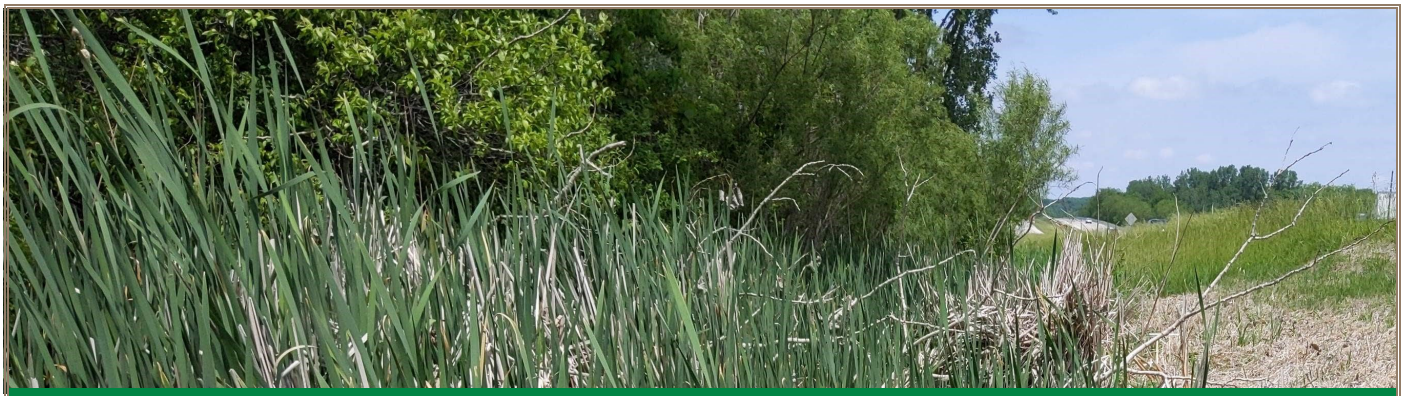


Water Resources Delineation Report

35 Acres, 2710 NE Hagan Road
Jackson County, Missouri

October 24, 2022

Prepared for:
Powell CWM
3200 S. State Route 291, Building 1
Independence, Missouri, 64057
816-373-4800

Prepared by:
Davey Resource Group, Inc.
5641 W 73rd Street
Indianapolis, Indiana 46278
317-558-8545

DAVEY Resource Group

Table of Contents

Tables

Appendices

Executive Summary

The 35-acre study area is located at 2710 NE Hagan Road, Jackson County, Missouri within Section 20, Township 48 North, Range 31 West. A water resources delineation was performed by Catherine Holland on October 17, 2022. A second site visit was performed by Reid Gibson on October 31, 2022.

The study area encompasses approximately 35 acres of an undeveloped urban lot. The study area consists of a pond, emergent wetlands, and uplands.

A map of the location and size of the water resources identified on the property is shown in Appendix A. Two emergent wetlands, one pond, and one 1,450 linear foot (LF) unnamed tributary (UNT) to Lakewood Lakes were identified during the October 2022 site visit (Table 1). The pond and wetlands are connected to UNT 1, which is hydrologically connected to Lakewood Lakes. Thus, the pond and wetlands are likely subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE).

Table 1. Water Resources Delineated on Site

ID	Type	Latitude	Longitude	Connectivity to Waters of the U.S.[1]	Total Area/Length Within Study Area (Acres/LF)
Wetlands					
Wetland A	emergent	38.9637383	94.3664641°W	jurisdictional	1.36 ac
Wetland B	scrub-shrub	38.9612572°N	94.3671305°W	jurisdictional	0.48 ac
Streams					
UNT 1	unnamed territory	38.9625134°N	94.3672033°W	jurisdictional	1,450 LF
Open Water					
pond	open water	38.9612248°N	94.3671993°W	jurisdictional	0.12 ac

[1] The final determination of a wetlands' connectivity to Waters of the U.S. is made by the U.S. Army Corps of Engineers.

Introduction

Study Area Description and Location

The 35-acre study area is located in Prairie Township, Jackson County, Missouri (Appendix B). The area is located at 2710 NE Hagan Road in Lee Summit, Missouri.

The study area contains emergent wetland and upland grass areas. An aerial photograph of the study area is included in Appendix D. Surrounding land use is predominantly occupied by commercial buildings and a municipal airport.

Secondary Source Information

The study area is shown on the Lee's Summit Quadrangle of the United States Geological Survey (USGS) map (Appendix E). The study area is between 930 and 970 feet above sea level.

A National Wetlands Inventory (NWI) map showing nearby NWI wetlands is located in Appendix F. One intermittent riverine stream bed (R4SBC) is shown within the study area boundary.

A map from the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey showing the soil types located on and adjacent to the site is found in Appendix G. The *Hydric Soils of the United States* (1991) was reviewed to determine potential hydric soils identified within the study area. Table 2 provides a list of soil types mapped for the site.

Table 2. Soil Types Mapped for the Site

Map Unit	Soil Description	Hydric Determination[1]
10024	Greenton-Urban Land Complex, 5–9 percent slopes	non-hydric
10136	Sibley-Urban Land Complex, 2–5 percent slopes	non-hydric

[1] As determined by The Hydric Soils of the United States (1991).

Methodology

The Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (U.S. Army Corps of Engineers 2012) were used in delineating wetlands within the study area. Water resources were delineated and surveyed on June 8, 2022. The water resources delineation fieldwork, boundary mapping, and data analysis were performed by Catherine Holland. Vegetation, soils, and wetlands maps were prepared using ArcGIS™ PRO v.2.8.3. Photopoints, data points, stream lines, and wetland areas were mapped and collected using a Trimble® GNSS R1 device.

Streams are identified as linear, flowing water features with a defined bed and bank. Streams are classified as ephemeral, intermittent, or perennial based upon flow regime. Ephemeral streams have flowing water only during, and for a short duration after, precipitation events. Intermittent streams have flowing water during certain times of the year, when groundwater and rainfall provide water for stream flow. During dry periods, intermittent streams may not have flowing water. Perennial streams have flowing water year-round, receiving water from groundwater and rainfall runoff.

