Appendix G.
2017 Main Stem Erosion Repair Project
Feasibility Report, May 2016

Wetland Delineation Report - DRAFT

Bassett Creek Restoration Project Feasibility Study

Prepared for
Bassett Creek Watershed Management Commission

March 2016

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1.0 Introduction

Bassett Creek Watershed Management Commission (BCWMC) is submitting a Wetland Delineation Report as part of a study that examines the feasibility of restoring stream reaches damaged by erosion or affected by sedimentation. The project area is located along several reaches of Bassett Creek from Cedar Lake Road to Dupont Avenue North (the new Bassett Creek tunnel entrance) and Second Avenue North (the old Bassett Creek tunnel entrance) (east section), plus the Fruen Mill site between Glenwood Avenue North and the first railroad bridge crossing (west section), Minneapolis, Hennepin County, Minnesota. The project area is within Sections 20 and 21 of Township 29 North, Range 24 West (**Figure 1**).

Creek edges and wetlands fringing the creek were delineated within the project area. Three wetland boundaries and the entire length of the creek were delineated within the project area and are depicted in **Figures 7 and 8**.

This Wetland Delineation Report has been prepared in accordance with the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual ("1987 Manual", USACE, 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE, 2010) and the requirements of the Minnesota Wetland Conservation Act (WCA) of 1991. Barr delineated the wetland boundaries and determined wetland types within the project area on November 25, 2015.

This report includes a project overview (Section 2.0), general environmental information (Section 3.0), descriptions of the delineated wetlands (Section 4.0), and a discussion of regulations and the administering authorities (Section 5.0). The Tables section includes the precipitation data. The Figures section includes the Site Location Map, Topography Maps, National Wetland Inventory (NWI), Public Waters Inventory (PWI), Soil Survey Map and the Wetland and Creek Delineation Maps. **Appendix A** includes Wetland Data Forms, and site photographs are included in **Appendix B**.

Regulatory approval is required for wetland delineations performed as a part of this feasibility study where impacts may occur. A site review should be completed as part of final design during the 2016 growing season. The site review would be conducted by a Technical Evaluation Panel consisting of representatives from the Minnesota Board of Water and Soil Resources, Hennepin County, City of Minneapolis, the Minnesota Department of Natural Resources, and USACE.

2.0 Project Description

The BCWMC Engineer walked the entire project area in September 2015 and identified sites that are candidates for stabilization to address bank erosion, scour, and/or bank failure. Additional site visits were conducted through November and December 2015 to meet with stakeholders on site, check conceptual stabilization alternatives, and observe the creek during different flow conditions. The project area presented in this report was deemed to be the most critical for meeting the BCWMC goals and objectives while providing a cost-effective benefit.

The bank erosion and bank failures throughout the project area appear to be caused by a combination of natural stream erosion processes, problems associated with changing watershed hydrology, and effects of riparian land use. Stream bank erosion is a natural process that occurs at some rate on all alluvial channels, and the natural erosion rate can be accelerated by local and regional changes in land use and hydrology. Stable stream channels are often said to be in a state of "dynamic equilibrium" with their watersheds, and they adjust to changes in the watershed hydrology. It may take many years or decades for a stream to fully adjust to a rapid change in watershed hydrology. The use of best management practices (BMPs) helps to reduce the impacts to streams from development projects. Nonetheless, development and land use changes fundamentally change the hydrology of the watershed, even if the impacts are significantly reduced compared to eras when BMPs were infrequently used. Physical changes and increased rates of erosion often occur as streams adjust to changes in the hydrology, which often include increased magnitude and frequency of high flow events.

3.0 General Environmental Setting

3.1 Site Description

The proposed project area is made up of an east section and west section and is located within City of Minneapolis property. Land use adjacent to the project area is a mixture of industrial facilities and wooded parks and hill slopes. Active and abandoned industrial facilities (including the City's vehicle impound lot) abut portions of the project area. Other portions of the project area include wooded hill slopes, which in the west section are part of the MPRB's Bassett's Creek Park. (**Figure 1**).

3.2 Topography

Most of the project area has steep and abrupt slopes leading into Bassett Creek. Adjacent areas to the creek and wetlands in the west section have abrupt to moderately undulating topography but flat topography on the Fruen Mill property (**Figure 2**). Adjacent areas in the east section of the project area have mostly flat topography due to the presence of parking areas, roads and industrial development closer to the creek (**Figure 3**).

3.3 Precipitation

Recent precipitation data were compared to historic data for evaluating annual and monthly deviations from normal conditions. Simulated precipitation data were obtained from the Minnesota Climatology Working Group, Wetland Delineation Precipitation Data Retrieval from a Gridded Database (http://climate.umn.edu/gridded_data/precip/wetland/wetland.asp) for wetlands in Hennepin County, Township 29 North, Range 24 West, Section 20.

In 2015, antecedent moisture conditions were within the normal range based on precipitation for the three months prior to the November 25, 2015 site visit. These data were obtained from NRCS climate station 214884, NWS: Lower St. Anthony Falls Weather Station (**Table 1**). The water year has varied between normal and wet for the past six years but fell mostly into the wet range from 2010 through 2015 (**Table 2**).

3.4 National Wetland Inventory

The National Wetland Inventory (NWI) Map has identified Bassett Creek as riverine wetland. It was identified as a riverine (R) wetland, lower perennial (2), with an unconsolidated bottom (UB) that has an intermittently exposed hydrologic regime (G) or an R2UBG riverine wetland. A portion of Wetland 2 was mapped as a forested wetland (PFO1A) and Wetland 3 was mapped as an excavated emergent wetland (PEM1Ax). No other NWI wetlands were mapped within the Bassett Creek project area (**Figure 4**).

3.5 Water Resources

The Minnesota Department of Natural Resources (MnDNR) Public Waters Inventory (PWI) has identified Bassett Creek as a public water inventory watercourse (**Figure 5**). Three wetlands and the edges of Bassett Creek were delineated within the project area. Bassett Creek is identified by the Minnesota Pollution

Control Agency (MPCA) as an impaired water because of the presence of chlorides and fish bioassessment results, with aquatic life as their affected use. Fecal Coliform is also noted as a pollutant with aquatic recreation as the affected use.

3.6 Soil Resources

Soil information for the project area was obtained from the Soil Survey of Hennepin County, Minnesota (USDA, 1974). Three soil map units were identified within the project area: Urban land-Udorthents, wet substratum, complex, 0 to 2 percent slopes, rarely flooded (U5A), Urban land-Lester complex, 2 to 18 percent slopes (L52C) and Udorthents, wet substratum, 0 to 2 percent slopes (U2A). All soils mapped within the project area or immediate adjacent areas are non-hydric (**Figure 6**).

4.0 Wetland Delineation

4.1 Wetland Delineation and Classification Methods

Wetlands within the project area were delineated and classified during a site visit on November 25, 2015. The wetland delineation was established according to the Routine On-Site Determination Method specified in the U.S. Army Corps of Engineers Wetlands Delineation Manual (1987 Edition) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE, 2010).

The delineated wetland boundaries, sample points and creek edges were surveyed using a Global Positioning System (GPS) with sub-meter accuracy (**Figures 7 and 8**).

Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) Cowardin System (Cowardin et al., 1979), the USFWS Circular 39 system (Shaw and Fredine, 1956), and the Eggers and Reed Wetland Classification System (Eggers and Reed, 1977).

Soil borings were placed in and around the delineated wetlands, to a depth of at least 20 inches below the ground surface where possible. Representative soil samples from each boring were examined for the presence of hydric soil indicators using the Natural Resources Conservation Service (NRCS) hydric soil indicators (Version 6.0). Soil colors (e.g., 7.5YR 4/2, etc.) were determined using a Munsell® soil color chart and noted on the Wetland Data Forms **Appendix A**.

