

U.S. ARMY CORPS OF ENGINEERS REGULATORY PROGRAM APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM) NAVIGABLE WATERS PROTECTION RULE

I. ADMINISTRATIVE INFORMATION

Completion Date of Approved Jurisdictional Determination (AJD): 13-MAY-2021 ORM Number: MVR-2021-00707-JN Associated JDs: N/A or ORM numbers and identifiers (e.g. HQS-2020-00001-MSW-MITSITE) Review Area Location¹: State/Territory: IA City: County/Parish/Borough: Hamilton County Center Coordinates of Review Area: Latitude 42.4771 Longitude -93.8133

II. FINDINGS

- **A. Summary:** Check all that apply. At least one box from the following list MUST be selected. Complete the corresponding sections/tables and summarize data sources.
 - The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
 - There are "navigable waters of the United States" within Rivers and Harbors Act jurisdiction within the review area (complete table in section II.B).
 - There are "waters of the United States" within Clean Water Act jurisdiction within the review area (complete appropriate tables in section II.C).
 - There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in section II.D).

B. Rivers and Harbors Act of 1899 Section 10 (§ 10)²

	§ 10 Name	§ 10 Size	§ 10 Criteria	Rationale for § 10 Determination
N/	/A	N/A	N/A	N/A

C. Clean Water Act Section 404

Territorial Seas and Traditional Navigable Waters ((a)(1) waters)³

(a)(1) Name	(a)(1) Size	(a)(1) Criteria	Rationale for (a)(1) Determination
N/A	N/A	N/A	N/A

Tributaries ((a)(2) waters):

(a)(2) Name	(a)(2) Size	(a)(2) Criteria	Rationale for (a)(2) Determination
N/A	N/A	N/A	N/A

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):

[(a)(3) Name	(a)(3) Size	(a)(3) C	riteria	Rationale for	(a)(3) Determination
	N/A	N/A	N/A	N/A		

Adjacent wetlands ((a)(4) waters):

(a)(4) Name	(a)(4) Size	(a)(4) Criteria	Rationale for (a)(4) Determination
N/A	N/A	N/A	N/A

¹ Map(s)/Figure(s) are attached to the AJD provided to the requestor.

² If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.

³ A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where independent upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD form. ⁴ Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.

⁵ Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.



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D. Excluded Waters or Features

Excluded waters $((b)(1) - (b)(12))^4$:

Exclusion Name	Exclusion Size	Exclusion ⁵	Rationale for Exclusion Determination
2021-0707	800 feet	ditch constructed in an (a)(4) water	Identified wetland is created by runoff from storm water and stays stagnant in the roadside ditch. The wetland is not connected to any WOTUS. This wetland will also be avoided during foreslope repair work.

III. SUPPORTING INFORMATION

- A. Select/enter all resources that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.
 - _X Information submitted by, or on behalf of, the applicant/consultant: 49352_JointApplication.pdf, IDNRFP_GradingPlan.pdf, IDNRFP_NFHLMapEX2.pdf, IDNRFP_VicinityMapEX1.pdf, IDNRFP_WorkmapEX3.pdf, Report_2021-04-02 WetlandDelineation.pdf. 5/11/2021
 - This information is sufficient for purposes of this AJD.
 - Rationale: N/A
 - ____ Data sheets prepared by the Corps: Title(s) and/or date(s).
 - Photographs: 2021-0707 2017 aerial.pdf, 2021-0707 LiDAR.pdf. 5/13/2021
 - ____ Corps Site visit(s) conducted on: Date(s).
 - Previous Jurisdictional Determinations (ÁJDs or PJDs): ORM Number(s) and date(s).
 - ____ Antecedent Precipitation Tool: provide detailed discussion in Section III.B.
 - ____ USDA NRCS Soil Survey: Title(s) and/or date(s).
 - ____ USFWS NWI maps: Title(s) and/or date(s).
 - ____ USGS topographic maps: *Title(s) and/or date(s)*.

Other data sources used to aid in this determination:

Data Source (select)	Name and/or date and other relevant information
USGS Sources	N/A.
USDA Sources	N/A.
NOAA Sources	N/A.
USACE Sources	N/A.
State/Local/Tribal Sources	N/A.
Other Sources	N/A.

B. Typical year assessment(s): N/A

C. Additional comments to support AJD: Identified wetland is created by runoff from storm water and stays stagnant in the roadside ditch. The wetland is not connected to any WOTUS. This wetland will also be avoided during foreslope repair work. No wetlands will be affected by the proposed work.

¹ Map(s)/Figure(s) are attached to the AJD provided to the requestor.

² If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.

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to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area. ⁵ Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions, but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

Rock Island District Regulatory Viewer

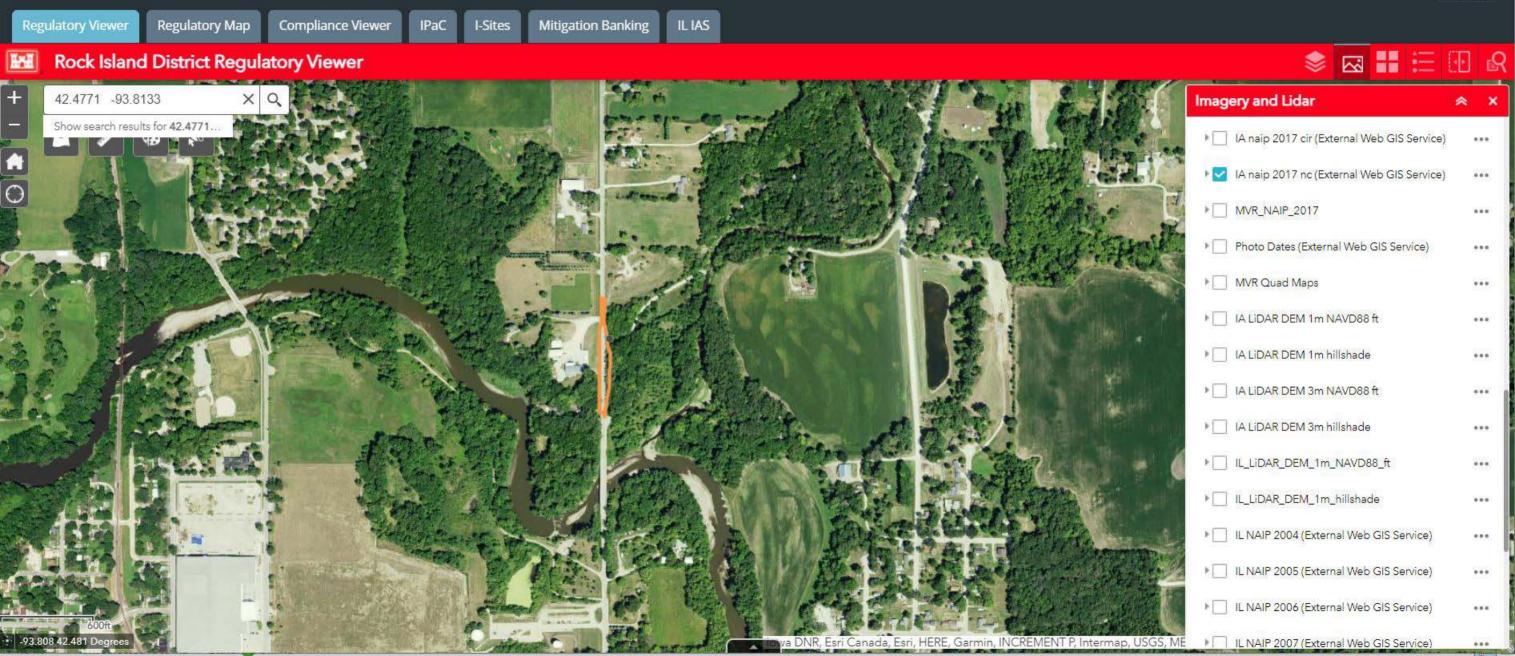


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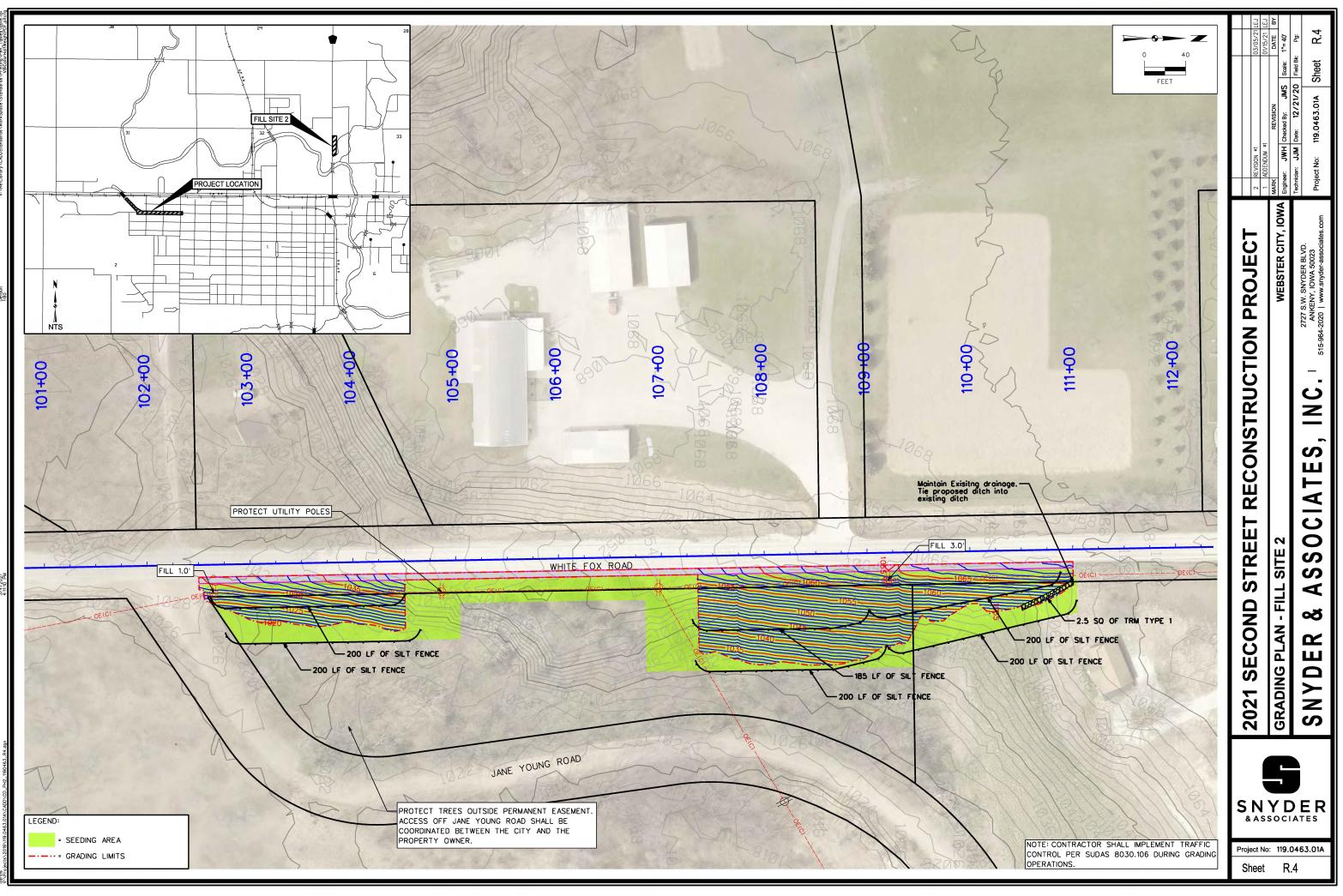
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Rock Island District Regulatory Viewer



