2015 Supplemental Wetland Investigation Report

Southwest LRT (METRO Green Line Extension)

Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie, Minnesota

Anderson Engineering of MN, LLC.—Project No. 13485

Revised October 2015

Contents

TABLES

APPENDICES

ATTACHMENTS

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2 Executive Summary

Anderson Engineering of Minnesota, LLC is a subcontractor to CH2M Hill, Inc. and the Metropolitan Council to provide professional wetland services to identify areas within the Southwest Light Rail Transit (LRT) study area that meet the wetland criteria of the 1987 United States Army Corps of Engineers (USACE) Wetland Delineation Manual (*Technical Report Y-87-1; January 1987*) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Midwest Regional Supplement).

This is the third wetland investigation report that has been completed and submitted for wetland basins associated with the Southwest LRT Project. In December of 2013, a comprehensive *Wetland Investigation Report* was completed for the wetland basins that were identified and delineated within the original proposed Southwest LRT study area. Upon the completion of the original Report, the project design progressed, the limits of disturbance of the study area were expanded, and additional wetlands were identified in 2014, as documented in the *2014 Supplemental Wetland Investigation Report*.

The project design has since undergone additional minor adjustments in select areas along the LRT alignment. Following an off-site review of the select additional areas identified by the Metropolitan Council in 2015, Anderson Engineering identified two areas that would require further on-site wetland investigation, as identified on the Location Exhibit in Appendix B.

The proposed Southwest LRT study area remains within the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. The LGUs that have Minnesota Wetland Conservation Act jurisdiction over water resources within the overall study area are the Minnesota Department of Transportation (MnDOT), the City of Eden Prairie, Nine Mile Creek Watershed District (NMCWD), the City of Minnetonka, Minnehaha Creek Watershed District (MCWD), and the City of Minneapolis. The United States Army Corps of Engineers (USACE) has Clean Water Act Section 404 jurisdiction on water resources within the entire corridor and the Minnesota Department of Natural Resources (MnDNR) regulates all public waters.

A total of three areas meeting wetland criteria were field delineated within the WCA Local Government Units (LGUs) jurisdictional boundaries of MnDOT and NMCWD. No additional wetlands were identified within the WCA jurisdiction of the City of Eden Prairie, the City of Minnetonka, Minnehaha Creek Watershed District, or the City of Minneapolis. The three wetland areas that were identified in 2015 are briefly summarized in Table 2-1. To avoid duplicate labeling, the number identification sequence for these wetlands begins where the number sequence from the 2014 Supplemental Report ended. Wetlands are classified using the Cowardin, Circular 39, and Eggers and Reed Wetland Classification systems, described in Appendix A. The format for the wetland identification labels is as follows: LGU abbreviation listed first, followed by geographic municipal location and a number identification.

Table 2-1
Summary of 2015 Field Delineated Wetlands

Wetland ID	Wetland Classifications		
	Circ. 39	Cowardin	Eggers and Reed
DOT-EP-23	Type 1	PEMAd	Seasonally Flooded Basin
DOT-EP-24	Type 1	PEMAd	Seasonally Flooded Basin
NM-EP-03*	Type 1/2	PFO1A/PEM2B	Floodplain Forest/Fresh Wet Meadow

*A portion of this wetland was previously delineated in 2013 and additional portion was delineated in 2015. The wetland type classifications listed in the table are referring only to the portion that was delineated in 2015.
Sources: *"Wetlands of the United States"* (U.S. Fish and Wildlife Service-Circular 39 Document); *"Classification of Wetlands and Deepwater Habitats of the United States"* (U.S. Fish and Wildlife Service-Cowardin et al. method); *"Wetland Plants and Plant Communities of MN and WI"*; (USACOE-St. Paul District; Eggers and Reed)

3 Background

As requested by the Metropolitan Council and CH2M Hill, Inc., Anderson Engineering of Minnesota, LLC has performed all necessary additional wetland determinations and jurisdictional delineations in accordance with the 1987 United States Army Corps of Engineers Wetland Delineation Manual and the Midwest Regional Supplement.

The purpose of this study was to investigate the additional areas resulting from 2015 design adjustments that meet the technical criteria for wetlands, to delineate the jurisdictional extent of the wetland basins, and to classify the observed wetland habitats.

Fieldwork for this project was completed by Environmental Associates Lucy Dahl, Courtney Luensman and Tina Justen in July and August of 2015.

4 Methodology

Field investigations and off-site reviews were performed to identify, delineate, and assess wetland areas within the 2015 design adjustment areas. The wetland boundary delineations were completed using data collected along sampling transects within the wetland, and through analysis of available data mapping resources. All wetland delineations were conducted under the oversight of a Minnesota Certified Wetland Delineator and in accordance with the 1987 United States Army Corps of Engineers Wetland Delineation Manual and the Midwest Regional Supplement.

4.1 Background Data Research Review

Mapping resources were used to initially locate potential wetland habitats prior to conducting field investigations. Data resources used include:

- United States Geologic Service 7.5" Topographic Quadrangle maps
- United States Fish and Wildlife Service National Wetlands Inventory maps
- United States Department of Agriculture Natural Resources Conservation Service Soil Survey of Hennepin County, Minnesota
- Minnesota Department of Natural Resources Public Water Inventory
- Aerial photographs
- City of Eden Prairie GIS data
- City of Minnetonka Water Resources Management Plan
- Minnehaha Creek Watershed District Functional Assessment of Wetlands

Potential wetland habitats, designated "sampling units", were distinguished by marked differences in vegetative cover, landscape position, soil types, and/or disturbances relevant to aquatic resources. The most effective way to detect these differences was to review vegetative signatures on aerial photographs, since it typically reflects spatial variations in geomorphology, hydrology, soils, and other factors important to the formation and maintenance of wetlands. When natural vegetation was absent or disturbed, however, sampling units were determined based on landscape position, soil types, and/or other disturbances. During on-site data collection, sampling units were adjusted as needed based on observed field conditions.

4.2 On-Site Data Collection and Field Demarcation

All land parcels required Right of Entry permits prior to an on-site investigation and property owners were contacted by the Metropolitan Council to coordinate field investigation date, time, and preferred

demarcation method (temporary pin-flags, lath, flagging ribbon, etc.). Following coordination with the property owner, Gopher State One Call was notified to ensure underground utilities were marked and avoided during soil investigations.

On-site data were collected at sample points within sampling units to determine wetland boundaries and assess wetland habitat quality. Vegetation, soil, and hydrology data were recorded at each wetland. At least one sample point transect crosses the delineated wetland edge of each wetland basin. The transect consists of two sample points: one point within the basin, the wetland point, and one point outside of the basin, the upland point. Other sample points may have been taken in areas which have one or more of the wetland vegetative, soil, or hydrologic characteristics present; where questionable conditions exist; or to verify the absence of wetland criteria. Sample point locations were selected to be representative of the sampling unit.

The hydric soil assessment procedure of the Routine On-site Determination Method was used during this investigation. This method includes the following procedures:

1) Sampling of the vegetative community in all present strata (herbaceous, sapling/shrub, tree, and woody vine) to determine whether the sampling unit meets the hydrophytic vegetation criteria specified by the Midwest Regional Supplement.

2) Digging soil pits with a Dutch auger typically to depths of 16”-36”, noting soil profile and any hydric soil characteristics to determine whether the sampling unit meets the hydric soil criteria specified by the Midwest Regional Supplement.

3) Observing and recording indicators of surface and subsurface hydrology to determine whether the sampling unit meets the wetland hydrology criteria specified by the Midwest Regional Supplement.

A data form was completed for each sample point in the sampling unit and for any additional investigative sampling points (Appendix C). In wetland-upland transition areas, sample points and associated data forms from the wetland and upland were used to illustrate and document differences between the wetland and upland. Digital photographs were taken of each wetland delineated to document general condition and status. Photographs are included in Appendix D.

Points along the wetland boundary were recorded with a mapping-grade Trimble GeoXH Global Positioning Satellite (GPS) unit with sub-meter accuracy.

4.3 Wetland Functional Assessment

Minnesota Routine Assessment Method (MnRAM) is a process designed to help assess qualitative functions and values associated with Minnesota wetlands. Anderson Engineering of MN, LLC environmental staff completed a wetland functional evaluation for wetland NM-EP-03 at the time it was delineated in 2013. This analysis is included in Appendix E. MnRAM analyses were not completed for wetlands DOT-EP-23 & DOT-EP-24 because they are “incidental” wetlands that were created as a result of development or human activity without the intent of creating a wetland, and are not regulated under the Minnesota Wetland Conservation Act.

5 Resource Review

The following resources were reviewed and are included on the Environmental Exhibits in Appendix B & the Antecedent Precipitation & 30 Day Rolling Total data in Appendix F:

5.1 U.S. Fish and Wildlife Service National Wetlands Inventory

The National Wetlands Inventory (NWI) identifies one PFO1Ad wetland within the area delineated as wetland NM-EP-03. There are no other NWI basins identified within the 2015 wetland investigation area of the proposed Southwest LRT Project.

5.2 Natural Resources Conservation Service Soil Survey

The Soil Survey of Hennepin County, MN identifies one hydric soil map unit (Muskego L16A) within the area delineated as wetland NM-EP-03. There are no other hydric soil map units within the 2015 wetland investigation area of the proposed Southwest LRT Project.

5.3 Minnesota Department of Natural Resources Public Water Inventory

According to the Minnesota Department of Natural Resources Public Water Inventory, the South Fork of Nine Mile Creek is located near wetland NM-EP-03. There are no other public waters located in the 2015 wetland investigation area of the proposed Southwest LRT Project.

5.4 Minnesota Climatology Working Group 30 Day Rolling Precipitation Total & Antecedent Precipitation Data

A review of the 30 day rolling total precipitation data and antecedent precipitation data collected from the Minnesota Climatology Working Group (Appendix F) indicated that precipitation totals for the previous months were generally within the normal range in Hennepin County and hydrologic conditions. Although slightly above average at the time of the delineations, the climatic conditions were suitable for completing accurate wetland determinations and boundary delineations.

6 2015 Field Delineation Results and Discussion

6.1 Field Results

A total of three areas have been classified, field delineated, and mapped within the 2015 investigation area. Two additional areas (wet ditches) were delineated within MnDOT ROW, and an additional portion of a wetland basin that was previously delineated by the project in 2013 was further delineated within the jurisdictional boundaries of NMCWD. The wetland boundaries are depicted on the Delineation Exhibits located in Appendix B, and the results of the 2015 wetland investigation are divided by LGU and described below. Wetland descriptions below include wetland type, size, wetland and upland dominant vegetation and soil descriptions, wetland to upland transition description, and observed wetland hydrology indicators. Wetlands are described as either being located entirely within the study area or extending outside the study area. If the wetland basin is located completely within the investigation area, the size of the entire wetland is given. For wetlands that extend outside of the investigation area, the size of only the on-site portion is given and the portion outside of the investigation area is excluded.

6.1.1 Minnesota Department of Transportation

DOT-EP-23: DOT-EP-23 is a small PEMAd, Type 1, seasonally flooded basin/wet ditch. The basin is located entirely within the study area and is approximately 2,315 square feet in size. The wet ditch appears to flow southeast through a pipe as a part of the MnDOT drainage network (see MnDOT drainage map in Appendix B). The wetland vegetation is dominated by narrow-leaf cat-tail (*Typha angustifolia*). The underlying soils are mapped as Udorthents. Soils in the investigation area meet the redox dark surface

(F6) hydric soil indicator. Wetland hydrology indicators include high water table (A2), geomorphic position (D2), and FAC-neutral test (D5).

The transition from wetland to upland is a moderate change. Upland vegetation is dominated by yellow rocket (*Barbarea vulgaris*), Canada thistle (*Cirsium arvense*), and American vetch (*Vicia americana*). Upland soils are a dark brown silt loam and do not meet any hydric soil indicators. No hydrology indicators were observed in the upland.

