Appendices

Appendix A Wetland Delineation Report

Appendix B Feasibility-Level Cost Estimates

Appendix A

Wetland Delineation Report (2020)

Wetland Delineation Report

DeCola Ponds – SEA School/Wildwood Park Flood Storage Project

Prepared for
City of Golden Valley

October 2020

Wetland Delineation Report

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Wetland Delineation Report

October 2020

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1.0 Introduction

This wetland delineation report has been prepared by Barr Engineering Co., (Barr) on behalf of the City of Golden Valley in support of the DeCola Ponds – SEA School/Wildwood Park Flood Storage Project Stormwater Project. The project area is located in the City of Golden Valley, Minnesota in Section 29 of Township 118 North, Range 21 West (**Figure 1**). A field wetland delineation was conducted by Barr for the proposed project on September 14, 2020. This delineation delineated two wetlands within the project area.

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.

This report includes general environmental information (Section 2.0), descriptions of the delineated wetlands (Section 3.0), and a discussion of regulations and the administering authorities (Section 4.0). The Tables section includes antecedent precipitation data. The Figures section includes the Project Location Map, Topography Map, National Wetland Inventory (NWI), Public Waters Inventory (PWI), Hydric Soils Map, and the Wetland Delineation Map. **Appendix A** includes Wetland Data Forms and **Appendix B** includes site photographs.

2.0 General Environmental Setting

2.1 Site Description

The project area is made up of two segments. (**Figure 1**). The southern segment of the project area is located within the City of Golden Valley's Wildwood Park and the School of Engineering and Arts (SEA) School property. Wildwood Park offers recreational amenities such as pickleball courts, play structures, picnic shelter, general open space, and trails. This area also includes the area along the storm sewer discharge from Duluth Street to DeCola Pond E. The northern project area is located within a residential neighborhood and is crossed by Winnetka Heights Drive, following along the outlet pipe alignment from the south end of DeCola Pond D to the north end of DeCola Pond E (Figure 6).

2.2 Topography

The project area is in an urban setting where the natural topography has been altered. Generally, The topography of the project area gentle slopes towards the DeCola Ponds. The highest elevation in the project area is 916 Feet MSL located in Wildwood Park just south of the pickleball court. The lowest elevation is 890 feet MSL along DeCola Pond E (**Figure 2**). Developed areas surrounding the project area are relatively flat.

2.3 Precipitation

Recent precipitation data was compared to historic precipitation data to evaluate monthly deviations from normal conditions. Precipitation data was obtained from the Minnesota Climatology Working Group, Wetland Delineation Precipitation Data Retrieval from a Gridded Database (Minnesota Climatology Office, 2020) for wetlands in Hennepin County, Township 118 North, Range 21 West, Section 29.

Antecedent moisture conditions were within the normal range according to precipitation data from the three months prior to the September 14, 2020, site visit (**Table 1**). During the month of August, the City of Golden Valley received around 4.97 inches of precipitation, which is within the normal range for August. In July the area received below-average levels of precipitation while June was within normal range. The water year has varied between dry and wet for the past nine years but fell mostly into the wet range from 2016 through 2019 (**Table 2**).

Table 1, Antecedent Moisture Conditions

Score using 1981-2010 normal period

(value are in inches)	first prior month: **August 2020**	second prior month: **July 2020**	third prior month: **June 2020**
estimated precipitation total for this location:	4.97R	2.75R	3.74R
there is a 30% chance this location will have less than:	3.47	2.86	3.46
there is a 30% chance this location will have more than:	5.12	4.25	5.34
type of month: **dry normal wet**	**normal**	**dry**	**normal**
monthly score	3 * **2** = 6	2 * **1** = 2	1 * **2** = 2
multi-month score:	**10 (normal)**		

6 to 9 (**dry**) 10 to 14 (**normal**) 15 to 18 (**wet**)	

*"R" following a monthly total indicates a provisional value derived from radar-based estimates

Table 2 Precipitation in comparison to WETS data

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%	0.53	0.51	1.16	1.64	2.60	3.19	2.45	2.80	1.84	1.24	0.72	0.58	16.41	26.13	26.05
70%	1.07	1.16	2.08	2.80	4.28	5.37	4.45	4.57	3.91	2.73	1.86	1.37	21.43	32.82	32.07
mean	0.89	0.91	1.67	2.43	3.69	4.44	3.84	3.71	3.08	2.26	1.53	1.06	18.76	29.50	29.51
1981-2010 Summary Statistics															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.54	0.40	1.35	2.29	2.84	3.46	2.86	3.47	2.16	1.24	1.09	0.73	18.45	30.59	27.84
70%	1.25	1.06	2.15	3.02	4.17	5.34	4.25	5.12	4.03	3.70	2.08	1.46	21.99	34.50	35.69
mean	0.89	0.81	1.95	2.80	3.67	4.60	4.31	4.17	3.42	2.56	1.85	1.25	20.17	32.28	32.08
Year-to-Year Data															
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
2020	0.94	0.52	2.26R	1.54R	4.10R	3.74R	2.75R	4.97R							
2019	0.52	2.27	2.31	3.58	7.36	2.85	6.32	6.58	4.74	5.10	1.56	2.16	27.85	45.35	42.96
2018	0.96	1.34	1.35	2.23	2.46	4.22	3.62	3.29	6.25	3.37	1.50	1.56	19.84	32.15	32.22
2017	0.78	0.73	0.70	3.54	6.33	3.77	3.83	6.85	1.65	5.39	0.40	0.71	22.43	34.68	36.06
2016	0.30	0.83	1.65	3.79	2.19	3.18	5.68	9.89	6.30	3.18	2.64	2.06	27.24	41.69	42.63
2015	0.32	0.30	0.67	2.08	4.22	3.34	7.25	3.36	3.91	2.75	4.30	1.77	22.08	34.27	28.73
2014	1.20	1.36	0.76	7.17	4.27	10.36	3.05	3.13	1.61	1.11	1.11	1.06	22.42	36.19	39.52
2013	0.71	1.19	2.08	4.61	4.89	7.73	4.64	1.55	1.26	4.37	0.59	1.65	20.07	35.27	32.61
2012	0.52	2.10	1.39	2.93	9.29	4.07	4.30	1.46	0.51	1.36	0.93	1.66	19.63	30.52	28.64
2011	0.96	0.96	2.28	3.19	5.99	4.11	6.93	4.14	0.44	0.94	0.21	0.92	21.61	31.07	36.34
2010	0.62	0.88	0.96	2.07	2.73	6.24	4.10	6.00	5.97	2.00	2.01	3.33	25.04	36.91	38.37
2009	0.50	1.06	1.93	1.43	0.38	3.61	1.05	6.53	0.76	5.97	0.59	2.24	12.33	26.05	21.60
2008	0.14	0.52	2.11	4.23	2.57	4.19	2.10	2.74	2.10	1.58	1.23	1.54	13.70	25.05	27.85
2007	0.58	1.45	3.66	2.37	3.01	2.12	2.56	6.59	4.97	5.21	0.09	1.85	19.25	34.46	31.62
2006	0.74	0.39	1.84	3.36	3.69	4.10	2.44	5.93	3.14	0.66	1.08	2.57	19.30	29.94	33.28
2005	1.28	1.06	1.30	2.63	3.55	6.10	2.85	3.74	6.67	4.47	1.77	1.41	22.91	36.83	34.57
2004	0.55	1.57	2.23	2.82	5.78	4.63	3.82	1.48	4.63	3.80	1.09	0.50	20.34	32.90	30.63
2003	0.30	0.99	1.70	2.94	5.43	8.04	1.69	0.29	2.19	0.96	1.17	0.99	17.64	26.69	27.83
2002	0.59	0.58	2.01	4.13	4.20	8.48	6.40	6.45	4.06	3.91	0.08	0.27	29.59	41.16	41.68
2001	1.39	1.45	1.05	7.26	5.59	4.87	2.36	3.14	4.02	0.92	3.21	0.65	19.98	35.91	37.72

2.4 National Wetland Inventory

The National Wetland Inventory (NWI) data was reviewed for any wetlands located within or adjacent to the project area. Two NWI wetlands are mapped within the project area. The northern most NWI is classified as a freshwater pond with a shallow open water plant community (PABH**; Figure 3**). The southern most wetland is classified as a freshwater pond with a non-vegetated aquatic community (PUBH). No NWIs are located within Wildwood Park or the SEA School property.

2.5 Water Resources

The Minnesota Department of Natural Resources (MnDNR) Public Water Inventory (PWI) was queried for any Public Waters located within or adjacent to the project area (**Figure 4**). No PWI watercourses or PWI basins are located within the project area. DeCola Pond A is the closet PWI located approximately 220 feet west of the project area. DeCola Pond A is hydrologically connected to Decola Pond D through a series of culverts that ultimately lead to Decola Pond D. DeCola Pond D and E are not identified by the Minnesota Pollution Control Agency (MPCA) as impaired waters.

2.6 Soil Resources

Soil information for the wetland delineation area was obtained from the Soil Survey for Hennepin County, Minnesota (USDA, 2004). Four soils are mapped within the project area (**Table 3**). None of the soils are classified as hydric soils (**Figure 5)**.

