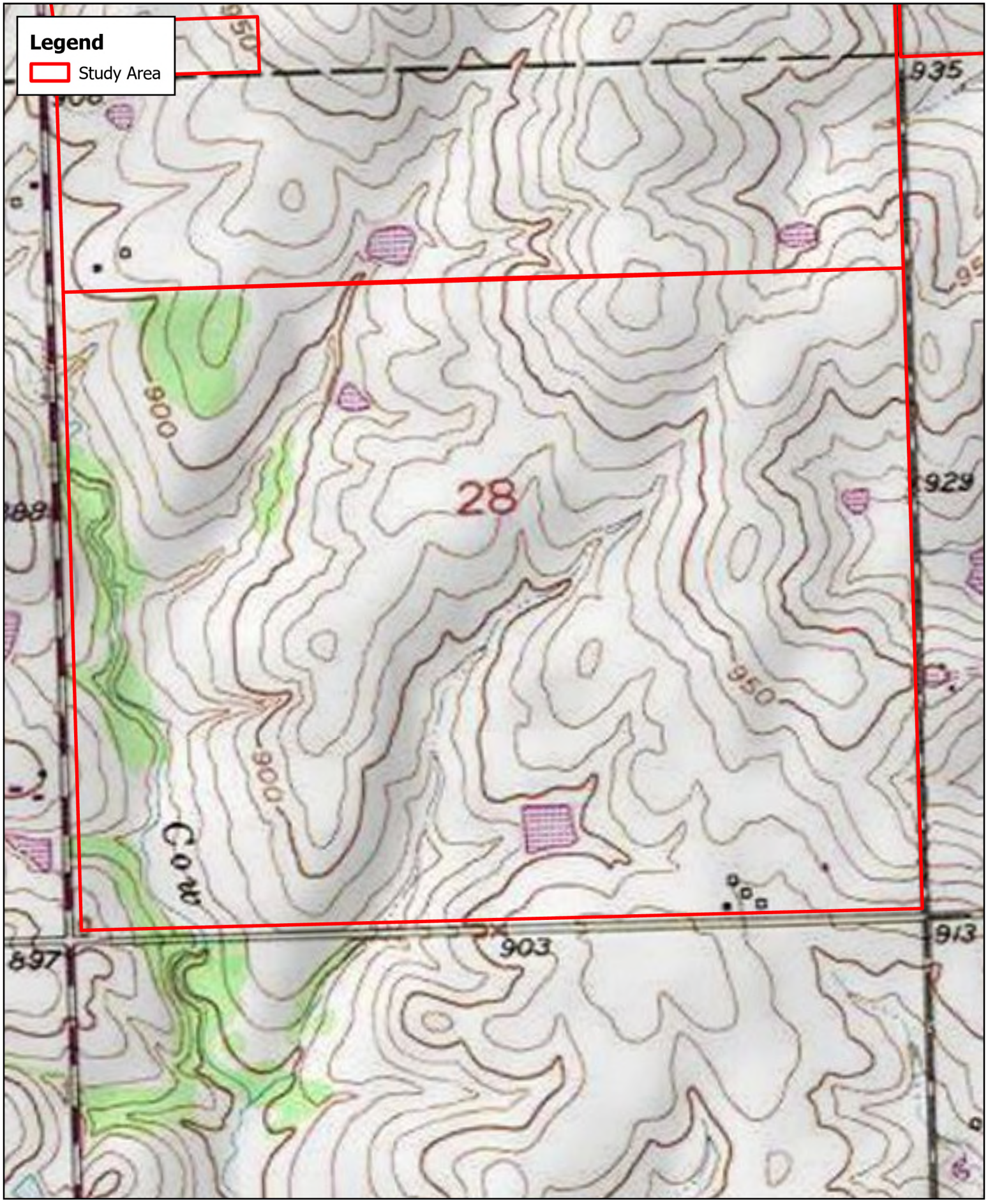


Kimley»Horn

0 400 800 US Feet

N

Figure 2.2 USGS Topographic Map
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

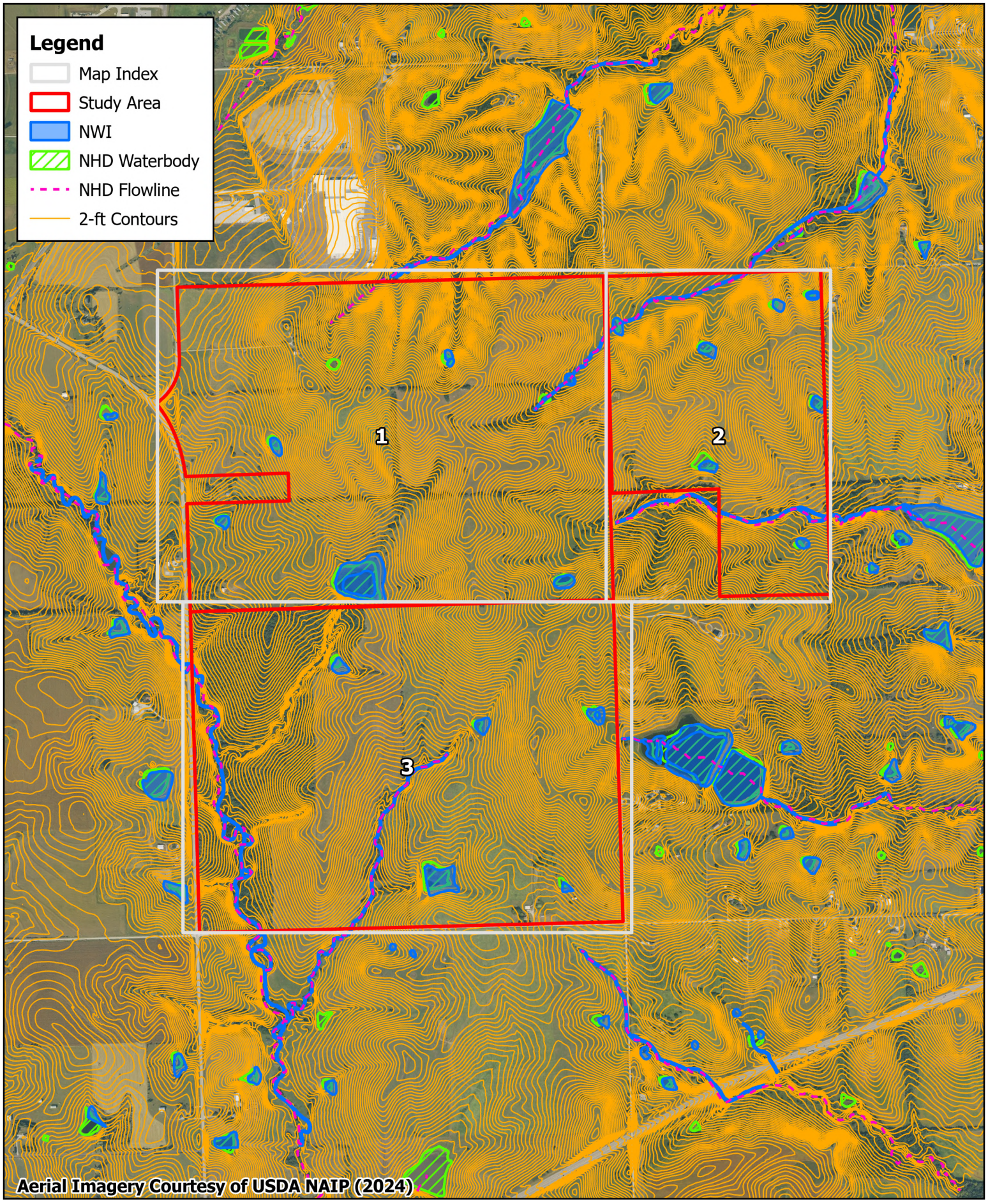


Kimley»Horn

0 400 800 US Feet

N

Figure 2.3 USGS Topographic Map
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



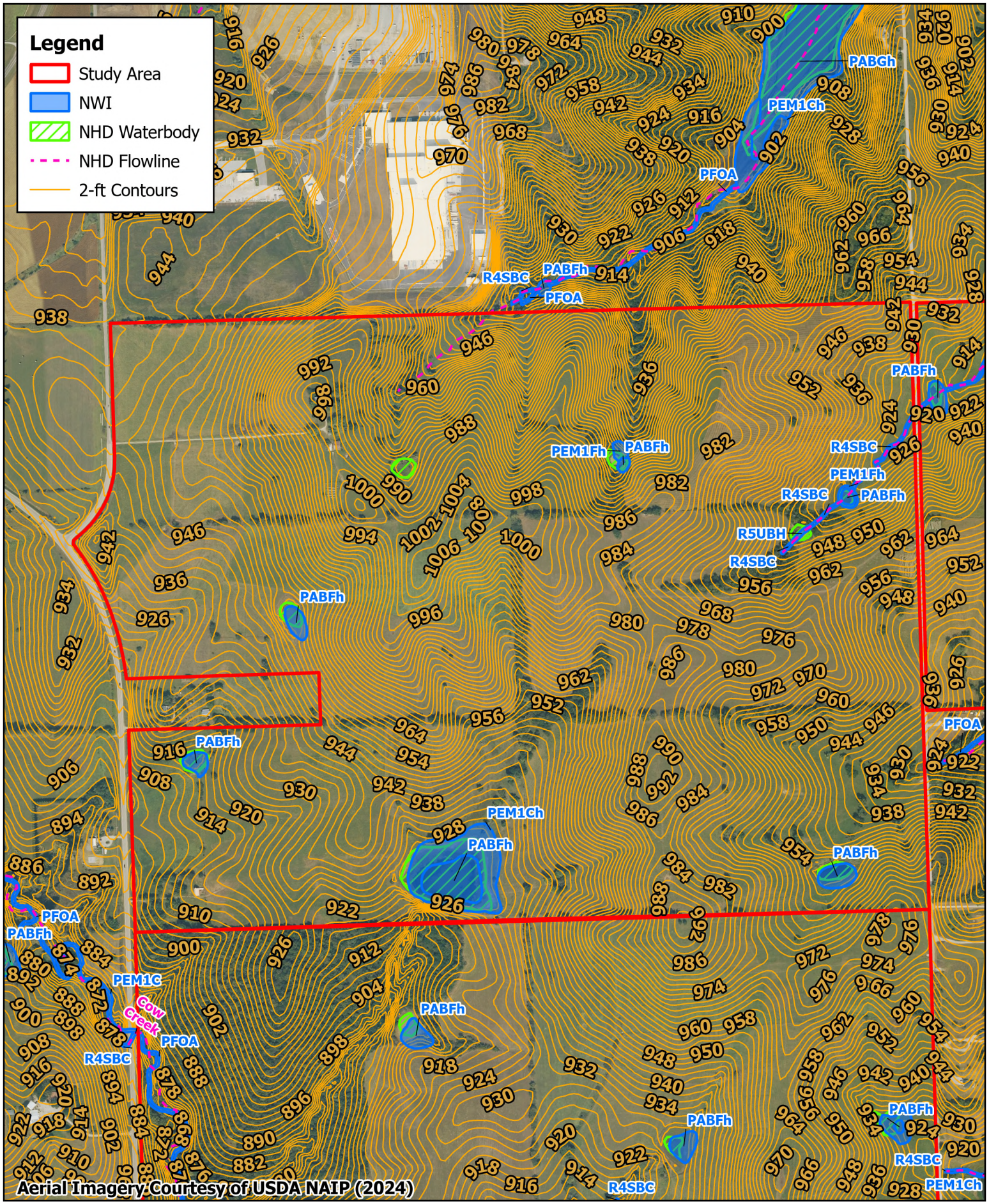
Kimley»Horn

0 750 1,500 US Feet

N

Figure 3. NWI, NHD, 2-ft Contours - Overview

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

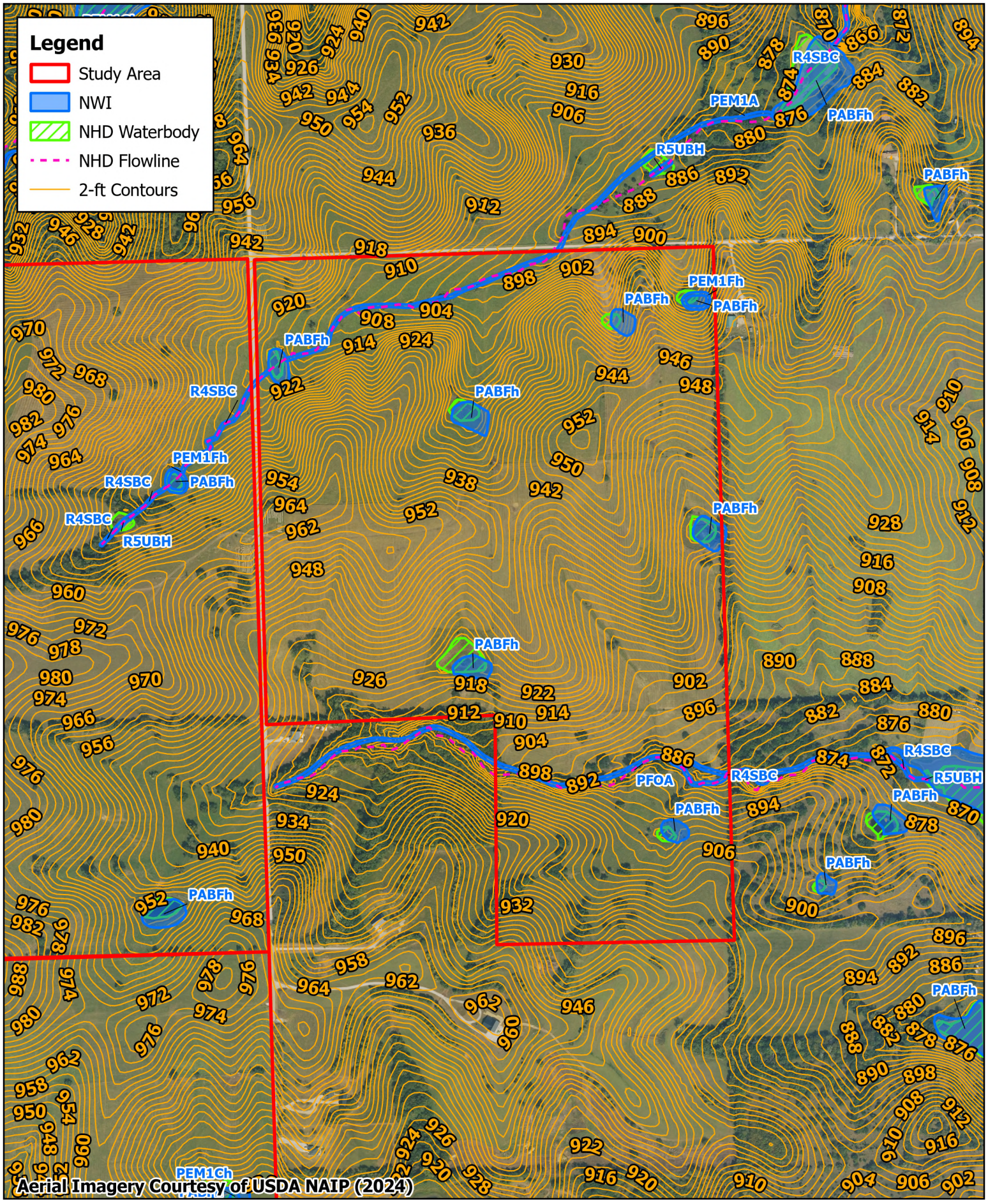


Kimley»Horn

0 400 800 US Feet

N

Figure 3.1 NWI, NHD, 2-ft Contours
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

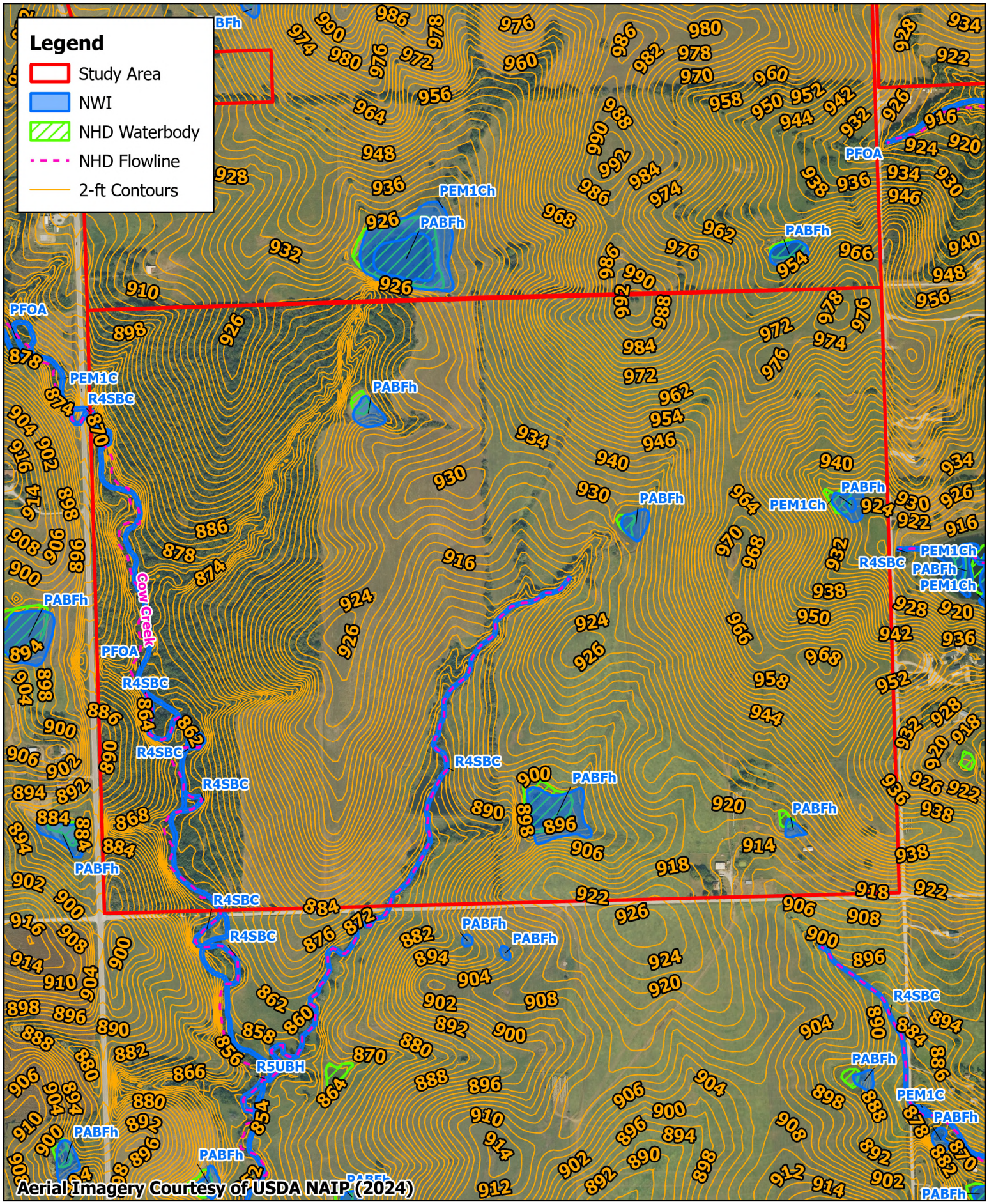


Kimley»Horn

0 350 700 US Feet

N

Figure 3.2 NWI, NHD, 2-ft Contours
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

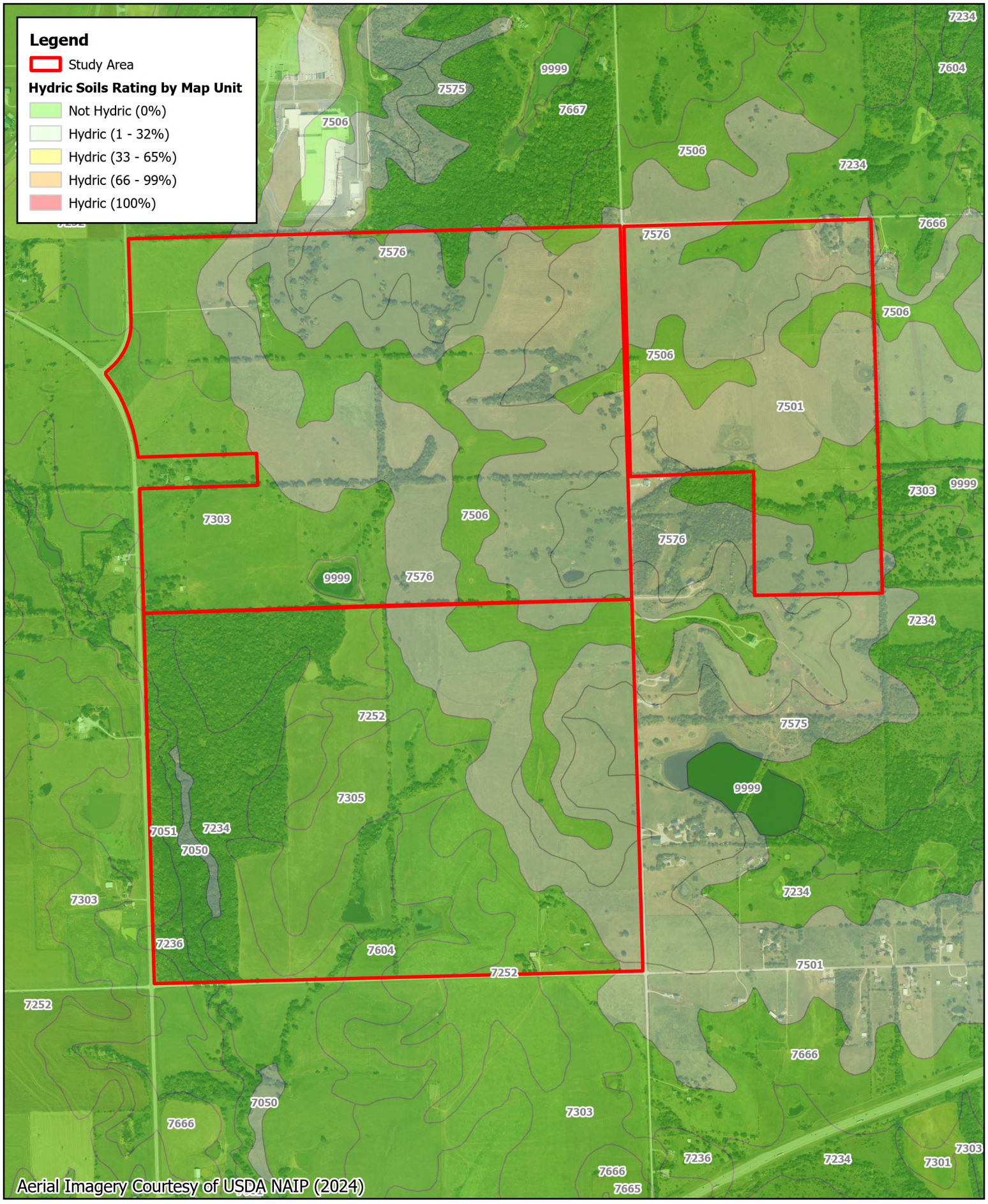


Kimley»Horn

0 400 800 US Feet

N

Figure 3.3 NWI, NHD, 2-ft Contours
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

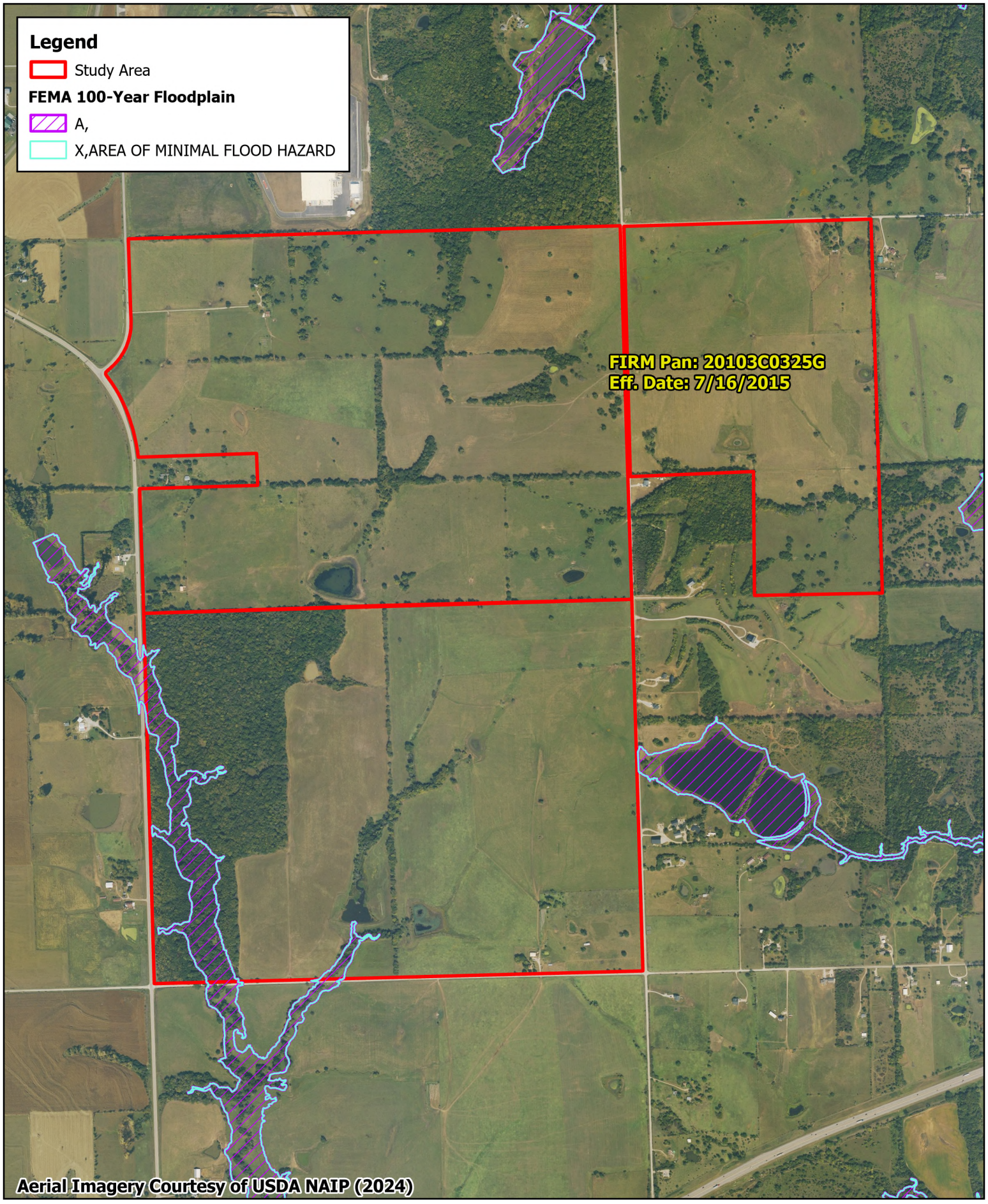


Kimley»Horn

0 650 1,300 US Feet

N

Figure 4. Hydric Soils Rating
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

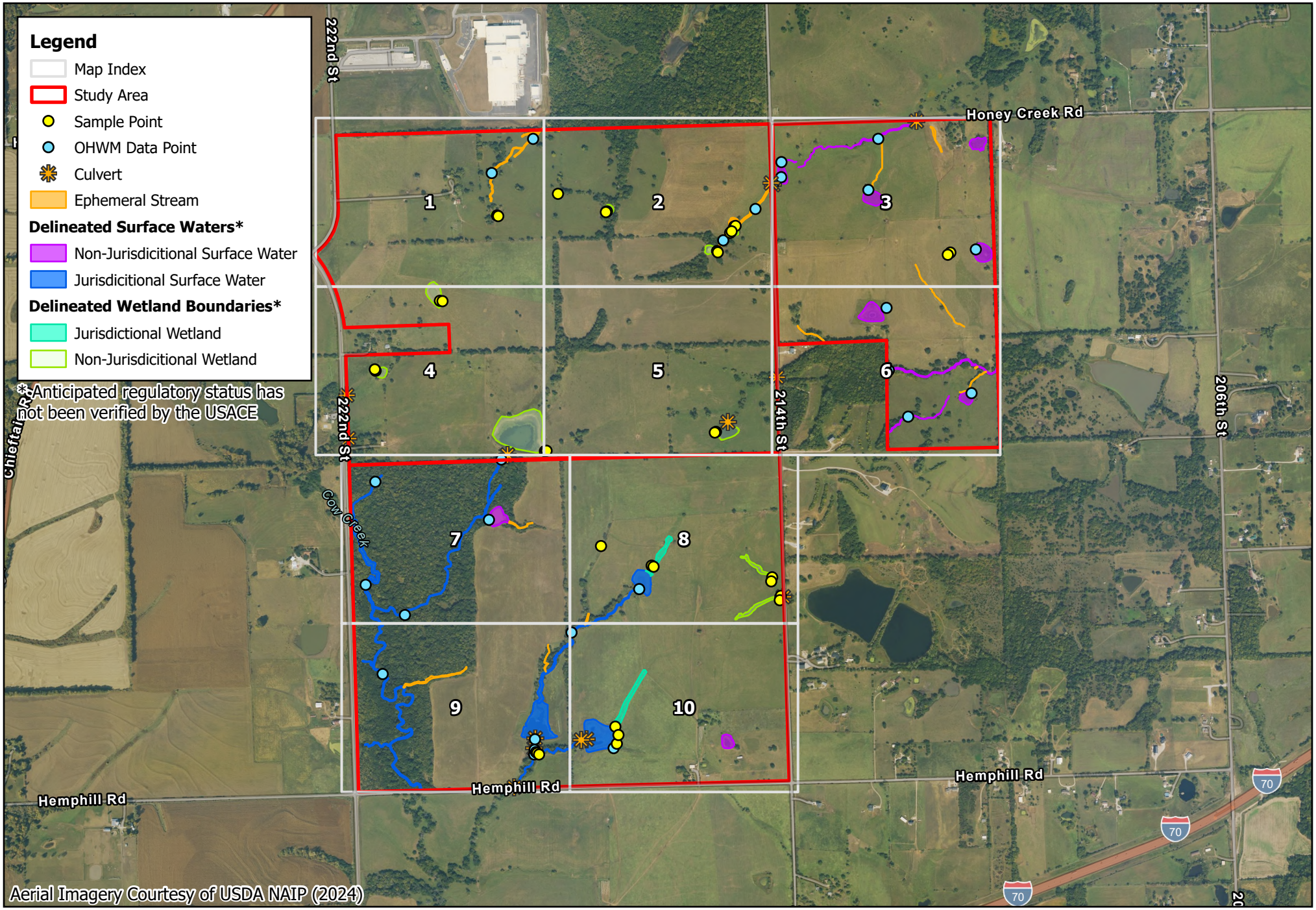


Kimley»Horn

0 650 1,300 US Feet

N

Figure 5. FEMA 100-Year Floodplain
Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

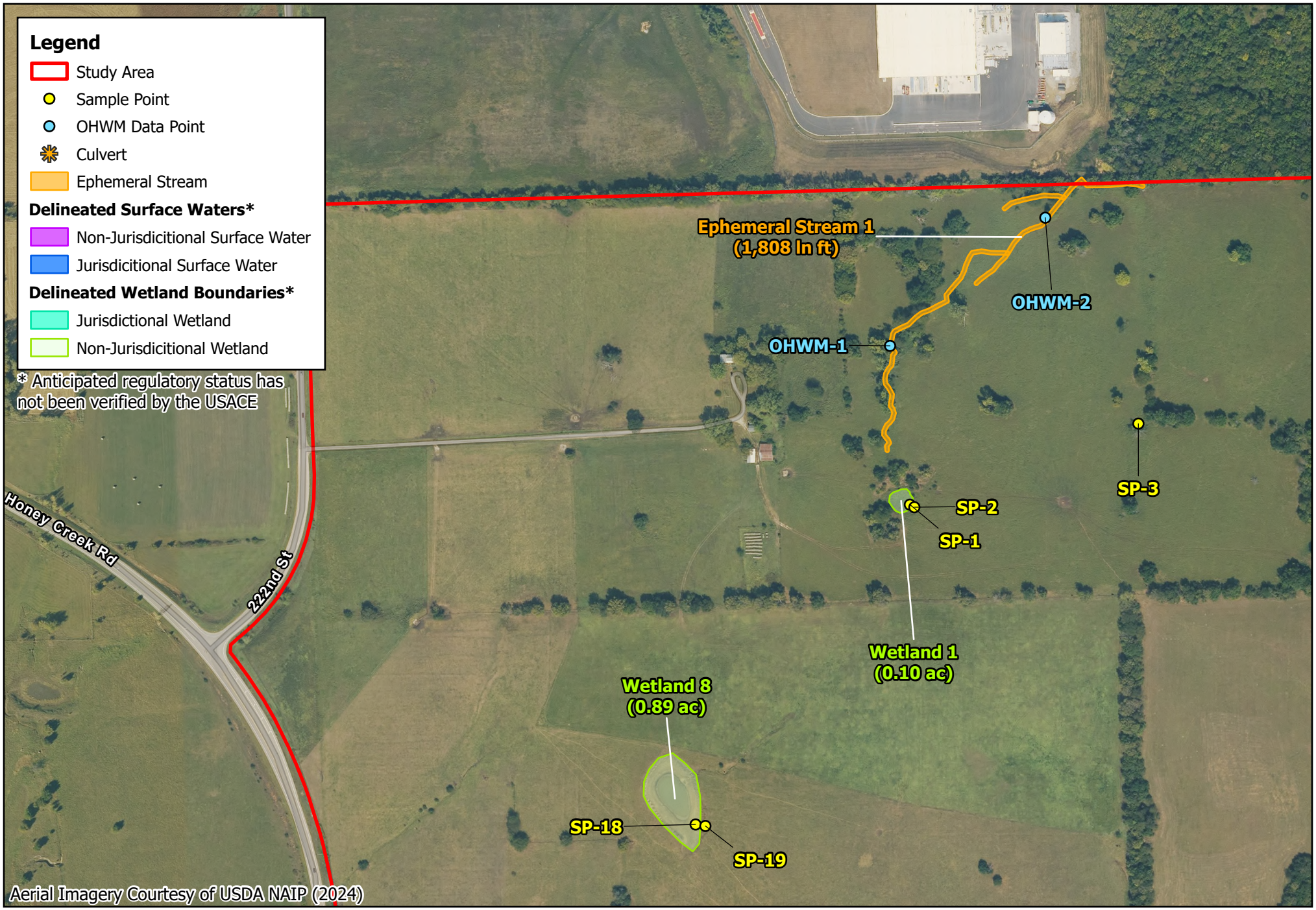


Kimley»Horn

0 750 1,500
US Feet

N

Figure 6.1 Delineation Summary - Overview
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

