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MEMORANDUM

TO: Mr. Leonard Linton, City Engineer, City of Ramsey

FROM: Rebecca Beduhn, SEH Biologist

DATE: October 7, 2021

RE: COR Wetland Monitoring
SEH No. RAMSY 158452 14.00

Background and Purpose
In 2005-2006, the City of Ramsey completed the construction of two wetland mitigation sites associated with the Center of Ramsey (COR) (previously Ramsey Town Center) development. These mitigation sites were permitted by the Lower Rum River Watershed Management Organization (LRRWMO) under permits 2003-07 and 2012-08. A third mitigation site, identified as "SW Pond" on the construction plans and "WNW" in the monitoring reports, was originally proposed but was not completed. Wetland credits were used in lieu of the third mitigation site. Monitoring reports were submitted or the two wetland mitigation sites in 2011 and 2012. Based on a letter submitted to the City of Ramsey from the LRRWMO on July 6, 2020, no subsequent monitoring reports have been completed.

This memorandum provides a wetland delineation to determine the quantity and quality of the wetland mitigation created at the COR and determine if the sites are in compliance with the approved permit and wetland replacement plan.

It is understood that the project impacted a total of 176,418 ft^2(4.05 acres) of wetland. Application of a 2:1 replacement ratio result in a need to provide for 352,836 ft^2 or 8.10 acres of mitigation. A portion of the mitigation was completed through the purchase of wetland credits, which provided for 105,602 ft^2 (2.42 acres). Partial mitigation was also provided through construction of 97,600 ft^2 (2.24 acres) of stormwater ponds within the COR site, which have been previously approved. **A remainder of 149,634 ft^2 (3.44 acres) of wetland mitigation is still required through on-site replacement.** This remaining mitigation need was proposed through the construction of new wetlands with associated storm water and upland buffer components in two locations, identified as the Charter and Northwest sites.

A summary of the wetland impacts and proposed mitigation needs are provided in **Table 1**.

Table 1: Summary of Wetland Impacts and Mitigation Requirements

Impact Summary	Square Feet	Acres
Wetland Impacts	176,418	4.05
Wetland Replacement Ratio	2:01	
Wetland Mitigation Required	352,836	8.10
Completed Mitigation		
Purchase Wetland Credits	105,602	2.42
Storm Water Ponds	97,600	2.24
Remaining Project-Specific Needs	**149,634**	**3.44**

Under the rules in place at the time of permitting (pre-2015 WCA revisions), wetland mitigation included two basic components: New Wetland Credit (NWC) for the creation or restoration of wetland and a companion Public Value Credit (PVC) component which considered areas of storm water pond treatment and upland buffer. These components were measured by square feet, with 100% of the area determining the crediting for features. Both mitigation sites have proposed a combination of NWC and PVC.

Performance standards under previous iterations of the WCA were less specific than current standards. While some sites could have an agreed upon site-specific standard, most mitigation sites were expected to be dominated by native vegetation and have a minimum number of native species present. Based on the 2011-2012 monitoring reports, the sites did not meet performance standards, and extensive work was completed to improve vegetation quality from what had developed since 2006 without any maintenance. This restoration work included herbicide applications to remove all vegetation, followed by reseeding and planting of plugs. In essence, the vegetation of the site was reset with these activities.

Wetland Mitigation Goals

The goal of the project is to create 70,816 ft^2 of wetland (NWC), and 78,818 ft^2 of Public Value Credit (PVC) through the creation of two wetland mitigation sites: Charter School Wetland and Northwest Wetland (**Figure 1**). A summary of the wetland mitigation area goals based on the requirements identified in the 2011 and 2012 monitoring reports is provided in **Table 2**.

Table 2: Summary of Wetland Mitigation Goals

Feature and Location	Credit Type	Proposed (square feet)
Charter Site		
New Wetland	NWC	24,816
Stormwater Pond and Buffer	PVC	32,818
Subtotal		57,634
Northwest Site		
New Wetland	NWC	46,000
Stormwater Pond and Buffer	PVC	46,000
Subtotal		92,000
	Total	**149,634**

The 2011/2012 wetland monitoring reports discuss that the two sites appeared to generally follow the approved construction plans, but additional wetland habitat was present beyond what was anticipated. This may be from minor deviation from construction or a result of more than expected hydrology following construction. It was noted in the monitoring report that more wetland was present than proposed, but appeared to result from natural expansion of the wetland area and not from over-excavation by contractors.

The 2011/2012 wetland monitoring reports also provided better precision on the proposed areas of wetland and associated features. These appear to be based on GIS-derived as-builts of the two areas, and an estimate of what is anticipated based on the conditions present at the time. This includes an estimate of wetland communities and more details on the areas of the pond and surrounding upland buffer.

The as-built analysis indicates that the Charter Wetland is essentially constructed as proposed, while the Northwest Wetland appears to have been graded to create more wetland than initially proposed. The total area planned is unchanged (149,634 ft^2), however the total actual area present (152,634 ft^2) is larger by

3,000 ft^2. This appears to be related to a larger area of the Northwest wetland mitigation site, based on the mapping included in the monitoring report that indicates the actual size of the site is larger than what was included in the mitigation plan. A summary of the 2005 planned areas is provided in **Table 3**.

Table 3: Planned Wetland, Stormwater Treatment, and Upland Buffer Areas

Charter Site	
	Planned Area (ft^2)
New Wetland (Shallow Marsh)	7,592
New Wetland (Wet Meadow)	17,224
Stormwater Pond	4,860
Upland Buffer	27,958
Subtotal	57,634
Northwest Site	
New Wetland (Shallow Marsh)	26,181
New Wetland (Wet Meadow)	19,819
Stormwater Pond	19,476
Upland Buffer	26,524
Subtotal	92,000
Total	**149,634**

Vegetation standards are not specifically identified in the background material provided for this review; however, the 2011/2012 monitoring reports includes "Expected Values" for hydrology and vegetation in their evaluation. For the purposes of this analysis, hydrology measurements were not completed, relying instead on the criteria used to meet the criteria used in the wetland delineation. Assumed vegetation standards, which can be evaluated, have been summarized in **Table 4**.

