Item 4D. BCWMC 6-17-21 Document body posted separately

# Appendices

Appendix AWetland Delineation ReportAppendix BFeasibility-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

### DeCola Ponds – SEA School/Wildwood Park Flood Storage Project

Prepared for City of Golden Valley

October 2020

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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**).

Score using 1981-2010 normal period			
(value are in inches)	first prior month:	second prior month:	third prior month:
	August 2020	July 2020	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 * <b>2</b> = 6	2 * <b>1</b> = 2	1 * <b>2 =</b> 2
multi-month score:		10 (normal)	

#### Table 1, Antecedent Moisture Conditions

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

Table 2	Precipitation in comparison to WETS data

Precipitation Totals a	re 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	<b>WAT</b> = water year (Oct. previous year thru Sep.
	present year)

					P	eriod-of-F	Record Su	ummary	Statistics	5				in the second	
	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
						1981-20	010 Summ	nary Stat	istics						
	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
					-	)	fear-to-Ye	ear 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

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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 20:46 File: I:\Client\BassettCreek\Work\_Orders\2020\SEASchool\_Wildwood\Maps\Reports\Wetland\_Delineation\_Report\Figure 2 LiDAR Map.mxd User: VAW









Feet 1 inch = 300 feet

FIGURE 3

BARR

Barr Footer: ArcGIS 10.7.1, 2020-09-24 20:46 File: 1:\Client\BassettCreek\Work\_Orders\2020\SEASchool\_Wildwood\Maps\Reports\Wetland\_Delineation\_Report\Figure 3 PWI Map.mxd User: TAC



1 inch = 300 feet

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



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



0 Culverts



FIGURE 6



Appendix A Wetland Delineation Datasheets

Project/Site:	Sea Scho	<u>loc</u>			Applicant/	Owner:	<u>City of C</u> Valley	<u>Golden</u>	City/County	: Golden V	alley/	State:	<u>MN</u>	Sampling Date:	<u>09/14/20</u>
Investigator(s):	TAC				Section:	<u>29</u>			Township:	<u>118</u>		Range:	<u>21</u>	Sampling Point:	<u>SP 1</u>
Land Form:	Depress	ion			Local Reli	ef: <u>Co</u>	ncave		Slope %:	<u>0</u>	Soil Map U	nit Name.	: <u>Urban</u>	Land-lester com	plex
Subregion (LRR)	: <u>M</u>				Latitude:	<u>45.</u>	<u>.001748</u>		Longitude:	<u>-93.37384</u>	5	Datum:	<u>NAD 19</u>	83 Hennepin Cou	unty Feet
Cowardin Classif	fication:	PUBH	<u> </u>		Circular 3	9 Classi	ification:	Type 4			Mapped	NWI Cla	ssificatior	n: <u>PUBH</u>	
Are climatic/hydro	ologic condi	itions o	n the site ty	pical for this	time of yea	ar?	Yes	(If no, expla	ain in remark	s)	Eggers	& Reed (	primary):	Deep Marsl	<u>n</u>
Are vegetation	No	Soil	No	Hydrology	No	signific	cantly dist	urbed?	Are "norma	Yes	Eggers	& Reed (	secondar	y):	
°,						Ũ			nresent?	.63	Eggers	& Reed (i	tertiary):		
Are vegetation	<u>No</u>	Soil	No	Hydrology	No	natural	ly problem	natic?	prosont:		Eggers	& Reed (	quaternar	y):	

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

Hydrophytic vegetation present? Hydric soil present? Indicators of wetland hydrology present?	<u>Yes</u> <u>Yes</u> 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.	
Is the sampled area within a wetland?	Yes	If yes, optional Wetla	nd Site ID: Wetland 1	

#### VEGETATION

	Tree Stratum	(Plot Size:	<u>30 ft</u> )	<u>Absolute</u> <u>% Cover</u>	<u>Dominant</u> Species?	<u>Indicator</u> <u>Status</u>	50/20 Thresholds: Tree Stratum		20% 9	<u>50%</u> 22.5
1.	Populus deltoides			45	Yes	FAC	Herb Stratum		<u> </u>	40
2.				0			Woody Vine Stratum		0	0
3.				0			Dominance Test Workshoet:			
4.			Total Courses	0			Number of Deminent Oregies			
			Total Cover:	<u>45</u>			That Are OBL, FACW or FAC:	4	(A)	
	Sapling/Shrub Stratum	(Plot Size:	<u>15 ft</u> )				Total Number of Dominant			
1.	Ulmus americana			15	Yes	FACW	Species Across All Strata:	4	(B)	
2.				0			Percent of Dominant Species	100 00%	( <b>/</b> / <b>R</b> )	
з. 4							That Are OBL, FACW or FAC:			
ч. 5.				0			Prevalence Index Worksheet:			
			Total Cover:	15			Total % Cover of:	М	Itiply by:	
	Herb Stratum	(Plot Size:	5 ft	_			OBL Species 0	X 1 =		0
1	Impatiens capensis		,	40	Yes	FACW	FACW Species 85	X 2 =	1	70
2.	Phalaris arundinacea			30	Yes	FACW	FAC Species 55	X 3 =	1	65
3.	Rhamnus cathartica			10	No	FAC	EACU Species 0	X 4 =		0
4.				0				X 5 =		0
5.				0			OPL Species140	(A)	3	35 (B)
6.				0			Column Totals:	Β/Λ =		20
7.				0			Hudronhutia Variatation Indicatore	<i>D/A</i> -	Z.	39
8.				0			Hydrophylic Vegetation indicators			
			Total Cover:	<u>80</u>			No Rapid Test for Hydroph	ytic vegetation		
	Woody Vine Stratum	(Plot Size:	<u>30 ft</u> )				$\frac{1}{\text{Yes}} = \frac{1}{\text{Prevalence Index}} \le 3.0$	/0 [1]		
1.				0			No Morphological Adaptat	ions [1] (provid	le suppor	ting data
2.				0			in vegetation remarks of	or on a separate	sheet)	•
			Total Cover:	<u>0</u>			No Problematic Hydrophyt	ic Vegetation [	l] (Explair	ı)
% B	are Ground in Herb Stratum	1:	_	% Sphagnu	m Moss Cove	r:	[1] Indicators of hydric soil & wetland h disturbed or problematic.	ydrology must be	present, u	nless
Veg	etation Remarks: (include p	hoto numbers	here or on a separate s	sheet)			Hydrophytic vegetation present?	Yes		