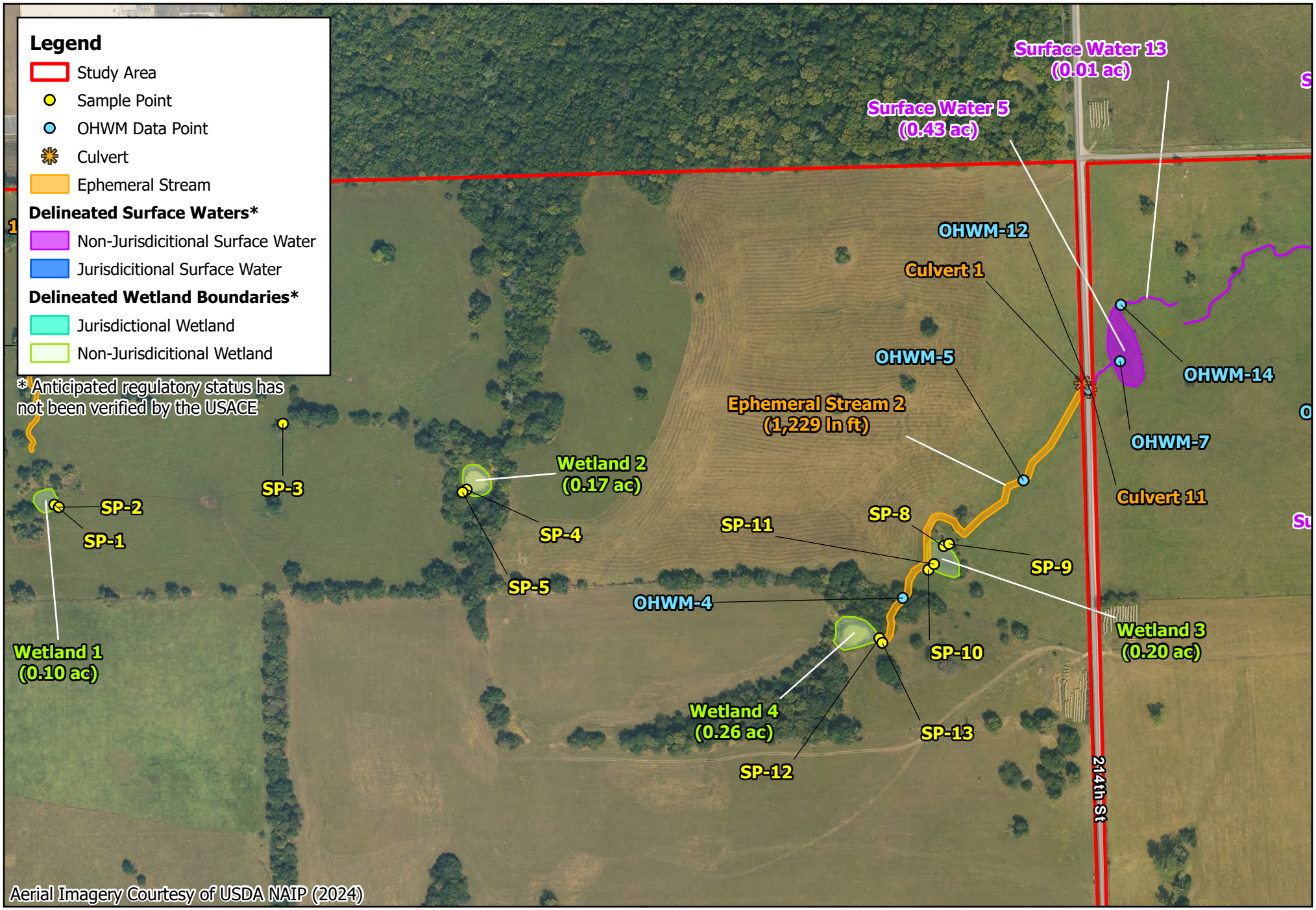


Kimley»Horn

0 200 400 US Feet

N

Figure 6.2 Delineation Summary - Index 1
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

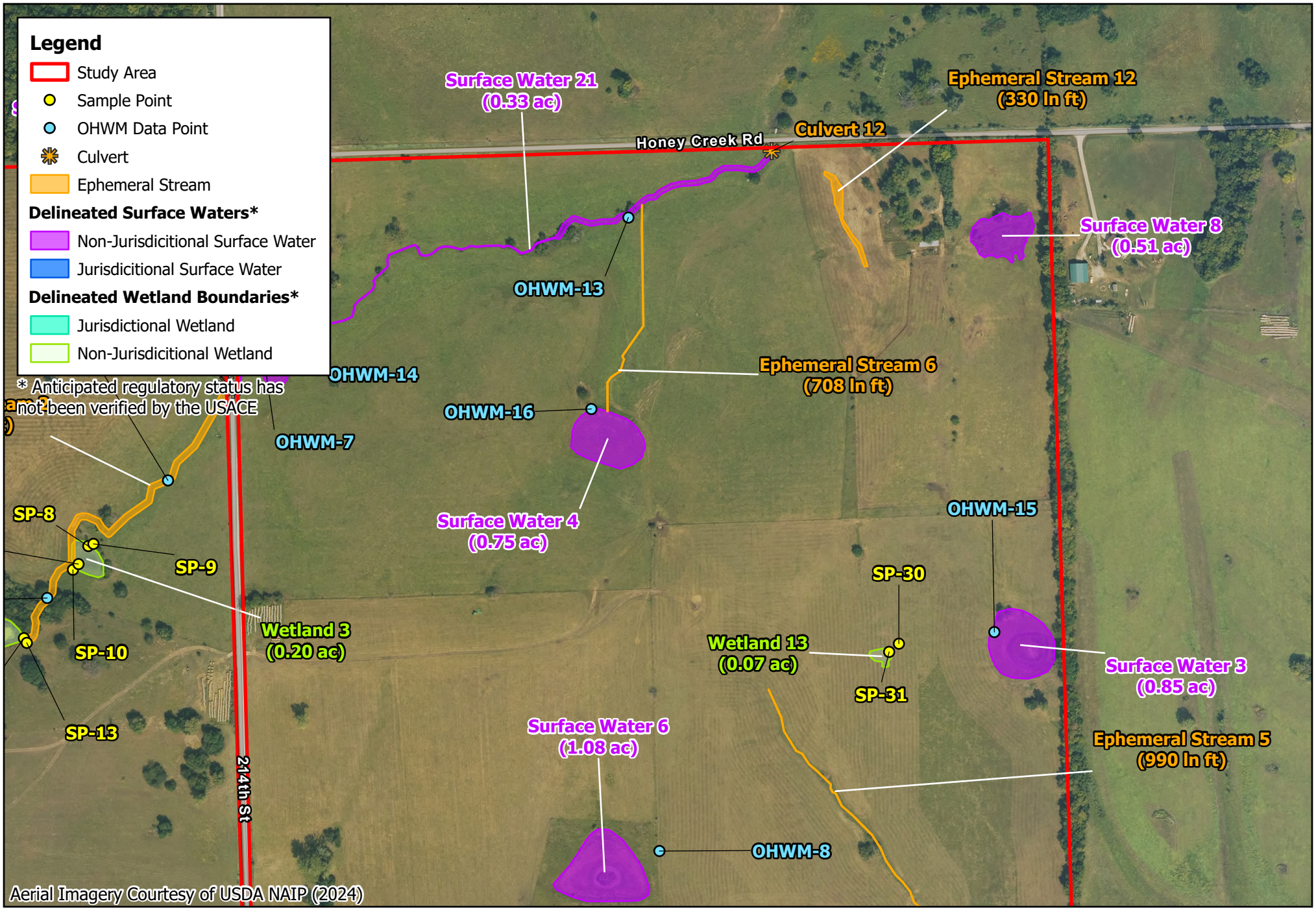


Kimley»Horn

0 200 400 US Feet

N

Figure 6.3 Delineation Summary - Index 2
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC



Kimley»Horn

0 200 400 US Feet

N

Figure 6.4 Delineation Summary - Index 3
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

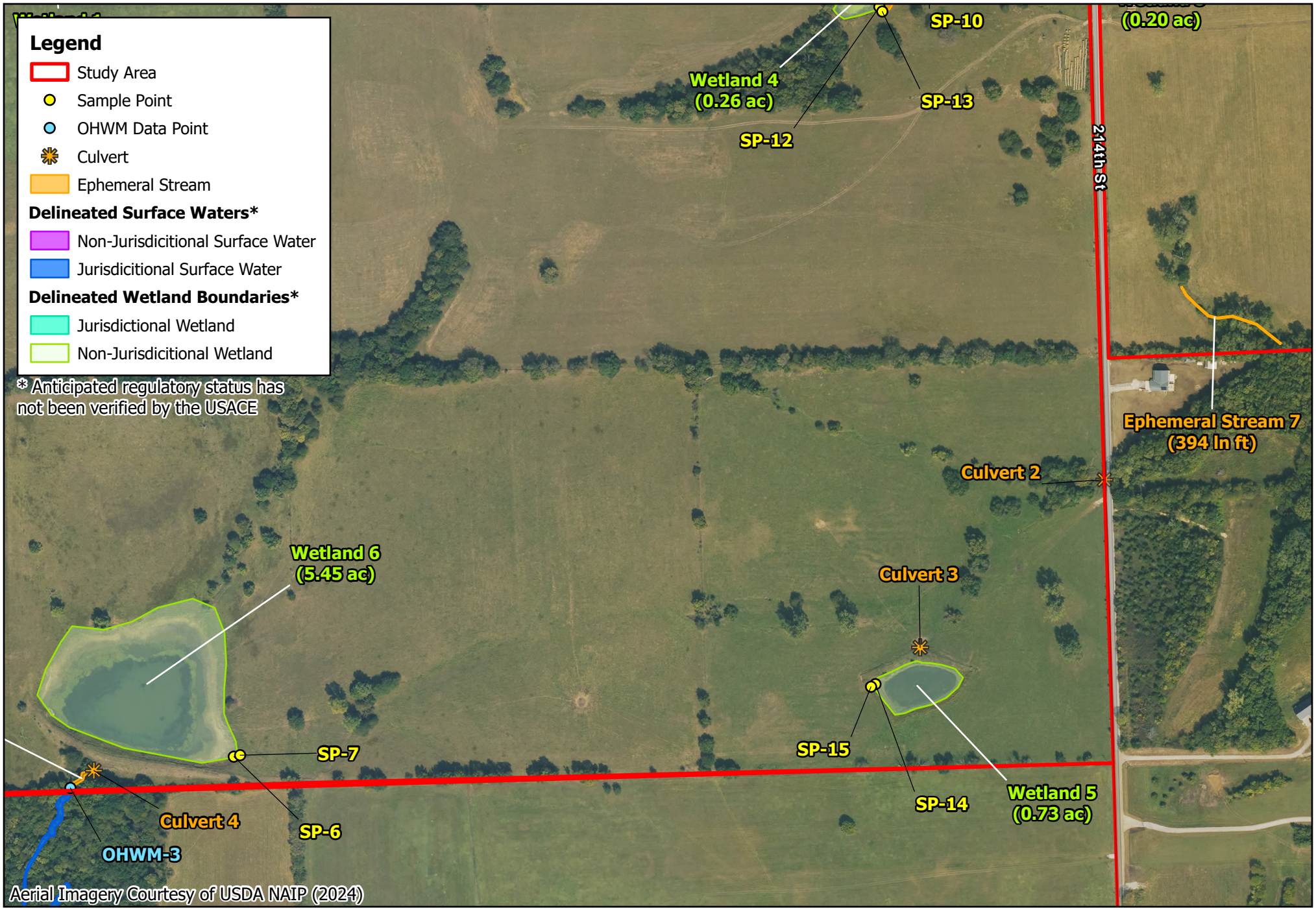


Kimley»Horn

0 200 400 US Feet

N

Figure 6.5 Delineation Summary - Index 4
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

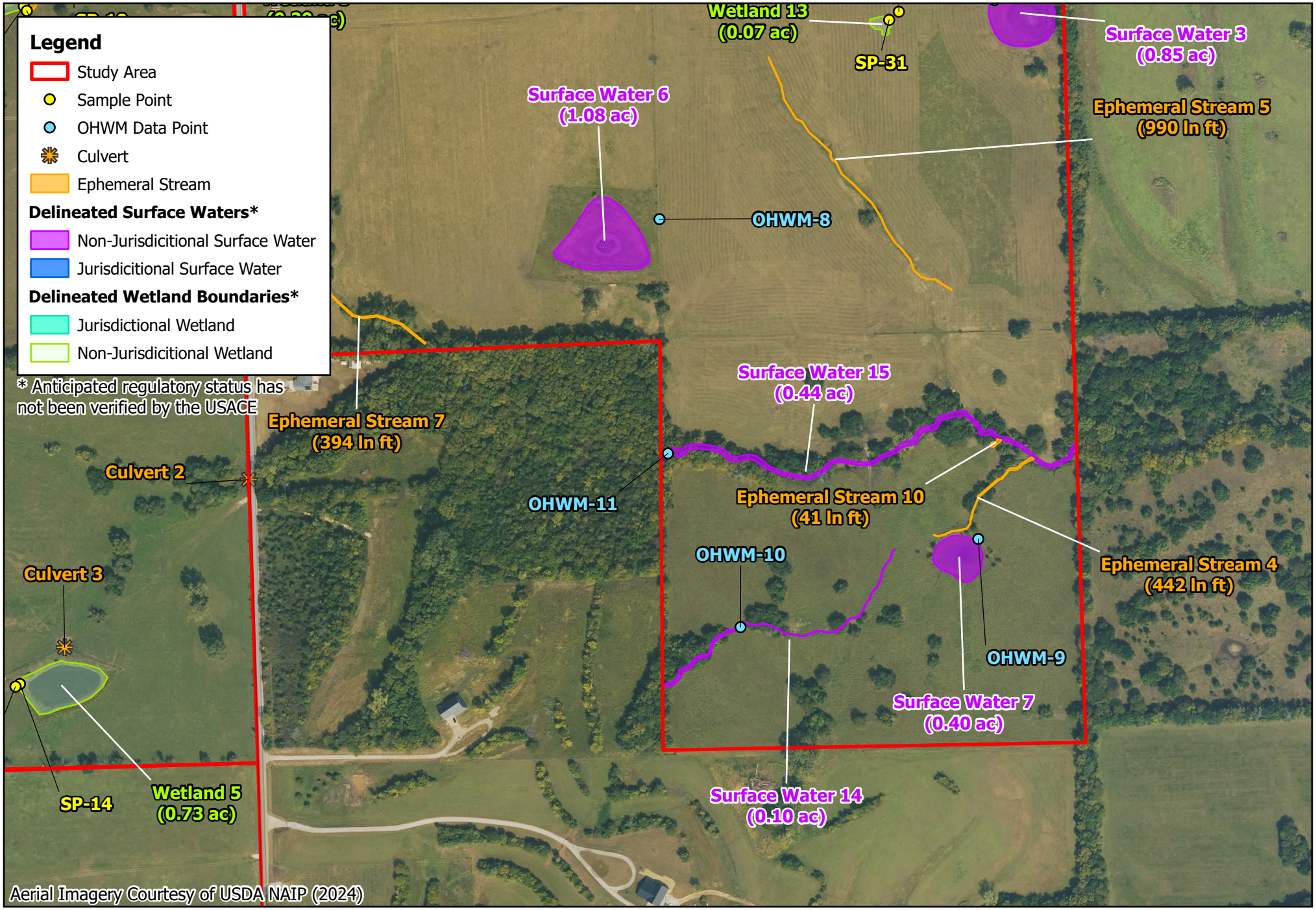


Kimley»Horn

0 200 400
US Feet

N

Figure 6.6 Delineation Summary - Index 5
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

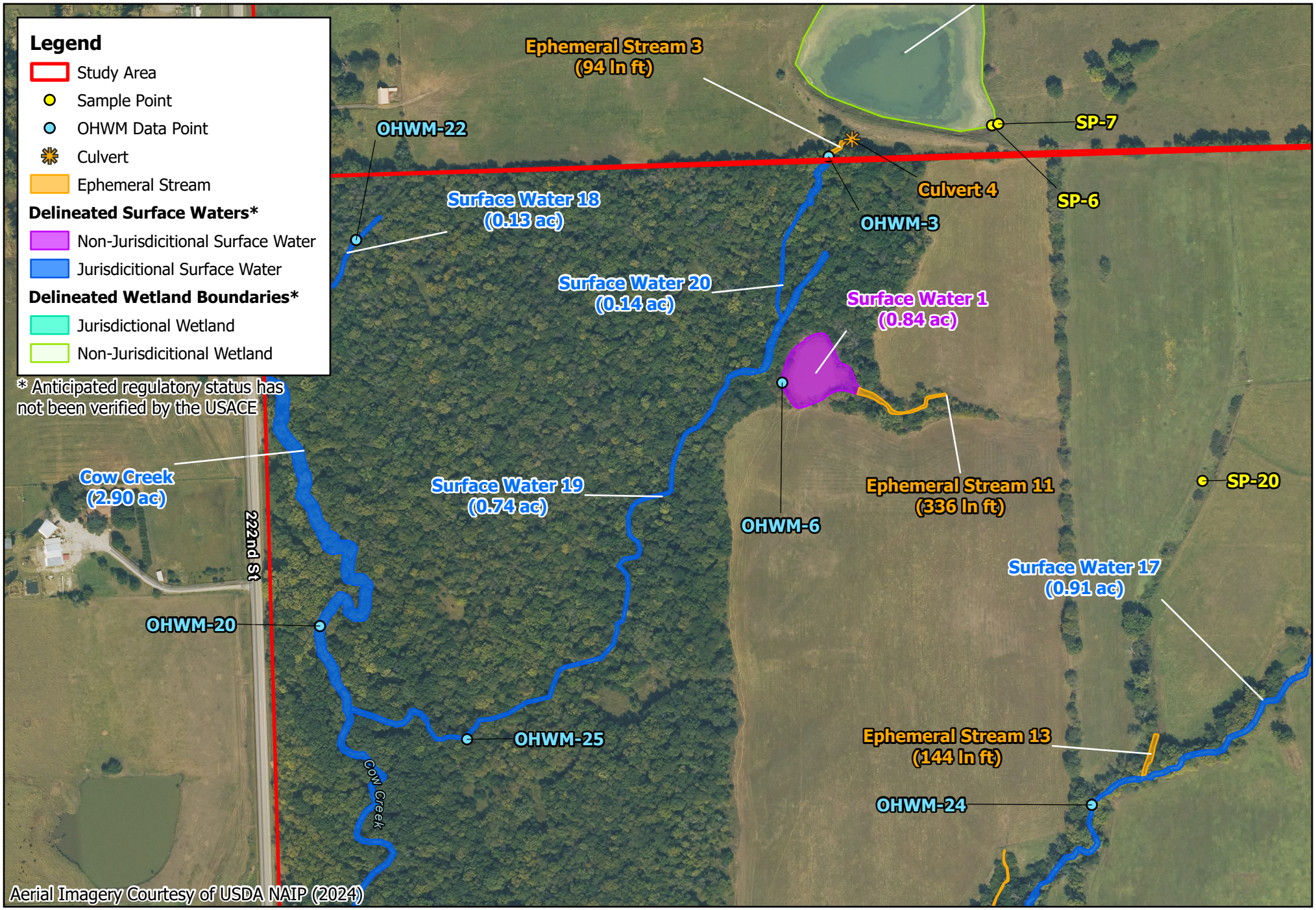


Kimley»Horn

0 200 400
US Feet

N

Figure 6.7 Delineation Summary - Index 6
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

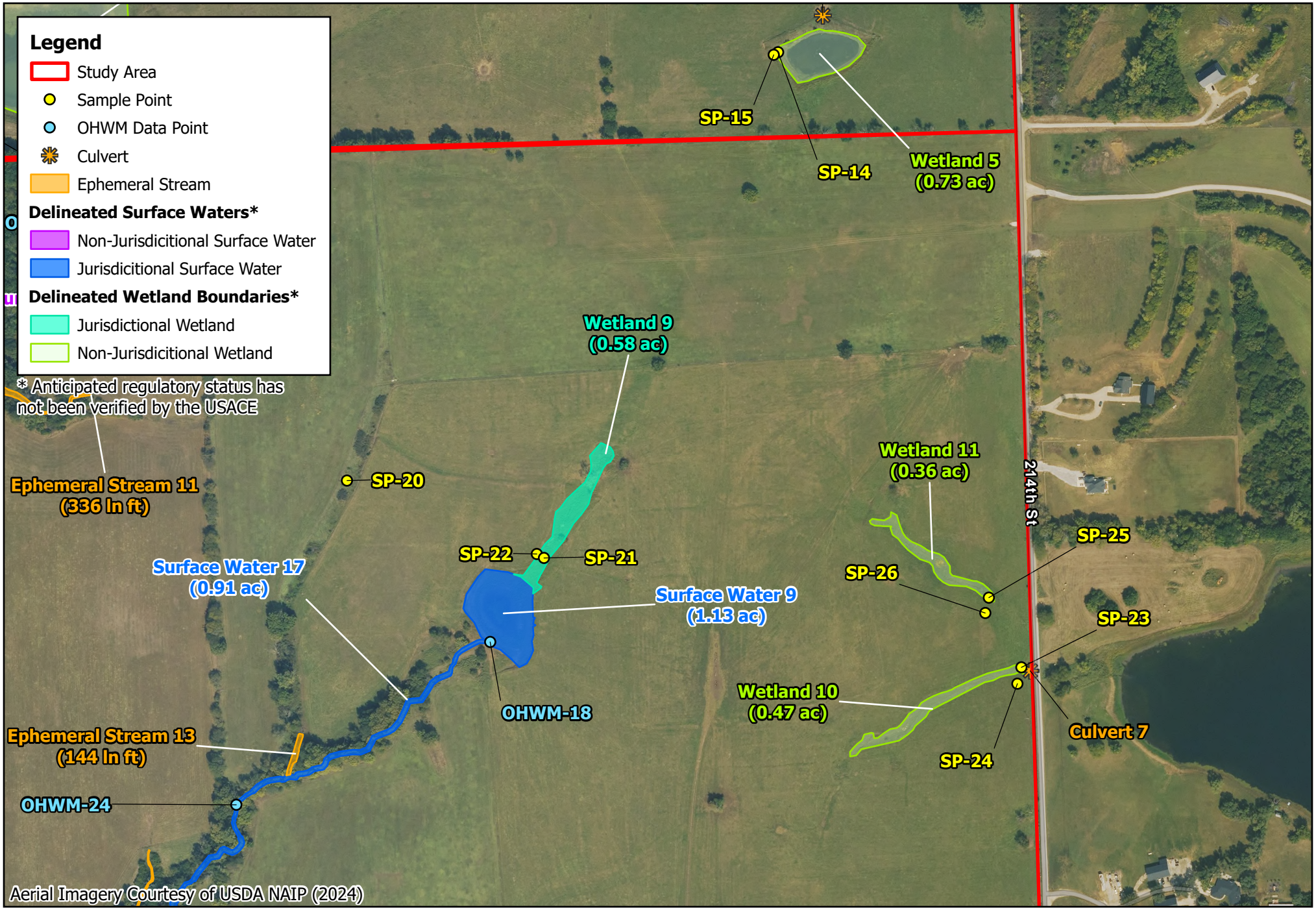


Kimley»Horn

0 200 400
US Feet

N

Figure 6.8 Delineation Summary - Index 7
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

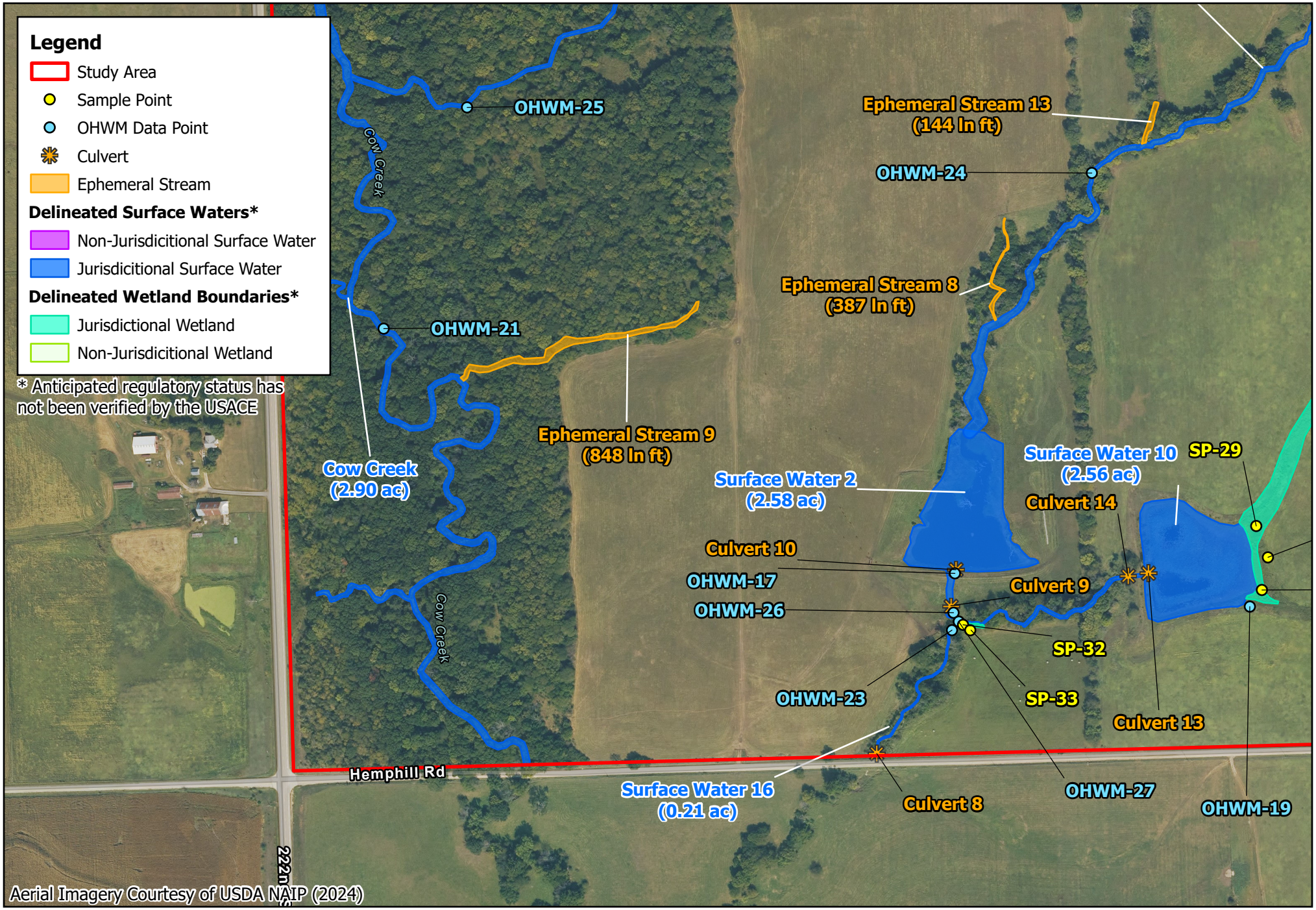


Kimley»Horn

0 200 400 US Feet

N

Figure 6.9 Delineation Summary - Index 8
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

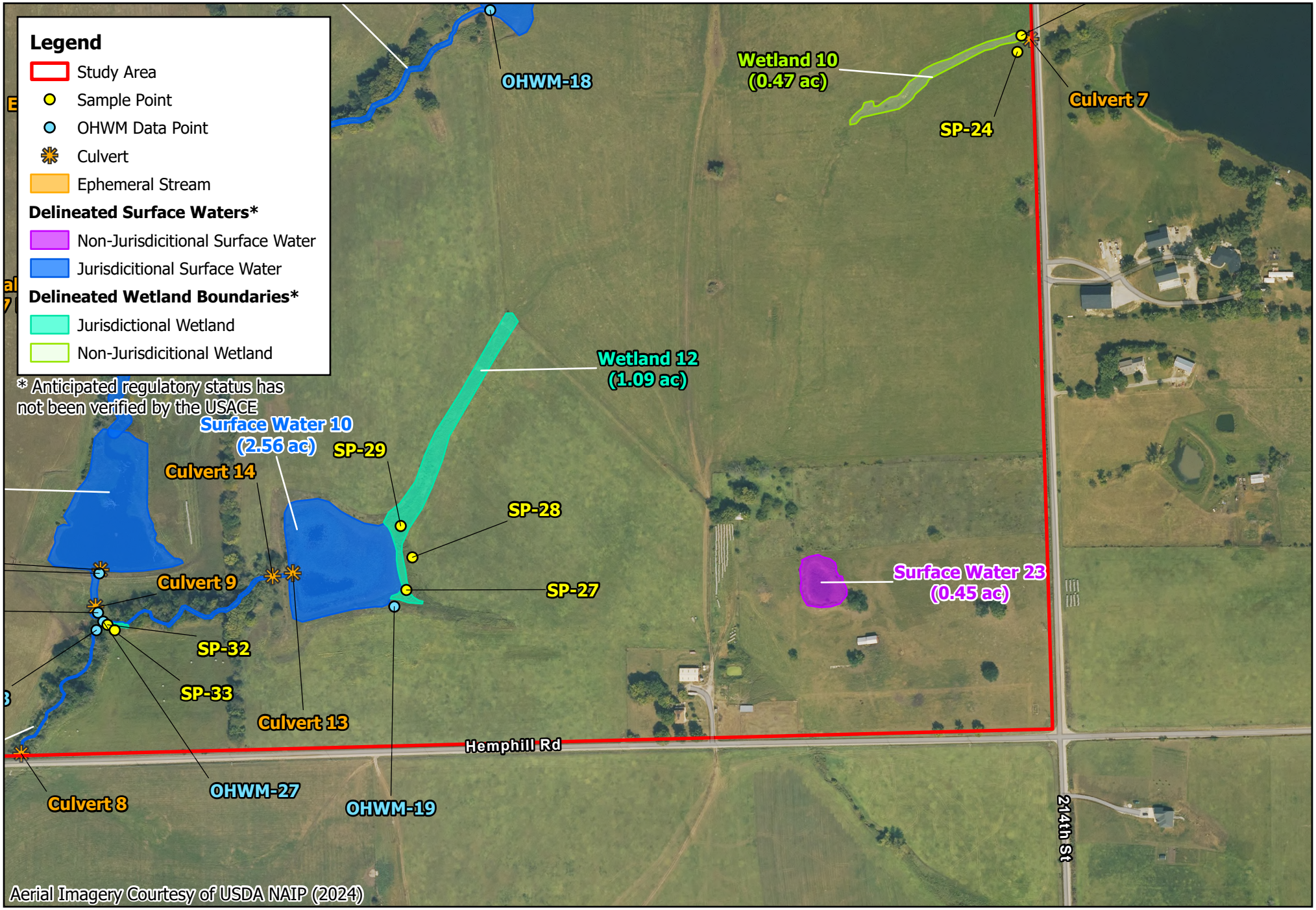


Kimley»Horn

0 200 400 US Feet

N

Figure 6.10 Delineation Summary - Index 9
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC



Kimley»Horn

0 200 400
US Feet

N

Figure 6.11 Delineation Summary - Index 10
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

Appendix A: Hydric Soils Information

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Leavenworth County, Kansas



December 29, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
Soil Information for All Uses.....5
Suitabilities and Limitations for Use.....5
Land Classifications.....5
Hydric Rating by Map Unit.....5