Table 4: Summary of Performance Standards

Performance Standard	Expected Goal
Wet Meadow No. of Native Species	12
Wet Meadow Percent Native Cover	90%
Shallow Marsh No. of Native Species	8
Shallow Marsh Percent Native Cover	75%
Percent FAC or Wetter	75%
Upland Buffer No. of Native Species	15%
Upland Buffer Percent Native Cover	90%

Wetland Delineation

In order to determine the amount of wetland present, a wetland delineation was completed. The study area was examined on May 21, 2021 for areas meeting the technical wetland criteria per the U.S. Army Corps of Engineers *Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (USACE 2010). The delineation procedures in the Corps *Manual* (*i.e.*, the Routine Onsite Determination Method), in combination with wetland indicators and guidance provided in the *Regional Supplement*, were applied for this delineation. Where differences in the two documents occur, the *Regional Supplement* takes precedence over the Corps *Manual*.

Field notes, samples, and photographs were taken at representative locations in each wetland basin, with data transect locations following spacing guidelines in the *Regional Supplement.* The respective wetland and upland plots for each wetland were documented on Wetland Determination Data Forms (**Appendix A**). Relevant photographs of the site and representative sample locations are included in **Appendix B**; all other photographs will be retained on file at SEH.

Wetland plant species nomenclature follows the *National Wetland Plant List* (USACE 2016). Identification was aided with field guides for the region. Vegetation was sampled in nested circular plots: 5-ft radius for herbaceous species, 15-ft radius for shrubs, and 30-ft radius for trees and vines.

Soils were observed for hydric soil characteristics. Soils were examined in cores taken with a Dutch auger. Soil profiles were observed at a depth necessary to confirm hydric soil characteristics. Typical soil profile depths are typically within 18-24 inches below ground surface to allow for: (1) observation of an adequate portion of the soil profile to determine presence/absence of hydric soil characteristics; (2) observation of hydrology including depth to the water table and saturated soils; and, (3) identification of disturbances (*e.g.*, buried horizon, plow line, etc.). Soil color determinations were made using Munsell Soil Color Charts (Gretag-Macbeth 1994). Site soil characteristics were compared to those mapped and described in the Soil Survey for Anoka County (USDA 2021). Hydric soil characteristics were compared to those identified in the *Northcentral and Northeastern Regional Supplement* (USACE 2012) and the most recent version of the NRCS publication *Field Indicators of Hydric Soils in the United States, Version 8.1* (USDA 2017).

Primary and secondary indicators of hydrology were identified in the field to determine the presence or absence of wetland hydrology, as described in the *Northcentral and Northeastern Regional Supplement* (USACE 2012) and are listed in each wetland description. Subsurface wetland hydrology indicators were examined using the soil cores and/or soil pits as deep as 24 inches.

Wetland classification follows the methods described in *Wetlands and Deepwater Habitats of the United States* (Cowardin, et al. 1979) that is used by the USFWS NWI. The Circular 39 classification (Shaw and Fredine 1956) is also provided. Wetland classification is also provided following *Wetland Plants and Plant Communities of Minnesota & Wisconsin* (Eggers and Reed 2014), which is used for classifying wetlands for permitting-related activities under the Minnesota Wetland Conservation Act (WCA) and the USACE *Final St. Paul District Policy for Wetland Compensatory Mitigation in Minnesota* (USACE 2009).

Wetland boundaries were located and marked with pin flags with “WETLAND BOUNDARY” to allow for field review. The locations of the delineated wetland boundaries were collected with a sub-meter accuracy Global Positioning System (GPS) unit and mapped. The results of the delineation are shown on **Figures 3 and 4**. The sample points noted identify where data was collected.

Wetland Delineation Results – Charter Wetland

The Charter mitigation wetland is comprised of a large central wetland, with three storm water treatment areas, and a perimeter of upland buffer. A pedestrian bridge crosses the site, and a constructed platform is present on the northeast side to allow people to overlook the site.

The wetland is dominated by hybrid cattail (*Typha glauca*), which is present throughout the basin. The three (3) storm water treatment areas are also dominated by hybrid cattail. The perimeter of the wetland has some transition to wet meadow as hydrology is drier here than the center of the basin, but it was mapped as Shallow Marsh with an eastern area of deep marsh where water depths are sufficient to prevent emergent vegetation from being established. While the majority (>90%) of the wetland area is

dominated by hybrid cattail, other native species are present including several sedges. Reed canary grass (*Phalaris arundinacea*) is low density. Most of the vegetation diversity is located along the edges, as are several red osier dogwood shrubs that may have been planted as part of landscaping. Given the distribution and presence primarily as small areas of individual plants, this appears to be remnants of what was a more diverse site prior to cattail-dominance. A previous reference to a large area of sedge meadow that was present in 2011 could not be located and is presumed no longer present within the limits.

Upland buffer is present around the entire perimeter. The buffer width varies but is approximately 10 feet on average. The site is located within a greenway corridor, so there is maintained turf outside of the unmanaged vegetation. For the purposes of this evaluation, the extent of the upland buffer did not include any areas of turf. The upland buffer is diverse, and has a large percentage of native species, including several grasses and forbs. Like the wetland, the composition and distribution of native species indicates much of it is a remnant of previous plantings. Several invasives have become established but are also widely dispersed. **Table 5** is a summary of the vegetation observed in the wetland and upland buffer portions of the Charter mitigation site.

Table 5: Charter Mitigation Site Vegetation Summary

Wetland Plant Inventory	
Scientific Name	**Common Name**
Acorus calamus	Sweetflag
Carex lacustris	Lake sedge
Carex stricta	tussock sedge
Cornus sericea	Red osier dogwood
Eleocharus obtusa	blunt spikerush
Helenium autumnale	Sneezeweed
Onoclea sensibilis	Sensitive fern
Phalaris arundinacea	Reed canary grass
Scirpus cyperinus	Woolgrass
Typha glauca	Hybrid cattail

Upland Buffer Plant Inventory	
Scientific Name	**Common Name**
Andropogon gerardii	Big bluestem
Astragalus canadensis	Canada milk vetch
Berteroa incana	Hoary alyssum
Bouteloua curtipendula	Sideoats grama
Elymus canadensis	Canada wild rye
Helianthus giganteus	Giant sunflower
Linaria vulgaris	Butter and Eggs
Monarda fistulosa	Wild bergamot
Panicum virgatum	Switchgrass
Potentilla norvegica	Norwegian cinquefoil
Schizachyrium scoparium	Little bluestem
Solidago canadensis	Canada goldenrod
Sonchus arvense	Sow thistle
Sorghastrum nutans	Indian grass
Symphyotrichum oolentangiense	Sky blue aster
Thlapsi arvense	Field pennycress
Urtica dioca	Stinging nettle
Verbascum thapsus	Common mullein

Soils within the wetland were dominated by black and dark brown coarse sand, which is likely the soil present from construction. Hydrology was present as inundation for most of the basin, and saturation near the perimeter. Inlet and outlet structures are present to assist with moderating hydrology within the site.

