

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

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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	Туре	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	the The Hadris Seile afthe Huited States (1001)	

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).

<u>Soils</u>

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
А	A3	saturation	C9, D2, D5	Saturation Visible on Aerial Imagery, Geomorphic Position, FAC-Neutral Test
В	A3	saturation	C9, D2, D5	Saturation Visible on Aerial Imagery, Geomorphic Position, FAC-Neutral Test

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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



Appendix B: Location of Study Area on Missouri County Map



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Appendix C: Location of Study Area on Highway Map



Appendix D: Location of Study Area on Aerial Photograph



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



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



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Appendix G: Location of Study Area on Soil Survey Map



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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



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



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

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



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 Summi	t, Jackson County	Sampling Date: 10/17/2022
Applicant/Owner:	Powell CWM				State: MO Sampling Point: 1		
Investigator(s):	Catherine Holland			on, Townshi	p, Range: 20, 48N, 31W		
Landform (hillslope,	, terrace, etc.): Depre	ssion			Local r	elief (concave, convex, none):	Concave
Slope (%):	0% Lat:	38.963028°N		Long:	94	4.366442°W	Datum: NAD83
Soil Map Unit Name	e: Greenton-Urb	an Land Complex, 5-9 p	percent slopes, r	nonhydric		NWI class	ification: PEM
Are climatic / hydrol	logic conditions on the s	ite typical for this time o	f year?	Yes	x No	(If no, explain in Remark	(S.)
Are Vegetation	, Soil	, or Hydrology	significantly d	isturbed?	Are "No	ormal Circumstances" present	Yes x No
Are Vegetation	, Soil	, or Hydrology	naturally prob	lematic?	(If need	led, explain any answers in Re	marks.)
SUMMARY OF	FINDINGS Atta	ch site map showi	ing sampling	g point loca	tions, tra	nsects, important featu	ires, etc.
Hvdrophytic Vegeta	ation Present?	Yes X	No	ls the S	Sampled Are	ea	
Hydric Soil Present	?	Yes X	No	within	a Wetland?	Yes 🔰	X No
Wetland Hydrology	Present?	Yes X	No				
Remarks: 38.963028, -94.366	6442						
VEGETATION	Use scientific na	ames of plants.					
		·	Absolute	Dominant	Indicator		
Tree Stratum (Plot	size: 30' radius)	% Cover	Species?	Status	Dominance Test workshee	/t:
1. Robinia pseudo	bacacia		10%	Yes	FACU		
2. Salıx nıgra			5%	Yes	OBL	Number of Dominant Specie	S C· 3 (A)
4.						That Ale ODE, I AOW, OF I A	C. <u> </u>
5.						Total Number of Dominant	
			15%	= Total Cover		Species Across All Strata:	(B)
		Barry A				Denoted Denoted Oracia	
Sapling/Shrub Strat	tum (Plot size: 15' rad	jus)				That Are OBL EACW or EA	3 .C [.] 75% (Δ/Β)
2.						mathic obe, i how, of the	0. 10/0 (///D)
3.							
4.						Prevalence Index workshee	ət:
5.				Tatal Cause		Tatal % Causa af	Maritine has been
Herb Stratum (Plot	size: 5' radius)		= Total Cover		OBL species 65%	x1 = 0.65
1. Phragmites aus	stralis	/	95%	Yes	FACW	FACW species 95%	$x^{2} = 1.9$
2. Typha x glauca			60%	Yes	OBL	FAC species	x3 =
3. Solidago canad	lensis		5%	No	FACU	FACU species 15%	x4 = 0.6
4						UPL species	x5 = (D)
56							(A) <u>3.15</u> (B)
7.						Prevalence Index =	B/A = 1.80
8.							
9							
10						Hydrophytic Vegetation Inc	licators:
12						1-Rapid Test for Hy	drophytic Vegetation
13.						X 2-Dominance Test is	s >50%
14.						X 3-Prevalence Index	is ≤3.0 ¹
15.						4-Morphological Ada	aptations ¹ (Provide supporting
16						data in Remarks or	on a separate sheet)
17							onytic vegetation (Explain)
19.						¹ Indicators of hydric soil and	wetland hydrology must
20.						be present, unless disturbed	or problematic.
			160%	= Total Cover			
Woody Vine Stratur	m (Plot size: 20' rod	dius \				Hydrophytic	
1.	<u></u> (1 101 3126. <u>30 180</u>	<u>/////////////////////////////////////</u>				Vegetation	
2.						Present? Yes	X No
			:	Total Cover			
Remarks: (Include	photo numbers here or	on a separate sheet.)					