DOT-EP-24: DOT-EP-24 is a small PEMAd, Type 1, seasonally flooded basin/wet ditch. The wetland is located entirely within the investigation area and is approximately 677 square feet in size. The wet ditch appears to be the low spot in the ditch that during precipitation events would flow southeast, eventually into a pipe connected to the MnDOT drainage network (see MnDOT drainage map in Appendix B). The wetland vegetation is dominated by reed canary grass (*Phalaris arundinacea*) and narrow-leaf cat-tail (*Typha angustifolia*). The underlying soils are mapped as Lester loam. Soils in the investigation area meet the depleted below dark surface (A11) and depleted matrix (G3) hydric soil indicators. Wetland hydrology indicators include high water table (A2), saturation (A3), geomorphic position (D2), and FAC-neutral test (D5).

The transition from wetland to upland is an abrupt change. Upland vegetation is dominated by Canada thistle (*Cirsium arvense*) and smooth brome (*Bromus inermis*) and American vetch (*Vicia americana*). Upland soils are composed of a black, brown, gray disturbed/mixed matrix and do not meet any hydric soil indicators. No hydrology indicators were observed in the upland.

6.1.2 Nine Mile Creek Watershed District

NM-EP-03: Wetland NM-EP-03 is a fringe wetland associated with the South Fork of Nine Mile Creek. Two separate portions of this wetland have been delineated for the Southwest LRT Project, as illustrated on the Area B Delineation Exhibit located in Appendix B. The portion of NM-EP-03 that was delineated in 2013 is a PEMC, Type 3, shallow marsh that is divided by Nine Mile Creek.

The portion of NM-EP-03 that was delineated in 2015 is a PFO1A/PEM2B, Type 1/2, floodplain forest/fresh wet meadow that is connected through a culvert that runs underneath the pedestrian trail that divides this wetland. The wetland extends outside of the investigation area and the on-site portion delineated in 2015 is approximately 6,396 square feet in size. The wetland vegetation at this location is dominated by reed canary grass (*Phalaris arundinacea*), orange jewelweed (*Impatiens capensis*), and green ash (*Fraxinus pennsylvanica*). The underlying soils are mapped as Muskego muck. The soils in the investigation area meet hydric criteria based on the presence of organic material in the soil, the hydrogen sulfide odor encountered at 3 inches (hydric soil indicator A4), and best professional judgement. Wetland hydrology indicators include a high water table at 12 inches (A2), saturation at 8 inches (A3), geomorphic position (D2), and the FAC-neutral test (D5).

The transition from wetland to upland is a gradual change. Upland vegetation is dominated by common buckthorn (*Rhamnus cathartica*) and eastern cottonwood (*Populus deltoides*). Upland soils are composed of a dry black loam that does not meet any hydric soil indicators. No hydrology indicators were observed in the upland.

7 Conclusion

Field investigation in 2015 resulted in a total of three field delineated areas meeting wetland criteria, or portions thereof. All delineations were performed in accordance with the 1987 United States Army Corps of Engineers Wetland Delineation Manual and Midwest Regional Supplement within the updated Southwest Light Rail Transit Project investigation area located in Hennepin County, Minnesota.

The Local Government Units responsible for implementing the Minnesota Wetland Conservation Act at this project location are the Minnesota Department of Transportation and Nine Mile Creek Watershed District. The wetlands in this report are potentially regulated by multiple regulatory agencies including, but not limited to, the United States Army Corps of Engineers and state and local government units. Any work within or adjacent to regulated wetlands will require permits and authorization from the appropriate regulatory agency(ies).

This wetland investigation meets the standards and criteria described in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and the Midwest Regional Supplement. The results reflect the conditions present at the time of the delineations.

I certify that I performed the field analysis and wrote the report for this wetland determination.

Courtney Luensman — 8/27/2015
Environmental Scientist
MN Certified Wetland Delineator #1251
Anderson Engineering of Minnesota, LLC

Lucy Dahl — 8/27/2015
Environmental Associate
Anderson Engineering of Minnesota, LLC

Kristina Justen — 8/27/2015
Environmental Associate
Anderson Engineering of Minnesota, LLC

I certify that I performed the field analysis and/or reviewed work completed by above staff.

Benjamin J Hodapp, PWS — 8/27/2015
Environmental Services Manager
MN Certified Wetland Delineator #1016
Anderson Engineering of Minnesota, LLC

APPENDIX A

Wetland Classification Descriptions

Circular 39 Wetland Classification System

Type 1	**Seasonally Flooded Basins or Floodplains** • Vegetation varies according to the season and the amount of flooding. • Benefits of Type 1 wetlands include seasonal waterfowl habitat, water quality, protection and groundwater recharge and discharge.
Type 2	**Wet Meadows** • Soil is without standing water during the growing season, but is saturated below the surface. • Vegetation includes grasses, sedges, rushes, and various broad-leaved plants. • Type 2 wetlands provide waterfowl and wildlife habitat, water quality benefits and groundwater discharge and recharge.
Type 3	**Shallow Marshes** • Soil is usually waterlogged early in the spring and often covered with six or more inches of water. • Vegetation includes grasses, bullrushes, spikerushes, cattails, arrowheads, pickerelweed, and smartweed. • Type 3 wetlands protect water quality and shoreland, retain floodwater, provide habitat for waterfowl, amphibians and fish, and offer recreation, including hunting, fishing, and canoeing.
Type 4	**Deep Marshes** • Soil is usually covered with water during spring and summer--anywhere from six to three feet. • Vegetation includes cattails, reeds, bulrushes, spikerushes, and wild rice. In open areas, pondweed, naiads, coontail, watermilfoils, waterweeds, duckweeds, waterliles or spatterdocks may grow. • Deep marshes may completely fill shallow lake basins, potholes, limestone sinks and depressions. • Type 4 wetlands provide water quality protection, floodwater detention, wildlife and fisheries habitat and recreation, including hunting, fishing and canoeing.
Type 5	**Open Water Wetlands** (Including shallow ponds and reservoirs) • Water is less than six feet deep and fringed by a border of emergent vegetation. • Type 5 wetlands provide floodwater detention, wildlife and fish habitat, and recreation, including hunting, fishing, and canoeing.
Type 6	**Shrub swamps** • Soil is waterlogged during much of the growing season, and is covered with as much as six inches of water. • Vegetation includes alders, willows, buttonbush, dogwoods, leatherleaf and swamp-privet. • Benefits of Type 6 wetlands include water quality, floodwater detention, low flow augmentation, and wildlife habitat.
Type 7	**Wooded swamps** • Soil is waterlogged to within a few inches of the surface during the growing season, and can be covered with as much as a foot of water. • Typical trees include tamarack, white cedar, arborvitae, black spruce, balsam, red maple, and black ash. • Type 7 wetland benefits include water quality, low flow augmentation, floodwater detention, and timber harvesting.
Type 90	**Riverine System** • All wetland and deepwater habitats contained within a channel. Wetlands typically develop in the floodplain on either side of the defined channel.

Source: Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/wetlands/classwet/index.htm (Version 04DEC1998).

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

System: M - Marine

Subsystem	Class	Subclass
1 - Subtidal	RB – Rock Bottom	1 Bedrock 2 Rubble
	UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud
	AB – Aquatic Bed	1 Algal 3 Rooted Vascular
	RF – Reef	1 Coral 3 Worm
2 - Intertidal	AB – Aquatic Bed	1 Algal 3 Rooted Vascular
	RF – Reef	1 Coral 3 Worm
	RS – Rocky Shore	1 Bedrock 2 Rubble
	US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

System: E - Estuarine

Subsystem	Class	Subclass
1 - Subtidal	RB – Rock Bottom	1 Bedrock 2 Rubble
	UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
	AB – Aquatic Bed	1 Algal 3 Rooted Vascular 4 Floating Vascular
	RF – Reef	2 Mollusk 3 Worm
2 - Intertidal	AB – Aquatic Bed	1 Algal 3 Rooted Vascular 4 Floating Vascular
	RF – Reef	2 Mollusk 3 Worm
	SB – Streambed	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic
	RS – Rocky Shore	1 Bedrock 2 Rubble
	US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
	EM – Emergent	1 Persistent 2 Non-persistent 5 *Phragmites australis*
	SS – Scrub-Shrub	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen
	FO – Forested	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

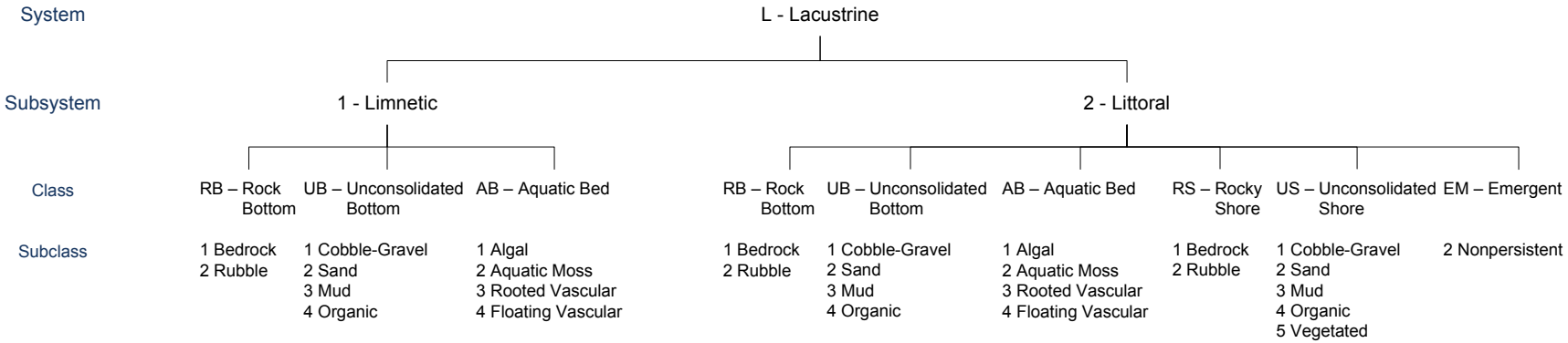
System: R - Riverine

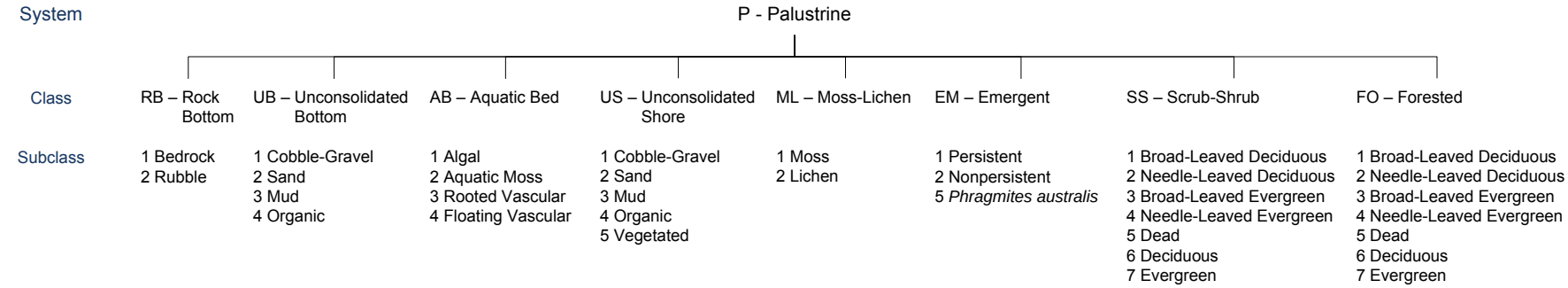
Subsystem	Class	Subclass
1 - Tidal	RB** – Rock Bottom	1 Bedrock 2 Rubble
	UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
	SB** – Streambed	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated
	AB – Aquatic Bed	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular
	RS – Rocky Shore	1 Bedrock 2 Rubble
	US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
	EM – Emergent	2 Nonpersistent
2 – Lower Perennial		
3 – Upper Perennial		
4* - Intermittent		
5* – Unknown Perennial		

* **Intermittent** is limited to the **Streambed** Class;
Unknown Perennial is limited to **Unconsolidated Bottom** Class code **R5UB** only
** **Rock Bottom** is not permitted for the **Lower Perennial** Subsystem;
Streambed is limited to **Tidal** and **Intermittent** Subsystems

Classification of Wetlands and Deepwater Habitats of the United States, Cowardin *et al*. 1979