Depth Matrix	eaea to aoc	ument the indicator or c Re	ontirm th dox Featu	e abscence o ires	f indicators).			
(inches) Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Rem	arks
0 - 6 10YR 2/1	100					SiL	Mucky	
6 - 12 10YR 2/1	60					SiL		
- <u>10Y 5/1</u>	40					SiL		
<u>12 - 24</u> <u>10Y 5/1</u>	/0				. <u></u>	SiL		
	Reduced M	atrix, MS=Masked Sand	Grains	[2] Location:	PL=Pore Lir	ning, M=Matrix.		
ic Soil Indicators: (applicable to all LRRs	, unless otl	erwise noted)			Ind	icators for Problematic Hydric	Soils [3]:	
listosol (A1)		📃 Sandy Gl	leyed Matı	rix (S4)		Coast Prairie Redox (A16)		
listic Epipedon (A2)		Sandy Re	edox (S5)			Dark Surface (S7)		
Black Histic (A3)		Stripped	Matrix (S6	3)		Iron-Manganese Masses (F12)		
lydrogen Sulfide (A4)		Loamv M	lucky Mine	eral (F1)		Very Shallow Dark Surface (TF1	(2)	
Stratified Layers (A5)		✓ Loamv G	leved Mat	rix (F2)		Other (explain in soil remarks)	,	
cm Muck (A10)			Matrix (F:	3)				
Depleted Below Dark Surface (A11)		Redox Di	ark Surfac	-, e (F6)				
Flick Dark Surface (A12)			Dark Sud	e (F7)				
Sandy Mucky Mineral (S1)		Bedox D	onrossions	c (F8)	[3]	Indicators of hydrophytic vege	etation and wetland	hydrolog
			000000000		m			
5 cm Mucky Peat or Peat (S3) trictive Layer (if present): Type:		Dept	th (inche	s):		st be present, unless disturbed Hydric soil present?	Yes	
5 cm Mucky Peat or Peat (S3) strictive Layer (if present): Type:		Depi	th (inche	s):		st be present, unless disturbed Hydric soil present?	Yes	
5 cm Mucky Peat or Peat (S3) trictive Layer (if present): Type: Remarks: DROLOGY		Dep	th (inche	s):		st be present, unless disturbed	Yes	
5 cm Mucky Peat or Peat (S3) trictive Layer (if present): Type:	check all th	Depi	th (inche	s):		st be present, unless disturbed Hydric soil present?	Yes	
5 cm Mucky Peat or Peat (S3) trictive Layer (if present): Type: Remarks: DROLOGY tland Hydrology Indicators: nary Indicators (minimum of one required; Surface Water (A1)	check all th	Depu	th (inches	s):		the present, unless disturbed Hydric soil present? Ondary Indicators (minimum of Surface Soil Cracks (B6)	Yes f two required)	
5 cm Mucky Peat or Peat (S3) trictive Layer (if present): Type: Remarks: DROLOGY tland Hydrology Indicators: nary Indicators (minimum of one required; Surface Water (A1) High Water Table (A2)	check all th	Depu Depu Depu Depu Depu Depu Depu Depu	th (inche es (B9)	s):		t be present, unless disturbed Hydric soil present? Condary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10)	Yes	
5 cm Mucky Peat or Peat (S3) trictive Layer (if present): Type: I Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required; Surface Water (A1) High Water Table (A2) Saturation (A3)	check all th		th (inche) es (B9) ) (B14)	s):		Hydric soil present? Hydric soil present? Condary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2)	Yes	
5 cm Mucky Peat or Peat (S3)  trictive Layer (if present): Type:	check all th		th (inche es (B9) ) (B14) for (C1)	s):		Hydric soil present? Hydric soil present? Condary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Cravfish Burrows (C8)	Yes	
5 cm Mucky Peat or Peat (S3)  trictive Layer (if present): Type:	check all th		th (inches es (B9) ) (B14) dor (C1) res on Livi	s):		Hydric soil present? Hydric soil present? ondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Agrial Imag	Yes of two required)	
5 cm Mucky Peat or Peat (S3) trictive Layer (if present): Type:	check all th		th (inche) es (B9) ) (B14) dor (C1) res on Livi	s):	Sec	Hydric soil present? Hydric soil present? Hydric soil present? ondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1)	<u>Yes</u> of two required)	
5 cm Mucky Peat or Peat (S3)  strictive Layer (if present): Type:	check all th	Deputer-Stained Leaver Water-Stained Leaver Aquatic Fauna (B13) True Aquatic Plants Hydrogen Sulfide Oc Oxidized Rhizospher Presence of Reduce	th (inches es (B9) ) (B14) dor (C1) res on Livi d Iron (C4	s):	Sec	Hydric soil present? Hydric soil present? Fondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1) Geomorphic Position (D2)	Yes Yes of two required) gery (C9)	
5 cm Mucky Peat or Peat (S3) atrictive Layer (if present): Type: I Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required; 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)	check all th		th (inches es (B9) ) (B14) dor (C1) res on Livi d Iron (C4 on in Tillec C7)	s): ing Roots (C3) !) d Soils (C6)	Sec	Hydric soil present? Hydric soil present? Hydric soil present? ondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	Yes Yes of two required) gery (C9)	
5 cm Mucky Peat or Peat (S3) strictive Layer (if present): Type: I Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required; 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)	check all th	Depu Depu Depu Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants Hydrogen Sulfide Oc Oxidized Rhizosphen Presence of Reduce Recent Iron Reducti Thin Muck Surface (	th (inche: es (B9) ) dor (C1) res on Livi d Iron (C4 on in Tilleo C7) (D0)	s): ing Roots (C3) !) d Soils (C6)	Sec [	Hydric soil present? Hydric soil present? Hydric soil present? Fondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	Yes <u>Yes</u> of two required) gery (C9)	
5 cm Mucky Peat or Peat (S3)  tricitive Layer (if present): Type:	check all t		th (inches es (B9) ) (B14) dor (C1) res on Livi d Iron (C4 on in Tilleo (C7) (D9) narks)	s): ing Roots (C3) () d Soils (C6)	Sec [	Hydric soil present? Hydric soil present? Hydric soil present? Hydric soil present? Ondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	Yes Yes of two required) gery (C9)	
5 cm Mucky Peat or Peat (S3) strictive Layer (if present): Type: I Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required; 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)	check all th	Depl         Deply)         Water-Stained Leave         Aquatic Fauna (B13)         True Aquatic Plants         Hydrogen Sulfide Oc         Oxidized Rhizosphei         Presence of Reduce         Recent Iron Reductii         Thin Muck Surface (         Gauge or Well Data         Other (explain in ren	th (inches es (B9) ) dor (C1) res on Livi d Iron (C4 on in Tilleo C7) (D9) narks)	s): ing Roots (C3) !) d Soils (C6)		Hydric soil present? Hydric soil present? Hydric soil present? Fondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	Yes <u>Yes</u> of two required) gery (C9)	
5 cm Mucky Peat or Peat (S3) atrictive Layer (if present): Type: I Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required; 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) Id Observations: face water present?	check all th	Deputer Stained Leaven Water-Stained Leaven Aquatic Fauna (B13) Water-Stained Leaven (B13) Aquatic Fauna (B13) True Aquatic Plants Hydrogen Sulfide Oc Oxidized Rhizosphere Recent Iron Reduction Recent Iron Reduction Thin Muck Surface ( Gauge or Well Data Other (explain in ren	th (inches th (inches es (B9) ) (B14) dor (C1) res on Livi d Iron (C4 on in Tilleo (C7) (D9) narks)	s): ing Roots (C3) () 1 Soils (C6)		Hydric soil present? Hydric soil present? Hydric soil present? Ondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	<u>Yes</u> of two required) gery (C9) plogy present?	
5 cm Mucky Peat or Peat (S3) strictive Layer (if present): Type:	check all th		th (inches):	s):		Hydric soil present? Hydric soil present? Hydric soil present? Hydric soil present? Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydro Describe Recorded Data:	Yes <u>Yes</u> of two required) gery (C9) plogy present?	
5 cm Mucky Peat or Peat (S3) strictive Layer (if present): Type: I Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required; 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) Id Observations: face water present? ter table present?	check all th		th (inches es (B9) ) (B14) dor (C1) res on Livi d Iron (C4 on in Tilleo (C7) (D9) narks) nches): hes):	s):		Hydric soil present? Hydric soil present? Hydric soil present? Fondary Indicators (minimum of Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imag Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydro Describe Recorded Data:	<u>Yes</u> <u>of two required</u> ) gery (C9) plogy present?	

Project/Site:	Sea Sch	<u>ool</u>			Applicant/	Owner:	<u>City of (</u> Valley	<u>Golden</u>	City/County.	: Golden \	Valley	State:	<u>MN</u>	Sampling Date:	<u>09/14/20</u>
Investigator(s):	TAC				Section:	<u>29</u>			Township:	<u>118</u>		Range:	<u>21</u>	Sampling Point:	<u>SP 2</u>
Land Form:	Depress	ion			Local Reli	ef: <u>Co</u>	ncave		Slope %:	<u>0</u>	Soil Map U	nit Name.	<u>Urban</u>	land-Lester com	<u>plex</u>
Subregion (LRR)	: <u>M</u>				Latitude:	45	<u>.001767</u>		Longitude:	<u>-93.37383</u>	<u>32</u>	Datum:	<u>NAD 19</u>	83 Hennepin Cou	unty Feet
Cowardin Classif	fication:	<u>Uplar</u>	<u>ıd</u>		Circular 3	9 Classi	ification:	<u>Upland</u>			Маррес	NWI Cla	ssificatior	<u>: Upland</u>	
Are climatic/hydro	ologic cond	itions o	n the site ty	pical for this	time of yea	ar?	Yes	(If no, expla	ain in remarks	s)	Eggers	& Reed (	orimary):	Upland	
Are vegetation	No	Soil	No	Hydrology	No	signifi	cantly dist	turbed?	Are "normal	Yes	<u>s</u> Eggers	& Reed (	secondary	/):	
U U	_		_	, ,,	—	Ũ	- <b>1</b>		nrosont?	.88	Eggers	& Reed (i	tertiary):		
Are vegetation	<u>No</u>	Soil	No	Hydrology	No	natural	ly problen	natic?	procont:		Eggers	& Reed (	quaternar	y):	

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

Hydrophytic vegetation present?	<u>Yes</u>	General Remarks	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.
Hydric soil present?	<u>No</u>	(explain any	
Indicators of wetland hydrology present?	No	answers if needed):	
Is the sampled area within a wetland?	<u>No</u>	lf yes, optional Wetla	nd Site ID:

#### VEGETATION

	Tree Stratum	(Plot Size:	<u>30 ft</u>	)	<u>Absolute</u> <u>% Cover</u>	<u>Dominant</u> Species?	<u>Indicator</u> <u>Status</u>	<u>50/20 Thresholds:</u> Tree Stratum		-	<u>20%</u> 9	<u>50%</u> 22.5
1.	Populus deltoides				45	Yes	FAC	Sapling/Shrub Strat	tum	-	3	7.5
2.					0			Woody Vine Stratur	n	-	20	
3.					0							
4.					0			Dominance Test We	orksneet:			
	Continue/Chruch Christian		Tot	al Cover:	<u>45</u>			Number of Dominal That Are OBL, FAC	nt Species W or FAC:		3 <i>(A)</i>	
	Saping/Snrub Stratum	(Plot Size:	<u>15 II</u>	,	45	Vaa	EA CIA/	Total Number of Do	minant			
1. 2	Ulmus americana				15	Yes	FACW	Species Across All	Strata:		4 (B)	
2. 3.					0			Percent of Dominar	nt Species W or EAC:	75.00	% (A/B)	
4.					0				i or rao.			
5.					0			Prevalence Index W	orksheet:			
			Tot	al Cover:	<u>15</u>			Total % Cov	er of:	/	lultiply by:	
	Herb Stratum	(Plot Size:	<u>5 ft</u>	)				OBL Species	0	X 1 =		0
1.	Poa pratensis				45	Yes	FAC	FACW Species	15	X 2 =		30
2.	Glechoma hederacea				40	Yes	FACU	FAC Species	90	X 3 =	2	70
3.	Taraxacum officinale				15	No	FACU	FACU Species	55	X 4 =	2	20
4.					0			UPL Species	0	X 5 =		0
5.					0			Column Totals:	160	(A)	5	20 (B)
0. 7					0			Preva	alence Index =	B/A =	3.	25
7. 8					0			Hydrophytic Vegetat	tion Indicators:			
0.			Tot	al Cover:	100			No Rapid Te	st for Hydroph	ytic Vegetatio	on	
	Woodv Vine Stratum	(Plot Size:	30 ft	)	100			Yes Dominan	ice Test is >50%	6		
1				,	0			No Prevalen	ce Index $\leq 3.0$	[1]		
2.					0			No Morphole	ogical Adaptati ation remarks o	ons [1] (prov r on a separa	ride suppor	ting data
			Tot	al Cover:	0			No <b>Problem</b>	atic Hydrophyti	ic Vegetation	[1] (Explai	n)
% B	are Ground in Herb Stratun	ı:	0		% Sphagnu	m Moss Cove	r:	[1] Indicators of hydric disturbed or problemat	soil & wetland hy ic.	drology must	be present, u	inless
Veg	etation Remarks: (include p	hoto number:	s here or on a	a separate sl	heet)			Hydrophytic vegetati	on present?	Yes		
Veg	etation at the sample point wa	as mowed.						11				