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SOURCES: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, @ OpenStreetMap contributors, and the GIS User Community

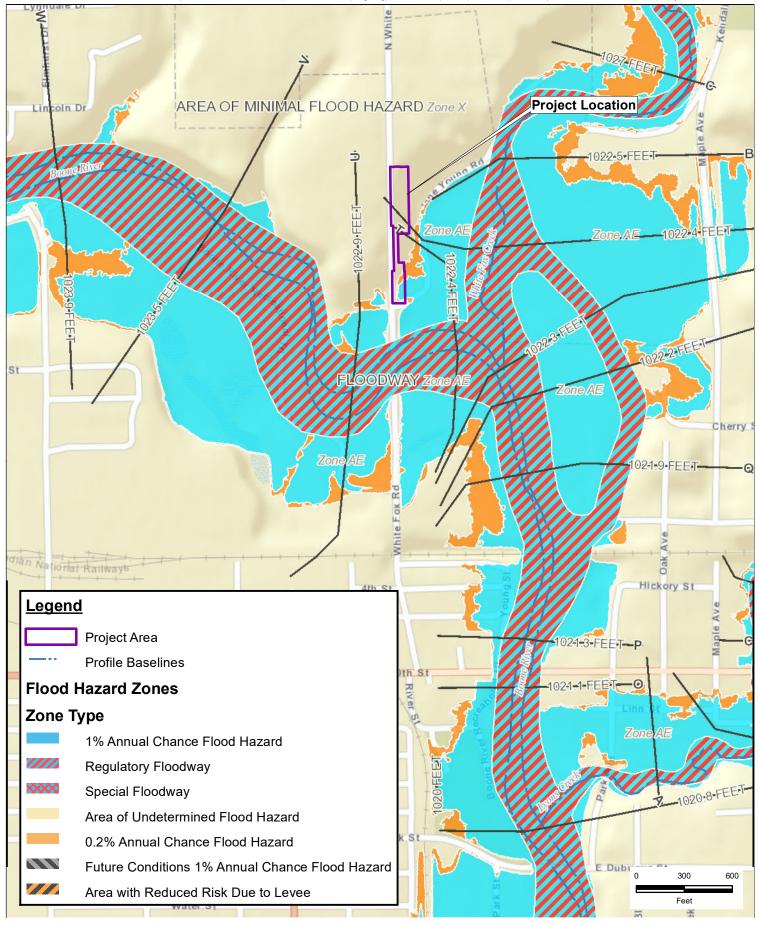




Exhibit 2 - NFHL Map

2021 2nd Street Reconstruction Project | Webster City, Iowa | 5/5/2021

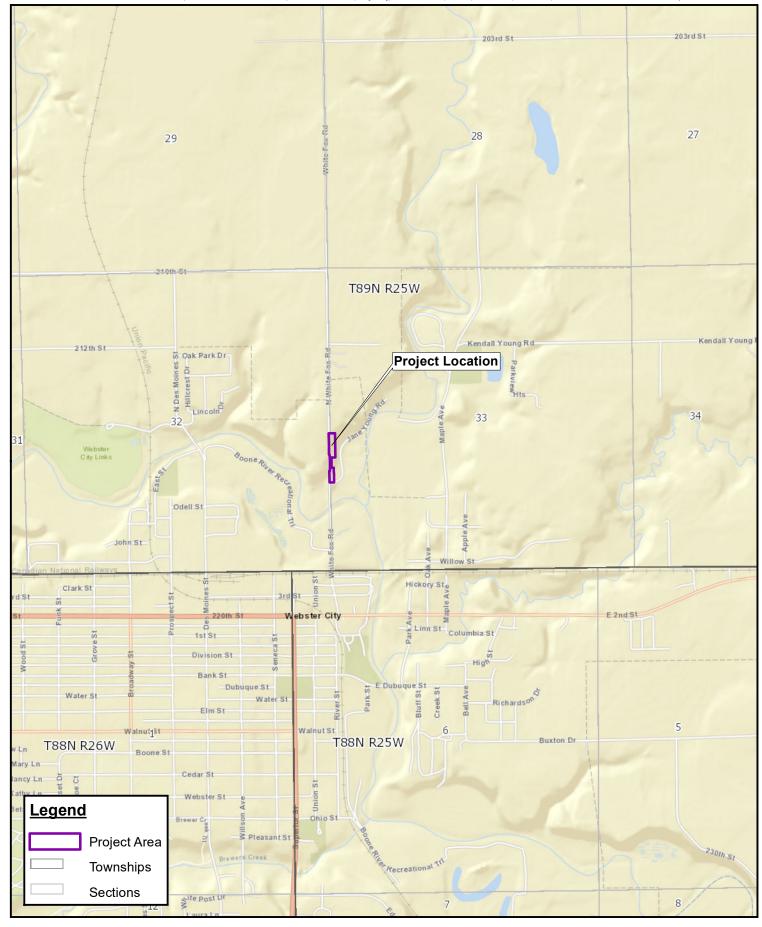


Exhibit 1 - Vicinity Map

2021 2nd Street Reconstruction Project | Webster City, Iowa | 5/5/2021

SOURCES: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

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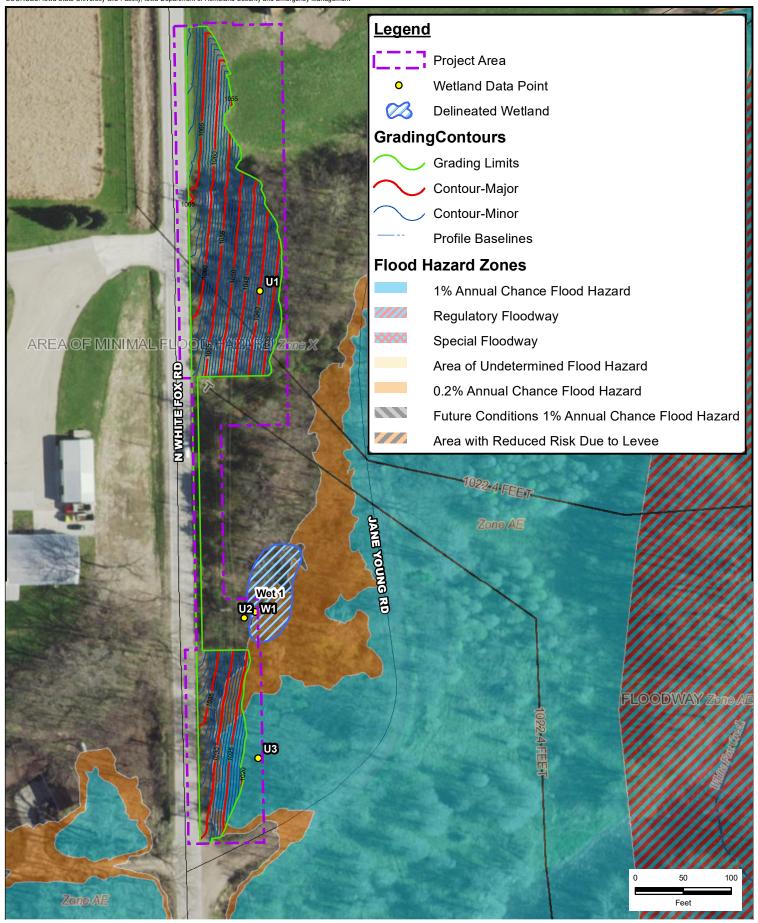




Exhibit 3 - Project Workmap

2021 2nd Street Reconstruction Project | Webster City, Iowa | 5/5/2021



WETLAND DELINEATION

White Fox Road Reconstruction Project

Webster City, Iowa | April 2, 2021

Prepared for:

CITY OF WEBSTER CITY 400 2ND STREET WEBSTER CITY, IOWA 50595

Snyder & Associates, Inc. Project No. 119.0463.01A

Prepared by:

4/2/2021

Kelcie Kraft Environmental Scientist

Reviewed by:

Walt

Jeff Walters, PWS Principal Environmental Scientist

4/2/2021

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1. Introduction

Snyder & Associates, Inc. delineated the project area for the proposed White Fox Road Reconstruction in Webster City, Iowa for the presence of wetlands on March 25, 2021 in accordance with the proposal and general conditions. The project consists of reconstruction of approximately 850 feet of 2nd Street in Webster City, Iowa. The project boundary is located in the SE ¼ of Section 32 and SW ¼ of Section 33, Township 89 North, Range 25 West in Hamilton County, Iowa.

The scope of this investigation was to indicate the presence/absence of wetlands, identify wetlands that could be impacted by the project, and delineate the upper boundaries of potential jurisdictional wetlands within the project area. In addition to wetlands, Waters of the United States (WUS), which include lakes, ponds, rivers, and streams, were included in the delineation. This report is used by the United States Army Corps of Engineers (USACE) and the Iowa Department of Natural Resources (IDNR). The USACE has discretion to use this report for the purposes of making jurisdictional determinations and enforcing Section 404 of the Clean Water Act. The IDNR uses the report for the purpose of enforcing Section 401 of the Clean Water Act.

The information and recommendations presented in this report are professional opinions based on visual observation, review of available data pertaining to the subject property, and interpretation of available public records. The opinions and recommendations presented herein apply to the subject property conditions at the time of Snyder & Associates, Inc. investigation.

2. Methodology

Prior to performing the wetland delineation, several map and aerial photograph resources were reviewed to assist with identifying WUS within the project area.

USGS Topographic Maps

United States Geological Survey (USGS) topographic maps were used to identify drainage areas, streams, forests, and topography that may indicate the presence of WUS. No WUS were identified within the project area.

National Wetlands Inventory

The National Wetlands Inventory (NWI), published by the United States Department of the Interior's Fish and Wildlife Services (USFWS), were reviewed for probable wetland areas. No NWI-indicated wetland areas were identified on the project site.

USDA Soil Survey

The Hamilton County Soil Survey provided by the United States Department of Agriculture (USDA) was used to identify the hydric soils in the project area. As shown in Exhibit 4, *USDA Soil Survey*, two soils with hydric components are indicated in the project area. The soil descriptions identified in the project area are identified in Table 1.