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION





MODIFIERS

In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

Water Regime			Special Modifiers	Water Chemistry			Soil
Nontidal	**Saltwater Tidal**	**Freshwater Tidal**		**Coastal Halinity**	**Inland Salinity**	**pH Modifiers for all Fresh Water**	
A Temporarily Flooded	L Subtidal	S Temporarily Flooded-Tidal	b Beaver	1 Hyperhaline	7 Hypersaline	a Acid	g Organic
B Saturated	M Irregularly Exposed	R Seasonally Flooded-Tidal	d Partly Drained/Ditched	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	T Semipermanently Flooded-Tidal	f Farmed	3 Mixohaline (Brackish)	9 Mixosaline	i Alkaline	
E Seasonally Flooded/ Saturated	P Irregularly Flooded	V Permanently Flooded-Tidal	h Diked/Impounded	4 Polyhaline	0 Fresh		
F Semipermanently Flooded			r Artificial	5 Mesohaline			
G Intermittently Exposed			s Spoil	6 Oligohaline			
H Permanently Flooded			x Excavated	0 Fresh			
J Intermittently Flooded							
K Artificially Flooded							

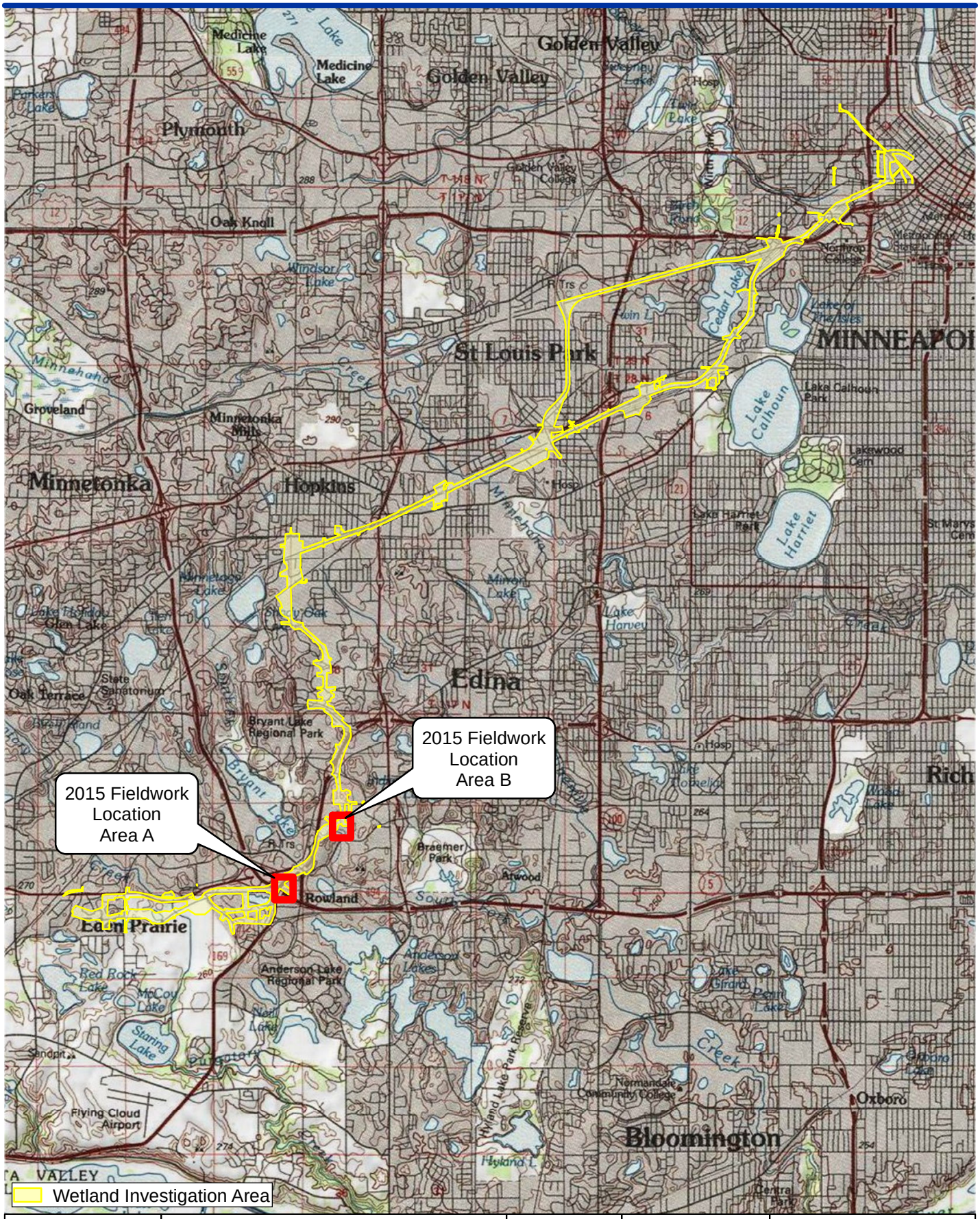
Eggers and Reed
Wetland Plants and Plant Communities of Minnesota and Wisconsin

Shallow Open Water	• Generally have water depths of less than 6.6 feet (2 meters). • Submergent, floating and floating-leaved aquatic vegetation including pondweeds, water-lilies, water milfoil, coontail, and duckweeds characterize this wetland type. • Size can vary from a one-quarter acre pond, to a long oxbow of a river or shallow bay of a lake.
Deep Marsh	• Deep marsh plant communities have standing water depths of between 6 inches and 3 or more feet during the growing season. • Herbaceous emergent, floating, floating-leaved, and submergent vegetation compose this community, with the major dominance by cattails, hardstem bulrush, pickerelweed, giant bur-reed, *Phragmites*, wild rice, pondweeds and/or water-lilies.
Shallow Marsh	• Shallow marsh plant communities have soils that are saturated to inundated by standing water up to 6 inches in depth, throughout most of the growing season. • Herbaceous emergent vegetation such as cattails, bulrushes, arrowheads, and lake sedges characterize this community.
Fresh Wet Meadow	• Faxon soils have a seasonal high water table at the surface to 12 inches below the surface during November through May of most years. • Fresh (wet) meadows are dominated by grasses, such as redtop grass and reed canary grass, and by forbs such as giant goldenrod, growing on saturated soils. • The grass family (Gramineae) and aster family (Compositae) are well represented in fresh (wet) meadows. • The forbs and grasses of these meadows tend to be less competitive, more nutrient demanding, and often shorter-lived species than the sedges of the sedge meadow community.
Shrub Carr	• Shrub-carrs are plant communities composed of tall, deciduous shrubs growing on saturated to seasonally flooded soils. • Usually dominated by willows and/or red-osier dogwood, and sometimes silky dogwood. • The groundlayer typically includes some of the ferns, sedges, grasses and forbs of sedge meadow and fresh (wet) meadow communities. • Hydrology is primarily groundwater and overland runoff. Rifle muck is typically saturated to the surface and may have as much as 6 inches of standing water after spring snowmelt and heavy rainfall events.
Hardwood Swamp	• Hardwood swamps are dominated by deciduous hardwood trees and have soils that are saturated during much of the growing season, and may be inundated by as much as a foot of standing water. • Dominant trees include black ash, red maple, yellow birch and, south of the vegetation tension zone, silver maple.
Floodplain Forest	• Wetlands dominated by mature, deciduous hardwood trees growing on alluvial soils associated with riverine systems. • The soils are inundated during flood events, but are usually somewhat well-drained for much of the growing season.
Seasonally Flooded Basin	• Poorly drained, shallow depressions that may have standing water for a few weeks each year, but are usually dry for much of the growing season. • Ponding following spring snowmelt and heavy summer rainfall events, as well as a high water table. • Typical species include smartweeds, beggarticks, nut-grasses, and wild millet.

Source: Eggers, Steve D., and Donald M. Reed. 1997. Wetland plants and communities of Minnesota and Wisconsin. U.S. Army Corps of Engineers, St. Paul District. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/plants/mnplant/index.htm (Version 03SEP1998).

APPENDIX B

Map Exhibits



SOUTHWEST

Southwest LRT

2015 Wetland Delineation Supplement

Location Exhibit

METROPOLITAN COUNCIL

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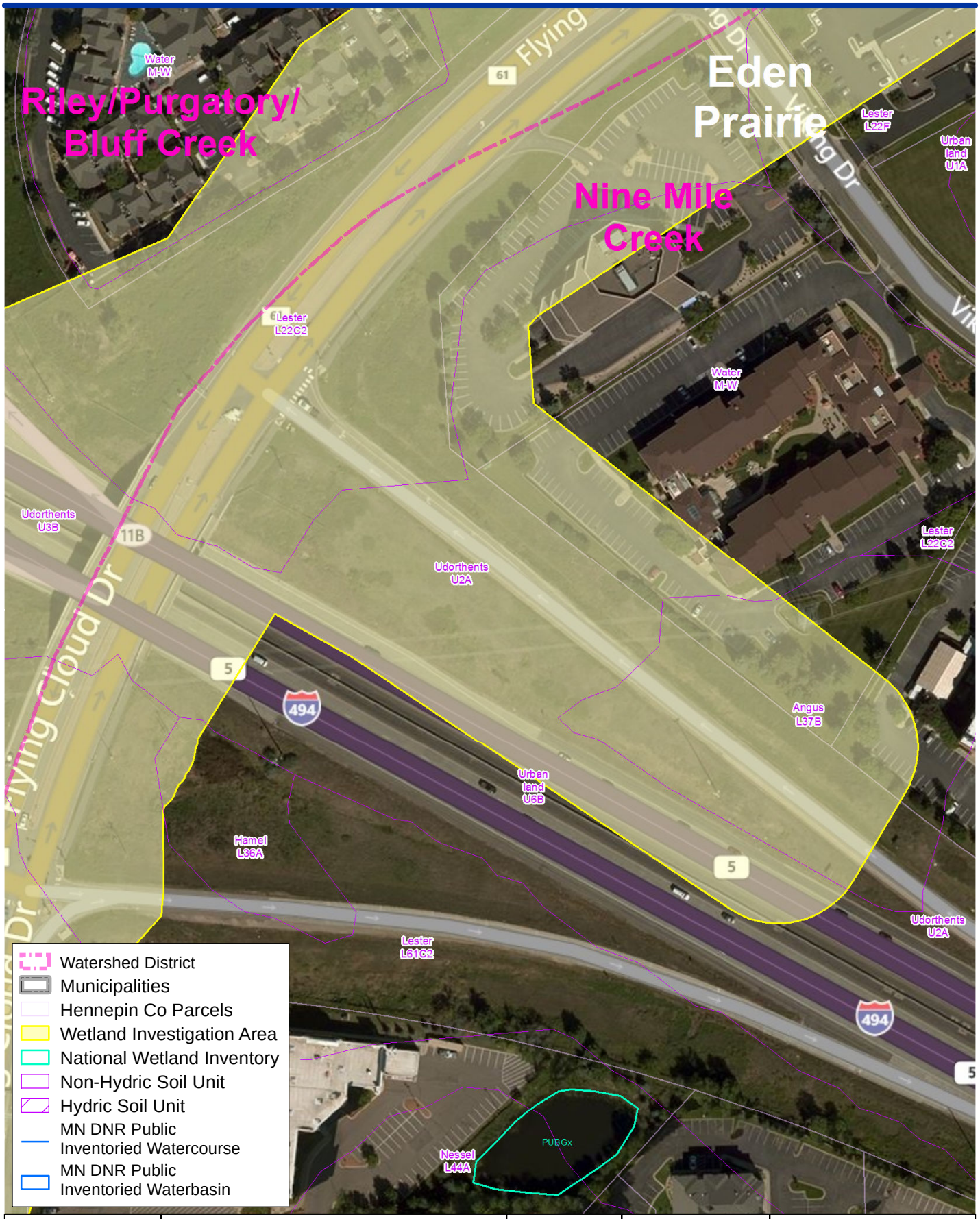