Profile Desc	ription: (Describe	to the depth need	ed to document the i	ndicator or c	onfirm the a	bsence of	indicators.)	
Depth	Matrix		Red	dox Features	-	. 2	- (
(inches)	Color (moist)	%	Color (moist)	%	Туре	Loc	lexture	Remarks
0-12"	10YR 2/1	100					Mucky Clay Loam	
				·				
				·				
¹ Type: C=C	oncentration, D=De	pletion, RM=Reduc	ed Matrix, CS=Covere	ed or Coated S	Sand Grains.	² Locatio	on: PL=Pore Lining,	M=Matrix.
Hydric Soil I	ndicators:					Indica	ators for Problemati	c Hydric Solls":
Histoso	ol (A1)		Sandy Gleye	ed Matrix (S4)				Redox (A16)
Histic E	pipedon (A2)		Sandy Redo	x (S5)			Iron-Mangane	
Black F	listic (A3)		Stripped Ma	trix (S6)			Dark Surface	
Hydrog	en Sulfide (A4)		X Loamy Muck	xy Mineral (F1)		Very Shallow	Dark Surface (TF12)
Stratifie	ed Layers (A5)		Loamy Gleye	ed Matrix (F2)			Other (Explai	n in Remarks)
2 cm M	IUCK (A1U)	(0.4.4)	Depleted Ma	itrix (F3)				
	eu Below Dark Surfa	ice (A11)	Redox Dark	Surrace (F6)	7)		3 mail and a mail of the	ula dia sanatati ang ang d
	vark Surrace (A12)		Depleted Da	rk Surrace (F	()		indicators of hydro	provide vegetation and
Sandy	Mucky Mineral (S1)		Redox Depr	essions (F8)			wetland hydrolo	gy must be present,
5 cm M	lucky Peat or Peat (\$3)					unless disturb	ed or problematic.
Restrictive L	ayer (if observed):							
Type: I	Riprap							
Depth (i	nches):	12"				Hydric S	Soil Present?	Yes X No
HYDROL	OGY							
Wotland Hyp	rology Indicators							
Primary India	cators (minimum of	one is required: che	ock all that apply)				Secondary Indicato	rs (minimum of two required)
Surface	e Water (A1)	one is required. Che	Water-Stain	ed Leaves (B	3)		Surface Soil	Cracks (B6)
High W	ater Table (A2)		Aquatic Fau	na (B13)	- /		Drainage Pat	terns (B10)
X Saturat	ion (A3)			Plante (B14)				Nater Table (C2)
Water I	Marks (B1)		Hydrogen Si	ilfide Odor (C	1)		Cravfish Burr	ows (C8)
Sedime	ant Denosits (B2)		Oxidized Rh	izospheres or) Living Root	s (C3)	Saturation Vi	sible on Aerial Imagery (C9)
Drift De	enosits (B3)		Presence of	Reduced Iror	(C4)	.5 (00)	Stunted or St	ressed Plants (D1)
	lat or Crust (B4)		Recent Iron	Reduction in .	Tilled Soils (I	C6)	X Geomorphic	Position (D2)
Iron De	nosits (B5)		Thin Muck S	urface (C7)		00)	X FAC-Neutral	Test (D5)
Inundat	tion Visible on Aeria	I Imagery (B7)	Gauge or W	ell Data (D9)				
Snarse	ly Vegetated Conca	ve Surface (B8)	Other (Expla	in in Remarks	3)			
Obser	······	10 Canace (20)						
	or Brogont?		Donth lingt	۰.				
Water Table	Drecent?		Depth (inches).				
Soturation D	resent?		Depth (inches). \.	Wotland		v Brocont?	Vac Y No
(includes car	nesent :		Deptil (illelies)	wettant	riyurolog	yrresents	
Describe Re	corded Data (stream	n gauge monitoring	well aerial photos p	revious inspe	ctions) if ava	ailable:		
20001120110	0		,, aona priotoo, p		,,			
Remarks:								