Soil Map Unit	Description	Hydric
308	Wadena loam, 0 to 2 percent slopes	Yes
356G	Storden-Hayden loams, 25 to 50 percent slopes	No
536	Hanlon fine sandy loam, 0 to 2 percent slopes	No
1536	Hanlon fine sandy loam, channeled, 0 to 2 percent slopes	Yes

Table 1. Soil Map Units and Descriptions

3. Site Review

During a pedestrian field survey potential wetlands were examined for wetland indicators using the Routine On-Site Determination Method as defined in the 1987 Corps of Engineers Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (2010 Midwest Supplement). Wetlands are defined by the USACE and the Environmental Protection Agency (EPA) as:

"Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.¹"

Under normal conditions, if one (1) or more of the wetland criteria are not identified, the area was not considered a wetland. If all three (3) wetland indicators were identified, the area was classified a wetland. Additional observations were made throughout the wetland areas to define the wetland/non-wetland boundary, which was mapped with GPS technology. Vegetation, soil, and hydrology assessment data from at least one (1) location within each wetland and the characteristics of one (1) upland location outside of the wetlands were recorded on a USDA Wetland Determination Form. The recorded data forms for the project area are enclosed in Appendix B and the data point locations are shown on Exhibit 5, *Wetland Delineation*..

Plant Community Assessment

The project area was visually observed to assess the plant species and absolute percentage of ground cover for four stratums of plant community types including tree, scrub/shrub, herbaceous and woody vine stratums. The vegetation for each selected area was identified using *Midwestern Wetland Flora, A Field Office Guide to Plant Species* (Mohlenbrock and Mohlenbrock), and *Wildflowers and other Plants of Iowa Wetlands* (Runkel and Roosa, 1999).

Each dominant species of vegetation observed was evaluated for their wetland indicator status. Indicator status was assessed using the USDA North American Digital Flora, National Wetland Plant List and the national List of Plant Species that Occur in Wetlands – Region 3 (Reed 1988). Indicator categories for vegetation are presented below:

- Obligate Wetland (OBL) occurs almost always (estimated probability greater than 99%) under natural conditions in wetlands.
- Facultative Wetland (FACW) usually occur in wetland (estimated probability 67% 99%) but occasionally found in not-wetlands.

¹ Environmental Laboratory. <u>1987 Corps of Engineers Wetlands Delineation Manual</u>. Vicksburg, MS: U.S. Army Corps of Engineers, 1987.

- Facultative (FAC) equally likely to occur in wetlands or non-wetlands (estimated probability 34% 66%).
- Facultative Upland (FACU) usually occur in non-wetlands (estimated probability 67% 99%) but occasionally found in wetlands.
- Obligate Upland (UPL) rarely occurs in wetlands, but occur almost always (estimated probability greater than 99%) under natural conditions in non-wetlands.

Hydric Soil Assessment

Subsurface soil samples to a depth of approximately 24 inches were collected and evaluated using Munsell Soil Color Charts (Munsell 1994). The soil samples were also evaluated for hydric soil indicators listed on the USACE Midwest Region Wetland Determination Data Form including hydrogen sulfide, depletion below dark surface, thick dark surface, depleted matrix, redox depressions, loamy gleyed matrix and stripped matrix. Soil was considered to be hydric if hydric soil indicators were observed in the subsurface soil sample.

Wetland Hydrology Assessment

Potential wetlands were visually evaluated for wetland hydrology indicators. If one (1) primary or two (2) secondary indicators were observed, the location was considered to have wetland hydrology. Primary wetland indicators include surface water, high water table, saturation, water marks, drift deposits, iron deposits, presents of reduced iron, and oxidized rhizospheres on living roots. Secondary wetland indicators include surface soil cracks, drainage patterns, stunted or stressed plants and crayfish burrows.

4. Environmental Setting

Weather during the wetland delineation on March 25, 2021 was mostly cloudy at approximately 45° F with winds blowing from the SW at about 7 mph².

According to the National Climatic Data Center,³ data for WEBSTER CITY, IA, the average precipitation in March is 2.0 inches. Current climate data was obtained from the Natural Resources Conservation Service (NRCS) Field Office Technical Guide website⁴ for WEBSTER CITY, IA. Total precipitation recorded to prior to delineation in March 2021 was 1.64 inches.

² http://www.wunderground.com/history/

³ http://cdo.ncdc.noaa.gov/cgi-bin/climatenormals/climatenormals.pl?directive=prod_select2&prodtype=CLIM20&subrnum=

⁴ http://efotg.sc.egov.usda.gov/efotg locator.aspx

Date	Max Temperature	Min Temperature	Avg Temperature	Precipitation	Snowfall	Snow Depth
2021-03-01	37	16	26.5	0.00	0.0	2
2021-03-02	30	17	23.5	0.00	0.0	2
2021-03-03	49	21	35.0	0.00	0.0	2
2021-03-04	52	26	39.0	0.00	0.0	1
2021-03-05	52	25	38.5	0.00	0.0	Т
2021-03-06	46	27	36.5	0.00	0.0	Т
2021-03-07	52	31	41.5	0.00	0.0	Т
2021-03-08	64	34	49.0	0.00	0.0	0
2021-03-09	70	36	53.0	0.00	0.0	0
2021-03-10	71	43	57.0	0.00	0.0	0
2021-03-11	70	32	51.0	0.01	0.0	0
2021-03-12	50	23	36.5	0.00	0.0	0
2021-03-13	50	23	36.5	0.00	0.0	0
2021-03-14	58	28	43.0	0.00	0.0	0
2021-03-15	45	29	37.0	0.15	2.0	2
2021-03-16	30	29	29.5	Т	Т	2
2021-03-17	36	29	32.5	Т	0.0	Т
2021-03-18	39	29	34.0	0.00	0.0	Т
2021-03-19	46	23	34.5	0.00	0.0	0
2021-03-20	60	21	40.5	0.00	0.0	0
2021-03-21	61	28	44.5	0.00	0.0	0
2021-03-22	65	37	51.0	0.00	0.0	0
2021-03-23	55	37	46.0	0.20	0.0	0
2021-03-24	53	41	47.0	1.28	0.0	0
2021-03-25	48	37	42.5	0.06	0.0	0
Average Sum	51.56	28.88	40.22	1.7	2	0.55

Table 2: Climatological Data WEBSTER CITY, IA - March 2021

Product generated by ACIS - NOAA Regional Climate Centers.

5. Field Observations

Field investigations were performed on March 25, 2021 by Snyder & Associates, Inc. to identify potential WUS, including wetlands within the project boundary. One forested wetland was identified within the project boundary during the wetland delineation. WUS identified during the wetland delineation are shown on Exhibit 5, *Wetland Delineation*. Wetland Determination Data Forms for each wetland area can be found in Appendix B. Photographic documentation provide a record of the physical characteristics of the field sites observed during the field survey.

Wetland 1 is a forested wetland with approximately 0.01 acres located within the project area. The wetland is located at the bottom of a steep road embankment. The wetland is isolated and is fed from water running down the road embankment with no other outlet or drainage. The wetland is dominated by cottonwood (*Populous deltoids*), hackberry (*Celtis occidentalis*), and slippery elm (*Ulmas rubra*). Little herbaceous vegetation was observed at the time of delineation.



Photo 1: north view of Wetland 1.

6. Summary

Snyder & Associates, Inc. has performed a Wetland Delineation in conformance with the 1987 Corps of Engineers Wetlands Delineation Manual and the Midwest Regional Supplement of the proposed Wooded Acres development project in Polk County, Iowa. Based on the findings of the wetland delineation, one forested wetland was found. This wetland is likely non-jurisdictional.

According to Regulation 33CFR §328.3, WUS include traditional navigable waters, interstate waters, tributaries of navigable and interstate waters, interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, and certain isolated wetlands. WUS are under the jurisdiction of the USACE.

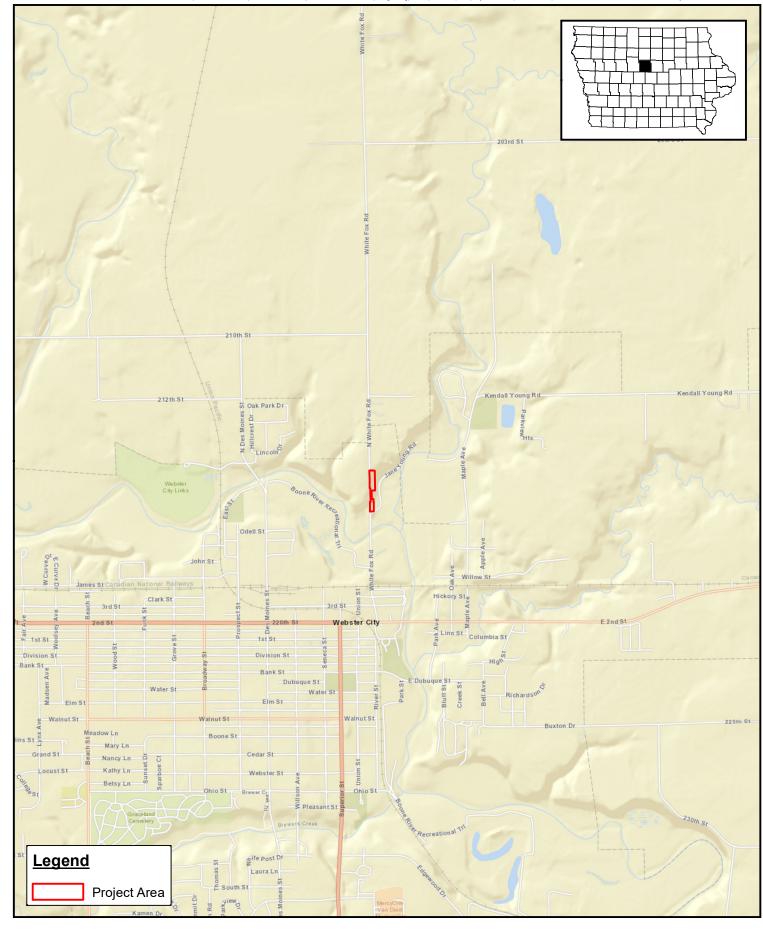
Discharges of dredged or fill material, excavation, and mechanized land clearing in the WUS will require authorization from the USACE. Final determination of the limit of WUS, including wetlands, for permitting purposes rests with the USACE. For final authorization for activities in WUS, the USACE must approve these findings.