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Rating by Map Unit

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

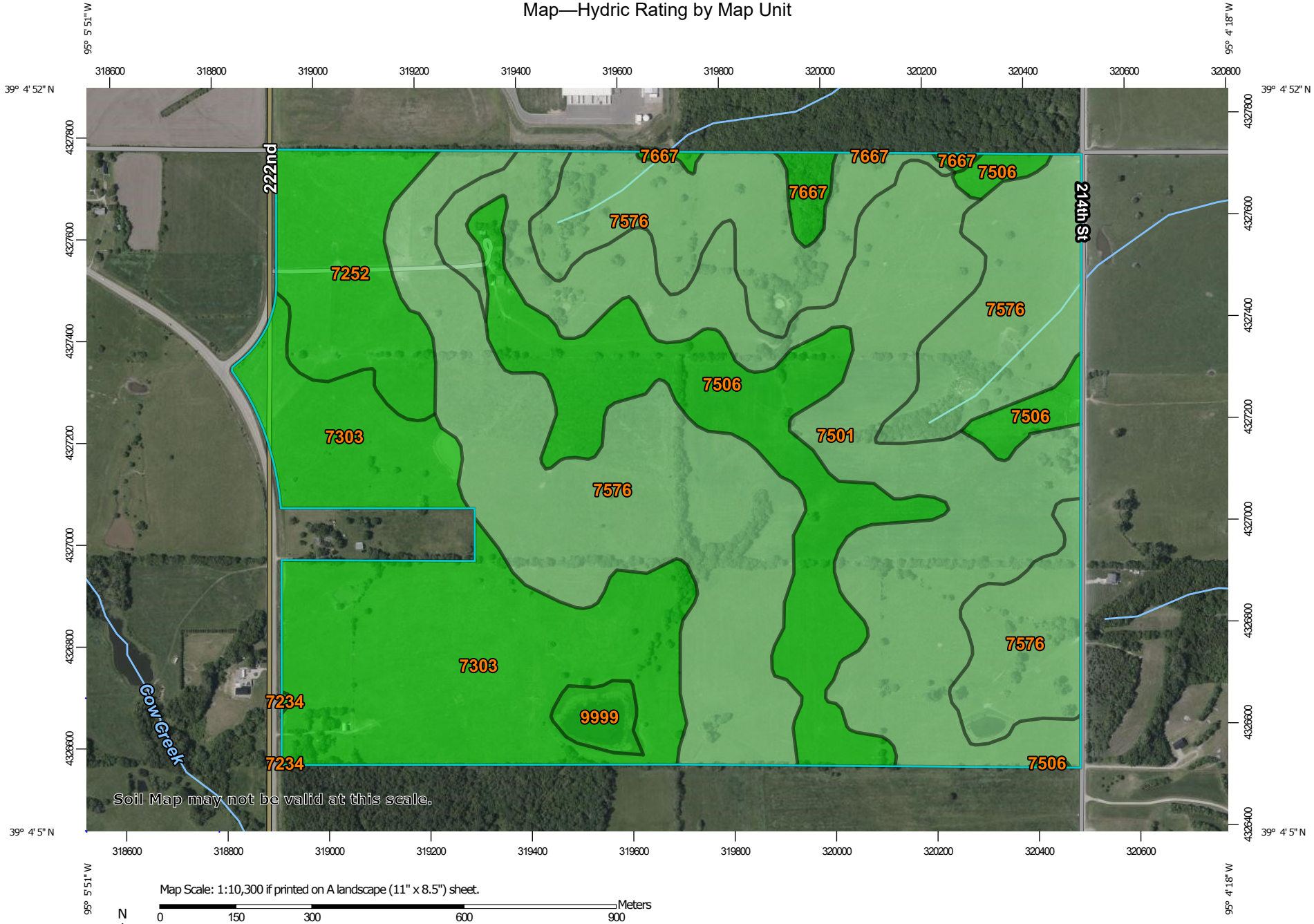
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Custom Soil Resource Report
Map—Hydric Rating by Map Unit



Map Scale: 1:10,300 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Leavenworth County, Kansas
Survey Area Data: Version 20, Aug 27, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7234	Elmont silt loam, 3 to 7 percent slopes, eroded	0	0.1	0.0%
7252	Grundy silty clay loam, 1 to 3 percent slopes	0	29.9	6.4%
7303	Martin silty clay loam, 3 to 7 percent slopes, eroded	0	94.9	20.3%
7501	Pawnee clay loam, 4 to 8 percent slopes, eroded	1	103.8	22.3%
7506	Pawnee clay loam, 1 to 4 percent slopes, eroded	0	59.7	12.8%
7576	Shelby clay loam, 8 to 12 percent slopes, eroded	1	168.5	36.1%
7667	Vinland-Rock outcrop complex, 15 to 40 percent slopes	0	4.7	1.0%
9999	Water	0	4.7	1.0%
Totals for Area of Interest			**466.5**	**100.0%**

Rating Options—Hydric Rating by Map Unit

Aggregation Method: Percent Present

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Percent Present" returns the cumulative percent composition of all components of a map unit for which a certain condition is true. For example, attribute "Hydric Rating by Map Unit" returns the cumulative percent composition of all components of a map unit where the corresponding hydric rating is "Yes". Conditions may be simple or complex. At runtime, the user may be able to specify all, some or none of the conditions in question.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

United States Department of Agriculture

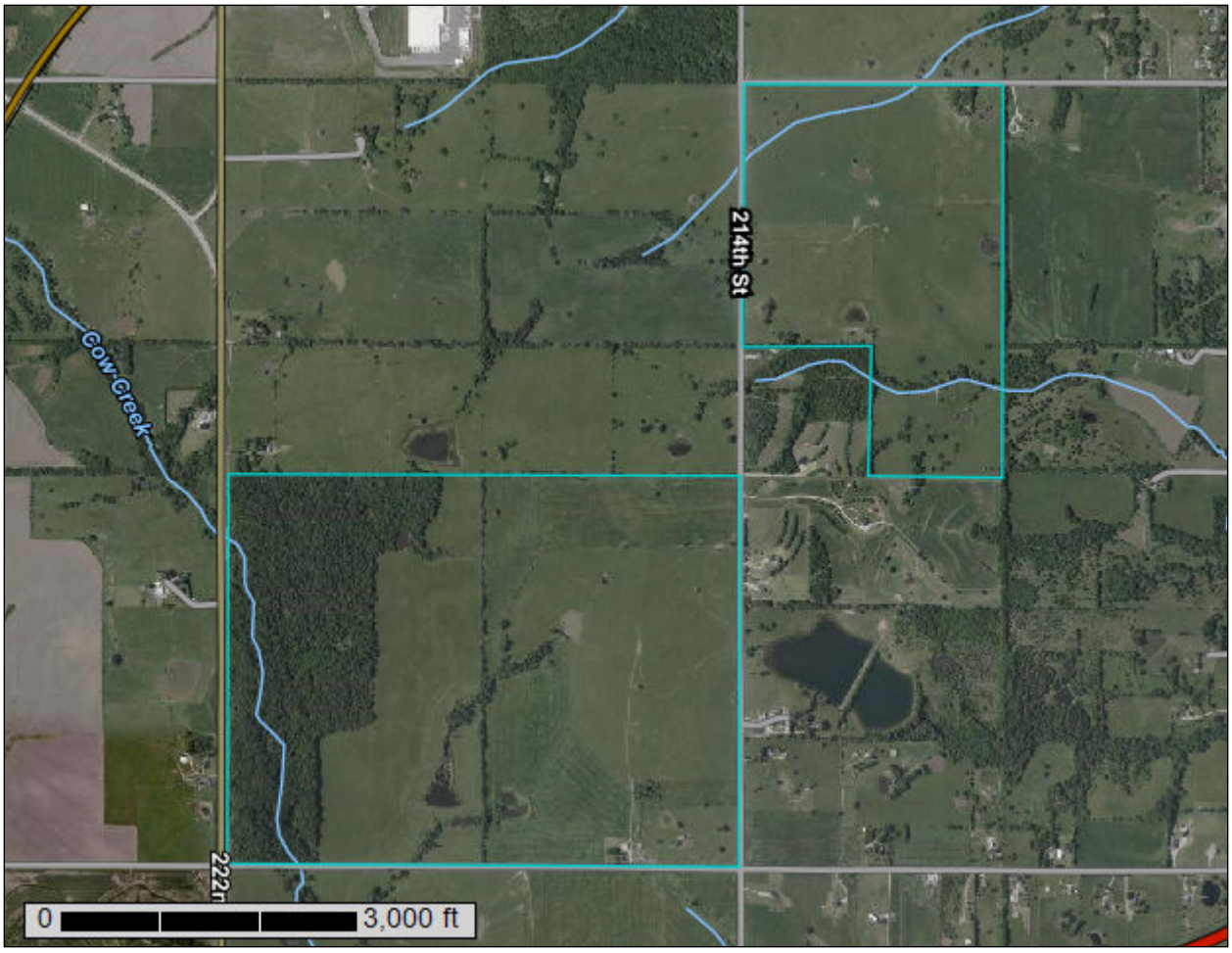
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Leavenworth County, Kansas

Tonganoxie



May 22, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface.....2
Soil Information for All Uses.....5
Suitabilities and Limitations for Use.....5
Land Classifications.....5
Hydric Rating by Map Unit.....5
References.....10

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Rating by Map Unit

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

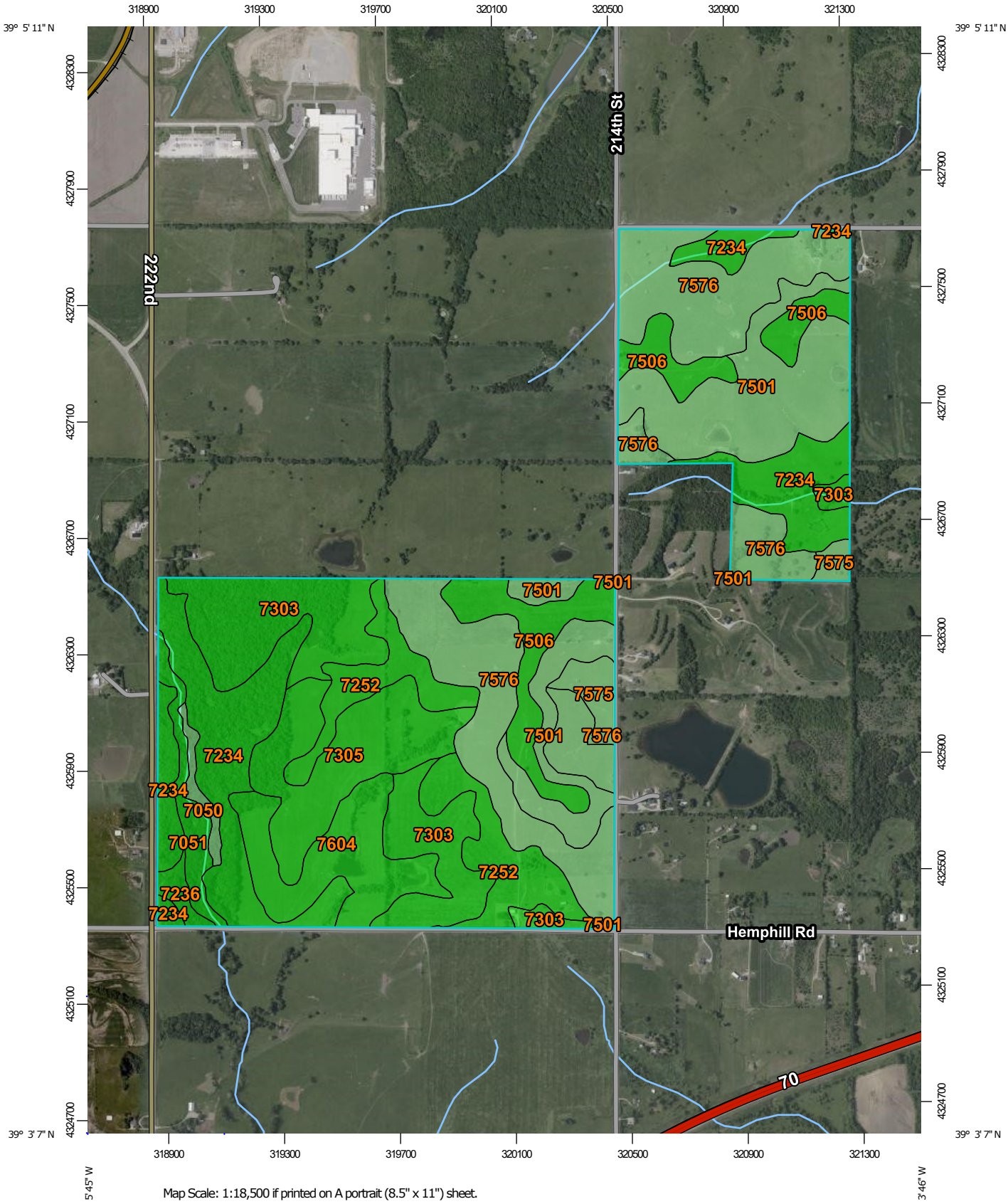
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Custom Soil Resource Report
Map—Hydric Rating by Map Unit



Map Scale: 1:18,500 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 250 500 1000 1500

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Leavenworth County, Kansas
Survey Area Data: Version 20, Aug 27, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 16, 2019—Jul 1, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
7050	Kennebec silt loam, occasionally flooded	5	4.8	0.7%
7051	Kennebec silt loam, frequently flooded	0	13.8	2.1%
7234	Elmont silt loam, 3 to 7 percent slopes, eroded	0	102.4	15.3%
7236	Elmont silt loam, 7 to 12 percent slopes, eroded	0	4.6	0.7%
7252	Grundy silty clay loam, 1 to 3 percent slopes	0	51.9	7.8%
7303	Martin silty clay loam, 3 to 7 percent slopes, eroded	0	86.5	12.9%
7305	Martin silty clay loam, 7 to 12 percent slopes, eroded	0	57.0	8.5%
7501	Pawnee clay loam, 4 to 8 percent slopes, eroded	1	95.1	14.2%
7506	Pawnee clay loam, 1 to 4 percent slopes, eroded	0	51.0	7.6%
7575	Shelby clay loam, 4 to 8 percent slopes, eroded	1	12.8	1.9%
7576	Shelby clay loam, 8 to 12 percent slopes, eroded	1	144.4	21.6%
7604	Sibleyville loam, 3 to 7 percent slopes, eroded	0	44.8	6.7%
Totals for Area of Interest			**669.1**	**100.0%**

Rating Options—Hydric Rating by Map Unit

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix B: Historic Aerial Review



Kimley»Horn

N

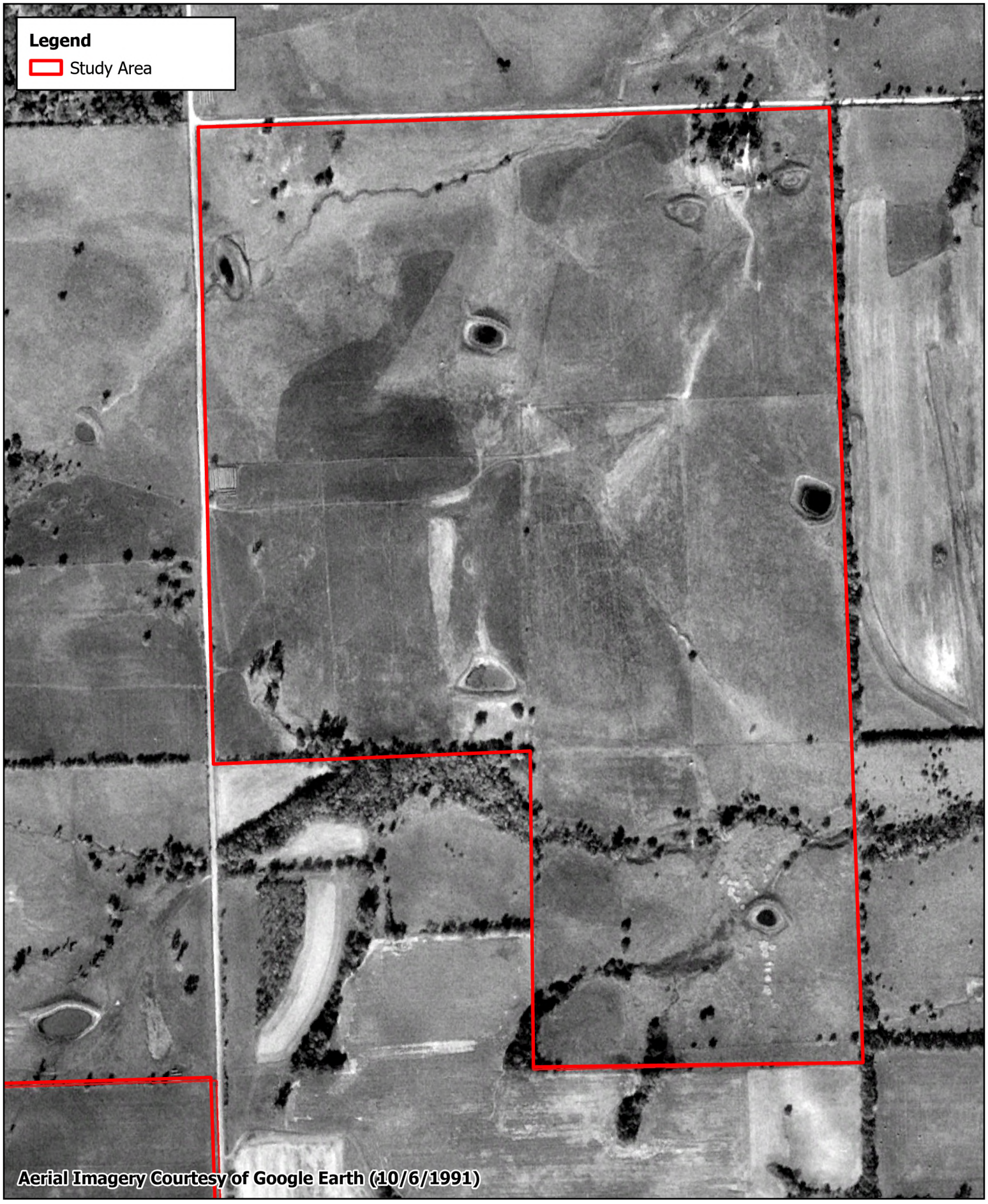
0 400 800

US Feet

Historic Aerial - Central Section: October 1991 (Dry Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



Kimley»Horn

0 250 500 Feet

N

Historic Aerial - East Section: October 1991 (Dry Year)
Tonganoxie and Stranger Townships, Leavenworth County
Western Meadowlark Projectco LLC



Kimley»Horn

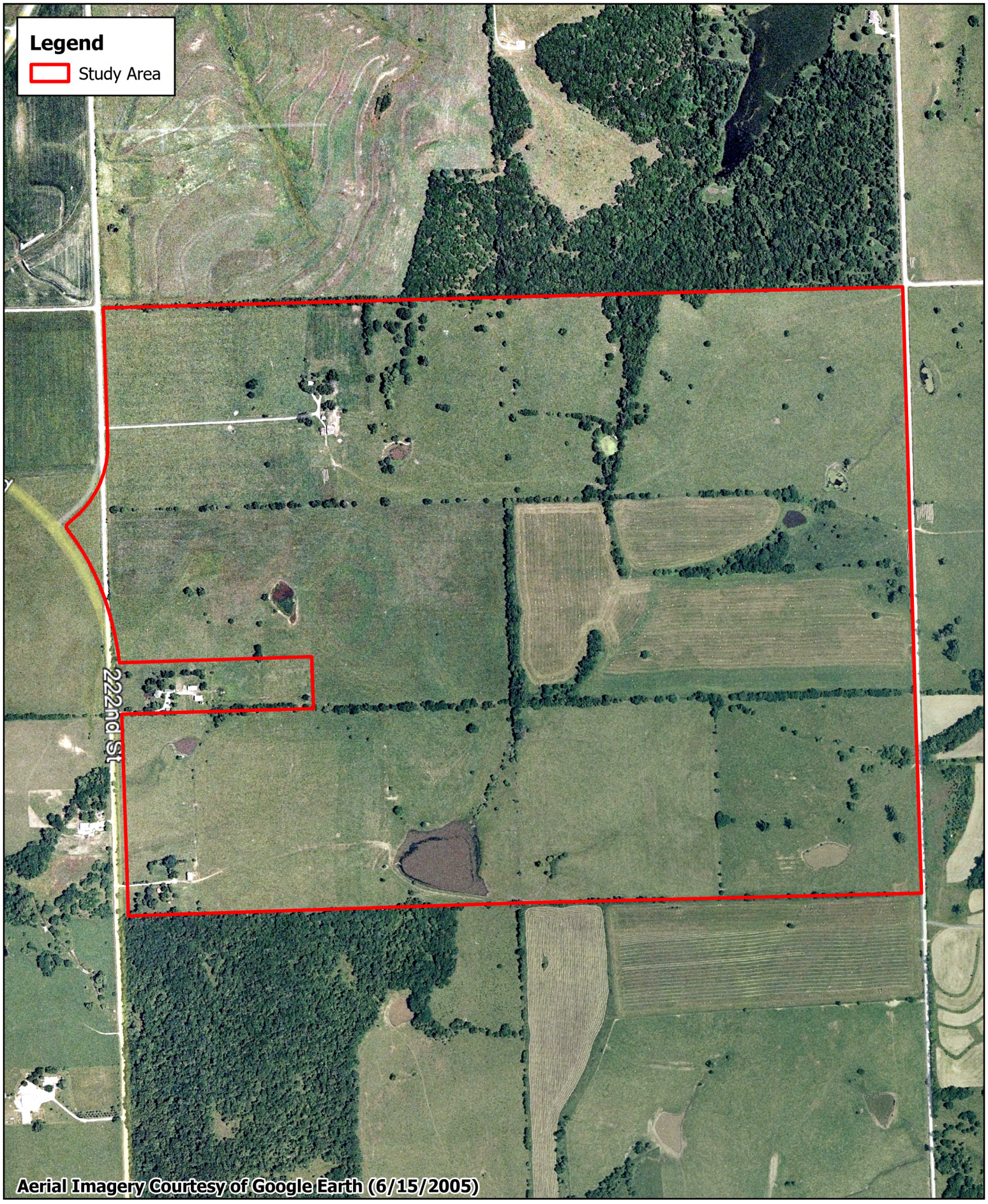
0 400 800 Feet

N

Historic Aerial - South Section: October 1991 (Dry Year)

Tonganoxie and Stranger Townships, Leavenworth County

Western Meadowlark Projectco LLC



Kimley»Horn

N

0 400 800

US Feet

Historic Aerial - Central Section: June 2005 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



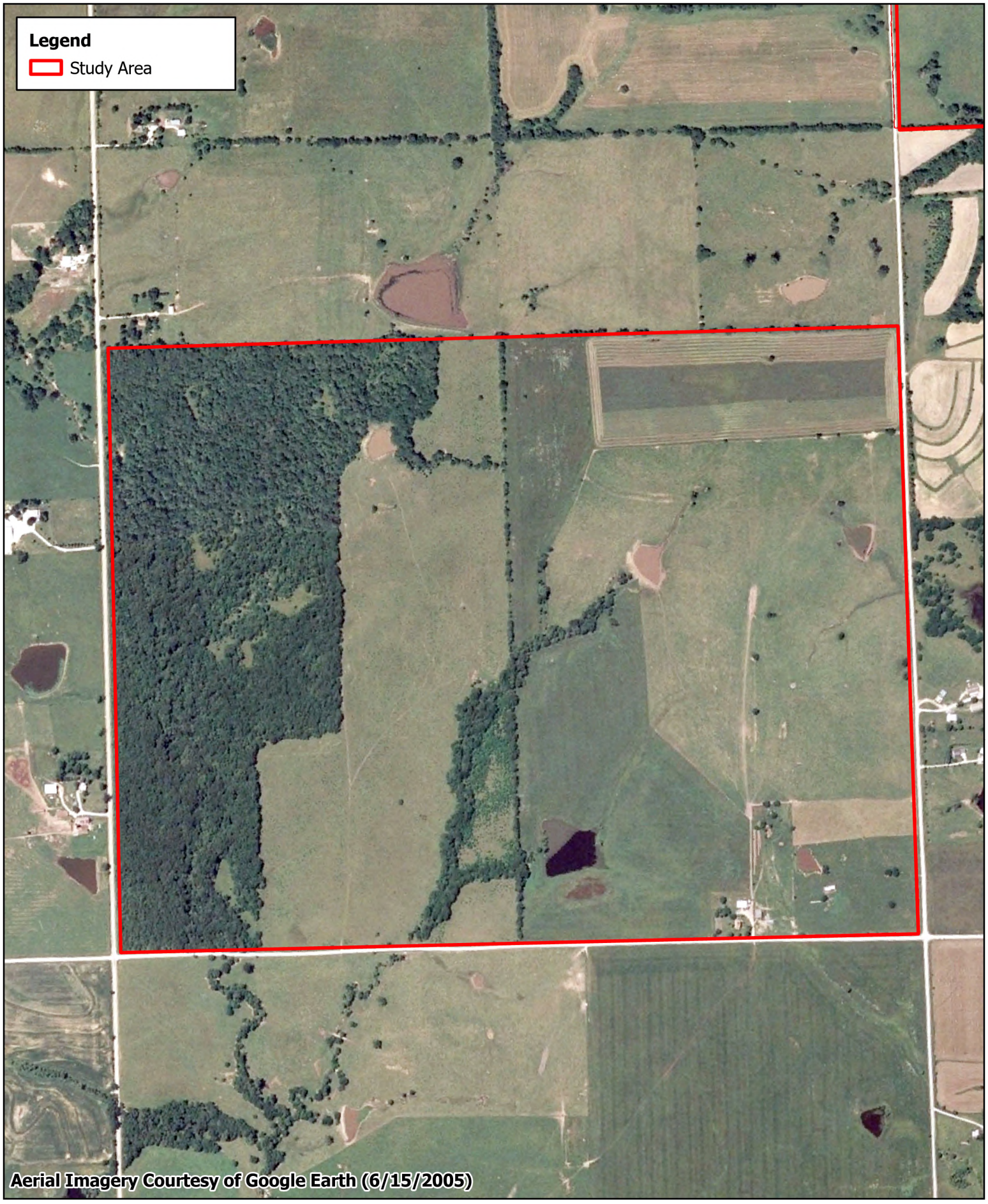
Kimley»Horn

0 250 500 Feet

N

Historic Aerial - East Section: June 2005 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



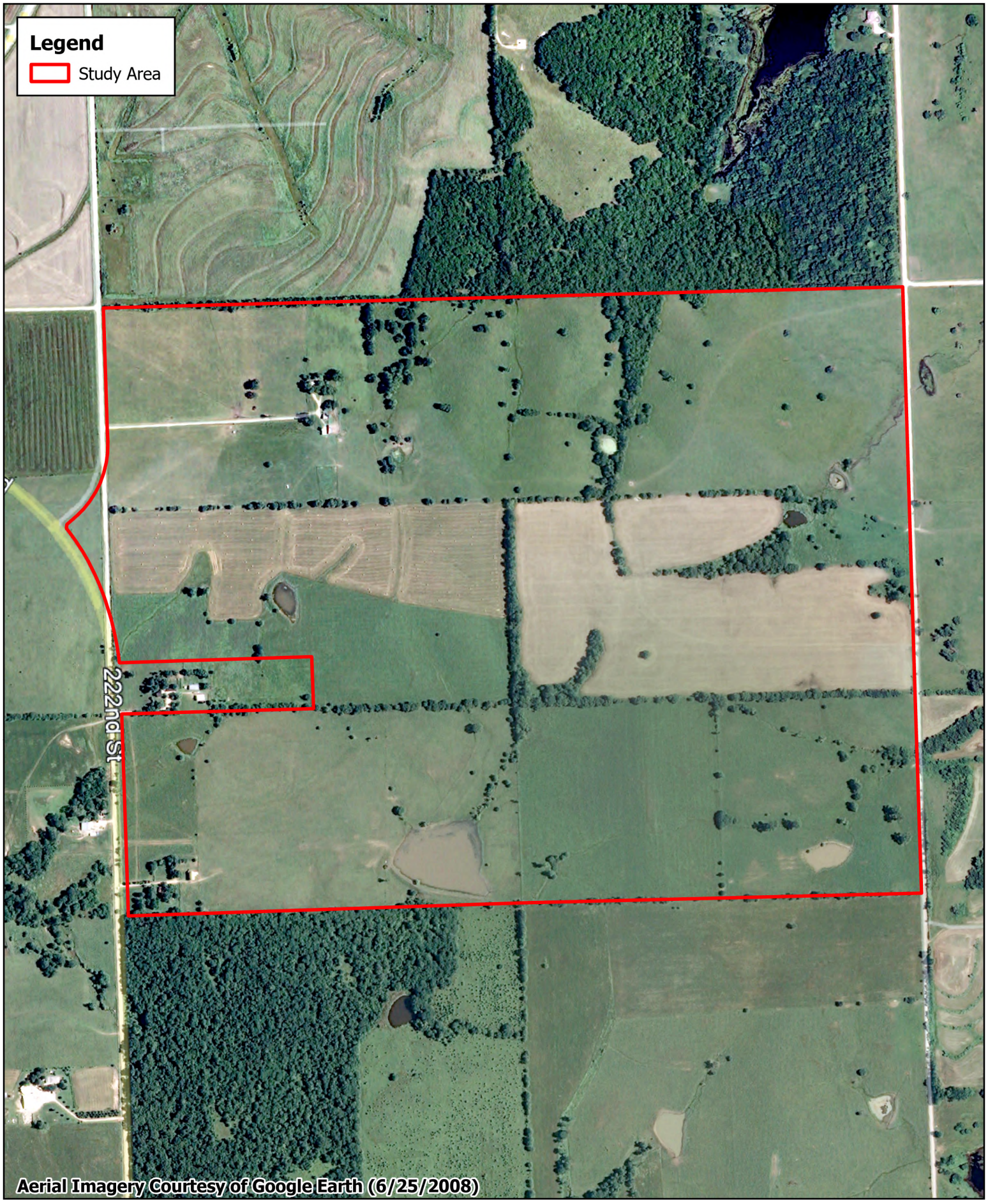
Kimley»Horn

0 400 800
Feet

N

Historic Aerial - South Section: June 2005 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



Kimley»Horn

N

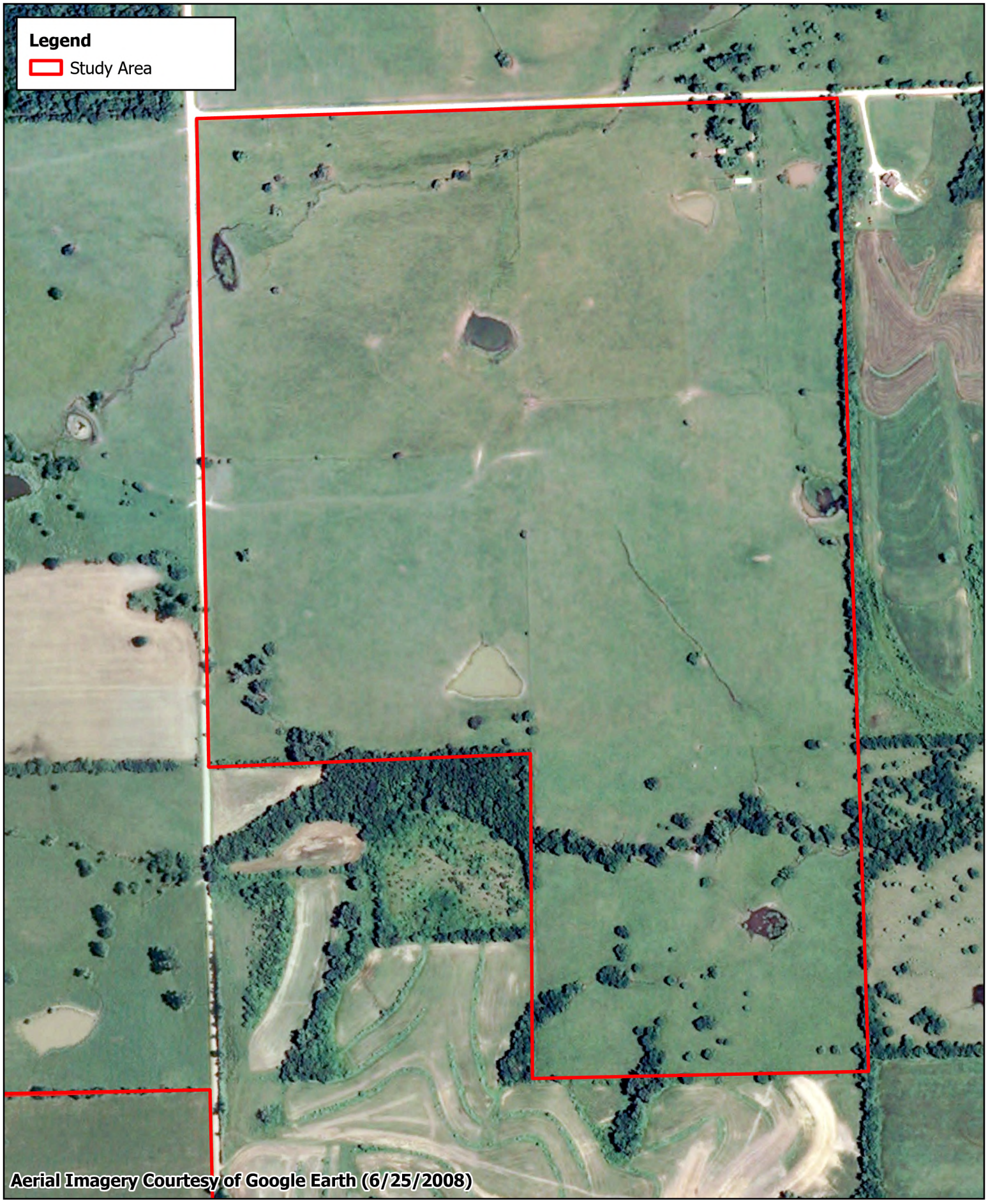
0 400 800

US Feet

Historic Aerial - Central Section: June 2008 (Wet Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