Wetland Delineation Results – Northwest Wetland

The northwest mitigation site is comprised of a large wetland on the north side with a single stormwater treatment basin located on the south side of the site. Upland buffer is present around the perimeter of the wetland. A berm separates the storm water pond from the wetland and is considered part of the upland buffer component. The wetland is dominated by hybrid cattail (*Typha glauca*), which is present throughout the wetland. The exception being a larger area of deep marsh in the center of the basin which lacks vegetation. Along the perimeter there is minimal transition to upland, and the wetland is present essentially at the toe of the slope. While not dominant overall, small pockets of sedges are present, which are likely remnants from the 2011 restoration efforts. A few small black willow (*Salix nigra*) trees have also become established within the margins of the wetland. The stormwater pond components of the site are almost entirely composed of hybrid cattail and open water.

Upland buffer lies around the perimeter of the site. While reed canary grass is present at the base of the upland buffer the mixture of vegetation is more diverse than expected. Areas of spotted knapweed (*Centaurea stoebe*) and smooth brome (*Bromus inermis*) are present, but smaller density native species such as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), and sideoats grama (*Bouteloua curtipendula*) are also present. Overall, the upland buffer is diverse, but is not dominated by native species. Like the wetlands, native upland vegetation includes some remnants of the 2011 reseeding. The berm between the wetland and storm water treatment area is entirely reed canary grass, and much of it may be wetland, or at least wet enough to discourage upland species from being present. **Table 6** is a summary of the vegetation observed in the wetland and upland buffer portions of the Northwest mitigation site.

Table 6: Northwest Mitigation Site Vegetation Summary

Wetland Plant Inventory	
Scientific Name	**Common Name**
Acorus calamus	Sweetflag
Asclepias incarnata	Swamp milkweed
Carex stricta	Tussock sedge
Hydrophyllum virginianum	Shawnee-salad
Onoclea sensibilis	Sensitive fern
Phalaris arundinacea	Reed canary grass
Phragmites australis	Giant reed grass
Poa palustris	Fowl bluegrass
Rumex crispus	Curly dock
Salix nigra	Black willow
Scirpus cyperinus	Woolgrass
Typha glauca	Hybrid cattail
Urtica dioca	Stinging nettle

Upland Buffer Plant Inventory	
Scientific Name	**Common Name**
Andropogon gerardii	Big bluestem
Asclepias syriaca	Common milkweed
Berteroa incana	Hoary alyssum
Bouteloua curtipendula	Sideoats grama
Bromus inermis	Smooth brome grass
Centaurea stoebe	Spotted knapweed
Monarda fistulosa	Wild bergamot
Oenothera biennis	Evening primrose
Panicum virgatum	Switchgrass
Pycnanthemum virginianum	Mountain mint
Salix nigra	Black willow
Schizachyrium scoparium	Little bluestem
Solidago canadensis	Canada goldenrod
Solidago rigida	Stiff goldenrod
Ulmus pumila	Siberian elm
Verbascum thapsus	Common mullein

Soils within the wetland were dominated by black and dark brown coarse sand, which is likely the soil present from construction. Hydrology was present as inundation for most of the basin, and saturation near the perimeter. Hydrology was present as inundation for most of the basin, and saturation near the perimeter. Inlet and outlet structures are present to assist with moderating hydrology within the site.

Wetland Delineation Results – Wetland Area and Credits

The wetland delineation was used to determine the amount and types of wetland present at each of the wetland mitigation site locations. During the wetland delineation, the location and extent of storm water features was also verified, although the mapping was completed using GIS resources and previous as-built maps of the areas. The extent of upland buffer was mapped using the extent of unmanaged vegetation in place currently. Areas within the parcel that are not functional buffer was not included.

The area available for consideration as the mitigation site was verified to be within the drainage and utility easement identified within the recorded plat. A summary of the results in provided in **Table 7**. This includes areal estimates provided in the 2011 and 2012 monitoring reports, to show the progression from what was originally planned to the conditions ten years ago, to current conditions.

Table 7: Summary of NWC and PVC Credits Proposed and Created

Feature	Area (Square Feet)		
	Proposed	2011/2012	Current (2021)
Charter Site			
New Wetland (Shallow Marsh)	26,181	17,973	40,154
New Wetland (Wet Meadow)	19,819	29,514	0
New Wetland (Deep Marsh)	0	0	9,862
Stormwater Treatment Area	19,476	7,933	19,366
Upland Buffer	26,524	37,997	43,952
Subtotal	92,000	93,417	113,334
Northwest Site			
New Wetland (Shallow Marsh)	7,592	7,640	17,688
New Wetland (Wet Meadow)	17,224	17,717	0
New Wetland (Deep Marsh)	0	0	7,086
Stormwater Treatment Area	4,860	4,659	5,980
Upland Buffer	27,958	29,201	15,825
Subtotal	57,634	59,217	46,579
Total	**149,634**	**152,634**	**159,913**

Although a total area of 149,634 ft^2 (3.44 acres) was proposed, a larger area of 159,913 ft^2 (3.67 acres) is present. Specific to the area of wetland, a total of 70,816 ft^2 (1.63 acres) was proposed, but a total of 74,790 ft^2 (1.72 acres) is present currently. This additional area of wetland was identified in 2011 and appears to be related to a larger area of wetland that was graded. This has increased further, which may be related to the site maturing or following a prolonged period of above average annual precipitation (2014-2019, according to the MN Climatology Working Group). The wetland is currently located at the toe of the slope and is not likely to expand beyond the current footprint. The increase in the total footprint is

likely related to an adjustment of the constructed area, but is within he platted area and is assumed to be the correct quantity to consider based on site conditions for the previous ten years.

The wetland communities present are also different from what was proposed. The proposed wetland was anticipated to be comprised of wet meadow and shallow marsh. The current wetland is comprised of shallow marsh with smaller areas of deep marsh. The wet meadow component is generally not present, although small fringe areas do contain typical wet meadow species. This adjustment in wetland communities' correlates to the increase in wetland area, as both are a result if an increase in wetland hydrology.

