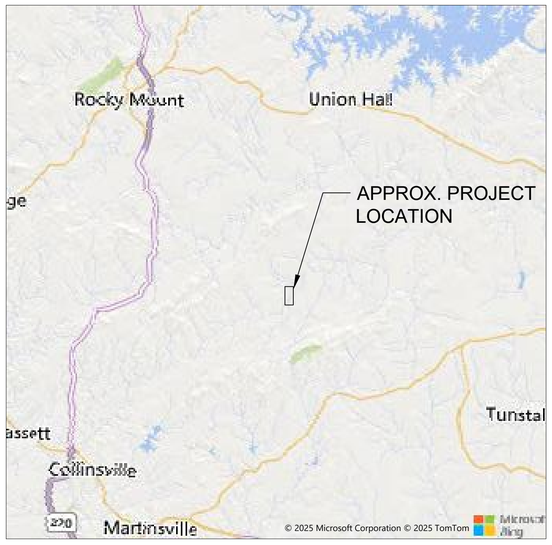
SNOW CREEK WETLAND MITIGATION SITE

SNOW CREEK, VA
FRANKLIN COUNTY



VICINITY MAP, SCALE 1:20,000

SHEET INDEX

CONCEPT DESIGN

AUGUST 8, 2025

PN 186472

CHRIS YOW
CIVIL ENGINEER
License No. 0402052534

no.	date	by	ckd	description

BURNS McDONNELL
110 FRANKLIN RD SE SUITE 700
ROANOKE, VA 24011
816-333-9400
Burns & McDonnell Engineering Co, Inc.
LICENSEE NO. 0411001221

CONSTRUCTION SEQUENCE AND SPECIFICATIONS

1. Contractor to Comply with the Site-Specific Health and Safety Plan including all premobilization forms, AHAs and PTAs.
2. Install construction entrance, staging areas, haul roads, erosion and sediment control measures.
3. Spray proposed wetland creation areas with herbicide to kill non-native grasses and vegetation that will be invasive to the native wetland vegetation that will be planted.
4. Wetland Creation Areas
    a. Cut and rake 7 days after herbicide application. Remove dead vegetation, place in the soil disposal area.
    b. Strip (top 4") and stockpile topsoil in the soil disposal area.
    c. Grade sub-grade to depth according to concept design, transport excess soil to soil disposal area.
    d. Grades to be checked by Contractor and validated by the Engineer before moving to the next step.
    e. Recover areas with stockpiled topsoil, 4-inch depth.
    f. Disk to depth of 6-8 inches in a crisscross pattern.
    g. Seed and plant per Planting Plan.
5. Wetland Restoration Areas
    a. Remove and dispose of drain tiles 2 drains approximately 200 LF each.
    b. Conduct minor grading for connection to wetland creation areas.
    c. Grades to be checked by Contractor and validated by the Engineer before moving to the next step.
    d. Disk to depth of 6-8 inches in a crisscross pattern.
    e. Seed and plant per Planting Plan.
6. Install water control structures to plug existing ditch. Each structure will consist of a gravel base filter, 12 inch thick, 4'x12' in area, approximate 12 boulders 2'x3'x4' backed by non-woven filter fabric.
7. Finish grading soil disposal area, seed and straw mulch.
8. Install fence and gates. Fence shall be composed of 4 strand barb wire, metal posts. Typical 10' agriculture style gates, 3 total.
9. Restore haul roads (rip/disc, seed and straw mulch.).
10. Remove debris from site. Construction debris, woody debris is not allowed to be disposed of on site.
11. Submit As-Built Drawings to the Engineer. Contractor may not move to next step until As-Built Drawings have been submitted and approved.
12. Once temporary ESC vegetation is stable remove erosion and sediment control measures and demobilize.

Scale For Microfilming
Millimeters
Inches

no.	date	by	ckd	description

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date	detailed
AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

CHRIS YOW
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GENERAL NOTES

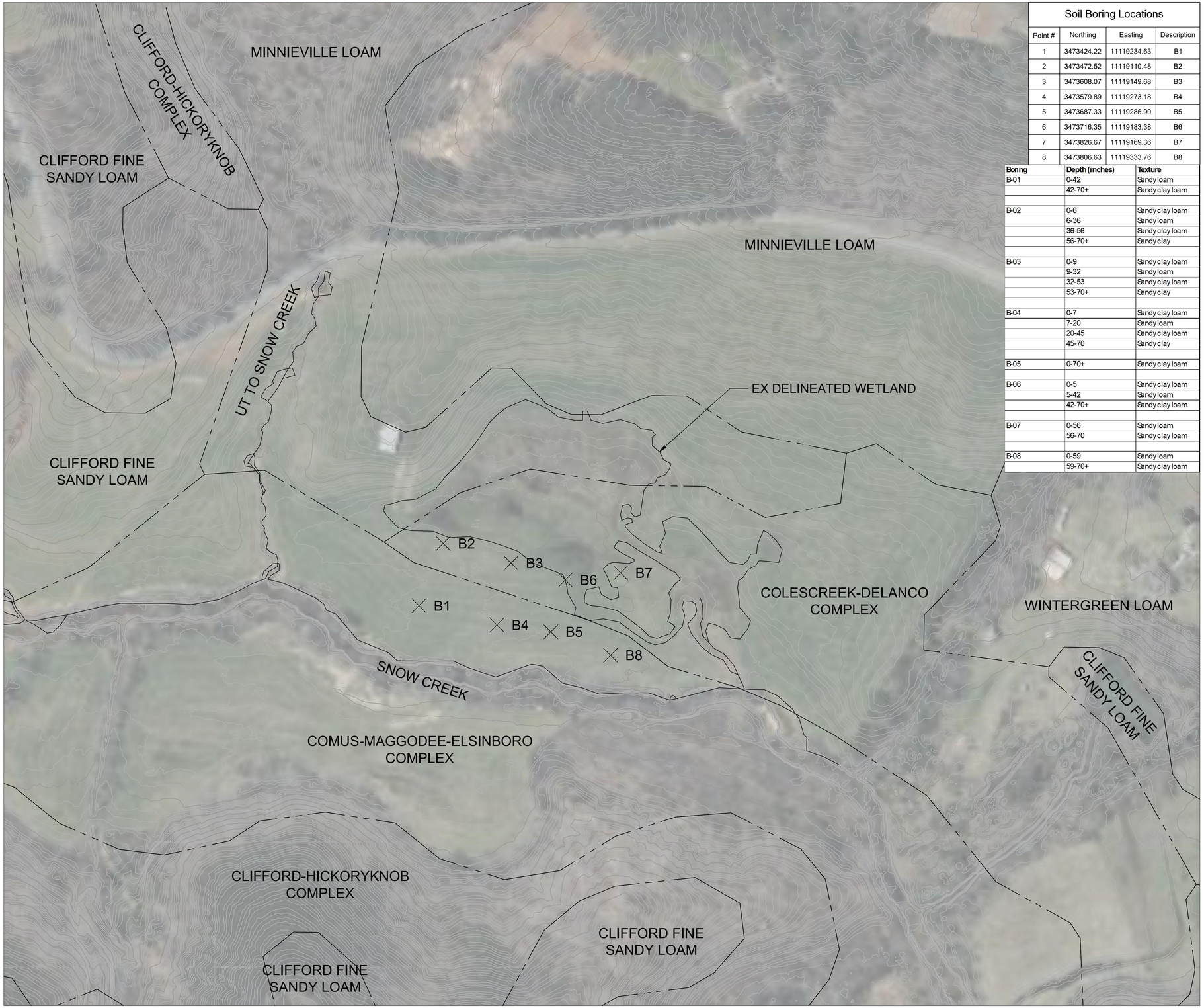
SNOW CREEK WETLAND
MITIGATION SITE

project	contract
186472	

drawing **G-002** rev. –

sheet 2 of 11 sheets

file



Soil Boring Locations			
Point #	Northing	Easting	Description
1	3473424.22	11119234.63	B1
2	3473472.52	11119110.48	B2
3	3473608.07	11119149.68	B3
4	3473579.89	11119273.18	B4
5	3473687.33	11119286.90	B5
6	3473716.35	11119183.38	B6
7	3473826.67	11119169.36	B7
8	3473806.63	11119333.76	B8