Wetlands are identified based on three criteria: vegetation, soils, and hydrology. An area must meet all three criteria to be considered a jurisdictional wetland. Sampling points were established in the field to determine wetlands boundaries. Data sheets reporting the results of soils, vegetation, and hydrology analyses were completed for each sample station and are located in Appendix J.

Soil samples were obtained to determine the extent of hydric soils on the site. A standard Munsell soil color chart was used to determine the hue, value, and chroma of each soil sample. Soil samples were taken to a depth to adequately make a hydric soil determination. Criteria established by the National Technical Committee for Hydric Soils (1991) were used to determine hydric soils.

Wetland hydrology was characterized during this water resources delineation. Inundation and/or soil saturation were noted for each sample point. Other hydrological indicators, including watermarks, drift lines, sediment deposits, wetlands drainage patterns, blackened leaves, morphological indicators, iron/manganese concretions, and oxidized root zones within the upper soil layers, were documented, if observed.

Quantitative vegetation data were collected at each sampling point. Dominance was estimated by percent areal cover. Four strata were considered for each sample point—trees, saplings/shrubs, herbs, and woody vines. Trees were defined as any woody plant having a diameter at breast height (DBH) greater than 3.0 inches. Saplings and shrubs were those woody plants with a DBH of less than 3.0 inches and greater than 3.2 feet in height. For each stratum, plant species within a plot were identified and percent areal cover was estimated for each species. Thirty-foot-radius plots were used for trees and vines; 15-foot-radius plots were used for saplings and shrubs; and 5-foot-radius plots were used for herbs.

Any species within a stratum comprising 20% or more of the total plot areal cover was considered to be dominant. Dominant species within all strata were then added to determine the percentage of wetlands vegetation for each sample point. The wetlands vegetation criterion was met if greater than 50% of the dominant vegetation was indicative of wetlands conditions.

Lichvar et al (2016) was used to assign indicator statuses to each identified species. Plants with an indicator status of obligate (OBL), facultative wetland (FACW), or facultative (FAC) were considered to be indicative of wetlands conditions. Plants with an indicator status of facultative upland (FACU) or upland (UPL) were considered to be indicative of upland conditions. Plants that could only be identified to genus were sometimes assigned an indicator status based on the professional judgment of Davey Resource Group, Inc.. These plants were classified as wetlands indicator species (WIS) or upland indicator species (UIS). See Appendix I for a more detailed explanation of wetlands vegetation indicator statuses.

Wetlands that are hydrologically connected to traditional navigable waters of the U.S. are considered non-isolated and fall under the federal jurisdiction of the U.S. Army Corps of Engineers (USACE).

Results

Wetlands

Vegetation

The site contains emergent wetlands and grassy uplands on disturbed soil. Photograph locations are shown in Appendix A. Photographs showing water resources identified on the site are included in Appendix H. Wetland assessment data forms are included in Appendix J.

Wetland A (1.36 acres, emergent) contained dominant vegetation consisting of common reed (*Phragmites* australis, FACW), black willow (*Salix nigra,* OBL), and cattail (*Typha* × *glauca*, OBL) at data point 1. Dominant vegetation at data point 2 consisted of deer-tongue grass (*Dichanthelium clandestinum*, FACW), rough barnyard grass (*Echinochloa muricata*, OBL), yellow bristle grass (*Setaria pumila,* FAC), and prairie cordgrass (*Spartina pectinata*, FACW).

Wetland B (0.48 acre, emergent) contained dominant vegetation consisting of black willow (*Salix nigra,* OBL), cattail (*Typha* × *glauca*, OBL), and reed canary grass (*Phragmites australis*, FACW).

Soils

All wetlands delineated on site contained hydric soils. The data point 1 met the Loamy Mucky Mineral (F1) hydric soil indicator, while data point 2 met the Depleted Matrix (F3) and Redox Dark Surface (F6) hydric soil indicator.

Hydrology

Hydrology present in the study area derives from overland flow and groundwater input from the associated stream on site. The emergent wetland coincides with shelves along and within the stream banks, as well as low areas with pooling water within the field. The primary hydrologic indicator identified on site was Saturation (A3). Secondary indicators identified included Saturation Visible on Aerial Imagery (C9), Geomorphic position (D2), and FAC-Neutral test (D5). Table 4 shows the hydrology indicators observed in each wetland on the site.

Table 3. Hydrology Indicators for On-Site Wetlands

Wetland	Primary Indicator Numbers	Primary Indicator Descriptions	Secondary Indicator Numbers	Secondary Indicator Descriptions
A	A3	saturation	C9, D2, D5	Saturation Visible on Aerial Imagery, Geomorphic Position, FAC-Neutral Test
B	A3	saturation	C9, D2, D5	Saturation Visible on Aerial Imagery, Geomorphic Position, FAC-Neutral Test

Streams

Stream 1 (1,450 Linear Feet within study area) appears to be an ephemeral, unnamed tributary. Approximately 1,450 linear feet of the channel flows through the study area. The stream consists of a channel that eventually flows into Lakewood Lakes. The bed of the stream consisted predominantly of both silt and leaf litter throughout its length within the site. The ordinary high watermark (OHWM) depth averaged 6 inches within the study area. The OHWM width averaged 1 ft within the study area. This system shows evidence of channelization.