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site:	Lee Summit			City/County:	Lee Summi	t, Jackson County	Sampling Date: 10/17/2022
Applicant/Owner:	Powell CWM					Sampling Point: 2	
Investigator(s):	Catherine Holland				ion, Townshi	p, Range: 20, 48N, 31W	·
Landform (hillslope	, terrace, etc.): Base o	f Hillslope			Local r	elief (concave, convex, none):	Concave
Slope (%):	0% Lat:	38.962889 N		Long:	9	4.366435 W	Datum: NAD83
Soil Map Unit Name	e: Greenton-Urba	In Land Complex, 5-9	percent slopes, r	nonhydric		NWI class	ification: PEM
Are climatic / hydro	logic conditions on the si	te typical for this time o	of year?	Yes	x No	(If no, explain in Remark	(S.)
Are Vegetation	, Soil	, or Hydrology	significantly d	isturbed?	Are "No	ormal Circumstances" present	? Yes x No
Are Vegetation	, Soil	, or Hydrology	naturally prob	lematic?	(If need	ded, explain any answers in Re	emarks.)
SUMMARY OF	FINDINGS Attac	h site map show	ing sampling	g point loca	tions, tra	nsects, important featu	ires, etc.
Hydrophytic Vegeta	ation Present?	Yes X	No	Is the	Sampled Ar	ea	
Hydric Soil Present	?	Yes X	No	within	a Wetland?	Yes	X No
Wetland Hydrology	Present?	Yes X	No				
Remarks:							
VEGETATION	Use scientific na	mes of plants.					
			Absolute	Dominant	Indicator		
Tree Stratum (Plot	size: 30' radius)	% Cover	Species?	Status	Dominance Test workshee	et:
1						Number of Demission to Oracia	
2						That Are OBL EACW or EA	s ΔC: Δ (Δ)
4.						That Ale OBE, I AOW, OF I A	·····
5.			_			Total Number of Dominant	
				= Total Cover		Species Across All Strata:	4 (B)
Sapling/Shrub Strat	tum (Plot size: 15' rad	ius)				Percent of Dominant Specie	S 400% (A/D)
1 2						That Are OBL, FACW, of FA	.C: 100% (A/B)
3.							
4.						Prevalence Index workshee	ət:
5.							
				= Total Cover		Total % Cover of:	Multiply by:
Herb Stratum (Plot	size: <u>5' radius</u>	_)	200/	Vee		OBL species 30%	x1 = 0.3
2. Dichanthelium	clandestinum		30%	Yes	FACW	FAC species 30%	$x_2 = \frac{1.3}{0.9}$
3. Setaria pumila			30%	Yes	FAC	FACU species 15%	x4 = 0.6
4. Spartina pectin	ata		30%	Yes	FACW	UPL species	x5 =
5. Juncus torreyi			15%	No	FACW	Column Totals: 1.50	(A) 3.3 (B)
6. Symphyotrichu	m pilosum		10%	No	FACU		
7. Plantago lance	olata		5%	No	FACU	Prevalence Index =	B/A = 2.20
9.							
10.						Hydrophytic Vegetation Inc	dicators:
11.							
12						1-Rapid Test for Hy	drophytic Vegetation
13						X 2-Dominance Test i	s >50%
14						4-Morphological Ad	antations ¹ (Provide supporting
16.						data in Remarks or	on a separate sheet)
17.						Problematic Hydror	phytic Vegetation ¹ (Explain)
18.							
19						¹ Indicators of hydric soil and	wetland hydrology must
20			4500/	Tatal Quarter	<u> </u>	be present, unless disturbed	or problematic.
			150%	= Total Cover			
Woody Vine Stratur 1.	m (Plot size: <u>30'</u> rad	ius)				Hydrophytic Vegetation	
2.				= Total Cover		Present? Yes	X No
Remarks: (Include	photo numbers here or o	on a separate sheet.)					