Boring	Depth (inches)	Texture
B-01	0-42	Sandy loam
	42-70+	Sandy clay loam
B-02	0-6	Sandy clay loam
	6-36	Sandy loam
	36-56	Sandy clay loam
	56-70+	Sandy clay
B-03	0-9	Sandy clay loam
	9-32	Sandy loam
	32-53	Sandy clay loam
	53-70+	Sandy clay
B-04	0-7	Sandy clay loam
	7-20	Sandy loam
	20-45	Sandy clay loam
	45-70	Sandy clay
B-05	0-70+	Sandy clay loam
B-06	0-5	Sandy clay loam
	5-42	Sandy loam
	42-70+	Sandy clay loam
B-07	0-56	Sandy loam
	56-70	Sandy clay loam
B-08	0-59	Sandy loam
	59-70+	Sandy clay loam

NOTES:

N

0 100' 200'
SCALE IN FEET

LEGEND:
SOIL TYPE BOUNDARY

Scale For Microfilming
Millimeters
Inches

no.	date	by	ckd	description

BURNS McDONNELL
110 FRANKLIN RD SE SUITE 700
ROANOKE, VA 24011
816-333-9400
Burns & McDonnell Engineering Co, Inc.
LICENSEE NO. 04110012221

date	detailed
AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

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EXISTING CONDITIONS

SNOW CREEK WETLAND
MITIGATION SITE

project	contract
186472	
drawing	rev.
C-001	-
sheet 3 of 11 sheets	
file	

WATER BUDGET NARRATIVE
SNOW CREEK MITIGATION SITE

I. Introduction

The water budgets on this sheet were prepared to determine the nature of the water regime expected in this constructed wetland system to assist in vegetation selection, to develop confidence that the prerequisite hydrology necessary to support a wetland will be achieved, to predict system modifications that will be required as the contributing watershed develops over time, and to determine which elements of the design are critical to the success of the project.

The water budgets were prepared for the aforementioned wetland system using the methodologies described herein to calculate the water budget using Excel.

The proposed wetland area is located east of Airport Rd. and west of Snow Creek in Franklin County, VA. The site is primarily grassland with gentle slopes across the site. The site is a natural low point and will be used to create a wetland mitigation bank for the MVP Southgate Pipeline. The creation of wetland habitat will help increase the storage capacity of the surrounding watershed, increase habitat diversity, and increase biodiversity in the area.

Approximately 6.5 acres of open grassland are proposed for the site. A typical water budget is presented to demonstrate the expected hydroperiod for the typical dry, normal, and wet years for the proposed wetland areas. This typical water budget uses conservative estimates of the various parameters and depicts the expected variation in the hydroperiod for these restored wetland areas. Many of these cells will have more hydrologic inputs and/or slower infiltration rates in the underlying materials than this typical water budget.

II. Primary Components Quantified

A. Inputs

1. Precipitation

Precipitation has been quantified from the Martinsville Filter Plant NOAA station for the past 61 years of available data. Excel was used to determine the typical dry, normal, and wet years by evaluating the 30th, 50th, and 70th percentile annual rainfall. 1984 was determined to be the 30th percentile or dry year, 1952 was the 50th percentile or normal year, and 1993 was the 70th percentile or the wet year. Precipitation falling directly on the constructed wetland area comprises this input factor.

2. Surface Runoff

Surface runoff was calculated using the SCS runoff curve number method.

$$Q=(P-I_a)^2/((P-I_a)+S)$$

where

Q=runoff (in.)
P=rainfall (in.)
S=potential maximum retention after runoff begins (in.)
I_a=initial abstraction (in.)

and

S=(1000/Curve Number)-10
I_a=0.2*S

3. Groundwater Infiltration

Groundwater infiltration is probable for the site but is not considered to present the most conservative water budget possible. The water budget indicates target water levels are achieved despite the conservative approach.

4. Overbank Flow

Snow Creek runs adjacent to the east site of the proposed wetland but overflow from the creek is not considered in the water budget for simplicity and to provide a more conservative water budget.

B. Outputs

1. Evapotranspiration

Potential evapotranspiration was estimated using the Thornthwaite forumla for monthly PET in Excel.

$$E_t=1.6*(10*T_a/I)^a$$

where

E_t=PET in cm/mo
T_a=mean monthly air temperature (Centigrade)
I=monthly heat index

$$I=\sum(T_a/5)^{1.5}$$
for twelve months, and
$$a=0.49+0.0179*I-0.0000771*I^2+0.000000675*I^3$$

The formula is for a standard month of 30 days of daylight and must be adjusted for latitude and month (Dun and Leopold 1978) by a correction factor provided by a table developed for use with this formula.

Data for the PET was sourced from the the Martinsville Filter Plant NOAA station.

2. Groundwater Exfiltration

The groundwater exfiltration output is the water lost due to the permeability of the soil materials underlying the constructed wetland area. Data suggested by the NRCS Soil Survey Manual indicate highly permeable soils in the area with saturated hydraulic conductivity of 9 micrometer/s. To remain conservative in our estimate, a saturated hydraulic conductivity of 0.07 micrometers/s or 0.01 in/hr was used to calculate groundwater exfiltration.

Converted to a loss rate in in/mo, k=0.01 in/hr is equal to:
0.01 in/hr x 24 hr/d x 30 d/mo
=7.2 in/mo

This approach is conservative as it uses Darcy's Law with 1-foot of head and a 1-foot restrictive layer. In actuality, the head is rarely more than a few inches.

3. Outflow

The maximum water elevations of the constructed wetland area will occur whenever the water level reaches the top of the wetland boundary. When this occurs, water will outflow from the wetland to Snow Creek and the surrounding area.

4. Water Level Baseline

The water level baseline for the water budget was assumed to be at max capacity of the wetland to simplify storage calculations. By assuming the wetland to be at maximum capacity, we remain conservative in our water budget because the wetland will have no additional storage capacity and will overflow unless storage capacity is gained in the previous months water budget.