APPENDIX A EXHIBITS

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SNYDER & ASSOCIATES

SOURCES: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, @ OpenStreetMap contributors, and the GIS User Community



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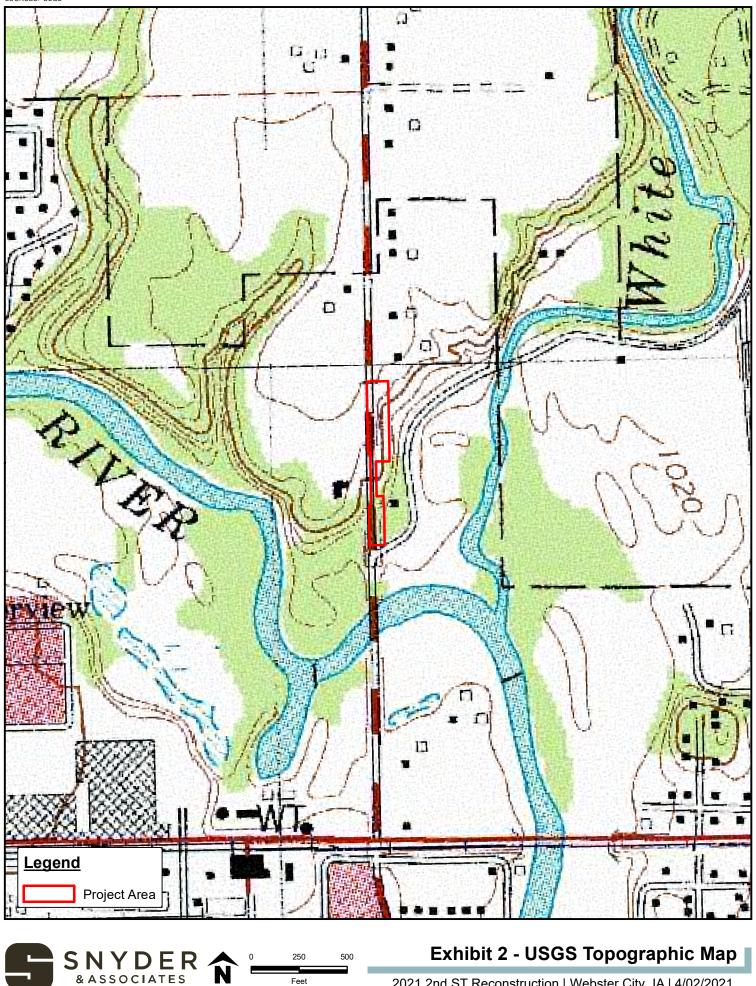
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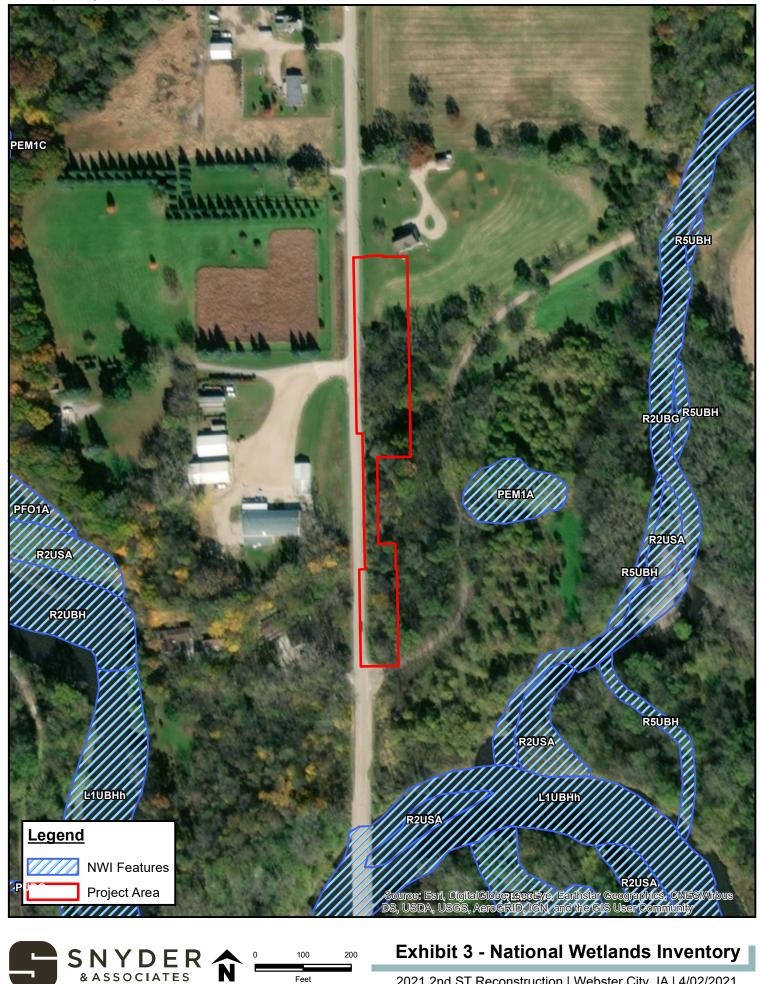
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Exhibit 1 - Vicinity Map



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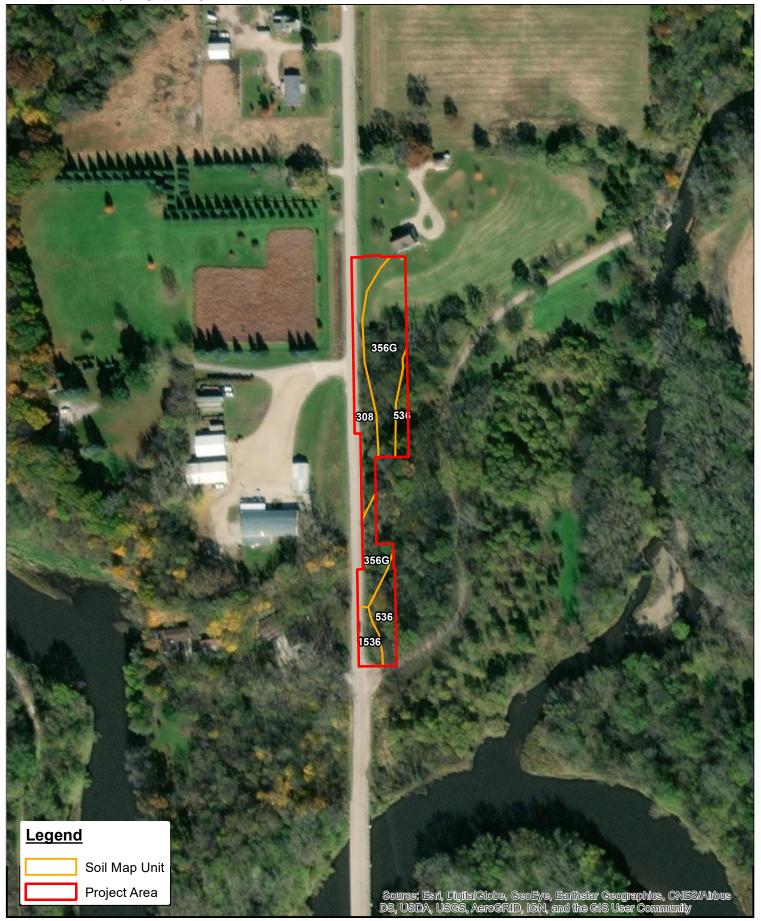
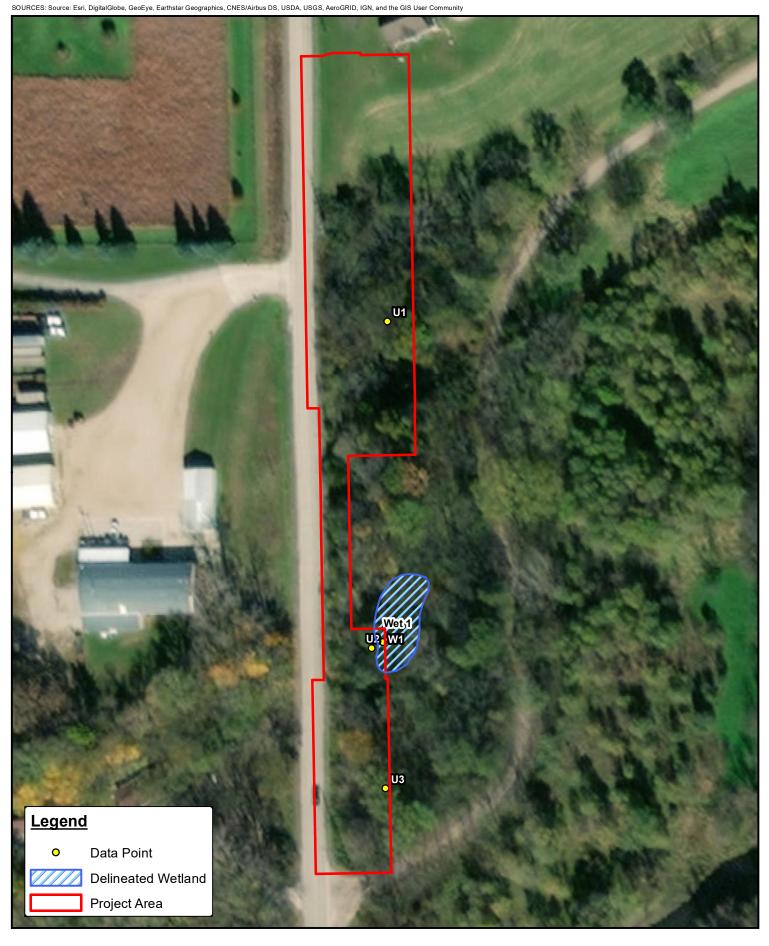


Exhibit 4 - USDA Soil Survey



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Exhibit 5 - Wetland Delineation

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APPENDIX B DATA FORMS



WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: White Fox Road Reconstruction		City/County: Webster City				Sampling Date:	3-25-2	2021
Applicant/Owner: City of Webster City		_		State:	IA	Sampling Point:	:	U1
Investigator(s): Kelcie Kraft		Section, To	ownship, Range:	Sec 33, T8	39N, 25V	V		
Landform (hillside, terrace, etc.): Hillslope			Local relief (con	cave, conve	x, none):	Convex		
Slope (%): 25 to 50 Lat: 42.47731		Long: -9	3.813139			Datum: NAD83	3	
Soil Map Unit Name: Storden-Hayden loams				NW	l classific	cation: None		
Are climatic / hydrologic conditions on the site typical	for this time of	year?	Yes X No	(If no,	explain i	in Remarks.)		
Are Vegetation, Soil, or Hydrology	significant	tly disturbed	? Are "Norma	I Circumstar	ices" pre	esent? Yes	X	No
Are Vegetation, Soil, or Hydrology						in Remarks.)		
SUMMARY OF FINDINGS – Attach site n				ions, tran	isects,	important fe	atures	s, etc.
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes	No X No X		Sampled Area			No X		
Wetland Hydrology Present? Yes	No X	WILIIII	a Wellanu:	16	es	<u>No X</u>		
Remarks:								
VEGETATION – Use scientific names of pl	ants.							
Tree Stratum (Plot size:)		Dominant Species?	Indicator Status I	Dominance	Test wo	rksheet:		
1. Juniperus virginiana	40	Yes	FACU	Number of D	ominant	Species		
2. Ulmus rubra	30	Yes	FAC	That Are OBI	L, FACW	/, or FAC:	2	(A)
3 4		·		Total Numbe Species Acro			4	(B)
5		otal Cover		Percent of Do That Are OBI			50.0%	(A/B)
Sapling/Shrub Stratum (Plot size:)							_ ` `

4 5				Total Number of D				
5				Species Across Al	i Strata:		4	(B)
				Percent of Domina	•			
	70	=Total Cover		That Are OBL, FA	CW, or FAC:	50	.0%	(A/B)
Sapling/Shrub Stratum (Plot size:)							
1. Lonicera tatarica	50	Yes	FACU	Prevalence Index				
2				Total % Cove	er of:	Multi	ply by:	
3				OBL species		x 1 =	0	
4				FACW species	0	x 2 =	0	
5				FAC species	45	x 3 =	135	
	50	=Total Cover		FACU species	90	x 4 =	360	
Herb Stratum (Plot size:)		_		UPL species	0	x 5 =	0	
1. Rumex crispus	15	Yes	FAC	Column Totals:	135	(A)	495	(B)
2.				Prevalence	Index = B/A		3.67	
3.								
4.				Hydrophytic Vege	etation Indica	ators:		
5.				1 - Rapid Test			tation	
	-			2 - Dominance	, , ,			
6 7				3 - Prevalence				
8.				4 - Morpholog			vide sup	porting
0					arks or on a			
J				Problematic H	lydrophytic V	egetatior	n ¹ (Expla	in)
10.		=Total Cover		¹ Indicators of hydri		tland by	drology	must
10	15				c soll and we			
10(Plot size:)	15			be present, unless				nuot
	15			be present, unless				indot
	15			be present, unless				
<u>Woody Vine Stratum</u> (Plot size:) 1.	15	=Total Cover		be present, unless			atic.	