Hydrologic conditions were evaluated at each soil boring, and this information was also noted on the Wetland Data Forms. The dominant plant species were identified, and the corresponding wetland indicator status of each plant species was determined and noted on the Wetland Data Forms (**Appendix A**). Photographs taken at the time of the site visit are provided in **Appendix B**.

4.2 Wetland Descriptions

The creek channel and three wetlands were delineated within the project area. Descriptions and assessments of these delineated areas are provided below, with representative photographs in **Appendix B**.

4.2.1 Wetland 1

Wetland 1 is a Type 1 (PEMA), seasonally flooded basin within floodplain located within the west section of the project area within Bassett Creek Park (**Figure 7**). The surrounding area has steep and abrupt slopes leading into Wetland 1 and into Bassett Creek at this location. The abandoned Fruen Mill site is located on the opposite side (east side) of Bassett Creek from Wetland 1 and has flat topography. Flood waters likely encroach Wetland 1 during the growing season which is keeping herbaceous vegetation from proliferating.

There were no herbaceous plants at Wetland Sample Point 1-1 (SP 1-1 WET) because of periodic flooding of the basin. Tree species were present within 30 feet of SP 1-1 WET but were not directly within it.

Primary indicators of hydrology that were observed at the time of the site visit were high water table (A2), saturation (A3), sparsely vegetated concave surface (B6), and water-stained leaves (B9). Geomorphic position (D2) was the only secondary indicator of hydrology present.

Soils mapped at SP 1-1 WET and throughout Wetland 1 were identified as Urban Land-Lester complex, 2-18% slopes. Sampled soils were black at the surface with 5 percent redoximorphic concentrations down to 16 inches with clay loam textures. Soils from 16 inches to 21 inches were brown with 5 percent redoximorhic features with sandy textures. The hydric soil indicator at SP 1-1 WET is redox dark surface (F6).

The transition to upland was defined by the lack of hydrology and hydric soil indicators. Dominant vegetation in upland areas consisted of ash-leaf maple (*Acer negundo*, FAC), burr oak (*Quercus macrocarpa*, FAC) and common buckthorn (*Rhamnus cathartica*, FAC).

4.2.2 Wetland 2

Wetland 2 is a Type 3/6 (PEM/SS1C), shallow marsh and shrub-carr wetland located in the west section of the project area approximately 500 feet downstream from Wetland 1 (**Figure 7**). Wetland 2 is a sloping wetland that appears to be fed by groundwater seepage coming from adjacent uplands. Several small channels extend through the wetland and connect to Bassett Creek.

There was no herbaceous plants at SP 2-1 WET likely die to soil saturation from the groundwater seepage. The remaining area of Wetland 2 was dominated by reed canary grass (*Phalaris arundinacea*, FACW) and narrow-leaf cattail (*Typha angustifolia*, OBL).

Primary indicators of hydrology that were observed were high water table (A2), and saturation (A3). Geomorphic position (D2) was the only secondary indicator of hydrology present at SP 2-1 WET.

Soils mapped at SP 2-1 WET and throughout Wetland 2 were identified as Urban Land-Lester complex, 2-18% slopes. Sampled soils were black mucky-mineral soils down to 10 inches. Soils from 10 inches to 15 inches were brown clays, which became gleyed starting at 15 inches again with clay textures. The hydric soil indicator at SP 2-1 WET is loamy mucky mineral (F1).

The transition to upland was defined by the lack of hydrology and hydric soil indicators. Dominant vegetation in upland areas consisted of burr oak (*Quercus macrocarpa*, FAC) and common buckthorn (*Rhamnus cathartica*, FAC).

4.2.3 Wetland 3

Wetland 3 is a Type 1/3 (PEMA/Fx), seasonally flooded basin and shallow marsh wetland located in the east section of the project area (**Figure 8**). Wetland 3 is an excavated linear wetland with a subsurface connection to Bassett Creek at its south end. Topography within Wetland 3 has a gradual decent from the south end to the north end where it then connects to the old Bassett Creek tunnel entrance at Second Avenue North and continues in a northerly direction underground.

Dominant plants at SP 3-1 WET were late goldenrod (*Solidago gigantea*, FACW), and reed canary grass. Dominant plants at the south end of Wetland 3 were late goldenrod, reed canary grass, and a species of willow (*Salix sp.*). The dominant species within the north-central portion of Wetland 3 was narrow-leaf cattail. There was also a section of non-vegetated open water at the north end of Wetland 3 at the tunnel entrance.

No primary indicators of hydrology were observed at SP 3-1 WET. Secondary indicators of hydrology observed were geomorphic position (D2), and a positive FAC-neutral test (D5).

Soils mapped at SP 3-1 WET and throughout Wetland 3 were identified as Urban Land-Udorthents, wet substratum, 0-2% slopes. Sampled soils were black sandy clay loam down to 2 inches, then transitioned to very dark grayish brown loamy sand with 2 percent redoximorphic features down to 8 inches. From 8 to 15 inches soils were returned to black but with a more yellow hue than the surface layer and had a loamy sand texture and 2 percent redoximorphic features. The hydric soil indicators at SP 3-1 WET are sandy redox (S5) and redox dark surface (F6).

The transition to upland was defined by the lack of hydrology and hydric soil indicators. Dominant vegetation in upland areas consisted of Kentucky bluegrass (*Poa pratensis*, FAC).

4.2.4 Delineated Creek Channel

Within the project area, Bassett Creek is a low-gradient, channelized stream that flows through an unconfined alluvial valley that was historically occupied by wetlands in places.

Bassett Creek in the project area has an approximate average bankfull depth of 2.5 to 3 feet, and an approximate bankfull width of 25 to 30 feet. The stream is channelized throughout the project area and does not include any significant meandering; the stream is confined to a channel with lower banks between 2.5 feet and 6.5 feet high with little or no floodplain.

Water flow within the creek channel had a slow to medium velocity and substrate was sandy and rocky in most of the shallow areas and more silty in deeper areas. No emergent, or aquatic plants were observed within the creek channel. Mixed hardwood trees and shrubs were dominant at higher elevations adjacent to the creek.

Within the project area, the entire creek channel was delineated as a linear waterway and classified using the USFWS Cowardin System. The creek channel within the project area was classified as an R2UBG linear waterway (**Figures 7 and 8**), which concurs with the NWI designation.

5.0 Regulatory Overview

The USACE regulates the placement of dredge or fill materials into wetlands that are located adjacent to or are hydrologically connected to interstate or navigable waters under the authority of Section 404 of the Clean Water Act. If the USACE has jurisdiction over any portion of a project, they may also review impacts to wetlands under the authority of the National Environmental Policy Act.

Filling, excavating, and draining wetlands are also regulated by the Minnesota Wetland Conservation Act (WCA), and the Minnesota Public Waters Inventory Program, which are administered by the City of Minneapolis and the Minnesota Department of Natural Resources (DNR) respectively. The USACE, the City of Minneapolis and the DNR should be contacted before altering any wetlands within the project area. In addition, delineated wetland boundaries may be reviewed, if needed, by a Technical Evaluation Panel (TEP) consisting of representatives from the Minnesota Board of Water and Soil Resources, and Hennepin County, along with the City of Minneapolis, DNR and USACE.

6.0 References

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U.S. Fish and Wildlife Service. 1956. *Wetlands of the United States Circular 39*. U.S. Government Printing Office, Washington, D.C.