30th Percentile (Dry) - 1984

Precipitation

DATE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.00	0.00
2	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.13
3	0.00	0.34	0.00	0.31	1.31	0.00	0.00	0.00	0.96	0.00	0.00	0.00
4	0.02	0.10	0.10	0.40	0.00	0.00	0.28	0.07	0.00	0.00	0.56	0.00
5	T	0.00	0.86	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.75
6	0.00	0.01	0.09	0.00	0.41	0.00	0.12	0.89	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.09	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	T	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00
10	1.08	0.07	0.00	0.09	0.00	0.00	0.46	0.02	0.00	0.00	0.10	0.03
11	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00
12	0.00	0.00	0.47	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00
13	0.26	2.65	0.73	0.10	0.00	0.00	0.08	0.99	0.00	0.00	0.00	0.00
14	0.00	0.18	0.00	0.55	0.00	0.00	0.00	T	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	T	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.02	0.00	T	1.70	0.00	0.00	0.00	0.00	0.00
18	0.75	0.00	0.18	0.00	0.00	0.18	0.28	0.04	0.00	0.05	0.00	0.06
19	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
20	0.00	0.00	0.00	0.04	0.00	0.01	0.09	0.00	0.00	0.00	0.10	0.07
21	0.00	0.00	0.00	0.08	0.00	0.00	0.10	0.00	0.00	0.13	0.00	0.20
22	0.00	0.54	0.00	0.16	0.00	0.00	0.16	0.00	0.00	0.13	0.00	0.04
23	0.06	1.22	0.00	0.49	0.31	0.00	0.00	0.02	0.00	0.12	0.00	0.00
24	0.36	0.00	0.00	0.02	0.00	0.02	0.00	0.08	0.00	0.57	0.00	0.00
25	0.00	0.00	0.50	0.00	0.00	0.20	0.50	0.00	0.00	T	0.00	0.02
26	0.00	0.00	0.07	0.00	0.23	0.00	0.03	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.35	0.00	0.35	0.06	0.09	0.18	0.05	0.00	0.00	0.00
28	T	0.53	1.92	0.08	1.13	0.00	0.35	0.20	0.03	0.17	0.05	0.00
29	0.00	0.12	0.35	T	0.43	T	0.05	0.00	0.05	0.33	1.20	0.00
30	0.00		0.00	0.00	0.00	0.13	0.08	1.45	1.63	T	0.00	0.00
31	0.00		0.00		0.00		0.11	0.00		0.00		0.12
Total (in.)	2.53	5.78	6.71	3.54	4.63	0.62	4.95	4.85	2.72	1.52	2.28	1.42

Evapotranspiration

Average Monthly Temp.* (F)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	34.8	42.5	42.5	49.5	58.0	73.8	72.5	74.9	63.8	63.7	42.6	43.8

*Monthly averages displayed as "M" so averages taken from daily summaries

Average Monthly Temp.* (C)	1.56	5.83	5.83	9.72	14.44	23.22	22.50	23.83	17.67	17.61	5.89	6.56	
Monthly Heat Index (I)	0.174	1.260	1.260	2.711	4.910	10.009	9.546	10.497	6.642	6.610	1.278	1.501	56.309
Correct factor	1.374												
PET (cm/mo)	0.273	1.680	1.680	3.389	5.838	11.209	10.733	11.616	7.699	7.665	1.702	1.972	
PET (in/mo)	0.108	0.661	0.661	1.334	2.298	4.413	4.226	4.573	3.031	3.018	0.670	0.776	

Groundwater Infiltration 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2

Runoff

CN	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	
S	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	
Ia	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Runoff Outside Wetland(in.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Runoff to Wetland (in.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Net Per Month (in.)	-2.253	16.109	22.773	1.378	6.821	-10.621	6.945	5.949	-4.363	-6.434	-3.801	-6.398	
Yearly Total (in.)	-2.253	13.856	36.629	38.007	44.828	34.207	41.152	47.101	42.737	34.304	30.503	24.105	
Actual Water Level (in.)	-2.253	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

50th Percentile (Dry) - 1952

Precipitation

DATE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.00	0.00	0.68	0.03	0.00	0.00	0.06	0.00	0.76	0.00	0.00	0.00
2	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.36	0.02	0.15	0.00	0.09
3	0.00	1.48	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
4	0.05	0.03	0.52	0.00	0.00	0.00	0.00	0.44	0.00	0.00	T	T
5	0.15	0.00	0.00	0.37	0.00	0.00	T	0.00	0.00	0.00	0.00	0.22
6	0.07	0.00	0.00	0.00	0.00	0.00	0.18	1.63	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.11	T	0.00	T	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.34	1.34	0.01	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.08	0.00	0.05	0.08	0.00	0.60	0.00	0.00
10	0.80	0.00	0.00	0.00	0.07	0.00	0.00	1.83	0.00	0.18	0.31	0.33
11	0.00	0.00	1.90	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.41	0.79
12	0.00	0.00	0.00	T	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.01	0.00	0.09	0.00	0.00	0.00	T	0.00	0.00	0.00	0.00
14	0.00	0.39	0.00	0.38	0.00	0.08	T	0.18	0.00	0.00	0.00	0.00
15	0.00	0.00	0.04	0.00	0.00	0.07	0.30	0.00	0.29	0.00	0.70	0.00
16	0.00	S	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.00
17	0.00	0.51A	0.00	0.00	0.00	0.06	0.00	0.67	0.00	0.00	0.00	0.00
18	T	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.00	0.00	0.00
19	0.00	0.00	1.18	0.00	0.56	0.00	0.00	T	0.07	0.00	0.23	0.00
20	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.29	0.00	0.00	1.03	T
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.00	0.00	1.04	0.34
22	0.58	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.15	0.00	0.13	0.00
23	0.00	0.00	0.87	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	T
24	0.00	0.20	1.14	0.22	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	1.95	1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.06	0.15	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
27	0.22	0.12	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
28	0.93	0.00	0.00	0.69	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.10	0.00	0.00	0.00	0.00
30	0.00		0.00	0.00	0.17	T	0.22	0.00	0.00	0.00	0.03	0.00
31	0.00		0.05		0.00		0.21	2.10		0.00		0.98
Total (in.)	2.86	2.38	6.80	4.15	4.23	0.96	3.71	9.75	1.30	1.00	3.96	2.75

Evapotranspiration

Average Monthly Temp (F)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	42.4	40.9	45.9	56.8	64.2	76.2	77.4	73.8	65.7	51.7	45.8	37.3

*Monthly averages displayed as "M" so averages taken from daily summaries

Average Monthly Temp.* (C)	5.78	4.94	7.72	13.78	17.89	24.56	25.22	23.22	18.72	10.94	7.67	2.94	
Monthly Heat Index (I)	1.242	0.983	1.919	4.074	6.767	10.884	11.330	10.009	7.246	3.238	1.899	0.462	60.544
Correct factor	1.441												
PET (cm/mo)	1.496	1.195	2.272	5.232	7.622	12.031	12.505	11.101	8.139	3.755	2.248	0.566	
PET (in/mo)	0.589	0.470	0.894	2.060	3.001	4.737	4.923	4.371	3.204	1.478	0.885	0.223	

Groundwater Infiltration 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2

Runoff

CN	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	
S	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	
Ia	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Runoff Outside Wetland(in.)	0.43	0.25	2.92	1.10	1.15	0.00	0.85	5.32	0.01	0.00	0.99	0.39	
Runoff to Wetland (in.)	3.64	2.07	24.50	9.23	9.63	0.03	7.13	44.37	0.07	0.01	8.30	3.25	
Net Per Month (in.)	-1.289	-3.219	23.203	4.117	3.655	-10.950	-1.280	42.746	-9.039	-7.666	4.177	-1.422	
Yearly Total (in.)	-1.289	-4.509	18.694	22.812	26.466	15.516	14.236	56.982	47.943	40.277	44.454	43.032	
Actual Water Level (in.)	-1.289	-3.219	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