The areas of proposed storm water treatment are similar to what was proposed, however the treatment area in the Northwest wetland is larger. This appears to be from additional hydrology present, and an expansion of the treatment area into the sidelopes.

The proposed upland buffers also differ a little in area from what was proposed. At the Charter site, there is additional buffer present, which was initially identified in 2011. It is unclear if this was a deliberate adjustment, but it was identified as an increased area in 2011, and it may have expanded slightly as the area was not mowed and perhaps expanded naturally. Conversely, at the Northwest site, the area of upland buffer is less than what was proposed, although the decrease appears to be related to an increase in the area of wetland and stormwater treatment. Overall, the total area of the Northwest site has decreased, based off the current property boundaries and limits of the current drainage and utility easements present on these parcels.

On the basis of the quantity of credits generated, the objective of creating 149,634 square feet of wetland, stormwater treatment and upland buffer has been achieved.

Vegetation Quality and Performance Standards
An assessment of vegetation performance standards was completed to see if the sites meet the presumed success criteria identified in the 2011 monitoring report (**Table 7**). Wet Meadow criteria were determined to be not applicable, as that community is not present. No performance standards for deep marsh were identified as this was not an expected community, although the presence of only hybrid cattail would presumably not meet the anticipated standards.

Table 7: Summary of Expected and Observed Vegetation Performance Standards – Charter Site

Performance Standard	Expected	Observed (Charter)	Observed (Northwest)	Standard Met?
Wet Meadow No. of Native Species	12	N/A	N/A	N/A
Wet Meadow Percent Native Cover	90%	N/A	N/A	N/A
Shallow Marsh No. of Native Species	8	8	8	Yes
Shallow Marsh Percent Native Cover	75%	<10%	<10%	No
Deep Marsh No. of Native Species	N/A	0	0	No
Deep Marsh Percent Native Cover	N/A	<5	<5%	No
Percent FAC or Wetter	75%	100%	100%	Yes
Upland Buffer No. of Native Species	15	11	10	No
Upland Buffer Percent Native Cover	90%	75%	60%	No

Shallow marsh performance standards are partially met, as the number of native species has been matched, as has the number of FAC or wetter species. This is likely a result of the restoration efforts completed in 2011, as there is a good abundance of native species present; presumably remnants of the seeding and plugs installed when the site was reestablished. The abundance however, as measured by percent cover of native species, is less than the presumed performance standard. While species richness is high for shallow marsh, the dominance of hybrid cattails is very high, and is not likely to change without intervention.

Upland buffer performance standards are not met, although the native species richness is close, and the percent cover of native species is higher than anticipated for a site with no maintenance since 2012. Much like the presence of individual native species in the shallow marsh, the occurrence of native grasses and forbs in the upland buffer are likely remnants of the restoration initiated in 2011. It is anticipated that the native species will decrease in richness and percent cover as non-native and invasive species outcompete them over time.

Overall, the vegetation quality observed in the two mitigation sites does not meet the presumed performance standards. This is not surprising, given the lack of maintenance although they were better quality than anticipated when compared to similar sites.

Recommendations

The quantity of wetland and associated stormwater treatment and upland buffer exceeds what we proposed. On the basis of credits, the two sites meet the quantity criteria. It is recommended that specific to the wetland credits, the sites are approved as is.

The quality of the wetland mitigation sites does not meet the presumed performance standards. The number of native species present in the shallow marsh and upland buffer meets or nearly meets the standard, but the percent native cover does not. This is primarily because both sites are dominated by hybrid cattail. This species is very aggressive and will outcompete native species. The restoration of the site in 2011 had an initial site that met performance standards, but without intensive management, cattails have taken over. The scattered number of native species present indicate that some individuals have persisted, but overall, the site lacks diversity.

While vegetation management could be initiated, including herbicide applications and reseeding, the dominance of hybrid cattails is not likely to be easily controlled. After 10 years of development, there is likely a hybrid cattail seedbank that cannot be effectively removed. Removal of the seed bank would require scraping of the entire site, including the stormwater treatment areas. This is not a feasible activity, as it is more extensive than a typical maintenance task. It is also not likely to be successful as hybrid cattails are still present in the area and stormwater runoff will still flow through the sites. As has been demonstrated with the need to reset the site in 2011 and the current conditions, the long-term prognosis of these sites without perpetual maintenance to meet very challenging performance standards is poor.

Based on our assessment of the site, we advise that the City of Ramsey present these findings and recommendations to the LRRWMO and TEP with the following request:

1. Approve the two mitigation sites on the basis that the area of wetland credit exceeds the quantity required.

2. Approve the two mitigation sites performance standards on the basis that while the desired quality is not met it is unlikely to be significantly improved with remediation and the long-term

outcome is likely similar to what is present currently. While improvements to the upland buffer can be achieved with strategic herbicide applications, mowing, and interseeding to augment native species, the dominance of hybrid cattails likely cannot be overcome.

3. Not specific to this assessment, the mitigation sites also require the recording of a deed of restrictions and covenants. While both sites are under a drainage and utility easement, and therefore have some level of protection, wetland mitigation sites convey additional land use restrictions and should be completed. It is recommended that this be completed after the mitigation sites have been approved, likely as a contingency of said approval.

4. A requirement is also to monument the sites to identify where the mitigation site is located. It is recommended to discuss options with the LRRWMO and TEP for what would be appropriate signage. While signage may be less critical for sites entirely within city-owned property, the demarcation of the boundaries can assist with preventing accidental encroachment. They can also provide educational opportunities if information about the site is presented in conjunction with a boundary marker.

It is recommended that a site visit be convened in the fall of 2021 to provide the opportunity to inspect the site and verify the findings of this memorandum. SEH staff will facilitate the review and assist with the necessary steps to achieve closure of these mitigation sites.

Please contact me at rbeduhn@sehinc.com or at 651.470.6027 if I can be of any assistance in elaborating the content and recommendations of this memorandum.