Table 3 Soils located in the project area

Map Unit Symbol	Map Unit Name	Hydric Rating (%)	Acres in AOI	Percent of Project Area
L22C2	Lester loam, 6 to 10 percent slopes, moderately eroded	predominantly non-hydric (2%)	3	32.3
L52C	Urban land-ester complex, 2 to 18 percent slopes	No Hydric (0%)	3.9	41.2
M-W	Water, Miscellaneous	Not Hydric (0%)	0	0.2
U1A	Urban land-udorthents, wet substratum, complex, 0 to 2 percent slopes	Not Hydric (0%)	0.7	7.1
U2A	Udortents, wet substratum, 0 to 2 percent slopes	Not Hydric (0%)	1.8	19.3
Total			9.4	100

3.0 Wetland Delineation

3.1 Wetland Delineation and Classification Methods

The wetland delineation was completed according to the Routine On-Site Determination Method specified in the U.S. Army Corps of Engineers Wetlands Delineation Manual (1987 Edition), 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.

The delineated wetland boundaries and associated sample points were surveyed using a Global Positioning System (GPS) with sub-meter accuracy. 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, 2015).

Soil samples were collected to examine for the presence of hydric soil indicators using the Natural Resources Conservation Service (NRCS) hydric soil indicators (Version 8.2). Hydrologic conditions were evaluated at each soil boring. Additionally, the dominant plant species were identified, and the corresponding wetland indicator status of each plant species was determined. The soil colors, hydrologic conditions, and dominant plant species and indicator species were noted on the Wetland Data Forms (**Appendix A**). Photographs taken at the time of the site visit are provided in **Appendix B**.

3.2 Aquatic Resources

During the wetland delineation, two wetlands totaling 0.03 acres were delineated within the project area (**Table 4**). The delineated wetlands included DeCola Pond D and E (**Figure 6**). Delineations were limited to the areas around the DeCola Pond D outlet pipe, the northern storm sewer discharge into DeCola Pond E, and the southern storm sewer discharge into DeCola Pond E, where potential modifications to storm sewer infrastructure might be made. Descriptions and assessments of the wetland areas are provided below, with representative photographs in **Appendix B**.

Table 4: Delineated Wetlands

Wetland Name	Circular 39	Cowardin Classification	Eggers and Reed	Wetland Size (Acres)
DeCola Pond D	Type 4	PUBH	Deep marsh	0.01
Dakolo Pond E	Type 4	PUBH	Deep marsh	0.02

DeCola Ponds D and E are connected hydrologically through a culvert located under Winnetka Heights Dr. Water flows from DeCola Pond D into Pond E and then flows outside of the project area into DeCola Pond F, ultimately draining to Bassett Creek. Since DeCola Ponds D and E are similar and, one upland/wetland transect was conducted to represent both of the delineated wetland areas for this project. At Sample Point 1, two primary hydrology indicators were observed, including saturation (A3), inundation visible on aerial imagery (B7). Both of the wetlands were classified as a Type 4/deep marsh due to the depth of the wetlands and lack of emergent vegetation (PUBH; **Figure 6**). The two ponds are hydrologically connected through a culvert under Winnetka Heights Drive, that drains Decola Pond D into Decola Pond E.

The wetlands are bordered by private residences that have altered the vegetation along the wetland boundary. Mowed lawns are maintained up to the wetland boundary and ornamental tree species have been planted in the surrounding area. Species identified along the wetland borders included, reed canary grass (*Phalaris arundinacea*; FACW), jewel weed (*Impatiens capensis*; FACW), water smartweed (*Persicaria amphibia*; OBL). Woody vegetation such as boxelder (*Acer negundo*; FAC) and eastern cottonwood (*Populus deltoides*; FAC), and American elm (*Ulmus americana*; FACW) were also identified. No emergent vegetation was observed within the inundated area of the wetland boundary.

According to NRCS data, the soils mapped at Sample Point 1 are classified as Urban land-Lester complex, 2 to 18 percent slopes, a non-hydric soil. Sampled soils consisted of a dark matrix color from the soil surface down to approximately 6 inches. A gleyed matrix with a lighter gray color was found 6 inches below the soil surface. The soils at Sample Point 1 met the loamy gleyed matrix (F2) hydric soil indicator.

The transition to upland was defined by a sudden 2 foot change in elevation around the perimeter of the wetland. The vegetation in the adjacent upland area consisted of maintained lawns. The southern boundary of DeCola Pond D was defined by a constructed retaining wall made of rocks.

Using the MnRAM wetland assessment methodology, both DeCola Pond E and D were classified as a Manage 2 wetlands. As the wetland is rated medium for aesthetics and low for amphibian habitat . See the attached for the MnRAM Excel spreadsheet.

4.0 Regulatory Overview

The U.S. Army Corps of Engineers (USACE) regulates the dredge or placement of 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 (NEPA).

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 Golden Valley and the MnDNR. The City of Golden Valley, MnDNR, and the USACE, should be contacted before altering any aquatic resources in the project area. 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 (BWSR), Hennepin County, and the City of Golden Valley, along with the USACE.

5.0 References

Cowardin, L.M., V. Carter, F.C. Golet, and R.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, FWS/OBS079/31, 103 pp.

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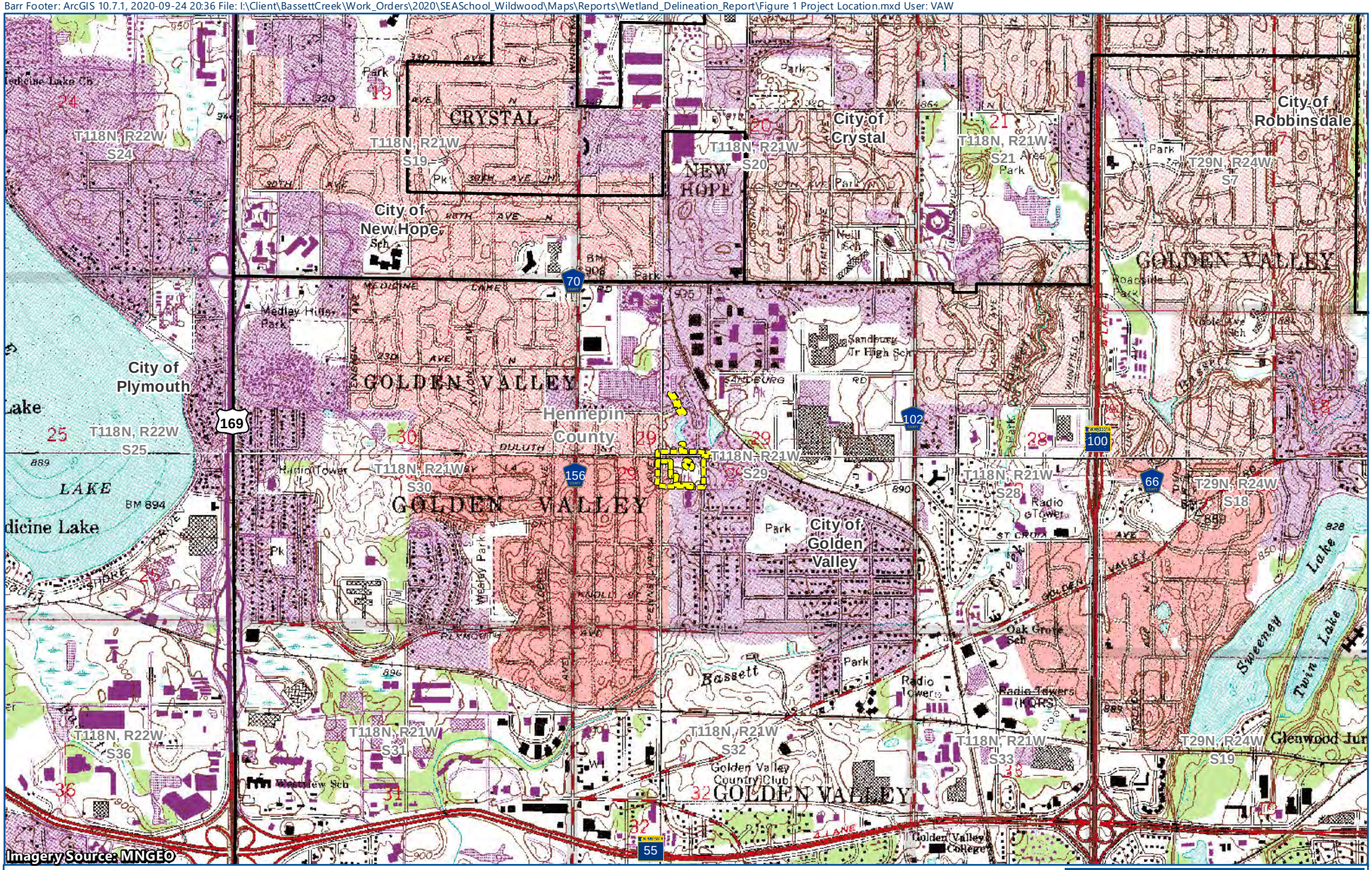
U.S. Fish and Wildlife Service. 1956. *Wetlands of the United States Circular 39*. U.S. Government Printing Office, Washington, D.C.