70th Percentile (Dry) - 1993

Precipitation

DATE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.00	0.00	0.00	0.03	0.00	0.00	0.11	0.00	0.29	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	1.88	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.77	0.00	0.00	0.84	1.16	0.00	0.00	0.00	0.00	T
4	0.42	0.00	2.23	0.00	0.46	0.33	0.14	0.22	0.60	0.00	0.00	1.23
5	0.87	0.00	0.03	0.93	0.03	0.00	1.52	0.00	0.00	0.00	0.19	0.52
6	0.00	0.00	0.00	0.14	0.00	0.00	0.00	1.30	0.00	0.00	0.10	0.00
7	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
8	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00
9	0.62	0.00	0.00	0.84	0.31	0.00	0.00	0.00	0.00	0.15	0.00	0.00
10	0.05	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.03
11	0.13	0.12	0.00	0.00	0.17	0.00	0.03	0.04	0.00	0.15	0.00	0.00
12	0.08	0.00	0.36	0.00	0.83	0.00	T	0.00	0.00	0.00	0.00	0.00
13	0.02	0.00	1.93	0.00	0.27	0.53	0.00	0.70	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.08
15	0.00	0.00	0.00	0.03	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.89
16	0.01	0.56	0.00	1.34	T	0.00	0.02	0.00	0.21	0.00	0.00	0.00
17	0.00	0.00	0.53	0.00	0.12	0.00	0.00	0.00	0.27	0.10	0.26	0.00
18	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.23	0.00	0.00	0.11
19	0.03	0.00	0.00	0.00	0.21	0.00	1.84	0.00	0.00	0.03	0.00	0.00
20	0.00	0.00	T	0.00	0.00	0.00	0.00	0.13	0.08	0.00	0.00	1.09
21	0.84	1.10	0.07	0.13	0.00	0.01	0.00	0.00	0.00	0.14	0.00	0.00
22	0.03	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	1.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T
24	0.36	H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.21	0.00	0.00	0.05	0.00	0.02	0.06	0.53	0.00	0.00	0.01
26	0.00	0.33	0.17	0.75	0.09	0.06	0.16	0.02	0.02	T	0.00	0.00
27	0.00	0.01	1.15	0.00	0.00	0.00	0.00	0.00	0.13	0.03	1.60	0.00
28	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
29	0.00		0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.10
30	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00
31	0.00		0.26		0.15		0.00	0.00		T		0.00
Total (in.)	4.79	3.19	9.46	4.36	4.22	2.01	7.32	2.47	2.64	1.43	2.18	4.46

Evapotranspiration

Average Monthly Temp (F)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	37.8	35.6	42.1	53.5	64.2	70.6	77.7	74.6	68.4	54.8	45.2	35.0

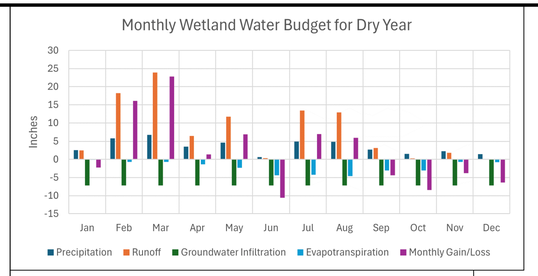
*Monthly averages displayed as "M" so averages taken from daily summaries

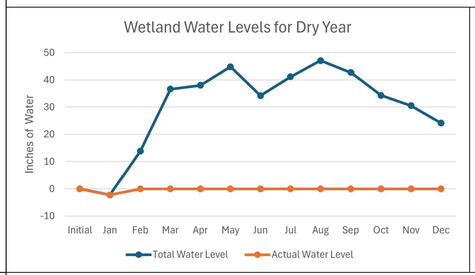
Average Monthly Temp.* (C)	3.22	2.00	5.61	11.94	17.89	21.44	25.39	23.67	20.22	12.67	7.33	1.67	
Monthly Heat Index (I)	0.517	0.253	1.189	3.692	6.767	8.882	11.442	10.298	8.134	4.032	1.776	0.192	57.176
Correct factor	1.388												
PET (cm/mo)	0.722	0.373	1.559	4.447	7.789	10.017	12.661	11.485	9.233	4.825	2.260	0.289	
PET (in/mo)	0.284	0.147	0.614	1.751	3.067	3.944	4.985	4.522	3.635	1.899	0.890	0.114	

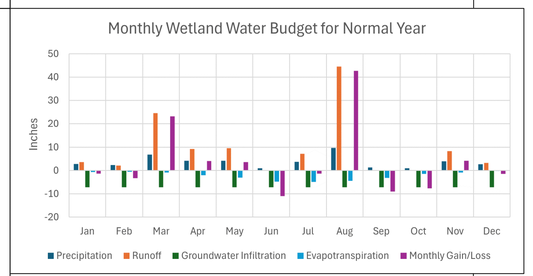
Groundwater Infiltration (in.) 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2

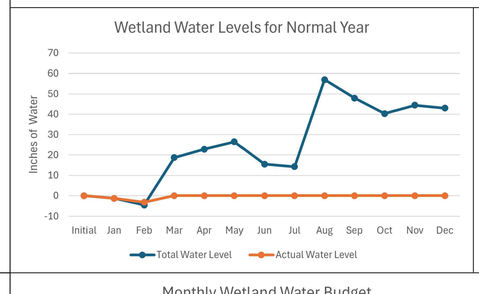
Runoff

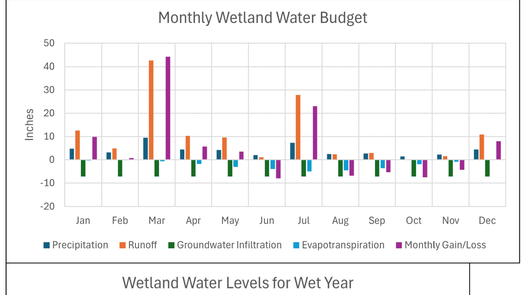
CN	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	
S	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	5.45	
Ia	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	
Runoff Outside Wetland(in.)	1.50	0.58	5.07	1.23	1.14	0.13	3.32	0.28	0.34	0.02	0.18	1.29	
Runoff to Wetland (in.)	12.56	4.90	42.51	10.28	9.58	1.11	27.86	2.34	2.88	0.17	1.53	10.80	
Net Per Month (in.)	9.852	0.742	44.151	5.693	3.529	-8.019	22.999	-6.913	-5.316	-7.502	-4.386	7.944	
Yearly Total (in.)	9.852	10.595	54.746	60.438	63.967	55.948	78.948	72.035	66.718	59.217	54.831	62.775	
Actual Water Level (in.)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

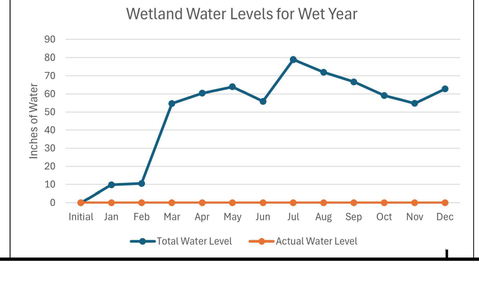












CHRIS YOW
CIVIL ENGINEER
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no.	date	by	ckd	description

BURNS McDONNELL
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LICENSEE NO. 0411001221

date	detailed
AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

WATER BUDGET

SNOW CREEK WETLAND
MITIGATION SITE

project	contract
186472	

drawing C-002 rev. –

sheet 4 of 11 sheets

file

N

0 200' 400'

SCALE IN FEET

no.	date	by	ckd	description

Scale For Microfilming
Millimeters
Inches

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AUGUST 2025	S. LAHODNY
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S. LAHODNY	C. YOW

CONCEPT GRADING PLAN

SNOW CREEK WETLAND
MITIGATION SITE

project	contract
186472	
drawing	rev.
C-101	–
sheet 5 of 11 sheets	
file	

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N

0 200' 400'
SCALE IN FEET

LEGEND:

UPLAND BUFFER SEED/PLANT

FORESTED WETLAND SEED/PLANT

CHRIS YOW
CIVIL ENGINEER
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no.	date	by	ckd	description

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date	detailed
AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