Southwest LRT

2015 Wetland Delineation Supplement
Area A

Environmental Exhibit

NORTH

0 75 150
Feet

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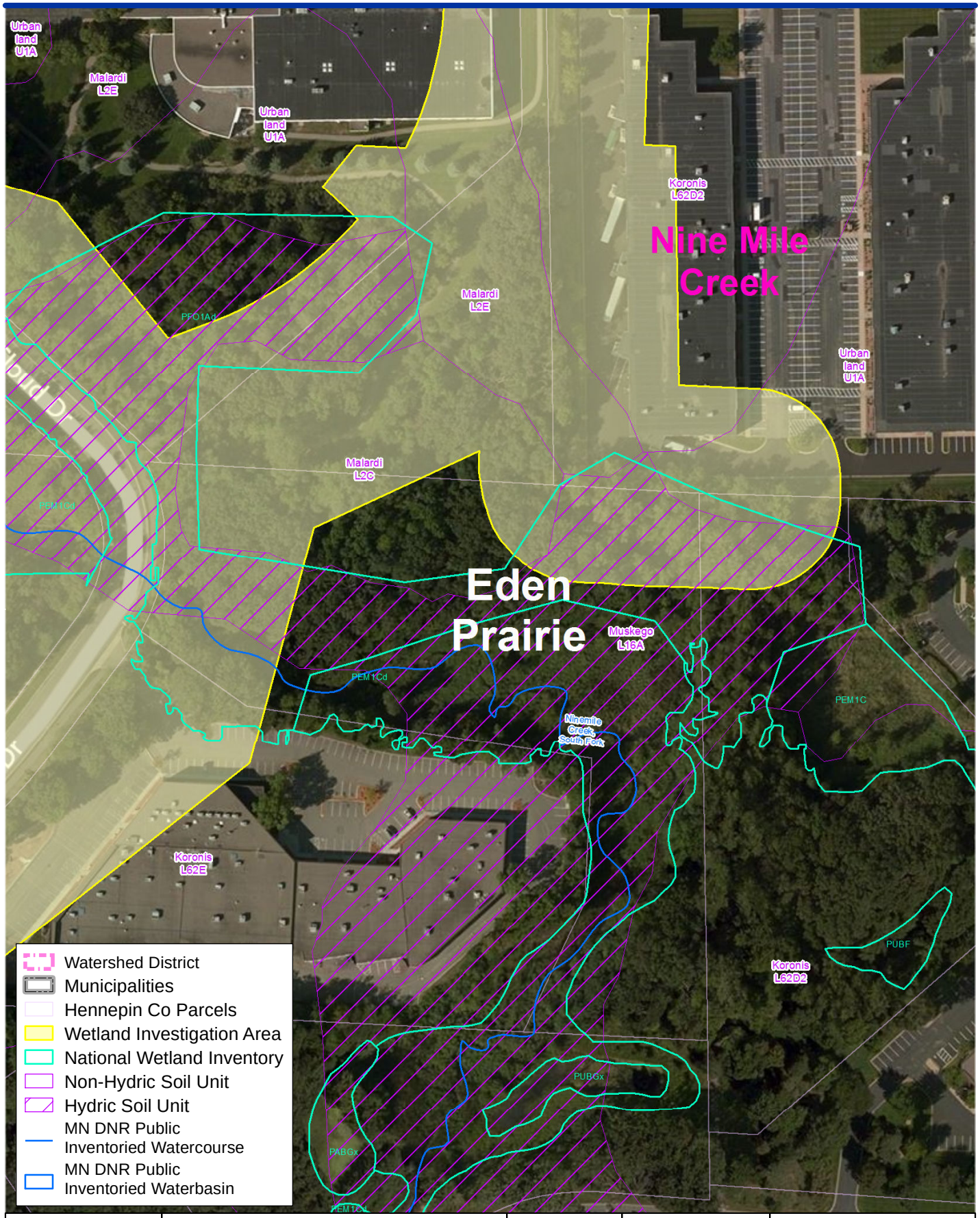


SOUTHWEST

Southwest LRT

2015 Wetland Delineation Supplement
Area B

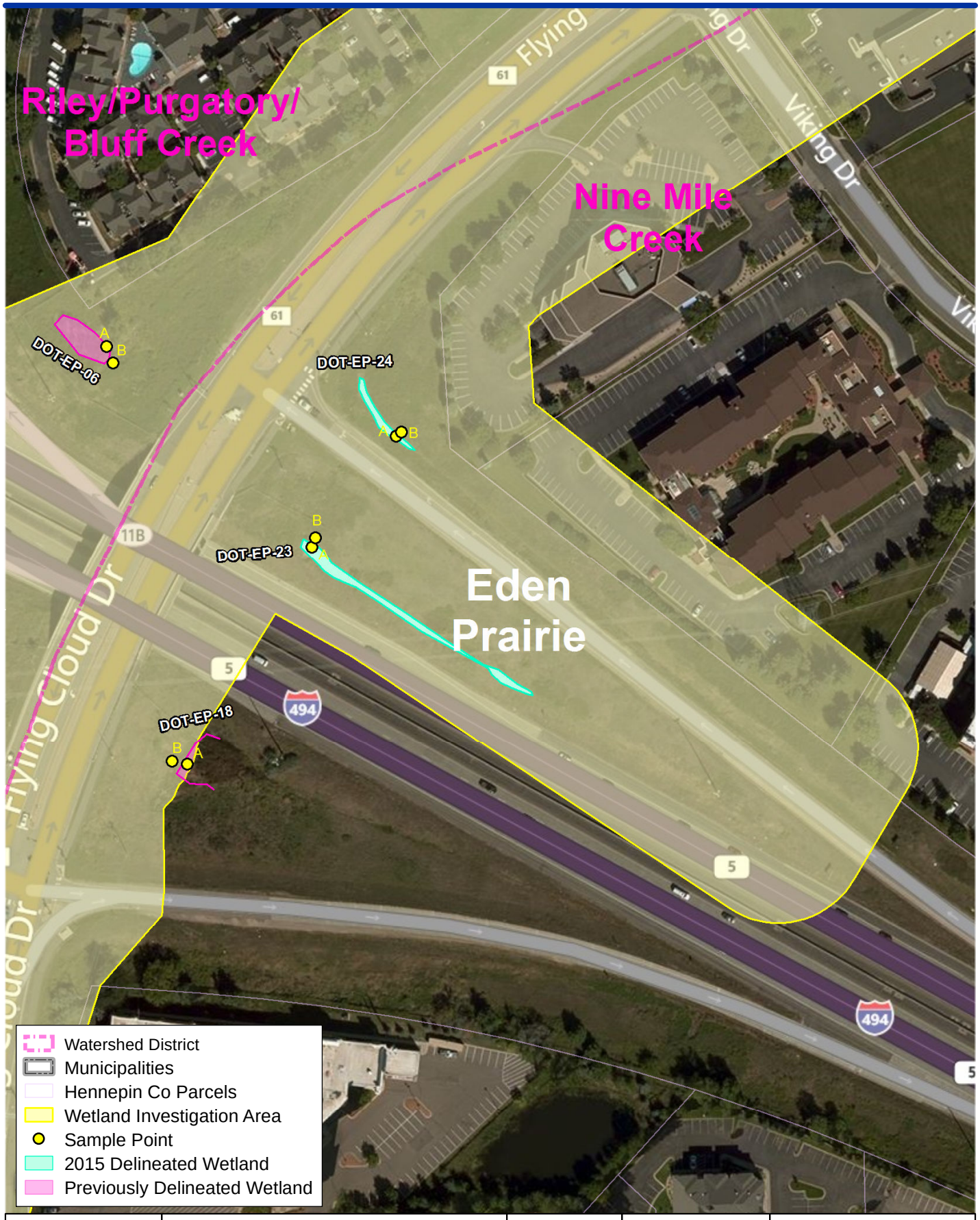
Delineation Exhibit

NORTH

0 75 150
Feet

METROPOLITAN COUNCIL

PLN_AE_SWLRT_2015FieldWork_Environmental_NM_EP_03_20150810_R00_00



Southwest LRT

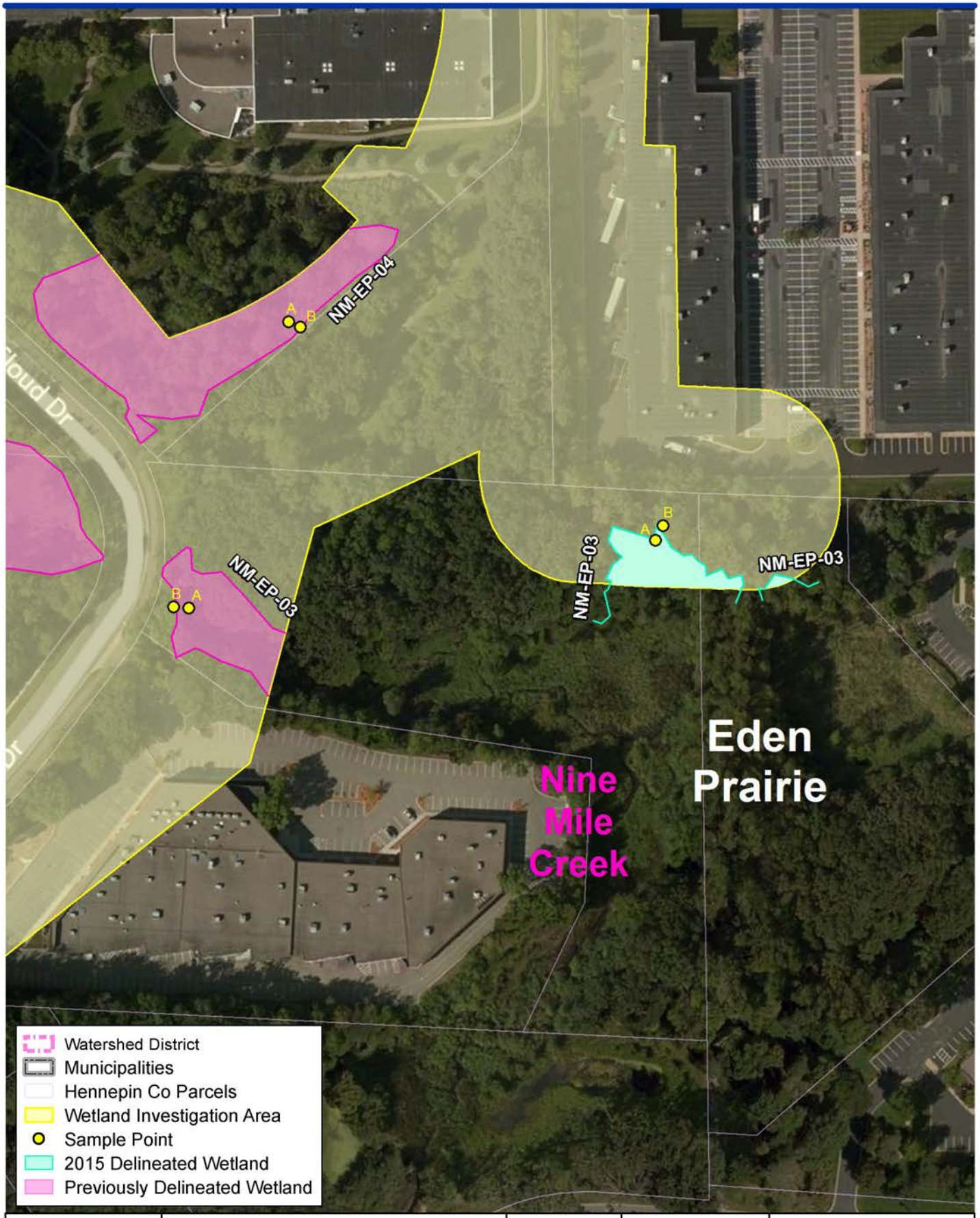
2015 Wetland Delineation Supplement
Area A