Kimley»Horn

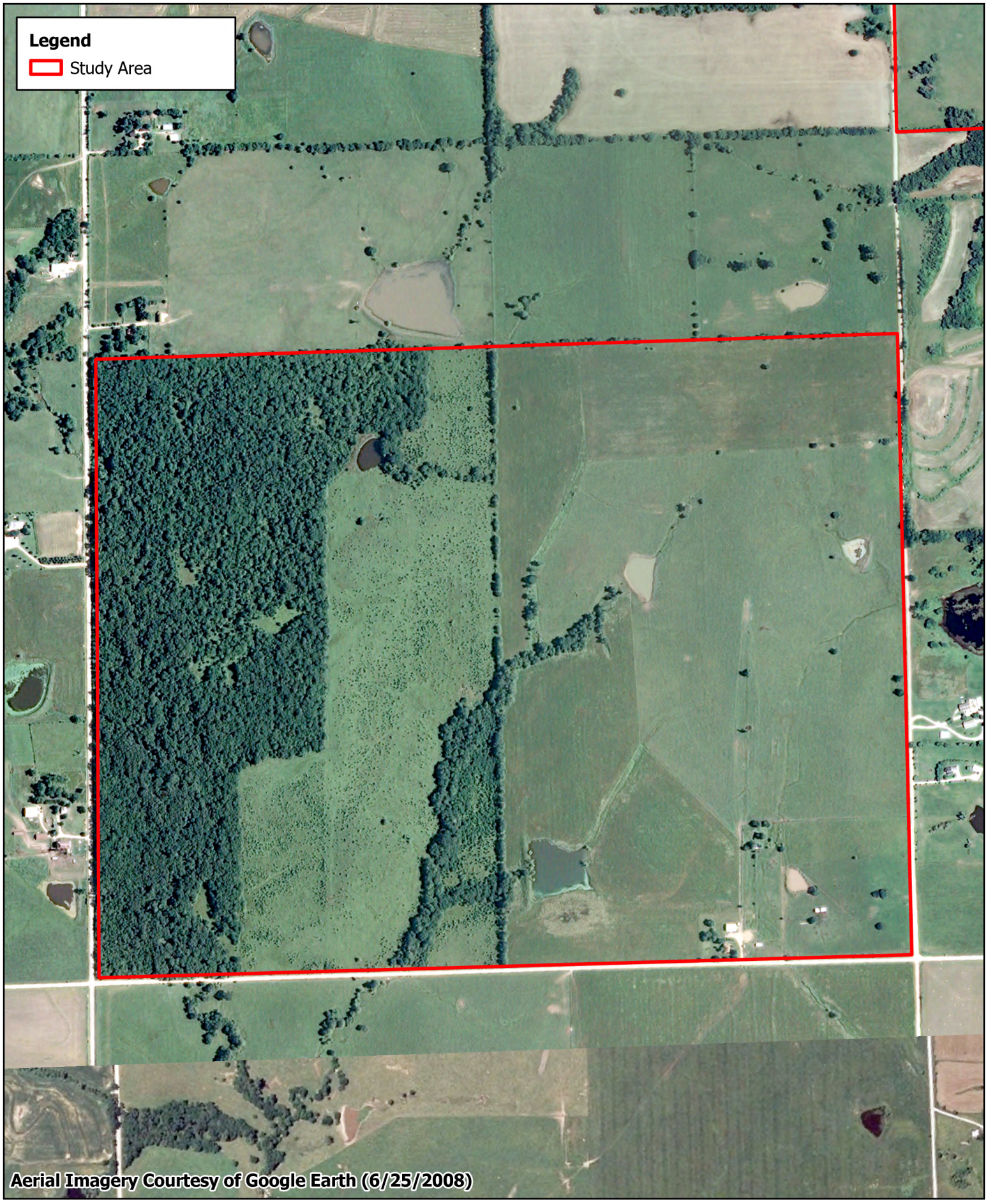
0 250 500 Feet

N

Historic Aerial - East Section: June 2008 (Wet Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark Projectco LLC



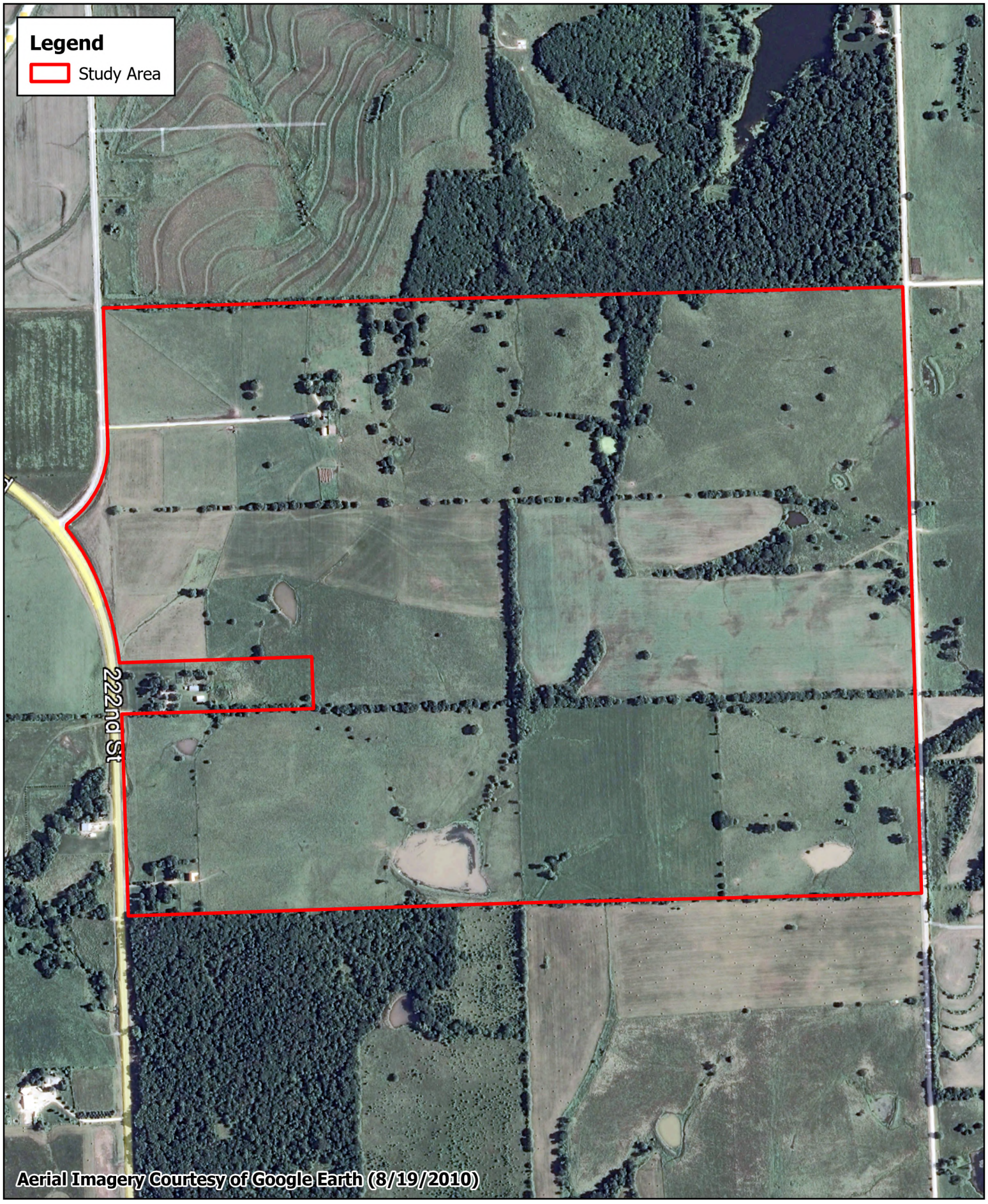
Kimley»Horn

0 400 800
Feet

N

Historic Aerial - South Section: June 2008 (Wet Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



Kimley»Horn

N

0 400 800

US Feet

Historic Aerial - Central Section: August 2010 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



Kimley»Horn

0 250 500 Feet

N

Historic Aerial - East Section: August 2010 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



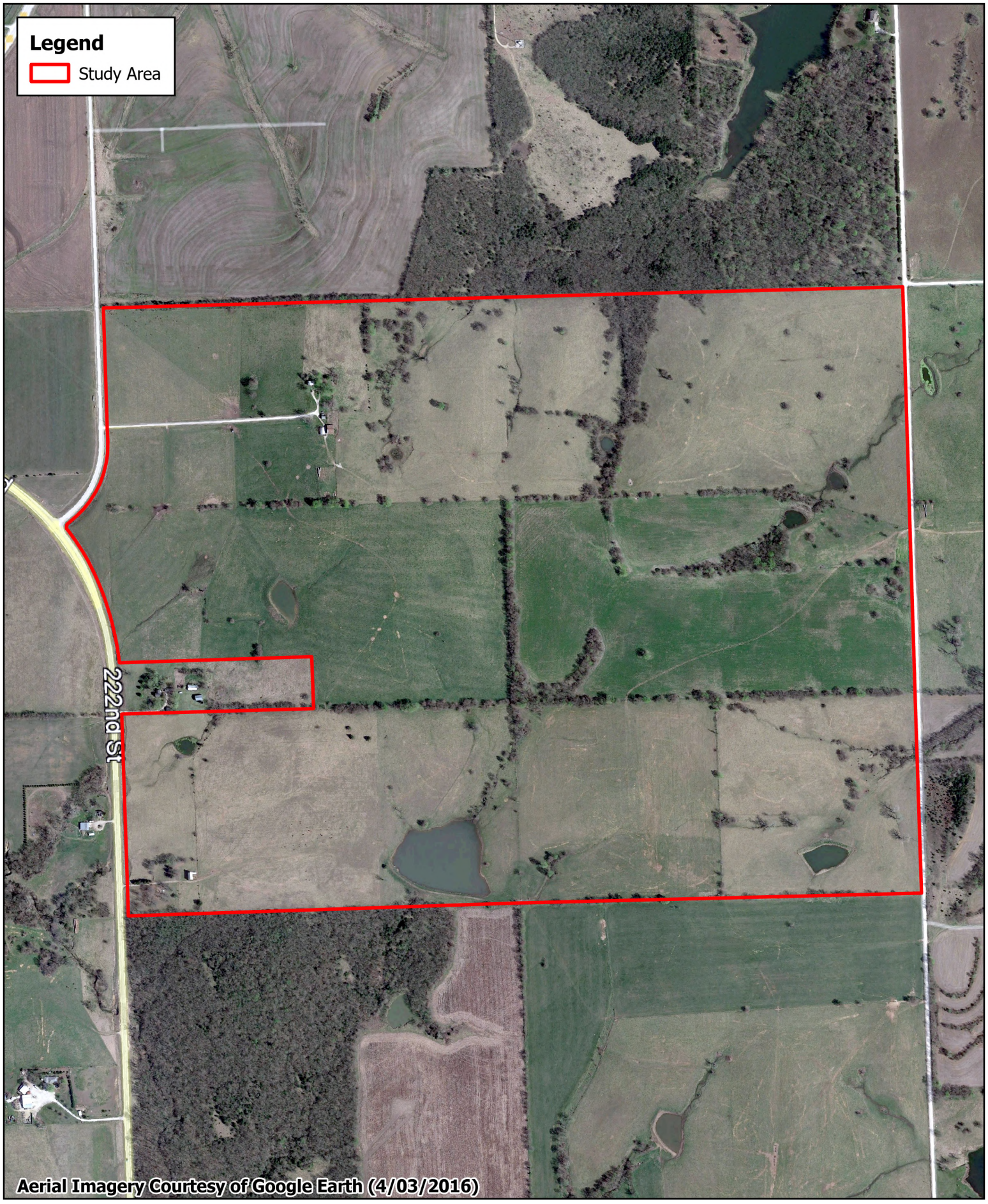
Kimley»Horn

0 400 800
Feet

N

Historic Aerial - South Section: August 2010 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



Kimley»Horn

N

0 400 800

US Feet

Historic Aerial - Central Section: April 2016 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



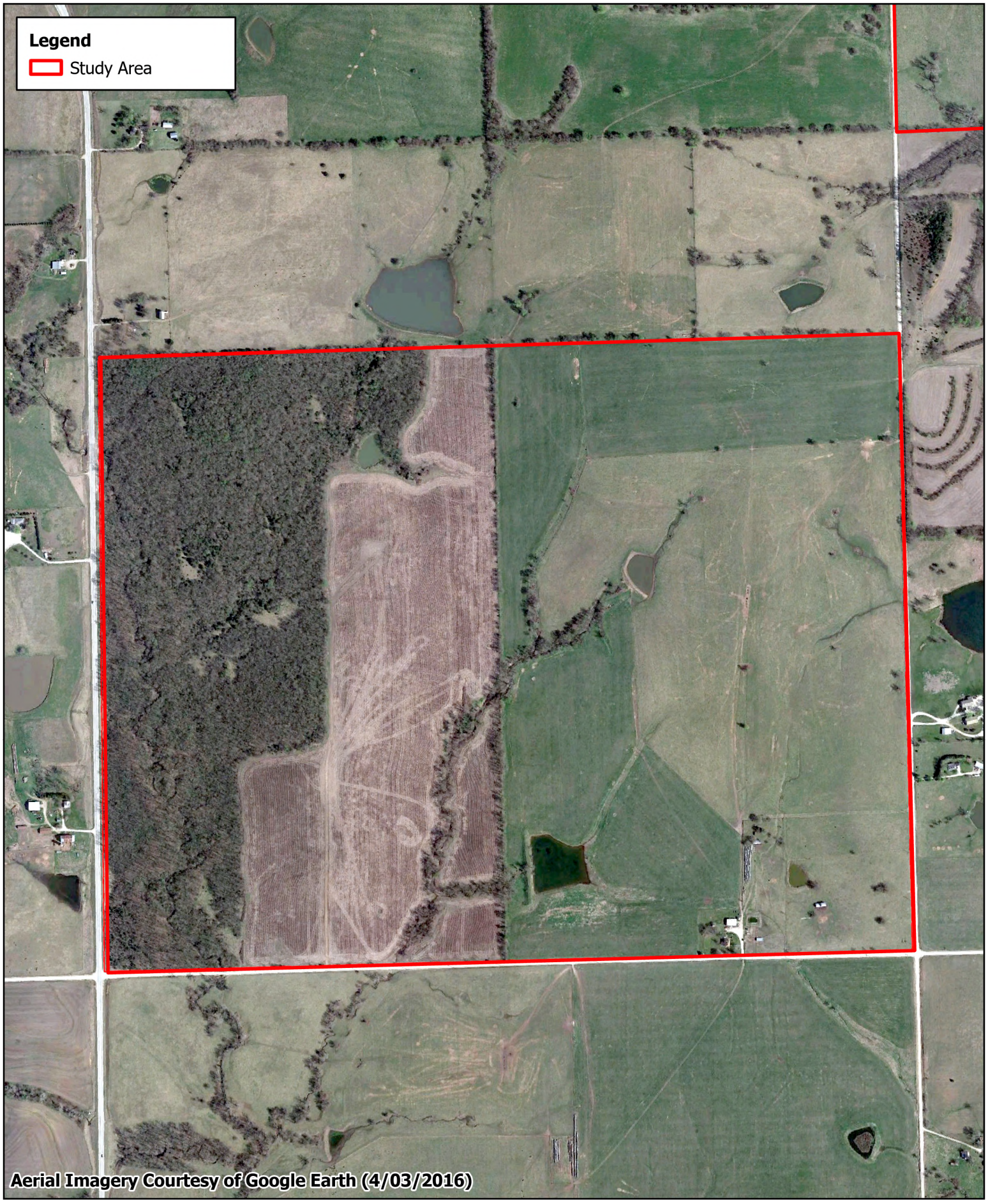
Kimley»Horn

0 250 500 Feet

N

Historic Aerial - East Section: April 2016 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



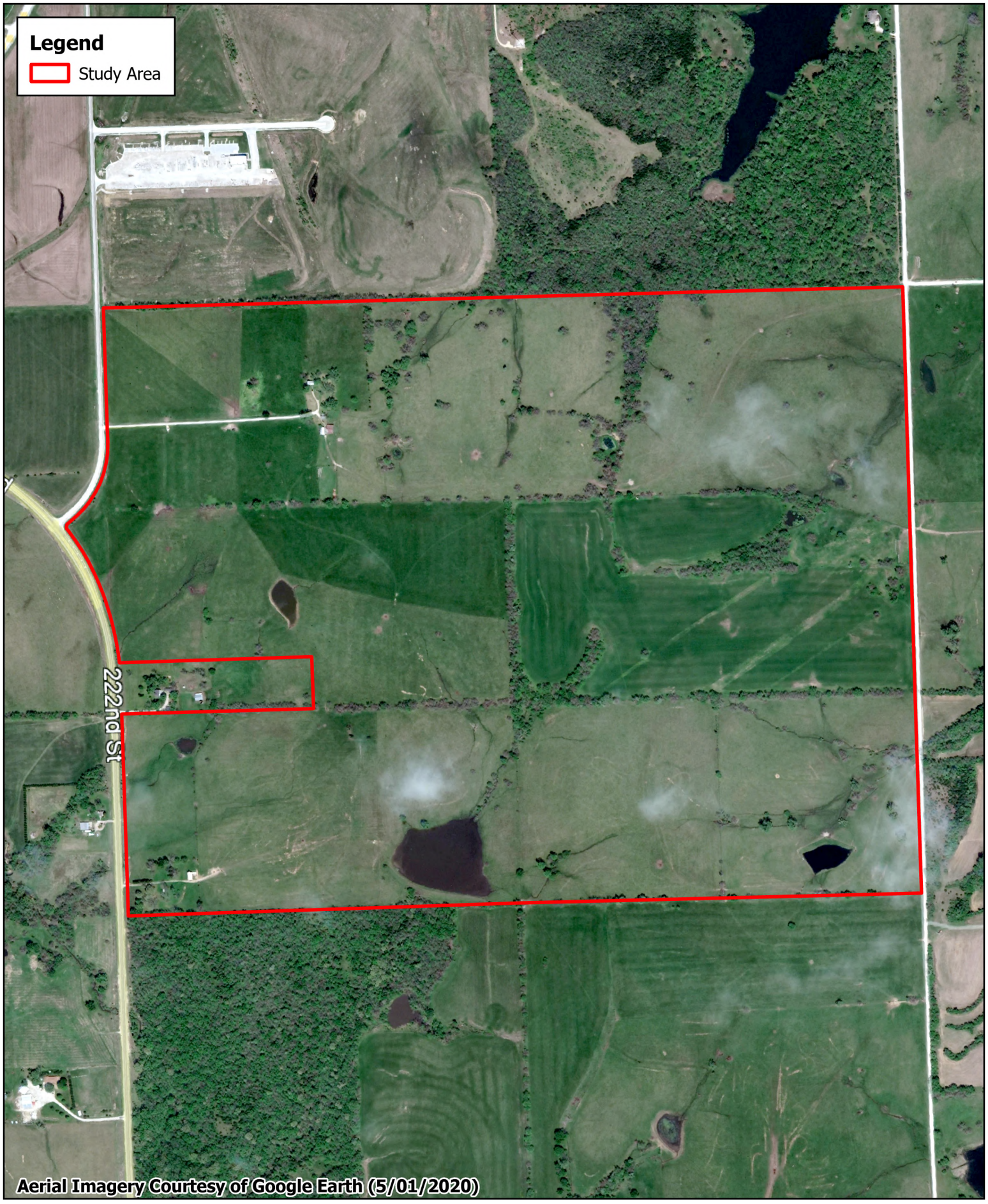
Kimley»Horn

0 400 800
Feet

N

Historic Aerial - South Section: April 2016 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



Kimley»Horn

N

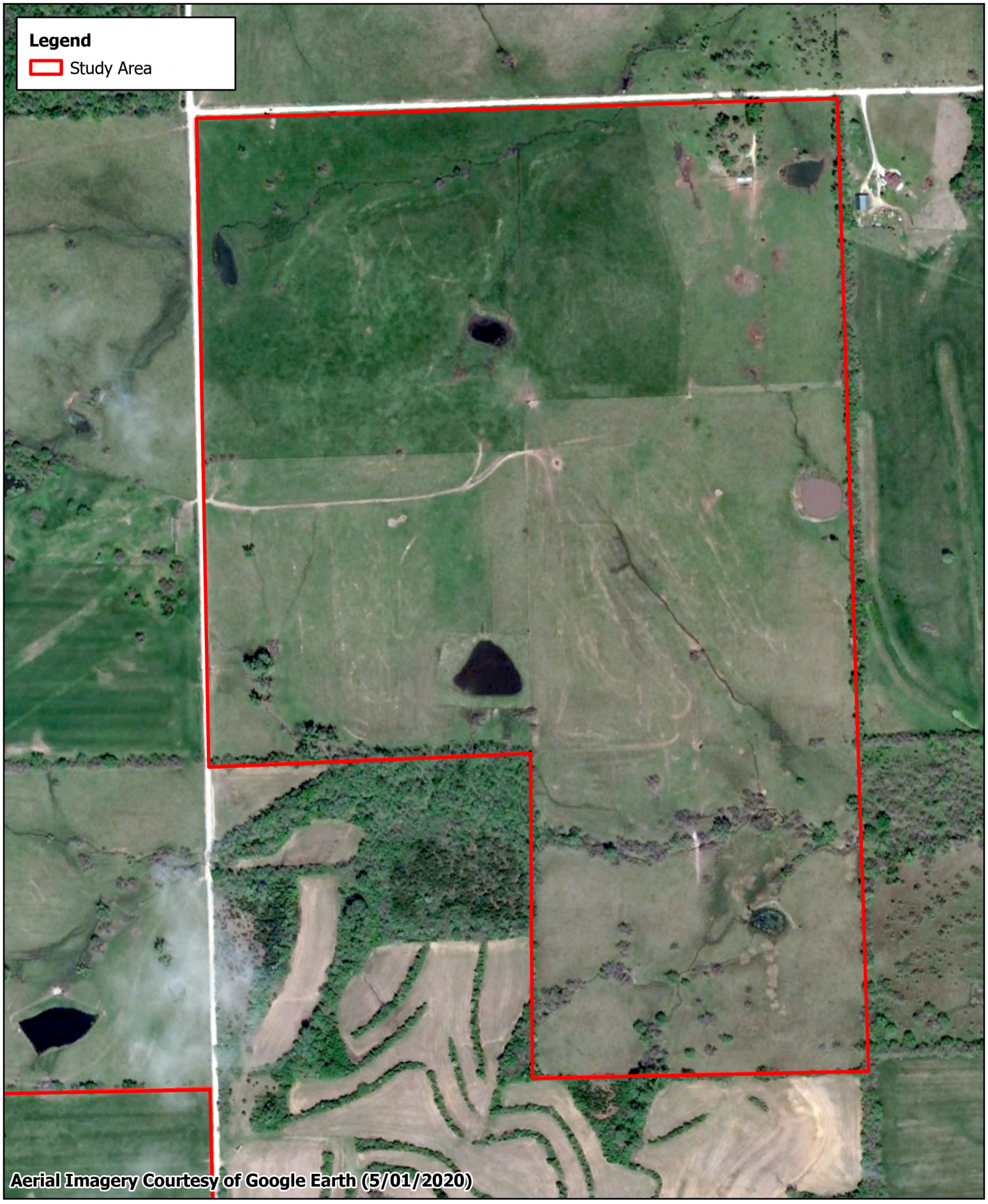
0 400 800

US Feet

Historic Aerial - Central Section: May 2020 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



Kimley»Horn

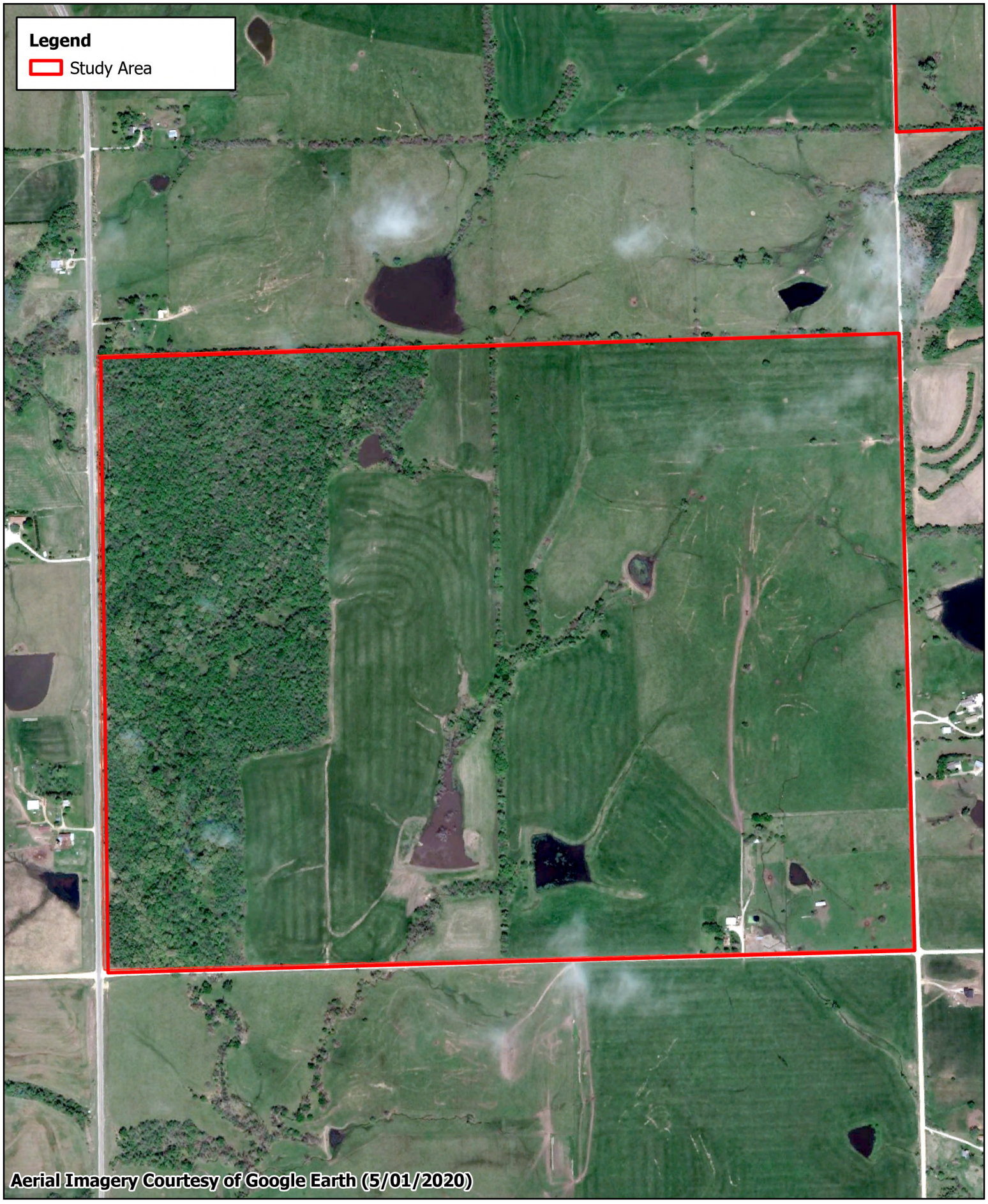
0 400 800 Feet

N

Historic Aerial - East Section: May 2020 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark Projectco LLC



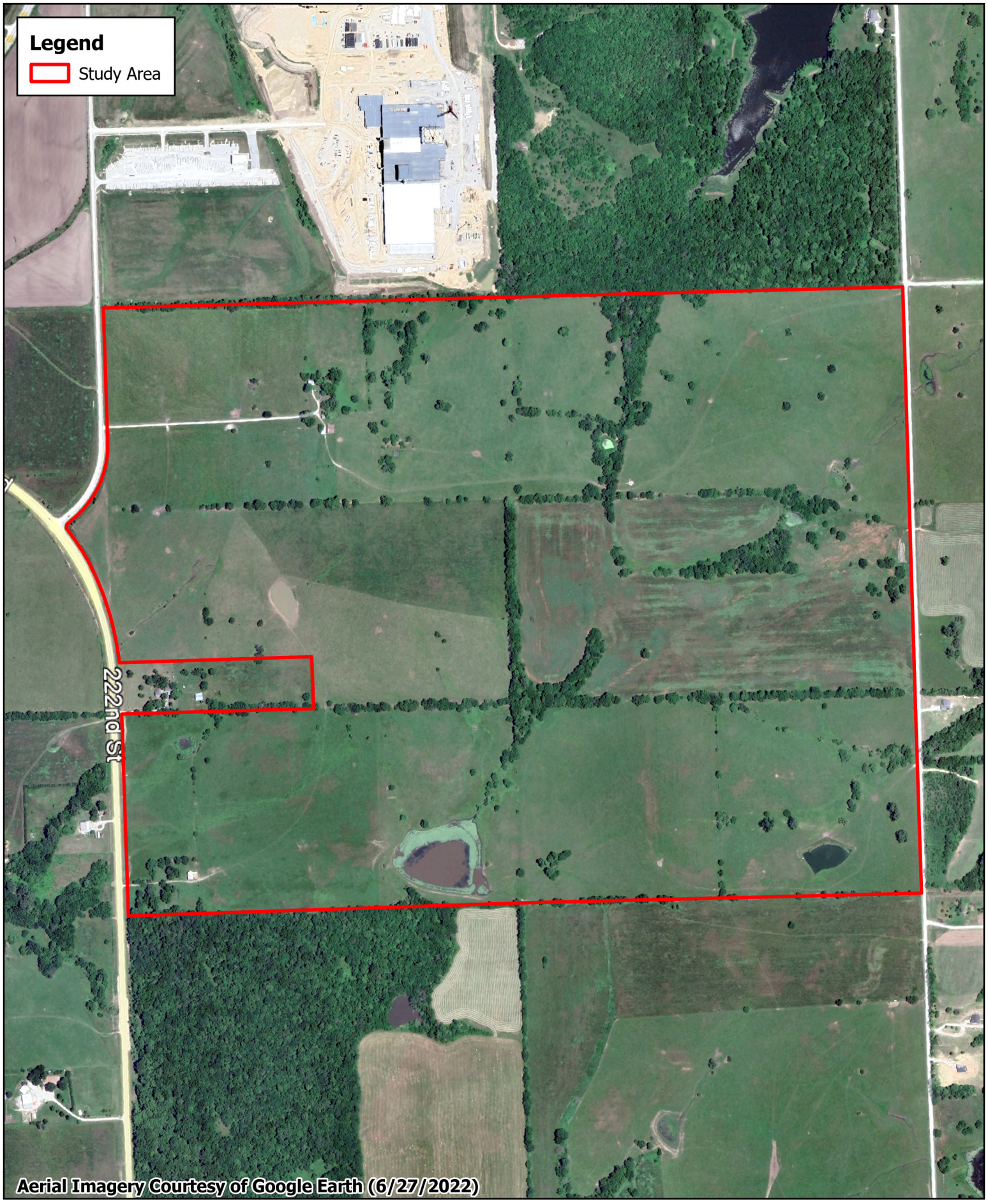
Kimley»Horn

0 400 800
Feet

N

Historic Aerial - South Section: May 2020 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