Midwest Region version 2.0

SOIL

Profile Desc	ription: (Describe to	the depth need	led to document the in	ndicator or c	onfirm the a	absence of	f indicators.)	
(inches)	Color (moist)	0/2	Color (moist)		Type ¹	1 oc^2	Toxturo	Pemarka
					Турс	LUC		Remains
0-4	101R 4/2	98	10 YR 0/8		C		clay loam	
4-10"	10YR 2/1	90	10YR 5/8	10	С	M&PL	clay loam	
¹ Type: C=C	oncentration. D=Deple	tion. RM=Redu	ced Matrix. CS=Covere	d or Coated	Sand Grains	² Locati	on: PL=Pore Lining	. M=Matrix.
Hydric Soil I	ndicators:	,	,		-	Indic	ators for Problema	atic Hydric Soils ³ :
Histoso	l (A1)		Sandy Gleve	d Matrix (S4))		Coast Prairi	ie Redox (A16)
Histic E	pipedon (A2)		Sandy Redo	x (S5)			Iron-Manga	nese Masses (F12)
Black H	listic (A3)		Stripped Mat	trix (S6)			Dark Surface	e (S7)
Hvdrog	en Sulfide (A4)		Loamy Muck	v Mineral (F1)		Very Shallow	v Dark Surface (TF12)
Stratifie	d Lavers (A5)		Loamy Gleve	ed Matrix (F2))		Other (Expl	ain in Remarks)
2 cm M	uck (A10)		X Depleted Ma	trix (F3)	,		= (=xpr	,
Denlete	d Below Dark Surface	(A11)	X Redox Dark	Surface (F6)				
Thick D	ark Surface (A12)	、···/	Depleted Da	rk Surface (F	7)		³ Indicators of hvd	rophytic vegetation and
Sandy I	Mucky Mineral (S1)		Bedox Depre	essions (F8)	•)		wetland hydrol	logy must be present
5 cm M	ucky Peat or Peat (S3)						unless distur	bed or problematic
	(
Restrictive L	ayer (if observed):							
Type:						I have been	0 - 11 Day	Maa Na
Deptil (i						Tiyunc	Son Fresent:	
HYDROL	DGY							
Wetland Hyd	rology Indicators:	in an and an dealer	I II. 4h - 4 h - h					
Primary India	ators (minimum of one	is required: ch	eck all that apply)	d Loovoo /P	0)		Secondary Indica	tors (minimum of two required)
Surface	vvaler (AT)				9)		Surface Sol	
High W	ater Table (A2)		Aquatic Faur	na (B13)			Drainage Pa	atterns (B10)
Saturat	ion (A3)		Irue Aquatio	Plants (B14))		Dry-Season	Water Table (C2)
Water M	Aarks (B1)		Hydrogen St	ulfide Odor (C	;1)	(00)	Crayfish Bu	rrows (C8)
Sedime	nt Deposits (B2)			zospheres or	n Living Root	ts (C3)	x Saturation	/isible on Aerial Imagery (C9)
Drift De	posits (B3)		Presence of	Reduced Iror	n (C4)		Stunted or s	Stressed Plants (D1)
Algal M	at or Crust (B4)		Recent Iron I	Reduction in	Tilled Soils (C6)	x Geomorphic	c Position (D2)
Iron De	posits (B5)		Thin Muck S	urface (C7)			X FAC-Neutra	al Test (D5)
Inundat	ion Visible on Aerial In	nagery (B7)	Gauge or We	ell Data (D9)				
Sparse	y Vegetated Concave	Surface (B8)	Other (Expla	in in Remark	s)			
Field Observ	vations:				ſ			
Surface Wat	er Present?	Yes No	Depth (inches)):				
Water Table	Present?	Yes No	Depth (inches):				
Saturation P	resent?	Yes No	Depth (inches)):	Wetland	d Hydrolog	gy Present?	Yes X No
(includes cap	oillary fringe)							
Describe Re	corded Data (stream g	auge, monitorin	g well, aerial photos, pr	evious inspe	ctions), if ava	ailable:		
Remarks:								
l								