PLANTING PLAN

SNOW CREEK WETLAND
MITIGATION SITE

project	contract
186472	

drawing	rev.
C-301	–

sheet 6 of 11 sheets

file

Scale For Microfilming
Millimeters
Inches

Snow Creek Palustrine Forested Wetland (PFO) Area Vegetation Schedule

Container Planting Zone		Species Group	Species[1]	Indicator Status (EMP)	Wildlife Value[2]	Plant Spacing[3]	Container Size, Rate, and Quantity[4]		Planting Quantities (Based on One-Gallon Size)[4]	
							Plants per acre	# of Plants	Area (SF): Area (AC):	A 270,072 6.2
PFO Area	Tree Layer	1	Liquidambar styraciflua (Sweet gum)	FAC		10' O.C.[3]	400 One-Gallon --or-- 800 tubelings --or-- 1,200 Bare Root	2,480 (based on one-gallon)	Gallon	2,480
			Betula nigra (River birch)	FACW	+					
			Quercus bicolor (Swamp White Oak)	FACW	+					
			Acer rubrum (Red maple)	FAC						
		2	Quercus michauxii (Swamp chestnut Oak)	FACW	+	15' O.C.[2]	200 One-Gallon --or-- 400 tubelings --or-- 600 Bare Root	1,240 (Based on one-gallon)	Gallon	1,240
			Ulmus americana (American elm)	FACW	-					
			Platanus occidentalis (American sycamore)	FACW						
			Acer negundo (Box elder)	FAC	+					
			Nyssa sylvatica (Black gum)	FAC	+					
	Shrub Layer	3	Salix nigra (Black willow)	OBL		15' O.C.[3]	200 Tubelings --or-- Livestakes	1,240 (Tubelings or Livestakes only)	Tubelings or livestakes only	1,240
		4	Cornus amomum (Silky dogwood)	FACW	+	15' O.C.[3]	200 One-Gallon --or-- 400 tubelings --or-- 600 Bare Root	1,240 (Based on One-Gallon)	Gallon	1,240
			Lindera benzoin (Northern spicebush)	FAC	+					
			Carpinus caroliniana (American hornbeam)	FAC	+					
			Alnus serrulata (Brookside alder)	OBL	+					
			Ilex verticillata (Winterberry holly)	FACW	+					
Palustrine Forested Wetland Quantity Subtotals							1,000	6,200		6,200

Seeding Schedule

Seed Planting Zone	Species Group	Species[1]	Indicator Status (EMP)	Wildlife Value[2]	Seeding Rate (lbs/acre)[5]	Area per plant (Ac)	Quantity (lbs.)	Seeding Quantities Area (SF): Area (Ac):	A 270,072 6.2
PFO Area Seed Mix	5	Lolium perenne ssp. multiflorum (Annual ryegrass)	FACU		45	13.76	279		279
		Chamaechrista fasciculata (Partridge pea)	FACU		10	13.76	62		62
	6	Leersia oryzoides (Rice cut grass)	OBL	+	10	13.76	62		62
		Tripsacum dactyloides (Gama grass)	FACW	+	10	13.76	62		62
		Juncus effusus (Soft rush)	FACW	+	10	13.76	62		62
	7	Lobelia siphilitica (Blue cardinal flower)	FACW	+	0.5	13.76	3.1		3.1
		Lycopus americanus (American bugleweed)	OBL	-	0.5	13.76	3.1		3.1
		Eupatorium perfoliatum (Common boneset)	FACW		0.5	13.76	3.1		3.1
		Verbesina alternifolia (Wingstem)	FAC		0.5	13.76	3.1		3.1
		Conoclinium coelestinum (Blue mistflower)	FAC	+	0.5	13.76	3.1		3.1
	8	Eupatorium fistulosum (Hollow joe pye weed)	FAC	+	0.2	13.76	1.24		1.24
		Persicaria sagittata (Arrow-leaved tearthumb)	OBL	-	0.2	13.76	1.24		1.24
		Lycopus virginicus (Virginia water horehound)	OBL	-	0.2	13.76	1.24		1.24
	9	Onoclea sensibilis (Sensitive fern)	FACW		0.1	13.76	0.62		0.62
		Carex crinita (Fringed sedge)	OBL	+	0.1	13.76	0.62		0.62
		Ludwigia alternifolia (Seedbox)	FACW	-	0.1	13.76	0.62		0.62
		Lobelia cardinalis (Cardinal flower)	FACW	+	0.1	13.76	0.62		0.62
		Thalictrum pubescens (Tall Meadow Rue)	FACW	-	0.1	13.76	0.62		0.62
		Lysimachia ciliata (Fringed loosestrife)	FACW	-	0.1	13.76	0.62		0.62
	10	Echinochloa muricata (Barnyard grass)	FACW	-	0.1	13.76	0.62		0.62
		Dichanthelium clandestinum (Deertongue)	FAC	+	0.1	13.76	0.62		0.62
		Carex vulpinoidea (Fox sedge)	OBL	-	0.1	13.76	0.62		0.62
	11	Symphyotrichum novae-angliea (New England aster)	FACW	-	0.2	13.76	1.24		1.24
		Carex lurida (Sallow sedge)	OBL	+	0.2	13.76	1.24		1.24
		Helenium autumnale (Common sneezeweed)	FACW	+	0.2	13.76	1.24		1.24
	12	Carpinus caroliniana (American hornbeam)	FAC	+	0.5	13.76	3.1		3.1
		Sambucus canadensis (Elderberry)	FAC	+	0.5	13.76	3.1		3.1
		Lindera benzoin (Northern Spicebush	FAC	+	0.5	13.76	3.1		3.1
		Cornus amomum (Silky Dogwood)	FACW	+	0.5	13.76	3.1		3.1
	13	Platanus occidentalis (American sycamore)	FACW		0.5	13.76	3.1		3.1
		Betula nigra (River birch)	FACW	+	0.5	13.76	3.1		3.1
		Ulmus americana (American elm)	FACW	-	0.5	13.76	3.1		3.1
		Liquidambar styraciflua (Sweetgum)	FAC		0.5	13.76	3.1		3.1
Seeding totals					93.6		580.32		580.32

PFO Area Planting and Seeding Notes:
1. Substitutions for selected species based upon availability shall be requested in writing to engineer, documenting lack of availability.
2. Wildlife value indicator is based on the Virginia Department of Conservation and Recreation (DCR)'s brochure: "Native Plants for Conservation, Restoration & Landscaping: Virginia Piedmont Region." Species with "-" are regionally native but not included on brochure.
3. The planted trees and shrubs shall be randomly spaced and species mixed throughout the planting areas.
4. Container rates and quantities shown for one gallon size. For purposes of substitution, two tubelings are the equivalent of one 1-gallon.
5. All seeding rates are expressed in pounds of pure live seed (PLS).

Snow Creek Upland Buffer Woody Vegetation Schedule

Container Planting Zone		Species Group	Species[1]	Indicator Status (EMP)	Wildlife Value[2]	Plant Spacing[3]	Container Size, Rate, and Quantity[4]		Planting Quantities (Based on One-Gallon Size)[4]	
							Plants per acre	# of Plants	Area (SF): Area (AC):	A 108,500 2.49
Upland Buffer	Tree Layer	1	Quercus coccinea (Scarlet oak)	NI	+	10' O.C.[3]	400 One-Gallon --or-- 800 tubelings --or-- 1,200 Bare Root	996 (based on one-gallon)	Gallon	996
			Quercus alba (White oak)	FACU	+					
			Quercus phellos (Willow oak)	FAC	+					
			Quercus rubra (Northern red oak)	FACU	+					
		2	Liriodendron tulipifera (Tuliptree)	FACU	+	15' O.C.[2]	200 One-Gallon --or-- 400 tubelings --or-- 600 Bare Root	498 (Based on one-gallon)	Gallon	498
			Carya ovata (Shagbark Hickory)	FACU						
			Quercus falcata (Southern red oak)	FACU	+					
			Fagus grandifolia (American beech)	FACU	+					
			Carya tomentosa (Mockernut Hickory)	NI						
	Shrub Layer	3	[illegible] bush)	FAC	+	15' O.C.[3]	200 One-Gallon --or-- 400 tubelings --or-- 600 Bare Root	498 (Based on One-Gallon)	Gallon	498
			Viburnum acerifolium (Maple-leaf Arrow-wood)	UPL	-					
			Cornus florida (Flowering dogwood)	FACU	+					
			Ilex opaca (American holly)	FACU	+					
			Asimina triloba (Common pawpaw)	FAC	+					
Palustrine Forested Wetland Quantity Subtotals							800	1,992		1,992