Figures

Barr Footer: ArcGIS 10.7.1, 2020-09-24 20:36 File: I:\Client\BassettCreek\Work_Orders\2020\SEASchool_Wildwood\Maps\Reports\Wetland_Delineation_Report\Figure 1 Project Location.mxd User: VAW



Project Boundary

N

0 2,000 4,000

Feet

1 inch = 2,000 feet

BARR

PROJECT LOCATION
DeCola Ponds- SEA School-Wildwood Park Flood Storage Project

FIGURE 1

Project Boundary

Elevation

Index Contour (10' Interval)

Intermediate Contour (2' Interval)

N

0 300 600

Feet

1 inch = 300 feet

LIDAR MAP
DeCola Ponds- SEA School-Wildwood Park Flood Storage Project

FIGURE 2

Barr Footer: ArcGIS 10.7.1, 2020-09-24 20:46 File: I:\Client\BassettCreek\Work_Orders\2020\SEASchool_Wildwood\Maps\Reports\Wetland_Delineation_Report\Figure 3 NWI Map.mxd User: VAW

Project Boundary

National Wetland Inventory

N

0 300 600

Feet

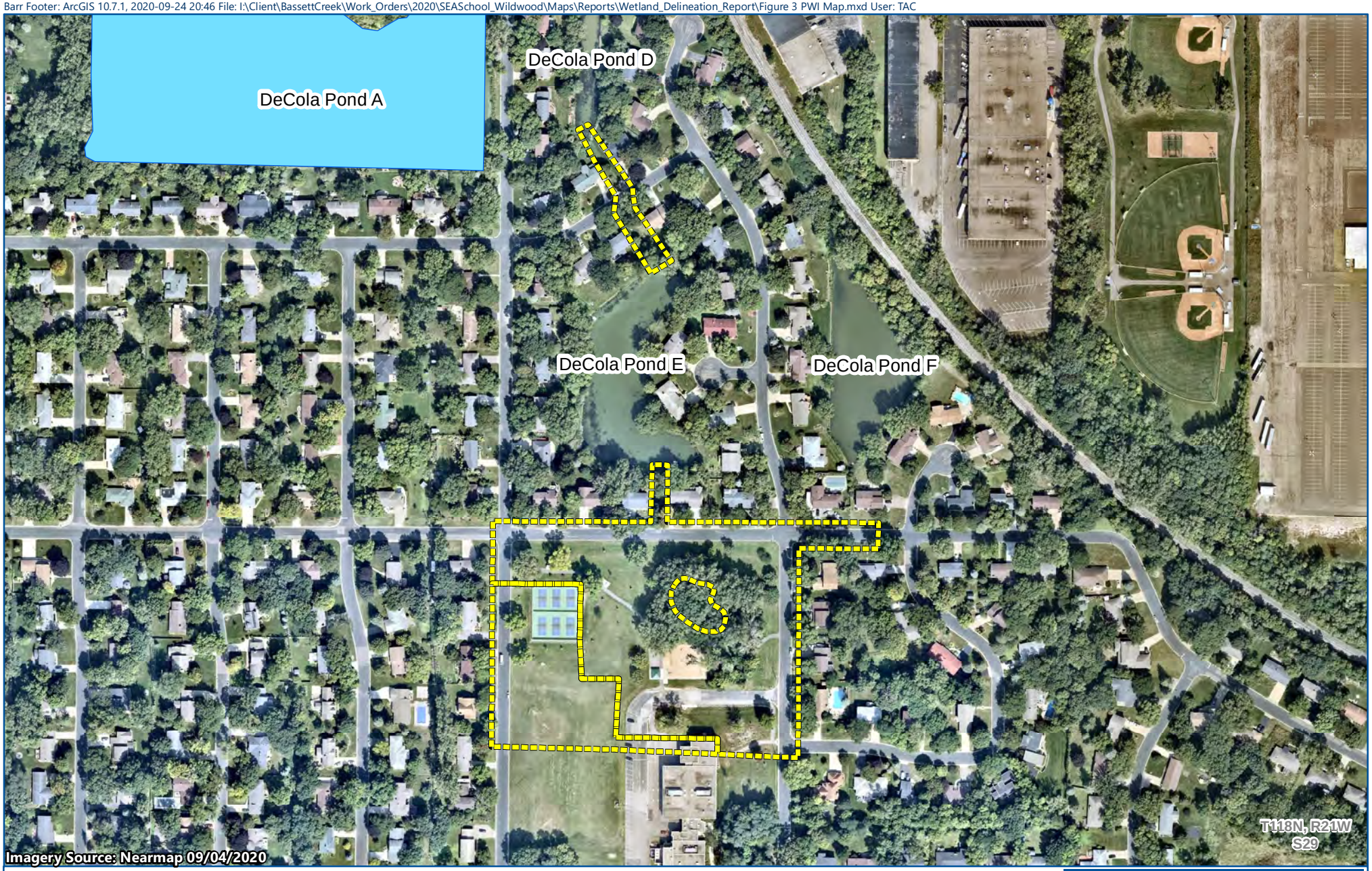
1 inch = 300 feet

BARR

NWI MAP
DeCola Ponds- SEA School-Wildwood Park Flood Storage Project

FIGURE 3

Barr Footer: ArcGIS 10.7.1, 2020-09-24 20:46 File: I:\Client\BassettCreek\Work_Orders\2020\SEASchool_Wildwood\Maps\Reports\Wetland_Delineation_Report\Figure 3 PWI Map.mxd User: TAC



Project Boundary
Public Water Inventory Watercourses
Public Water Inventory Basins

N

0 300 600
Feet

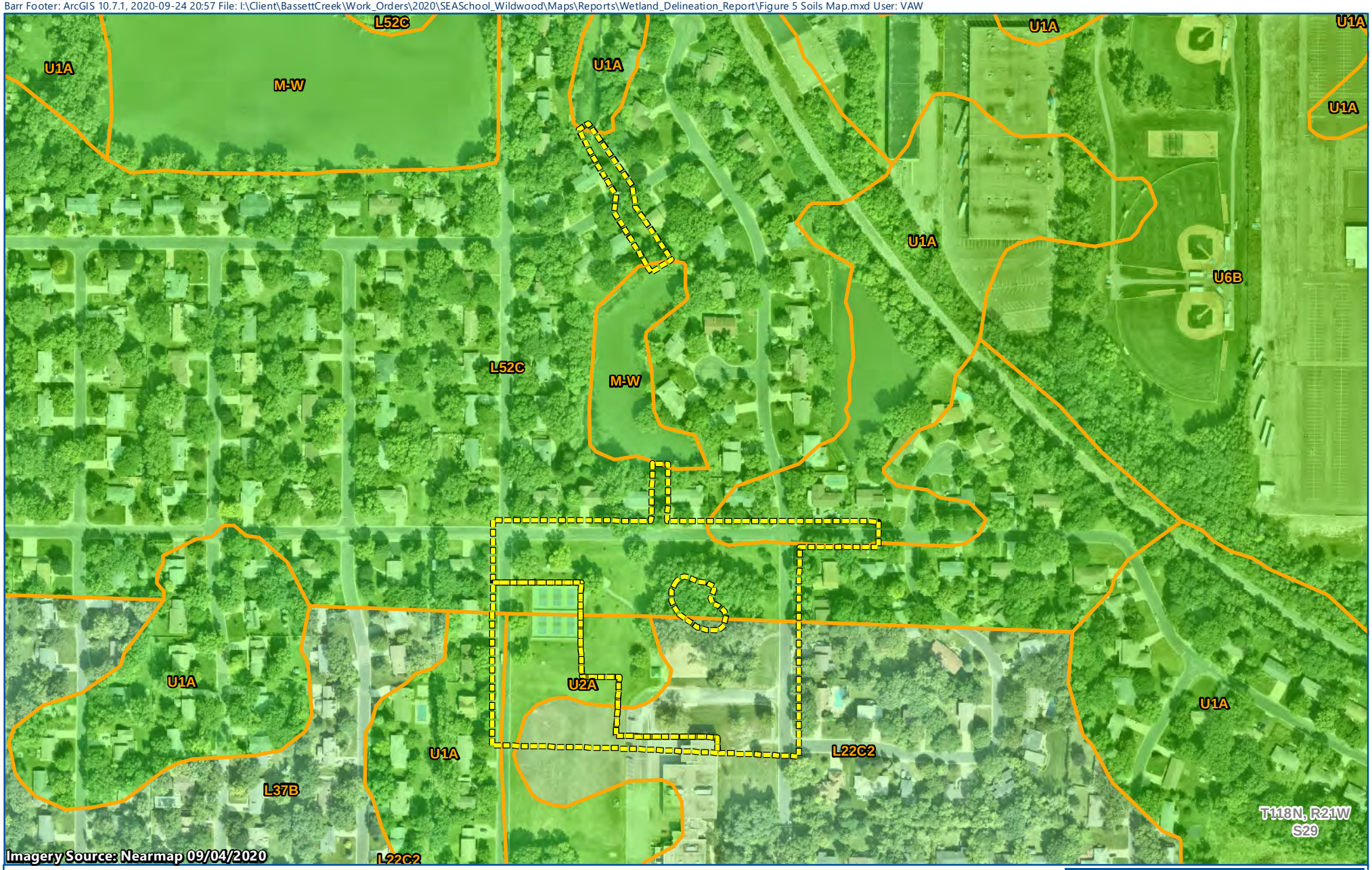
1 inch = 300 feet

BARR

PWI MAP
DeCola Ponds- SEA School-Wildwood Park Flood Storage Project

FIGURE 4

Barr Footer: ArcGIS 10.7.1, 2020-09-24 20:57 File: I:\Client\BassettCreek\Work_Orders\2020\SEASchool_Wildwood\Maps\Reports\Wetland_Delineation_Report\Figure 5 Soils Map.mxd User: VAW



Project Boundary

Soil Boundary

Hydric Rating by Map Unit

Predominantly non-hydric (1 to 33%)

Not Hydric (0%)