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			on, Townshi	o, Range: 20, 48N, 31W		
Landform (hillslope,	, terrace, etc.): Depr	ression			Local re	elief (concave, convex, none):	Concave
Slope (%):	0% Lat:	38.963067	N	Long:	94	4.366192 W	Datum: NAD83
Soil Map Unit Name	e: Greenton-Ur	ban Land Complex, 5-	9 percent slopes, i	nonhydric		NWI classi	fication: None
Are climatic / hydrol	logic conditions on the	site typical for this time	e of year?	Yes	x No	(If no, explain in Remark	.s.)
Are Vegetation	, Soil	, or Hydrology	significantly d	isturbed?	Are "No	ormal Circumstances" present?	Yes x No
Are Vegetation	. Soil	or Hydrology	naturally prob	lematic?	(If need	ed. explain any answers in Re	marks.)
SUMMARY OF	FINDINGS Atta	ach site map sho	wing sampling	n point loca	tions. tra	nsects, important featu	res. etc.
Hydrophytic Vegeta	ation Present?	Ves	No X	le the	Sampled Are		
Hydric Soil Present	?	Yes		within	a Wetland?	Yes	No X
Wetland Hydrology	Present?	Yes	No X				
Remarks:							
VEGETATION	Use scientific I	names of plants.					
			Absolute	Dominant	Indicator		
Tree Stratum (Plot	size: 30' radius)	% Cover	Species?	Status	Dominance Test workshee	t:
1. Robinia pseudo	bacacia		5%	Yes	FACU		
2						Number of Dominant Specie	S C: 0 (A)
4.				·		That Ale OBL, FACW, OF FA	0 (A)
5.						Total Number of Dominant	
			5%	= Total Cover		Species Across All Strata:	(B)
Sapling/Shrub Strat	tum (Plot size: <u>15' ra</u>	adius)	F 0/	Vee		Percent of Dominant Species	S 00/ (A/D)
1. Elaeagnus umb	pellata		5%	Yes	UPL	That Are OBL, FACW, or FA	C: <u> </u>
3.							
4.						Prevalence Index workshee	et:
5.							
			5%	= Total Cover		Total % Cover of:	Multiply by:
Herb Stratum (Plot	size: <u>5' radius</u>)	20%	Vee	FACU		x1 =
2 Digitaria sangui	inalis		30%	Yes	FACU	FACW species	x2 =
3. Taraxacum offic	cinale		15%	No	FACU	FACU species 90%	x4 = 3.6
4. Melilotus officin	alis		10%	No	FACU	UPL species 10%	x5 = 0.5
5. Daucus carota			5%	No	UPL	Column Totals: 1.00	(A) <u>4.1</u> (B)
6						Drevelance Index -	D/A - 4.40
8				·		Flevalence index -	B/A - 4.10
9.				·			
10.						Hydrophytic Vegetation Inc	dicators:
11							
12						1-Rapid Test for Hyd	drophytic Vegetation
13						2-Dominance Test is 3-Prevalence Index	s >50% is ≤3.0 ¹
15.						4-Morphological Ada	aptations ¹ (Provide supporting
16.						data in Remarks or	on a separate sheet)
17.						Problematic Hydrop	ohytic Vegetation ¹ (Explain)
18						1 maliantena at hualuin anil analu	
19 20						he present upless disturbed	or problematic
20			90%	= Total Cover		be present, unless disturbed	or problematic.
Woody Vine Stratur	m (Plot size: 30' ra	adius)				Hydrophytic	
1						Vegetation	
2				- Total Court		Present? Yes	<u>No X</u>
				- Total Cover			
Remarks: (Include	photo numbers here c	or on a separate sheet.)				