Tables

Table 1
Antecedent Moisture Conditions Prior to November 25, 2015 Site Visit
Basset Creek Restoration Project Feasibility Study Wetland Delineation
Minneapolis, MN

Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:

County: Hennepin
Township Name: unnamed
Nearest Community: Glenwood Junction
Township Number: 29N
Range Number: 24W
Section Number: 20

Aerial photograph or site visit date:
Wednesday, November 25, 2015

Score using 1981-2010 normal period

(value are in inches)	first prior month: **October 2015**	second prior month: **September 2015**	third prior month: **August 2015**
estimated precipitation total for this location:	**2.77**	**3.75**	**3.15**
there is a 30% chance this location will have less than:	1.33	2.16	3.51
there is a 30% chance this location will have more than:	3.64	3.97	5.08
type of month: **dry** **normal** **wet**	**normal**	**normal**	**dry**
monthly score	**3 * 2 = 6**	**2 * 2 = 4**	**1 * 1 = 1**
multi-month score: 6 to 9 (**dry**) 10 to 14 (**normal**) 15 to 18 (**wet**)	11 (**normal**)		

Table 2
Precipitation in Comparison to WETS Data
Basset Creek Restoration Project Feasibility Study Wetland Delineation
Minneapolis, MN

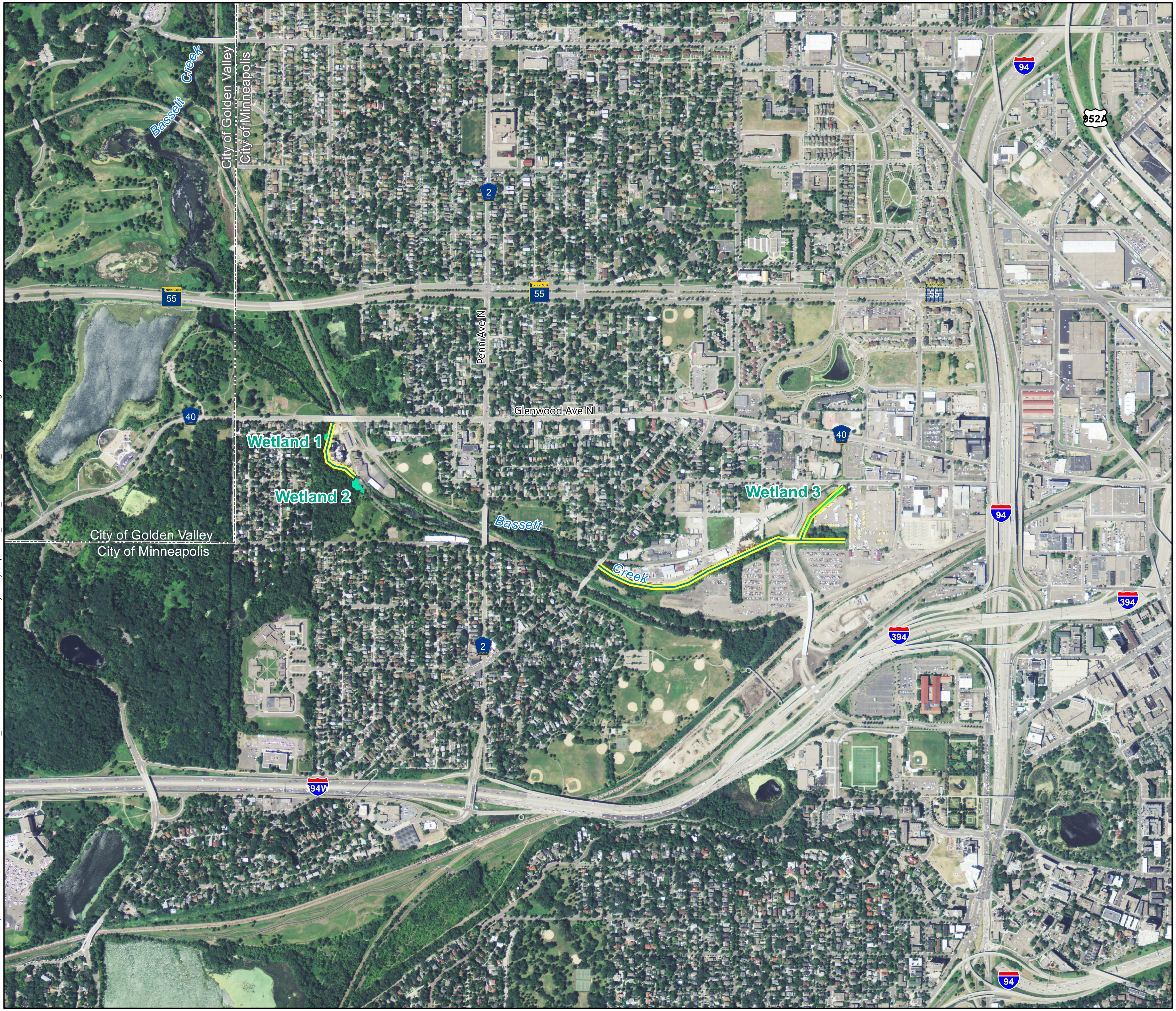
Precipitation data for target wetland location:

County: Ramsey
Township Name: unnamed
Nearest Community: Glenwood Junction
Township Number: 29N
Range Number: 24W
Section Number: 20

Precipitation Totals are in Inches	
Color Key	**Multi-month Totals**:
total is in lowest 30th percentile of the period-of-record distribution	**WARM** = warm season (May thru September)
total is => 30th and <= 70th percentile	**ANN** = calendar year (January thru December)
total is in highest 30th percentile of the period-of-record distribution	**WAT** = water year (Oct. previous year thru Sep. present year)