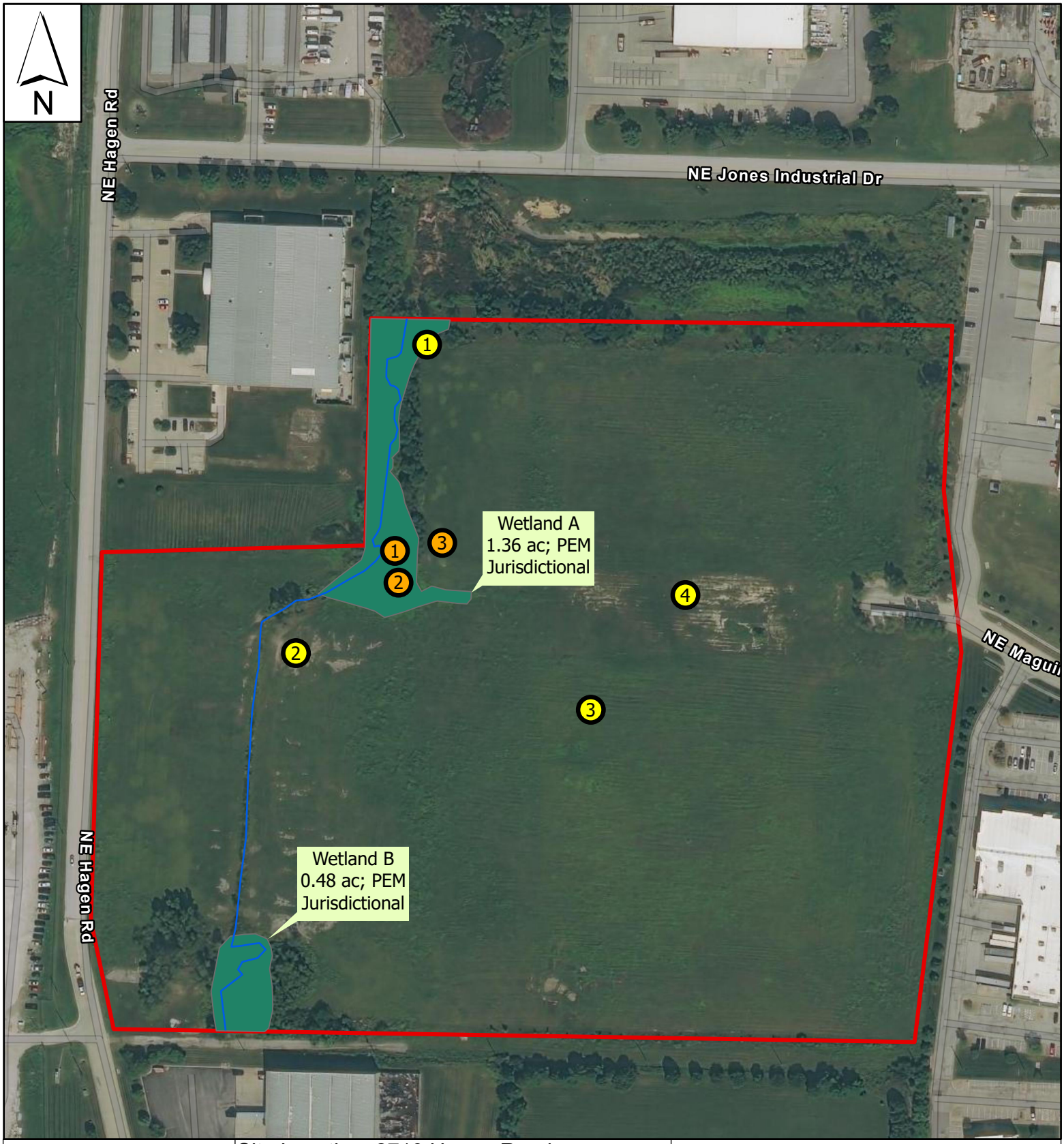
Conclusions

One emergent and one scrub-shrub wetland totaling 1.84 acre are within the study area, one 0.12-acre pond, and one UNT totaling 1,450 LF were encountered during the October 2022 site visit. The UNT runs through the project area and through the emergent wetland. This UNT is hydrologically connected to Lakewood Lakes. Thus, both the wetland and UNT are likely considered jurisdictional and subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE).

DRG is confident that all jurisdictional wetlands and drainageways were identified on this site. All water resource studies conducted by Davey Resource Group, Inc. "DRG" are objective and based strictly on professional judgment. DRG and its employees have no vested interest in this property or the proposed project. Appendix K contains references used in the creation of this report.

All wetland delineations must be verified by the U.S. Army Corps of Engineers to be considered official. This wetlands delineation is reflective of environmental conditions at the time the fieldwork was performed. Wetlands are dynamic natural systems; therefore, boundaries may change slightly over time.