Midwest Region version 2.0

SOIL

3

Color (moist) % Color (moist) % Type1 Loc2 Texture 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 9-18" 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 9-18" 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 9-18" 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 9-18" 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 9 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 9 10YR 6/8 2 c M&PL Clay Delay Delay<				ox Features	Red		Matrix	Depth
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 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 1 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 1 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 1 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 1 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 1 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 1 10YR 5/1 98 10YR 6/8 2 c M&PL Clay 1 10YR 5/1 98 10YR 6/8 2 c M Matri 1 10ticators Sandy Gleyed Matrix (S4) Coast Prairie Redox (S5) Iron-Manganese Mas Dark Surface (S7) Dark Surface (S7) Dark Surface (S7)	² Texture Remarks	Loc ²	Type ¹	%	Color (moist)	%	Color (moist)	(inches)
9-18" 10YR 5/1 98 10YR 6/8 2 c M&PL Clay "Indicators: Indicators: Indicators: Indicators for Problematic Hydroc "Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (A1) Histic Epipedon (A2) Sandy Redox (S5) Iron-Manganese Mas Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Su 2 cm Muck (A10) X Depleted Matrix (F3) X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) 3 Indicators of hydrophytic very	Clay Loam	m	с	2	10YR 6/8	98	10YR 3/2	0-9"
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: Indicators for Problematic Hydrid Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (A1) Histic Epipedon (A2) Sandy Redox (S5) Iron-Manganese Mas Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Su Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Ren 2 cm Muck (A10) X Depleted Matrix (F3) Thick Dark Surface (A11) Thick Dark Surface (A12) Depleted Dark Surface (F6) 3Indicators of hydrophytic vertice	'L Clay	M&PL	С	2	10YR 6/8	98	10YR 5/1	9-18"
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matri Hydric Soil Indicators: Indicators for Problematic Hydrid Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (Histic Epipedon (A2) Sandy Redox (S5) Iron-Manganese Mas Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Sur Stratified Layers (A5) Loamy Gleyed Matrix (F3) Other (Explain in Ren 2 cm Muck (A10) X Depleted Matrix (F3) Other (Explain in Ren X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) ³ Indicators of hydrophytic vertice for the the hydrophytic vertice for the form of the form of the the hydrophytic vertice for the form of the the hydrophytic vertice for the form of the form of the the hydrophytic vertice for the form of the form of the hydrophytic vertice for the form of the form of the hydrophytic vertice for the hydrophytic vertice for the form of the hydrophytic vertice for the form of the hydrophytic vertice for the hydrophytic vertice for the hydrophytic vertice form of the hydrophytic vertice for the hydrophytic vertice for the hydrophytic vertice form of the hydrop						·		
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matri Hydric Soil Indicators: Indicators for Problematic Hydrid Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (Histic Epipedon (A2) Sandy Redox (S5) Iron-Manganese Mas Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Sur Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Ren 2 cm Muck (A10) X Depleted Matrix (F3) Thick Dark Surface (A11) X Depleted Below Dark Surface (A12) Depleted Dark Surface (F7) ³ Indicators of hydrophytic vertice of the surface (F7)								
Indicators: Indicators for Problematic Hydri Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (S5) Histic Epipedon (A2) Sandy Redox (S5) Iron-Manganese Mas Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Su Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Ren 2 cm Muck (A10) X Depleted Matrix (F3) X Depleted Below Dark Surface (A11) Redox Dark Surface (F7) ³ Indicators of hydrophytic very	cation: PL=Pore Lining, M=Matrix.	. ² Locati	Sand Grains	or Coated	Matrix, CS=Covered	on, RM=Reduc	oncentration, D=Depleti	¹ Type: C=Cc
Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (S1) Histic Epipedon (A2) Sandy Redox (S5) Iron-Manganese Mas Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Surface (S7) Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Ren 2 cm Muck (A10) X Depleted Matrix (F3) X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) ³ Indicators of hydrophytic vertice	dicators for Problematic Hydric Soils ³ :	Indic					ndicators:	lydric Soil In
Histic Epipedon (A2) Sandy Redox (S5) Iron-Manganese Mas Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Sur Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Ren 2 cm Muck (A10) X Depleted Matrix (F3) X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) ³ Indicators of hydrophytic vertice	Coast Prairie Redox (A16))	d Matrix (S4)	Histosol (A1) Sandy Gleyed			
Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Sur Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Ren 2 cm Muck (A10) X Depleted Matrix (F3) X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) ³ Indicators of hydrophytic vertice	Iron-Manganese Masses (F12)			(S5)	Sandy Redox		pipedon (A2)	Histic Ep
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Su Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Ren 2 cm Muck (A10) X Depleted Matrix (F3) X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) ³ Indicators of hydrophytic vertice	Dark Surface (S7)			ix (S6)	Stripped Matr		istic (A3)	Black Hi
Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Rer. 2 cm Muck (A10) X Depleted Matrix (F3) X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) ³ Indicators of hydrophytic voltarity of hydr	Very Shallow Dark Surface (TF12)		Loamy Mucky Mineral (F1)				en Sulfide (A4)	Hydroge
2 cm Muck (A10) X Depleted Matrix (F3) X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) ³ Indicators of hydrophytic voltage (F7)	Other (Explain in Remarks)	Loamy Gleyed Matrix (F2)				d Layers (A5)	Stratified	
X Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) ³ Indicators of hydrophytic volume			X Depleted Matrix (F3)				uck (A10)	2 cm Mu
Thick Dark Surface (A12) Deleted Dark Surface (F7) ³ Indicators of hydrophytic v				Surface (F6)	Redox Dark S	۵11)	d Below Dark Surface (X Depleter
	³ Indicators of hydrophytic vegetation and		7)	k Surface (F	Neology Bulk C	,	ark Surface (A12)	Thick D
Sandy Mucky Mineral (S1) Redox Depressions (E8) Wetland hydrolody must	wetland hydrology must be present		Depressions (F8)				Mucky Mineral (S1)	Sandy M
Sandy Mucky Minter a Control (2)	unless disturbed or problematic			5510115 (1 0)			uela Dest er Dest (S2)	Sandy IV
	unless disturbed of problematic.						JCKy Feat OF Feat (33)	
Restrictive Layer (if observed):							ayer (if observed):	Restrictive La
Type: Compact Clay							Compact Clay	Type: C
Depth (inches): 18" Hydric Soil Present? Yes	ric Soil Present? Yes No x	Hydric				•	nches): 18'	Depth (in