N

0 300 600

Feet

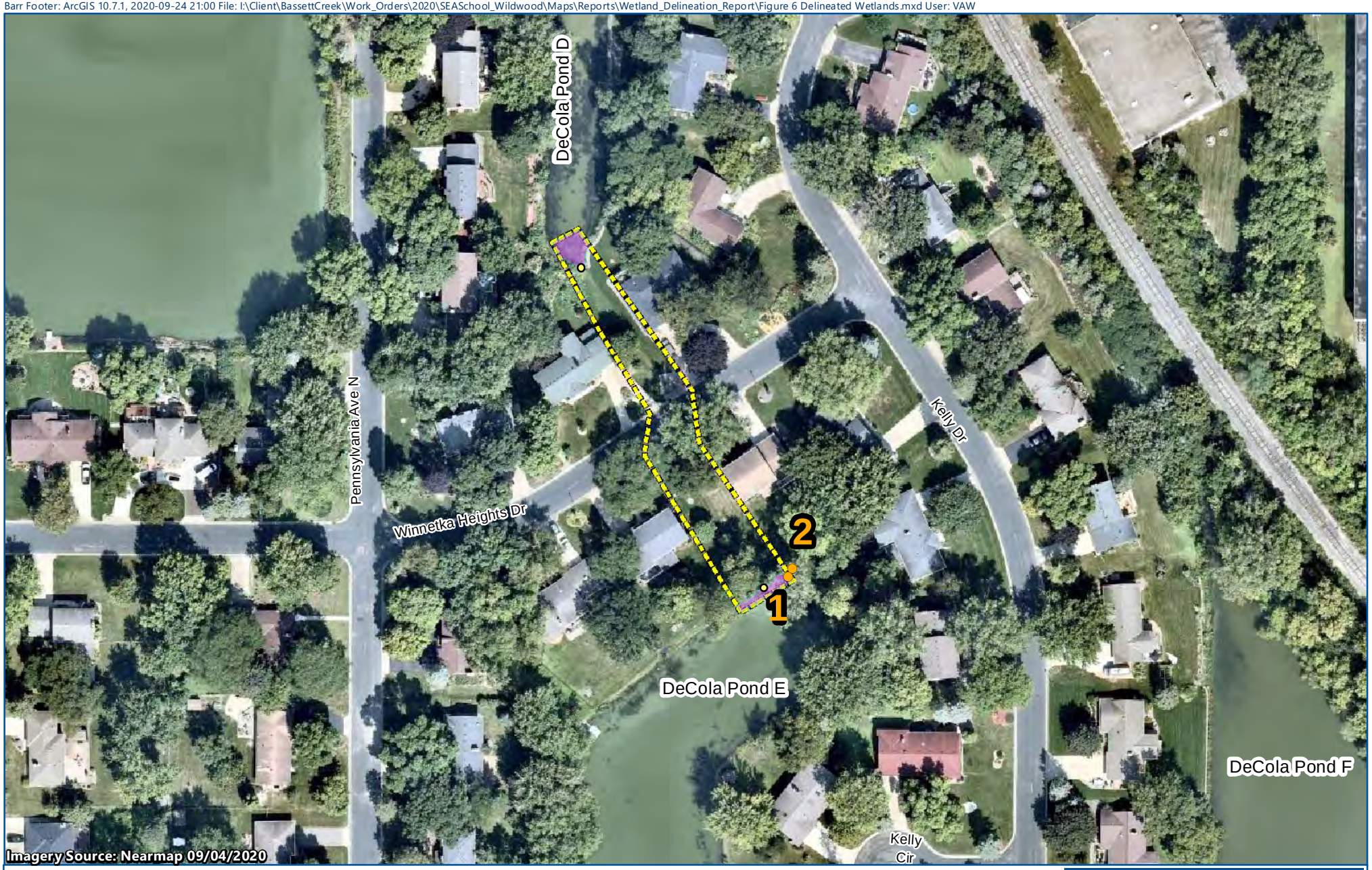
1 inch = 300 feet

BARR

SOILS MAP
DeCola Ponds- SEA School-Wildwood Park Flood Storage Project

FIGURE 5

Barr Footer: ArcGIS 10.7.1, 2020-09-24 21:00 File: I:\Client\BassettCreek\Work_Orders\2020\SEASchool_Wildwood\Maps\Reports\Wetland_Delineation_Report\Figure 6 Delineated Wetlands.mxd User: VAW



Sample Point
Project Boundary
Delineated Wetlands (PUBH)
Culverts

N

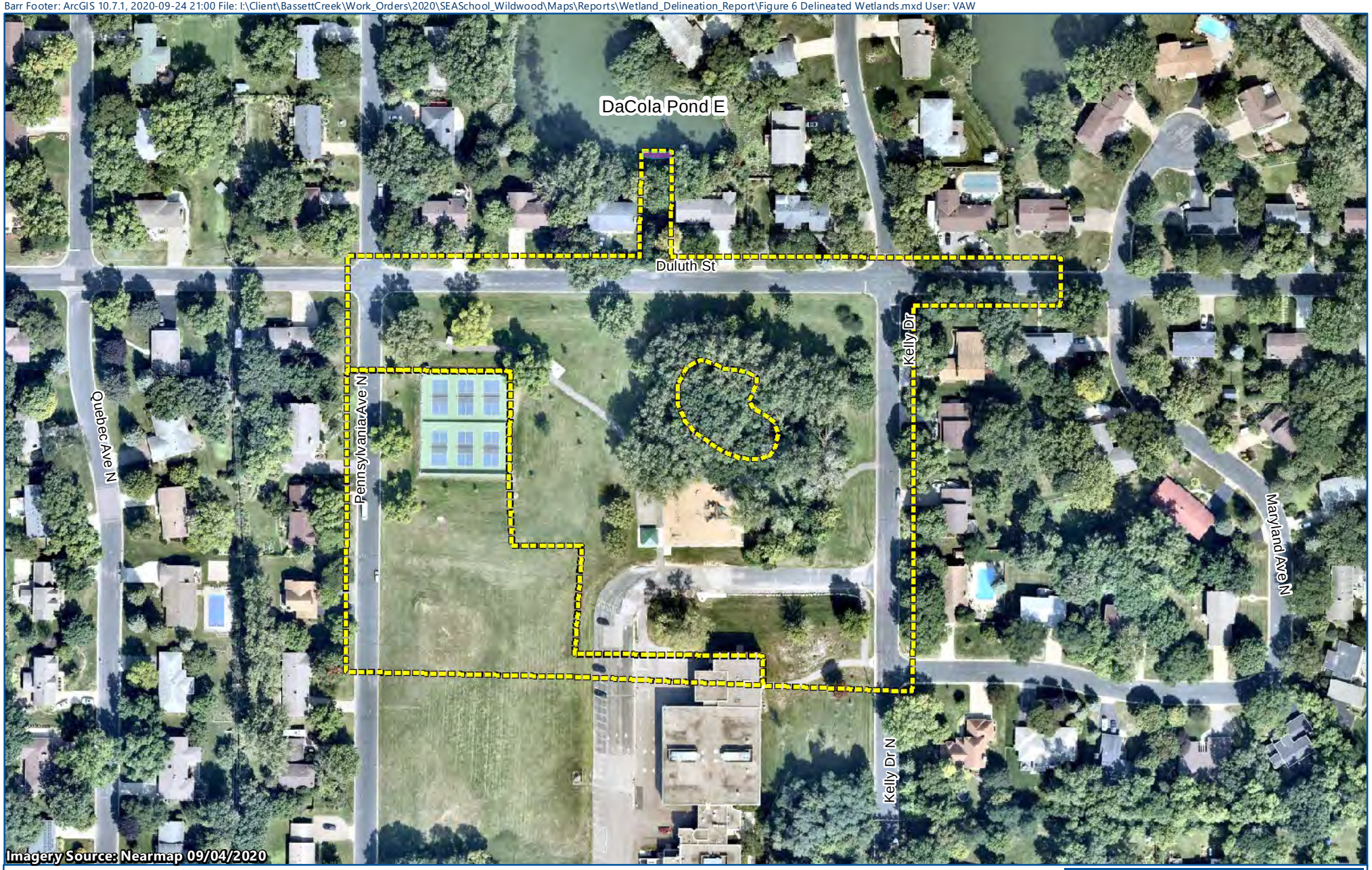
0 100 200
Feet

1 inch = 116 feet

DELINEATED WETLANDS
DeCola Ponds- SEA School-Wildwood Park Flood Storage Project

FIGURE 6

Barr Footer: ArcGIS 10.7.1, 2020-09-24 21:00 File: I:\Client\BassettCreek\Work_Orders\2020\SEASchool_Wildwood\Maps\Reports\Wetland_Delineation_Report\Figure 6 Delineated Wetlands.mxd User: VAW



Sample Point
Project Boundary
Delineated Wetlands (PUBH)
Culverts

BARR

N

0 100 200
Feet

1 inch = 163 feet

DELINEATED WETLANDS
DeCola Ponds- SEA School-Wildwood Park Flood Storage Project

FIGURE 6

Appendix A
Wetland Delineation Datasheets

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Sea School | Applicant/Owner: City of Golden Valley | City/County: Golden Valley | State: MN | Sampling Date: 09/14/20

Investigator(s): TAC | Section: 29 | Township: 118 | Range: 21 | Sampling Point: SP 1

Land Form: Depression | Local Relief: Concave | Slope %: 0 | Soil Map Unit Name: Urban Land-lester complex

Subregion (LRR): M | Latitude: 45.001748 | Longitude: -93.373845 | Datum: NAD 1983 Hennepin County Feet

Cowardin Classification: PUBH | Circular 39 Classification: Type 4 | Mapped NWI Classification: PUBH

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks) | Eggers & Reed (primary): Deep Marsh

Are vegetation No Soil No Hydrology No significantly disturbed? | Are "normal circumstances" present? Yes | Eggers & Reed (secondary):

Are vegetation No Soil No Hydrology No naturally problematic? | 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): Sample point is located within the boundary of wetland 1. According to antecedent precipitation data the area has received normal levels of rain fall in the past three months.