Depth         Matrix         Redox Features           (inches)         Color (moist)         %         Type [1]         Loc [2]         Texture         Remarks           (inches)         Color (moist)         %         Type [1]         Loc [2]         Texture         Remarks           (inches)         Color (moist)         %         Type [1]         Loc [2]         Texture         Remarks           (inches)         IOYR 3/1         90         7.5YR 4/6         5         C         PL         SL	Depth         Matrix           (inches)         Color (moist)           0 - 14         10YR 3/1           14 - 24         10YR 3/1           10YR 0/4         10YR 0/4					muicators).			
Choice (moist)       %       Color (moist)       %       Type [1]       Loc [2]       Texture       Remarks         0 - 14       10VR 3/1       100       7.5YR 4/6       5       C       PL       SL	(inches)         Color (moist)           0 - 14         10YR 3/1           14 - 24         10YR 3/1           10YR 9/1		Red	ox Featur	res				
0-14       10/R 3/1       100	0 - 14 10YR 3/1 14 - 24 10YR 3/1 10YR 3/1	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Remar	ks
14 - 4       UVTK-3/1       90       /. 3/TK 4/b       5       C       PL       SL         -       10YR 8/1       5       C       PL       SL         -       10YR 8/1       5       C       PL       SL         -       -       -       -       -       -       -         -       -       -       -       -       -       -       -         -	<u>14 - 24</u> <u>10YR 3/1</u>	100					SL		
i       i       i         i       i       i         Type: C-Concentration, D-Depletion, RM-Reduced Matrix, MS-Masked Sand Grains [2] Location: PL=Pore Lining, M-Matrix.         tric Soil Indicators: (applicable to all LRRs, unless otherwise noted)       Indicators for Problematic Hydric Soils [3]:         Histoscol (A1)       Indicators for Problematic Hydric Soils [3]:         Histoscol (A2)       Indicators (applicable to all LRRs, unless otherwise noted)       Indicators for Problematic Hydric Soils [3]:         Black Histic (A3)       Stripped Matrix (S4)       Indicators (S7)         Black Histic (A4)       Loamy Mucky Mineral (F1)       Very Shallow Dark Surface (S7)         Straßfiel Layers (A4)       Indemy Gleyed Matrix (F2)       Other (explain in soil remarks)         2 cm Muck (A10)       Depleted Matrix (F2)       Other (explain in soil remarks)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F7)         Sandy Mucky Mineral (S1)       Redox Depressions (F8)       [3] Indicators of hydrophytic vegetation and wetland hydrolog must be present, unless disturbed or problematic.         5 cm Mucky Peat or Peat (S3)       Secondary Indicators (minimum of one required)       Secondary Indicators (minimum of two required)         surface Water (A1)       Water-Stained Loaves (B9)       Surface Soil Cracks (B6)       High Water Table (A2)         Hand Hydrology Indicators:       M	- 10YR 8/1	90	1.51K 4/0	5	U	PL	SL		
Type: C-Concentration, D-Depletion, RM=Reduced Matrix, MS=Masked Sand Grains       [2] Location: PL=Pore Lining, M=Matrix.         Type: C-Concentration, D-Depletion, RM=Reduced Matrix, MS=Masked Sand Grains       [2] Location: PL=Pore Lining, M=Matrix.         the Soil Indicators: (applicable to all LRRs, unless otherwise noted)       Indicators for Problematic Hydric Soils [3]:         Histocal (A1)       Gandy Gleyed Matrix (S4)       Coast Prairie Redox (A16)         Histo (A2)       Sandy Redox (S5)       Dark Surface (S7)         Black Histic (A3)       Charry Mucky Mineral (F1)       Very Shallow Dark Surface (TF12)         Strattified Layers (A5)       Loarny Gleyed Matrix (F2)       Other (explain in soil remarks)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in soil remarks)         2 nm Muck (A10)       Depleted Matrix (F3)       Gandy Mucky Mineral (F1)       Indicators of hydrophytic vegetation and wetland hydrolog must be present, unless disturbed or problematic.         5 orm Mucky Peat or Peat (S3)       Type:       Depleted Matrix (F3)       Depleted Matrix (F3)         Hemarks:       Depleted Matrix (F3)       Secondary Indicators (minimum of une required, check all that apply)       Secondary Indicators (minimum of une required, check all that apply)       Secondary Indicators (minimum of une required, check all that apply)       Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)       High Water Table (A2)	-								
Type: C-Concentration, D-Depletion, RM-Reduced Matrix, MS-Masked Sand Graim [2] Location: PL=Pore Lining, M=Matrix.   tric Soll Indicators: (applicable to all LRRs, unless otherwise noted) Indicators for Problematic Hydric Solls [3]:   Histo: Epipedon (A2) Sandy Gleyed Matrix (S4) Coast Prairie Redox (A16)   Histo: Epipedon (A2) Sandy Redox (S5) Dark Surface (S7)   Biack Histic (A3) Stripped Matrix (S6) IonManganese Masses (F12)   Hydrogen Suffide (A4) Loarny Mucky Mineral (F1) Very Shallow Dark Surface (TF2)   Strattified Layers (A5) Dapheted Matrix (F2) Other (explain in soil remarks)   Depleted Below Dark Surface (A11) Redox Dark Surface (F7) [3] Indicators of hydrophytic vegetation and wetland hydrolog must be present, unless disturbed or problematic.   strictive Layer (If present): Type: Depleted Matrix (F3)   Depleted Below Dark Surface (A12) Depleted Dark Surface (F7)   Sandy Mucky Mineral (S1) Redox Depressions (F8)   strictive Layer (If present): Type:   Depleted Below Dark Surface (A12) Depleted Matrix (F3)   It Remarks: Image: Strippe	·			·			·		
dric Soil Indicators: (applicable to all LRRs, unless otherwise noted)       Indicators for Problematic Hydric Soils [3]:         Histosca (A1)       Sandy Gleyel Matrix (S4)       Coast Praine Redox (A16)         Histo: Epipedon (A2)       Sandy Redox (S5)       Dark Surface (S7)         Black Histic (A3)       Stripped Matrix (S4)       Dorw Surface (S7)         Black Histic (A4)       Loamy Mucky Mineral (F1)       Very Shallow Dark Surface (TF12)         Stratified Layers (A5)       Doapy Gleyed Matrix (F2)       Other (explain in soil remarks)         2 or Muck (A10)       Depleted Matrix (F3)       Depleted Back Surface (F1)         Stratified Layers (A11)       Redox Dark Surface (F6)       Trick Dark Surface (A12)         Stratified Soil Surface (A12)       Depleted Dark Surface (F7)       Sandy Mucky Mineral (S1)       Redox Depressions (F8)         Strictive Layer (if present):       Type:       Deplet (inches):       Hydric soil present?       Ne         Strictive Layer (if present):       Type:       Deplet (inches):       Hydric soil present?       Ne         Strictive Layer (if present):       Type:       Deplet (inches):       Hydric soil present?       Ne         Strictive Layer (if present):       Type:       Deplet (inches):       Secondary Indicators (minimum of two required)       Secondary Indicators (minimum of two required)       Secondary Ind	Type: C=Concentration, D=Depletion, RM=R	Reduced I	Matrix, MS=Masked Sand G	irains	[2] Location:	PL=Pore Lii	ning, M=Matrix.		
Histosal (A1)   Gast Prairie Redox (A16)   Gost Prairie Redox (A16)   Histic Epipedon (A2)   Gast Prairie Redox (A5)   Dark Surface (S7)   Black Histic (A3)   Stripped Matrix (S6)   Iron-Manganese Masses (F12)   Hydrogen Suffice (A4)   Gamy Mucky Mineral (F1)   Very Shallow Dark Surface (TF12)   Stratified Layers (A5)   Dark Surface (TF12)   Other (explain in soil remarks)   Gamy Gleyed Matrix (F2)   Other (explain in soil remarks)   Gamy Gleyed Matrix (F2)   Other (explain in soil remarks)   Gamy Gleyed Matrix (F3)   Depleted Bark Surface (A11)   Redox Dark Surface (F7)   Sandy Mucky Mineral (S1)   Depleted Dark Surface (F7)   Sandy Mucky Mineral (S1)   Redox Depressions (F8)   Gamtart (F3)   Mydric soil present? No   Gamtart (F3)   Gamtart (F4)   Gamtart (F3)   Gamtart (F3)   Gamtart (F4)   Gamta	dric Soil Indicators: (applicable to all LRRs,	unless of	herwise noted)			Ind	icators for Problematic Hydric Soils [	[3]:	
Histic Epipedon (A2) <ul> <li>Sandy Redox (S5)</li> <li>Dark Surface (S7)</li> <li>Iron-Manganese Masses (F12)</li> <li>Hydrogen Sulfide (A4)</li> <li>Loamy Mucky Mineral (F1)</li> <li>Very Shallow Dark Surface (TF12)</li> <li>Stratified Layers (A5)</li> <li>Loamy Gleyed Matrix (F2)</li> <li>Other (explain in soil remarks)</li> </ul> <li>Thick Dark Surface (A11)</li> <li>Depleted Matrix (F3)</li> <li>Depleted Below Dark Surface (A11)</li> <li>Redox Dark Surface (F7)</li> <li>Sandy Mucky Mineral (S1)</li> <li>Depleted Dark Surface (F7)</li> <li>Sandy Mucky Mineral (S1)</li> <li>Redox Depressions (F8)</li> <li>Indicators of hydrophytic vegetation and wetland hydrolog must be present, unless disturbed or problematic.</li> <li>for Mucky Peat or Peat (S3)</li> <li> <ul> <li>Type: Depth (inches):</li> <li>Hydric soil present? No</li> </ul> </li> <li>Il Remarks:         <ul> <li> </li> <li>             Surface Matrix (A11)             <ul> <li>Water-Stained Leaves (B9)</li> <li>Surface Soil Cracks (B6)</li> <li>Hydric Faule (A2)</li> <li>Aquatic Fauna (B13)</li> <li>Drainage Patterns (B10)</li> <li>Saturation (A3)</li> <li>The Aquatic Plants (B14)</li> <li>Dy-Season Water Table (C2)</li> <li>Water Marks (B1)</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Crayitish Burrows (C8)</li> <li>Solutand Deposits (B2)</li> <li>Oxidized Philospheres on Living Roots (C3)</li> <li>Saturation Visible on Adveral Imagery (C9)</li> </ul> </li> </ul></li>	Histosol (A1)		Sandy Gle	yed Matrix	x (S4)		Coast Prairie Redox (A16)		
Black Histic (A3)       Stripped Matrix (S6)       Iron-Manganese Masses (F12)         Hydrogen Suffide (A4)       Loamy Mucky Mineral (F1)       Very Shallow Dark Surface (TF12)         Stratified Layers (A5)       Loamy Gleyed Matrix (F2)       Other (explain in soil remarks)         2 cm Muck (A10)       Depleted Matrix (F3)       Other (explain in soil remarks)         3 brack Histic (A10)       Depleted Matrix (F3)       Generative (F6)         1 hick Dark Surface (A12)       Depleted Dark Surface (F7)       [3] Indicators of hydrophytic vegetation and wetland hydrolog must be present, unless disturbed or problematic.         5 cm Mucky Peat or Peat (S3)       Favorant (inches):       Hydric soil present?       No         Surface Kall that apply         Secondary Indicators:         imary Indicators:         imary Indicators (minimum of one required; check all that apply)         Secondary Indicators:         imary Indicators (minimum of one required; check all that apply)         Surface Water (A1)         No         Surface Soil Cracks (B6)         Hydric soil present?         Surface Water (A1)         Depth (inches):       Surface Soil Cracks (B6)         Indicators (minimum of one required; c	Histic Epipedon (A2)		Sandy Red	dox (S5)			Dark Surface (S7)		
Hydrogen Sulfide (A4) <ul> <li>Loamy Mucky Mineral (F1)</li> <li>Very Shallow Dark Surface (TF12)</li> <li>Stratified Layers (A5)</li> <li>Loamy Gleyed Matrix (F2)</li> <li>Other (explain in soil remarks)</li> <li>2 cm Muck (A10)</li> <li>Depleted Matrix (F3)</li> <li>Depleted Below Dark Surface (A11)</li> <li>Redox Dark Surface (F6)</li> <li>Thick Dark Surface (A12)</li> <li>Depleted Dark Surface (F7)</li> <li>Sandy Mucky Mineral (S1)</li> <li>Redox Depressions (F8)</li> <li>f Indicators of hydrophytic vegetation and wetland hydrolog must be present, unless disturbed or problematic.</li> <li>f cm Mucky Peat or Peat (S3)</li> <li>f Indicators (minimum of one required; check all that apply)</li> <li>Surface Water (A1)</li> <li>Water Stained Leaves (B9)</li> <li>Surface Soil Cracks (B6)</li> <li>High Water Table (A2)</li> <li>Aqualic Fauna (B13)</li> <li>Drainage Patterns (B10)</li> <li>Surface G12</li> <li>Surface B(1)</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Crayfish Burrows (C8)</li> <li>Sectured or Starved (B1)</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Crayfish Burrows (C8)</li> <li>Sectured (B1)</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Crayfish Burrows (C9)</li> <li>Sectured or Starved (Binth (M1)</li> <li>Depresent (C1)</li> <li>Crayfish Burrows (C9)</li> <li>Sectured or Starved (Binth (M1)</li> <li>Sectured or Starve</li></ul>	Black Histic (A3)		Stripped M	latrix (S6)			Iron-Manganese Masses (F12)		
Stratified Layers (A5) <ul> <li>Loamy Gleyed Matrix (F2)</li> <li>Other (explain in soil remarks)</li> </ul> 2 cm Muck (A10)              Depleted Matrix (F3)         Depleted Below Dark Surface (A11)              Redox Dark Surface (F6)         Thick Dark Surface (A12)              Depleted Dark Surface (F7)         Sandy Mucky Mineral (S1)              Redox Depressions (F8)         Strictive Layer (if present):              Type:         Depth (inches):              Hydric soil present? No         strictive Layer (if present):              Type:         Depth (inches):              Hydric soil present? No         strictive Layer (if present):              Type:         Depth (inches):              Hydric soil present? No         strictive Layer (if present):              Type:         Depth (inches):              Hydric soil present? No         strictive Layer (if present):              Type:         Bepth (inches):              Hydric soil present? No         strictive Layer (if present):              Type:         Bepth (inches):              Bepth (inches):         Image: Strictive Layer (if present):              Type:         Strictive Layer (if present):	Hydrogen Sulfide (A4)		🗌 Loamy Mu	icky Miner	al (F1)		Very Shallow Dark Surface (TF12)		
2 cm Muck (A10)       Depleted Matrix (F3)         Depleted Below Dark Surface (A11)       Redox Dark Surface (F6)         Thick Dark Surface (A12)       Depleted Dark Surface (F7)         S andy Mucky Mineral (S1)       Redox Depressions (F8)         5 cm Mucky Peat or Peat (S3)       Depleted Dark Surface (F7)         Image: Strictive Layer (if present):       Type:         Depth (inches):       Hydric soil present?         Model       Mucky Peat or Peat (S3)         Image: Strictive Layer (if present):       Type:         Depth (inches):       Hydric soil present?         Model       Model         Surface Soil Cracks (B6)       Surface Soil Cracks (B6)         Image: Strictive Layer (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         Surface Water (A1)       Aquatic Fauna (B13)       Drainage Patterns (B10)       Saturation (A3)         Sturtation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)       Water Marks (B1)       Dry-Season Atlent Table (C2)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)       Saturation Visible on Aerial Imagery (C9)       Saturation Visible on Aerial Imagery (C9)       Drives on Aerial Imagery (C9)       Saturation Visible on Aerial Imagery (C9)       Defendence (C1)       Saturation Visible on Aerial Imagery (C9)       <	Stratified Layers (A5)		🗌 Loamy Gle	eyed Matri	x (F2)		Other (explain in soil remarks)		