Attachments:

Figure Set

Appendix A – Wetland Determination Data Forms

Appendix B – Site Photographs

drd
c: Deric Deuschle, SEH

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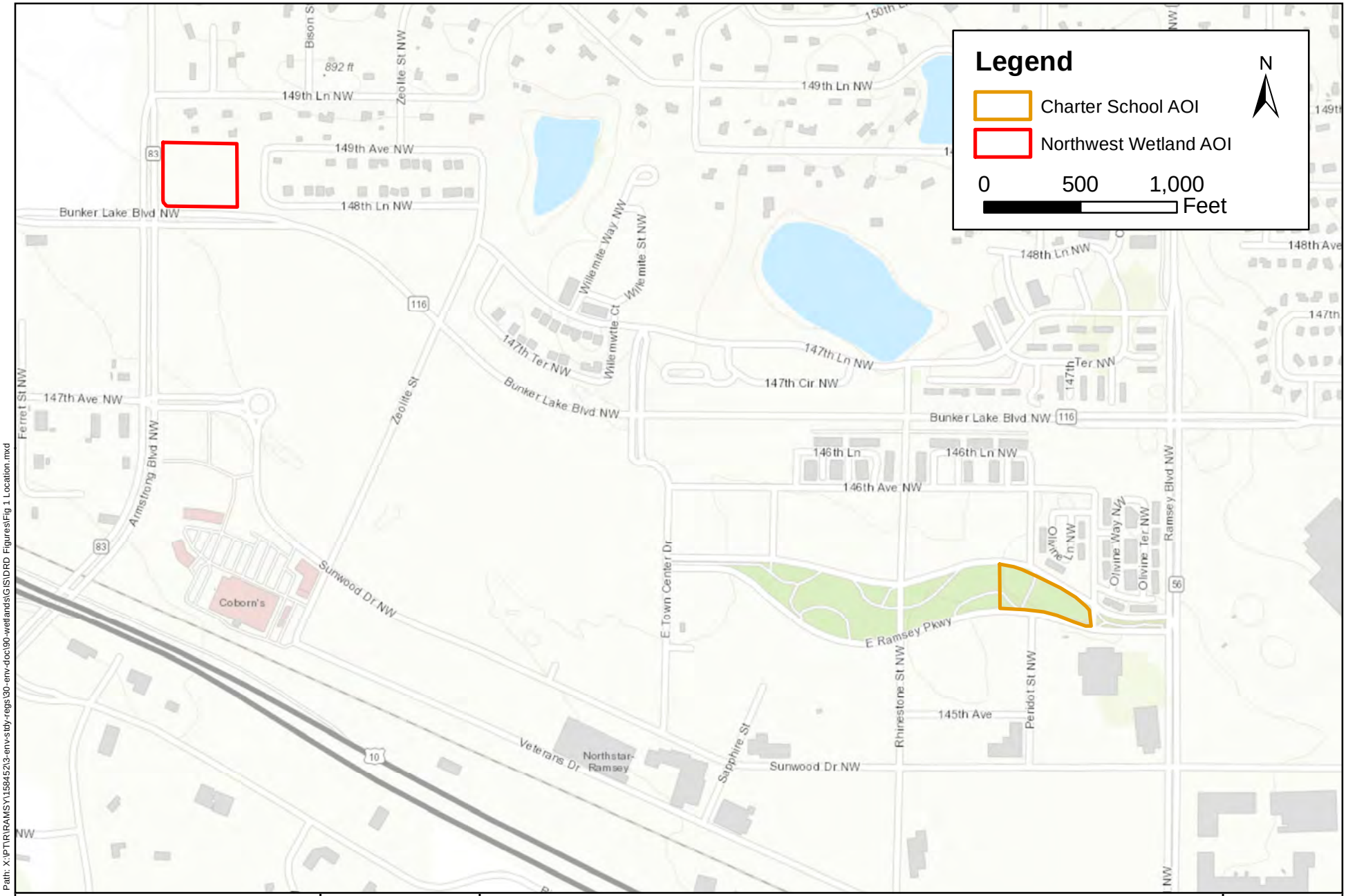
Figures



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3535 VADNAIS CENTER DR.
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Project: RAMSY 158452
Print Date: 10/7/2021

Map by: ddeuschle
Projection: UTM NAD 83 Zone 15N
Source: MnGeo, SEH, ESRI

Mitigation Site Locations

COR Wetland Mitigation Monitoring
Ramsey, Anoka County, Minnesota

Figure 1

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2020 Aerial Photograph Charter Site

COR Wetland Mitigation Monitoring
Ramsey, Anoka County, Minnesota

Figure 2

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2020 Aerial Photograph Northwest Site

COR Wetland Mitigation Monitoring
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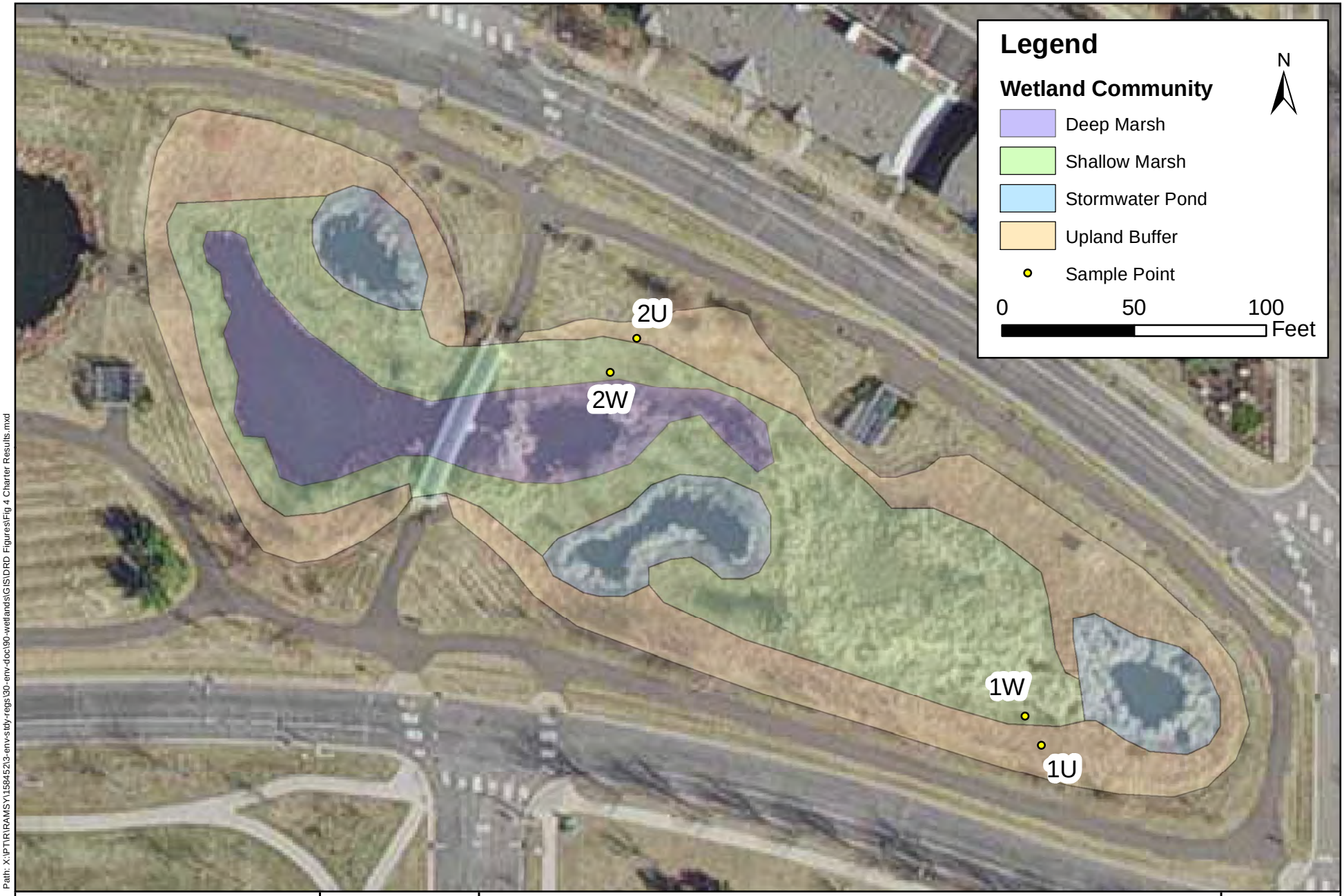
Figure 3