Period-of-Record Summary Statistics															
	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*WARM*	*ANN*	*WAT*
30%	0.52	0.49	1.11	1.63	2.57	3.14	2.33	2.57	1.94	1.23	0.71	0.55	16.05	25.99	26.20
70%	1.06	1.13	2.03	2.87	4.20	5.46	4.56	4.43	3.74	2.60	1.84	1.35	21.34	32.49	31.60
mean	0.89	0.89	1.66	2.41	3.63	4.46	3.81	3.60	3.04	2.20	1.53	1.03	18.53	29.14	29.14
1981-2010 Summary Statistics															
	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*WARM*	*ANN*	*WAT*
30%	0.54	0.41	1.37	2.18	2.66	3.57	2.81	3.51	2.16	1.33	1.09	0.70	18.11	30.39	28.23
70%	1.23	1.03	2.06	3.05	4.11	5.30	4.97	5.08	3.97	3.64	2.10	1.54	22.11	34.59	36.30
mean	0.90	0.79	1.93	2.84	3.65	4.56	4.41	4.20	3.44	2.61	1.87	1.25	20.26	32.45	32.26
Year-to-Year Data															
Year	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*WARM*	*ANN*	*WAT*
2015	0.32	0.31	0.70	2.20	4.45	3.72	6.89	3.15	3.75	2.77	4.31	2.10	21.96	34.67	28.82
2014	1.11	1.32	0.76	6.80	4.05	10.19	2.95	2.82	2.03	1.16	1.13	1.04	22.04	35.36	38.41
2013	0.81	1.19	1.99	4.53	5.22	7.39	4.26	1.92	1.25	4.21	0.62	1.55	20.04	34.94	32.43
2012	0.57	1.91	1.54	3.07	9.09	3.72	4.82	1.54	0.42	1.33	0.94	1.60	19.59	30.55	28.78
2011	0.97	1.06	2.46	3.20	5.31	4.45	7.18	4.09	0.56	0.95	0.24	0.91	21.59	31.38	36.42
2010	0.65	0.81	0.91	2.14	2.71	6.53	4.59	6.55	6.07	1.93	1.86	3.35	26.45	38.10	39.94
2009	0.54	1.13	1.73	1.62	0.35	3.32	1.21	6.54	0.63	6.04	0.55	2.39	12.05	26.05	21.69
2008	0.15	0.55	2.04	4.15	2.51	3.90	2.09	2.52	2.12	1.71	1.33	1.58	13.14	24.65	27.10
2007	0.68	1.56	3.67	2.14	3.05	1.97	2.36	6.51	5.46	5.04	0.11	1.92	19.35	34.47	31.34
2006	0.92	0.39	1.81	3.56	3.30	3.68	2.55	6.69	2.97	0.59	1.06	2.29	19.19	29.81	33.87
2005	1.33	1.11	1.25	2.75	3.42	5.52	3.11	3.97	6.41	4.88	1.72	1.40	22.43	36.87	34.26
2004	0.54	1.62	2.26	2.97	6.01	3.83	4.14	1.40	4.66	3.75	1.11	0.53	20.04	32.82	30.52
2003	0.35	0.93	1.76	2.85	5.76	7.90	1.83	0.42	2.02	0.93	1.18	0.98	17.93	26.91	28.31
2002	0.53	0.61	2.11	3.95	3.65	8.50	5.84	6.14	3.90	4.13	0.07	0.29	28.03	39.72	40.03
2001	1.34	1.51	1.07	7.39	5.67	5.14	2.28	2.73	4.12	0.95	3.17	0.68	19.94	36.05	38.10
2000	0.99	1.18	1.17	1.38	4.18	3.78	6.68	3.71	3.20	1.13	4.19	1.53	21.55	33.12	28.04
1999	1.48	0.35	1.93	3.62	6.69	5.21	5.21	3.82	2.93	0.60	0.81	0.36	23.86	33.01	36.25
1998	1.49	0.71	3.73	2.20	4.32	4.66	2.86	4.88	1.06	2.76	1.70	0.55	17.78	30.92	29.03
1997	1.71	0.15	1.52	1.11	1.92	3.95	12.53	5.18	2.89	2.01	0.85	0.26	26.47	34.08	42.13
1996	2.13	0.23	1.80	0.80	3.47	3.93	1.87	1.32	1.49	3.91	5.56	1.70	12.08	28.21	24.68

Figures



Delineated Wetland
Bassett Creek
Bassett Creek Tunnel
Study Reaches
Municipal Boundary

Aerial Imagery: FSA 2013

Feet
500 0 500 1,000 1,500 2,000

FIGURE 1

PROJECT LOCATION
Main Stem Stabilization-Delineation
Bassett Creek Watershed
Management Commission

Delineated Wetland
Stream Channel
10-Foot Contour
2-Foot Contour

Aerial Imagery: MN DNR 2012

Feet
50 0 50 100 150 200

FIGURE 2

TOPOGRAPHY (WEST)
Main Stem Stabilization-Delineation
Bassett Creek Watershed
Management Commission

Delineated Wetland
Stream Channel
10-Foot Contour
2-Foot Contour

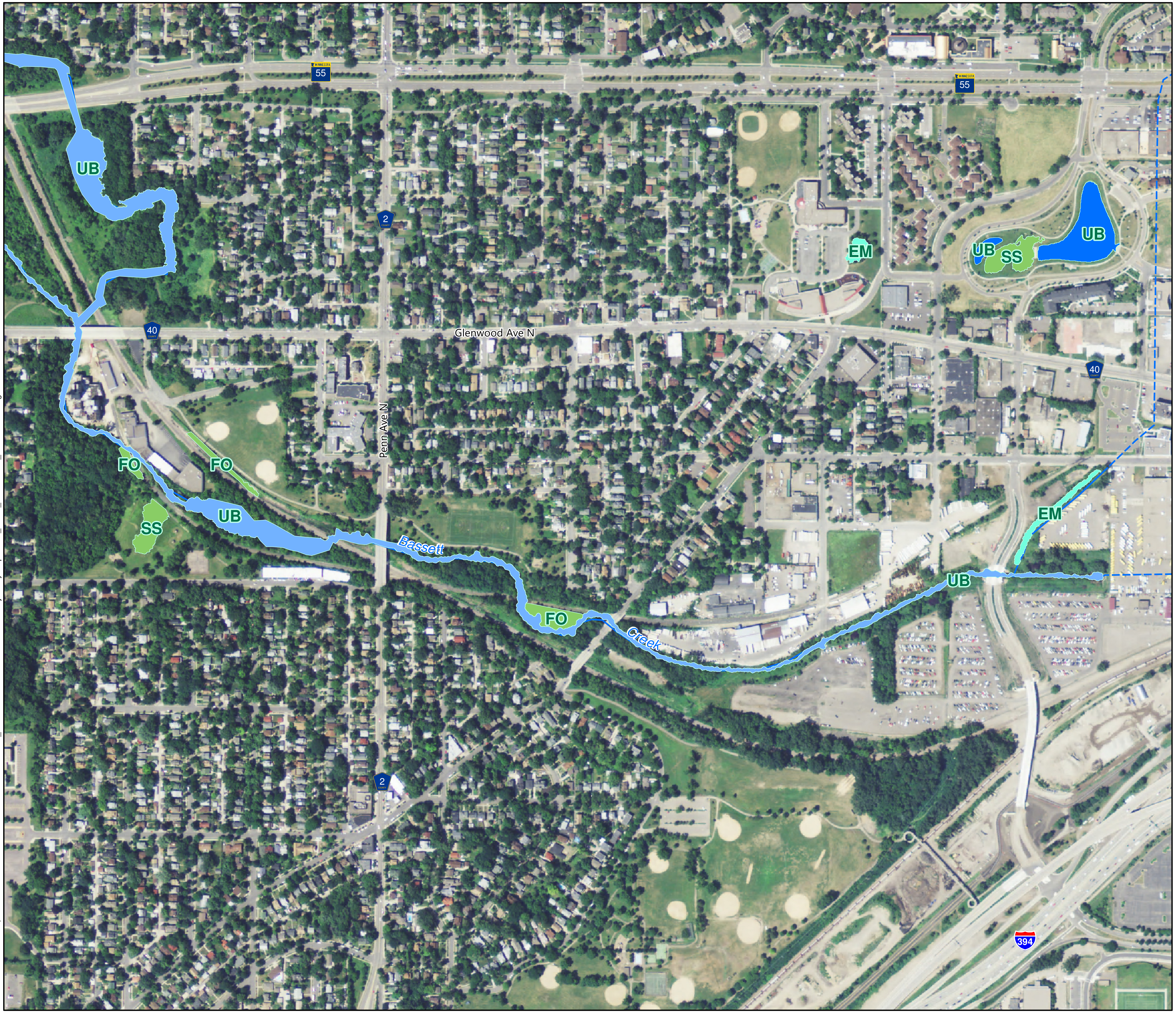
Aerial Imagery: MN DNR 2012

N

Feet
50 0 50 100 150 200

FIGURE 3

TOPOGRAPHY (EAST)
Main Stem Stabilization-Delineation
Bassett Creek Watershed
Management Commission



- Bassett Creek
- Bassett Creek Tunnel

Wetlands (MN DNR NWI East Central Update)