SOIL

U1

Depth	Matrix		Redo			0		
nches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-14	10YR 2/1	100					Loamy/Clayey	
Гуре: С=0	Concentration, D=De	pletion, RM=	Reduced Matrix, M	S=Maske	ed Sand	Grains.	² Location: PL	=Pore Lining, M=Matrix.
ydric Soi	I Indicators:						Indicators f	for Problematic Hydric Soils ³ :
Histoso	ol (A1)		Sandy Gley	ed Matrix	: (S4)		Coast F	Prairie Redox (A16)
Histic E	Epipedon (A2)		Sandy Redo	эх (S5)			Iron-Ma	nganese Masses (F12)
Black H	Histic (A3)		Stripped Ma	atrix (S6)			Red Pa	rent Material (F21)
Hydrog	gen Sulfide (A4)		Dark Surfac	;e (S7)			Very Sł	nallow Dark Surface (TF12)
Stratifie	ed Layers (A5)		Loamy Muc	-			Other (I	Explain in Remarks)
2 cm N	/luck (A10)		Loamy Gley	ed Matrix	k (F2)			
Deplet	ed Below Dark Surfa	ice (A11)	Depleted Ma	atrix (F3)				
Thick [Dark Surface (A12)		Redox Dark		` '		³ Indicators of	of hydrophytic vegetation and
	Mucky Mineral (S1)		Depleted Da					I hydrology must be present,
5 cm N	/lucky Peat or Peat (S3)	Redox Depr	essions ((F8)		unless	disturbed or problematic.
	lover /if shares	A.						
estrictive	e Layer (if observed	·):						
Туре:		ı): 	_					
Type: Depth (in		y: 					Hydric Soil Pre	sent? Yes <u>No X</u>
Type: Depth (in Remarks:	nches):		_ 				Hydric Soil Pre	sent? Yes <u>No X</u>
Type: Depth (in Remarks:	ogy						Hydric Soil Pre	sent? Yes <u>No X</u>
Type: Depth (in Remarks: YDROL	oches): OGY Vydrology Indicators							
Type: Depth (in Remarks: YDROLO Vetland H Primary Ind	OGY Jicators (minimum of						<u>Secondary I</u>	Indicators (minimum of two require
Type: Depth (in Remarks: YDROL Yetland H Yrimary Ind Surfact	OGY dicators (minimum of e Water (A1)		Water-Stain	ned Leave	· · /		<u>Secondary I</u> Surface	Indicators (minimum of two require Soil Cracks (B6)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface High W	OGY Jicators (minimum of e Water (A1) Vater Table (A2)		Water-Stain Aquatic Fau	ned Leave una (B13)			<u>Secondary I</u> Surface	Indicators (minimum of two require Soil Cracks (B6) Je Patterns (B10)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface High W Satura	OGY ////////////////////////////////////		Water-Stain Aquatic Fau True Aquati	ned Leave una (B13) ic Plants ((B14)		Secondary I Surface Drainag Dry-Sea	Indicators (minimum of two require Soil Cracks (B6) Je Patterns (B10) ason Water Table (C2)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surfacd High W Satura Water	OGY Vydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) titon (A3) Marks (B1)		Water-Stain Aquatic Fau True Aquati Hydrogen S	ned Leave una (B13) ic Plants (Sulfide Od	(B14) lor (C1)	ing Boots (Secondary I Surface Drainag Dry-Sea Crayfisl	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface High W Satura Water Sedimo	OGY ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2)		Water-Stain Aquatic Fau True Aquati Hydrogen S	ned Leave una (B13) ic Plants (Sulfide Od nizospher	(B14) lor (C1) res on Liv		<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat	Indicators (minimum of two require Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9)
Type: Depth (in Remarks: YDROLO Vetland H Primary Ind Surface High W Satura Satura Satura Satura Drift De	OGY ydrology Indicators <u>dicators (minimum of</u> e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3)		Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh	ned Leave una (B13) ic Plants (Gulfide Od nizospher f Reduce	(B14) lor (C1) res on Liv d Iron (C	4)	<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat Stunted	Indicators (minimum of two require Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1)
Type: Depth (in Remarks: Primary Ind Surface High W Satura Water Sedime Algal M	OGY Vydrology Indicators dicators (minimum of re Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4)		Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Resence of Recent Iron	ned Leave una (B13) ic Plants (Sulfide Od nizospher f Reduced Reductio	(B14) lor (C1) res on Liv d Iron (C on in Tille	4)	<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat Stuntec) Geomo	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface Uniface Surface Surface Surface Surface Drift De Algal M Iron De	OGY Vater Called Calle	s: Fone is requir	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S	ned Leave una (B13) o Plants (Gulfide Od nizospher f Reduce Reductic Surface (((B14) lor (C1) res on Liv d Iron (C- on in Tille C7)	4)	<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat Stuntec) Geomo	Indicators (minimum of two require Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1)
Type: Depth (in Remarks: YDROL Vetland H Primary Inc Surface High W Satura Water Sedime Drift De Algal M Iron De Inunda	OGY Vydrology Indicators dicators (minimum of re Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4)	s: f one is requir	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Gauge or W	ned Leave una (B13) o Plants (Gulfide Od nizospher f Reduced Reductio Surface (0 /ell Data	(B14) lor (C1) res on Liv d Iron (C on in Tille C7) (D9)	4)	<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat Stuntec) Geomo	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2)
Type: Depth (in Remarks: YDROLO Yetland H Primary Ind Surface High W Satura Satura Satura Gurift De Algal M Iron De Inunda Sparse	OGY ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aeria ely Vegetated Conca	s: f one is requir	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Gauge or W	ned Leave una (B13) o Plants (Gulfide Od nizospher f Reduced Reductio Surface (0 /ell Data	(B14) lor (C1) res on Liv d Iron (C on in Tille C7) (D9)	4)	<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat Stuntec) Geomo	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2)
Type: Depth (in Remarks: YDROLO Yetland H Primary Ind Surface High W Satura Water Sedime Drift De Algal M Iron De Inunda Sparse	OGY ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aeria ely Vegetated Conca ervations:	s: f one is requir l Imagery (B7 ve Surface (E	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S 7) Gauge or W 38 Other (Expla	ned Leave una (B13) ic Plants (Gulfide Od nizospher f Reduce Reductic Surface ((/ell Data ain in Rer	(B14) lor (C1) res on Liv d Iron (C on in Tille C7) (D9)	4)	<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat Stuntec) Geomo	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface High W Satura Water Sedime Drift De Algal M Iron De Inunda Sparse Surface Wa	OGY Vatorlogy Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) tion Visible on Aeria ely Vegetated Conca ervations: ater Preser Yes	s: Fone is requir I Imagery (B7 ve Surface (E	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S Gauge or W B8 Other (Expla	ned Leave una (B13) ic Plants (Sulfide Od nizospher f Reduced Reductio Surface ((/ell Data ain in Rer	(B14) lor (C1) res on Liv d Iron (C on in Tille C7) (D9)	4)	<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat Stuntec) Geomo	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface High W Satura Water Sedime Drift De Algal M Iron De Inunda Sparse Surface Wa	OGGY Vydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aeria ely Vegetated Conca ervations: ater Preser Yes le Present? Yes	S: Fone is requir I Imagery (B7 ve Surface (E	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S 7) Gauge or W 38 Other (Expla X Depth (inche X Depth (inche	ned Leave una (B13) c Plants (Sulfide Od nizospher f Reduced Reductio Surface ((/ell Data ain in Rer es):	(B14) lor (C1) res on Liv d Iron (C on in Tille C7) (D9)	4) d Soils (C6	Secondary I Surface Drainag Dry-Sea Crayfisl C3) Saturat Stuntec) Geomo FAC-Ne	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2) eutral Test (D5)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface High W Satura Water Sedima Drift De Algal M Iron De Inunda Sparse Surface Wa Saturation I	OGY ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aeria ely Vegetated Conca ervations: ater Preser Yes le Present? Yes	S: Fone is requir I Imagery (B7 ve Surface (E	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S 7) Gauge or W 38 Other (Expla X Depth (inche	ned Leave una (B13) c Plants (Sulfide Od nizospher f Reduced Reductio Surface ((/ell Data ain in Rer es):	(B14) lor (C1) res on Liv d Iron (C on in Tille C7) (D9)	4) d Soils (C6	<u>Secondary I</u> Surface Drainag Dry-Sea Crayfisl C3) Saturat Stuntec) Geomo	Indicators (minimum of two requir e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2) eutral Test (D5)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface High W Satura Water Sedime Satura Unift De Algal M Iron De Inunda Sparse Surface Wa Surface Wa Surface Wa Surface Wa	OGGY ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) ation Visible on Aeria ely Vegetated Conca ervations: ater Preser Yes le Present? Yes Present? Yes	I Imagery (B7 ve Surface (E	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S O Gauge or W Ba Other (Expla X Depth (inche X Depth (inche	ned Leave una (B13) c Plants (culfide Od nizospher f Reduce Reductic Surface ((/ell Data ain in Rer es): es): 	(B14) lor (C1) es on Liv d Iron (C- on in Tille C7) (D9) marks)	4) d Soils (C6 Wetland	Secondary I Surface Drainag Dry-Sea Crayfisl Saturat Stunted FAC-Ne	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2) eutral Test (D5)
Type: Depth (in Remarks: YDROL Vetland H Primary Ind Surface High W Satura Water Sedime Drift De Algal M Iron De Inunda Sparse Surface Wa Surface Wa Surface Wa Surface Wa Surface Wa	OGY ydrology Indicators dicators (minimum of e Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) vat or Crust (B4) eposits (B5) eposits (B5	I Imagery (B7 ve Surface (E	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron Thin Muck S O Gauge or W Ba Other (Expla X Depth (inche X Depth (inche	ned Leave una (B13) c Plants (culfide Od nizospher f Reduce Reductic Surface ((/ell Data ain in Rer es): es): 	(B14) lor (C1) es on Liv d Iron (C- on in Tille C7) (D9) marks)	4) d Soils (C6 Wetland	Secondary I Surface Drainag Dry-Sea Crayfisl Saturat Stunted FAC-Ne	Indicators (minimum of two require e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) h Burrows (C8) ion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) rphic Position (D2) eutral Test (D5)