If yes, optional Wetland Site ID: Wetland 1

VEGETATION

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	45	Yes	FAC
2.	0		
3.	0		
4.	0		
Total Cover:	45		
Sapling/Shrub Stratum (Plot Size: 15 ft)			
1. Ulmus americana	15	Yes	FACW
2.	0		
3.	0		
4.	0		
5.	0		
Total Cover:	15		
Herb Stratum (Plot Size: 5 ft)			
1. Impatiens capensis	40	Yes	FACW
2. Phalaris arundinacea	30	Yes	FACW
3. Rhamnus cathartica	10	No	FAC
4.	0		
5.	0		
6.	0		
7.	0		
8.	0		
Total Cover:	80		
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	9	22.5
Sapling/Shrub Stratum	3	7.5
Herb Stratum	16	40
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (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	85	X 2 =	170	
FAC Species	55	X 3 =	165	
FACU Species	0	X 4 =	0	
UPL Species	0	X 5 =	0	
Column Totals:	140	(A)	335	(B)

Prevalence Index = B/A = 2.39

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: SP 1

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 %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	0 - 6	10YR 2/1	100					SiL	Mucky
2.	6 - 12	10YR 2/1	60					SiL	
3.	-	10Y 5/1	40					SiL	
4.	12 - 24	10Y 5/1	70					SiL	
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): 3
- 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:

10/5/2020 5:49:52 PM

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Sea School | Applicant/Owner: City of Golden Valley | City/County: Golden Valley | State: MN | Sampling Date: 09/14/20

Investigator(s): TAC | Section: 29 | Township: 118 | Range: 21 | Sampling Point: SP 2

Land Form: Depression | Local Relief: Concave | Slope %: 0 | Soil Map Unit Name: Urban land-Lester complex

Subregion (LRR): M | Latitude: 45.001767 | Longitude: -93.373832 | Datum: NAD 1983 Hennepin County Feet

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

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):

Are vegetation No Soil No Hydrology No naturally problematic? | 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? No
Indicators of wetland hydrology present? No
Is the sampled area within a wetland? No

General Remarks (explain any answers if needed): Sample point is located adjacent to Wetland 1. According to antecedent precipitation data the project area has received normal levels of precipitation over the last three months.

If yes, optional Wetland Site ID:

VEGETATION

Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	45	Yes	FAC
2.	0		
3.	0		
4.	0		
Total Cover:	45		
Sapling/Shrub Stratum (Plot Size: 15 ft)			
1. Ulmus americana	15	Yes	FACW
2.	0		
3.	0		
4.	0		
5.	0		
Total Cover:	15		
Herb Stratum (Plot Size: 5 ft)			
1. Poa pratensis	45	Yes	FAC
2. Glechoma hederacea	40	Yes	FACU
3. Taraxacum officinale	15	No	FACU
4.	0		
5.	0		
6.	0		
7.	0		
8.	0		
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30 ft)			
1.	0		
2.	0		
Total Cover:	0		

% Bare Ground in Herb Stratum: 0 | % Sphagnum Moss Cover:

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

Vegetation at the sample point was mowed.

50/20 Thresholds:	20%	50%
Tree Stratum	9	22.5
Sapling/Shrub Stratum	3	7.5
Herb Stratum	20	50
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: 4 (B)

Percent of Dominant Species That Are OBL, FACW or FAC: 75.00% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL Species	0	X 1 =	0	
FACW Species	15	X 2 =	30	
FAC Species	90	X 3 =	270	
FACU Species	55	X 4 =	220	
UPL Species	0	X 5 =	0	
Column Totals:	160	(A)	520	(B)

Prevalence Index = B/A = 3.25

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

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WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: SP 2

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 %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	0 - 14	10YR 3/1	100					SL	
2.	14 - 24	10YR 3/1	90	7.5YR 4/6	5	C	PL	SL	
3.	-	10YR 8/1	5						
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 were observed.

Appendix B
Site Photographs

DeCola Ponds – SEA School/Wildwood Park Flood Storage Project

Photolog September 14, 2020

Photograph 1, west side of the pickleball courts in Wildwood Park. view north

Photograph 2, northside of the pickleball courts in Wildwood Park, view east

Photograph 3, Northeastern segment of project area. view east

Photograph 4, eastern edge of Wildwood Park, view south

Photograph 5, Wildwood Park. view west

Photograph 6, wooded trails in Wildwood Park, view east

Photograph 7, Southern DaCola Pond E outlet.

Photograph 8, Southern boundary of DaCola Pond E, view north.

Photograph 9, northern segment of project area, view north.

Photograph 10, northern segment of project area, view south.

Photograph 11, northern boundary of DaCola pond E, view south.

Photograph 12, northern boundary of DaCola pond E, view east.

Photograph 13, southern boundary of DaCola pond D, view south.

Photograph 14, DaCola pond E, view north.

Appendix C
MnRAM Wetland Management Classification
DeCola Pond D

MnRAM 3.2 Digital Worksheet, Side 2

		Question Description	User entry	Rating									
	1	Veg. Table 2, Option 4		0.20									
		TOTAL VEG Rating	0.22	L									
	4	Listed, rare, special plant species?	n	next									
	5	Rare community or habitat?	n	next									
	6	Pre-European-settlement conditions?	n	next									
	7	hydrogeo & topo	onal/Flow	#N/A									
	8	Water depth (inches)	60										
		Water depth (% inundation)											
	9	Local watershed/immedita drainage (acres)											
	10	Existing wetland size	0.75										
	11	SOILS: Up/Wetland (survey classification + site)											
Digital worksheet, section I	12	Outlet characteristics for flood retention	A	1									
	13	Outlet characteristics for hydrologic regime	A	1									
	14	Dominant upland land use (within 500 ft)	B	0.5	0.5								
	15	Soil condition (wetland)	B	0.5									
	16	Vegetation (% cover)	7%	L	0.1								
	17	Emerg. veg. flood resistance	C	0.1									
	18	Sediment delivery	C	0.1									
	19	Upland soils (based on soil group)	B	0.5									
	20	Stormwater runoff pretreatment & detention	A	1	0.1								
	21	Subwatershed wetland density	B	0.5									
	22	Channels/sheet flow	A	1									
	23	Adjacent naturalized buffer average width (feet)	2	L	WQ	0.1	L		0.1				
	24	Adjacent Area Management: % Full	0%	0	1	**0.5**							
		adjacent area mgmt: % Manicured	100%	0.5									
		adjacent area mgmt: % Bare	0%	0									
	25	Adjacent Area Diversity & Structure: % Native	10%	0.1	2	**0.55**							
		adjacent area diversity: % Mixed	90%	0.45									
		adjacent area diversity: % Sparse/Inv./Exotic	0%	0									
	26	Adjacent Area Slope: % Gentle	100%	1	1	**1**							
		adjacent area slope: % Moderate	0%	0									
		adjacent area slope: % Steep	0%	0									
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1									
	28	Nutrient loading	C	0.1									
	29	Shoreline wetland?	N	N									
	30	Rooted shoreline vegetation (%cover)		Enter a percentage									
	31	Wetland in-water width (in feet, average)		Enter a percentage									
	32	Emergent vegetation erosion resistance		Enter valid choice									
	33	Shoreline erosion potential		Enter valid cho									
	34	Bank protection/upslope veg.		Enter valid choice									
	35	Rare Wildlife	N	N									
	36	Scarce/Rare/S1/S2 local community	N	N									
	37	Vegetation interspersion cover (see diagram 1)	8	L	0.1								
	38	Community interspersion (see diagram 2)	1	L	0.1						0		
	39	Wetland detritus	C	0.1									
	40	Wetland interspersion on landscape	B	0.5	0.1								
	41	Wildlife barriers	C	0.1									
	42	Amphibian breeding potential-hydroperiod	A	1									
	43	Amphibian breeding potential--fish presence	c	0.1									
	44	Amphibian & reptile overwintering habitat	A	1									
	45	Wildlife species (list)	Redwing black bird										
	46	Fish habitat quality	B	0.5									
	47	Fish species (list)	N/A										
	48	Unique/rare educ./cultural/rec.opportunity	N	N									
	49	Wetland visibility	A	1									
	50	Proximity to population	Y	1									
	51	Public ownership	A	1									
	52	Public access	C	0.1									
	53	Human influence on wetland	C	0.1									
	54	Human influence on viewshed	C	0.1									
	55	Spatial buffer	B	0.5									
	56	Recreational activity potential	C	0.1									
	57	Commercial crop--hydrologic impact	N/A	N/A									

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Highest-rated:
0.3

Enter data starting here. Yellow boxes are used in calculations.