Depleted Below Dark Surface (A11)       Redox Dark Surface (F6)         Thick Dark Surface (A12)       Depleted Dark Surface (F7)         Sandy Mucky Mineral (S1)       Redox Depressions (F8)         5 cm Mucky Peat or Peat (S3)       Hydric soil present?         strictive Layer (if present):       Type:         Depth (inches):       Hydric soil present?         will Remarks:         /DROLOGY         strictive Layer (if present):       Water-Stained Leaves (B9)         Surface Water (A11)       Water-Stained Leaves (B9)         Surface Water (A12)       Aquatic Fauna (B13)         High Water Table (A2)       Aquatic Fauna (B13)         Saturation (A3)       True Aquatic Plants (B14)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)	2 cm Muck (A10)		Depleted N	Matrix (F3)	)				
Thick Dark Surface (A12)       □ Depleted Dark Surface (F7)       [3] Indicators of hydrophytic vegetation and wetland hydrolog must be present, unless disturbed or problematic.         S andy Mucky Mineral (S1)       □ Redox Depressions (F8)       [3] Indicators of hydrophytic vegetation and wetland hydrolog must be present, unless disturbed or problematic.         S orm Mucky Peat or Peat (S3)       □ Depth (inches):	Depleted Below Dark Surface (A11)		🗌 Redox Dar	rk Surface	(F6)				
Sandy Mucky Mineral (S1)       Redox Depressions (F8)       [3] Indicators of hydrophytic vegetation and welland hydrolog must be present, unless disturbed or problematic.         5 cm Mucky Peat or Peat (S3)       hydric soil present?       No         istrictive Layer (if present):       Type:       Depth (inches):       Hydric soil present?       No         iil Remarks:       ////////////////////////////////////	Thick Dark Surface (A12)		Depleted L	Dark Surfa	ice (F7)				
5 cm Mucky Peat or Peat (S3)         estrictive Layer (if present):       Type:       Depth (inches):       Hydric soil present?       No         vil Remarks:         //DROLOGY         etland Hydrology Indicators:         imary Indicators (minimum of one required; check all that apply)       Secondary Indicators (minimum of two required)         ] Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         ] High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         ] Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         [ Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         [ Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)	Sandy Mucky Mineral (S1)		🗌 Redox Dep	oressions	(F8)	[3] mu	Indicators of hydrophytic vegetation a st be present. unless disturbed or pro	and wetland h oblematic.	ydrolo
estrictive Layer (if present): Type: Depth (inches): Hydric soil present? No pil Remarks:	5 cm Mucky Peat or Peat (S3)								
estrictive Layer (if present): Type: Depth (inches): Hydric soil present? No poil Remarks: //DROLOGY //etland Hydrology Indicators: rimary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) ] Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6) ] High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10) ] Saturation (A3) True Aquatic Plants (B14) Dry-Season Water Table (C2) ] Water Marks (B1) Hydrogen Sulfide Odor (C1) Crayfish Burrows (C8) ] Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Saturation Visible on Aerial Imagery (C9)									
Doil Remarks:         //DROLOGY         Vetland Hydrology Indicators:         rimary Indicators (minimum of one required; check all that apply)       Secondary Indicators (minimum of two required)         ] Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         ] High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         ] Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         [ Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         [ Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)	estrictive Laver (if present): Type:		Donth						
YDROLOGY         Vetland Hydrology Indicators:         rimary Indicators (minimum of one required; check all that apply)       Secondary Indicators (minimum of two required)         Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)			Depth	i (inches	):		Hydric soil present?	No	
YDROLOGY         /etland Hydrology Indicators:         rimary Indicators (minimum of one required; check all that apply)       Secondary Indicators (minimum of two required)         Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)	il Remarks:		Deput	i (inches)	):		Hydric soil present?	<u>No</u>	
Vetland Hydrology Indicators:       Secondary Indicators (minimum of one required; check all that apply)       Secondary Indicators (minimum of two required)         ] Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         ] High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         ] Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         ] Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         ] Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)         ] Drift Deposits (P2)       Dry       Dry       Sturted or Streaged Plants (D1)	il Remarks:		Depin	i (inches)	):		Hydric soil present?	<u>No</u>	
Image: Indicators (minimum of one required; check all that apply)       Secondary Indicators (minimum of two required)         Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (P2)       Broanne of Bedward Iron (C4)       Structed or Stragged Plants (D1)	il Remarks:		Depn	i (inches)	):		Hydric soil present?	<u>No</u>	
Surface Water (A1)       Water-Stained Leaves (B9)       Surface Soil Cracks (B6)         High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposite (R2)       Drift Deposite (R2)       Sturation Visible on Aerial Imagery (C9)	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators:		Depn	ı (inches)	):		Hydric soil present?	<u>No</u>	
High Water Table (A2)       Aquatic Fauna (B13)       Drainage Patterns (B10)         Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (P2)       Processon of Reduced Iron (C1)       Stupted or Streaged Plants (D1)	il Remarks: <b>'DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c	heck all t	ihat apply)	ı (inches)	):		Hydric soil present?	No required)	
Saturation (A3)       True Aquatic Plants (B14)       Dry-Season Water Table (C2)         Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (P2)       Processes of Bedward Iron (C4)       Sturted or Stressed Plants (D1)	il Remarks: <b>'DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c Surface Water (A1)	heck all t	that apply)	s (B9)	):		Hydric soil present?	No required)	_
Water Marks (B1)       Hydrogen Sulfide Odor (C1)       Crayfish Burrows (C8)         Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (P2)       Researce of Reduced Iron (C1)       Stynted or Streaged Plants (D1)	il Remarks: <b>'DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2)	:heck all t	that apply) Water-Stained Leaves Aquatic Fauna (B13)	s (B9)	):	Sec	Hydric soil present?	No required)	
Sediment Deposits (B2)       Oxidized Rhizospheres on Living Roots (C3)       Saturation Visible on Aerial Imagery (C9)         Drift Deposits (P2)       Presence of Reduced Iron (C4)       Sturted or Streaged Plants (D4)	il Remarks: <b>'DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2) Saturation (A3)	:heck all t	that apply) U Water-Stained Leaves Aquatic Fauna (B13) True Aquatic Plants (I	s (B9) B14)	):	Sec	Hydric soil present?	No required)	_
	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	check all t	that apply)  Water-Stained Leaves Aquatic Fauna (B13) True Aquatic Plants (Laboration of the second	s (B9) B14) pr (C1)	):	Sec [	Hydric soil present?	<u>No</u> required)	_
	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	:heck all t	that apply) Water-Stained Leaves Aquatic Fauna (B13) True Aquatic Plants (I Hydrogen Sulfide Odd	s (B9) B14) br (C1) es on Livin	):	Sec	Hydric soil present?	<u>No</u> required)	
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2)	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	check all t	that apply)  Water-Stained Leaves Aquatic Fauna (B13) True Aquatic Plants (I Hydrogen Sulfide Odd Oxidized Rhizosphere Presence of Reduced	s (B9) B14) pr (C1) es on Livin I Iron (C4)	9:	Sec 	Hydric soil present?	<u>No</u> required) 9)	_
Iron Deposits (B5) Thin Muck Surface (C7) FAC-Neutral Test (D5)	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	check all t	that apply) Water-Stained Leaves Aquatic Fauna (B13) True Aquatic Plants (I Hydrogen Sulfide Odd Oxidized Rhizosphere Presence of Reduced Recent Iron Reduction	s (B9) B14) or (C1) es on Livin I Iron (C4) n in Tilled	g Roots (C3) Soils (C6)	Sea	Hydric soil present?	No required) 9)	
	il Remarks: <b>'DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c 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)	check all t	that apply)  Water-Stained Leaves Aquatic Fauna (B13)  True Aquatic Plants (I Hydrogen Sulfide Odd Oxidized Rhizosphere Presence of Reduced Recent Iron Reduction Thin Muck Surface (C	s (B9) B14) Dr (C1) es on Livin I Iron (C4) n in Tilled :7)	g Roots (C3) Soils (C6)	See	Hydric soil present?	<u>No</u> required) 19)	_
Inundation Visible on Aerial Imageny (B7) Gauge or Well Data (D9)	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c 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 Imageny (B7)	check all i	that apply)  Water-Stained Leaves Aquatic Fauna (B13)  True Aquatic Plants (I Hydrogen Sulfide Odd Oxidized Rhizosphere Presence of Reduced Recent Iron Reduction Thin Muck Surface (C Gauge or Well Data (I	s (B9) B14) or (C1) es on Livin I Iron (C4) n in Tilled :7) D9)	g Roots (C3) Soils (C6)	Sec 	Hydric soil present?	No required)	
Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9) Sparsely Vegetated Concave Surface (B8) Other (explain in remarks)	il Remarks: DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one required; c 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)	check all t	that apply) Water-Stained Leaves Aquatic Fauna (B13) Aquatic Fauna (B13) True Aquatic Plants (I Hydrogen Sulfide Odd Oxidized Rhizosphere Presence of Reduced Recent Iron Reduction Recent Iron Reduction Gauge or Well Data (I Other (explain in remaining the second secon	s (B9) B14) Dr (C1) es on Livin I Iron (C4) n in Tilled T) D9) arks)	g Roots (C3) Soils (C6)	See	Hydric soil present?	<u>No</u> required)	_
Inundation Visible on Aerial Imagery (B7)       Gauge or Well Data (D9)         Sparsely Vegetated Concave Surface (B8)       Other (explain in remarks)         eld Observations:       Indicators of wetland hydrology present?	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c 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)	check all i	Image: Control of the second secon	s (B9) B14) or (C1) ss on Livin I Iron (C4) n in Tilled :7) D9) arks)	g Roots (C3) Soils (C6)	Sec	Hydric soil present?	No required) 9)	
Inundation Visible on Aerial Imagery (B7)       Gauge or Well Data (D9)         Sparsely Vegetated Concave Surface (B8)       Other (explain in remarks)         eld Observations:       Indicators of wetland hydrology present?         virface water present?       Surface Water Depth (inches):	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c 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) etd Observations: rrface water present?	check all t	that apply) Water-Stained Leaves Aquatic Fauna (B13) True Aquatic Plants (I Hydrogen Sulfide Odd Oxidized Rhizosphere Presence of Reduced Recent Iron Reduction Thin Muck Surface (C Gauge or Well Data (I Other (explain in remains)	s (B9) B14) br (C1) es on Livin l Iron (C4) n in Tilled 7) D9) arks) ches):	): g Roots (C3) Soils (C6)	Sec	Hydric soil present?	No required) (9) present?	No
Inundation Visible on Aerial Imagery (B7)       Gauge or Well Data (D9)         Sparsely Vegetated Concave Surface (B8)       Other (explain in remarks)         ield Observations:       Indicators of wetland hydrology present?         urface water present?       Surface Water Depth (inches):         Water Table Depth (inches):       Describe Recorded Data:	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c 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) etd Observations: rrface water present? ater table present?		Interpretation       Interpretation         Interpretation       Interpreta	s (B9) B14) or (C1) so on Livin I Iron (C4) n in Tilled (7) D9) arks) <b>ches):</b> es):	g Roots (C3) Soils (C6)	Sec 	Hydric soil present?       Image: Sondary Indicators (minimum of two responses to the solid cracks (B6)         Drainage Patterns (B10)       Dry-Season Water Table (C2)         Crayfish Burrows (C8)       Saturation Visible on Aerial Imagery (C8)         Saturation Visible on Aerial Imagery (C8)       Saturation Visible on Aerial Imagery (C8)         Stunted or Stressed Plants (D1)       Geomorphic Position (D2)         FAC-Neutral Test (D5)       Indicators of wetland hydrology program         Describe Recorded Data:       Describe Recorded Data:	No required) 9) present?	No
Inundation Visible on Aerial Imagery (B7)       Gauge or Well Data (D9)         Sparsely Vegetated Concave Surface (B8)       Other (explain in remarks)	il Remarks: <b>DROLOGY</b> etland Hydrology Indicators: imary Indicators (minimum of one required; c 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)	check all t	that apply)  Water-Stained Leaves Aquatic Fauna (B13)  True Aquatic Plants (L Hydrogen Sulfide Odd Oxidized Rhizosphere Presence of Reduced Recent Iron Reduction Thin Muck Surface (C Gauge or Well Data (L Other (explain in remained)	s (B9) B14) or (C1) son Livin I Iron (C4) n in Tilled 7) D9) arks)	g Roots (C3) Soils (C6)	Sec 	Hydric soil present?	No required) 9)	-