Snow Creek Upland Wetland Buffer Seeding Schedule

Seed Planting Zone	Species[1]	Indicator Status (EMP)	Wildlife Value[2]	Seeding Rate (lbs/ac)[3]	Area per plant (Ac)	Quantity (lbs)	Seeding quantities Area (SF): Area (AC):	B 108,500 2.49
Upland Wetland Buffer Seed Mix	Lolium perenne ssp. multiflorum (Annual ryegrass)	FACU		45	4.97	112.05		112.05
	Chamaechrista fasciculata (Partridge pea)	FACU		10	4.97	24.9		24.9
	Sorghastrum nutans (Indiangrass)	FACU	+	10	4.97	24.9		24.9
	Agrostis perennans (Autumn bentgrass)	FACU		10	4.97	24.9		24.9
	Panicum virgatum (Switchgrass)	FAC	+	9	4.97	22.41		22.41
	Elianthus giganteus (Sugarcane plumegrass)	FACW	+	0.3	4.97	0.75		0.75
	Achillea millefolium (Common yarrow)	FACU		0.3	4.97	0.75		0.75
	Asclepias syriaca (Common milkweed)	FACU	+	0.3	4.97	0.75		0.75
	Senna marilandica (Maryland wild senna)	FAC		0.2	4.97	0.5		0.5
	Pycnanthemum tenuifolium (Narrow-leaved mountain mint	FACW	+	0.2	4.97	0.5		0.5
	Doellingeria umbellata (Flat-topped white aster)	FACW		0.2	4.97	0.5		0.5
	Asclepias tuberosa (Butterfly weed)	NI	+	0.2	4.97	0.5		0.5
	Baptisia tinctoria (Yellow wild indigo)	NI	+	0.2	4.97	0.5		0.5
Seeding totals				85.9		213.91		213.91

no.	date	by	ckd	description

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date	detailed
AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

PLANTING SCHEDULE

SNOW CREEK WETLAND
MITIGATION SITE

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C-302	-
sheet 7 of 11 sheets	
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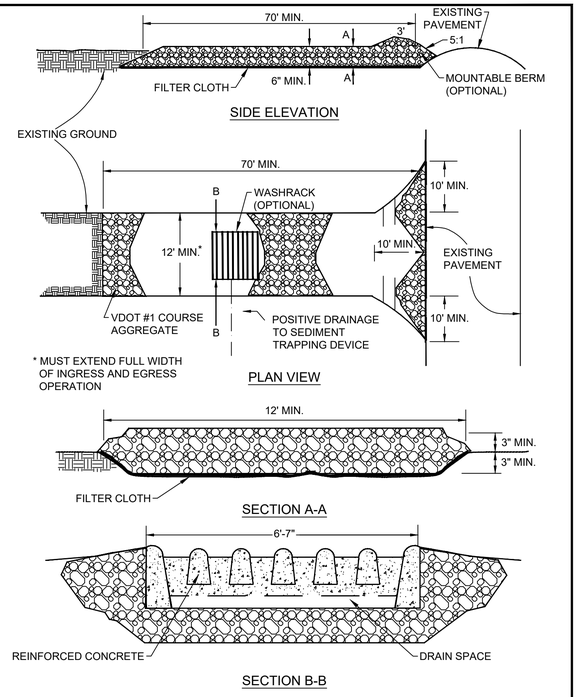
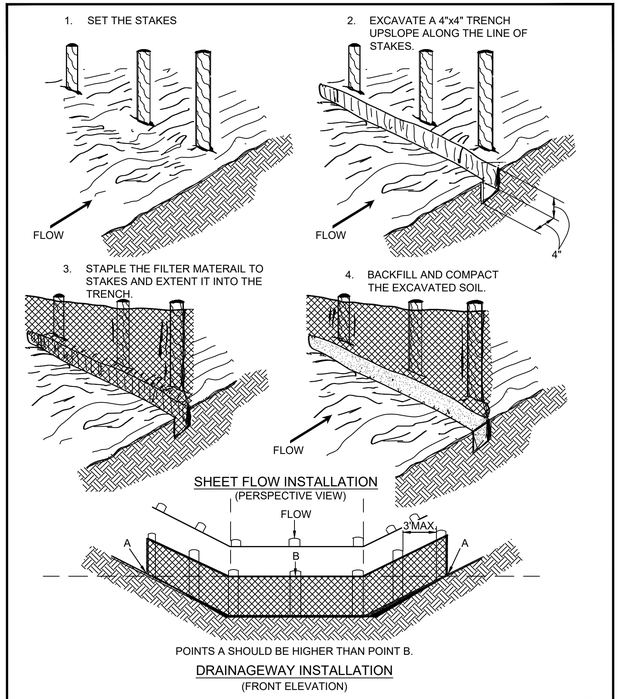


VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

STONE CONSTRUCTION ENTRANCE

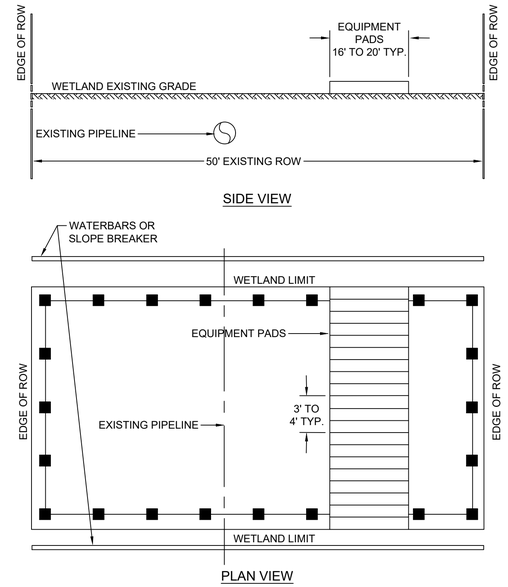
v1.1 SOURCE: VA. DSWC, MD ESC STDS C-SCM-03-1