Kimley»Horn

N

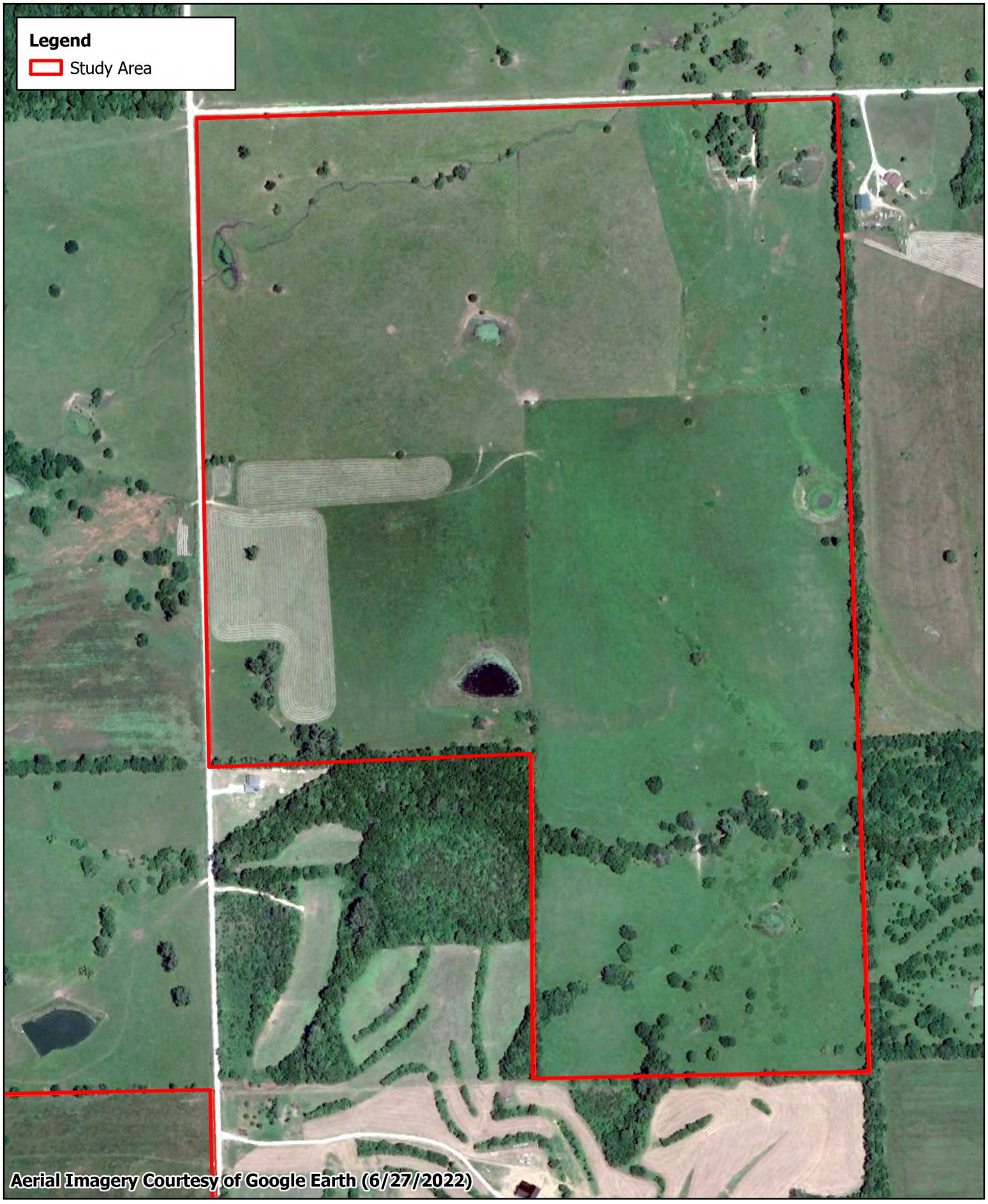
0 400 800

US Feet

Historic Aerial - Central Section: June 2022 (Normal Year)

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



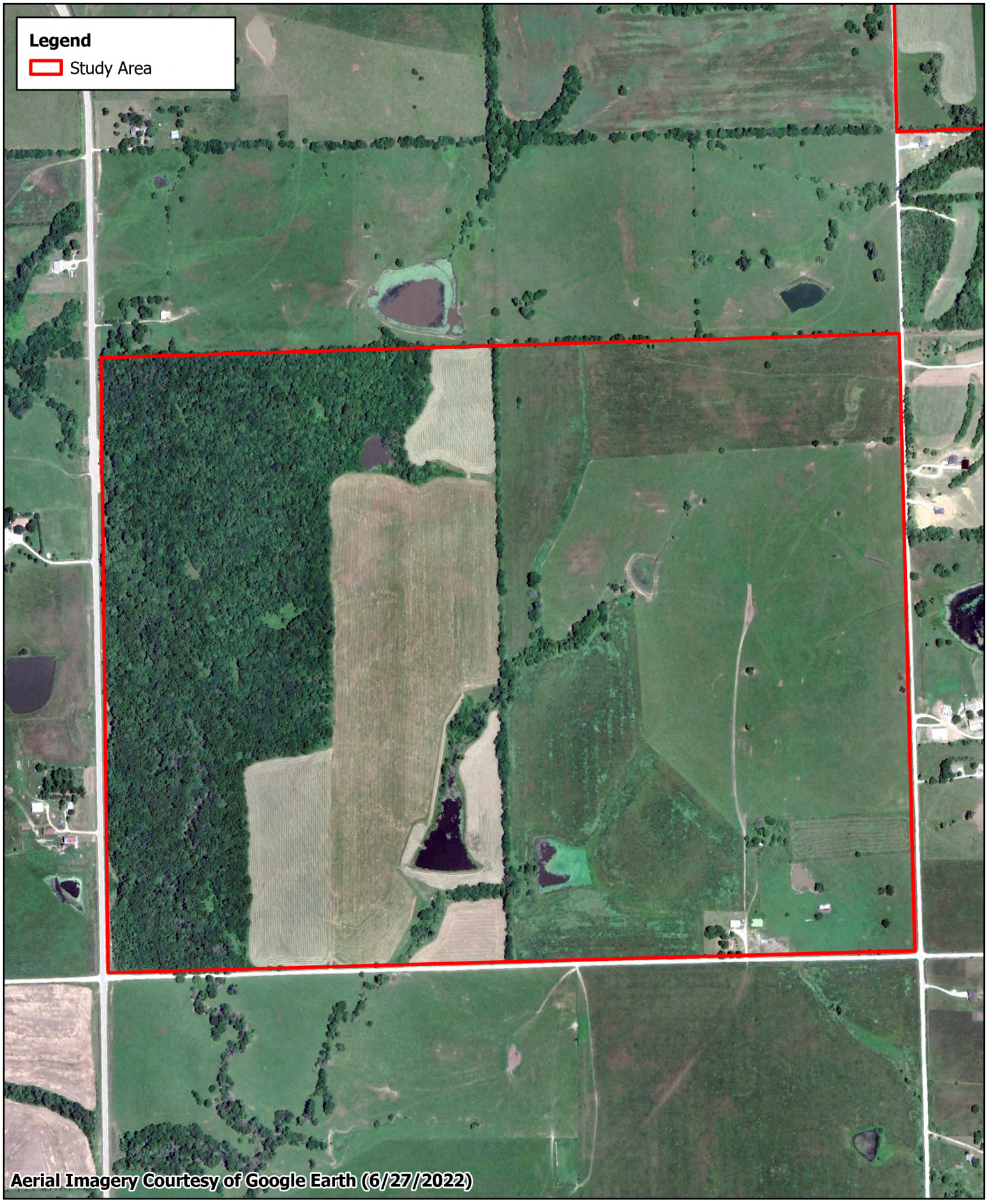
Kimley»Horn

0 250 500 Feet

N

Historic Aerial - East Section: June 2022 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC



Kimley»Horn

0 400 800
Feet

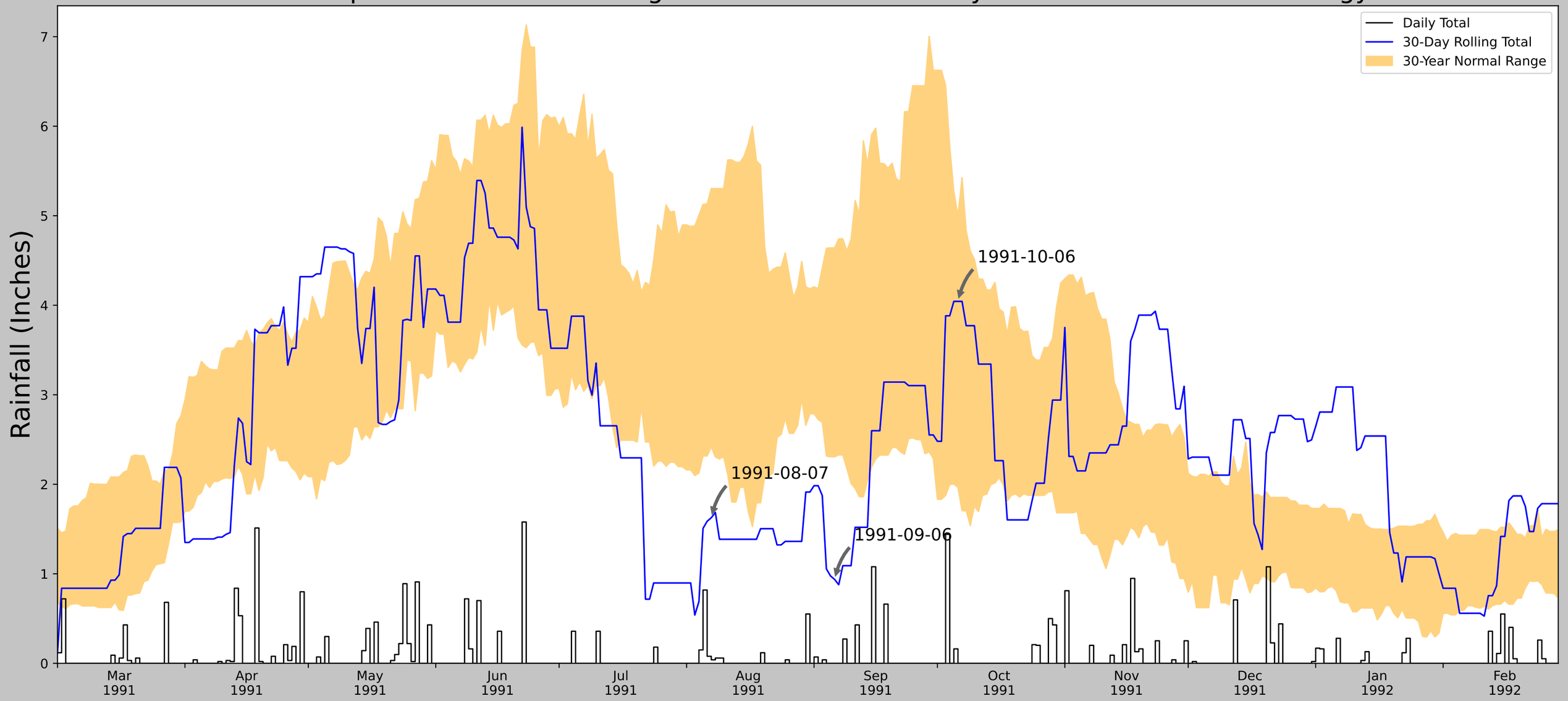
N

Historic Aerial - South Section: June 2022 (Normal Year)

Tonganoxie Township, Leavenworth County
Western Meadowlark Projectco LLC

Appendix C: Precipitation Data

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0757, -95.0676
Observation Date	1991-10-06
Elevation (ft)	942.823
Drought Index (PDSI)	Severe drought
WebWIMP H_2O Balance	Wet Season

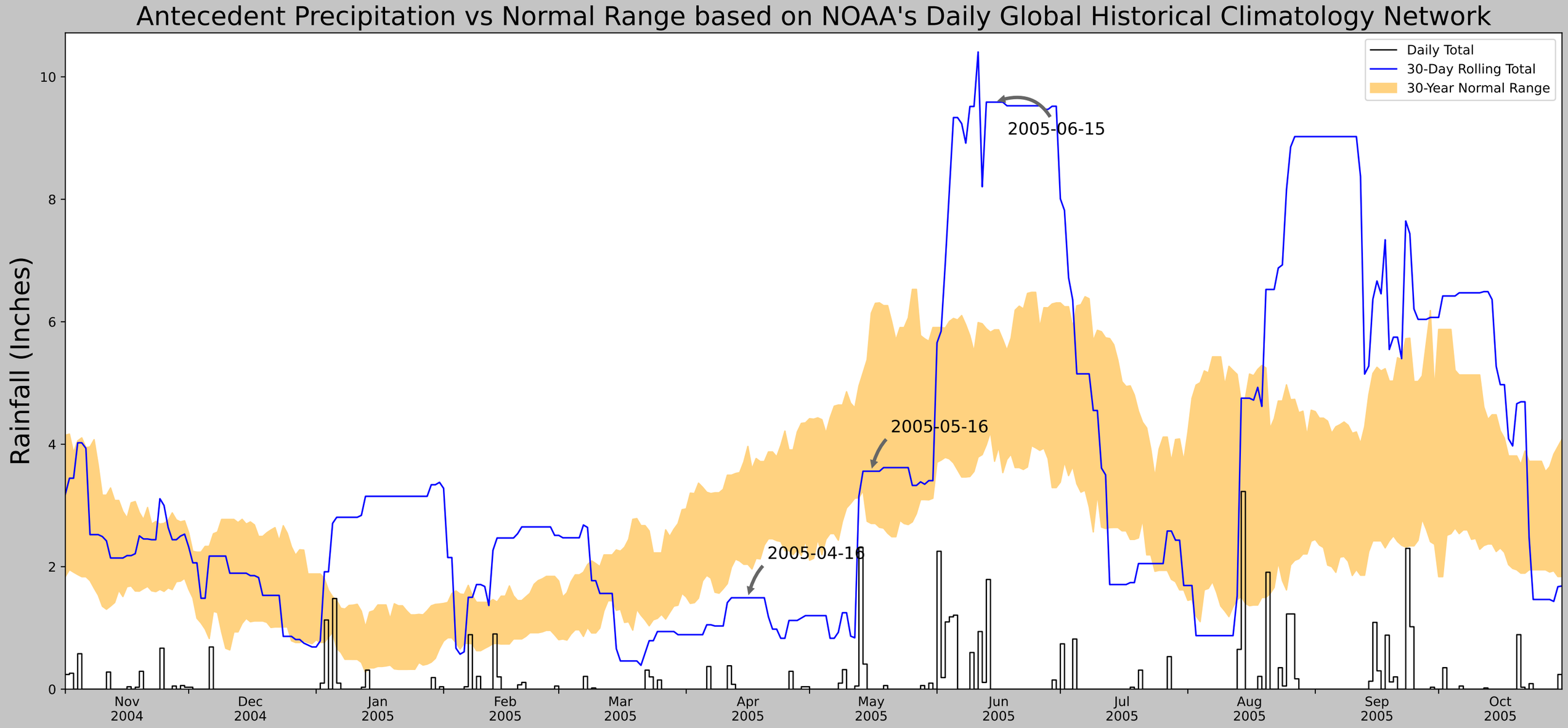
30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
1991-10-06	1.964567	5.000788	4.043307	Normal	2	3	6
1991-09-06	2.307087	4.640945	0.937008	Dry	1	2	2
1991-08-07	2.417323	5.303937	1.625984	Dry	1	1	1
Result							Drier than Normal - 9

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.17	112.77	1.784	11341	90
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	11	0



Coordinates	39.0757, -95.0676
Observation Date	2005-06-15
Elevation (ft)	942.823
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2005-06-15	3.720866	5.869292	9.586614	Wet	3	3	9
2005-05-16	2.705118	6.140158	3.559055	Normal	2	2	4
2005-04-16	2.038976	3.965748	1.492126	Dry	1	1	1
Result							Normal Conditions - 14

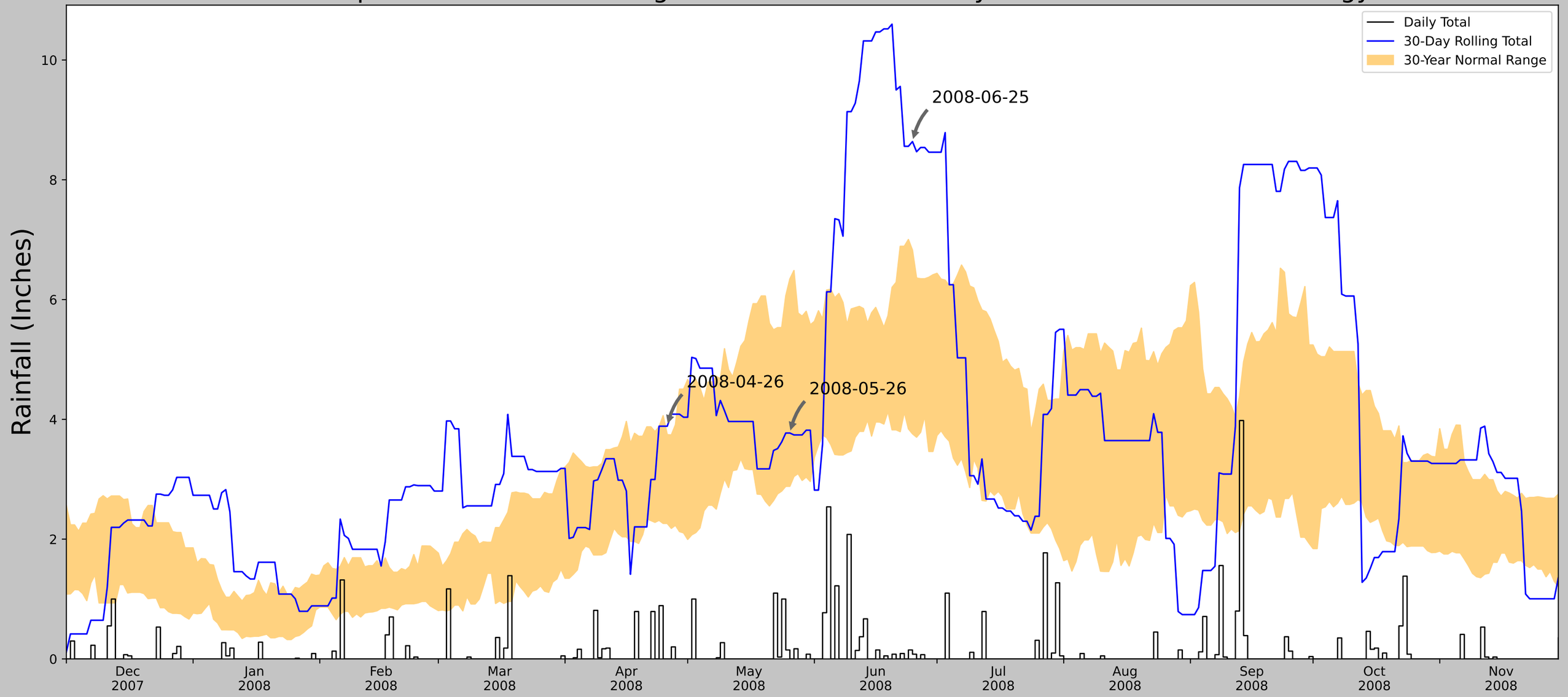
Figures and tables made by the Antecedent Precipitation Tool Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.17	112.77	1.784	11315	90
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	31	0
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	7	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0757, -95.0676
Observation Date	2008-06-25
Elevation (ft)	942.823
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2008-06-25	3.759055	6.825197	8.637796	Wet	3	3	9
2008-05-26	2.88189	6.344882	3.771654	Normal	2	2	4
2008-04-26	2.262598	3.744882	3.885827	Wet	3	1	3
Result							Wetter than Normal - 16

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

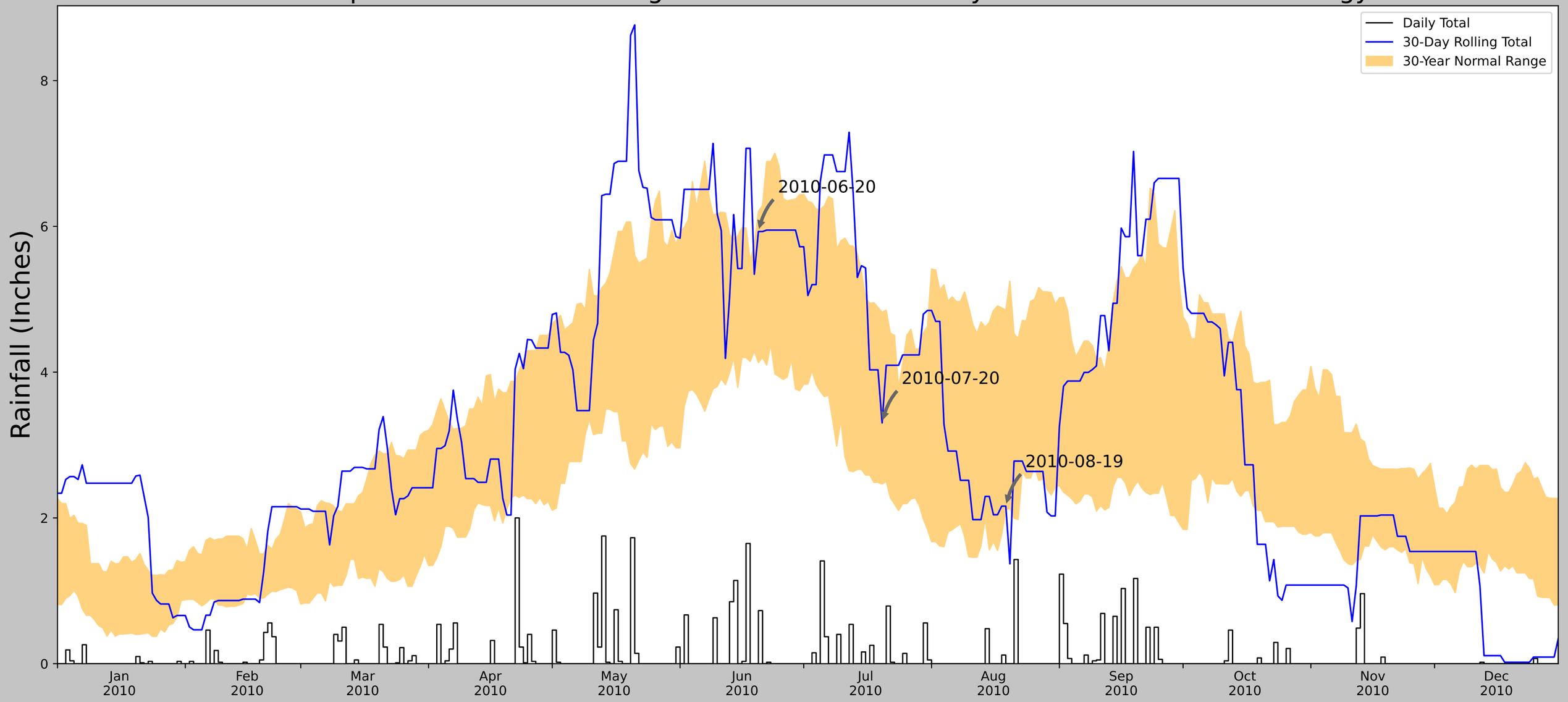
US Army Corps of Engineers

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.17	112.77	1.784	11290	90
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0757, -95.0676
Observation Date	2010-08-19
Elevation (ft)	942.823
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2010-08-19	2.110236	4.848425	2.161417	Normal	2	3	6
2010-07-20	2.464173	4.820473	3.30315	Normal	2	2	4
2010-06-20	4.13189	6.203937	5.929134	Normal	2	1	2
Result							Normal Conditions - 12

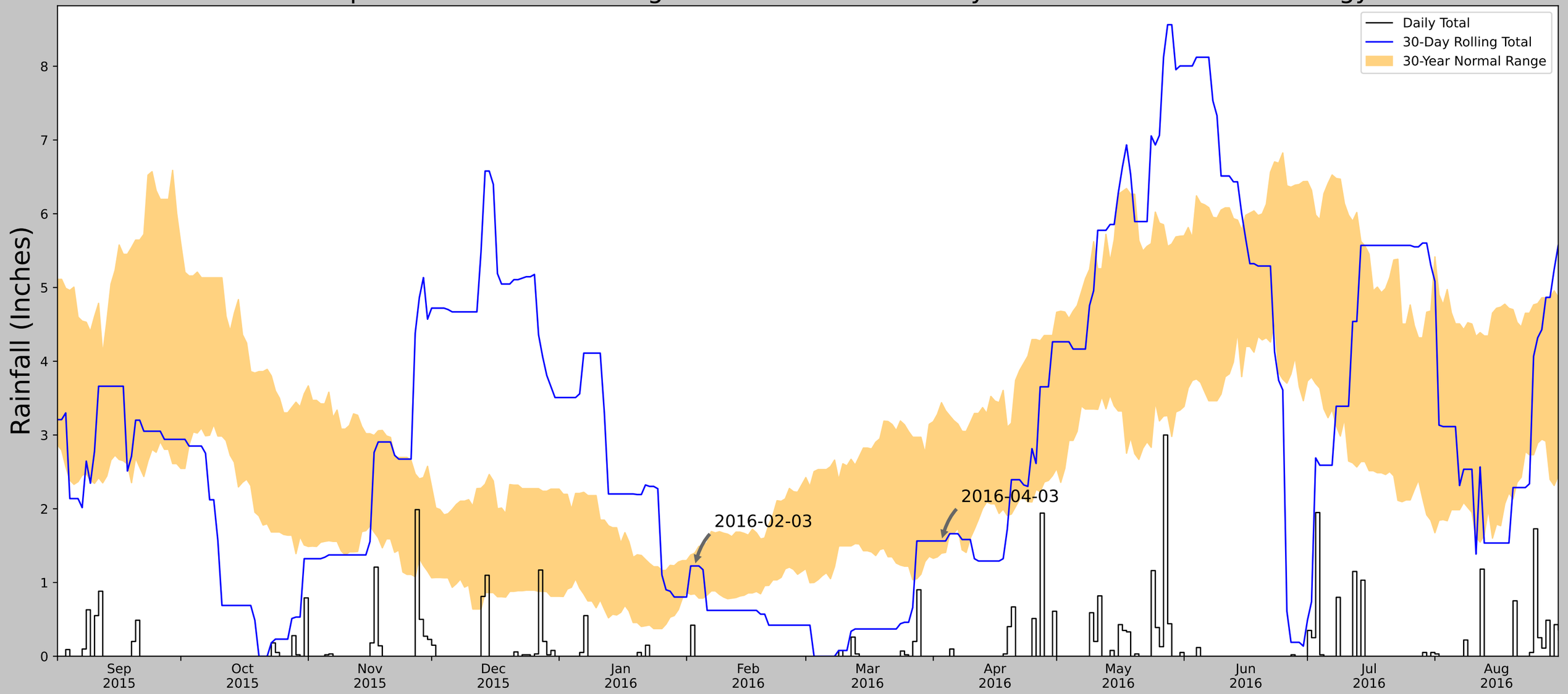
Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.17	112.77	1.784	11291	90
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0757, -95.0676
Observation Date	2016-04-03
Elevation (ft)	942.823
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2016-04-03	1.398032	3.438583	1.562992	Normal	2	3	6
2016-03-04	1.03937	2.531496	0.0	Dry	1	2	2
2016-02-03	0.84685	1.399606	1.224409	Normal	2	1	2
Result							Normal Conditions - 10

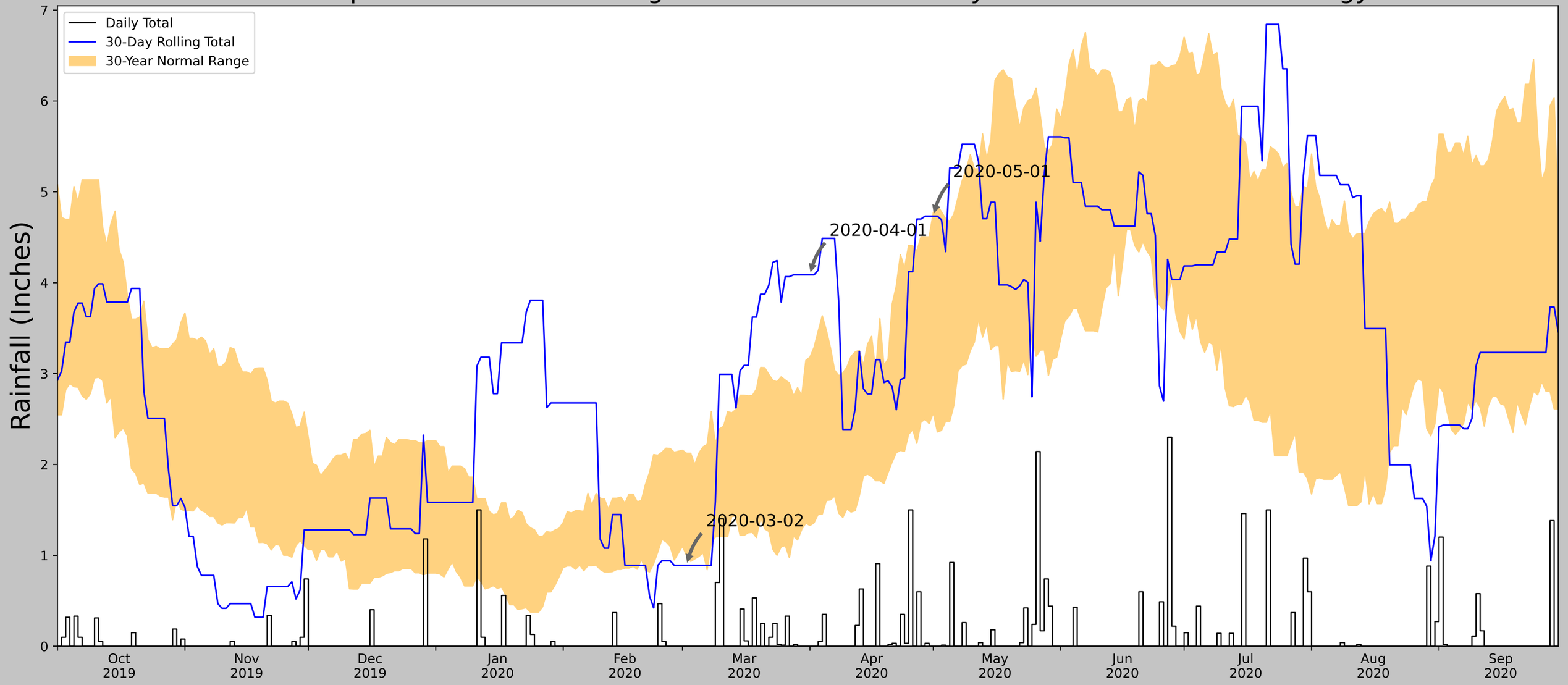
Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.17	112.77	1.784	11288	90
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	2	0
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0
BONNER SPRINGS	39.0636, -94.8961	850.066	8.667	20.013	4.074	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0757, -95.0676
Observation Date	2020-05-01
Elevation (ft)	942.823
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2020-05-01	2.566929	4.772047	4.732284	Normal	2	3	6
2020-04-01	1.327953	3.181102	4.086614	Wet	3	2	6
2020-03-02	0.996457	2.123228	0.889764	Dry	1	1	1
Result							Normal Conditions - 13

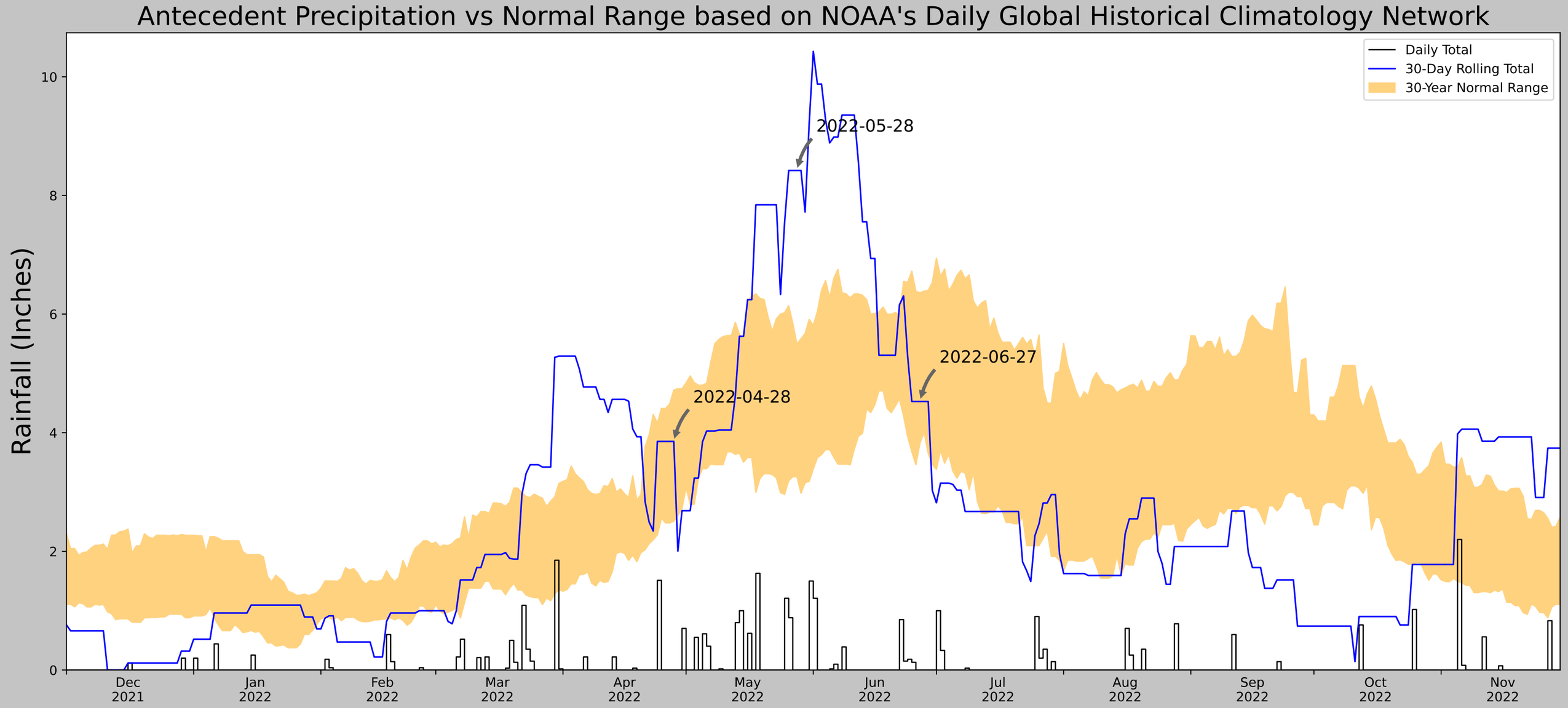
Figures and tables made by the Antecedent Precipitation Tool Version 3.0

US Army Corps of Engineers.