Appendix A: Mapped Water Resources



DAVEY Resource Group

Date: October 25, 2022

Site Location: 2710 Hagan Road, Prairie Township, Jackson County, Missouri

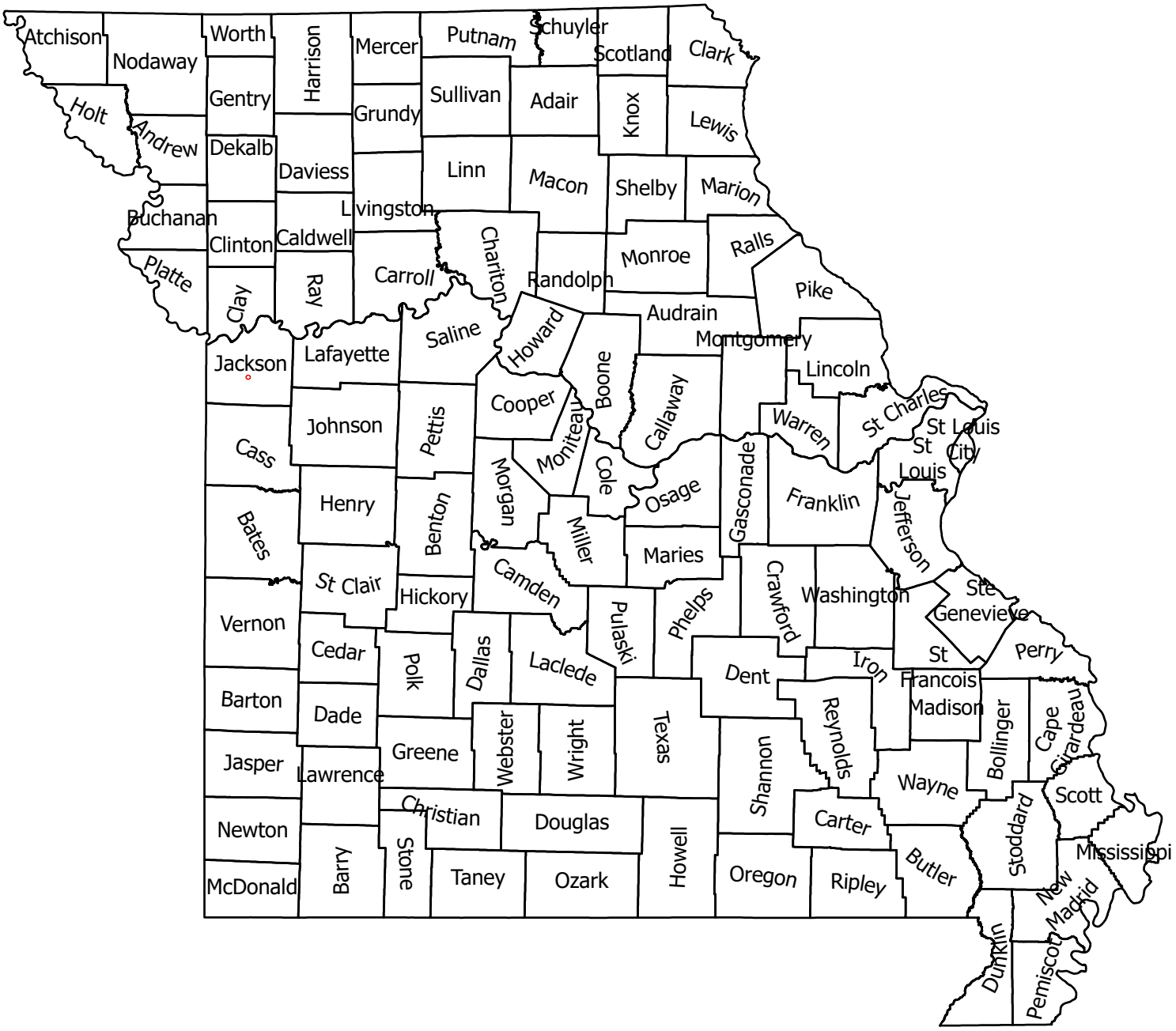
Sources: Esri World Imagery Hybrid. Imagery Date 2021.

0 175 350 700 Feet

Legend

- Photo Point
- Data Point
- Stream
- Wetland
- Site Boundary

Appendix B: Location of Study Area on Missouri County Map



DAVEY Resource Group

Date: October 25, 2022

Site Location: 2710 Hagan Road, Prairie Township, Jackson County, Missouri

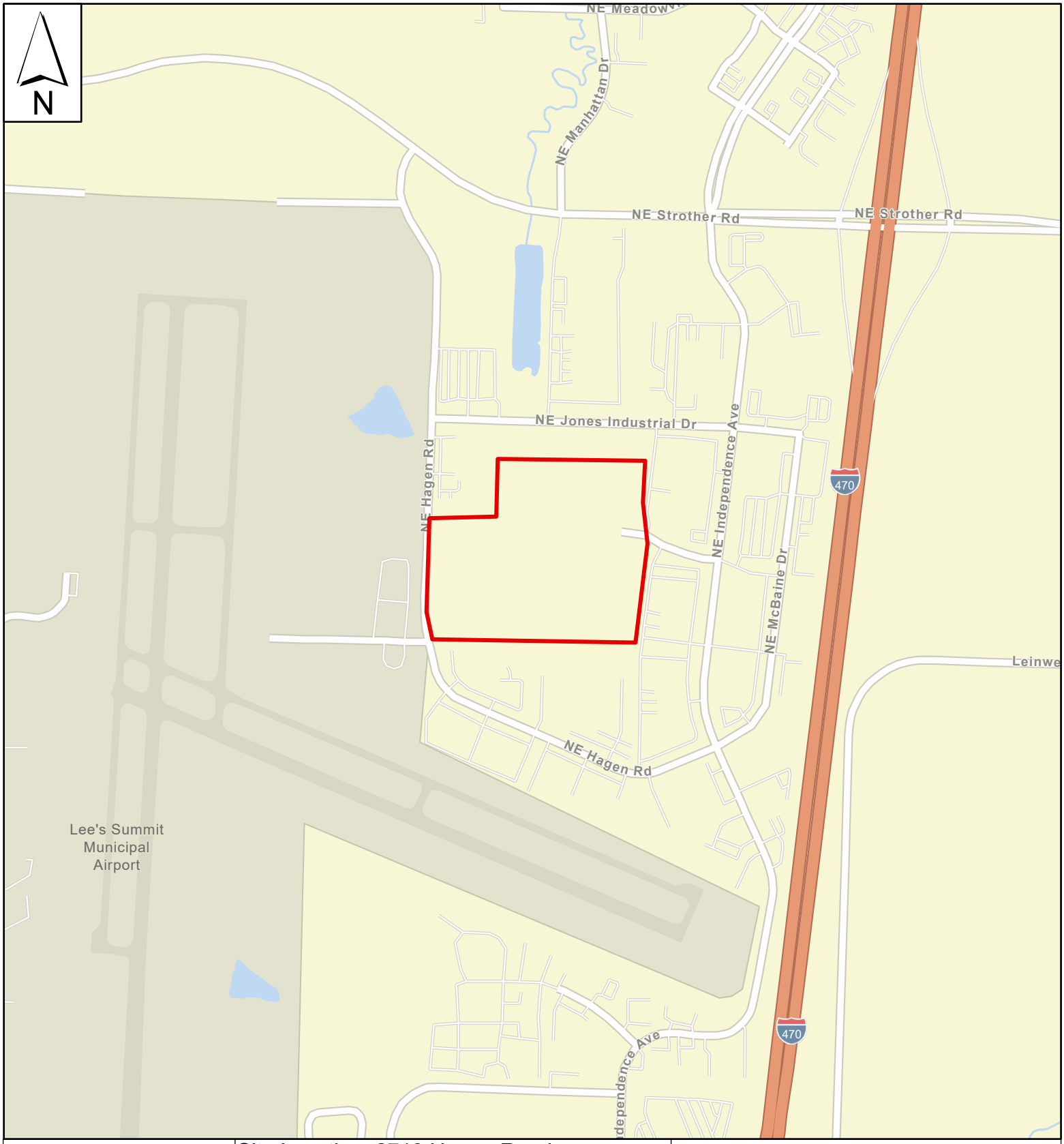
Sources: Esri World Imagery Hybrid. Imagery Date 2021.