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

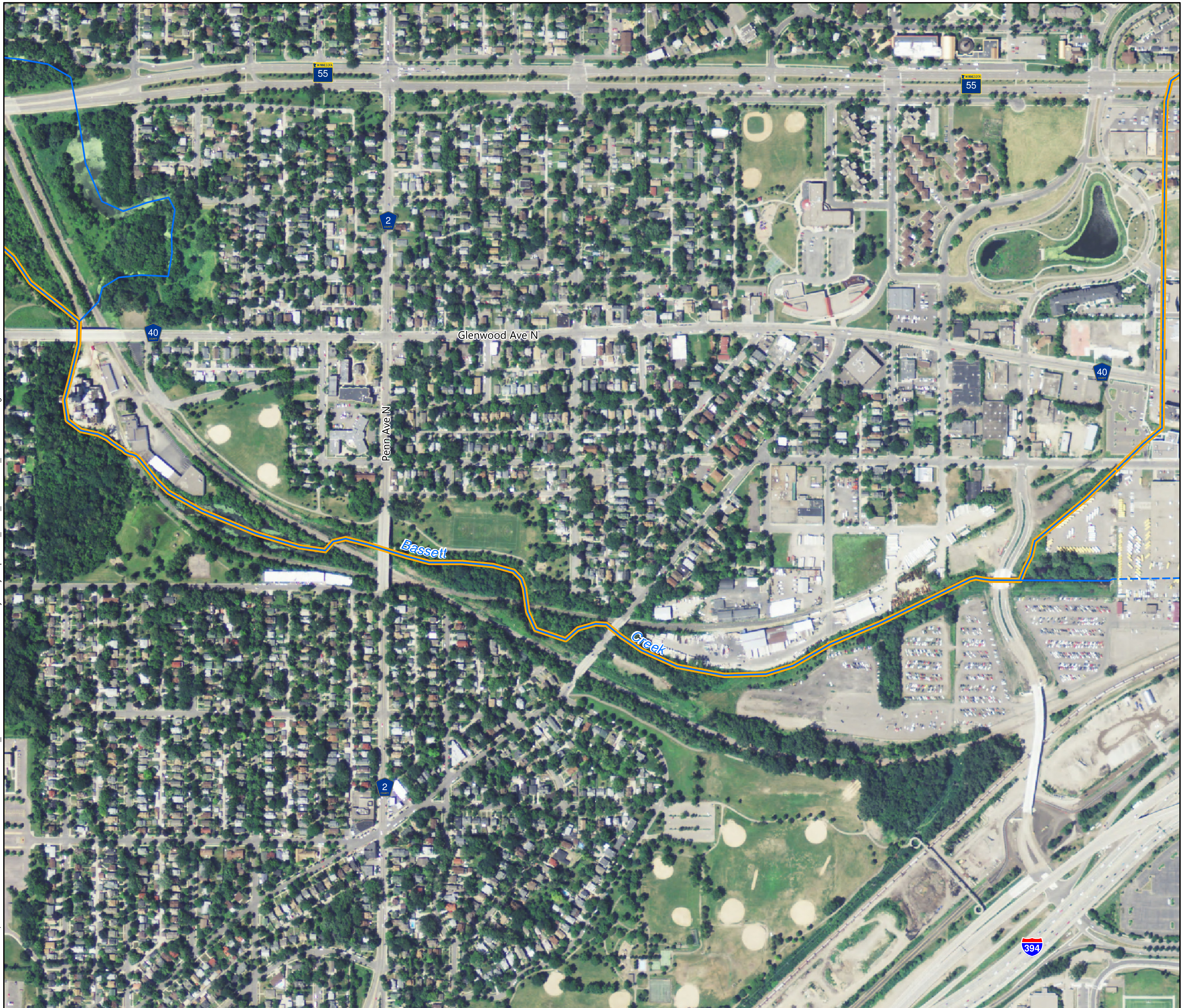
Aerial Imagery: FSA 2013

Feet

250 0 250 500 750 1,000

FIGURE 4

NATIONAL WETLANDS INVENTORY (NWI)
MN DNR EAST CENTRAL UPDATE
Main Stem Stabilization-Delineation
Bassett Creek Watershed
Management Commission



Public Water Inventory Watercourse
Bassett Creek
Bassett Creek Tunnel

Aerial Imagery: FSA 2013

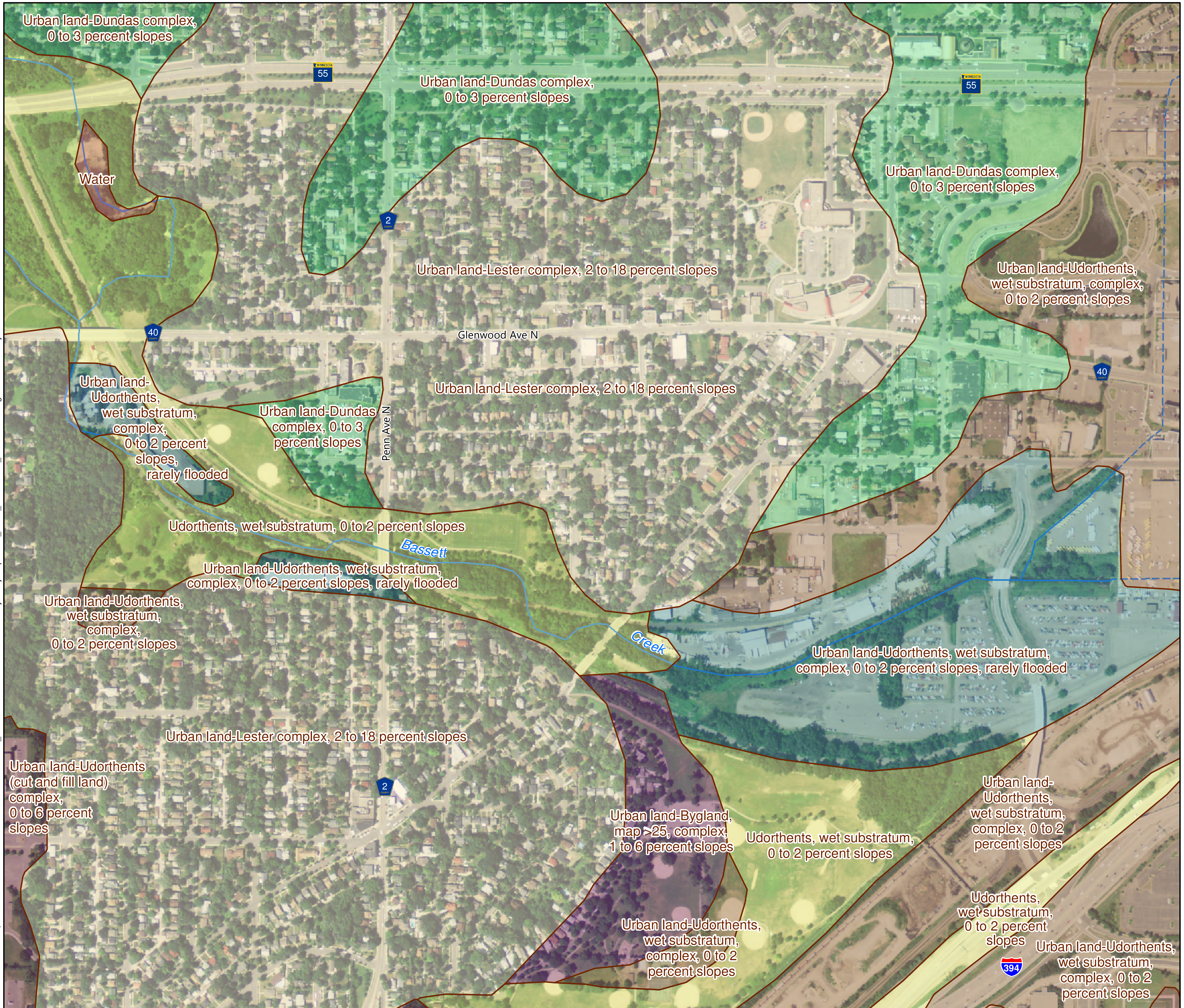
N

Feet
250 0 250 500 750 1,000

Bassett Creek Watershed Management Commission

FIGURE 5

PUBLIC WATER INVENTORY (PWI)
Main Stem Stabilization-Delineation
Bassett Creek Watershed
Management Commission



Bassett Creek

Bassett Creek Tunnel

Aerial Imagery: FSA 2013

Note: All soils within this view extent have a Hydric Rating of 0.