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.17	112.77	1.784	11265	89
TONGANOXIE 4.9 SSW	39.0445, -95.119	833.99	3.697	3.937	1.678	4	0
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	12	0
TONGANOXIE 6.3 SSW	39.0295, -95.1391	955.053	4.666	125.0	2.683	6	0
EUDORA 1S	38.9311, -95.1017	876.969	7.423	46.916	3.689	4	1
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0



Coordinates	39.0757, -95.0676
Observation Date	2022-06-27
Elevation (ft)	942.823
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-06-27	3.827165	6.359843	4.527559	Normal	2	3	6
2022-05-28	3.262599	5.494882	8.42126	Wet	3	2	6
2022-04-28	2.507087	4.719685	3.854331	Normal	2	1	2
Result							Normal Conditions - 14

Figures and tables made by the Antecedent Precipitation Tool Version 3.0

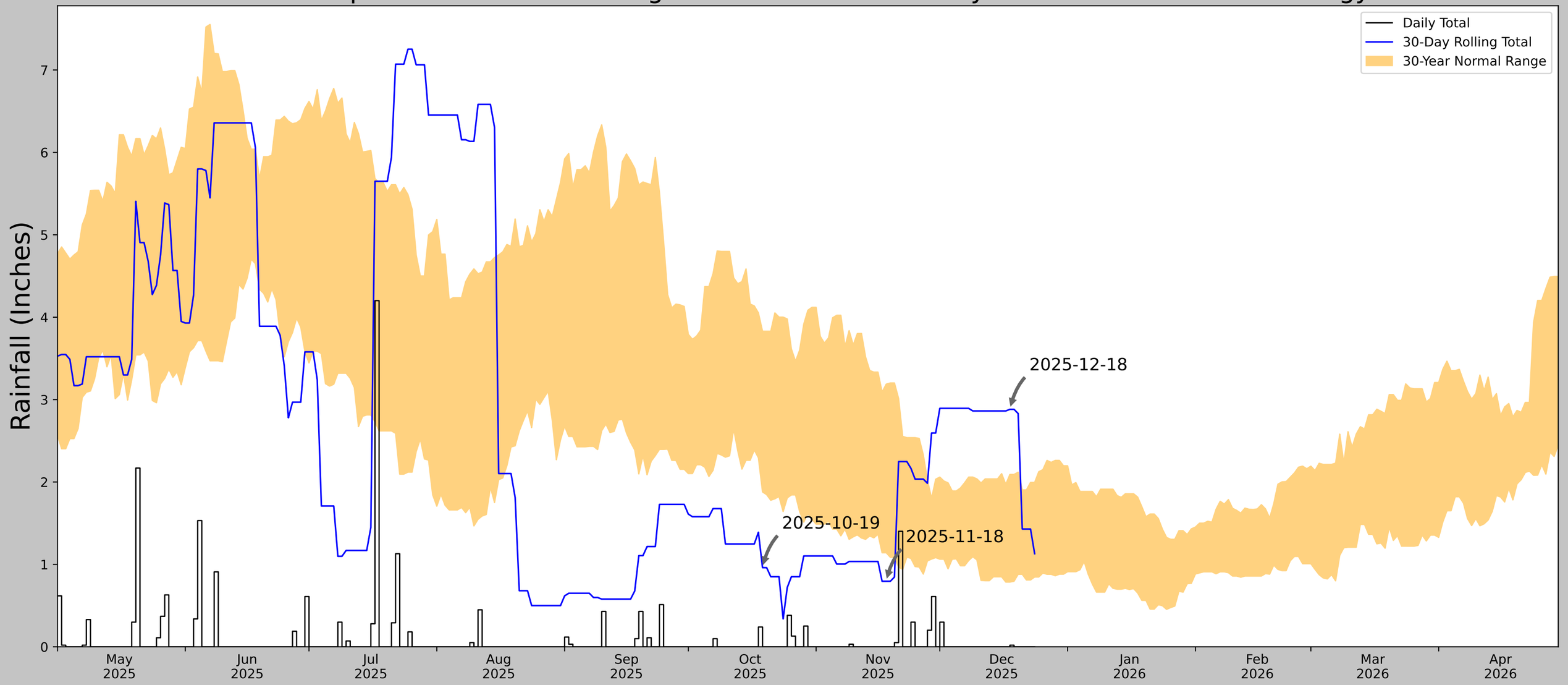
US Army Corps of Engineers.

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.17	112.77	1.784	11234	90
TONGANOXIE 4.9 SSW	39.0445, -95.119	833.99	3.697	3.937	1.678	12	0
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	12	0
TONGANOXIE 6.3 SSW	39.0295, -95.1391	955.053	4.666	125.0	2.683	6	0
EUDORA 1S	38.9311, -95.1017	876.969	7.423	46.916	3.689	28	0
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.07417, -95.08398
Observation Date	2025-12-18
Elevation (ft)	968.175
Drought Index (PDSI)	Normal (2025-11)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-12-18	0.785827	2.091732	2.88189	Wet	3	3	9
2025-11-18	1.141339	3.187795	0.795276	Dry	1	2	2
2025-10-19	1.879528	3.829528	0.96063	Dry	1	1	1
Result							Normal Conditions - 12

Figures and tables made by the Antecedent Precipitation Tool Version 3.0

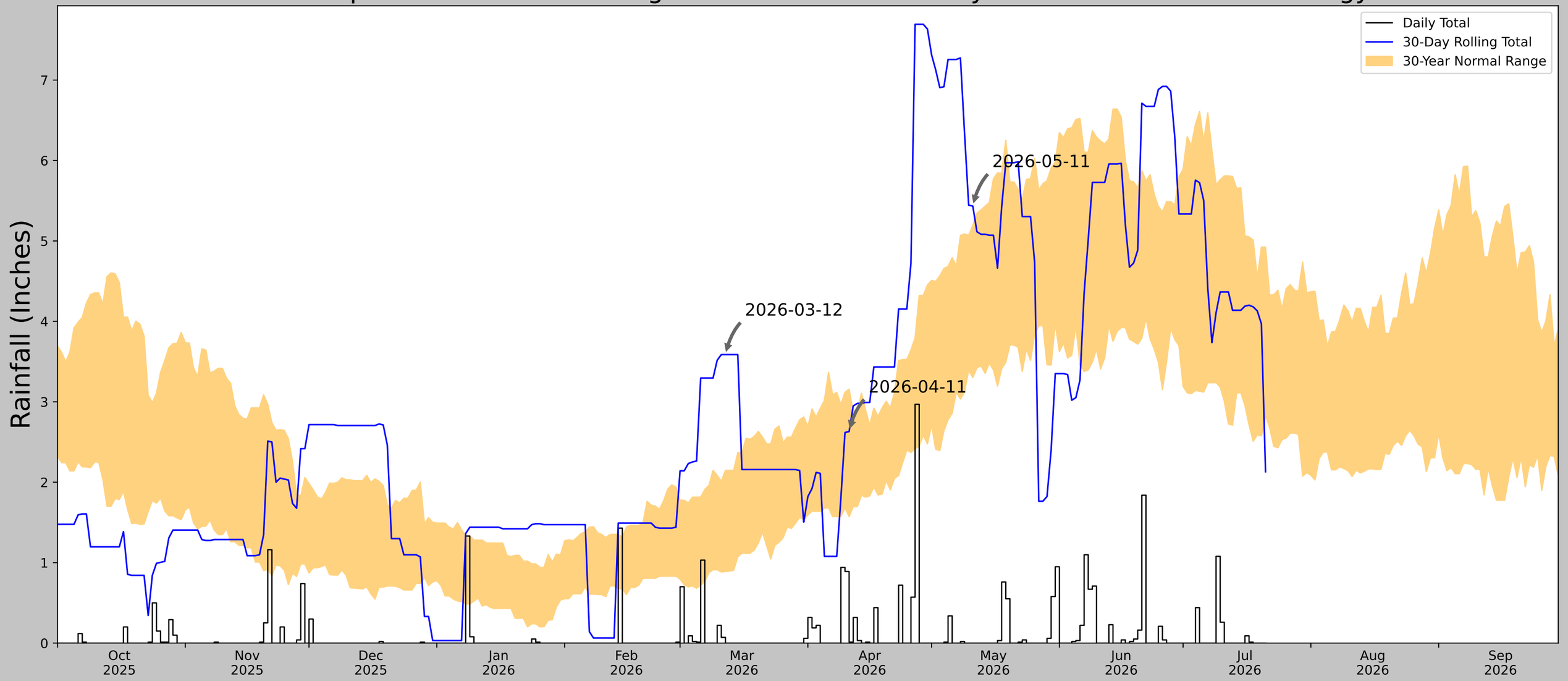
US Army Corps of Engineers.

ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
TONGANOXIE 5SE	39.0314, -95.0522	830.053	3.412	138.122	2.007	11171	72
TONGANOXIE 4.9 SSW	39.0445, -95.119	833.99	3.697	3.937	1.678	13	0
DE SOTO	38.9708, -94.9775	839.895	5.798	9.842	2.666	12	0
TONGANOXIE 6.3 SSW	39.0295, -95.1391	955.053	4.666	125.0	2.683	6	0
EUDORA 1S	38.9311, -95.1017	876.969	7.423	46.916	3.689	90	0
LAWRENCE ASOS	39.0078, -95.2114	827.1	8.7	2.953	3.941	61	18

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0638, -95.0829
Observation Date	2026-05-11
Elevation (ft)	911.747
Drought Index (PDSI)	Incipient drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2026-05-11	3.301181	5.19252	5.433071	Wet	3	3	9
2026-04-11	1.572441	3.15748	2.629921	Normal	2	2	4
2026-03-12	0.88937	2.147638	3.586614	Wet	3	1	3
Result							Wetter than Normal - 16

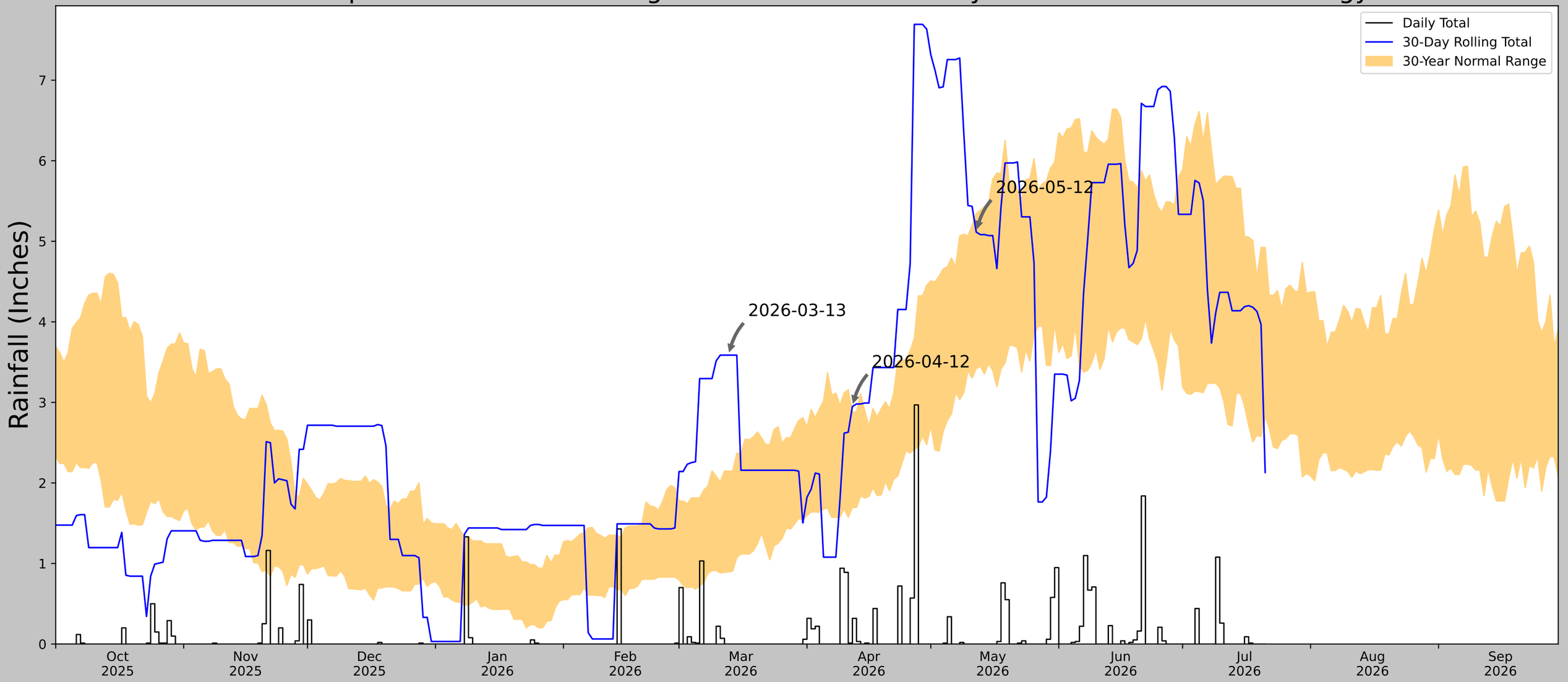
Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
LAWRENCE ASOS	39.0078, -95.2114	827.1	7.908	84.647	4.228	9865	90
LAWRENCE 1.2 N	38.9803, -95.2542	854.003	2.982	26.903	1.422	6	0
LAWRENCE 1.8 NNW	38.9873, -95.2647	859.908	3.193	32.808	1.542	3	0
LAWRENCE 1.5 E	38.9649, -95.228	928.15	3.095	101.05	1.705	2	0
LAWRENCE 1.6 ESE	38.9543, -95.228	834.974	3.803	7.874	1.741	8	0
LAWRENCE	38.9569, -95.2483	1046.916	4.037	219.816	2.704	1441	0
TONGANOXIE 5SE	39.0314, -95.0522	830.053	8.7	2.953	3.941	28	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0638, -95.0829
Observation Date	2026-05-12
Elevation (ft)	911.747
Drought Index (PDSI)	Incipient drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2026-05-12	3.42126	5.344488	5.114173	Normal	2	3	6
2026-04-12	1.695276	2.879134	2.948819	Wet	3	2	6
2026-03-13	0.895276	2.147638	3.586614	Wet	3	1	3
Result							Wetter than Normal - 15

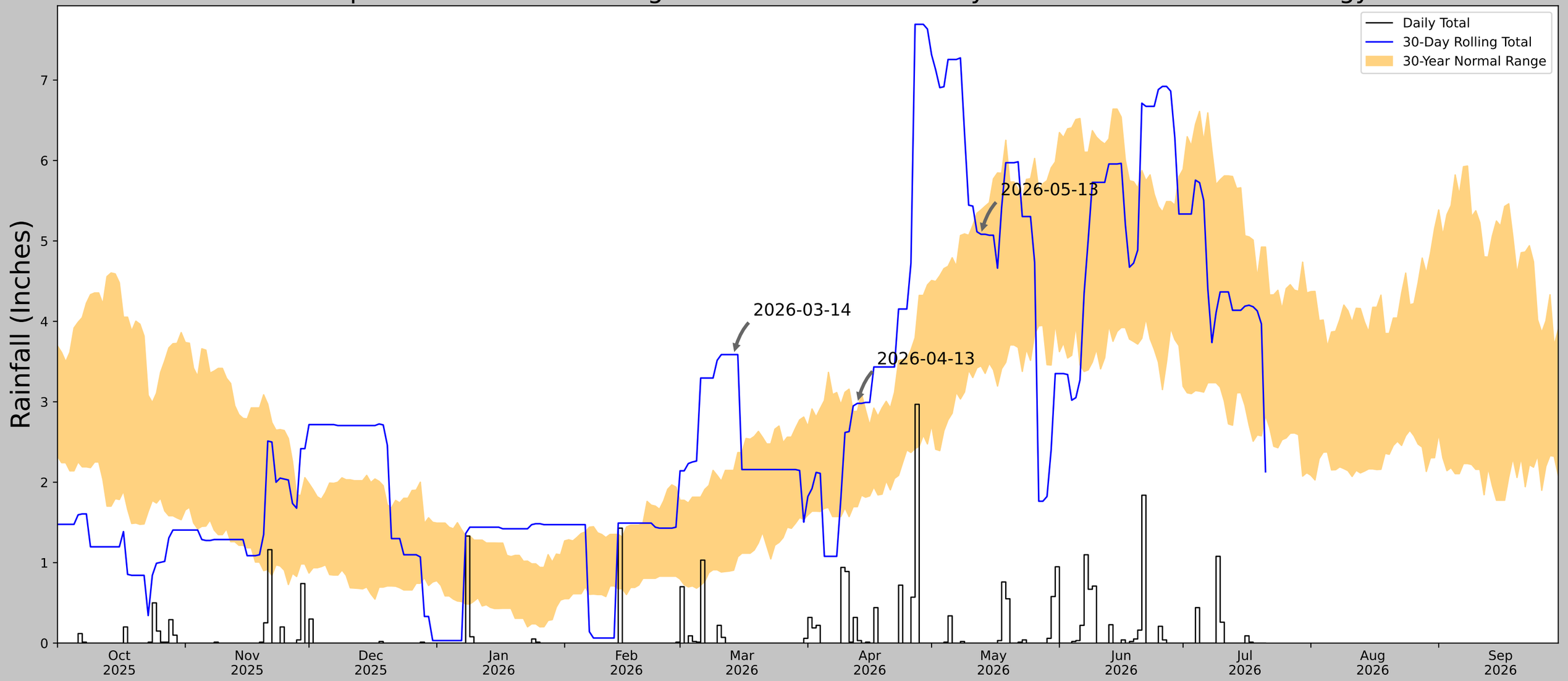
Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
LAWRENCE ASOS	39.0078, -95.2114	827.1	7.908	84.647	4.228	9865	90
LAWRENCE 1.2 N	38.9803, -95.2542	854.003	2.982	26.903	1.422	6	0
LAWRENCE 1.8 NNW	38.9873, -95.2647	859.908	3.193	32.808	1.542	3	0
LAWRENCE 1.5 E	38.9649, -95.228	928.15	3.095	101.05	1.705	2	0
LAWRENCE 1.6 ESE	38.9543, -95.228	834.974	3.803	7.874	1.741	8	0
LAWRENCE	38.9569, -95.2483	1046.916	4.037	219.816	2.704	1441	0
TONGANOXIE 5SE	39.0314, -95.0522	830.053	8.7	2.953	3.941	28	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.0638, -95.0829
Observation Date	2026-05-13
Elevation (ft)	911.747
Drought Index (PDSI)	Incipient drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2026-05-13	3.446063	5.385433	5.082677	Normal	2	3	6
2026-04-13	1.695276	2.882677	2.980315	Wet	3	2	6
2026-03-14	0.905906	2.147638	3.586614	Wet	3	1	3
Result							Wetter than Normal - 15

Figures and tables made by the
Antecedent Precipitation Tool
Version 3.0

US Army Corps of Engineers.
ERDC

Developed by:
U.S. Army Corps of Engineers and
U.S. Army Engineer Research and
Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
LAWRENCE ASOS	39.0078, -95.2114	827.1	7.908	84.647	4.228	9865	90
LAWRENCE 1.2 N	38.9803, -95.2542	854.003	2.982	26.903	1.422	6	0
LAWRENCE 1.8 NNW	38.9873, -95.2647	859.908	3.193	32.808	1.542	3	0
LAWRENCE 1.5 E	38.9649, -95.228	928.15	3.095	101.05	1.705	2	0
LAWRENCE 1.6 ESE	38.9543, -95.228	834.974	3.803	7.874	1.741	8	0
LAWRENCE	38.9569, -95.2483	1046.916	4.037	219.816	2.704	1441	0
TONGANOXIE 5SE	39.0314, -95.0522	830.053	8.7	2.953	3.941	28	0

Appendix D: Field Data Sheets

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-17

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-1

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.0774447 Long: -95.08667049 Datum: WGS 84

Soil Map Unit Name: 7501 - Pawnee clay loam, 4 to 8 percent slopes, eroded NWI classification: PABFh

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

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

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

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

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

Remarks:
Sample point taken in depression in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Echinochloa crus-galli	40	✔	FACW
2. Carex pensylvanica	25	✔	UPL
3. Verbena urticifolia	5		FAC
4. Panicum virgatum	5		FAC
5. Persicaria hydropiperoides	5		OBL
6. Symphyotrichum pilosum	5		FACU
7.			
8.			
9.			
10.			
	85	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 5	x 1 = 5
FACW species 40	x 2 = 80
FAC species 10	x 3 = 30
FACU species 5	x 4 = 20
UPL species 25	x 5 = 125
Column Totals: 85 (A)	260 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 22	10YR 3/1	85	5YR 4/6	15	C	M	Silty Clay	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-17

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-2

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex

Slope (%): 2 Lat: 39.07747643 Long: -95.08667241 Datum: WGS 84

Soil Map Unit Name: 7501 - Pawnee clay loam, 4 to 8 percent slopes, eroded NWI classification: PABFh

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken on hillslope in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Maclura pomifera	5	✔	FACU
2.			
3.			
4.			
5.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Gleditsia triacanthos	5	✔	FACU
2.			
3.			
4.			
5.			
	5	=Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Lolium arundinaceum	25	✔	FACU
2. Symphyotrichum pilosum	20	✔	FACU
3. Verbena urticifolia	5		FAC
4. Xanthium strumarium	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	55	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	65 (A)		250 (B)

Prevalence Index = B/A = 3.84

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 7	10YR 3/1	100					Silty Clay	
7 - 23	10YR 3/1	93	5YR 4/6	7	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-17

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-3

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Erosional Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.07810602 Long: -95.0840686 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: None

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken in bottom of erosional feature. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Lolium arundinaceum	40	✔	FACU
2. Chaerophyllum procumbens	5		FACW
3. Perilla frutescens	5		FAC
4. Verbena urticifolia	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	55 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 5	x 2 = 10
FAC species 10	x 3 = 30
FACU species 40	x 4 = 160
UPL species 0	x 5 = 0
Column Totals: 55 (A)	200 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 3/1	97	10YR 4/6	3	C	M	Silty Clay	
14 - 23	10YR 4/1	95	10YR 5/6	5	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-17

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-4

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.07745783 Long: -95.08200756 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: None

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

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

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

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

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

Remarks:
Sample point taken in depression adjacent to pond in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Echinochloa crus-galli	30	✔	FACW
2. Ranunculus sceleratus	15	✔	OBL
3. Stellaria media ssp. media	10		FACU
4. Cyperus rotundus	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	60 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 15	x 1 = 15
FACW species 30	x 2 = 60
FAC species 5	x 3 = 15
FACU species 10	x 4 = 40
UPL species 0	x 5 = 0
Column Totals: 60 (A)	130 (B)

Prevalence Index = B/A = 2.16

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 3/1	95	7.5YR 4/6	5	C	M	Silty Clay	
10 - 20	5PB 3/1	80	10YR 5/4	20	C	M	Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-17

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-5

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex

Slope (%): 1 Lat: 39.07746367 Long: -95.08206562 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: None

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

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

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

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

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

Remarks:
Sample point taken on hillslope adjacent to pond in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Maclura pomifera	5	✔	FACU
2.			
3.			
4.			
5.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Rosa multiflora	5	✔	FACU
2.			
3.			
4.			
5.			
	5	=Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Lolium arundinaceum	40	✔	FACU
2. Perilla frutescens	10		FAC
3. Symphyotrichum pilosum	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	55	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	65 (A)		250 (B)

Prevalence Index = B/A = 3.84

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 5/1	92	5YR 4/6	2	C	M	Silty Clay	
0 - 14			10YR 6/6	6	C	M	Silty Clay	
14 - 22	10YR 6/6	75	7.5YR 5/8	5	C	M	Silty Clay	
14 - 22			10YR 7/1	20	D	M	Silty Clay	
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

Saturation Present? Yes ___ No ✔ Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-17

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-6

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S28 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.06961692 Long: -95.08498846 Datum: WGS 84

Soil Map Unit Name: 7303 - Martin silty clay loam, 3 to 7 percent slopes, eroded NWI classification: PEM1Ch

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ✔ No ____
Hydric Soil Present? Yes ✔ No ____
Wetland Hydrology Present? Yes ✔ No ____

Is the Sampled Area within a Wetland? **Yes** ✔ **No** ____

Remarks:
Sample point taken in depression adjacent to pond. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Echinochloa crus-galli	25	✔	FACW
2. Cyperus rotundus	20	✔	FAC
3. Persicaria lapathifolia	20	✔	FACW
4. Verbena hastata	5		FACW
5.			
6.			
7.			
8.			
9.			
10.			
	70	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		160 (B)

Prevalence Index = B/A = 2.28

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

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

SOIL

Sampling Point: SP-6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 16	10YR 3/1	95	5YR 4/6	5	C	M	Silty Clay	
16 - 22	10YR 4/1	95	10YR 5/6	5	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-17

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-7

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S28 T11S R21E

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex

Slope (%): 1 Lat: 39.06963021 Long: -95.08491634 Datum: WGS 84

Soil Map Unit Name: 7303 - Martin silty clay loam, 3 to 7 percent slopes, eroded NWI classification: PEM1Ch

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken on hillslope above pond depression. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Lolium arundinaceum	50	✔	FACU
2. Elymus virginicus	20	✔	FACW
3. Symphyotrichum pilosum	10		FACU
4. Ambrosia artemisiifolia	5		FACU
5. Setaria pumila	5		FAC
6.			
7.			
8.			
9.			
10.			
	90 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 20	x 2 = 40
FAC species 5	x 3 = 15
FACU species 65	x 4 = 260
UPL species 0	x 5 = 0
Column Totals: 90 (A)	315 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 26	10YR 2/1	100					Silty Clay	
26 - 32	10YR 2/1	98	10YR 6/8	2	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-8

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.07682841 Long: -95.07671133 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: PABFh

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

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

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

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

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

Remarks:
Sample point taken in depression in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Cyperus rotundus	20	✔	FAC
2. Echinochloa crus-galli	20	✔	FACW
3. Verbena urticifolia	10		FAC
4. Lolium arundinaceum	5		FACU
5. Xanthium strumarium	5		FAC
6.			
7.			
8.			
9.			
10.			
	60	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	35	x 3 =	105
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	60 (A)		165 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

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

SOIL

Sampling Point: SP-8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 19	10YR 3/1	95	7.5YR 4/6	5	C	M	Silty Clay	
19 - 25	10YR 4/1	97	10YR 4/6	3	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-9

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex

Slope (%): 1 Lat: 39.07684589 Long: -95.07658211 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: PABFh

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

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

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

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

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

Remarks:
Sample point taken on hillslope in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Maclura pomifera	5	✔	FACU
2.			
3.			
4.			
5.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Cyperus rotundus	15	✔	FAC
2. Lolium arundinaceum	10	✔	FACU
3. Setaria pumila	5		FAC
4. Verbena urticifolia	5		FAC
5. Xanthium strumarium	5		FAC
6.			
7.			
8.			
9.			
10.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	45 (A)		150 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 13	10YR 3/1	100					Silty Clay	
13 - 20	10YR 5/1	60	10YR 5/6	5	C	M	Silty Clay	
13 - 20	10YR 3/1	35					Silty Clay	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18
Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-10
Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E
Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave
Slope (%): 0 Lat: 39.0766252 Long: -95.07682057 Datum: WGS 84
Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: R4SBC
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ✔ No ____
Hydric Soil Present? Yes ✔ No ____
Wetland Hydrology Present? Yes ____ No ✔

Is the Sampled Area within a Wetland? **Yes** ____ **No** ✔

Remarks:
Sample point taken on hillslope south of pond. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Setaria pumila	40	✔	FAC
2. Verbena urticifolia	20	✔	FAC
3. Cyperus rotundus	15		FAC
4. Verbena hastata	10		FACW
5. Muhlenbergia rigens	5		FACU
6.			
7.			
8.			
9.			
10.			
	90	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 10	x 2 = 20
FAC species 75	x 3 = 225
FACU species 5	x 4 = 20
UPL species 0	x 5 = 0
Column Totals: 90 (A)	265 (B)

Prevalence Index = B/A = 2.94

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

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

SOIL

Sampling Point: SP-10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 8	10YR 2/1	100					Silty Clay	
8 - 16	10YR 2/1	97	10YR 4/6	3	C	M	Silty Clay	
16 - 22	10YR 3/1	93	10YR 6/6	2	C	M	Silty Clay	
16 - 22	10YR 4/6	5					Silty Clay	
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-11

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.07667459 Long: -95.07675238 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: PEM1Fh

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

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

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

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

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

Remarks:
Sample point taken in dry pond depression. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Echinochloa crus-galli	40	✔	FACW
2. Verbena urticifolia	15	✔	FAC
3. Cyperus rotundus	10		FAC
4. Lolium arundinaceum	10		FACU
5. Setaria pumila	10		FAC
6.			
7.			
8.			
9.			
10.			
	85 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 40	x 2 = 80
FAC species 35	x 3 = 105
FACU species 10	x 4 = 40
UPL species 0	x 5 = 0
Column Totals: 85 (A)	225 (B)

Prevalence Index = B/A = 2.64

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 30	10YR 3/1	97	5YR 3/4	3	C	M	Silty Clay	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-12

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.07607847 Long: -95.07743265 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: None

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No ____
Hydric Soil Present? Yes ✔ No ____
Wetland Hydrology Present? Yes ✔ No ____

Is the Sampled Area within a Wetland? **Yes** ✔ **No** ____

Remarks:
Sample point taken in depression adjacent to pond. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Cornus amomum ssp. amomum	5	✔	FACW
2.			
3.			
4.			
5.			
	5 =Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Panicum virgatum	60	✔	FAC
2. Cyperus rotundus	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	65 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 5	x 2 = 10
FAC species 65	x 3 = 195
FACU species 0	x 4 = 0
UPL species 0	x 5 = 0
Column Totals: 70 (A)	205 (B)

Prevalence Index = B/A = 2.92

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

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

SOIL

Sampling Point: SP-12

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 3/2	95	10YR 4/6	5	C	M	Silty Clay	
8 - 24	10YR 4/1	90	10YR 4/6	10	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18
Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-13
Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E
Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
Slope (%): 1 Lat: 39.07602037 Long: -95.07737671 Datum: WGS 84
Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ____ No ✔
Hydric Soil Present? Yes ____ No ✔
Wetland Hydrology Present? Yes ____ No ✔

Is the Sampled Area within a Wetland? **Yes** ____ **No** ✔

Remarks:
Sample point take on hillslope adjacent to pond. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Maclura pomifera	5	✔	FACU
2.			
3.			
4.			
5.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Lolium arundinaceum	60	✔	FACU
2. Setaria pumila	15		FAC
3. Ambrosia trifida	5		FAC
4. Astragalus canadensis	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	85	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	90 (A)		335 (B)

Prevalence Index = B/A = 3.72

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

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

SOIL

Sampling Point: SP-13

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 16	10YR 3/2	100					Silty Clay	
16 - 24	10YR 4/1	95	10YR 6/6	5	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-14

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S28 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.07006337 Long: -95.07770177 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: None

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ✔ No ____
Hydric Soil Present? Yes ✔ No ____
Wetland Hydrology Present? Yes ✔ No ____

Is the Sampled Area within a Wetland? **Yes** ✔ **No** ____

Remarks:
Sample point taken in depression adjacent to pond. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Cornus amomum ssp. amomum	35	✔	FACW
2.			
3.			
4.			
5.			
	35 =Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Persicaria hydropiperoides	30	✔	OBL
2. Leersia oryzoides	15	✔	OBL
3. Chaerophyllum procumbens	5		FACW
4. Cyperus rotundus	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	55 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	40	x 2 =	80
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		140 (B)

Prevalence Index = B/A = 1.55

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

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

SOIL

Sampling Point: SP-14

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/1	97	10YR 4/6	3	C	M	Sandy Clay	
6 - 16	10YR 5/3	95	10YR 6/6	5	C	M	Sandy Clay	
16 - 24	10YR 5/6	80	5PB 5/1	20	D	M	Sandy Clay	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 8

Hydric Soil Present? Yes ✔ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

Saturation Present? Yes ✔ No ___ Depth (inches): 2

(includes capillary fringe)

Wetland Hydrology Present? Yes ✔ No ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-15

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S28 T11S R21E

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex

Slope (%): 2 Lat: 39.07002897 Long: -95.07758527 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: None

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

Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

Sample point taken on hillslope. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juniperus virginiana	5	✔	FACU
2.			
3.			
4.			
5.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Cornus racemosa	5	✔	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Lolium arundinaceum	60	✔	FACU
2. Andropogon gerardii	10		FAC
3. Andropogon virginicus	5		FACU
4. Solanum carolinense	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	80	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 0	x 2 = 0
FAC species 15	x 3 = 45
FACU species 75	x 4 = 300
UPL species 0	x 5 = 0
Column Totals: 90 (A)	345 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-15

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 3/1	93	7.5YR 4/6	7	C	M	Silty Clay	
20 - 26	10YR 5/3	95	10YR 3/1	3	D	M	Silty Clay	
20 - 26			10YR 5/6	2	C	M	Silty Clay	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-16

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S28 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.07245764 Long: -95.09203845 Datum: WGS 84

Soil Map Unit Name: 7303 - Martin silty clay loam, 3 to 7 percent slopes, eroded NWI classification: None

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

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

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

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

Hydrophytic Vegetation Present? Yes ✔ No ____
Hydric Soil Present? Yes ✔ No ____
Wetland Hydrology Present? Yes ✔ No ____