0 37.5 75 150 Miles

Legend

Site Boundary

Appendix C: Location of Study Area on Highway Map



DAVEY Resource Group

Date: October 25, 2022

Site Location: 2710 Hagan Road, Prairie Township, Jackson County, Missouri

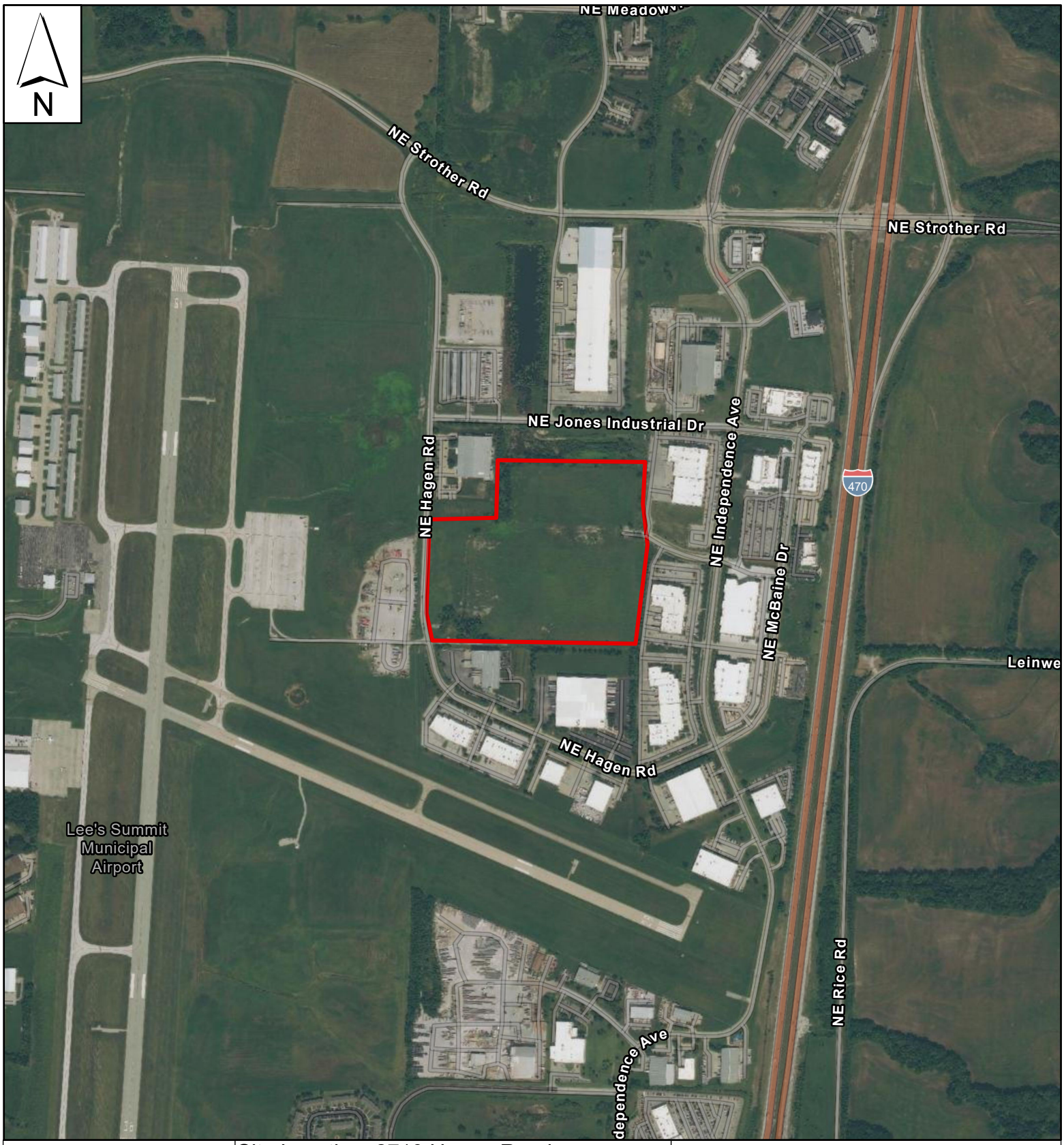
Sources: Esri World Imagery Hybrid. Imagery Date 2021.

0 500 1,000 2,000 Feet

Legend

Site Boundary

Appendix D: Location of Study Area on Aerial Photograph



DAVEY Resource Group

Date: October 25, 2022

Site Location: 2710 Hagan Road, Prairie Township, Jackson County, Missouri

Sources: Esri World Imagery Hybrid. Imagery Date 2021.