Delineation Exhibit

NORTH

0 75 150
Feet

PLN_AE_SWLRT_2015FieldWork_Delineation_DOT_EP_23_24_20150727_R00_00



Southwest LRT

2015 Wetland Delineation Supplement
Area B

Delineation Exhibit

NORTH

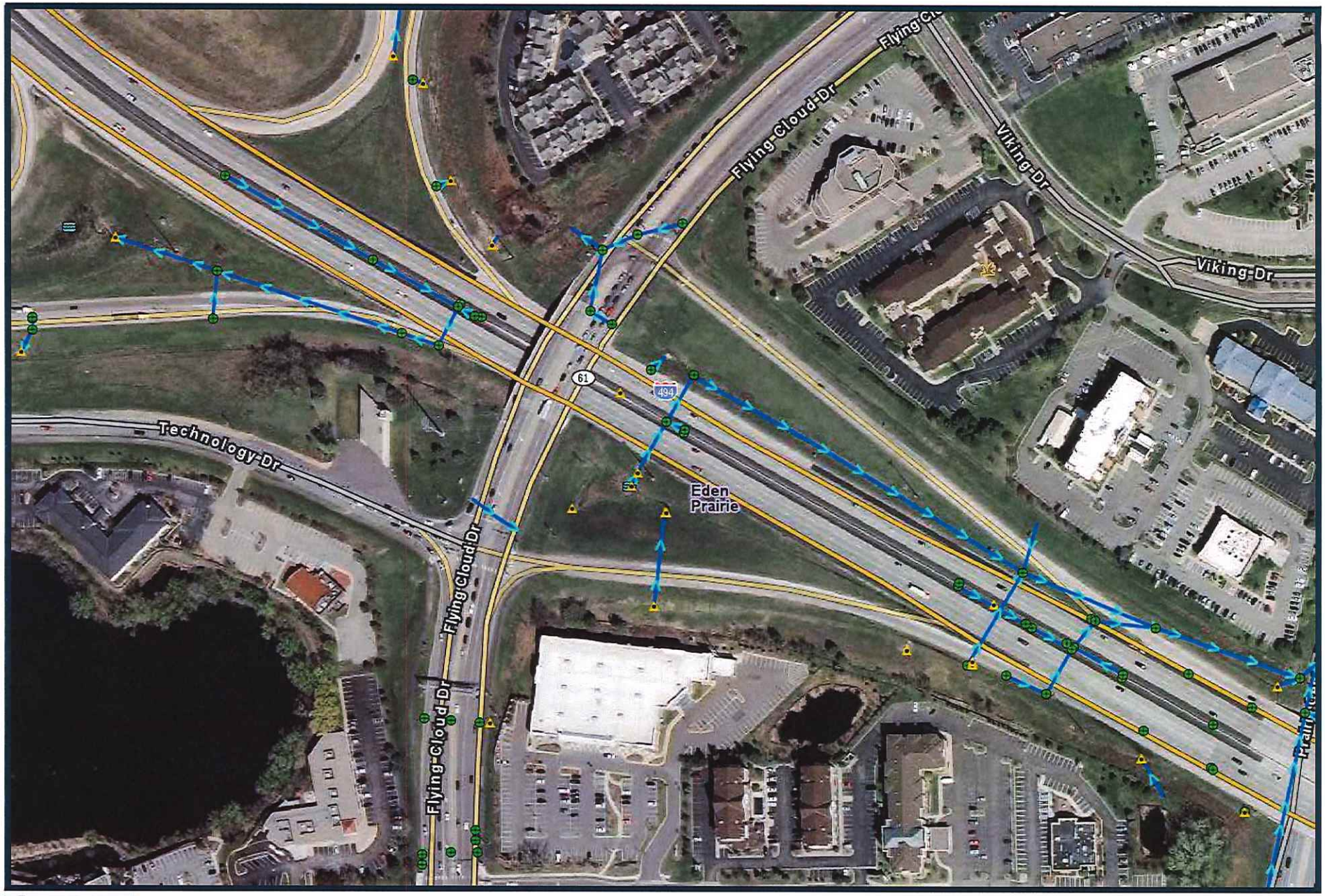
0 75 150
Feet

PLN_AE_SWLRT_2015FieldWork_Delineation_NM_EP_03_20150810_R00_00

Map

MINNESOTA DEPARTMENT OF TRANSPORTATION

Traffic Engineering



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APPENDIX C

Routine On-site Determination Method Datasheets

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: DOT-EP-23 | City/County: Hennepin | Sampling Date: 7/13/2015

Applicant/Owner: SWLRT | State: MN | Sampling Point: A

Investigator(s): Courtney Luensman, Lucy Dahl | Section, Township, Range: S36 T117N R22W

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

Slope (%): 6-12% | Lat: | Long: | Datum:

Soil Map Unit Name: Udorthents (U2A) | 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 X, or hydrology ____ significantly disturbed? Are "normal circumstances" present? No

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

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

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

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

Normal circumstances not met due to significantly disturbed soils from grading/construction of highway. All wetland criteria met, area is a wetland.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)		Absolute % Cover	Dominant Species	Indicator Staus
1				
2				
3				
4				
5				
		0	= Total Cover	
Sapling/Shrub stratum (Plot size:)				
1				
2				
3				
4				
5				
		0	= Total Cover	
Herb stratum (Plot size:)				
1	*Typha angustifolia*	60	Y	OBL
2	*Parthenocissus quinquefolia*	10	N	FACU
3	*Barbarea vulgaris*	10	N	FAC
4	*Cirsium arvense*	10	N	FACU
5				
6				
7				
8				
9				
10				
		90	= Total Cover	
Woody vine stratum (Plot size:)				
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	60	x 1 =	60
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column totals	90 (A)		170 (B)

Prevalence Index = B/A = 1.89

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical 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)

SOIL

Sampling Point: A

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					L	High organic content
6-10	10YR 2/2	90	10YR 3/6	10	C	M	CL	Compacted
10-20	10YR 5/2	30	5YR 4/4	30	C	M	CL	Mixed matrix, compacted
10-20	10YR 5/4	30					CL	Mixed matrix, compacted
10-20	10YR 2/1	30					CL	Mixed matrix, compacted
20-24	10YR 2/1	100					CL	Compacted

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

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X 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)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

Soil is compacted and disturbed due to grading associated with construction of adjacent highway.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- X 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	X	No		Depth (inches):	6
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:

Water table was sitting on top of a compacted layer - soil was not saturated due to compaction.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: DOT-EP-23 | City/County: Hennepin | Sampling Date: 7/13/2015

Applicant/Owner: SWLRT | State: MN | Sampling Point: B

Investigator(s): Courtney Luensman, Lucy Dahl | Section, Township, Range: S36 T117N R22W

Landform (hillslope, terrace, etc.): Slight slope | Local relief (concave, convex, none): None

Slope (%): 6-12% | Lat: | Long: | Datum:

Soil Map Unit Name: Udorthents (U2A) | 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 X, or hydrology ____ significantly disturbed? Are "normal circumstances" present? No

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.)

Normal circumstances not met due to significantly disturbed soils from grading/construction of highway. Wetland criteria not met; area is not a wetland.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size:)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size:)			
1 *Barbarea vulgaris*	40	Y	FAC
2 *Vicia americana*	30	Y	FACU
3 *Cirsium arvense*	15	N	FACU
4			
5			
6			
7			
8			
9			
10			
	85 = Total Cover		
Woody vine stratum (Plot size:)			
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	40	x 3 =	120
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column totals	85 (A)		300 (B)

Prevalence Index = B/A = 3.53

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical 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)

SOIL

Sampling Point: B

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					L	
6-12	10YR 5/4	100					SL	Fine gravel @ 6"

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

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ 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)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

Soil is disturbed due to grading associated with construction of adjacent highway.

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	X	No		Depth (inches):	18

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: DOT-EP-24 | City/County: Hennepin | Sampling Date: 7/13/2015

Applicant/Owner: SWLRT | State: MN | Sampling Point: A

Investigator(s): Courtney Luensman, Lucy Dahl | Section, Township, Range: S36 T117N R22W

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

Slope (%): 6-12% | Lat: | Long: | Datum:

Soil Map Unit Name: Lester (L22C2) | 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 X, or hydrology ____ significantly disturbed? Are "normal circumstances" present? No

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

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

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

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

Normal circumstances not met due to significantly disturbed soils from grading/construction of highway. All wetland criteria met, area is a wetland.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size:)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size:)			
1 *Phalaris arundinacea*	60	Y	FACW
2 *Typha angustifolia*	10	N	OBL
3 *Cirsium arvense*	10	N	FACU
4 *Verbena hastata*	5	N	FACW
5			
6			
7			
8			
9			
10			
	85 = Total Cover		
Woody vine stratum (Plot size:)			
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	10	x 1 =	10
FACW species	65	x 2 =	130
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column totals	85 (A)		180 (B)

Prevalence Index = B/A = 2.12

Hydrophytic Vegetation Indicators:

- ____ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ____ Morphogical 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)

SOIL

Sampling Point: A

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 2/1	100					SiCL	
6-14	10YR 5/2	60	10YR 4/6	10	C	M	CL	Mixed matrix
	10YR 5/4	30						
14-20	10YR 5/1	80	10YR 4/6	20	C	M	CL	
20-24	10YR 3/1	90	10YR 4/4	10	C	M	CL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

Soil is disturbed due to grading associated with construction of adjacent highway.

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):	0
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: DOT-EP-24 | City/County: Hennepin | Sampling Date: 7/13/2015

Applicant/Owner: SWLRT | State: MN | Sampling Point: B

Investigator(s): Courtney Luensman, Lucy Dahl | Section, Township, Range: S36 T117N R22W

Landform (hillslope, terrace, etc.): Slight slope | Local relief (concave, convex, none): None

Slope (%): 6-12% | Lat: | Long: | Datum:

Soil Map Unit Name: Lester (L22C2) | 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 X, or hydrology ____ significantly disturbed? Are "normal circumstances" present? No

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.)

Normal circumstances not met due to significantly disturbed soils from grading/construction of highway. Wetland criteria not met; area is not a wetland.

VEGETATION -- Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Staus
Tree Stratum (Plot size:)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Sapling/Shrub stratum (Plot size:)			
1			
2			
3			
4			
5			
	0 = Total Cover		
Herb stratum (Plot size:)			
1 *Cirsium arvense*	60	Y	FACU
2 *Vicia americana*	30	Y	FACU
3 *Lotus corniculatus*	5	N	FACU
4 *Barbarea vulgaris*	5	N	FAC
5 *Phalaris arundinacea*	5	N	FACW
6			
7			
8			
9			
10			
	105 = Total Cover		
Woody vine stratum (Plot size:)			
1			
2			
	0 = Total Cover		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column totals	105 (A)		405 (B)

Prevalence Index = B/A = 3.86

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical 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)

SOIL

Sampling Point: B

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 2/1	100					L	
6-12	10YR 5/4	70	10YR 4/6	5	C	M	CL	Mixed matrix
6-12	10YR 5/2	25					CL	Mixed matrix
12-24	10YR 5/2	85	10YR 4/6	15	C	M	C	

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

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ 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)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

Soil is disturbed due to grading associated with construction of adjacent highway.

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: NM-EP-03 (portion delineated in 2015) City/County: Hennepin Sampling Date: 8/10/15

Applicant/Owner: Southwest LRT State: MN Sampling Point: A

Investigator(s): Lucy Dahl, Tina Justen Section, Township, Range: S12 T116N R22W

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

Slope (%): 0-5% Lat: Long: Datum:

Soil Map Unit Name: Muskego Muck (L16A) NWI Classification: PFO1Ad

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

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

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

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:	

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

Climatic conditions were not normal because precipitation levels were slightly above average at the time of the delineation. All wetland criteria met; area is a wetland.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	
Sapling/Shrub stratum (Plot size:)			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size:)			
1 *Phalaris arundinacea*	65	Y	FACW
2 *Eutrochium purpureum*	15	N	FAC
3 *Eupatorium perfoliatum*	10	N	OBL
4 *Verbena hastata*	5	N	FACW
5 *Mentha arvensis*	5	N	FACW
6			
7			
8			
9			
10			
	100	= Total Cover	
Woody vine stratum (Plot size:)			
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	10	x 1 =	10
FACW species	75	x 2 =	150
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		205 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical 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)

SOIL

Sampling Point: A

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
0-3	10YR 2/1	100					SiL	organics mixed in
3-6	10YR 2/1	50					SiL	hydrogen sulfide odor
	10YR 5/3	30	10YR 3/6	20	C	M		
6-28	2.5N	100					L	

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

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ 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)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- X Other (explain in remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

Soils meet hydric criteria based on the presense of organic material in the soil, the hydrogen sulfide odor encountered at 3 inches, and best professional judgement.