HYDROLOGY

Wetland Hydrology Indicators:	i.							
Primary Indicators (minimum of	one is requi	Secondary Indicators (minimum of two required)						
Surface Water (A1)			Water-Stained Leaves (B	39)	Surface Soil Cra	acks (B6)		
High Water Table (A2)			Aquatic Fauna (B13)		Drainage Patter	ns (B10)		
Saturation (A3)			True Aquatic Plants (B14	+)	Dry-Season Wa	ter Table (C2)		
Water Marks (B1)			Hydrogen Sulfide Odor (0	C1)	Crayfish Burrow	Crayfish Burrows (C8)		
Sediment Deposits (B2)			Oxidized Rhizospheres o	on Living Roots (C3)	Saturation Visib	le on Aerial Imagery	′ (C9)	
Drift Deposits (B3)			Presence of Reduced Iro	n (C4)	Stunted or Stres	sed Plants (D1)		
Algal Mat or Crust (B4)	Geomorphic Pos	sition (D2)						
Iron Deposits (B5) Thin Muck Surface (C7)					FAC-Neutral Te	st (D5)		
Inundation Visible on Aeria								
Sparsely Vegetated Conca	ve Surface							
Field Observations:								
Surface Water Present?	Yes	No	Depth (inches):					
Water Table Present?	Yes	No	Depth (inches):					
Saturation Present?	Yes	No	Depth (inches):	Wetland Hydrolog	gy Present?	Yes I	No <u>X</u>	
(includes capillary fringe)								
Describe Recorded Data (stream	n gauge, m	onitoring w	ell, aerial photos, previous inspe	ections), if available:				
Remarks:								

Appendix K References

- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. United States Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
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- US Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0). Headquarters, US Army Corps of Engineers, Washington, D.C.
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