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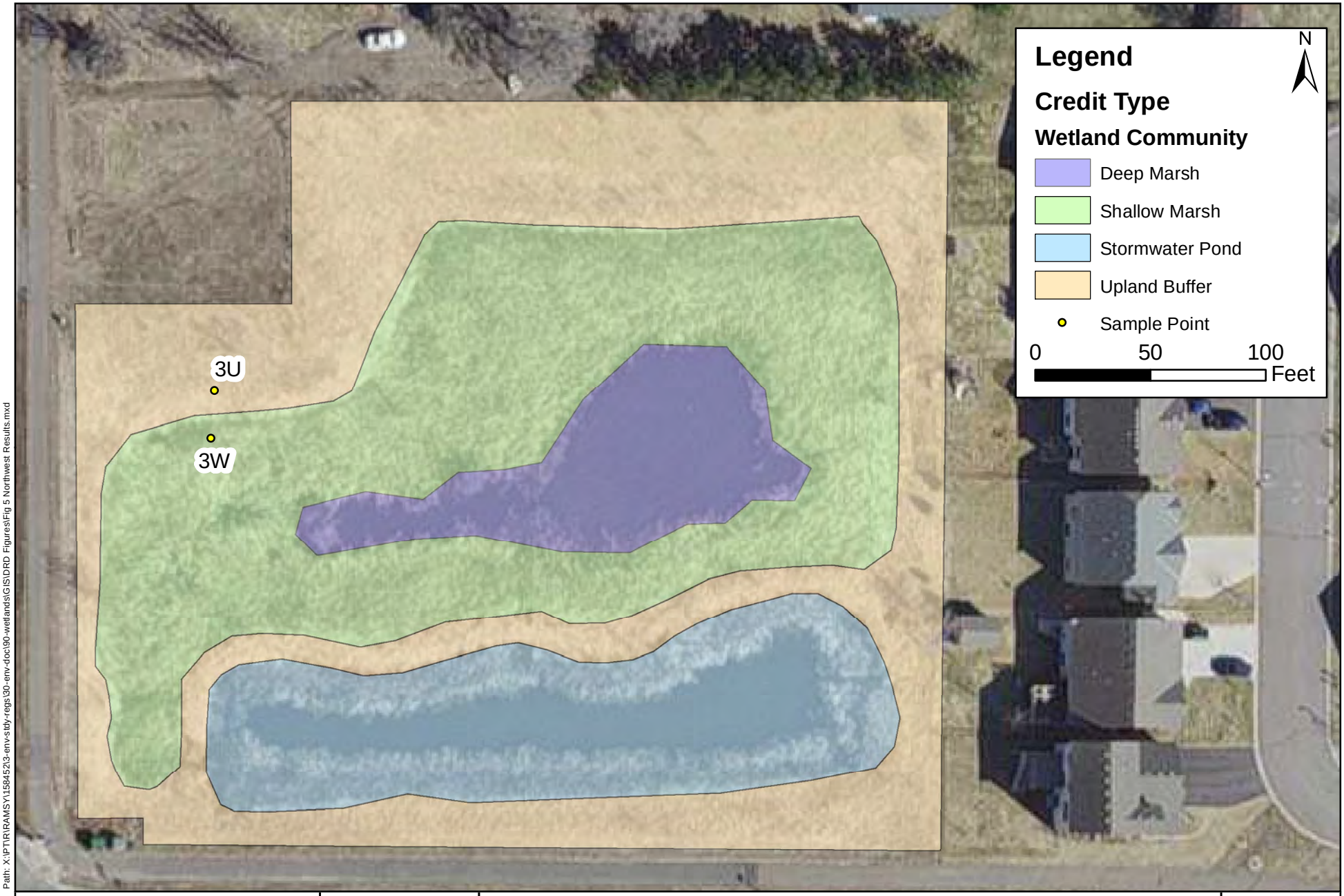
Credit Areas and Wetland Communities - Charter Site

COR Wetland Mitigation Monitoring
Ramsey, Anoka County, Minnesota

Figure 4



Path: X:\PT\R\RAMSY\158452\3-env-stdy-regs\30-env-doc\90-wetlands\GIS\DRD Figures\Fig 5 Northwest Results.mxd

SEH
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110
PHONE: (651) 490-2000
FAX: (651) 490-2150
WATTS: 800-325-2055
www.sehinc.com

Project: RAMSY 158452
Print Date: 10/7/2021

Map by: ddeuschle
Projection: UTM NAD 83 Zone 15N
Source: MnGeo, SEH, ESRI

Credit Areas and Wetland Communities - Northwest Site

COR Wetland Mitigation Monitoring
Ramsey, Anoka County, Minnesota

Figure 5

Appendix A

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: COR Wetland Mitigation Monitoring - Charter | City/County: Ramsey/Anoka | Sampling Date: 5/30/2021