Is the Sampled Area within a Wetland? **Yes** ✔ **No** ____

Remarks:
Sample point taken in depression in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Persicaria hydropiperoides	25	✔	OBL
2. Cyperus rotundus	10	✔	FAC
3. Inula helenium	10	✔	FACU
4. Sporobolus cryptandrus	10	✔	FACU
5. Rumex pulcher	5		FAC
6. Verbena urticifolia	5		FAC
7.			
8.			
9.			
10.			
	65 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	65 (A)		165 (B)

Prevalence Index = B/A = 2.53

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

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

SOIL

Sampling Point: SP-16

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 3/1	97	10YR 4/6	3	C	M	Silty Clay	
14 - 20	10YR 5/1	70	10YR 5/6	5	C	M	Silty Clay	
14 - 20	10YR 3/1	25					Silty Clay	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-17

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S28 T11S R21E

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex

Slope (%): 1 Lat: 39.07249365 Long: -95.09206985 Datum: WGS 84

Soil Map Unit Name: 7303 - Martin silty clay loam, 3 to 7 percent slopes, eroded NWI classification: None

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

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

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

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

Hydrophytic Vegetation Present?	Yes ____	No ✔
Hydric Soil Present?	Yes ✔	No ____
Wetland Hydrology Present?	Yes ____	No ✔

Is the Sampled Area within a Wetland? Yes ____ No ✔

Remarks:
Sample point taken on hillslope in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Setaria pumila	50	✔	FAC
2. Lolium arundinaceum	25	✔	FACU
3. Daucus carota	5		UPL
4. Panicum virgatum	5		FAC
5. Solanum carolinense	5		FACU
6.			
7.			
8.			
9.			
10.			
	90	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	30	x 4 =	120
UPL species	5	x 5 =	25
Column Totals:	90 (A)		310 (B)

Prevalence Index = B/A = 3.44

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-17

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 17	10YR 3/1	97	10YR 5/6	3	C	M	Silty Clay	
17 - 24	10YR 4/1	97	10YR 4/6	3	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-18

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 39.07467582 Long: -95.08921257 Datum: WGS 84

Soil Map Unit Name: 7303 - Martin silty clay loam, 3 to 7 percent slopes, eroded NWI classification: PABFh

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

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

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

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

Hydrophytic Vegetation Present?	Yes ✔	No ____
Hydric Soil Present?	Yes ✔	No ____
Wetland Hydrology Present?	Yes ✔	No ____

Is the Sampled Area within a Wetland? Yes ✔ No ____

Remarks:
Sample point taken in depression in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Echinochloa crus-galli	40	✔	FACW
2. Setaria pumila	20	✔	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	60 (A)		140 (B)

Prevalence Index = B/A = 2.33

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-18

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 5/1	90	10YR 5/6	7	C	M	Silty Clay	
0 - 14			7.5YR 4/6	3	C	M	Silty Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 14

Hydric Soil Present? Yes ✔ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? Yes ✔ No ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS City/County: City of Tonganoxie/Leavenworth County Sampling Date: 2025-12-18

Applicant/Owner: Western Meadowlark ProjectCo LLC State: Kansas Sampling Point: SP-19

Investigator(s): Beth Mowry and Ian Van Wazer Section, Township, Range: S21 T11S R21E

Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex

Slope (%): 1 Lat: 39.07462061 Long: -95.08908868 Datum: WGS 84

Soil Map Unit Name: 7576 - Shelby clay loam, 8 to 12 percent slopes, eroded NWI classification: None

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

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

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

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

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

Remarks:
Sample point taken on hillslope in pasture field. Vegetation has been disturbed due to livestock activity. Field visit constituted normal precipitation conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Sorghum halepense	80	✔	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	80 (A)		320 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-19

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 3/1	100					Silty Clay	
14 - 24	10YR 4/1	85	5YR 4/6	10	C	M	Silty Clay	
14 - 24			10YR 6/6	5	C	M	Silty Clay	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-20
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Swale | Local relief (concave, convex, none): Concave
Slope (%): 0 | Lat: 39.06640103 | Long: -95.0827408 | Datum: WGS 84
Soil Map Unit Name: 7252 - Grundy silty clay loam, 1 to 3 percent slopes | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ____ No ✔
Hydric Soil Present? Yes ✔ No ____
Wetland Hydrology Present? Yes ____ No ✔

Is the Sampled Area within a Wetland? Yes ____ No ✔

Remarks:
Sample point taken in a grass and scrub/shrub swale. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Cornus drummondii	15	✔	FAC
2. Gleditsia triacanthos	10	✔	FACU
3. Ulmus americana	5		FACW
4.			
5.			
	30 =Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	80	✔	FAC
2. Asclepias sullivantii	10		FAC
3. Galium aparine	10		FACU
4. Liatris aspera	10		
5. Toxicodendron radicans	5		FAC
6.			
7.			
8.			
9.			
10.			
	115 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	110	x 3 =	330
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	135 (A)		420 (B)

Prevalence Index = B/A = 3.11

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-20

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/1	100					Silty Clay	
6 - 24	10YR 2/1	60	5YR 5/8	40	C		Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-21
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Swale | Local relief (concave, convex, none): Concave
Slope (%): 0 | Lat: 39.06567956 | Long: -95.08052377 | Datum: WGS 84
Soil Map Unit Name: 7252 - Grundy silty clay loam, 1 to 3 percent slopes | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken in an agricultural depression within a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Scirpus atrovirens	30	✔	OBL
2. Xanthium strumarium	30	✔	FAC
3. Ambrosia trifida	15		FAC
4. Carex vulpinoidea	5		FACW
5. Rumex longifolius	5		FAC
6.			
7.			
8.			
9.			
10.			
	85 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	5	x 2 =	10
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		190 (B)

Prevalence Index = B/A = 2.23

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-21

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/1	100					Silty Clay	
6 - 24	10YR 2/1	70	5YR 5/8	30	C		Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-22
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave
Slope (%): 2 | Lat: 39.06571688 | Long: -95.08060457 | Datum: WGS 84
Soil Map Unit Name: 7252 - Grundy silty clay loam, 1 to 3 percent slopes | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken on hillslope in a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	80	✔	FAC
2. Trifolium pratense	5		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	85 (A)		260 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-22

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 24	10YR 2/1	100					Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ✔ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-23
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave
Slope (%): 0 | Lat: 39.064572 | Long: -95.0751654 | Datum: WGS 84
Soil Map Unit Name: 7575 - Shelby clay loam, 4 to 8 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken in an agricultural depression in a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Carex vulpinoidea	70	✔	FACW
2. Ambrosia trifida	10		FAC
3. Hordeum brachyantherum	5		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 75	x 2 = 150
FAC species 10	x 3 = 30
FACU species 0	x 4 = 0
UPL species 0	x 5 = 0
Column Totals: 85 (A)	180 (B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:
✔ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-23

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 2/1	100					Silty Clay	
5 - 24	10YR 2/1	95	5YR 5/8	5	C	M	Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-24
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): Convex
Slope (%): 1 | Lat: 39.06449249 | Long: -95.07528364 | Datum: WGS 84
Soil Map Unit Name: 7575 - Shelby clay loam, 4 to 8 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ✔ No ____
Hydric Soil Present? Yes ____ No ✔
Wetland Hydrology Present? Yes ____ No ✔

Is the Sampled Area within a Wetland? Yes ____ No ✔

Remarks:
Sample point taken on a hillslope in a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	90	✔	FAC
2. Lolium arundinaceum	10		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		310 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-24

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 12	10YR 2/1	100					Clay Loam	
12 - 24	10YR 2/1	98	5YR 5/8	2	C		Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-25
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave
Slope (%): 0 | Lat: 39.06520207 | Long: -95.07550616 | Datum: WGS 84
Soil Map Unit Name: 7575 - Shelby clay loam, 4 to 8 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point was taken in an agricultural depression within a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Carex vulpinoidea	80	✔	FACW
2. Iva annua	30	✔	FAC
3. Descurainia sophia	15		UPL
4. Torilis nodosa	5		UPL
5.			
6.			
7.			
8.			
9.			
10.			
	130	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	20	x 5 =	100
Column Totals:	130 (A)		350 (B)

Prevalence Index = B/A = 2.69

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-25

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20	10YR 2/1	75	5YR 5/8	25	C		Clay Loam	
20 - 30	10YR 2/1	100					Clay Loam	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-26
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): Convex
Slope (%): 1 | Lat: 39.06508286 | Long: -95.0755835 | Datum: WGS 84
Soil Map Unit Name: 7575 - Shelby clay loam, 4 to 8 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ____ No ✔
Hydric Soil Present? Yes ____ No ✔
Wetland Hydrology Present? Yes ____ No ✔

Is the Sampled Area within a Wetland? Yes ____ No ✔

Remarks:
Sample point taken on a hillslope within a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Poa pratensis	80	✔	FAC
2. Ambrosia artemisiifolia	15		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	95 (A)		300 (B)

Prevalence Index = B/A = 3.15

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-26

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 24	10YR 2/1	100					Clay Loam	
24 - 36	10YR 2/1	20	10YR 5/8	60	C		Clay Loam	
24 - 36	10YR 4/3	20					Clay Loam	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

Saturation Present? Yes ___ No ✔ Depth (inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-27
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none): Concave
Slope (%): 0 | Lat: 39.05988692 | Long: -95.08231837 | Datum: WGS 84
Soil Map Unit Name: 7604 - Sibleyville loam, 3 to 7 percent slopes, eroded | NWI classification: PABFh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken in an agricultural depression within a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Eleocharis palustris	30	✔	OBL
2. Lycopus americanus	20	✔	OBL
3. Scirpus pendulus	15	✔	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	65 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	65 (A)		65 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:
✔ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-27

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 2/1	100					Clay	
4 - 12	10YR 2/1	98	5YR 5/8	2	C		Clay	
12 - 24	10YR 2/1	70	10YR 5/6	20	C		Clay	
12 - 24			10YR 7/1	10	D		Clay	
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-28
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): Convex
Slope (%): 2 | Lat: 39.05997912 | Long: -95.08224864 | Datum: WGS 84
Soil Map Unit Name: 7604 - Sibleyville loam, 3 to 7 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken on a hillslope within a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Gleditsia aquatica	2		OBL
2. Salix nigra	2		OBL
3.			
4.			
5.			
	4 =Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Lolium arundinaceum	90	✔	FACU
2. Symphoricarpos orbiculatus	2		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	92 =Total Cover		
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	4	x 1 =	4
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	92	x 4 =	368
UPL species	0	x 5 =	0
Column Totals:	96 (A)		372 (B)

Prevalence Index = B/A = 3.87

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-28

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 2/1	80	7.5YR 5/8	20	C		Clay	
12 - 36	10YR 4/1	80	10YR 6/8	20	C		Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ✔ Depleted Below Dark Surface (A11)
- ✔ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-11
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-29
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Swale | Local relief (concave, convex, none): Concave
Slope (%): 0 | Lat: 39.06044346 | Long: -95.08237598 | Datum: WGS 84
Soil Map Unit Name: 7604 - Sibleyville loam, 3 to 7 percent slopes, eroded | NWI classification: PABFh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken in pond bed within a pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Agrimonia parviflora	30	✔	FACW
2. Barbarea stricta	5		FAC
3. Symphoricarpos orbiculatus	5		FACU
4. Carex praecox	2		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	42	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	5	x 3 =	15
FACU species	7	x 4 =	28
UPL species	0	x 5 =	0
Column Totals:	42 (A)		103 (B)

Prevalence Index = B/A = 2.45

Hydrophytic Vegetation Indicators:
✔ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-29

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 16	10YR 2/1	70	7.5YR 5/8	30	C		Clay	
16 - 32	10YR 3/1	70	7.5YR 5/6	15	C		Clay	
16 - 32			10YR 6/8	15	C		Clay	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-13
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-30
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S22 T11S R21E
Landform (hillside, terrace, etc.): Toeslope | Local relief (concave, convex, none): Concave
Slope (%): 2 | Lat: 39.07572614 | Long: -95.06751272 | Datum: WGS 84
Soil Map Unit Name: 7501 - Pawnee clay loam, 4 to 8 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken on toe of slope in pasture field. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Carex vulpinoidea	20	✔	FACW
2. Ambrosia artemisiifolia	5	✔	FACU
3. Lepidium densiflorum	5	✔	FAC
4. Rumex crispus	5	✔	FAC
5. Conium maculatum	3		FACW
6. Trifolium repens	3		FACU
7.			
8.			
9.			
10.			
	41	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	23	x 2 =	46
FAC species	10	x 3 =	30
FACU species	8	x 4 =	32
UPL species	0	x 5 =	0
Column Totals:	41 (A)		108 (B)

Prevalence Index = B/A = 2.63

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-30

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/3	70	7.5YR 5/8	30	C	M	Clay	
12 - 16	10YR 5/4	60	7.5YR 5/8	30	C	M	Clay	
12 - 16	10YR 2/1	10					Clay	
16 - 24	10YR 5/4	30	7.5YR 6/8	35	C		Clay	
16 - 24			10YR 7/1	35	D		Clay	
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-05-13
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-31
Investigator(s): Ford Kern and Parker Evans | Section, Township, Range: S22 T11S R21E
Landform (hillside, terrace, etc.): Toeslope | Local relief (concave, convex, none): Convex
Slope (%): 1 | Lat: 39.075669 | Long: -95.067631 | Datum: WGS 84
Soil Map Unit Name: 7501 - Pawnee clay loam, 4 to 8 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken at toe of slope in a pasture field., Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5 ft r)			
1. Carex vulpinoidea	45	✔	FACW
2. Trifolium pratense	15		FACU
3. Trifolium repens	15		FACU
4. Conium maculatum	5		FACW
5.			
6.			
7.			
8.			
9.			
10.			
	80	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	50	x 2 =	100
FAC species	0	x 3 =	0
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	80 (A)		220 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:
✔ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-31

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/1	100					Sandy Clay	
6 - 24	10YR 2/1	50	7.5YR 5/8	50	C	M	Sandy Clay	
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-07-15
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-32
Investigator(s): Michael Jochheim | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Alluvial Terrace | Local relief (concave, convex, none): Concave
Slope (%): 0 | Lat: 39.059648 | Long: -95.085715 | Datum: WGS 84
Soil Map Unit Name: 7234 - Elmont silt loam, 3 to 7 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation____, Soil____, or Hydrology____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____
Are Vegetation____, Soil____, or Hydrology____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes ✔ No ____
Hydric Soil Present? Yes ✔ No ____
Wetland Hydrology Present? Yes ✔ No ____

Is the Sampled Area within a Wetland? Yes ____ No ✔

Remarks:
Sample point taken on alluvial terrace. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	35	✔	OBL
2. Platanus occidentalis	10	✔	FACW
3.			
4.			
5.			
	45	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Cornus racemosa	10	✔	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Carex vulpinoidea	40	✔	FACW
2. Dichanthelium clandestinum	20	✔	FACW
3. Ambrosia trifida	20	✔	FAC
4. Urtica dioica	10		FACW
5. Agrimonia gryposepala	10		FACU
6.			
7.			
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	80	x 2 =	160
FAC species	30	x 3 =	90
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	155 (A)		325 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
✔ 2 - Dominance Test is >50%
✔ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✔ No ____

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

SOIL

Sampling Point: SP-32

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/1	90	10YR 4/1	10	D	M	Clay Loam	
6 - 16	10YR 2/1		10YR 4/1		D	M	Clay Loam	
6 - 16			2.5YR 4/4		C	M	Clay	
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ✔ **No** ___

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Midwest Region
See ERDC/EL TR-10-16; the proponent agency is CECW-COR

OMB Control #: 0710-0024, Exp: 09/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Tonganoxie, KS Phase II | City/County: City of Tonganoxie, Leavenworth County | Sampling Date: 2026-07-15
Applicant/Owner: Western Meadowlark ProjectCo LLC | State: Kansas | Sampling Point: SP-33
Investigator(s): Michael Jochheim | Section, Township, Range: S28 T11S R21E
Landform (hillside, terrace, etc.): Hillslope | Local relief (concave, convex, none): Convex
Slope (%): 3 | Lat: 39.059598 | Long: -95.085636 | Datum: WGS 84
Soil Map Unit Name: 7234 - Elmont silt loam, 3 to 7 percent slopes, eroded | NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)
Are Vegetation ✔, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✔
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Sample point taken on hillslope south of wetland. Vegetation is not indicative of natural community due to agricultural disturbance. USACE Antecedent Precipitation Tool classified precipitation conditions for the delineation as wetter than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Gleditsia triacanthos	10	✔	FACU
2.			
3.			
4.			
5.			
	10	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft r)			
1. Gleditsia triacanthos	10	✔	FACU
2. Elaeagnus umbellata	10	✔	
3. Morus alba	5	✔	FAC
4.			
5.			
	25	=Total Cover	
Herb Stratum (Plot size: 5 ft r)			
1. Lolium perenne	75	✔	FACU
2. Daucus carota	10		UPL
3. Desmodium canadense	10		FACU
4. Poa pratensis	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 30 ft r)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 25.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	105	x 4 =	420
UPL species	10	x 5 =	50
Column Totals:	125 (A)		500 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No ✔

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

SOIL

Sampling Point: SP-33

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 24	10YR 2/1	100					Clay Loam	
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ✔ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21) Very
- ___ Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** ✔

Remarks:

Thick dark surface is not assumed due to the lack of hydrophytic vegetation and wetland hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

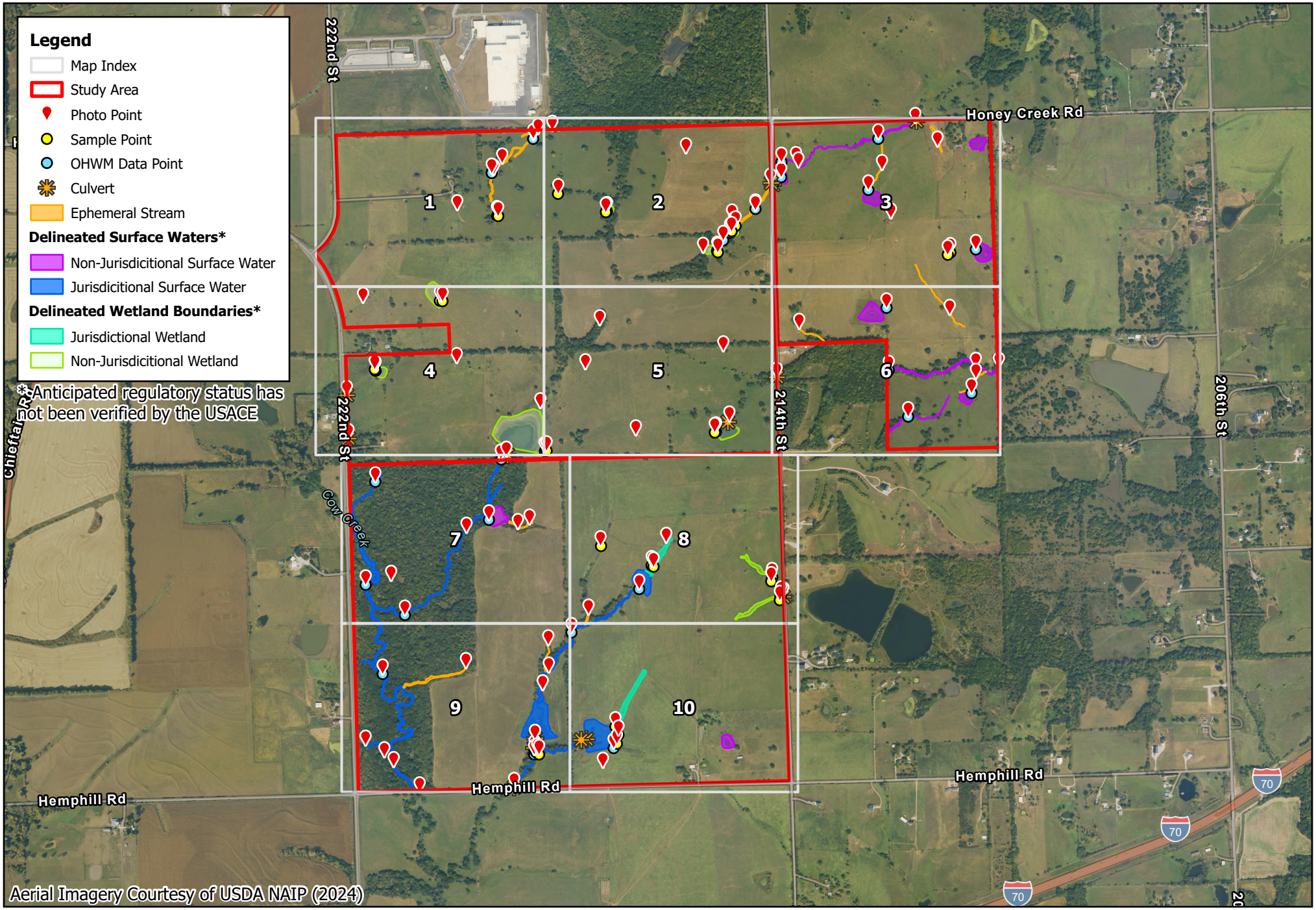
Surface Water Present?	Yes ___	No ✔	Depth (inches): ___
Water Table Present?	Yes ___	No ✔	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ✔	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** ✔

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

Remarks:

Appendix E: Photos

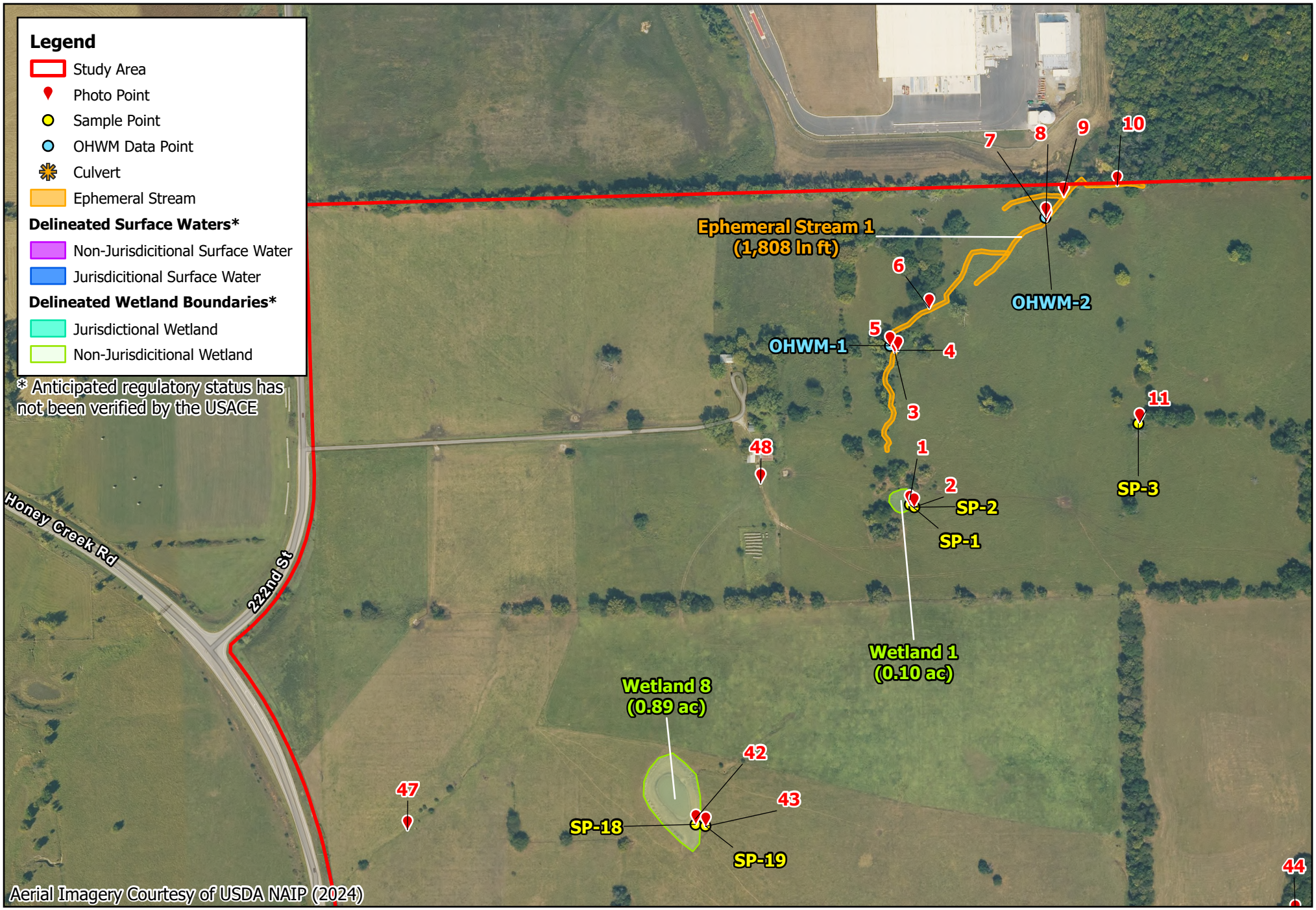


Kimley»Horn

0 750 1,500
US Feet

N

Appendix E.1 Photo Locations Map - Overview
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC