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: White Fox Road Reconstruction	City/County: Webster City			Sampling Date:	3-25-2021
Applicant/Owner: City of Webster City		State:	IA	Sampling Point:	U2
Investigator(s): Kelcie Kraft	Section, Township, Range:	Sec 33, T	89N, 25V	V	
Landform (hillside, terrace, etc.): Hillslope	Local relief (conc	cave, conve	x, none)	Convex	
Slope (%): 25 to 50 Lat: 42.476377	Long: <u>-93.813215</u>			Datum: NAD83	
Soil Map Unit Name <u>Storden-Hayden loams</u>		NW	/I classifi	cation: None	
Are climatic / hydrologic conditions on the site typical for this time of ye	ear? Yes <u>X</u> No	(lf no,	explain	in Remarks.)	
Are Vegetation, Soil, or Hydrologysignificantly	disturbed? Are "Normal	Circumsta	nces" pre	esent? Yes	X No
Are Vegetation, Soil, or Hydrologynaturally pro	oblematic? (If needed, ε	explain any	answers	in Remarks.)	
SUMMARY OF FINDINGS – Attach site map showing s	sampling point locati	ions, trar	nsects	, important fea	atures, etc.
Hydrophytic Vegetation Present? Yes <u>No X</u>	Is the Sampled Area				
Hydric Soil Present? Yes No X	within a Wetland?	Y	es	<u>No X</u>	
Wetland Hydrology Present? Yes No X					
Remarks:					

VEGETATION – Use scientific names of plants.

	Absolute	Dominant	Indicator	
Tree Stratum (Plot size:)	% Cover	Species?	Status	Dominance Test worksheet:
1. Ulmus rubra	70	Yes	FAC	Number of Dominant Species
2				That Are OBL, FACW, or FAC:(A)
3				Total Number of Dominant
4		<u> </u>		Species Across All Strata: 4 (B)
5				Percent of Dominant Species
	70	=Total Cover		That Are OBL, FACW, or FAC: 50.0% (A/B)
Sapling/Shrub Stratum (Plot size:)			
1. Lonicera tatarica	15	Yes	FACU	Prevalence Index worksheet:
2.		· _		Total % Cover of: Multiply by:
3.		·		OBL species 0 x 1 = 0
4.				FACW species 0 x 2 = 0
5.				FAC species 85 x 3 = 255
	15	=Total Cover		FACU species 30 x 4 = 120
Herb Stratum (Plot size:)				UPL species 0 x 5 = 0
1. Rumex crispus	15	Yes	FAC	Column Totals: 115 (A) 375 (B)
2. Digitaria sanguinalis	10	Yes	FACU	Prevalence Index = B/A = 3.26
3. Hackelia virginiana	5	No	FACU	
4.				Hydrophytic Vegetation Indicators:
5.				1 - Rapid Test for Hydrophytic Vegetation
6.				2 - Dominance Test is >50%
7.				3 - Prevalence Index is ≤3.0 ¹
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.		•		Problematic Hydrophytic Vegetation ¹ (Explain)
	30	=Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size:)				be present, unless disturbed or problematic.
1.				
2.				Hydrophytic Vegetation
		=Total Cover		Present? Yes No X
Remarks: (Include photo numbers here or on a sepa	rate sheet.))		