Applicant/Owner: City of Ramsey | State: Minnesota | Sampling Point: C- 1U

Investigator(s): Rebecca Beduhn and Luke Menden | Section, Township, Range: S28, T32, R25W

Landform (hillslope, terrace, etc.): Backslope | Local relief (concave, convex, none): Convex

Slope (%): 7 | Lat: 45.2345 | Long: -93.451784 | Datum: UTM NAD83 Zone 15N

Soil Map Unit Name: Hubbard loamy sand, 0 to 2 percent slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N		
Hydric soil present?	N	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' Radius)			Absolute % Cover	Dominant Species	Indicator Status
1	--				
2	--				
3	--				
4	--				
5	--				
			0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' Radius)					
1	--				
2	--				
3	--				
4	--				
5	--				
			0	= Total Cover	
Herb stratum (Plot size: 5' Radius)					
1	*Solidago canadensis*	*Canadian Goldenrod*	40	Y	FACU
2	*Poa Pratensis*	*Kentucky Blue Grass*	30	Y	FAC
3	*Cirsium arvense*	*Canadian Thistle*	15	N	FACU
4	*Monarda fistulosa*	*Oswego-Tea*	15	N	FACU
5	--				
6	--				
7	--				
8	--				
9	--				
10	--				
			100	= Total Cover	
Woody vine stratum (Plot size: 30' Radius)					
1	--				
2	--				
			0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:			
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column totals	100 (A)		370 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

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

Note: This data sheet has been adapted to use the 2016 National Wetland Plant List:

Robert W. Lichvar and John T. Kartesz. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC. (2016)

SOIL

Sampling Point: C- 1U

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

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-24	7.5YR 3/1	100					Coarse Sand	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: COR Wetland Mitigation Monitoring - Charter | City/County: Ramsey/Anoka | Sampling Date: 5/30/2021

Applicant/Owner: City of Ramsey | State: Minnesota | Sampling Point: C- 1W

Investigator(s): Rebecca Beduhn and Luke Menden | Section, Township, Range: S28, T32, R25W

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

Slope (%): 5 | Lat: 45.234532 | Long: -93.45181 | Datum: UTM NAD83 Zone 15N

Soil Map Unit Name: Hubbard loamy sand, 0 to 2 percent slopes | NWI Classification: PEM1Cx

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	Y
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:	Charter Wetland 1

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' Radius)		Absolute % Cover	Dominant Species	Indicator Status
1	--			
2	--			
3	--			
4	--			
5	--			
		0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' Radius)				
1	--			
2	--			
3	--			
4	--			
5	--			
		0	= Total Cover	
Herb stratum (Plot size: 5' Radius)				
1	*Typha X glauca* -- *Hybrid Cattail*	60	Y	OBL
2	*Hydrophyllum virginianum* -- *Shawnee-Salad*	20	Y	FAC
3	*Onoclea sensibilis* -- *Sensitive Fern*	10	N	FACW
4	*Urtica dioica* -- *Stinging Nettle*	5	N	FACW
5	--			
6	--			
7	--			
8	--			
9	--			
10	--			
		95	= Total Cover	
Woody vine stratum (Plot size: 30' Radius)				
1	--			
2	--			
		0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:				
OBL species	60	x 1 =	60	
FACW species	15	x 2 =	30	
FAC species	20	x 3 =	60	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	95	(A)	150	(B)

Prevalence Index = B/A = 1.58

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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

Note: This data sheet has been adapted to use the 2016 National Wetland Plant List:

Robert W. Lichvar and John T. Kartesz. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC. (2016)

SOIL

Sampling Point: C- 1W

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

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-10	10YR 3/1	100					Coarse Sand	
10-18	10YR 2/1	95	10YR 4/4	5	C	M	Loamy Sand	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes	X	No		Depth (inches):	4
Water table present?	Yes		No	X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	-3

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: COR Wetland Mitigation Monitoring - Charter | City/County: Ramsey/Anoka | Sampling Date: 5/30/2021

Applicant/Owner: City of Ramsey | State: Minnesota | Sampling Point: C- 2U

Investigator(s): Rebecca Beduhn and Luke Menden | Section, Township, Range: S28, T32, R25W

Landform (hillslope, terrace, etc.): Backslope | Local relief (concave, convex, none): Convex

Slope (%): 6 | Lat: 45.234923 | Long: -93.452386 | Datum: UTM NAD83 Zone 15N

Soil Map Unit Name: Hubbard loamy sand, 0 to 2 percent slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N		
Hydric soil present?	N	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' Radius)			Absolute % Cover	Dominant Species	Indicator Status
1	--				
2	--				
3	--				
4	--				
5	--				
			0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' Radius)					
1	--				
2	--				
3	--				
4	--				
5	--				
			0	= Total Cover	
Herb stratum (Plot size: 5' Radius)					
1	*Poa pratensis*	-- *Kentucky Blue Grass*	40	Y	FAC
2	*Solidago canadensis*	-- *Canadian Goldenrod*	20	Y	FACU
3	*Monarda fistulosa*	-- *Oswego-Tea*	15	N	FACU
4	*Verbascum thapsus*	-- *Great Mullein*	10	N	UPL
5	*Thlaspi arvense*	-- *Field Pennycress*	5	N	FACU
6	*Potentilla norvegica*	-- *Norwegian Cinquefoil*	5	N	FAC
7	--				
8	--				
9	--				
10	--				
			95	= Total Cover	
Woody vine stratum (Plot size: 30' Radius)					
1	--				
2	--				
			0	= Total Cover	

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

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:			
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	40	x 4 =	160
UPL species	10	x 5 =	50
Column totals	95 (A)		345 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Note: This data sheet has been adapted to use the 2016 National Wetland Plant List:

Robert W. Lichvar and John T. Kartesz. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC. (2016)

SOIL

Sampling Point: C- 2U

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

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-4	10YR 3/2	100					Coarse Sand	
4-5	10YR 4/3	100					Coarse Sand	
5-18	10YR 3/2	100					Coarse Sand	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: COR Wetland Mitigation Monitoring - Charter | City/County: Ramsey/Anoka | Sampling Date: 5/30/2021

Applicant/Owner: City of Ramsey | State: Minnesota | Sampling Point: C- 2W

Investigator(s): Rebecca Beduhn and Luke Menden | Section, Township, Range: S28, T32, R25W