Scroll down to answer more questions and see formula calculations

Additional questions

58	***GW - Wetland soils***	R	R or D	0.1
59	***GW - Subwatershed land use***	R	R or D	0.1
60	***GW - Wetland size and soil group***	R	R or D	0.1
61	GW - Wetland hydroperiod	D	R or D	1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	3.3
65	***Landowners affected by restoration***		***E a b c***	Enter valid choice
66A	***Existing wetland size (acres) [from #10]***	0.75	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-0.75	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category
Vegetative Diversity/Integrity		0.22	L
Hydrology - Characteristic		0.53	Med
Flood Attenuation		0.59	Med
Water Quality--Downstream		0.60	Med
Water Quality--Wetland		0.25	Low
Shoreline Protection		N/A	N/A
Characteristic Wildlife Habitat Structure	0.28	0.28	Low
Maintenance of Characteristic Fish Habitat	0.30	0.22	Low
Maintenance of Characteristic Amphibian Habitat		0.03	Low
Aesthetics/Recreation/Education/Cultural	0.38	0.49	Med
Commercial use		N/A	N/A

Formula shown to the right.

0

Special Features listing: -

Groundwater Interaction: indeterminate GW source

Groundwater Functional Index: no special indicators

Restoration Potential (draft formula): #VALUE! #####

Stormwater Sensitivity (not active)

Appendix C
MnRAM Wetland Management Classification
DeCola Pond E

MnRAM 3.2 Digital Worksheet, Side 2

		Question Description	User entry	Rating										
	1	Veg. Table 2, Option 4		0.22										
		TOTAL VEG Rating	0.22	L										
	4	Listed, rare, special plant species?	n	next										
	5	Rare community or habitat?	n	next										
	6	Pre-European-settlement conditions?	n	next										
	7	hydrogeo & topo onal/Flow		#N/A										
	8	Water depth (inches)	60											
		Water depth (% inundation)												
	9	Local watershed/immedita drainage (acres)												
	10	Existing wetland size	0.82											
	11	SOILS: Up/Wetland (survey classification + site)												
Digital worksheet, section I	12	Outlet characteristics for flood retention	A	1										
	13	Outlet characteristics for hydrologic regime	C	0.1										
	14	Dominant upland land use (within 500 ft)	B	0.5	0.5									
	15	Soil condition (wetland)	B	0.5										
	16	Vegetation (% cover)	30%	M	0.5									
	17	Emerg. veg. flood resistance	B	0.5										
	18	Sediment delivery	C	0.1										
	19	Upland soils (based on soil group)	B	0.5										
	20	Stormwater runoff pretreatment & detention	A	1	0.1									
	21	Subwatershed wetland density	B	0.5										
	22	Channels/sheet flow	A	1										
	23	Adjacent naturalized buffer average width (feet)	30	M	WQ	0.5	L		0.1					
	24	Adjacent Area Management: % Full	0%	0	1	**0.5**								
		adjacent area mgmt: % Manicured	100%	0.5										
		adjacent area mgmt: % Bare	0%	0										
	25	Adjacent Area Diversity & Structure: % Native	60%	0.6	3	**1.01**								
		adjacent area diversity: % Mixed	80%	0.4										
		adjacent area diversity: % Sparse/Inv./Exotic	10%	0.01										
	26	Adjacent Area Slope: % Gentle	25%	0.25	3	**0.525**								
		adjacent area slope: % Moderate	50%	0.25										
		adjacent area slope: % Steep	25%	0.025										
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5										
	28	Nutrient loading	C	0.1										
	29	Shoreline wetland?	N	N										
	30	Rooted shoreline vegetation (%cover)	Enter a percentage											
	31	Wetland in-water width (in feet, average)	Enter a percentage											
	32	Emergent vegetation erosion resistance	Enter valid choice											
	33	Shoreline erosion potential	Enter valid cho											
	34	Bank protection/upslope veg.	Enter valid choice											
	35	Rare Wildlife	N	N										
	36	Scarce/Rare/S1/S2 local community	N	N										
	37	Vegetation interspersion cover (see diagram 1)	4	M	0.5									
	38	Community interspersion (see diagram 2)	1	L	0.1					0				
	39	Wetland detritus	B	0.5										
	40	Wetland interspersion on landscape	B	0.5	0.5									
	41	Wildlife barriers	C	0.1										
	42	Amphibian breeding potential-hydroperiod	A	1										
	43	Amphibian breeding potential--fish presence	A	1										
	44	Amphibian & reptile overwintering habitat	A	1										
	45	Wildlife species (list)	Redwing black bird											
	46	Fish habitat quality	C	0.1										
	47	Fish species (list)	N/A											
	48	Unique/rare educ./cultural/rec.opportunity	N	N										
	49	Wetland visibility	A	1										
	50	Proximity to population	Y	1										
	51	Public ownership	A	1										
	52	Public access	A	1										
	53	Human influence on wetland	C	0.1										
	54	Human influence on viewshed	C	0.1										
	55	Spatial buffer	B	0.5										
	56	Recreational activity potential	C	0.1										
	57	Commercial crop--hydrologic impact	N/A	N/A										

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Highest-rated:
0.3

Enter data starting here. Yellow boxes are used in calculations.

Scroll down to answer more questions and see formula calculations

Additional questions

58	***GW - Wetland soils***	R	R or D	0.1
59	***GW - Subwatershed land use***	R	R or D	0.1
60	***GW - Wetland size and soil group***	R	R or D	0.1
61	GW - Wetland hydroperiod	D	R or D	1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding		Y or N	3.3
65	***Landowners affected by restoration***		***E a b c***	Enter valid choice
66A	***Existing wetland size (acres) [from #10]***	0.82	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	-0.82	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater		E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category
Vegetative Diversity/Integrity		0.22	L
Hydrology - Characteristic		0.30	Low
Flood Attenuation		0.64	Med
Water Quality--Downstream		0.59	Med
Water Quality--Wetland		0.25	Low
Shoreline Protection		N/A	N/A
Characteristic Wildlife Habitat Structure	0.29	0.28	Low
Maintenance of Characteristic Fish Habitat	0.17	0.22	Low
Maintenance of Characteristic Amphibian Habitat		0.32	Low
Aesthetics/Recreation/Education/Cultural	0.49	0.49	Med
Commercial use		N/A	N/A
Special Features listing:			-

Formula shown to the right.

0

Groundwater Interaction	indeterminate GW source
Groundwater Functional Index	no special indicators
Restoration Potential (draft formula)	#VALUE! #####
Stormwater Sensitivity (not active)	

Appendix B

Feasibility Level Cost Estimates

BARR	**PREPARED BY: BARR ENGINEERING COMPANY**		SHEET:	1	OF	2
			CREATED BY:	KJN2	DATE:	2/17/2021
ENGINEER'S OPINION OF PROBABLE PROJECT COST			CHECKED BY:	JAK2	DATE:	2/19/2021
PROJECT:	SEA School - Concept 1		APPROVED BY:		DATE:	
LOCATION:	City of Golden Valley	ISSUED:			DATE:	
PROJECT #:	23270051.50	ISSUED:			DATE:	
OPINION OF COST - SUMMARY		ISSUED:			DATE:	

Engineer's Opinion of Probable Project Cost

SEA School - Concept #1

Stormwater Retrofit (Feasibility Design)