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

	Δ	в	C	П	F	F	G	н	ĸ		м	N	Р
			MpPAM 3 2 Digital Works	hoot	Sido	2	0					1 14	
1			WITRAW 3.2 Digital WORKS	neer	, Side	Z							
2			Outputien Departmention	lleer	Dating								
3			Question Description	ontry	Rating		This comes	in from Side 1 aut	omaticall	y using the		Highes	st-rated
5		1	Veg. Table 2. Option 4	Citty	0.20		weighted av	erage. To use the	highest	rated veg.		0.3	}
6		-	TOTAL VEG Rating	0.22	L		value (show	n to the right) into the	he field a	at E5.		010	
7		4	Listed, rare, special plant species?	n	next	I							
8		5	Rare community or habitat?	n	next								
9		6	Pre-European-settlement conditions?	n	next								
10		7	hydrogeo & topo	onal/Flow	/#N/A								
11		8	Water depth (inches)	60									
12			Water depth (% inundation)			Enter	lata starti	ing here. Vella	NA/				
13		9	Local watershed/immedita drainage (acres)			boxes	are used	in calculation	5.				
14		10	Existing wetland size	0.75	J								
15	Ξ	11	SOILS: Up/Wetland (survey classification + site)	•	1 1								
10	ō	12	Outlet characteristics for hydrologic regime	A	1								
18	ščt	14	Dominant upland land use (within 500 ft)	B	0.5	0.5							
19	Se	15	Soil condition (wetland)	B	0.5								
20	et,	16	Vegetation (% cover)	7%	L	0.1							
21	he	17	Emerg. veg. flood resistance	С	0.1								
22	ks	18	Sediment delivery	C	0.1						-		
23	/or	19	Upland soils (based on soil group)	B	0.5	0.1					S	croll	
24	>	20	Stormwater runoii pretreatment & detention	A	1	0.1					dov	wn to	)
26	ita	21	Channels/sheet flow	A D	0.5						001		
27	Dig	23	Adjacent naturalized buffer average width (feet)	2	L	WO	0.1 L	0.1			an	swei	
28	-	24	Adjacent Area Management: % Full	0%	0	1	0.5				m	ore	
29			adjacent area mgmt: % Manicured	100%	0.5					(	ALLE	stion	S
30			adjacent area mgmt: % Bare	0%	0	_					140		
31		25	Adjacent Area Diversity & Structure: % Native	10%	0.1	2	0.55				and	l see	2
32			adjacent area diversity: % Mixed	90%	0.45						for	mula	l
34		26	Adjacent Area Slope: % Gentle	100%	1	1	1			C	alcu	Ilatio	ns
35		20	adjacent area slope: % Moderate	0%	0	-	-			00	2100	natio	110
36			adjacent area slope: % Steep	0%	0								
38						-							
39		27	Downstream sensitivity/WQ protection	A	1								
40		28	Nutrient loading	С	0.1						ー	5	
41		29	Shoreline wetland?	N	Ν							$\sim$	
42		30	Rooted shoreline vegetation (% cover )	En	ter a percen	itage							
43		31	Emergent vegetation erosion resistance	En En	ter a percen	oice							
45		33	Shoreline erosion potential	En	ter valid ch	0							
46		34	Bank protection/upslope veg.	En	ter valid ch	oice							
47		35	Rare Wildlife	N	Ν								
48	=	36	Scarce/Rare/S1/S2 local community	N	Ν								
49	ioi	37	Vegetation interspersion cover (see diagram 1)	8		0.1			0				
50 51	ect	38 30	Community interspersion (see diagram 2)	C	L 0.1	0.1			U				
52	Š	39 40	Wetland interspersion on landscape	B	0.1	0.1							
53	iet,	41	Wildlife barriers	C	0.1	0.1							
54	he	42	Amphibian breeding potential-hydroperiod	Α	1								
55	ks	43	Amphibian breeding potentialfish presence	с	0.1								
56	IOV	44	Amphibian & reptile overwintering habitat	A	1								
57	2	45	Wildlife species (list)	Redwing	black bird								
50	yite	46 77	Fish habitat quality	B N/A	0.5								
60	Diç	48	Unique/rare educ /cultural/rec opportunity	N	N								
61		49	Wetland visibility	A	1								
62		50	Proximity to population	Y	1								
63		51	Public ownership	А	1								
64		52	Public access	C	0.1								
65		53	Human influence on wetland	C	0.1								
00 67		54	Human influence on viewshed	B	0.1								
68		56	Recreational activity potential	C	0.5								
69		57	Commercial crophydrologic impact	N/A	N/A								
70													
1 * * 1													