SOIL

U2

Depth	Matrix		Redo	XT Gutur						
inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture		Ren	narks
0-14	10YR 2/2	100					Loamy/Claye	/		
		·								
		·								
		·								
Гуре: С=	Concentration, D=De	epletion, RM=	-Reduced Matrix, M	IS=Mask	ed Sand	Grains.	² Location:	PL=Pore I	Lining, M=Ma	trix.
ydric So	il Indicators:						Indicato	ors for Pro	blematic Hy	dric Soils ³ :
Histos	sol (A1)		Sandy Gley	ed Matrix	x (S4)		Coa	ist Prairie F	Redox (A16)	
Histic	Epipedon (A2)		Sandy Redo	ox (S5)			Iron	-Manganes	se Masses (F	12)
Black	Histic (A3)		Stripped Ma	atrix (S6)			Rec	Parent Ma	aterial (F21)	
Hydro	gen Sulfide (A4)		Dark Surfac	ce (S7)			Ver	y Shallow [Dark Surface	(TF12)
Stratif	ied Layers (A5)		Loamy Muc	ky Miner	al (F1)		Oth	er (Explain	in Remarks)	
	Muck (A10)		Loamy Gley	yed Matri	ix (F2)					
Deplet	ted Below Dark Surfa	ace (A11)	Depleted M	atrix (F3))					
Thick	Dark Surface (A12)		Redox Dark	Surface	e (F6)			•	phytic vegeta	
	/ Mucky Mineral (S1)		Depleted Da	ark Surfa	ace (F7)		wet	and hydrol	ogy must be	present,
5 cm I	Mucky Peat or Peat ((S3)	Redox Depr	ressions	(F8)		unle	ess disturbe	ed or problem	natic.
Restrictiv	e Layer (if observed	:):								
	•									
Type:	- · ·									
Type: Depth (ir							Hydric Soil	Present?	Yes	NoX
Type: Depth (ir Remarks:	nches):						Hydric Soil	Present?	Yes	<u>No X</u>
Type: Depth (ir Remarks: YDROL	nches):						Hydric Soil	Present?	Yes	<u>No X</u>
Type: Depth (ir Remarks: YDROL	nches): .OGY Iydrology Indicator									
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind	nches): .OGY łydrology Indicator: dicators (minimum o						Seconda	ary Indicato	ors (minimum	
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surfac	OGY Jydrology Indicator dicators (minimum o ce Water (A1)		Water-Stair	ned Leave	• •		<u>Seconda</u>	ary Indicato	ors (minimum racks (B6)	
Type: Depth (ir Remarks: YDROL Yetland H Primary Ind Surfac High V	.OGY Iydrology Indicators dicators (minimum o ce Water (A1) Nater Table (A2)		Water-Stair Aquatic Fat	ned Leav una (B13))		<u>Seconda</u> Sur Dra	ary Indicato face Soil C inage Patte	ors (minimum racks (B6) erns (B10)	of two requir
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surfac High V Satura	OGY Ivdrology Indicators dicators (minimum o ce Water (A1) Nater Table (A2) ation (A3)		Water-Stair Aquatic Fau True Aquati	ned Leav una (B13) ic Plants) (B14)		<u>Seconda</u> Sur Dra Dry	ary Indicato face Soil C inage Patte Season W	ors (minimum racks (B6) erns (B10) ater Table (C	of two requir
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surfac High V Satura Water	.OGY Hydrology Indicators dicators (minimum o ce Water (A1) Water Table (A2) ation (A3) Marks (B1)		Water-Stair Aquatic Fau True Aquati Hydrogen S	ned Leave una (B13) ic Plants Sulfide Oc) (B14) dor (C1)	ing Poots	Seconda Sur Dra Dry Cra	ary Indicato face Soil C inage Patte Season W yfish Burro	ors (minimum racks (B6) orns (B10) l'ater Table (C ws (C8)	of two requir
Type: Depth (ir Remarks: YDROL Yetland H Primary Ind Surfac High V Satura Water Sedim	OGY Jydrology Indicators dicators (minimum o ce Water (A1) Vater Table (A2) ation (A3) Marks (B1) nent Deposits (B2)		Water-Stair Aquatic Fau True Aquati Hydrogen S	ned Leave una (B13) ic Plants Sulfide Oc hizosphe) (B14) dor (C1) res on Liv	-	<u>Seconda</u> Sur Dra Dry (C3) Sat	ary Indicato face Soil C inage Patte Season W yfish Burro uration Visi	o <u>rs (minimum</u> racks (B6) erns (B10) 'ater Table (C ws (C8) ible on Aerial	of two requir :2) Imagery (C9
Type: Depth (ir Remarks: YDROL Yetland H Primary In Surfac High V Satura Water Sedim Drift D	OGY 		Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rł	ned Leave una (B13) ic Plants Sulfide Oc hizospher f Reduce) (B14) dor (C1) res on Liv ed Iron (C	4)	<u>Seconda</u> Sur Dra Dry (C3) Satu Stu	ary Indicato face Soil C inage Patte Season W yfish Burro uration Visi nted or Stro	o <u>rs (minimum</u> racks (B6) erns (B10) l'ater Table (C ws (C8) ible on Aerial essed Plants	of two requir :2) Imagery (C9
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surfac High V Satura Satura Sedim Drift D Algal I	OGY -Jydrology Indicators dicators (minimum o ce Water (A1) Water Table (A2) ation (A3) Marks (B1) nent Deposits (B2) Deposits (B3) Mat or Crust (B4)		Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence o Recent Iron	ned Leave una (B13 ic Plants Sulfide Oc hizospher f Reduce n Reduction) (B14) dor (C1) res on Liv ed Iron (C on in Tille	4)	<u>Seconda</u> Sur Dra Dry (C3) Sat Stu 6) Geo	ary Indicato face Soil C inage Patte Season W yfish Burro uration Visi inted or Stro morphic P	ors (minimum racks (B6) erns (B10) dater Table (C ws (C8) ble on Aerial essed Plants osition (D2)	of two requir :2) Imagery (C9
Type: Depth (ir Remarks: Primary Ind Surfac High V Satura Water Sedim Drift D Algal I Inon D	Anches): OGY Hydrology Indicators dicators (minimum of ce Water (A1) Nater Table (A2) ation (A3) Marks (B1) nent Deposits (B2) Deposits (B3) Mat or Crust (B4) Heposits (B5)	<u>f one is requi</u>	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence o Recent Iron Thin Muck S	ned Leave una (B13) ic Plants Sulfide Oc hizospher f Reduce n Reduction Surface () (B14) dor (C1) res on Liv ed Iron (C on in Tille (C7)	4)	<u>Seconda</u> Sur Dra Dry (C3) Sat Stu 6) Geo	ary Indicato face Soil C inage Patte Season W yfish Burro uration Visi nted or Stro	ors (minimum racks (B6) erns (B10) dater Table (C ws (C8) ble on Aerial essed Plants osition (D2)	of two requir :2) Imagery (C9
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surfac Unimary Ind Surfac Su	.OGY Hydrology Indicators dicators (minimum o ce Water (A1) Water Table (A2) ation (A3) Marks (B1) nent Deposits (B2) Deposits (B3) Mat or Crust (B4) Peposits (B5) ation Visible on Aeria	<u>f one is requi</u> al Imagery (B	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence o Recent Iron Thin Muck S 7) Gauge or W	ned Leave una (B13) ic Plants Sulfide Oc hizospher f Reduce n Reduction Surface (Vell Data) (B14) dor (C1) res on Liv ed Iron (C on in Tille (C7) (D9)	4)	<u>Seconda</u> Sur Dra Dry (C3) Sat Stu 6) Geo	ary Indicato face Soil C inage Patte Season W yfish Burro uration Visi inted or Stro morphic P	ors (minimum racks (B6) erns (B10) dater Table (C ws (C8) ble on Aerial essed Plants osition (D2)	of two requir :2) Imagery (C9
Type: Depth (ir Remarks: YDROL YDROL Vetland H Primary In Surfac High V Satura Satura Sedim Drift D Algal I Iron D Inunda Spars	OGY Jydrology Indicators dicators (minimum o ce Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) Mat or Crust (B4) Deposits (B5) ation Visible on Aeria ely Vegetated Conca	<u>f one is requi</u> al Imagery (B	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence o Recent Iron Thin Muck S 7) Gauge or W	ned Leave una (B13) ic Plants Sulfide Oc hizospher f Reduce n Reduction Surface (Vell Data) (B14) dor (C1) res on Liv ed Iron (C on in Tille (C7) (D9)	4)	<u>Seconda</u> Sur Dra Dry (C3) Sat Stu 6) Geo	ary Indicato face Soil C inage Patte Season W yfish Burro uration Visi inted or Stro morphic P	ors (minimum racks (B6) erns (B10) dater Table (C ws (C8) ble on Aerial essed Plants osition (D2)	of two requir :2) Imagery (C9
Type: Depth (ir Remarks: YDROL YDROL Vetland H Primary In Surfac High V Satura Satura Water Sedim Drift D Algal I Inunda Sparso	OGY 	i <u>f one is requi</u> al Imagery (B [:] ave Surface (I	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rł Presence o Recent Iron Thin Muck S 7) Gauge or W B8 Other (Expl	ned Leave una (B13) ic Plants Sulfide Oc hizospher f Reduce n Reduction Surface (Vell Data lain in Re) (B14) dor (C1) res on Liv ed Iron (C on in Tille (C7) (D9)	4)	<u>Seconda</u> Sur Dra Dry (C3) Sat Stu 6) Geo	ary Indicato face Soil C inage Patte Season W yfish Burro uration Visi inted or Stro morphic P	ors (minimum racks (B6) erns (B10) dater Table (C ws (C8) ble on Aerial essed Plants osition (D2)	of two requir :2) Imagery (C9
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surfac High V Satura Sedim Drift D Algal I Iron D Inunda Sparse Surface W	OGY Inches): Inches): Inches): Inches): Inches): Inches): Inches): Inches): Inches: Inches): Inches: Inches): Inches	al Imagery (B ave Surface (I	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rł Presence o Recent Iron Thin Muck S 7) Gauge or W B8 Other (Expla	ned Leave una (B13) ic Plants Sulfide Oc hizospher f Reduce n Reduction Surface (Vell Data lain in Re) (B14) dor (C1) res on Liv ed Iron (C on in Tille (C7) (D9)	4)	<u>Seconda</u> Sur Dra Dry (C3) Sat Stu 6) Geo	ary Indicato face Soil C inage Patte Season W yfish Burro uration Visi inted or Stro morphic P	ors (minimum racks (B6) erns (B10) dater Table (C ws (C8) ble on Aerial essed Plants osition (D2)	of two requir :2) Imagery (C9
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surfac High V Satura Water Sedim Drift D Algal I Iron D Inunda Sparso Field Obso Surface W Vater Tab	OGY Iydrology Indicators dicators (minimum o ce Water (A1) Water Table (A2) ation (A3) Marks (B1) hent Deposits (B2) Deposits (B3) Mat or Crust (B4) reposits (B5) ation Visible on Aeria ely Vegetated Conca ervations: 'ater Preser Yes ble Present? Yes	al Imagery (B ave Surface (I No	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence o Recent Iron Thin Muck S 7) Gauge or W B8 Other (Expla X Depth (inche	ned Leave una (B13) ic Plants Sulfide Oc hizospher of Reduce of Reduction Surface (Vell Data lain in Re es): es):) (B14) dor (C1) res on Liv ed Iron (C on in Tille (C7) (D9)	4) ed Soils (C	Seconds	ary Indicato face Soil C Season W yfish Burro uration Visi nted or Stro omorphic P C-Neutral T	ors (minimum racks (B6) erns (B10) ater Table (C ws (C8) able on Aerial essed Plants osition (D2) est (D5)	of two requir 2) Imagery (C9 (D1)
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surfac High V Satura Water Sedim Drift D Algal I Iron D Inunda Sparse Surface W Vater Tab Saturation	OGY lydrology Indicators dicators (minimum o ce Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) Mat or Crust (B4) leposits (B5) ation Visible on Aeria ely Vegetated Conca ervations: 'ater Preser Yes ble Present? Yes Present? Yes	al Imagery (B ave Surface (I No	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized Rł Presence o Recent Iron Thin Muck S 7) Gauge or W B8 Other (Expla	ned Leave una (B13) ic Plants Sulfide Oc hizospher of Reduce of Reduction Surface (Vell Data lain in Re es): es):) (B14) dor (C1) res on Liv ed Iron (C on in Tille (C7) (D9)	4) ed Soils (C	<u>Seconda</u> Sur Dra Dry (C3) Sat Stu 6) Geo	ary Indicato face Soil C Season W yfish Burro uration Visi nted or Stro omorphic P C-Neutral T	ors (minimum racks (B6) erns (B10) dater Table (C ws (C8) ble on Aerial essed Plants osition (D2)	of two requir :2) Imagery (C9 (D1)
Type: Depth (ir Remarks: YDROL Vetland H Primary Ind Surface High V Satura Water Sedim Drift D Algal I Iron D Inunda Sparse Surface W Vater Tab Saturation includes c	OGY lydrology Indicators dicators (minimum o ce Water (A1) Water Table (A2) ation (A3) Marks (B1) hent Deposits (B2) Deposits (B3) Mat or Crust (B4) reposits (B5) ation Visible on Aeria ely Vegetated Conca ervations: 'ater Preser Yes ble Present? Yes	al Imagery (B ave Surface (I No No No	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized RH Presence or Recent Iron Thin Muck S 7) Gauge or W B8 Other (Expland) X Depth (inche X Depth (inche X Depth (inche	ned Leave una (B13) ic Plants Sulfide Oc hizospher of Reduce of Re) (B14) dor (C1) res on Lived Iron (C on in Tille (C7) (D9) emarks)	4) ed Soils (C	Seconda	ary Indicato face Soil C Season W yfish Burro uration Visi nted or Stro omorphic P C-Neutral T	ors (minimum racks (B6) erns (B10) ater Table (C ws (C8) able on Aerial essed Plants osition (D2) est (D5)	of two requir 2) Imagery (C9 (D1)
Type: Depth (ir Remarks: Primary Ind Surface High V Satura Water Sedim Drift D Algal I Inunda Sparse Field Obse Surface W Water Tab Saturation includes c	OGY Jydrology Indicators dicators (minimum o be Water (A1) Water Table (A2) ation (A3) Marks (B1) ment Deposits (B2) Deposits (B3) Mat or Crust (B4) reposits (B5) ation Visible on Aeria ely Vegetated Conca ervations: dater Preser Yes present? Yes present? Yes capillary fringe)	al Imagery (B ave Surface (I No No No	Water-Stair Aquatic Fau True Aquati Hydrogen S Oxidized RH Presence or Recent Iron Thin Muck S 7) Gauge or W B8 Other (Expland) X Depth (inche X Depth (inche X Depth (inche	ned Leave una (B13) ic Plants Sulfide Oc hizospher of Reduce of Re) (B14) dor (C1) res on Lived Iron (C on in Tille (C7) (D9) emarks)	4) ed Soils (C	Seconda	ary Indicato face Soil C Season W yfish Burro uration Visi nted or Stro omorphic P C-Neutral T	ors (minimum racks (B6) erns (B10) ater Table (C ws (C8) able on Aerial essed Plants osition (D2) est (D5)	of two requir 2) Imagery (C9 (D1)

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: White Fox Road Reconstruction	City/County: Webster City	/		Sampling Date:	3-25-2021	
Applicant/Owner: City of Webster City			State:	IA	Sampling Point:	U3
Investigator(s): Kelcie Kraft	S	Section, Township, Range	e: Sec 33, T	89N, 25V	1	
Landform (hillside, terrace, etc.): Bottom of road e	mbankment	Local relief (co	ncave, conve	x, none):	Flat	
Slope (%): 0 to 2 Lat: 42.475976		Long: -93.813169			Datum: NAD83	
Soil Map Unit Name Hanlon fine sandy loam			NN	/I classific	cation: None	
Are climatic / hydrologic conditions on the site typic	al for this time of yea	ar? Yes <u>X</u> No	(If no	explain i	n Remarks.)	
Are Vegetation, Soil, or Hydrology	significantly	disturbed? Are "Norm	al Circumsta	nces" pre	sent? Yes	X No
Are Vegetation, Soil, or Hydrology	naturally pro	blematic? (If needed	, explain any	answers	in Remarks.)	
SUMMARY OF FINDINGS – Attach site	map showing s	ampling point loca	itions, trai	nsects,	important fea	atures, etc.
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes Wetland Hydrology Present? Yes		Is the Sampled Area within a Wetland?		es	No <u>X</u>	
Remarks:						
VEGETATION – Use scientific names of	plants.					
Tree Stratum (Plot size:)		minant Indicator ecies? Status	Dominance	Test wo	rksheet:	
1. Ulmus rubra	90	Yes FAC	Number of D	Dominant	Species	

1. Ulmus rubra	90	Yes	FAC	Number of Dominant Species
2. Platanus occidentalis	10	No	FACW	That Are OBL, FACW, or FAC: 2 (A)
3				Total Number of Dominant
4				Species Across All Strata: 4 (B)
5				Percent of Dominant Species
	100	=Total Cover		That Are OBL, FACW, or FAC: 50.0% (A/B)
Sapling/Shrub Stratum (Plot size:)			
1. Lonicera tatarica	15	Yes	FACU	Prevalence Index worksheet:
2				Total % Cover of: Multiply by:
3.				OBL species 0 x 1 = 0
4				FACW species 10 x 2 = 20
5.				FAC species 110 x 3 = 330
	15	=Total Cover		FACU species 35 x 4 = 140
Herb Stratum (Plot size:)		_		UPL species 0 x 5 = 0
1. Rumex crispus	15	Yes	FAC	Column Totals: 155 (A) 490 (B)
2. Digitaria sanguinalis	10	Yes	FACU	Prevalence Index = B/A = 3.16
3. Smilax tamnoides	5	No	FAC	
4. Hackelia virginiana	5	No	FACU	Hydrophytic Vegetation Indicators:
5. Rosa multiflora	5	No	FACU	1 - Rapid Test for Hydrophytic Vegetation
6.				2 - Dominance Test is >50%
7.				3 - Prevalence Index is ≤3.0 ¹
8.				4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.				Problematic Hydrophytic Vegetation ¹ (Explain)
	40	=Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size:)		_		be present, unless disturbed or problematic.
1.				Hydrophytic
2.				Vegetation
		=Total Cover		Present? Yes No X
Remarks: (Include photo numbers here or on a sepa	rate sheet	.)		