0 500 1,000 2,000 Feet

Legend

Site Boundary

Appendix E: Location of Study Area on USGS 7.5 Minute Topographic Map

DAVEY Resource Group

Date: October 25, 2022

Site Location: 2710 Hagan Road, Prairie Township, Jackson County, Missouri

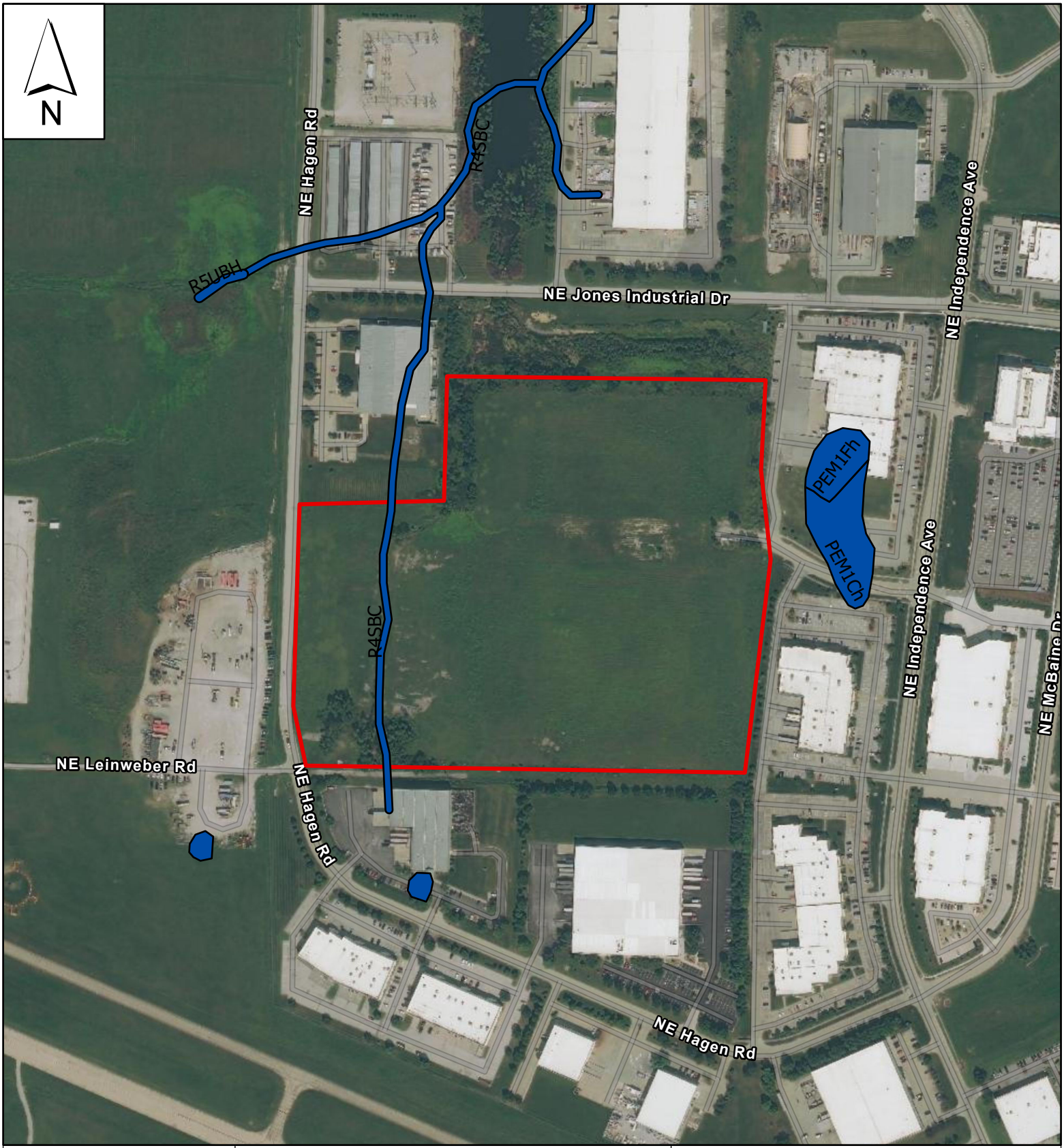
Sources: Esri World Imagery Hybrid. Imagery Date 2021.

0 500 1,000 2,000 Feet

Legend

Site Boundary

Appendix F: Location of Study Area on National Wetland Inventory Map



DAVEY Resource Group

Date: October 25, 2022

Site Location: 2710 Hagan Road, Prairie Township, Jackson County, Missouri

Sources: Esri World Imagery Hybrid. Imagery Date 2021.