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

CONSTRUCTION OF SILT FENCE WITHOUT WIRE SUPPORT

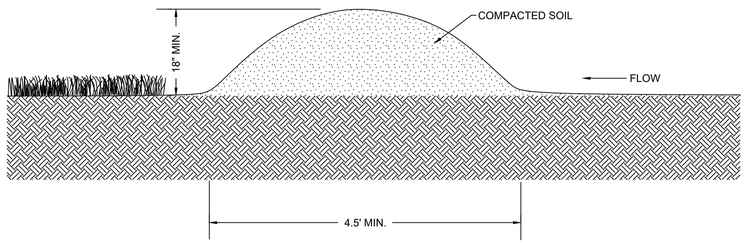
v1.1 SOURCE: ADAPTED FROM STRAW & FAB. BARRIERS, SHERWOOD & WYANT C-PCM-04-2B



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

STABLE WETLAND CROSSING LAYOUT DETAIL

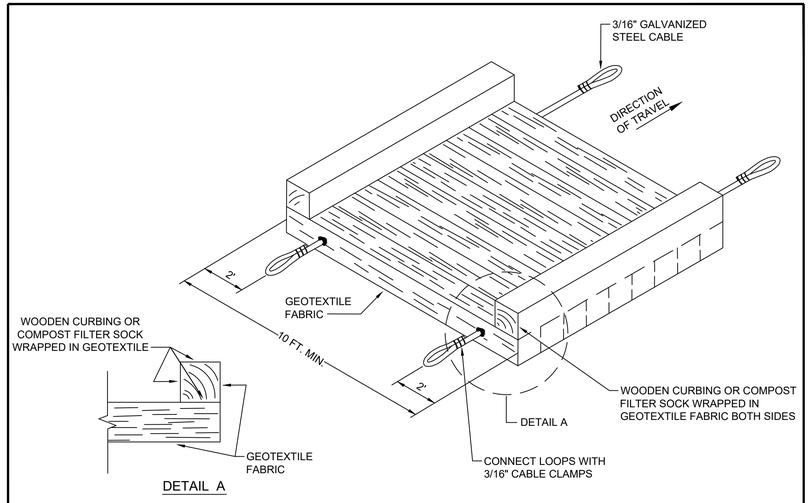
v1.1 SOURCE: VDEQ 1992 C-ENV-06-2



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

TEMPORARY DIVERSION DIKE

v1.1 SOURCE: VA. DSWC C-ECM-04-1



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

WOODEN WETLAND CROSSING DETAIL

v1.1 SOURCE: VDEQ 1992 C-ENV-06-2

NOTE : A FULL EROSION CONTROL PLAN HAS NOT BEEN DEVELOPED AT THIS TIME. THE ESC PLAN WILL BE DEVELOPED FOR THE FINAL MITIGATION PLAN AND PERMITTING PHASES OF THE PROJECT.

no.	date	by	ckd	description

BURNS McDONNELL
110 FRANKLIN RD SE SUITE 700
ROANOKE, VA 24011
816-333-9400
Burns & McDonnell Engineering Co, Inc.
LICENSEE NO. 0411001221

date	detailed
AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

ESC DETAILS

SNOW CREEK WETLAND MITIGATION SITE

project	contract
186472	
drawing	rev.
C-401	–
sheet 8 of 11 sheets	
file	

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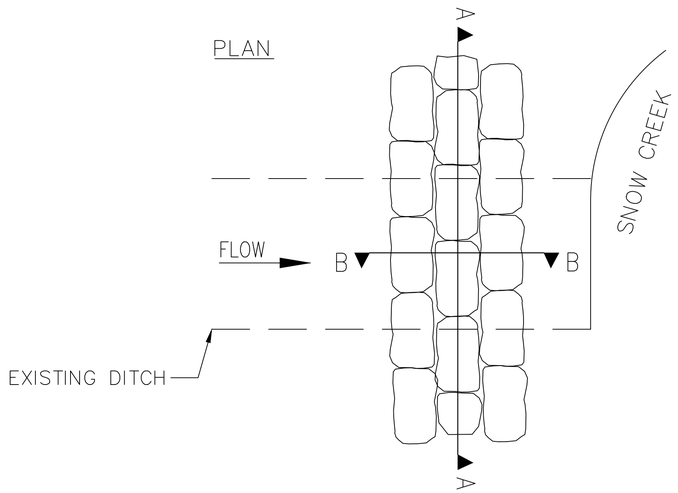

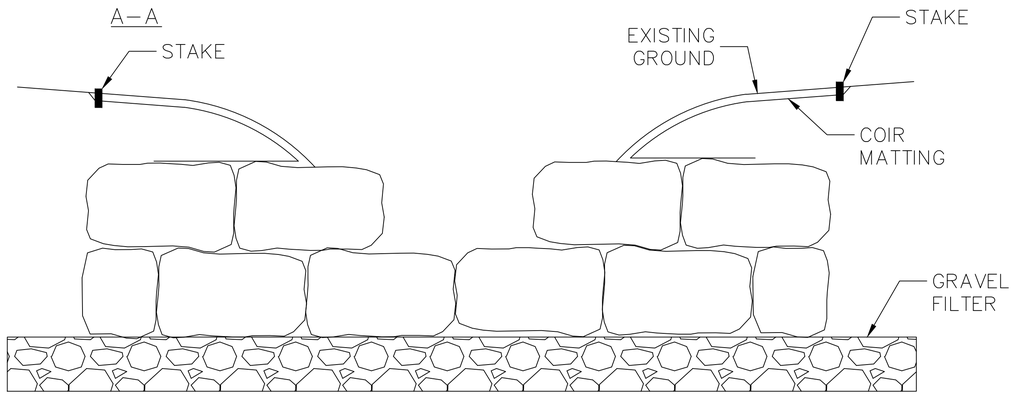

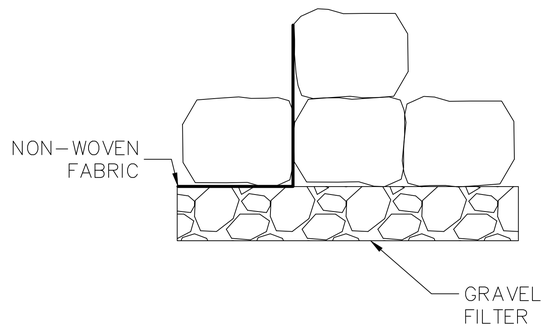

WATER CONTROL STRUCTURE DETAIL

Scale For Microfilming
Millimeters
Inches

no.	date	by	ckd	description

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816-333-9400
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AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

DETAILS

SNOW CREEK WETLAND
MITIGATION SITE

project	contract
186472	

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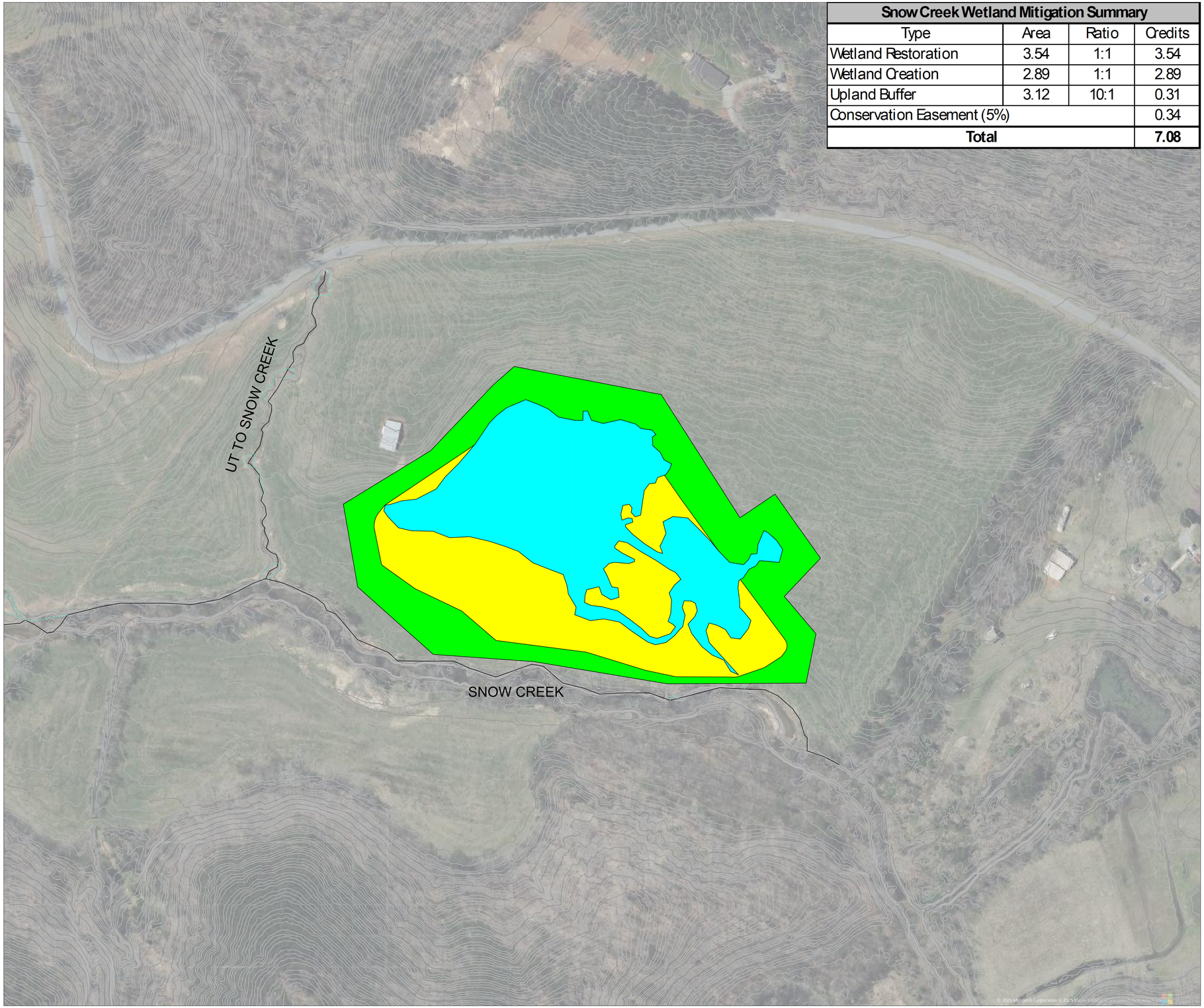
Snow Creek Wetland Mitigation Summary			
Type	Area	Ratio	Credits
Wetland Restoration	3.54	1:1	3.54
Wetland Creation	2.89	1:1	2.89
Upland Buffer	3.12	10:1	0.31
Conservation Easement (5%)			0.34
Total			**7.08**