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):	12
Saturation present? (includes capillary fringe)	Yes	X	No		Depth (inches):	8

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: NM-EP-03 (portion delineated in 2015) City/County: Hennepin Sampling Date: Revised 10/12/15

Applicant/Owner: Southwest LRT State: MN Sampling Point: B

Investigator(s): Lucy Dahl, Tina Justen Section, Township, Range: S12 T116N R22W

Landform (hillslope, terrace, etc.): Slight Slope Local relief (concave, convex, none): None

Slope (%): 5-10% Lat: Long: Datum:

Soil Map Unit Name: Muskego Muck (L16A) NWI Classification: PFO1Ad

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

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

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

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y		
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.)

Climatic conditions were not normal because precipitation levels were slightly above average at the time of the delineation. Area does not meet hydric soil or wetland hydrology indicators; area is not a wetland.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1 *Populus deltoides*	20	Y	FAC
2			
3			
4			
5			
	20	= Total Cover	
Sapling/Shrub stratum (Plot size:)			
1 *Rhamnus cathartica*	80	Y	FAC
2			
3			
4			
5			
	80	= Total Cover	
Herb stratum (Plot size:)			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
	0	= Total Cover	
Woody vine stratum (Plot size:)			
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	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	100	x 3 =	300	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	100	(A)	300	(B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical 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)

SOIL

Sampling Point: B

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
0-26	10YR 2/1	100					L	dry
26-45	10YR 2/1	100					CL	
45+	7.5YR 3/1	100					LS	Gravelly

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

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ 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)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

Soil profile was revised at delineation review on 10/12/2015 to determine the depth of color change (45").

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:

APPENDIX D

Site Photographs

DOT-EP-23

DOT-EP-23

DOT-EP-24

DOT-EP-24

NM-EP-03 (Portion delineated in 2015)

NM-EP-03 (Portion delineated in 2015)

APPENDIX E

MnRAM: Minnesota Routine Assessment Methodology

Management Classification Report for NM-EP-3 **SWLRT NM-EP-3**

ID: 66

County
Minnesota (Shakopee) Watershed, #33
Corps Bank Service Area 9

Based on the MnRAM data input from field and office review and using the classification settings as shown below, this wetland is classified as

Functional rank of this wetland based on MnRAM data	Functional Category	Self-defined classification value settings for this management level
Low	Vegetative Diversity/Integrity	High
Moderate	Habitat Structure (wildlife)	High
Low	Amphibian Habitat	Moderate
High	Fish Habitat	High
Moderate	Shoreline Protection	Moderate
Low	Aesthetic/Cultural/Rec/Ed and Habitat	High / Moderate
Moderate	Stormwater/Urban Sensitivity and Vegetative Diversity	High / Moderate
Moderate	Wetland Water Quality and Vegetative Diversity	High / Moderate
Moderate	Characteristic Hydrology and Vegetative Diversity	High / Moderate
Moderate	Flood/Stormwater Attenuation*	-
Not Applicable	Commericial use*	High
Moderate	Downstream Water Quality*	-

The critical function that caused this wetland to rank as **Manage 1** was
Maintenance of Characteristic Fish Habitat

Details of the formula for this action are shown below:

Maintenance of Characteristic Fish Habitat **[Q46*2)+Q24+Q18+Q20R+Q28+Q30+Q31+Q33R]/9**

Question	*Value*	*Description*
18	1	Sediment delivery
20	0.5	Stormwater runoff
24	1	Adjacent area Management
28	0.5	Nutrient loading
30	1	Shoreline rooted vegetation (%cover)
31	0.5	Shoreline wetland in-water width
33	1	Shoreline erosion potential
46	0.5	Fish habitat quality

* The classification value settings for these functions are not adjustable

Management Classification Report for NM-EP-3

SWLRT NM-EP-3

ID: 66

County
Minnesota (Shakopee) Watershed, #33
Corps Bank Service Area 9

This report was printed on: Tuesday, October 15, 2013

* The classification value settings for these functions are not adjustable

Wetland Functional Assessment Summary

Wetland Name	Hydrogeomorphology	Maintenance of Hydrologic Regime	Flood/ Stormwater/ Attenuation	Downstream Water Quality	Maintenance of Wetland Water Quality	Shoreline Protection
NM-EP-3	Depressional/Tributary (outlet but no perennial inlet or drainage entering from upstream subwatershed)	0.65	0.52	0.47	0.44	0.44
		Moderate	Moderate	Moderate	Moderate	Moderate

						Additional Information			
Wetland Name	Maintenance of Characteristic Wildlife Habitat Structure	Maintenance of Characteristic Fish Habitat	Maintenance of Characteristic Amphibian Habitat	Aesthetics/ Recreation/ Education/ Cultural	Commercial Uses	Ground-Water Interaction	Wetland Restoration Potential	Wetland Sensitivity to Stormwater and Urban Development	Additional Stormwater Treatment Needs
NM-EP-3	0.44	0.72	0.18	0.31	0.00	Combination Discharge, Recharge	0.00	0.10	0.44
	Moderate	High	Low	Low	Not Applicable		Not Applicable	Moderate	Moderate

Wetland Community Summary

		Vegetative Diversity/Integrity								
		Community								
Wetland Name	Location	Cowardin Classification	Circular 39	Plant Community	Wetland Proportion	Individual Community Rating	Highest Wetland Rating	Average Wetland Rating	Weighted Average Wetland Rating	
NM-EP-3	-116-22-12-001	PEMC	Type 3	Shallow Marsh	100	0.1	0.10	0.10	0.10	
							Low	Low	Low	
					100		0.10	0.10	0.10	☐

☑ *Denotes incomplete calculation data.*

MnRAM: Site Response Record

For Wetland: NM-EP-3

Location: -116-22-12-001

SWLRT NM-EP-3 66

Plant Community: Shallow Marsh

Cowardin Classification: PEMC

Circular 39: Type 3

4	*Listed, rare, special species?*	No
5	*Rare community or habitat?*	No
6	*Pre-European-settlement condition?*	No

Hydrogeomorphology / topography:

7		Depressional/Tributary
8-1	*Maximum water depth*	16 inche
8-2	*% inundated*	20%
9	*Immediate drainage--local WS*	4 acres
10	*Esimated size/existing site:*	*(see #66)*
11-Upland Soil		Lester
11-Wetland Soil		Lester

12	*Outlet for flood control*	C
13	*Outlet for hydro regime*	A
14	*Dominant upland land use*	C
15	*Wetland soil condition*	A
16	*Vegetation (% cover)*	15%
17	*Emerg. veg flood resistance*	B
18	*Sediment delivery*	A
19	*Upland soils (soil group)*	B
20	*Stormwater runoff*	B
21	*Subwatershed wetland density*	B
22	*Channels/sheet flow*	C
23	*Adjacent buffer width*	200 feet

Adjacent area management

24-A	*Full*	100%
24-B	*Manicured*	0%
24-C	*Bare*	0%

Adjacent area diversity/structure

25-A	*Native*	0%
25-B	*Mixed*	100%
25-C	*Sparse*	0%

Adjacent area slope

26-A	*Gentle*	0%
26-B	*Moderate*	70%
26-C	*Steep*	30%

27	*Downstream sens./WQ protect.*	B
28	*Nutrient loading*	B
29	*Shoreline wetland?*	Yes

Shoreline Wetland

30	*Rooted veg., % cover*	80%
31	*Wetland in-water width*	30 feet
32	*Emerg. veg. erosion resistance*	B
33	*Erosion potential of site*	C
34	*Upslope veg./bank protection*	C
35	*Rare wildlife?*	No
36	*Scare/Rare/S1/S2 community*	No
37	*Vegetative cover*	B
38	*Veg. community interspersion*	NA
39	*Wetland detritus*	C
40	*Interspersion on landscape*	B
41	*Wildlife barriers*	B

Amphibian-breeding potential

42	*Hydroperiod adequacy*	Adequate
43	*Fish presence*	B
44	*Overwintering habitat*	C
45	*Wildlife species (list)*	
46	*Fish habitat quality*	B
47	*Fish species (list)*	
48	*Unique/rare opportunity*	No
49	*Wetland visibility*	C
50	*Proximity to population*	Yes
51	*Public ownership*	C
52	*Public access*	C
53	*Human influence on wetland*	B
54	*Human influence on viewshed*	C
55	*Spatial buffer*	B
56	*Recreational activity potential*	C
57	*Commercial crop--hydro impact*	NA

Groundwater-specific questions

58	*Wetland soils*	Recharge
59	*Subwatershed land use*	Recharge
60	*Wetland size/soil group*	Recharge
61	*Wetland hydroperiod*	Recharge
62	*Inlet/Outlet configuration*	Discharge
63	*Upland topo relief*	Discharge

Additional information

64	*Restoration potential*	No
65	*LO affected by restoration*	
66	*Existing size*	2
	Restorable size	0
	Potential new wetland	0
67	*Average width of pot. buffer*	0 feet
68	*Ease of potential restoration*	
69	*Hydrologic alterations*	0
70	*Potential wetland type*	0
71	*Stormwater sensitivity*	B
72	*Additional treatment needs*	A

Watershed Minnesota (Shakopee)

WS# 33 Service Area: 9

For functional ratings, please run the Summary tab report.

This report printed on: 10/15/2013

MnRAM Site Assessment Report

Tuesday, October 15, 2013

Wetland: NM-EP-3 **Project: SWLRT NM-EP-3**

Wetland ID: 66, Township 116, Section 12, Range 22

Minnesota (Shakopee) Watershed, Corps Bank Service Area #9

Site conditions were Normal. This wetland is estimated to cover 2 acres.

This report reflects conditions on the ground at the date of the assessment and, unless noted or implicit in the standard questions, does not reflect speculation on the future or past conditions.

This wetland is located in or near the city of Eden Prairie in Hassan Township.

General Features

Hydrogeomorphology

The maximum water depth at this site is 16 inches, with 20 percent inundated. With an immedidate drainage area of 4 acres, it is doubtful that this wetland is sustainable given its small catchment area.

As a Depressional/Tributary wetland, this site has an outlet but no perennial inlet or drainage entering from the upstream subwatershed. As such, Placeholder for Depressional/Tributary discussion.

This wetland has been drained or altered 0% from its original size of 2 acres.

Soils

The soils in the immediate wetland area are primarily Lester. The adjacent upland, to about 500 feet, is Lester.

Vegetation and Upland Buffer

The extent of vegetation in this wetland is about 15 percent and the naturalized buffer width averages 200 feet. Vegetated buffers around wetlands provide multiple benefits including wildlife habitat, erosion protection, and a reduction in surface water runoff.

This buffer not only provides an excellent buffer for wetland water quality, it also serves as an important resources for wildlife habitat.

As a shoreline wetland, this site has the potential to protect from erosion and provide spawning and nursery habitat for fish and wildlife. Wetlands located in areas with strong currents and wave action have the greatest potential for protecting shoreline. Shorelines composed of sandy or erodible soils will benefit the most from shoreline wetland protection.

Special Features

There were no special features observed at the site at the time of this assessment

Vegetative Communities

The following plant communities were observed:

(See Appendix A for details on the Dominant Species per plant community)

(See Appendix A for details on the Dominant Species per plant community)

Shallow Marsh Type 3, PEMC. This community had a vegetative index of low and comprised 100 percent of the entire area.

The highest rated community was the Shallow Marsh community rated at 1. Averaging all the communities together, the Vegetative Diversity and Integrity of this wetland is Low. A more accurate look uses a weighted average; using this method, this site shows a Low Vegetative Diversity and Integrity.

The majority of vegetation at this site, such as it is, does not contribute to wetland function beyond water retention and flow resistance. However, because the weighted average can "hide" smaller communities, always check for even small patches of high-quality species.