				_		_			
72	A	В	C	D	E	F	GH	IJKL	.   M   N   P
73		58	GW - Wetland soils	R	R or D	0.1			
74		59	GW - Subwatershed land use	R	R or D	0.1			
75		60	GW - Wetland size and soil group	R	R or D	0.1			
76		61	GW - Wetland hydroperiod	D	R or D	1			
77	S	62	GW - Inlet/Outlet configuration	D	R or D	1			
78	5	63	GW - Surrounding upland topographic relief	D	R or D	1			
79	sti	64	Restoration potential w/o flooding		Y or N	3.3			
80	ne	65	Landowners affected by restoration		Eabc	Enter vali	id choice		
81	0	66A	Existing wetland size (acres) [from #10]	0.75	acres				
82	nal	66B	Total wetland restoration size (acres)		acres	0.1			
83	<u>0</u>	66C	(Calculated) Potential New Wetland Area [B-A]	-0.75	acres	% effecti	tively drained:	####	
84	dit	67	Average width of naturalized upland buffer (poten	0	feet	0.1	value:	####	
85	Ď	68	Likelihood of restoration success		abc	Enter vali	id choice		
86	4	69	Hydrologic alteration type		Outlet, Lile	, Ditch, G	W pump, Wtrs	shd div., Filling	
87		70	Notland equality to starray star		1, 2, 3, 4, 3	5, 6, 7, 8			
88		71	Additional stormwater tractment peode		Eabc				
09		12	Additional stormwater treatment needs		abc				
90									
92									
93						ħ			
94				d)	l gu	10g 100			
05				aw	ina	ati			
95			Function Name	R			Formula	shown to the right.	
90			vegetative Diversity/integrity		0.22	L			
98	s		Hydrology - Characteristic		0.53	Med	İ		
99	rie		nyuroiogy characteristic		0.55	Wied			
100	nal		Flood Attenuation		0.59	Med			
101	Ē						:		
102	, D		Water QualityDownstream		0.60	Med			
103	5								
104	Ľ.		Water QualityWetland		0.25	Low			
105	tat								
106	<u>~</u>		Shoreline Protection		N/A	N/A			
107	na			0.00	0.00	7	1		
108	io Li		Characteristic Wildlife Habitat Structure	0.28	0.28	Low			
109	<u>5</u>		Maintonance of Characteristic Fish Habitat	0.20	0.22	Low			
111	5		Maintenance of Characteristic Fish Habitat	0.30	0.22	LOW			
112			Maintenance of Characteristic Amphibian Habitat		0.03	Low	ł		
113			mainenance of characteristic rimpinotan mastar		0.05	2011	I		
114			Aesthetics/Recreation/Education/Cultural	0.38	0.49	Med			
115									
116			Commercial use		N/A	N/A	0		
117									
118			Special Features listing:						
119									
120			Groundwater Interaction		Indetermin	ate GW so	ource		
121			Groundwater Functional Index			no specia	al Indicators		
122			Postoration Dotontial (draft formula)		#\/^	######			
123			Stormwater Sensitivity (not active)		#VALUE!	<del>####</del> #			
124			otomiwater Gensitivity (not active)						
125									
120									
128									
129									
130									
131									
132									
133									
134									
135									
136									
137									
138									
139									
140									
1									

Appendix C MnRAM Wetland Management Classification DeCola Pond E

	Δ	B	C	П	F	F	G	H   I   J	ĸ		м	N	P
			MpPAM 3 2 Digital Works	hoot	Sido	2					101		
1			WITRAW 3.2 Digital WORKS	neer	, Side	2							
2			Outputien Departmention	lleer	Deting								
3			Question Description	ontry	Rating		This comes	in from Side 1 auto	maticall	y using the		Highest	-rated
5		1	Veg. Table 2. Option 4	Citary	0.22		weighted av	erage. To use the h	nighest r	ated veg.		0.3	laiot
6		-	TOTAL VEG Rating	0.22	L		value (showi	n to the right) into th	ne field a	at E5.		0.0	
7		4	Listed, rare, special plant species?	n	next								
8		5	Rare community or habitat?	n	next								
9		6	Pre-European-settlement conditions?	n	next								
10		7	hydrogeo & topo	onal/Flow	v#N/A								
11		8	Water depth (inches)	60									
12			Water depth (% inundation)			Enter	data starti	na here Vello	A.	1			
13		9	Local watershed/immedita drainage (acres)			boxes	are used	in calculations					
14		10	Existing wetland size	0.82						1			
15	-	11	SOILS: Up/Wetland (survey classification + site)	Δ	1 1								
10	jo	12	Outlet characteristics for hydrologic regime	A	0.1								
18	<u>cti</u>	14	Dominant upland land use (within 500 ft)	B	0.1	0.5							
19	se	15	Soil condition (wetland)	B	0.5	0.0							
20	et,	16	Vegetation (% cover)	30%	М	0.5							
21	he	17	Emerg. veg. flood resistance	В	0.5								
22	ks	18	Sediment delivery	C	0.1						~		
23	or	19	Upland soils (based on soil group)	В	0.5						S	croll	
24	3	20	Stormwater runoff pretreatment & detention	A		0.1					do	wn to	
20	ita	21	Subwatersned Wetland density	В	0.5						uu		
27	Dig	23	Adjacent naturalized buffer average width (feet)	30	M	WO	0.51	0.1			an	swer	
28		24	Adjacent Area Management: % Full	0%	0		0.5	0.1			m	ore	
29			adjacent area mgmt: % Manicured	100%	0.5							etions	-
30			adjacent area mgmt: % Bare	0%	0					,	que	30013	>
31		25	Adjacent Area Diversity & Structure: % Native	60%	0.6	3	1.01				and	d see	
32			adjacent area diversity: % Mixed	80%	0.4						for	mula	
33		26	adjacent area diversity: % Sparse/Inv./Exotic	10%	0.01	2	0.525					lation	
35		20	adjacent area slope: % Moderate	<u> </u>	0.25	5	0.323				aict	ΠαιίΟΙ	13
36			adjacent area slope: % Steep	25%	0.025								
20			<b>J 1 1</b>			-1							
30		27	Downstream sensitivity/WO protection	B	0.5								
40		28	Nutrient loading	C	0.1						4	Ļ	
41		29	Shoreline wetland?	N	Ν							$\checkmark$	
42		30	Rooted shoreline vegetation (% cover )	En	ter a percent	tage							
43		31	Wetland in-water width (in feet, average)	En	ter a percent	tage							
44		32	Emergent vegetation erosion resistance	Er Er	ter valid cho	bice							
45		33	Shoreline erosion potential	Er Er	ter valid cho								
40		35	Bank protection/upsiope veg. Rare Wildlife	N EI	N	Jice							
48	=	36	Scarce/Rare/S1/S2 local community	N	N								
49	u	37	Vegetation interspersion cover (see diagram 1)	4	М	0.5							
50	cti	38	Community interspersion (see diagram 2)	1	L	0.1			0				
51	sec	39	Wetland detritus	В	0.5								
52	ŗ,	40	Wetland interspersion on landscape	B	0.5	0.5							
53	lee	41	Wildlife barriers	C	0.1								
54 55	(sh	42 73	Amphibian breeding potential fish presence	A	1								
56	ork	44	Amphibian & rentile overwintering habitat	A	1								
57	Š	45	Wildlife species (list)	Redwing	g black bird								
58	tal	46	Fish habitat quality	C	0.1								
59	igi	47	Fish species (list)	N/A									
60	Δ	48	Unique/rare educ./cultural/rec.opportunity	N	N								
61		49	Wetland visibility	A	1								
02 63		50	Proximity to population	Υ	1								
64		52	Public access	A	1								
65		53	Human influence on wetland	C	0.1								
66		54	Human influence on viewshed	С	0.1								
67		55	Spatial buffer	В	0.5								
68		56	Recreational activity potential	С	0.1								
69		57	Commercial crophydrologic impact	N/A	N/A								
70					1								

	•		0	_		_						-			<b>.</b>	<u> </u>		<del>.</del>		
72	A	В	C	D	E	F		G	ŀ	-	I		J	K			Μ		1	Р
73		58	GW - Wetland soils	R	R or D	0.1														
74		59	GW - Subwatershed land use	R	R or D	0.1														
75		60	GW - Wetland size and soil group	R	R or D	0.1														
76		61	GW - Wetland hydroperiod	D	R or D	1														
77	ns	62	GW - Inlet/Outlet configuration	D	R or D	1														
78	ţi	63	GW - Surrounding upland topographic relief	D	R or D	1	5													
80	es	64 65	Landowners affected by restoration		Fabc	3.3 Enter v	) Valic	d ch	nice											
81	nb	66A	Existing wetland size (acres) [from #10]	0.82	acres		and		0100											
82	a	66B	Total wetland restoration size (acres)	0.01	acres	0.1														
83	o	66C	(Calculated) Potential New Wetland Area [B-A]	-0.82	acres	% effe	ectiv	vely	draiı	ned:	####	ŧ								
84	Į	67	Average width of naturalized upland buffer (poten	0	feet	0.1			va	lue:	####	¥								
85	þ	68	Likelihood of restoration success		abc	Enter v	alic	d ch	oice											
80	-	69 70	Hydrologic alteration type Potential wetland type (Circ. 39)			567	, GV 8	/v pi	ump,	vvtr	sna c	1IV.,	Fillin	ıg						
88		70	Wetland sensitivity to stormwater		Fabc	J, U, 7, 0 	0													
89		72	Additional stormwater treatment needs		abc															
90																				
92																				
93																				
94					50	ory B	•													
				IW	nal ting	ting	)													
95			Function Name	Ra	Fiı Ra	Ca Ra	_		For	mula	show	vn to	o the	right	t.					
96			Vegetative Diversity/Integrity		0.22	L														
97	G		Hudrology Characteristic		0.20	Low	-													
90	jë.		Hydrology - Characteristic		0.50	LOW														
100	nar		Flood Attenuation		0.64	Med	-													
101	Ē																			
102	Bul		Water QualityDownstream		0.59	Med														
103	5				0.25	<b>T</b>														
104	ti		Water QualityWetland		0.25	Low														
105	Ra		Shoreline Protection		N/A	N/A	-													
107	a		Shorenne i rotection		14/11	14/21														
108	o		Characteristic Wildlife Habitat Structure	0.29	0.28	Low														
109	cti																			
110	n		Maintenance of Characteristic Fish Habitat	0.17	0.22	Low														
111	ш		Maintanance of Characteristic Amphibian Habitat		0.22	Low	-		i											
112			Maintenance of Characteristic Amphibian Habitat		0.32	LOW			i											
114			Aesthetics/Recreation/Education/Cultural	0.49	0.49	Med	-													
115																				
116			Commercial use		N/A	N/A				0										
117																				
118			Special Features listing:			-														
120			Groundwater Interaction		indetermin	ate GW	l so	urce												
121			Groundwater Functional Index			no <u>spe</u>	cial	lind	licato	ors										
122																				
123			Restoration Potential (draft formula)		#VALUE!	#####														
124			Stormwater Sensitivity (not active)																	
125																				
126																				
127																				
129																				
130																				
131																				
132																				
133																				
134																				
135																				
137																				
138																				
139																				
140																				
141																				