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization/Demobilization	LS	1	$238,400	$238,400	1,2,3,4,5,6
B	Traffic and Pedestrian Safety Control Measures	LS	1	$5,000	$5,000	1,2,3,4,5,6
C	Construction Layout and Staking	LS	1	$20,000	$20,000	1,2,3,4,5,6
D	Temporary Erosion Control	LS	1	$5,500	$5,500	1,2,3,4,5,6
E	Coordinate Utility Relocation	LS	1	$4,000	$4,000	1,2,3,4,5,6
F	Clearing and Grubbing	AC	1	$10,000	$11,926	1,2,3,4,5,6
G	Remove and Dispose Bituminous Pavement	SY	1,903	$5	$9,516	1,2,3,4,5,6
H	Remove and Dispose of Concrete Pavement	SY	83	$5	$416	1,2,3,4,5,6
I	Remove and Dispose of Curb & Gutter	LF	189	$8	$1,509	1,2,3,4,5,6
J	Sawcut Bituminous Pavement (Full Depth)	LF	281	$6	$1,686	1,2,3,4,5,6
K	Remove and Dispose of Rock Wall	LF	186	$20	$3,720	1,2,3,4,5,6
L	Remove and Dispose Sewer Pipe (12" RCP)	LF	414	$30	$12,420	1,2,3,4,5,6
M	Remove and Dispose Sewer Pipe (24" RCP)	LF	8	$30	$240	1,2,3,4,5,6
N	Remove and Dispose Sewer Pipe (27" RCP)	LF	190	$30	$5,700	1,2,3,4,5,6
O	Remove and Dispose Sewer Pipe (30" RCP)	LF	170	$30	$5,100	1,2,3,4,5,6
P	Remove Existing Structure	Each	6	$600	$3,600	1,2,3,4,5,6
Q	Salvage and Place Topsoil (P)	CY	1,315	$10	$13,152	1,2,3,4,5,6
R	Excavation (P)	CY	21,096	$9	$189,864	1,2,3,4,5,6
S	Subgrade Excavation	CY	2,960	$11	$32,555	1,2,3,4,5,6
T	Offsite Disposal of Excavated Soil (Clean)	CY	21,376	$20	$427,510	1,2,3,4,5,6
U	Offsite Disposal of Excavated Soil (Contaminated)	TON	3,088	$30	$92,627	1,2,3,4,5,6
V	Aggregate Base (CV), Class 5	CY	425	$45	$19,136	1,2,3,4,5,6
W	Common Borrow Import	CY	1	$16	$16	1,2,3,4,5,6
X	Topsoil Import	TON	1,511	$40	$60,438	1,2,3,4,5,6
Y	Bituminous Pavement (Typ)	SY	952	$30	$28,560	1,2,3,4,5,6
Z	Concrete Sidewalk (Typ)	SY	1,600	$45	$71,979	1,2,3,4,5,6
AA	Curb & Gutter	LF	1,457	$35	$50,995	1,2,3,4,5,6
BB	15" CPEP Pipe Sewer	LF	42	$73	$3,066	1,2,3,4,5,6,7
CC	15" CPEP FES	Each	2	$800	$1,600	1,2,3,4,5,6
DD	Special Grate for 15" CPEP FES (0.5" Openings)	Each	1	$1,000	$1,000	1,2,3,4,5,6
EE	15" CPEP Inline Check Valve	Each	1	$5,000	$5,000	1,2,3,4,5,6
FF	12" RCP Pipe Sewer	LF	107	$90	$9,630	1,2,3,4,5,6,7
GG	12" RCP FES	Each	1	$680	$680	1,2,3,4,5,6
HH	12" FES Trash Rack	Each	1	$650	$650	1,2,3,4,5,6
II	15" RCP Pipe Sewer	LF	354	$110	$38,940	1,2,3,4,5,6,7
JJ	24" RCP Pipe Sewer	LF	103	$130	$13,390	1,2,3,4,5,6,7
KK	24" RCP FES	Each	3	$1,000	$3,000	1,2,3,4,5,6
LL	48" RCP Pipe Sewer	LF	360	$370	$133,200	1,2,3,4,5,6,7
MM	48" RCP FES	Each	2	$2,880	$5,760	1,2,3,4,5,6
NN	48" FES Trash Rack	Each	1	$4,800	$4,800	1,2,3,4,5,6
OO	48" Diameter RC Drainage Structure, Complete	Each	5	$5,500	$27,500	1,2,3,4,5,6
PP	60" Diameter RC Drainage Structure, Complete	Each	4	$7,500	$30,000	1,2,3,4,5,6
QQ	72" Diameter RC Drainage Structure with 6-foot Weir, Complete	Each	1	$15,000	$15,000	1,2,3,4,5,6
RR	Random Riprap, Class III with Filter Fabric	TON	30	$80	$2,400	1,2,3,4,5,6
SS	Bulkhead Existing Storm	LS	1	$1,000	$1,000	1,2,3,4,5,6
TT	Subsurface Storage	CF	69,520	$12	$834,240	1,2,3,4,5,6
UU	Restoration/Planting	AC	3.5	$50,000	$175,000	1,2,3,4,5,6
	CONSTRUCTION SUBTOTAL				$2,621,000	1,2,3,4,5,6,7,8
	CONSTRUCTION CONTINGENCY (25%)				$655,000	1,4,8
	ESTIMATED CONSTRUCTION COST				$3,276,000	1,2,3,4,5,6,7,8
	PLANNING, ENGINEERING, & DESIGN (25%)				$819,000	1,2,3,4,5,6,7,8
	EASEMENTS				$16,800	1,5,6
	PERMITTING & REGULATORY APPROVALS					1,5,6
	ESTIMATED TOTAL PROJECT COST				**$4,112,000**	1,2,3,4,5,6,7,8
ESTIMATED ACCURACY RANGE		**-20%**			$3,290,000	1,2,3,4,5,6,7,8
		30%			$5,346,000	1,2,3,4,5,6,7,8

Notes

[1] Quantities based on Design Work Completed (1 - 15%).

[2] Unit Prices Based on Information Available at This Time.

[3] Limited Soil Boring and Field Investigation Information Available.

[4] This design level (Class 4, 1-15% design completion per ASTM E 2516-11) cost estimate is based on concept designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +30%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[5] Estimate assumes that projects will not be located on contaminated soil.

[6] Estimate costs are to design, construct, and permit each alternative. The estimated costs do not include maintenance, monitoring or additional tasks following construction.

[7] Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

[8] Estimate costs are reported to nearest thousand dollars.

BARR	**PREPARED BY: BARR ENGINEERING COMPANY**		SHEET:	1	OF	2
			CREATED BY:	KJN2	DATE:	2/17/2021
ENGINEER'S OPINION OF PROBABLE PROJECT COST			CHECKED BY:	JAK2	DATE:	2/19/2021
PROJECT:	SEA School - Concept 2		APPROVED BY:		DATE:	
LOCATION:	City of Golden Valley	ISSUED:			DATE:	
PROJECT #:	23270051.50	ISSUED:			DATE:	
OPINION OF COST - SUMMARY		ISSUED:			DATE:	

Engineer's Opinion of Probable Project Cost

SEA School - Concept #2

Stormwater Retrofit (Feasibility Design)

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization/Demobilization	LS	1	$164,000	$164,000	1,2,3,4,5,6
B	Traffic and Pedestrian Safety Control Measures	LS	1	$5,000	$5,000	1,2,3,4,5,6
C	Construction Layout and Staking	LS	1	$20,000	$20,000	1,2,3,4,5,6
D	Temporary Erosion Control	LS	1	$5,500	$5,500	1,2,3,4,5,6
E	Coordinate Utility Relocation	LS	1	$4,000	$4,000	1,2,3,4,5,6
F	Clearing and Grubbing	AC	1	$10,000	$11,926	1,2,3,4,5,6
G	Remove and Dispose Bituminous Pavement	SY	1,903	$5	$9,516	1,2,3,4,5,6
H	Remove and Dispose of Concrete Pavement	SY	83	$5	$416	1,2,3,4,5,6
I	Remove and Dispose of Curb & Gutter	LF	189	$8	$1,509	1,2,3,4,5,6
J	Sawcut Bituminous Pavement (Full Depth)	LF	281	$6	$1,686	1,2,3,4,5,6
K	Remove and Dispose of Rock Wall	LF	186	$20	$3,720	1,2,3,4,5,6
L	Remove and Dispose Sewer Pipe (12" RCP)	LF	414	$30	$12,420	1,2,3,4,5,6
M	Remove and Dispose Sewer Pipe (24" RCP)	LF	8	$30	$240	1,2,3,4,5,6
N	Remove and Dispose Sewer Pipe (27" RCP)	LF	190	$30	$5,700	1,2,3,4,5,6
O	Remove and Dispose Sewer Pipe (30" RCP)	LF	170	$30	$5,100	1,2,3,4,5,6
P	Remove Existing Structure	Each	6	$600	$3,600	1,2,3,4,5,6
Q	Salvage and Place Topsoil (P)	CY	1,315	$10	$13,152	1,2,3,4,5,6
R	Excavation (P)	CY	24,787	$9	$223,083	1,2,3,4,5,6
S	Subgrade Excavation	CY	2,635	$11	$28,988	1,2,3,4,5,6
T	Offsite Disposal of Excavated Soil (Clean)	CY	24,514	$20	$490,270	1,2,3,4,5,6
U	Offsite Disposal of Excavated Soil (Contaminated)	TON	3,541	$30	$106,225	1,2,3,4,5,6
V	Aggregate Base (CV), Class 5	CY	418	$45	$18,830	1,2,3,4,5,6
W	Common Borrow Import	CY	1	$16	$16	1,2,3,4,5,6
X	Topsoil Import	TON	1,098	$40	$43,917	1,2,3,4,5,6
Y	Bituminous Pavement (Typ)	SY	952	$30	$28,560	1,2,3,4,5,6
Z	Concrete Sidewalk (Typ)	SY	1,559	$45	$70,140	1,2,3,4,5,6
AA	Curb & Gutter	LF	1,457	$35	$50,995	1,2,3,4,5,6
BB	15" CPEP Pipe Sewer	LF	42	$73	$3,066	1,2,3,4,5,6,7
CC	15" CPEP FES	Each	2	$800	$1,600	1,2,3,4,5,6
DD	Special Grate for 15" CPEP FES (0.5" Openings)	Each	1	$1,000	$1,000	1,2,3,4,5,6
EE	15" CPEP Inline Check Valve	Each	1	$5,000	$5,000	1,2,3,4,5,6
FF	12" RCP Pipe Sewer	LF	111	$90	$9,990	1,2,3,4,5,6,7
GG	12" RCP FES	Each	2	$680	$1,360	1,2,3,4,5,6
HH	12" FES Trash Rack	Each	1	$650	$650	1,2,3,4,5,6
II	15" RCP Pipe Sewer	LF	354	$110	$38,940	1,2,3,4,5,6,7
JJ	24" RCP Pipe Sewer	LF	55	$130	$7,150	1,2,3,4,5,6,7
KK	24" RCP FES	Each	1	$1,000	$1,000	1,2,3,4,5,6
LL	48" RCP Pipe Sewer	LF	360	$370	$133,200	1,2,3,4,5,6,7
MM	48" RCP FES	Each	2	$2,880	$5,760	1,2,3,4,5,6
NN	48" FES Trash Rack	Each	1	$4,800	$4,800	1,2,3,4,5,6
OO	48" Diameter RC Drainage Structure, Complete	Each	6	$5,500	$33,000	1,2,3,4,5,6
PP	60" Diameter RC Drainage Structure, Complete	Each	4	$7,500	$30,000	1,2,3,4,5,6
QQ	72" Diameter RC Drainage Structure with 6-foot Weir, Complete	Each	1	$15,000	$15,000	1,2,3,4,5,6
RR	Random Riprap, Class III with Filter Fabric	TON	32	$80	$2,560	1,2,3,4,5,6
SS	Bulkhead Existing Storm	LS	1	$1,000	$1,000	1,2,3,4,5,6
TT	Restoration/Planting	AC	4	$50,000	$180,000	1,2,3,4,5,6
	CONSTRUCTION SUBTOTAL				$1,804,000	1,2,3,4,5,6,7,8
	CONSTRUCTION CONTINGENCY (25%)				$451,000	1,4,8
	ESTIMATED CONSTRUCTION COST				$2,255,000	1,2,3,4,5,6,7,8
	PLANNING, ENGINEERING, & DESIGN (25%)				$564,000	1,2,3,4,5,6,7,8
	EASEMENTS				$16,800	1,5,6
	PERMITTING & REGULATORY APPROVALS					1,5,6
	ESTIMATED TOTAL PROJECT COST				**$2,836,000**	1,2,3,4,5,6,7,8
ESTIMATED ACCURACY RANGE		**-20%**			$2,269,000	1,2,3,4,5,6,7,8
		30%			$3,687,000	1,2,3,4,5,6,7,8

Notes

[1] Quantities based on Design Work Completed (1 - 15%).