Functional Ratings

Function	*Rating*	*Comment*
Vegetative Diversity	Low	If vegetation is present, the primary communities are compromised by extensive invasive and/or non-native species. Ongoing maintenance will be necessary to restore native ecologic communities, although the presence of invasives upstream will limit the success of restoration efforts.
Additional stormwater treatment needs	Moderate	Sediment removal would improve the ability of this site to maintain water quality.
Maintenance of Hydrologic Regime	Moderate	There has been some degree of human alteration of the wetland hydrology, either by outlet control or by altering immediate watershed conditions. However, the wetland retains some of the hydrologic regime similar to the original wetland type, either in part of the wetland or overall to some extent. Because of the interference (whether active or inadvertant), some characteristic vegetative communities have likely been affected, as also have the functions of flood attenuation, water quality and groundwater interaction.
Flood/Stormwater/Attenuation	Moderate	The wetland provides some flood storage and/or flood wave attenuation. It may have either an altered or unrestricted outlet, disturbed wetland soils, thin or little emergent vegetation (with channels) or it may be situated high in a watershed with a low proportion of impervious surfaces, moderate runoff volumes, loamy upland soils, and one or more other wetlands present within the subwatershed.
Downstream Water Quality	Moderate	This wetland has some ability and opportunity to protect downstream resources. The ability of the wetland to remove sediment from stormwater is determined by emergent vegetation and overland flow characteristics. A high nutrient removal rating indicates dense vegetation and sheet flow to maximize nutrient uptake and residence time within the wetland. The opportunity for a wetland to protect a valuable water resource diminishes with distance from the wetland so wetlands with valuable waters within 0.5 miles downstream have the greatest opportunity to provide protection, as do those that receive more (and less-treated) runoff.

Maintenance of Wetland Water Quality	Moderate	Wetland water quality is average. Sediment removal from incoming water would benefit the site. Also consider reducing the amount of stormwater directed at the site. Sustaining a diverse wetland may require additional control over upland land use and the buffer.
Shoreline Protection	Moderate	This fringe site provides some protection against erosive action. Reducing the amount of buffer that is manicured would further protect the adjacent water resource, as would increasing the buffer width.
Maintenance of Characteristic Wildlife Habitat Structure	Moderate	The site provides good habitat and is relatively accessible to wildlife, although it may be somewhat isolated on the landscape and lack the rich vegetative community and complex structure that would support a wider range of wildlife.
Maintenance of Characteristic Fish Habitat	High	The site has a direct connection to spawning or nursery habitat, or may provide refuge or shade for native species of fish. Low amounts of sediment mean that eggs are not smothered; good water quality supports fish health.
Maintenance of Characteristic Amphibian Habitat	Low	Predatory fish are always present and winter habitat unsuitable as site often freezes to the bottom. High inputs of untreated stormwater or unfiltered runoff contribute to poor water quality and reproductive conditions.
Aesthetics/Recreation /Education/Cultural	Low	Inaccessible, distant from population centers, little-used sites that are not culturally significant rank poorly even if their other functions rank high. Usually, however, even the most distant sites have a potential for recreational use and will drop to the lowest ranking only if they are negatively affected by human alteration.
Wetland restoration potential	Not Applicable	Because restoration would affect permanent structures or infrastructure (houses, roads, septic systems), this site is not suitable for restoration.
Wetland Sensitivity to Stormwater and Urban Development	Moderate	This wetland is moderately sensitive to stormwater; Floodplain forests, fresh wet meadows dominated by reed canary grass, shallow and deep marshes dominated by cattail, reed canary grass, giant reed or purple loosestrife, and shallow, open water communities with low to moderate vegetative diversity.

Appendix A: Dominant Species By Plant Community

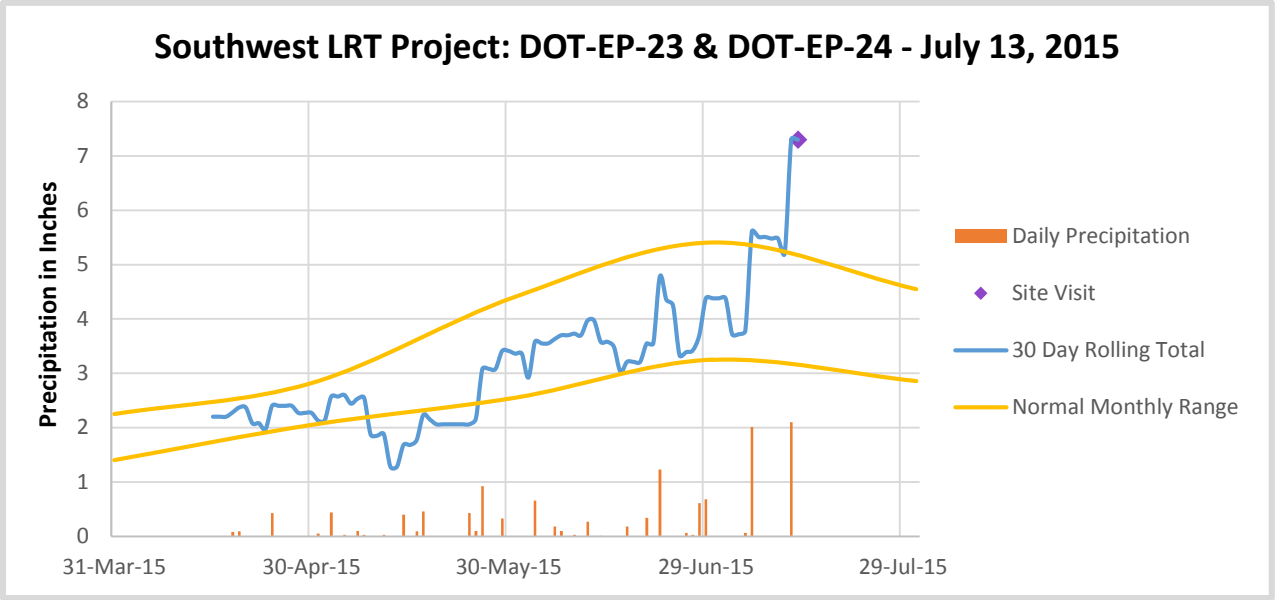
	Wetland Type	Plant Community	Dominant Species	Percent Cover
PEMC	**Type 3**	**Shallow Marsh**		
			Water smartweed	>10-25%
			Reed canary grass	>75-100%

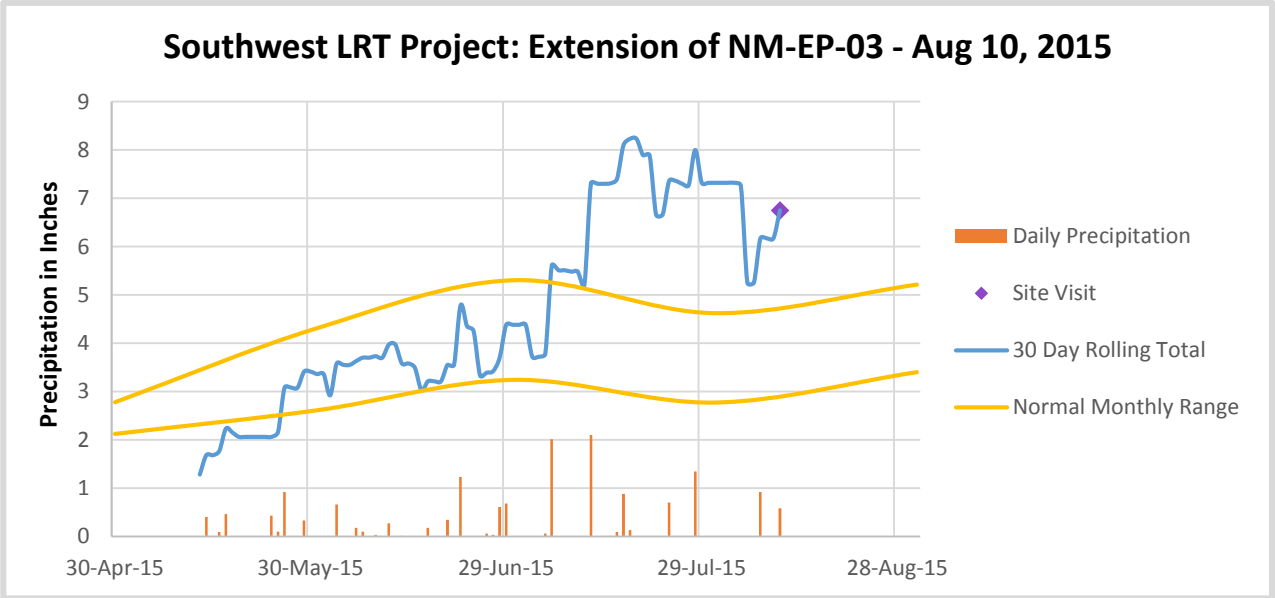
APPENDIX F

30 Day Rolling Precipitation Totals &

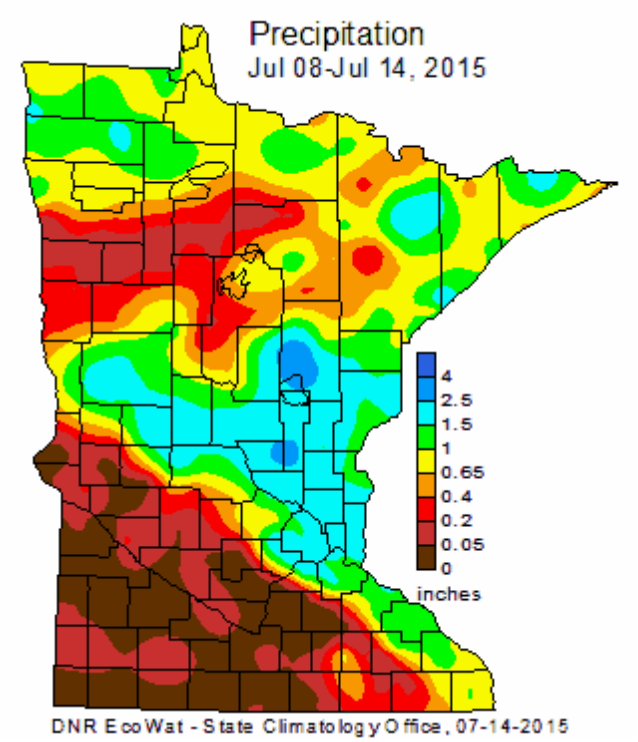
Antecedent Precipitation Record

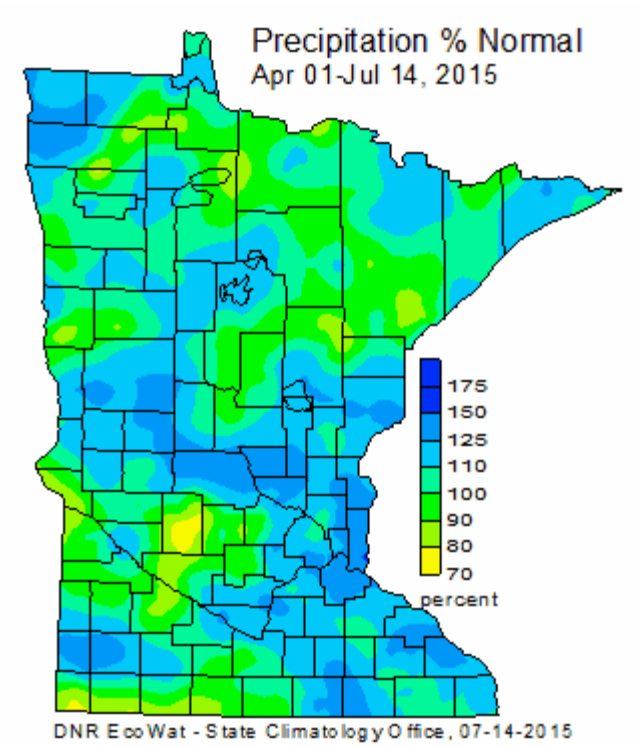
30 Day Rolling Total Precipitation Graphs