Appendix B

Feasibility Level Cost Estimates

-					
PREPARED BY: BARR ENGINEERING COMPANY		SHEET:	1	OF	2
BARR		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.			ESTIMATED			
No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization/Demobilization	LS	1	\$238,400	\$238,400	1,2,3,4,5,6
В	Traffic and Pedestrian Safety Control Measures	LS	1	\$5,000	\$5,000	1,2,3,4,5,6
С	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
	Remove and Dispose of Concrete Pavement	SY	83	>5 ¢0	\$416	1,2,3,4,5,6
1	Sawcut Bituminous Pavement (Full Denth)		281	20 \$6	\$1,509	1,2,3,4,5,6
ĸ	Remove and Dispose of Rock Wall	LI	186	\$20	\$1,000	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
М	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
0	Remove and Dispose Sewer Pipe (30" RCP)	LF	170	\$30	\$5,100	1,2,3,4,5,6
Р	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
V	Common Borrow Import		1	\$16	\$16	1,2,3,4,5,6
×	Rituminous Payament (Typ)	I UN SV	1,511	\$40 \$20	\$00,438 \$28,560	1,2,3,4,5,6
7	Concrete Sidewalk (Typ)	SV	1 600	\$30	\$28,300	1,2,3,4,5,6
AA	Curb & Gutter	IF	1,000	\$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
]]	24" RCP Pipe Sewer	LF	103	\$130	\$13,390	1,2,3,4,5,6,7
КК	24" RCP FES	Each	3	\$1,000	\$3,000	1,2,3,4,5,6
	48" RCP Pipe Sewer	LF	360	\$370	\$133,200	1,2,3,4,5,6,7
NN	48" RUP FES	Each	2	\$2,880	\$5,760	1,2,3,4,5,6
00	48" Diameter RC Drainage Structure Complete	Each	5	\$5,500	\$4,800	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
	72" Diameter RC Drainage Structure with 6-foot Weir. Complete			<i>\$1,500</i>	¢00,000	,,,,,,
QQ		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	1		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	156
						1,0,0
				1	¢4.443.000	
					\$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

<sup>1</sup> Quantities based on Design Work Completed (1 - 15%).

<sup>2</sup> Unit Prices Based on Information Available at This Time.

<sup>3</sup> Limited Soil Boring and Field Investigation Information Available.

<sup>4</sup> 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 included.

<sup>5</sup> Estimate assumes that projects will not be located on contaminated soil.

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

<sup>7</sup> Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

<sup>8</sup> Estimate costs are reported to nearest thousand dollars.

		PREPARED BY: BARR ENGINEERING COMPANY		SHEET:	1	OF	2
BARF	2			CREATED BY:	KJN2	DATE:	2/17/2021
ENGI	NEER'S	OPINION OF PROBABLE PROJECT COST		CHECKED BY:	JAK2	DATE:	2/19/2021
PROJ	ECT:	SEA School - Concept 2		APPROVED BY:		DATE:	
LOCA	TION:	City of Golden Valley	ISSUED:			DATE:	
PROJ	ECT #:	23270051.50	ISSUED:			DATE:	
OPIN	ION O	F COST - SUMMARY	ISSUED:			DATE:	

### Engineer's Opinion of Probable Project Cost

SEA School - Concept #2

Stormwater Retrofit (Feasibility Design)

Cat.			ESTIMATED			
No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	ITEM COST	NOTES
А	Mobilization/Demobilization	LS	1	\$164,000	\$164,000	1,2,3,4,5,6
В	Traffic and Pedestrian Safety Control Measures	LS	1	\$5,000	\$5,000	1,2,3,4,5,6
С	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
	Remove and Dispose of Concrete Pavement	SY	83	\$5 60	\$41b \$1.500	1,2,3,4,5,6
	Sawout Rituminous Payament (Full Denth)		289	۶۶ ۶۶	\$1,509	1,2,3,4,3,0
ĸ	Remove and Dispose of Rock Wall	LI	186	\$20	\$1,080	123456
L	Remove and Dispose Sewer Pine (12" RCP)	IF	414	\$30	\$12 420	1,2,3,4,5,6
M	Remove and Dispose Server Pipe (22 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
0	Remove and Dispose Sewer Pipe (30" RCP)	LF	170	\$30	\$5,100	1,2,3,4,5,6
Р	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
Т	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
х	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
	15" CPEP FES	Each	2	\$800	\$1,600	1,2,3,4,5,6
DD FF	15" CPED Jolino Check Volvo	Each	1	\$1,000	\$1,000	1,2,3,4,3,0
FE	13 CPEP IIIIII Clieck Valve	LE	111	\$3,000	\$5,000	1234567
66	12" RCD FFS	Fach	2	022 0892	\$5,550	123456
НН	12" FES Trash Back	Each	1	\$650	\$650	1.2.3.4.5.6
11	15" RCP Pipe Sewer	LF	354	\$110	\$38.940	1.2.3.4.5.6.7
ιι	24" RCP Pipe Sewer	LF	55	\$130	\$7.150	1,2,3,4,5,6,7
КК	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
00	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
					4	
	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
		-				-,5,0
		1	1		ća 000	1
	LITIVIATED 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

<sup>1</sup> Quantities based on Design Work Completed (1 - 15%).

<sup>2</sup> Unit Prices Based on Information Available at This Time.

<sup>3</sup> Limited Soil Boring and Field Investigation Information Available.

<sup>4</sup> 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 included.

<sup>5</sup> Estimate assumes that projects will not be located on contaminated soil.

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

<sup>7</sup> Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

<sup>8</sup> Estimate costs are reported to nearest thousand dollars.

	PREPARED BY: BARR ENGINEERING COMPANY		SHEET:	1	OF	1
BARR			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 O	F COST - SUMMARY	ISSUED:			DATE:	

### Engineer's Opinion of Probable Project Cost

SEA School - Concept #3

Stormwater Retrofit (Feasibility Design)

Cat.			ESTIMATED			
No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	ITEM COST	NOTES
A	Mobilization/Demobilization	LS	1	\$177.000	\$177.000	1,2,3,4,5,6
В	Traffic and Pedestrian Safety Control Measures	LS	1	\$5,000	\$5,000	1,2,3,4,5,6
С	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
н	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
к	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
М	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
0	Remove and Dispose Sewer Pipe (30" RCP)	LF	170	\$30	\$5,100	1,2,3,4,5,6
Р	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
Т	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
х	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
НН	15" RCP Pipe Sewer	LF	354	\$110	\$38,940	1,2,3,4,5,6,7
11	24" RCP Pipe Sewer	LF	99	\$130	\$12,870	1,2,3,4,5,6,7
11	24" RCP FES	Each	2	\$1,000	\$2,000	1,2,3,4,5,6
КК	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
00	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
хх	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
			1	I	¢1 047 000	
					\$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
	FASEMENTS				\$16.900	1 5 6
		1	1	1	J10,000	1,0,0

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

Notes

<sup>1</sup> Quantities based on Design Work Completed (1 - 15%).

<sup>2</sup> Unit Prices Based on Information Available at This Time. <sup>3</sup> Limited Soil Boring and Field Investigation Information Available.

<sup>4</sup> 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.

<sup>5</sup> Estimate assumes that projects will not be located on contaminated soil.

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

<sup>7</sup> Furnish and Install pipe cost per linear foot includes all trenching, bedding, backfilling, compaction, and disposal of excess materials

<sup>8</sup> Estimate costs are reported to nearest thousand dollars.