[2] Unit Prices Based on Information Available at This Time.

[3] Limited Soil Boring and Field Investigation Information Available.

[4] This design level (Class 4, 1-15% design completion per ASTM E 2516-11) cost estimate is based on concept designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +30%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[5] Estimate assumes that projects will not be located on contaminated soil.

[6] Estimate costs are to design, construct, and permit each alternative. The estimated costs do not include maintenance, monitoring or additional tasks following construction.

[7] Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

[8] Estimate costs are reported to nearest thousand dollars.

BARR	**PREPARED BY: BARR ENGINEERING COMPANY**		SHEET:	1	OF	1
			CREATED BY:	KJN2	DATE:	2/17/2021
ENGINEER'S OPINION OF PROBABLE PROJECT COST			CHECKED BY:	JAK2	DATE:	2/19/2021
PROJECT:	SEA School - Concept 3		APPROVED BY:		DATE:	
LOCATION:	City of Golden Valley	ISSUED:			DATE:	
PROJECT #:	23270051.50	ISSUED:			DATE:	
OPINION OF COST - SUMMARY		ISSUED:			DATE:	

Engineer's Opinion of Probable Project Cost

SEA School - Concept #3

Stormwater Retrofit (Feasibility Design)

Cat. No.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization/Demobilization	LS	1	$177,000	$177,000	1,2,3,4,5,6
B	Traffic and Pedestrian Safety Control Measures	LS	1	$5,000	$5,000	1,2,3,4,5,6
C	Construction Layout and Staking	LS	1	$20,000	$20,000	1,2,3,4,5,6
D	Temporary Erosion Control	LS	1	$5,500	$5,500	1,2,3,4,5,6
E	Coordinate Utility Relocation	LS	1	$4,000	$4,000	1,2,3,4,5,6
F	Clearing and Grubbing	AC	1	$10,000	$11,926	1,2,3,4,5,6
G	Remove and Dispose Bituminous Pavement	SY	1,903	$5	$9,516	1,2,3,4,5,6
H	Remove and Dispose of Concrete Pavement	SY	83	$5	$416	1,2,3,4,5,6
I	Remove and Dispose of Curb & Gutter	LF	189	$8	$1,509	1,2,3,4,5,6
J	Sawcut Bituminous Pavement (Full Depth)	LF	281	$6	$1,686	1,2,3,4,5,6
K	Remove and Dispose of Rock Wall	LF	186	$20	$3,720	1,2,3,4,5,6
L	Remove and Dispose Sewer Pipe (12" RCP)	LF	414	$30	$12,420	1,2,3,4,5,6
M	Remove and Dispose Sewer Pipe (24" RCP)	LF	8	$30	$240	1,2,3,4,5,6
N	Remove and Dispose Sewer Pipe (27" RCP)	LF	190	$30	$5,700	1,2,3,4,5,6
O	Remove and Dispose Sewer Pipe (30" RCP)	LF	170	$30	$5,100	1,2,3,4,5,6
P	Remove Existing Structure	Each	6	$600	$3,600	1,2,3,4,5,6
Q	Salvage and Place Topsoil (P)	CY	1,315	$10	$13,152	1,2,3,4,5,6
R	Excavation (P)	CY	23,721	$9	$213,489	1,2,3,4,5,6
S	Subgrade Excavation	CY	2,984	$11	$32,822	1,2,3,4,5,6
T	Offsite Disposal of Excavated Soil (Clean)	CY	23,823	$20	$476,457	1,2,3,4,5,6
U	Offsite Disposal of Excavated Soil (Contaminated)	TON	3,441	$30	$103,232	1,2,3,4,5,6
V	Aggregate Base (CV), Class 5	CY	336	$45	$15,117	1,2,3,4,5,6
W	Common Borrow Import	CY	1	$16	$16	1,2,3,4,5,6
X	Topsoil Import	TON	1,694	$40	$67,759	1,2,3,4,5,6
Y	Bituminous Pavement (Typ)	SY	952	$30	$28,560	1,2,3,4,5,6
Z	Concrete Sidewalk (Typ)	SY	1,064	$45	$47,863	1,2,3,4,5,6
AA	Curb & Gutter	LF	1,467	$35	$51,345	1,2,3,4,5,6
BB	15" CPEP Pipe Sewer	LF	73	$73	$5,329	1,2,3,4,5,6,7
CC	15" CPEP FES	Each	4	$800	$3,200	1,2,3,4,5,6
DD	Special Grate for 15" CPEP FES (0.5" Openings)	Each	1	$1,000	$1,000	1,2,3,4,5,6
EE	15" CPEP Inline Check Valve	Each	1	$5,000	$5,000	1,2,3,4,5,6
FF	12" RCP Pipe Sewer	LF	149	$90	$13,410	1,2,3,4,5,6,7
GG	12" RCP FES	Each	3	$680	$2,040	1,2,3,4,5,6
HH	15" RCP Pipe Sewer	LF	354	$110	$38,940	1,2,3,4,5,6,7
II	24" RCP Pipe Sewer	LF	99	$130	$12,870	1,2,3,4,5,6,7
JJ	24" RCP FES	Each	2	$1,000	$2,000	1,2,3,4,5,6
KK	48" RCP Pipe Sewer	LF	360	$370	$133,200	1,2,3,4,5,6,7
LL	48" RCP FES	Each	2	$2,880	$5,760	1,2,3,4,5,6
MM	48" FES Trash Rack	Each	1	$4,800	$4,800	1,2,3,4,5,6
NN	48" Diameter RC Drainage Structure, Complete	Each	6	$5,500	$33,000	1,2,3,4,5,6
OO	60" Diameter RC Drainage Structure, Complete	Each	5	$7,500	$37,500	1,2,3,4,5,6
PP	72" Diameter RC Drainage Structure with 6-foot Weir, Complete	Each	2	$15,000	$30,000	1,2,3,4,5,6
QQ	Random Riprap, Class III with Filter Fabric	TON	35	$80	$2,800	1,2,3,4,5,6
RR	Restoration/Planting	AC	3.7	$50,000	$185,000	1,2,3,4,5,6
SS	Clean Washed Sand with 5 percent iron filings	CY	102	$260	$26,579	1,2,3,4,5,6
TT	Small Splash Block Assembly (Pipe Discharge)	EA	1	$1,800	$1,800	1,2,3,4,5,6
UU	6" Perforated Dual Wall HDPE Draintile Pipe and Fittings (no sock) (P)	LF	387	$23	$8,901	1,2,3,4,5,6
VV	6" PVC Storm Sewer Pipe and Fittings (P)	LF	103	$36	$3,708	1,2,3,4,5,6
WW	6" Draintile Cleanout and Cover Unit	EA	3	$650	$1,950	1,2,3,4,5,6
XX	Planting Soil (75% sand, 25% leaf compost - MnDOT Grade II) (P)	CY	95	$60	$5,695	1,2,3,4,5,6
YY	Hydrodynamic Separator	Each	1	$65,000	$65,000	1,2,3,4,5,6
	CONSTRUCTION SUBTOTAL				$1,947,000	1,2,3,4,5,6,7,8
	CONSTRUCTION CONTINGENCY (25%)				$487,000	1,4,8
	ESTIMATED CONSTRUCTION COST				$2,434,000	1,2,3,4,5,6,7,8
	PLANNING, ENGINEERING, & DESIGN (25%)				$609,000	1,2,3,4,5,6,7,8
	EASEMENTS				$16,800	1,5,6

PERMITTING & REGULATORY APPROVALS					1,5,6
ESTIMATED TOTAL PROJECT COST				**$3,060,000**	1,2,3,4,5,6,7,8
ESTIMATED ACCURACY RANGE	**-20%**			$2,448,000	1,2,3,4,5,6,7,8
	30%			$3,978,000	1,2,3,4,5,6,7,8

Notes

[1] Quantities based on Design Work Completed (1 - 15%).

[2] Unit Prices Based on Information Available at This Time.

[3] Limited Soil Boring and Field Investigation Information Available.

[4] This design level (Class 4, 1-15% design completion per ASTM E 2516-11) cost estimate is based on concept designs, alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. A construction schedule is not available at this time. Contingency is an allowance for the net sum of costs that will be in the Final Total Project Cost at the time of the completion of design, but are not included at this level of project definition. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +30%. The accuracy range is based on professional judgement considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. The contingency and the accuracy range are not intended to include costs for future scope changes that are not part of the project as currently scoped or costs for risk contingency. Operation and Maintenance costs are not included.

[5] Estimate assumes that projects will not be located on contaminated soil.

[6] Estimate costs are to design, construct, and permit each alternative. The estimated costs do not include maintenance, monitoring or additional tasks following construction.

[7] Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

[8] Estimate costs are reported to nearest thousand dollars.