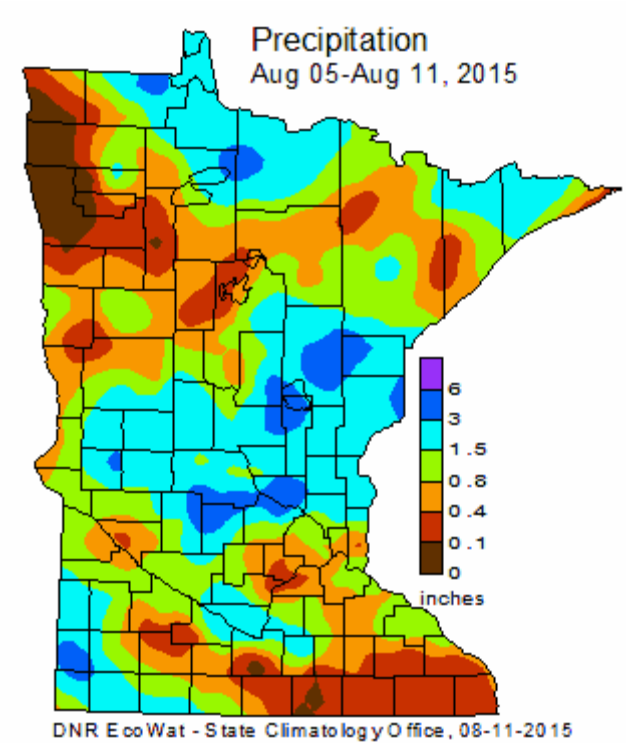


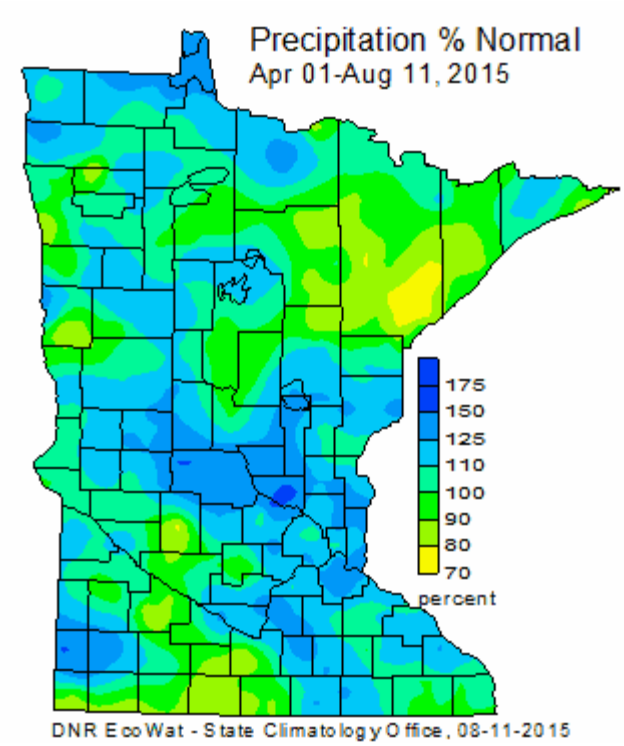


Antecedent Precipitation Record









Source: http://climate.umn.edu/doc/weekmap/weekmap_150714.htm &
http://climate.umn.edu/doc/weekmap/weekmap_150811.htm

ATTACHMENT 1

Anderson Engineering of Minnesota, LLC

Environmental Staff Credentials

ANDERSON ENGINEERING
MINNEAPOLIS, MINNESOTA • TAMPA, FLORIDA

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BENJAMIN J. HODAPP, PWS

Environmental Services Manager
Professional Wetland Scientist #1832
MN Certified Wetland Delineator #1016

Education:

MS Water Resources Management
University of Wisconsin-Madison

BS Biology; Ecology
Minnesota State University- Mankato

Specialized Training:

Wetland Delineation & Management Training
Richard Chinn Environmental Training, Inc.

Wetland Plant Identification
Biotic Consultants Inc.

Plant Identification for Wetland Delineation
University of Wisconsin-La Crosse

Watershed Academy Web Certificate
United States Environmental Protection Agency

Professional Associations:

Society of Wetland Scientists
MN Wetland Professionals Association (WPA)
MN WPA President 2010
Wisconsin Wetlands Association
Minnesota Native Plant Society
Ecological Society of America

Total Years of Experience:

14 years

Years with Current Firm:

2004 to Present

Selected Publications:

The Future of Rowan Creek Watershed: Connecting Land Use and Management with Water Quality. 2003. Water resources Management Workshop 2002 Gaylord Nelson Institute for Environmental Studies, University of Wisconsin, Madison.

The Tumultuous World of Drainage Districts: An Analysis of Existing Management Arrangements, with Recommendations. Working Paper Series 2002-1. Water Resources Institutions and Policies, Department of Urban and Regional Planning, University of Wisconsin, Madison.

Experience Summary:

Benjamin Hodapp, a Biologist and Project Manager, brings a broad background of knowledge and experience in the natural resource field to the Anderson Engineering team. Benjamin has a unique combination of biologic training and field skills in addition to working experience at various levels of government (NRCS, FSA, University of MN Extension, Watonwan County Soil and Water Conservation District and Watonwan County Environmental Services).

Benjamin's project experience includes natural resource inventory, wetland determinations, delineations, mitigation design and monitoring, regulatory permit applications, wetland functions and values assessments, flood plain analysis, ordinary high water determinations, aerial photo interpretation. Benjamin has training and experience with Global Positioning Systems (GPS) and Geographic Information Systems (GIS).

Representative Projects:

- **Farmed Wetland Determination Inventory - USDA NRCS – Various Counties, ND:** Project manager and field crew chief for farmed wetland determination inventory project within three counties in North Dakota. Project tasks included project management oversight of all supporting staff, client point of contact, scheduling field investigations with dozens of landowners, supervision of field staff during data collection, and quality control of deliverables sent to the USDA NRCS.

- **Wetland Delineation/Assessment – Northern Natural Gas – Dakota County and Freeborn County, MN & Worth County, IA:** Project manager and field crew chief for wetland determinations, boundary delineations and threatened and endangered species habitat assessments for three proposed natural gas line corridors located in Iowa and Minnesota. Project tasks and included project management oversight of all supporting staff, providing point of contact services for client, supervising field staff in completion of a wetland investigations and habitat assessments, and quality control of deliverables.

- **Wetland Delineation/Assessment – Northern Natural Gas – Redfield, IA:** Project manager and field crew chief for wetland determinations, boundary delineations and threatened and endangered species habitat assessments for 20 miles of proposed natural gas line corridors and 1,000 acres of proposed natural gas well pads. Project tasks and included project management oversight of all supporting staff, providing point of contact services for client, supervising field staff in completion of a wetland investigations and habitat assessments, and quality control of deliverables

- **Section 401/404 Wetland Permitting – Fort McCoy Commemorative Park Expansion – Fort McCoy, WI:** Provided project management services for Section 401/404 permitting associated with proposed wetland impacts resulting from the Commemorative Park Expansion Project at the Fort McCoy U.S. Army installation. Project tasks included project management of supporting staff, providing point of contact services for the U.S. Army, developing a wetland mitigation strategy in compliance with Section 401/404 and state wetland permitting requirements and oversight and quality control in preparing Section 401/404 permit application

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COURTNEY M. LUENSMAN

Environmental Associate

Education:

BA Environmental Studies
Illinois Wesleyan University

Professional Associations:

MN Wetland Professionals Association
Minnesota Naturalists' Association

Total Years Experience:

2 years

Years with Current Firm:

2013 to Present

Experience Summary:

Courtney Luensman, an Environmental Associate, brings a range of knowledge and experience in the field of biological monitoring to the Anderson Engineering team. Prior to her employment with Anderson Engineering of MN, LLC, Courtney worked as an Assistant Ecologist for Arrowhead Environmental Consulting and as an environmental educator in Cuyahoga Valley National Park. The skills Courtney has developed through her educational background and work experience make her proficient in clearly communicating a variety of solutions to clients and regulatory agencies.

Courtney's project experience includes natural resource inventories; watershed assessments; biologic assessments; collection of wetland data using the data forms provided in the U.S. Army Corps of Engineers (USACE) Regional Supplement(s) to the 1987 Delineation Manual; wetland determinations, delineations, and monitoring; regulatory permit applications; aquatic macro invertebrate sampling; Low Impact Development strategies; and technical document preparation. Courtney has experience with Global Positioning Systems (GPS), remote sensing, and Geographic Information Systems (GIS).

Representative Projects:

- **Farmed Wetland Determination Inventory – USDA NRCS – Various Counties, ND:** Services included completion of a farmed wetland determination inventory project within three counties in North Dakota. Performed on-site investigation on farmed wetlands on over 24,000 acres of agricultural land. Implemented standard sampling protocols such as standard transect sampling, vegetation identification, quantitative vegetative data collection and completion of standardized data sheets.
- Stream biological monitoring including macro invertebrate community and habitat assessment as well as water chemistry collection for Cuyahoga Valley National Park

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Lucy A Dahl
Environmental Associate

Education:
BA Environmental Science
University of Wisconsin, River Falls

Total Experience:
3 years

Years with Current Firm:
2014 to Present

Experience Summary:
Lucy Dahl, an Environmental Associate, brings a variety of knowledge and experience in the field of biological monitoring to the Anderson Engineering team. Prior to her employment with Anderson Engineering of MN, LLC, Lucy worked as a Federal Contractor for the USDA – Natural Resources Conservation Service (NRCS). The skills Lucy has developed through her educational background and work experience make her proficient in analyzing and interpreting data in order to clearly communicate a variety of solutions to clients and regulatory agencies.

Lucy's project experience includes NRCS wetland determinations; watershed assessments; National Environmental Policy Act (NEPA) report preparation; collection of wetland data using the data forms provided in the U.S. Army Corps of Engineers (USACE) Regional Supplement(s) to the 1987 Delineation Manual; regulatory permit applications; and technical document preparation. Lucy has experience with Global Positioning Systems (GPS), remote sensing, and Geographic Information Systems (GIS).

Representative Projects:

- **Wetland Determinations – USDA NRCS – Dunn, Pierce, and St. Croix Counties, WI:** Services included assisting the WI NRCS Wetland Specialist in completing requested wetland determinations for farmers participating in USDA Farm Bill programs. Determinations were completed on and off-site as necessary, and maps were developed and added to the existing wetland inventory for each county.

- National Environmental Policy Act (NEPA) report preparation experience includes completing environmental assessments on conservation practices being implemented through NRCS cost-share programs. Projects included wetland restoration projects, stream bank stabilization projects, manure storage facilities, and grade stabilization structures among others.

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KRISTINA A. JUSTEN

Environmental Associate

Education:

BS Biology
University of Wisconsin - River Falls

Specialized Training

Certified in Stream Electrofishing
WI DNR, April 2010

Professional Associations:

MN Wetland Professionals Association

Total Years Experience:

5 years

Years with Current Firm:

2010 to Present

Experience Summary:

Kristina Justen, an Environmental Associate, brings a range of knowledge and experience in the field of biological monitoring to the Anderson Engineering team. Prior to her employment with Anderson Engineering of MN, LLC, Kristina worked as a wetland technician for the Minnesota Pollution Control Agency. The skills Kristina has developed through her educational background and experience as a wetland technician make her proficient in assessing and addressing a range of natural resource issues, and clearly communicating solutions to clients and various regulatory agencies.

Kristina's project experience includes natural resource inventory, watershed assessments, biologic assessments, Threatened and Endangered Species analysis, NEPA project management and document preparation, wetland determinations, delineations, mitigation design and monitoring, regulatory permit applications, wetland functions and values assessments, flood plain analysis, ordinary high water determinations, wetland macroinvertebrate sampling, Floristic Quality Assessments, Total Maximum Daily Load (TMDL) investigation, and aerial photo interpretation. Kristina has experience with Global Positioning Systems (GPS), remote sensing, and Geographic Information Systems (GIS).

Representative Projects:

- Linear Corridor Projects including biologic assessment for critical habitat, threatened and endangered species, wetland determination, wetland delineation, and wetland mitigation replacement services for Northern Natural Gas– Ventura North III Natural Gas Pipeline
  Dakota County, MN, Freeborn County, MN & Worth County, IA

- Project Scientist for NEPA Environmental Assessment and Section 106 historic coordination as subcontractor for the United States Department of Veteran Affairs proposed parking ramp construction at Minneapolis VA Health Care System located in Minneapolis, MN.

- Project Scientist and Technical Writer for Nation-wide Environmental Management System (EMS) program development at 160 National Cemetery sites and EMS Manual preparation for 65 supervisory cemetery facilities; tracking database development; and Safety and Health Management System audits and manuals for 11 selected facilities for the United States Department of Veterans Affairs, National Cemetery Administration.

- Project Scientist for investigation and summary report regarding the shared storm water conveyance, treatment, and permitting requirements at Fort Snelling National Cemetery, Minneapolis, MN.

- Stream biological monitoring including fish and macroinvertebrate community and habitat assessment, as well as water chemistry collection for MPCA.

- Using an Index of Biotic Integrity to Measure the Effects of a Tributary (Parker Creek) on the Biotic Integrity of the Kinnickinnic River for UWRF.