N

Feet

250 0 250 500 750 1,000

FIGURE 6

SOIL SURVEY
Main Stem Stabilization-Delineation
Bassett Creek Watershed
Management Commission

Barr Footer: ArcGIS 10.4, 2016-03-01 10:31 File: I:\Client\BassettCreek\Work_Orders\2015\Bassett Creek Feasibility Study\Maps\Main_Creek_Stabilization_23270051.36\Figure 7 Wetland and Creek Delineation (West).mxd User: bal

Upland Sample Point
Wetland Sample Point
Delineated Wetland
Stream Channel

Aerial Imagery: MN DNR 2012

N

Feet
50 0 50 100 150 200

Bassett Creek Watershed Management Commission

FIGURE 7

WETLAND AND CREEK DELINEATION (WEST)
Main Stem Stabilization-Delineation
Bassett Creek Watershed Management Commission

Upland Sample Point
Wetland Sample Point
Delineated Wetland
Stream Channel

Aerial Imagery: MN DNR 2012

N

Feet
50 0 50 100 150 200

FIGURE 8

WETLAND AND CREEK DELINEATION (EAST)
Main Stem Stabilization-Delineation
Bassett Creek Watershed Management Commission

Appendix A

Wetland Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Basset Creek Restoration	Applicant/Owner:	BCWMC	City/County:	Minneapolis/Hennepin	State:	MN	Sampling Date:	11/25/15
Investigator(s):	BKB	Section:	20	Township:	29	Range:	24	Sampling Point:	1-1 UPL
Land Form:	Hillslope	Local Relief:	Concave	Slope %:	15	Soil Map Unit Name:	Urban Land-Lester complex 2-18% slopes		
Subregion (LRR):	M	Latitude:	4980800	Longitude:	475173	Datum:	UTM Nad 83 Zone 15N		

Cowardin Classification: Upland
Circular 39 Classification: Upland
Mapped NWI Classification: None mapped

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

Eggers & Reed (primary): Upland
Eggers & Reed (secondary):
Eggers & Reed (tertiary):
Eggers & Reed (quaternary):

Are vegetation No Soil No Hydrology No significantly disturbed?
Are vegetation No Soil No Hydrology No naturally problematic?
Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes
Hydric soil present?	No
Indicators of wetland hydrology present?	No
Is the sampled area within a wetland?	No

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: Upland

VEGETATION

Tree Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Quercus macrocarpa	10	Yes	FAC
2.	Acer negundo	5	Yes	FAC
3.		0		
4.		0		
	Total Cover:	15		

Sapling/Shrub Stratum (Plot Size: 15 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Rhamnus cathartica	25	Yes	FAC
2.	Celtis occidentalis	1	No	FAC
3.		0		
4.		0		
5.		0		
	Total Cover:	26		

Herb Stratum (Plot Size: 5 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Ageratina altissima	2	No	FACU
2.	Geranium maculatum	2	No	FACU
3.		0		
4.		0		
5.		0		
6.		0		
7.		0		
8.		0		
	Total Cover:	4		

Woody Vine Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: 96 **% Sphagnum Moss Cover:**

50/20 Thresholds:

	20%	50%
Tree Stratum	3	7.5
Sapling/Shrub Stratum	5.2	13
Herb Stratum	0.8	2
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	100.00%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	0	X 1	0
FACW Species	0	X 2	0
FAC Species	41	X 3	123
FACU Species	4	X 4	16
UPL Species	0	X 5	0
Column Totals:	45 (A)		139 (B)

Prevalence Index = B/A = 3.09

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
No	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

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

Delineation was performed out of the growing season

WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 1-1 UPL

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 7	10YR 2/2						Sandy Loam	
2.	7 - 14	7.5YR 4/4						Sandy Clay Loam	
3.	14 - 20	7.5 YR 2.5/1	97	7.5YR 5/8	3	C	M	Clay Loam	
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

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

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? No

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one 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? ☐ Surface Water Depth (inches):
- Water table present? ☐ Water Table Depth (inches):
- Saturation present? (includes capillary fringe) ☐ Saturation Depth (inches):

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks: No hydrology indicators

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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Basset Creek Restoration Applicant/Owner: BCWMC City/County: Minneapolis/Hennepin State: MN Sampling Date: 11/25/15

Investigator(s): BKB Section: 20 Township: 29 Range: 24 Sampling Point: 1-1 WET

Land Form: Flat Local Relief: None Slope %: 0 Soil Map Unit Name: Urban Land-Lester complex 2-18% slopes

Subregion (LRR): M Latitude: 4980799 Longitude: 475177 Datum: UTM Nad 83 Zone 15N

Cowardin Classification: PEMA Circular 39 Classification: Type 1 Mapped NWI Classification: None mapped

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

Eggers & Reed (primary): Seasonally Flooded Basin

Eggers & Reed (secondary):

Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

Are vegetation No Soil No Hydrology No significantly disturbed?

Are vegetation Yes Soil No Hydrology No naturally problematic?

Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes
Hydric soil present?	Yes
Indicators of wetland hydrology present?	Yes
Is the sampled area within a wetland?	Yes

General Remarks (explain any answers if needed): No herbaceous plants were present due to periodic flooding of Basset Creek.

If yes, optional Wetland Site ID: Wetland 1

VEGETATION

Tree Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Quercus macrocarpa	5	Yes	FAC
2.	Acer negundo	2	No	FAC
3.		0		
4.		0		
	Total Cover:	7		

Sapling/Shrub Stratum (Plot Size: 15 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
6.		0		
7.		0		
8.		0		
	Total Cover:	0		

Woody Vine Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: 100 % Sphagnum Moss Cover:

50/20 Thresholds:

	20%	50%
Tree Stratum	1.4	3.5
Sapling/Shrub Stratum	0	0
Herb Stratum	0	0
Woody Vine Stratum	0	0

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:		Multiply by:	
OBL Species	0	X 1	0
FACW Species	0	X 2	0
FAC Species	7	X 3	21
FACU Species	0	X 4	0
UPL Species	0	X 5	0
Column Totals:	7 (A)		21 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

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

No herbaceous plants were present due to periodic flooding of Basset Creek.

WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 1-1 WET

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 16	7.5YR 2.5/1	95	7.5YR 4/6	5	C	M	Clay Loam	
2.	16 - 21	7.5YR 4/2	95	7.5YR 4/6	5	C	M	Sand	
3.	-								
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

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

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? Yes

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one 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?	☐	**Surface Water Depth (inches):**	
Water table present?	☑	**Water Table Depth (inches):**	7
Saturation present? (includes capillary fringe)	☑	**Saturation Depth (inches):**	0

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Basset Creek Restoration Applicant/Owner: BCWMC City/County: Minneapolis/Hennepin State: MN Sampling Date: 11/25/15

Investigator(s): BKB Section: 20 Township: 29 Range: 24 Sampling Point: 2-1 UPL

Land Form: Hillslope Local Relief: Concave Slope %: 3 Soil Map Unit Name: Urban Land-Lester complex 2-18% slopes

Subregion (LRR): M Latitude: 4980643 Longitude: 475260 Datum: UTM Nad 83 Zone 15N

Cowardin Classification: Upland Circular 39 Classification: Upland Mapped NWI Classification: None mapped

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

Eggers & Reed (primary): Upland
Eggers & Reed (secondary):
Eggers & Reed (tertiary):
Eggers & Reed (quaternary):

Are vegetation No Soil No Hydrology No significantly disturbed?
Are vegetation No Soil No Hydrology No naturally problematic?
Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes
Hydric soil present?	No
Indicators of wetland hydrology present?	No
Is the sampled area within a wetland?	No

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: Upland

VEGETATION

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus macrocarpa	45	Yes	FAC
2.	0		
3.	0		
4.	0		
Total Cover:	45		

Sapling/Shrub Stratum (Plot Size: 15 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rhamnus cathartica	10	Yes	FAC
2.	0		
3.	0		
4.	0		
5.	0		
Total Cover:	10		

Herb Stratum (Plot Size: 5 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
3.	0		
4.	0		
5.	0		
6.	0		
7.	0		
8.	0		
Total Cover:	0		

Woody Vine Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0		
2.	0		
Total Cover:	0		

% Bare Ground in Herb Stratum: 100 % Sphagnum Moss Cover:

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

50/20 Thresholds:	20%	50%
Tree Stratum	9	22.5
Sapling/Shrub Stratum	2	5
Herb Stratum	0	0
Woody Vine Stratum	0	0

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:		Multiply by:	
OBL Species	0	X 1	0
FACW Species	0	X 2	0
FAC Species	55	X 3	165
FACU Species	0	X 4	0
UPL Species	0	X 5	0
Column Totals:	55 (A)		165 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

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WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 2-1 UPL

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 5	10YR 3/1						Loam	
2.	5 - 14	10YR 3/1						Sandy Clay Loam	
3.	14 - 18	10YR 3/1	98	10YR 3/4	2	C	M	Sandy Clay Loam	
4.	18 - 22	10YR 4/4	98	10YR 4/6	2	C	M	Sandy Clay	
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

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

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? No

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one 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?** ☐ **Surface Water Depth (inches):**
- **Water table present?** ☐ **Water Table Depth (inches):**
- **Saturation present? (includes capillary fringe)** ☐ **Saturation Depth (inches):**

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks: No hydrology indicators

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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Basset Creek Restoration	Applicant/Owner: BCWMC	City/County: Minneapolis/Hennepin	State: MN	Sampling Date: 11/25/15	
Investigator(s): BKB	Section: 20	Township: 29	Range: 24	Sampling Point: 2-1 WET	
Land Form: Footslope	Local Relief: Concave	Slope %: 1	Soil Map Unit Name: Urban Land-Lester complex 2-18% slopes		
Subregion (LRR): M	Latitude: 4980799	Longitude: 475177	Datum: UTM Nad 83 Zone 15N		
Cowardin Classification: PEM/SS1C	Circular 39 Classification: Type 3/6	Mapped NWI Classification: None mapped*			

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

Are vegetation No Soil No Hydrology No significantly disturbed?

Are vegetation No Soil No Hydrology No naturally problematic?

Are "normal circumstances" present? Yes

Eggers & Reed (primary): Shallow Marsh
Eggers & Reed (secondary): Shrub-Carr
Eggers & Reed (tertiary):
Eggers & Reed (quaternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes
Hydric soil present?	Yes
Indicators of wetland hydrology present?	Yes
Is the sampled area within a wetland?	Yes

General Remarks (explain any answers if needed): * Part of mapped PFO1A

If yes, optional Wetland Site ID: Wetland 2

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot Size: 30 ft)			
1. Quercus macrocarpa	30	Yes	FAC
2.	0		
3.	0		
4.	0		
Total Cover:	30		
Sapling/Shrub Stratum (Plot Size: 15 ft)			
1. Rhamnus cathartica	20	Yes	FAC
2. Salix spp.	2	No	
3.	0		
4.	0		
5.	0		
Total Cover:	22		
Herb Stratum (Plot Size: 5 ft)			
1.	0		
2.	0		
3.	0		
4.	0		
5.	0		
6.	0		
7.	0		
8.	0		
Total Cover:	0		
Woody Vine Stratum (Plot Size: 30 ft)			
1.	0		
2.	0		
Total Cover:	0		

% Bare Ground in Herb Stratum: 100 % Sphagnum Moss Cover:

50/20 Thresholds:	20%	50%
Tree Stratum	6	15
Sapling/Shrub Stratum	4.4	11
Herb Stratum	0	0
Woody Vine Stratum	0	0

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:		Multiply by:	
OBL Species	0	X 1	0
FACW Species	0	X 2	0
FAC Species	50	X 3	150
FACU Species	0	X 4	0
UPL Species	0	X 5	0
Column Totals:	50 (A)		150 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

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

No herbaceous layer in the vicinity of the sample point likely due to continuous saturation from seepage but areas further west are dominated by reed canary grass and narrow-leaf cattail.

WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 2-1 WET

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 10	2.5Y 2.5/1						Loamy Mucky Mineral	
2.	10 - 15	2.5Y 2.5/1						Clay	
3.	15 - 21	10Y 4/1 (Gley)						Clay	
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

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

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? Yes

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one 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:

	Present		
Surface water present?	☐	Surface Water Depth (inches):	
Water table present?	☑	Water Table Depth (inches):	4
Saturation present? (includes capillary fringe)	☑	Saturation Depth (inches):	0

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Basset Creek Restoration | Applicant/Owner: BCWMC | City/County: Minneapolis/Hennepin | State: MN | Sampling Date: 11/25/15

Investigator(s): BKB | Section: 21 | Township: 29 | Range: 24 | Sampling Point: 3-1 UPL

Land Form: Footslope | Local Relief: Concave | Slope %: 2 | Soil Map Unit Name: Urban land-Udorthents wet sub 0-2% slope

Subregion (LRR): M | Latitude: 4980541 | Longitude: 476718 | Datum: UTM Nad 83 Zone 15N

Cowardin Classification: Upland | Circular 39 Classification: Upland | Mapped NWI Classification: PEM1Ax

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

Eggers & Reed (primary): Upland

Are vegetation No Soil No Hydrology No significantly disturbed?

Are "normal circumstances" present? Yes

Eggers & Reed (secondary):

Eggers & Reed (tertiary):

Are vegetation No Soil No Hydrology No naturally problematic?