Kimley»Horn

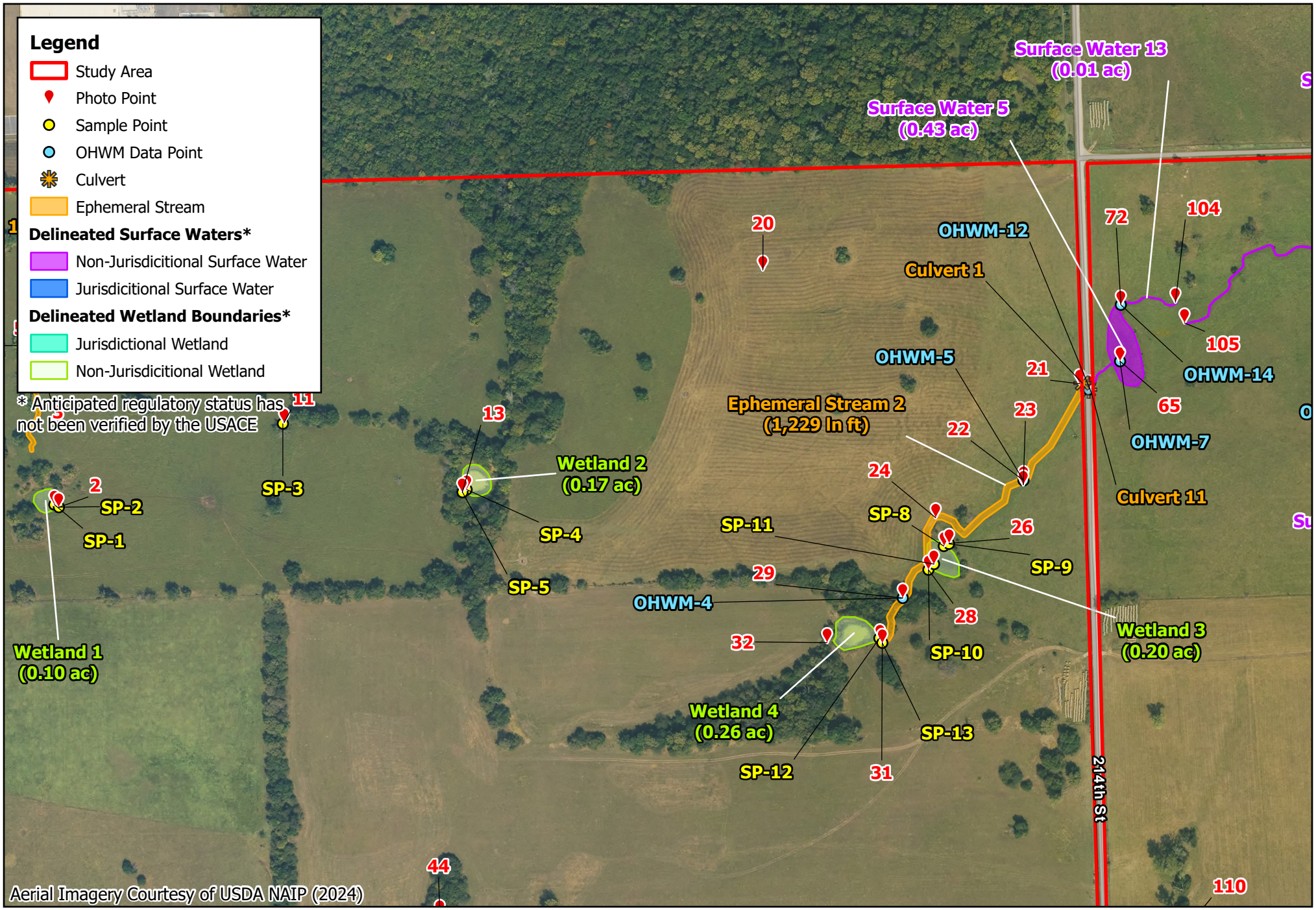
0 200 400 US Feet

N

Appendix E.2 Photo Locations Map - Index 1

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



Kimley»Horn

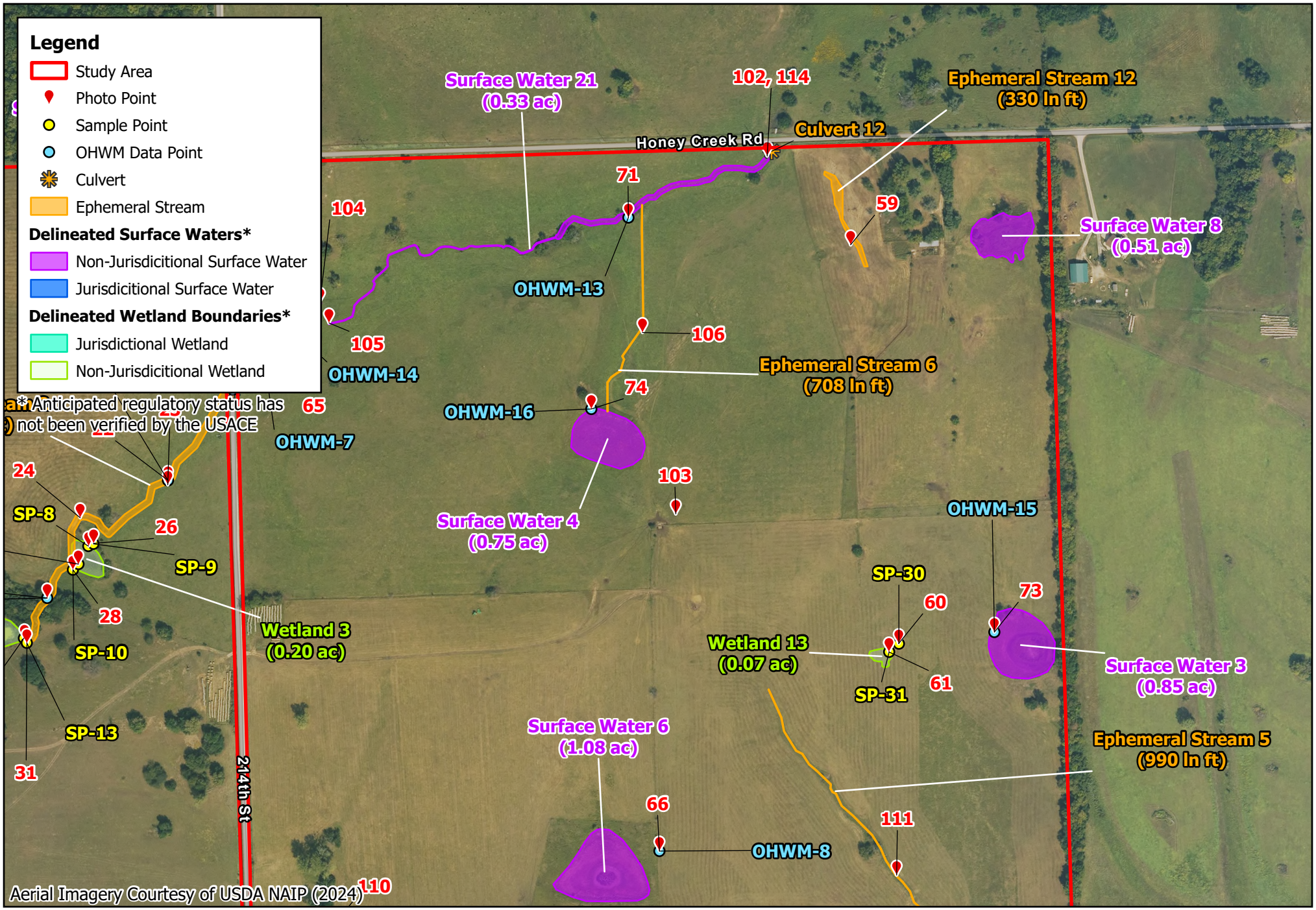
0 200 400 US Feet

N

Appendix E.2 Photo Locations Map - Index 2

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



Kimley»Horn

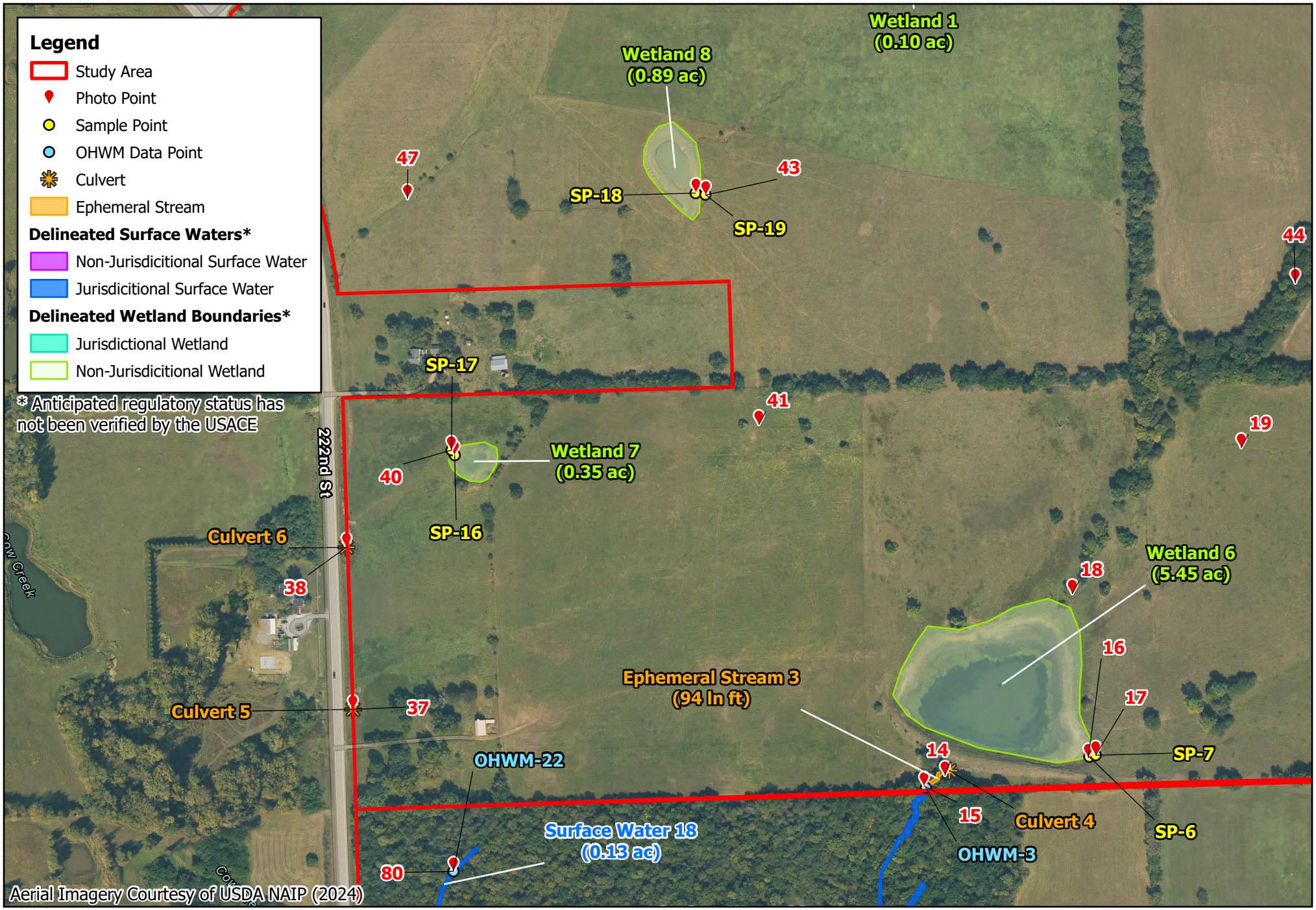
0 200 400 US Feet

N

Appendix E.3 Photo Locations Map - Index 3

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC



Kimley»Horn

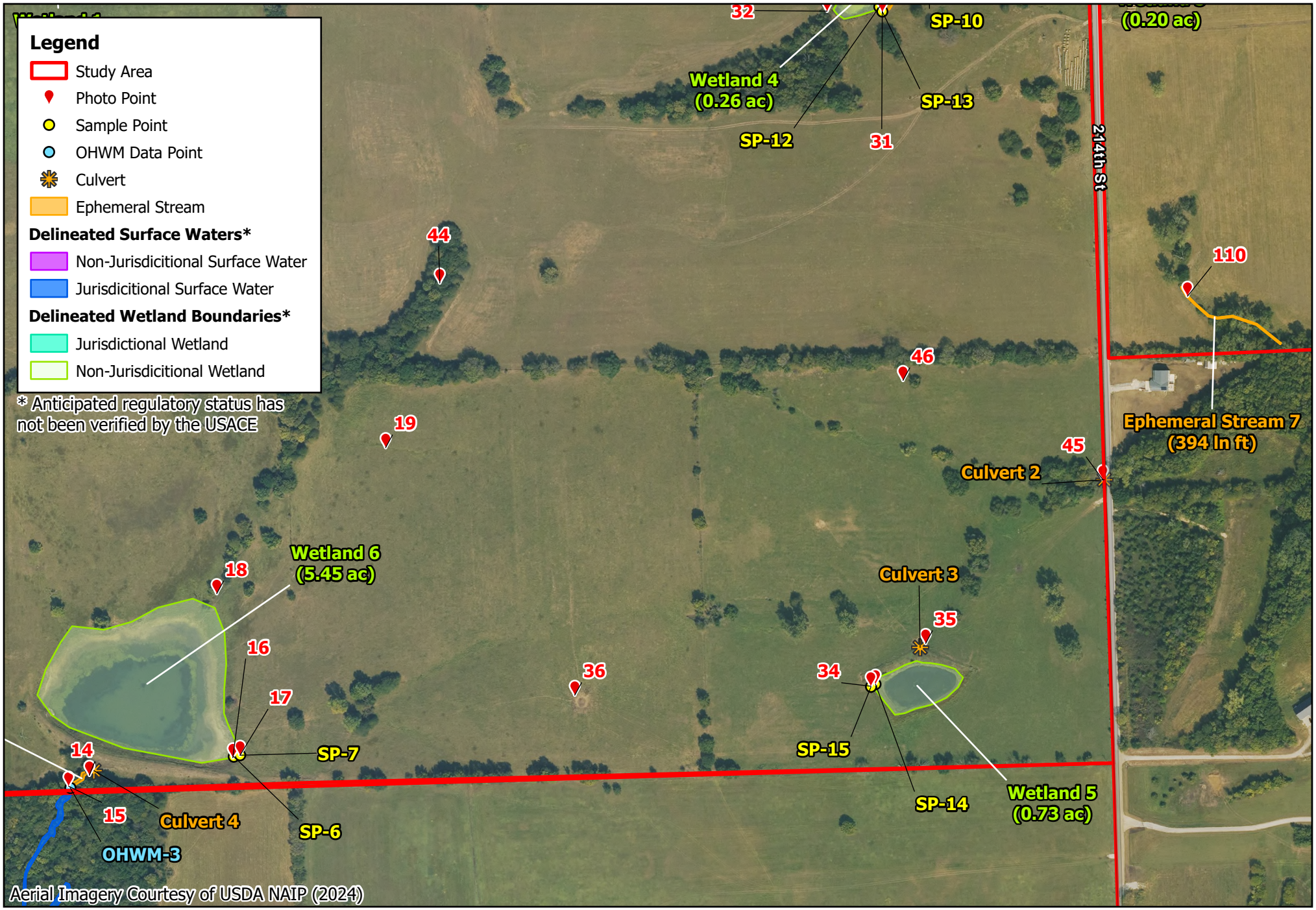
0 200 400 US Feet

N

Appendix E.5 Photo Locations Map - Index 4

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC

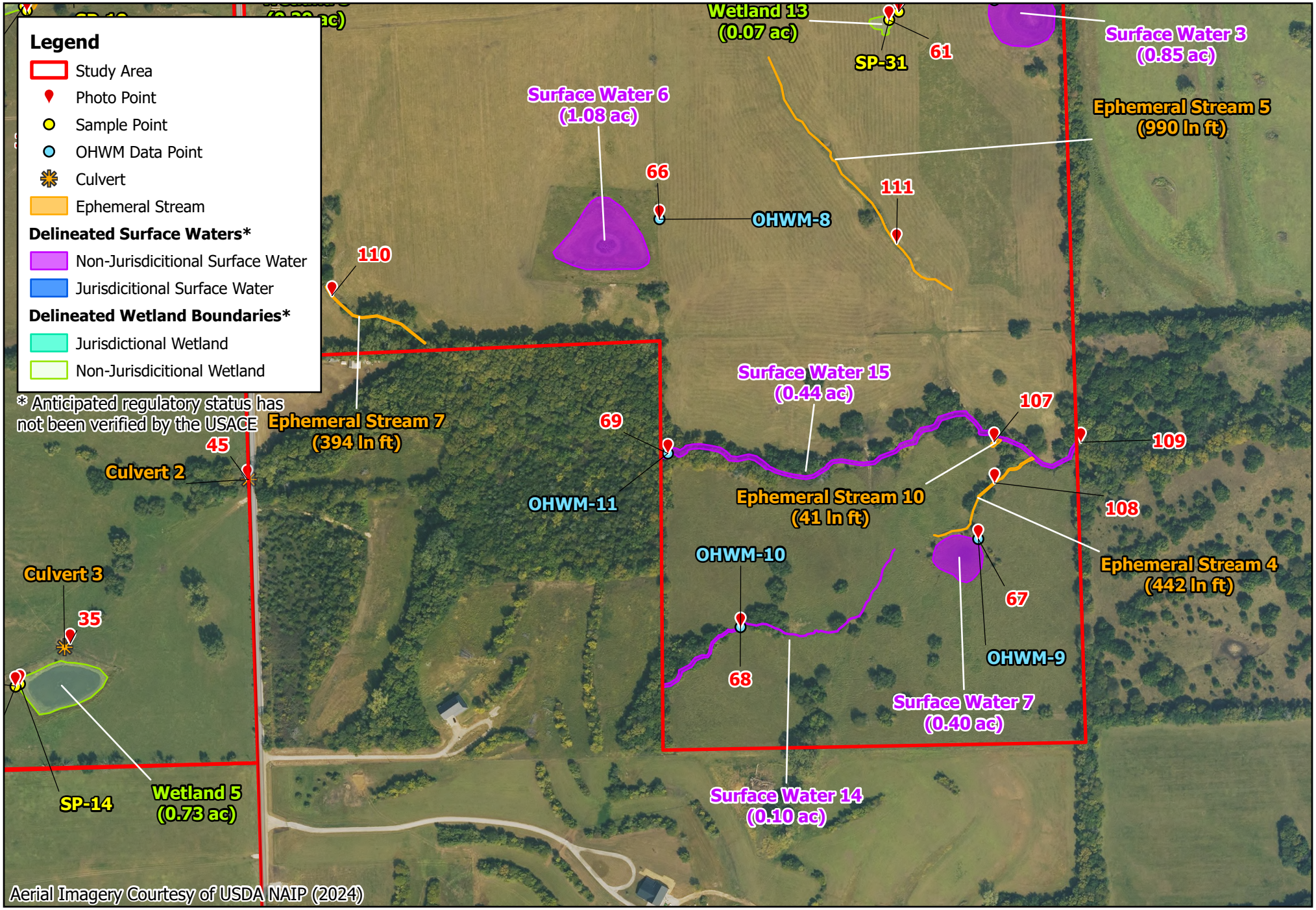


Kimley»Horn

0 200 400
US Feet

N

Appendix E.6 Photo Locations Map - Index 5
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC

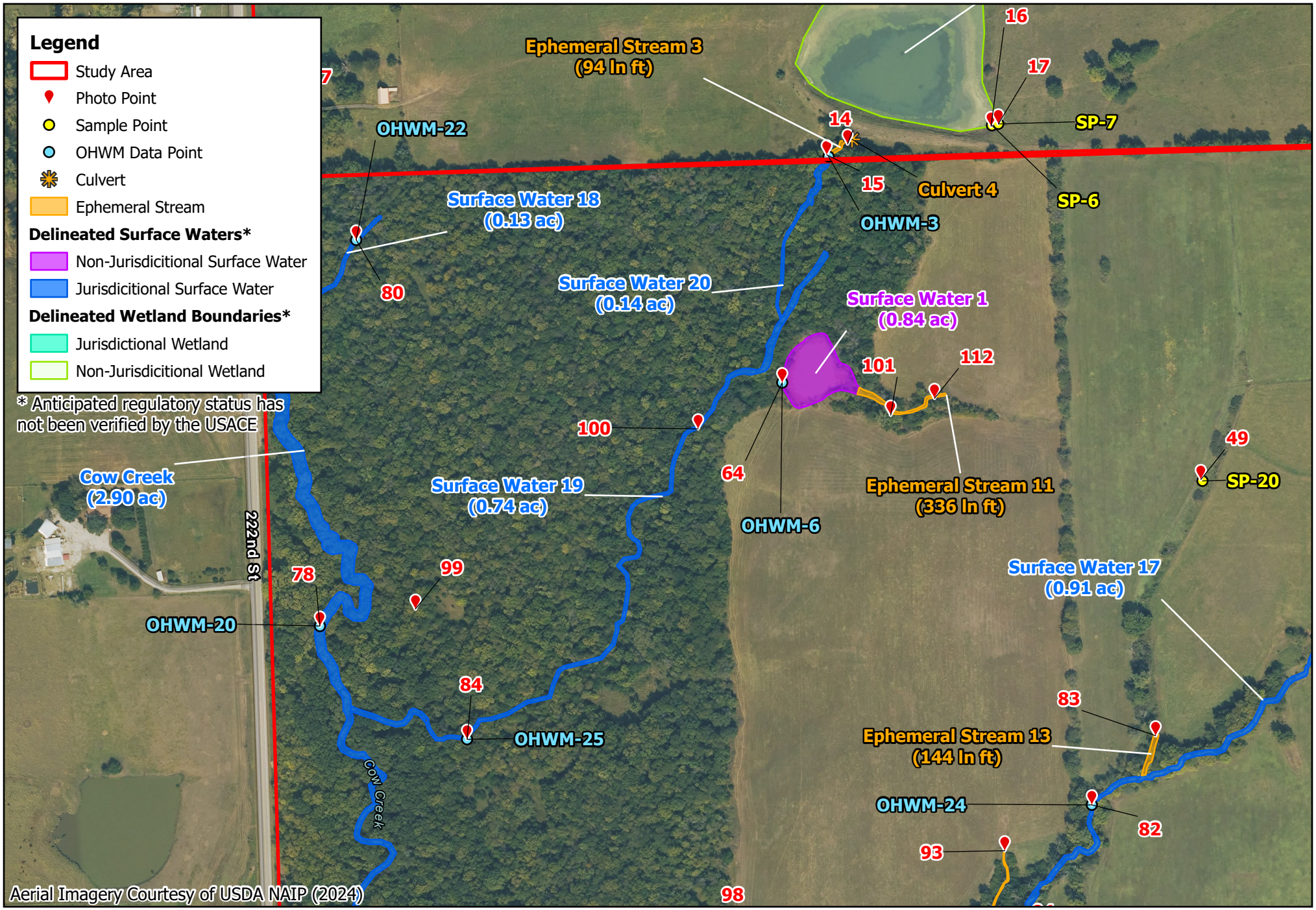


Kimley»Horn

0 200 400
US Feet

N

Appendix E.7 Photo Locations Map - Index 6
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC



Kimley»Horn

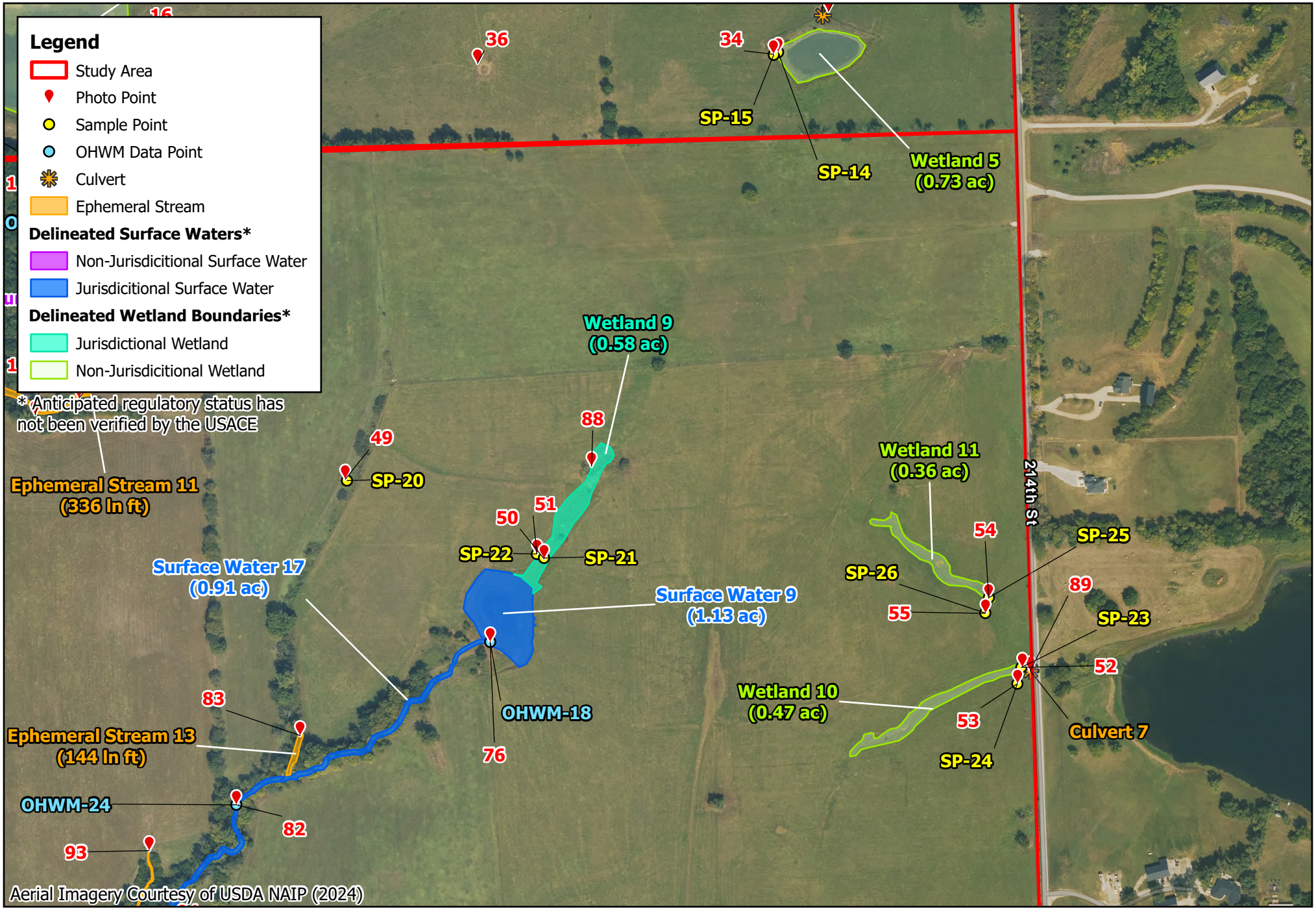
0 200 400 US Feet

N

Appendix E.8 Photo Locations Map - Index 7

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC

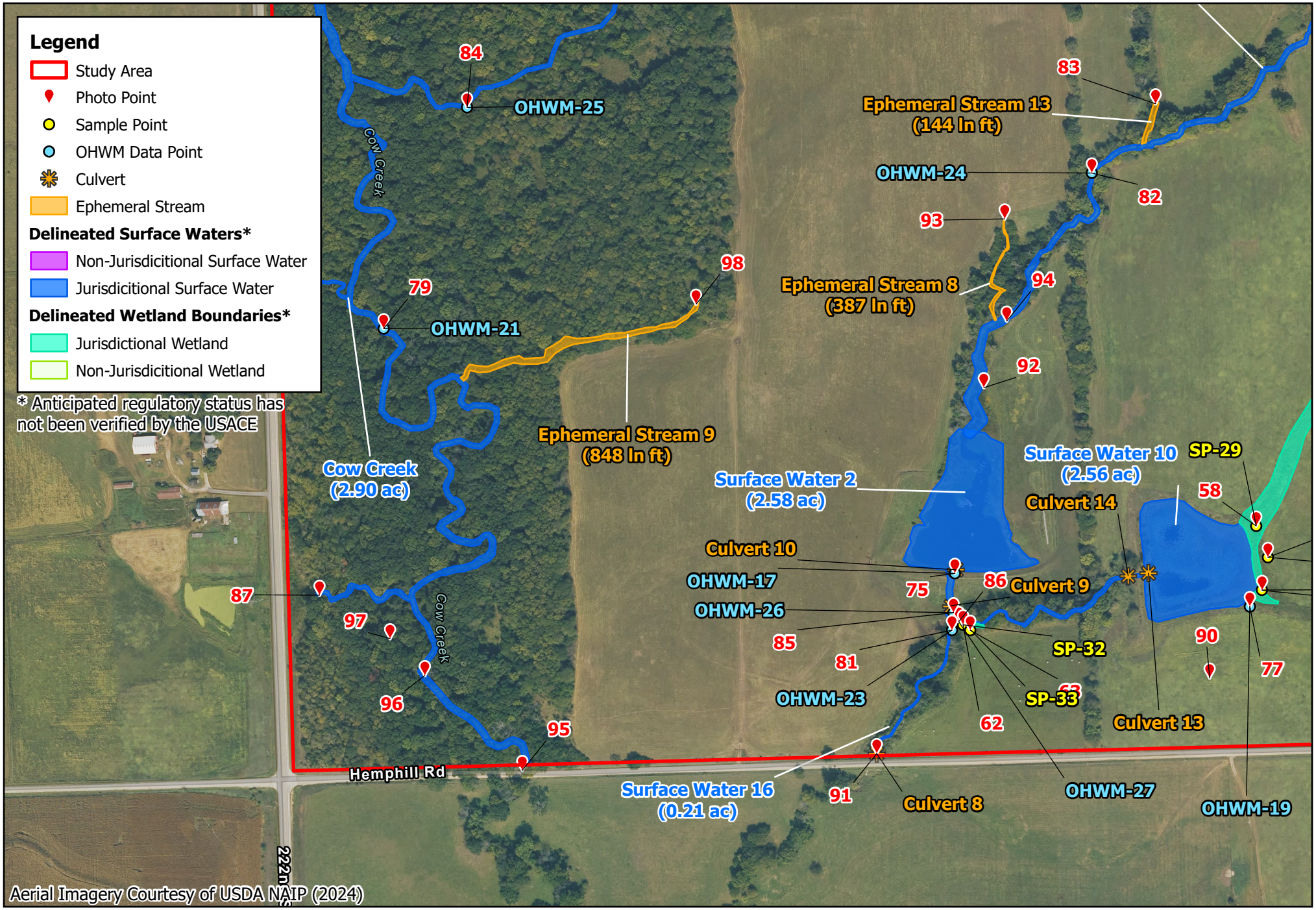


Kimley»Horn

Appendix E.9 Photo Locations Map - Index 8

Tonganoxie Township, Leavenworth County

Western Meadowlark ProjectCo LLC

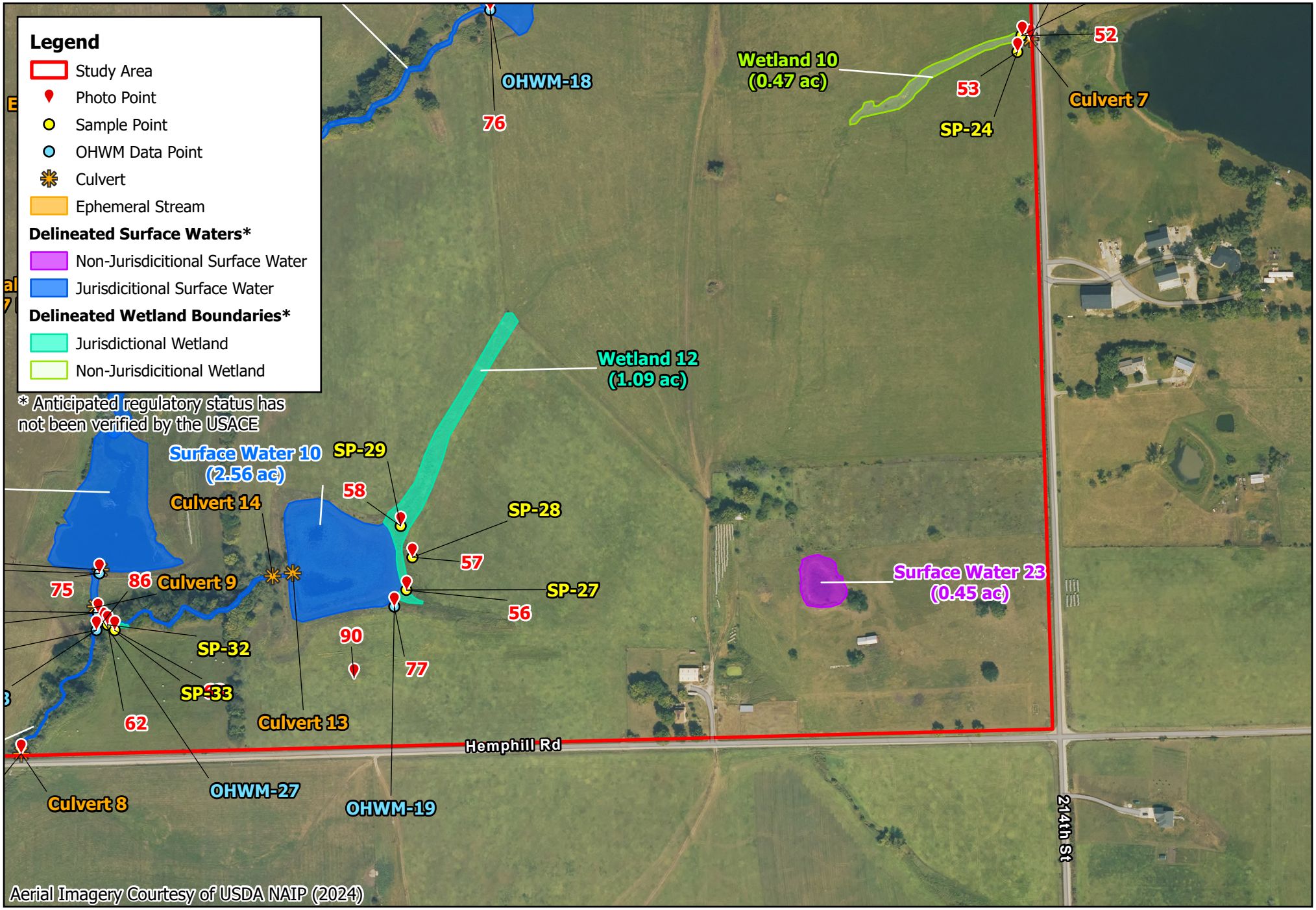


Kimley»Horn

0 200 400
US Feet

N

Appendix E.10 Photo Locations Map - Index 9
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC



Kimley»Horn

0 200 400
US Feet

N

Appendix E.11 Photo Locations Map - Index 10
Tonganoxie Township, Leavenworth County
Western Meadowlark ProjectCo LLC



Photo 1: SP-1, view of Wetland 1, facing north.



Photo 2: SP-2, view of Wetland 1, facing west.



Photo 3: View of Ephemeral Stream 1, facing south.



Photo 4: View of Ephemeral Stream 1, facing west.



Photo 5: OHWM-1, view of Ephemeral Stream 1, facing north.



Photo 6:View of Ephemeral Stream 1, facing east.



Photo 7: OHWM-2, view of eroded channel in Ephemeral Stream 1, facing south.



Photo 8: View of study area, facing west.



Photo 9: View of Ephemeral Stream 1, facing west.



Photo 10: View of Ephemeral Stream 1, facing west.



Photo 11: SP-3, facing north.



Photo 12: SP-4, view of Wetland 2, facing east.



Photo 13:SP-5, View of Wetland 2, facing north.



Photo 14: View of Culvert 4 and Ephemeral Stream 3, facing east.



Photo 15: OHWM-3, view of Ephemeral Stream 3, facing east.



Photo 16: SP-6, view of Wetland 6, facing west.



Photo 17: SP-7, view of Wetland 6, facing north.



Photo 18: View of study area, facing north.



Photo 19: View of study area, facing east.



Photo 20: View of study area, facing south.



Photo 21: View of Culvert 1, facing east.



Photo 22: OHWM-5, view of Ephemeral Stream 2, facing east.



Photo 23: View of Ephemeral Stream 2, facing west.



Photo 24: View of excavated area in Ephemeral Stream 2, facing south.



Photo 25: SP-8, view of Wetland 3, facing east.



Photo 26: SP-9, view of Wetland 3, facing south.



Photo 27: SP-11, view of Ephemeral Stream 2, facing west.



Photo 28: SP-10, view of Wetland 3, facing north.



Photo 29: OHWM-4, view of Ephemeral Stream 2, facing south.



Photo 30: SP-12, view of Wetland 4, facing west.



Photo 31: SP-13, view of Ephemeral Stream 2, facing north.



Photo 32: View of Wetland 4, facing east.



Photo 33: SP-14, view of Wetland 5, facing east.



Photo 34: SP-15, view of Wetland 5, facing south.



Photo 35: View of Culvert 3, facing south.



Photo 36: View of study area, facing north.



Photo 37: View of Culvert 5, facing west.



Photo 38: View of Culvert 6, facing west.



Photo 39: SP-16, view of Wetland 7, facing east.



Photo 40: SP-17, view of Wetland 7, facing south.



Photo 41: View of study area, facing south.



Photo 42: SP-18, view of Wetland 8, facing west.



Photo 43: SP-19, facing east.



Photo 44: View of study area, facing west.



Photo 45: View of Culvert 2, facing east.



Photo 46: View of study area, facing south.



Photo 47: View of study area, facing north.



Photo 48: View of study area, facing west.



Photo 49: View of SP-20, facing north.



Photo 50: View of SP-21 in fringe Wetland 9 of Surface Water 9, facing south.



Photo 51: View of upland sample point SP-22, facing west.



Photo 52: View of SP-23, facing east towards Wetland 2.



Photo 53: View of upland sample point SP-24, facing north.



Photo 54: View of SP-25, facing west towards Wetland 11.



Photo 55: View of upland sample point SP-26, facing south.



Photo 56: View of SP-27, facing south towards Wetland 12.



Photo 57: View of upland sample point SP-28, facing east.



Photo 58: View of SP-29, facing west towards fringe Wetland 12 and Surface Water 10.



Photo 59: View of Ephemeral Stream 12, facing northwest.



Photo 60: View of upland sample point SP-31, facing north.



Photo 61: View of SP-31 and Wetland 14, facing east.



Photo 62: View of SP-32 and Wetland 6, facing east.



Photo 63: View of upland point SP-33, facing east.



Photo 64: View of OHWM-6 and Surface Water 1, facing northeast.



Photo 65: View of OHWM-7 and Surface Water 5, facing south.



Photo 66: View of OHWM-8 and Surface Water 6, facing west.



Photo 67: View of OHWM-9 and Surface Water 7, facing south.



Photo 68: View of OHWM-10 and Surface Water 14, facing east.



Photo 69: View of OHWM-11 and Surface Water 15, facing east.



Photo 70: View of OHWM-12 and Surface Water 12, facing east.



Photo 71: View of OHWM-13 and Surface Water 21, facing east.



Photo 72: View of OHWM-14 and Surface Water 13, facing east.



Photo 73: View of OHWM-15 and Surface Water 3, facing southeast.



Photo 74: View of OHWM-16 and Surface Water 4, facing east.



Photo 75: View of OHWM-17 and Surface Water 2, facing west.



Photo 76: View of OHWM-18 and Surface Water 9, facing south.



Photo 77: View of OHWM-19 and Surface Water 10, facing north.



Photo 78: View of OHWM-20 and Cow Creek, facing north.



Photo 79: View of OHWM-21 and Cow Creek, facing north.



Photo 80: View of OHWM-22 and Surface Water 18, facing southwest.



Photo 81: View of OHWM-23 and Surface Water 16, facing southwest.



Photo 82: View of OHWM-24 and Surface Water 17, facing south.



Photo 83: View of Ephemeral Stream 13, facing south.



Photo 84: View of OHWM-25 and Surface Water 19, facing northeast.



Photo 85: View of OHWM-27, Culvert 9, and Surface Water 11, facing south.



Photo 86: View of Surface Water 16, facing east.



Photo 87: View of Cow Creek, facing west.



Photo 88: View of Wetland 9, facing south.



Photo 89: View of Culvert 7



Photo 90: General site photo, facing west.



Photo 91: View of Culvert 8, facing south.



Photo 92: View of Surface Water 17, facing south.



Photo 93: View of Ephemeral Stream 8, facing south.



Photo 94: View of Surface Water 17, facing southwest.



Photo 95: View of Cow Creek, facing east.



Photo 96: View of Cow Creek, facing north.



Photo 97: View of forested area west of Cow Creek, facing west.



Photo 98: View of Ephemeral Stream 9, facing west.



Photo 99: View of forested area east of cow creek, facing east.



Photo 100: View of Surface Water 19, facing southwest.



Photo 101: View of Ephemeral Stream 11, facing west.



Photo 102: View of Culvert 10, facing north.



Photo 103: View of northern parcel, facing west.



Photo 104: View of Surface Water 13 terminus, facing east.



Photo 105: View of Surface Water 21 terminus, facing west.



Photo 106: View of Ephemeral Stream 6, facing north.



Photo 107: View of Ephemeral Stream 10, facing north.



Photo 108: View of Ephemeral Stream 4, facing south.



Photo 109: View of Surface Water 15 continuing offsite to the east, facing east.



Photo 110: View of Ephemeral Stream 7, facing southeast.



Photo 111: View of Ephemeral Stream 5, facing northwest.



Photo 112: View of Ephemeral Stream 11, facing west.



Photo 113: View of Culvert 11, facing northeast.



Photo 114: View of Culvert 12, facing north.