SOIL

Sampling Point:

U3

Profile De Depth	scription: (Describ Matrix	e to the dep		ıment tl x Featur		or or con	firm the absence of in	ndicators.)
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-6	10YR 2/2	100	•••••		<u> </u>		Loamy/Clayey	
6-20	10YR 4/3	100					Loamy/Clayey	
0-20	1011(4/5	100					Loanty/Clayey	
¹ Type: C=	Concentration, D=D	epletion, RM	=Reduced Matrix, M	IS=Masł	ked Sand	Grains.	² Location: PL=P	ore Lining, M=Matrix.
Hydric So	il Indicators:							Problematic Hydric Soils ³ :
Histos	ol (A1)		Sandy Gley		x (S4)			irie Redox (A16)
	Epipedon (A2)		Sandy Red	• •				anese Masses (F12)
	Histic (A3)		Stripped Ma	•)			nt Material (F21)
	gen Sulfide (A4)		Dark Surfac	· · /				ow Dark Surface (TF12)
	ied Layers (A5)		Loamy Muc	-			Other (Exp	blain in Remarks)
	Muck (A10)	/	Loamy Gley		• •			
	ted Below Dark Surfa	ace (A11)	Depleted M	•	,		3	and any local second second second
	Dark Surface (A12)		Redox Dark		. ,			ydrophytic vegetation and
	Mucky Mineral (S1)		Depleted D		• •		-	/drology must be present,
	Mucky Peat or Peat		Redox Dep	ressions	(F8)		uniess dis	turbed or problematic.
_	e Layer (if observed	d):						
Type:								
Depth (ir	ncnes):						Hydric Soil Preser	nt? Yes <u>No X</u>
Remarks:								
HYDROL	OGY							
	lydrology Indicator	¢.						
	dicators (minimum o		ired: check all that a	apply)			Secondary Ind	icators (minimum of two required)
	e Water (A1)		Water-Stair		ves (B9)			oil Cracks (B6)
	Vater Table (A2)		Aquatic Fau		· · /			Patterns (B10)
	ation (A3)		True Aquat					on Water Table (C2)
Water	Marks (B1)		Hydrogen S		. ,			urrows (C8)
Sedim	ent Deposits (B2)		Oxidized RI	nizosphe	eres on Liv	ing Roots	(C3) Saturation	Visible on Aerial Imagery (C9)
Drift D	eposits (B3)		Presence o	f Reduce	ed Iron (C	4)	Stunted or	Stressed Plants (D1)
Algal I	Mat or Crust (B4)		Recent Iron	Reduct	ion in Tille	d Soils (C	Geomorph	ic Position (D2)
Iron D	eposits (B5)		Thin Muck	Surface	(C7)		FAC-Neut	ral Test (D5)
	ation Visible on Aeria			/ell Data	ı (D9)			
Spars	ely Vegetated Conca	ave Surface	B8 Other (Expl	ain in Re	emarks)			
Field Obs	ervations:							
Surface W	ater Preser Yes		X Depth (inche	es):				
	le Present? Yes		X Depth (inche					
Saturation	Present? Yes	No	X Depth (inche	es):		Wetland	d Hydrology Present?	Yes NoX
	apillary fringe)							
Describe F	Recorded Data (strea	am gauge, m	onitoring well, aerial	photos,	previous	inspectior	ns), if available:	
D. i								
Remarks:								
l								

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: White Fox Road Reconstruction	City/County: Webster City			Sampling Date:	3-25-2021
Applicant/Owner: City of Webster City		State:	IA	Sampling Point:	W1
Investigator(s): Kelcie Kraft	Section, Township, Range:	Sec 33, T8	39N, 25\	N	
Landform (hillside, terrace, etc.): Hilltoe	Local relief (cond	ave, conve	x, none)	: Concave	
Slope (%): 25 to 50 Lat: 42.476394	Long: <u>-93.813173</u>			Datum: NAD83	
Soil Map Unit Name: Storden-Hayden loams		NW	l classif	ication: None	
Are climatic / hydrologic conditions on the site typical for this	s time of year? Yes X No	(If no,	explain	in Remarks.)	
Are Vegetation, Soil, or Hydrologys	significantly disturbed? Are "Normal	Circumstar	nces" pre	esent? Yes	X No
Are Vegetation, Soil, or Hydrologyr	naturally problematic? (If needed, e	explain any	answers	in Remarks.)	
SUMMARY OF FINDINGS – Attach site map s	howing sampling point locati	ons, trar	sects	, important fea	atures, etc.

Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes Yes Yes	X X X	No No No	Is the Sampled Area within a Wetland?	Yes_X_ No
Remarks:	165		NO		

VEGETATION – Use scientific names of plants.

	Absolute	Dominant	Indicator	
Tree Stratum (Plot size:)	% Cover	Species?	Status	Dominance Test worksheet:
1. Populus deltoides	20	Yes	FAC	Number of Dominant Species
2. Celtis occidentalis	20	Yes	FAC	That Are OBL, FACW, or FAC: (A)
3. Ulmus rubra	20	Yes	FAC	Total Number of Dominant
4.				Species Across All Strata: 6 (B)
5.				Percent of Dominant Species
	60	=Total Cover		That Are OBL, FACW, or FAC: 66.7% (A/B)
Sapling/Shrub Stratum (Plot size:)			
1. Lonicera tatarica	10	Yes	FACU	Prevalence Index worksheet:
2.				Total % Cover of: Multiply by:
3.		·		OBL species 0 x 1 = 0
4.		·		FACW species 10 x 2 = 20
5.				FAC species 60 x 3 = 180
	10	=Total Cover		FACU species 15 x 4 = 60
Herb Stratum (Plot size:)				UPL species 0 x 5 = 0
1. Rumex stenophyllus	10	Yes	FACW	Column Totals: 85 (A) 260 (B)
2. Hackelia virginiana	5	Yes	FACU	Prevalence Index = $B/A = 3.06$
3.				
4.		·		Hydrophytic Vegetation Indicators:
5.		·		1 - Rapid Test for Hydrophytic Vegetation
6.		·		X 2 - Dominance Test is >50%
7		·		3 - Prevalence Index is ≤3.0 ¹
8.		·		4 - Morphological Adaptations ¹ (Provide supporting
9.				data in Remarks or on a separate sheet)
10.		·		Problematic Hydrophytic Vegetation ¹ (Explain)
	15	=Total Cover		¹ Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size:)				be present, unless disturbed or problematic.
· · · · · · · · · · · · · · · · · · ·				
2		·		Hydrophytic Verentitien
2.		=Total Cover		Vegetation Present? Yes X No
Bomarka: (Include photo numbero horo er en e cono	rata abaat)	-		
Remarks: (Include photo numbers here or on a sepa	rate sneet.)		

W1

Profile Description: (De Depth Ma	atrix			x Feature	es			
inches) Color (moi	st)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-4 10YR 2/1	1	100					Loamy/Clayey	
4-16 10YR 4/2	2	85	7.5YR 4/4	15	С	PL/M	Loamy/Clayey	Distinct redox concentrations
Type: C=Concentration, 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 Thick Dark Surface (Sandy Mucky Minera 5 cm Mucky Peat or Restrictive Layer (if obs	4)) A12) Il (S1) Peat (S3	e (A11)	Reduced Matrix, M Sandy Gley Sandy Red Stripped Ma Dark Surfac Loamy Muc Loamy Gley X Depleted M Redox Dark Depleted Dark X Redox Depl	red Matrix ox (S5) atrix (S6) ce (S7) cky Miner yed Matri atrix (F3) a Surface ark Surface	x (S4) al (F1) x (F2) (F6) ice (F7)	Grains.	Indicators f ? Coast F Iron-Ma Red Pa Very Sh Other (F ³ Indicators c wetland	Prore Lining, M=Matrix. For Problematic Hydric Soils ³ : Prairie Redox (A16) nganese Masses (F12) rent Material (F21) hallow Dark Surface (TF12) Explain in Remarks) of hydrophytic vegetation and hydrology must be present, disturbed or problematic.
Type: Depth (inches): Remarks:			_				Hydric Soil Pres	sent? Yes <u>X</u> No
			_				Hydric Soil Pres	sent? Yes <u>X</u> No
Depth (inches): Remarks: IYDROLOGY Wetland Hydrology Indi								
Depth (inches): Remarks: IYDROLOGY Wetland Hydrology Indi Primary Indicators (minim		<u>1e is requir</u>			(20)		<u>Secondary I</u>	ndicators (minimum of two required)
Depth (inches): Remarks: IYDROLOGY Wetland Hydrology Indi Primary Indicators (minim Surface Water (A1)	num of or	<u>ne is requir</u>	Water-Stair	ned Leav	· · /		<u>Secondary I</u> Surface	ndicators (minimum of two required) Soil Cracks (B6)
Depth (inches): Remarks: IYDROLOGY Netland Hydrology Indi Primary Indicators (minim Surface Water (A1) X High Water Table (A	num of or	<u>ne is requir</u>	Water-Stair Aquatic Fau	ned Leav una (B13)		<u>Secondary I</u> Surface Drainag	<u>ndicators (minimum of two required)</u> Soil Cracks (B6) e Patterns (B10)
Depth (inches): Remarks: PYDROLOGY Wetland Hydrology Indi Primary Indicators (minim Surface Water (A1) X High Water Table (A X Saturation (A3)	num of or	<u>ne is requir</u>	Water-Stair Aquatic Fau True Aquati	ned Leav una (B13 ic Plants) (B14)		<u>Secondary I</u> Surface Drainag Dry-Sea	ndicators (minimum of two required) Soil Cracks (B6) le Patterns (B10) ason Water Table (C2)
Depth (inches): Remarks: IYDROLOGY Vetland Hydrology Indi Primary Indicators (minim Surface Water (A1) X High Water Table (A1) X Saturation (A3) Water Marks (B1)	<u>num of or</u> 2)	<u>ne is requir</u>	Water-Stair Aquatic Fau True Aquati Hydrogen S	ned Leav una (B13 ic Plants Sulfide Oc) (B14) dor (C1)		Secondary I Surface Drainag Try-Sea	ndicators (minimum of two required) Soil Cracks (B6) le Patterns (B10) ason Water Table (C2) n Burrows (C8)
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