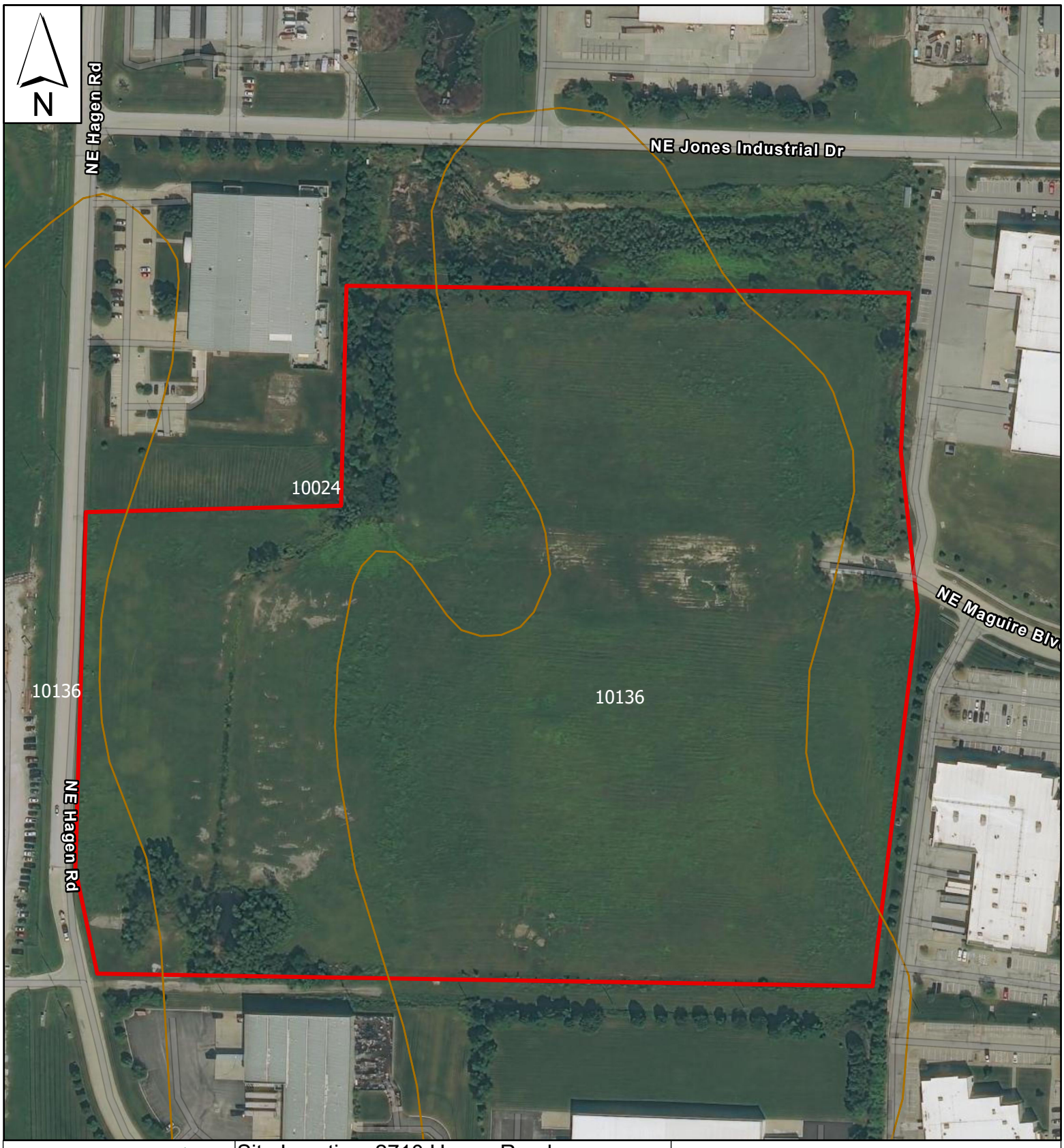
0 300 600 1,200 Feet

Legend

NWI

Site Boundary

Appendix G: Location of Study Area on Soil Survey Map



DAVEY Resource Group

Date: October 25, 2022

Site Location: 2710 Hagan Road, Prairie Township, Jackson County, Missouri

Sources: Esri World Imagery Hybrid. Imagery Date 2021.

0 180 360 720 Feet

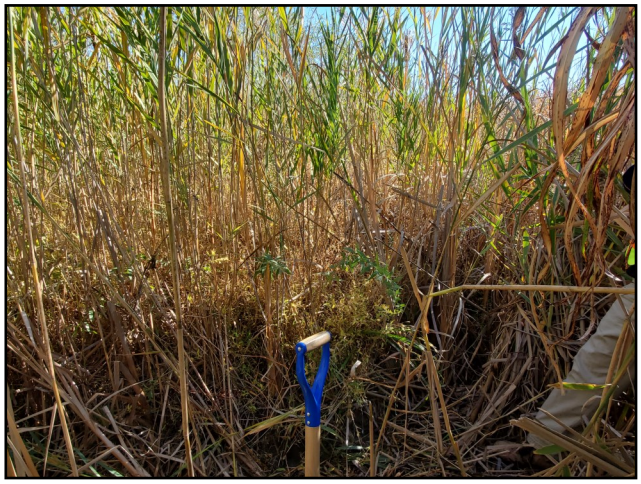
Legend

Site Boundary

Appendix H
Site Photographs (10/17/2022)

DP01, Soil

DP01, View looking north



DP01, View looking east

DP01, View looking south

DP01, View looking west

DP02, Soil

Appendix H
Continued (10/17/2022)

DP02, Soil detail

DP02, View looking north

DP02, View looking east

DP02, View looking south

DP02, View looking west

DP03, soil

DP03, View looking north

DP03, View looking east

DP03, View looking south

DP03, View looking west

PP01, View looking north

PP01, View looking west

Appendix H
Continued (10/17/2022)

PP02, View looking north

PP02, View looking east

PP02, View looking south

PP02, View looking west

PP03, View looking north

PP03, View looking east

PP03, View looking south

PP03, View looking west

PP04, View looking north

PP04, View looking east

PP04, View looking south

PP04, View looking west

Appendix H
Continued (10/17/2022 & 10/31/2022)

UNT 1, looking north

UNT 1, looking south

Pond, View looking north

Pond, View looking east

Wetland B, View looking north

Wetland B, View looking East

Wetland B, View looking south

Wetland B, View looking west

Appendix I

Definition of Wetlands Vegetation Indicator Status (from Lichvar et al 2016)

Obligate Wetlands (OBL). Almost always is a hydrophyte, rarely in uplands.

Facultative Wetlands (FACW). Usually is a hydrophyte but occasionally found in uplands.

Facultative (FAC). Commonly occurs as either a hydrophyte or non-hydrophyte.

Facultative Upland (FACU). Occasionally is a hydrophyte but usually occurs in uplands.

Obligate Upland (UPL). Rarely is a hydrophyte, almost always in uplands.

Species for which little or no information was available to base an indicator status were assigned a no indicator (NI) status. An asterisk (*) after the indicator status indicates that the indicator status was based on limited ecological information.

The wetlands indicator categories should not be equated to degrees of wetness. Many obligate wetlands species occur in permanently or semipermanently flooded wetlands, but a number of obligates also occur, and some are restricted to wetlands that are only temporarily or seasonally flooded. The facultative upland species include a diverse collection of plants that range from weedy species adapted to exist in a number of environmentally stressful or disturbed sites (including wetlands), to species in which a portion of the gene pool (an ecotype) always occurs in wetlands. Both the weedy and ecotype representatives of the facultative upland category occur in seasonally and semi permanently flooded wetlands.