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

Slope (%): 3 | Lat: 45.234885 | Long: -93.452426 | Datum: UTM NAD83 Zone 15N

Soil Map Unit Name: Hubbard loamy sand, 0 to 2 percent slopes | NWI Classification: PEM1Cx

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? Y	
Hydric soil present? Y	**Is the sampled area within a wetland?** Y
Indicators of wetland hydrology present? Y	If yes, optional wetland site ID: Charter Wetland 1

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' Radius)		Absolute % Cover	Dominant Species	Indicator Status
1	--			
2	--			
3	--			
4	--			
5	--			
		0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' Radius)				
1	--			
2	--			
3	--			
4	--			
5	--			
		0	= Total Cover	
Herb stratum (Plot size: 5' Radius)				
1	*Typha X glauca* -- *Hybrid Cattail*	40	Y	OBL
2	*Carex stricta* -- *Uptight Sedge*	30	Y	OBL
3	*Carex stricta* -- *Uptight Sedge*	15	N	OBL
4	*Eleocharis obtusa* -- *Blunt Spike-Rush*	15	N	OBL
5	--			
6	--			
7	--			
8	--			
9	--			
10	--			
		100	= Total Cover	
Woody vine stratum (Plot size: 30' Radius)				
1	--			
2	--			
		0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:				
OBL species	100	x 1 =	100	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	100	(A)	100	(B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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

Note: This data sheet has been adapted to use the 2016 National Wetland Plant List:

Robert W. Lichvar and John T. Kartesz. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC. (2016)

SOIL

Sampling Point: C- 2W

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

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-5	10YR 3/1	100					Loam	
5-11	10YR 5/2	80	5YR 4/4	20	C	M	Sandy Loam	
11-18	10BG 5/1	60	5YR 4/4	30	C	M	Loamy Sand	
			5YR 3/4	10	C	M		

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes		No	X	Depth (inches):	
Water table present?	Yes	X	No		Depth (inches):	-4
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	0

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: COR Wetland Mitigation Monitoring - Northwest | City/County: Ramsey/Anoka | Sampling Date: 5/30/2021

Applicant/Owner: City of Ramsey | State: Minnesota | Sampling Point: NW-3U

Investigator(s): Rebecca Beduhn and Luke Menden | Section, Township, Range: S28, T32, R25W

Landform (hillslope, terrace, etc.): Backslope | Local relief (concave, convex, none): Convex

Slope (%): 6 | Lat: 45.240772 | Long: -93.469844 | Datum: UTM NAD83 Zone 15N

Soil Map Unit Name: Hubbard loamy sand, 0 to 2 percent slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N		
Hydric soil present?	N	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' Radius)			Absolute % Cover	Dominant Species	Indicator Status
1	--				
2	--				
3	--				
4	--				
5	--				
			0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' Radius)					
1	--				
2	--				
3	--				
4	--				
5	--				
			0	= Total Cover	
Herb stratum (Plot size: 5' Radius)					
1	*Bromus inermis*	-- *Smooth Brome*	40	Y	FACU
2	*Poa pratensis*	-- *Kentucky Blue Grass*	35	Y	FAC
3	*Phalaris arundinacea*	-- *Reed Canary Grass*	15	N	FACW
4	*Verbascum thapsus*	-- *Great Mullein*	5	N	UPL
5	*Rumex crispus*	-- *Curly Dock*	5	N	FAC
6	*Panicum virgatum*	-- *Wand Panic Grass*	5	N	FAC
7	--				
8	--				
9	--				
10	--				
			105	= Total Cover	
Woody vine stratum (Plot size: 30' Radius)					
1	--				
2	--				
			0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:			
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	45	x 3 =	135
FACU species	40	x 4 =	160
UPL species	5	x 5 =	25
Column totals	105 (A)		350 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- ____ Dominance test is >50%
- ____ Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

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

Note: This data sheet has been adapted to use the 2016 National Wetland Plant List:

Robert W. Lichvar and John T. Kartesz. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC. (2016)

SOIL

Sampling Point: NW-3U

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

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18	10YR 3/2	100					Loamy Sand	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: COR Wetland Mitigation Monitoring - Northwest | City/County: Ramsey/Anoka | Sampling Date: 5/30/2021

Applicant/Owner: City of Ramsey | State: Minnesota | Sampling Point: NW-3W

Investigator(s): Rebecca Beduhn and Luke Menden | Section, Township, Range: S28, T32, R25W

Landform (hillslope, terrace, etc.): Backslope | Local relief (concave, convex, none): Convex

Slope (%): 0 | Lat: 45.240715 | Long: -93.469854 | Datum: UTM NAD83 Zone 15N

Soil Map Unit Name: Hubbard loamy sand, 0 to 2 percent slopes | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	Y
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:	Northwest Wetland 2

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' Radius)			Absolute % Cover	Dominant Species	Indicator Status
1	--				
2	--				
3	--				
4	--				
5	--				
			0	= Total Cover	
Sapling/Shrub stratum (Plot size: 15' Radius)					
1	--				
2	--				
3	--				
4	--				
5	--				
			0	= Total Cover	
Herb stratum (Plot size: 5' Radius)					
1	*Typha angustifolia*	-- *Narrow-Leaf Cat-Tail*	75	Y	OBL
2	*Phalaris arundinacea*	-- *Reed Canary Grass*	10	N	FACW
3	*Poa pratensis*	-- *Kentucky Blue Grass*	10	N	FAC
4	*Rumex crispus*	-- *Curly Dock*	5	N	FAC
5	*Carex vulpinoidea*	-- *Common Fox Sedge*	5	N	FACW
6	*Acorus calamus*	-- *Single-Vein Sweetflag*	5	N	OBL
7	--				
8	--				
9	--				
10	--				
			110	= Total Cover	
Woody vine stratum (Plot size: 30' Radius)					
1	--				
2	--				
			0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:			
OBL species	80	x 1 =	80
FACW species	15	x 2 =	30
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	110 (A)		155 (B)

Prevalence Index = B/A = 1.41

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
- ____ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

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

Note: This data sheet has been adapted to use the 2016 National Wetland Plant List:

Robert W. Lichvar and John T. Kartesz. 2009. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC. (2016)

SOIL

Sampling Point: NW-3W

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

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-6	10YR 2/2	100					Sandy Loam	
6-24	10YR 2/1	100					Sandy Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix B

Representative Site Photographs

Appendix B - Site Photos

Charter Site – Wetland area, north side, east of bridge