Eggers & Reed (quaternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes
Hydric soil present?	No
Indicators of wetland hydrology present?	No
Is the sampled area within a wetland?	No

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: Upland

VEGETATION

Tree Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
	Total Cover:	0		

Sapling/Shrub Stratum (Plot Size: 15 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Poa pratensis	80	Yes	FAC
2.	Solidago canadensis	15	No	FACU
3.	Mentha arvensis	1	No	FACW
4.	Artemisia absinthium	1	No	UPL
5.		0		
6.		0		
7.		0		
8.		0		
	Total Cover:	97		

Woody Vine Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: ______ % Sphagnum Moss Cover: ______

50/20 Thresholds:

	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	19.4	48.5
Woody Vine Stratum	0	0

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:		Multiply by:	
OBL Species	0	X 1	0
FACW Species	1	X 2	2
FAC Species	80	X 3	240
FACU Species	15	X 4	60
UPL Species	1	X 5	5
Column Totals:	97	(A)	307 (B)

Prevalence Index = B/A = 3.16

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
No	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

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

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WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 3-1 UPL

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 4	10YR 2/1						Sandy Clay Loam	
2.	4 - 6	10YR 3/1						Loamy Sand	
3.	6 - 11	10YR 3/2						Laomy Sand	
4.	11 - 14	10YR 3/4						Sand	
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains   [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

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

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): Type: ______ Depth (inches): ______

Hydric soil present? No

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one 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? ☐ Surface Water Depth (inches): ______
- Water table present? ☐ Water Table Depth (inches): ______
- Saturation present? (includes capillary fringe) ☐ Saturation Depth (inches): ______

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks: No hydrology indicators

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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Basset Creek Restoration	Applicant/Owner:	BCWMC	City/County:	Minneapolis/Hennepin	State:	MN	Sampling Date:	11/25/15
Investigator(s):	BKB	Section:	21	Township:	29	Range:	24	Sampling Point:	3-1 WET
Land Form:	Toeslope	Local Relief:	Concave	Slope %:	1	Soil Map Unit Name:	Urban land-Udorthents wet sub 0-2% slope		
Subregion (LRR):	M	Latitude:	4980539	Longitude:	476721	Datum:	UTM Nad 83 Zone 15N		

Cowardin Classification: PEMA/Fx Circular 39 Classification: Type 1/3 Mapped NWI Classification: PEM1Ax

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

Eggers & Reed (primary): Seasonally Flooded Basin
Eggers & Reed (secondary): Shallow Marsh
Eggers & Reed (tertiary):
Eggers & Reed (quaternary):

Are vegetation No Soil No Hydrology No significantly disturbed?
Are vegetation No Soil No Hydrology No naturally problematic?
Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes	General Remarks (explain any answers if needed):
Hydric soil present?	Yes	
Indicators of wetland hydrology present?	Yes	
Is the sampled area within a wetland?	Yes	If yes, optional Wetland Site ID: Wetland 3

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot Size: 30 ft)			
1.	0		
2.	0		
3.	0		
4.	0		
Total Cover:	0		
Sapling/Shrub Stratum (Plot Size: 15 ft)			
1.	0		
2.	0		
3.	0		
4.	0		
5.	0		
Total Cover:	0		
Herb Stratum (Plot Size: 5 ft)			
1. Solidago gigantea	60	Yes	FACW
2. Phalaris arundinacea	20	Yes	FACW
3. Arctium minus	2	No	FACU
4. Rumex crispus	1	No	FAC
5.	0		
6.	0		
7.	0		
8.	0		
Total Cover:	83		
Woody Vine Stratum (Plot Size: 30 ft)			
1.	0		
2.	0		
Total Cover:	0		

% Bare Ground in Herb Stratum: % Sphagnum Moss Cover:

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

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	16.6	41.5
Woody Vine Stratum	0	0

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:		Multiply by:	
OBL Species	0	X 1	0
FACW Species	80	X 2	160
FAC Species	1	X 3	3
FACU Species	2	X 4	8
UPL Species	0	X 5	0
Column Totals:	83 (A)		171 (B)

Prevalence Index = B/A = 2.06

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 3-1 WET

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 2	10YR 2/1						Sandy Clay Loam	
2.	2 - 8	10YR 3/2	98	10YR 3/4	2	C	M	Loamy Sand	
3.	8 - 15	2.5Y 2.5/1	98	10YR 3/4	2	C	M	Loamy Sand	
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

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

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? Yes

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one 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? ☐ Surface Water Depth (inches):
- Water table present? ☐ Water Table Depth (inches):
- Saturation present? (includes capillary fringe) ☐ Saturation Depth (inches):

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

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Appendix B

Site Photographs

Appendix B – Basset Creek Restoration Project Feasibility Study
Wetland Delineation Site Photos

Photo 1 – November 25, 2015

Wetland 1

Wetland 1 is located on the west side of Basset Creek across from the abandoned Fruen Mill. It is seasonally flooded by Basset Creek during the growing season. Soils were saturated to the surface throughout most of the basin and it is sparsely vegetated. Upland side slopes leading into Wetland 1 are approximately 15 percent.

Photo 2 – November 25, 2015

Basset Creek Study Reach

Reach segment looking downstream between Wetlands 1 and 2. Fruen Mill is pictured on the east side of Basset Creek. Shoreline is mostly rip-rap, but some of the creek edges are concrete.

Photo 3 – November 25, 2015

Wetland 2

Wetland 2 is a seepage wetland. This photo shows where Wetland 2 connects with Basset Creek. Water drains from Wetland 2 into Basset Creek at this point.

Appendix B – Basset Creek Restoration Project Feasibility Study
Wetland Delineation Site Photos

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Photo 4 – November 25, 2015

Wetland 2

Facing southwest toward forested upland. Wetland 2 is much higher in elevation than Basset Creek but much lower in elevation than the adjacent uplands to the west. The small channel in this photo shows water draining from Wetland 2 into Basset Creek. Wetland 2 is dominated by reed canary grass and cattails but there are also shrubs and a few trees present. Bare saturated soil is present near the seepage area.

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Photo 5 – November 25, 2015

Basset Creek Study Reach

Typical view of Basset Creek just east of Cedar Lake Road facing downstream to the east. Much of the creek edges are steep and undercut.

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Photo 6 – November 25, 2015

Basset Creek Study Reach

Another view of Basset Creek facing east further downstream from Photo2.

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Appendix B – Basset Creek Restoration Project Feasibility Study
Wetland Delineation Site Photos

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Photo 7 – November 25, 2015

Wetland 3

South portion of ditched Wetland 3. Soils are saturated within 12 inches of the soil surface in some areas. Dominant vegetation consists of reed canary grass, giant goldenrod and willow species.

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Photo 8 – November 25, 2015

Wetland 3

Central portion of ditched Wetland 3 has standing water up to 3 inches and is dominated by narrow-leaf cattail.

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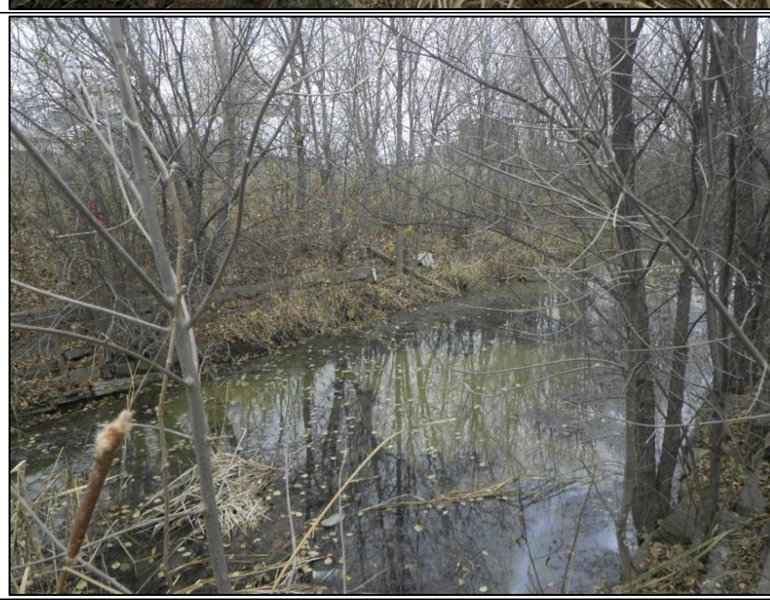
Photo 9 – November 25, 2015

Wetland 3

The northern portion of ditched Wetland 3 is inundated between 5 inches and 12 inches. Most of this area does not have emergent vegetation.

</td><td></td></tr>
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