Davey Resource Group has added two additional indicators for situations when plants can only be identified to genus. A Wetlands Indicator Species (WIS) is a plant that is most likely obligate wetlands, facultative wetlands, or facultative. An Upland Indicator Species (UIS) is a plant that is most likely indicative of upland or facultative upland conditions. These additional indicators are used when species identification is not possible. A variety of factors are part of the UIS and WIS assignments. Indicator statuses of all locally occurring members of the genus in question are considered, as are the health and size of the population and the indicator status of nearby plants.

Appendix J
Vegetation, Hydrology, and Soils Data Sheets

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Lee Summit | City/County: Lee Summit, Jackson County | Sampling Date: 10/17/2022

Applicant/Owner: Powell CWM | State: MO | Sampling Point: 1

Investigator(s): Catherine Holland | Section, Township, Range: 20, 48N, 31W

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

Slope (%): 0% | Lat: 38.963028°N | Long: 94.366442°W | Datum: NAD83

Soil Map Unit Name: Greenton-Urban Land Complex, 5-9 percent slopes, nonhydric | NWI classification: PEM

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

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

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

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

Remarks:
38.963028, -94.366442

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Robinia pseudoacacia*	10%	Yes	FACU
2. *Salix nigra*	5%	Yes	OBL
3.			
4.			
5.			
	15%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Phragmites australis*	95%	Yes	FACW
2. *Typha x glauca*	60%	Yes	OBL
3. *Solidago canadensis*	5%	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	160%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
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% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65%	x1 =	0.65
FACW species	95%	x2 =	1.9
FAC species		x3 =	
FACU species	15%	x4 =	0.6
UPL species		x5 =	
Column Totals:	1.75 (A)		3.15 (B)

Prevalence Index = B/A = 1.80

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation

X 2-Dominance Test is >50%

X 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 X No ____

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

SOIL

Sampling Point: 1

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
0-12"	10YR 2/1	100					Mucky Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated 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)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X 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]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Dark Surface (S7)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Riprap

Depth (inches): 12"

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X 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)
- X Geomorphic Position (D2)
- X 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** X **No** ___

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

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Lee Summit | City/County: Lee Summit, Jackson County | Sampling Date: 10/17/2022

Applicant/Owner: Powell CWM | State: MO | Sampling Point: 2

Investigator(s): Catherine Holland | Section, Township, Range: 20, 48N, 31W

Landform (hillslope, terrace, etc.): Base of Hillslope | Local relief (concave, convex, none): Concave

Slope (%): 0% | Lat: 38.962889 N | Long: 94.366435 W | Datum: NAD83

Soil Map Unit Name: Greenton-Urban Land Complex, 5-9 percent slopes, nonhydric | NWI classification: PEM

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X	No ____	**Is the Sampled Area**	
Hydric Soil Present?	Yes X	No ____	**within a Wetland?**	Yes X No ____
Wetland Hydrology Present?	Yes X	No ____		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: 5' radius)			
1. *Echinochloa muricata*	30%	Yes	OBL
2. *Dichanthelium clandestinum*	30%	Yes	FACW
3. *Setaria pumila*	30%	Yes	FAC
4. *Spartina pectinata*	30%	Yes	FACW
5. *Juncus torreyi*	15%	No	FACW
6. *Symphyotrichum pilosum*	10%	No	FACU
7. *Plantago lanceolata*	5%	No	FACU
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	150%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30%	x1 =	0.3
FACW species	75%	x2 =	1.5
FAC species	30%	x3 =	0.9
FACU species	15%	x4 =	0.6
UPL species		x5 =	
Column Totals:	1.50 (A)		3.3 (B)

Prevalence Index = B/A = 2.20

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation

X 2-Dominance Test is >50%

X 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 X No ____

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

SOIL

Sampling Point: 2

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
0-4"	10YR 4/2	98	10YR 6/8	2	c	m	clay loam	
4-10"	10YR 2/1	90	10YR 5/8	10	c	M&PL	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated 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)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Dark Surface (S7)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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** x **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)
- x Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- x Geomorphic Position (D2)
- X 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** X **No** _____

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

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Lee Summit | City/County: Lee Summit, Jackson County | Sampling Date: 10/17/2022

Applicant/Owner: Powell CWM | State: MO | Sampling Point: 3

Investigator(s): Catherine Holland | Section, Township, Range: 20, 48N, 31W

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

Slope (%): 0% | Lat: 38.963067 N | Long: 94.366192 W | Datum: NAD83

Soil Map Unit Name: Greenton-Urban Land Complex, 5-9 percent slopes, nonhydric | NWI classification: None

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X	**Is the Sampled Area**	
Hydric Soil Present?	Yes ____	No X	**within a Wetland?**	Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Robinia pseudoacacia*	5%	Yes	FACU
2.			
3.			
4.			
5.			
	5%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Elaeagnus umbellata*	5%	Yes	UPL
2.			
3.			
4.			
5.			
	5%	= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Plantago lanceolata*	30%	Yes	FACU
2. *Digitaria sanguinalis*	30%	Yes	FACU
3. *Taraxacum officinale*	15%	No	FACU
4. *Melilotus officinalis*	10%	No	FACU
5. *Daucus carota*	5%	No	UPL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	90%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
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% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species	90%	x4 =	3.6
UPL species	10%	x5 =	0.5
Column Totals:	1.00 (A)		4.1 (B)

Prevalence Index = B/A = 4.10

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 X

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

SOIL

Sampling Point: 3

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
0-9"	10YR 3/2	98	10YR 6/8	2	c	m	Clay Loam	
9-18"	10YR 5/1	98	10YR 6/8	2	c	M&PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated 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)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Dark Surface (S7)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Compact Clay

Depth (inches): 18"

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

Remarks:
Compaction from heavy machinery, evident in historic aerial imagery.

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** X

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

Remarks:

Appendix K
References

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