0 200' 400'
SCALE IN FEET

LEGEND:

- UPLAND BUFFER
- WETLAND RESTORATION
- WETLAND CREATION

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no.	date	by	ckd	description

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date	detailed
AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

CREDIT ANALYSIS SUMMARY

SNOW CREEK WETLAND MITIGATION SITE

project	contract
186472	
drawing	rev.
C-601	–

sheet 10 of 11 sheets
file

Scale For Microfilming
Millimeters
Inches

PRE-CONSTRUCTION

Evaluator Name: WJ Wetland ID: Pre-con Date: 08-06-2025

Total area of wetland: +/- 3.54 acres Adjacent land use: Rural, Cattle Pasture

Distance to nearest roadway or other development: ~315' Dominant wetland system present: PEM

How many tributaries contribute to wetland: 0 Does wetland contribute to tributary: Yes

Is wetland in RPA?: No Other observations/details: PEM wetland located within cattle pasture

Function/Value	Specific Characteristics	Principal Function	Comments
Groundwater Recharge/Discharge	7, 11		Associated with perennial Snow Creek
Floodflow Alteration	3, 5, 6, 7, 8, 9, 10, 13, 14, 15, 18	Y	Wetland area is within floodplain terrace
Fish and Shellfish Habitat	1, 4, 6, 7, 8, 14, 16, 17	Y	Snow Creek suitable for aquatic life
Sediment/Toxicant Retention	1, 4, 5, 10, 12, 13,		May provide this function, but is limited due to shallow depth
Nutrient Removal	3, 4, 5, 7, 8, 9, 10, 13	Y	Dense vegetation contributes to this
Production Export	7, 10, 12, 13		Food sources possible from succession, but currently lacking due to cattle grazing
Sediment/Shoreline Stabilization	3, 4, 9, 12,		Limited in this function as floodplain levee is present and artificial channel is only direct connection to stream
Wildlife Habitat	3, 6, 7, 10, 13		High density of vegetation and connectivity to stream
Endangered Species Habitat	N/A		Does not provide this value
Recreation	N/A		Located on private land and does not provide this value
Educational/Scientific Value	N/A		Does not provide this value
Uniqueness/Heritage	N/A		Does not provide this value
Visual Quality/Aesthetics	N/A		Does not provide this value
Additional Comments	None		

POST-CONSTRUCTION

Evaluator Name: WJ Wetland ID: Pre-con Date: 08-06-2025

Total area of wetland: +/- 6.2 acres Adjacent land use: Rural, Cattle Pasture

Distance to nearest roadway or other development: ~315' Dominant wetland system present: PFO

How many tributaries contribute to wetland: 0 Does wetland contribute to tributary: Yes

Is wetland in RPA?: No Other observations/details: PFO wetland located within field/floodplain

Function/Value	Specific Characteristics	Principal Function	Comments
Groundwater Recharge/Discharge	7, 9, 11, 15		Expected to increase due to increase in water retention time
Floodflow Alteration	3, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 18	Y	Expected to increase due to increase in water retention time
Fish and Shellfish Habitat	1, 4, 5, 6, 7, 8, 10, 12, 14, 16, 17	Y	Snow Creek suitable for aquatic life
Sediment/Toxicant Retention	1, 3, 4, 5, 10, 11, 12, 13, 14, 16		Expected to increase due to increase in water retention time
Nutrient Removal	2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14	Y	Function will be improved by increase in vegetation diversity and water retention time
Production Export	1, 2, 4, 5, 7, 8, 10, 12, 13, 14		Food sources likely to increase with increase in vegetation diversity
Sediment/Shoreline Stabilization	3, 4, 9, 12,		Limited in this function as floodplain levee is present and artificial channel is only direct connection to stream
Wildlife Habitat	3, 6, 7, 8, 9, 10, 11, 13, 14, 15, 17		High density of vegetation and connectivity to stream
Endangered Species Habitat	N/A		Does not provide this value
Recreation	N/A		Located on private land and does not provide this value
Educational/Scientific Value	N/A		Does not provide this value
Uniqueness/Heritage	N/A		Does not provide this value
Visual Quality/Aesthetics	N/A		Does not provide this value
Additional Comments	None		

Millimeters
Inches
Scale For Microfilming

no.	date	by	ckd	description

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AUGUST 2025	S. LAHODNY
designed	checked
S. LAHODNY	C. YOW

WETLAND VALUE AND FUNCTION SCORE SHEETS

SNOW CREEK WETLAND MITIGATION SITE

project	contract
186472	
drawing	rev.
C-602	-

sheet 11 of 11 sheets
file

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CIVIL ENGINEER
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Exhibit C
Site Selection Criteria

USACE Norfolk District and Virginia Department of Environmental Quality
October 2018

Bank/Site Name	Snow Creek Mitigation Site
ORM Number	
Date	08/08/2025

1. Principal Criteria (check all that apply)

- ☑ **a. Site activities will result in at least 80% of wetland credits obtained through wetland restoration/creation**
- ☐ **b. Site activities will result in at least 50% of stream credits obtained through stream restoration/enhancement**
- ☑ **c. Site is contiguous or connected to other aquatic resources**
- ☐ **d. Site contains minimal or no INU species**
- ☑ **e. Site has not been logged in the past 5 years**
- ☐ **f. Site abuts and/or adjoins an existing preservation/ conservation area, etc.**
- ☑ **g. Site has no known encumbrances (ie easements, liens, rights of way, reserved timber, severed surface or subsurface mineral or natural gas rights, etc.) on the site, on adjacent properties or within the watershed of the site that will negatively affect the compensation goals**
- ☑ **h. Immediately adjacent land is less than 10% impervious cover**
- ☑ **i. Site does not contain any impoundments that are not proposed for removal**
- ☑ **j. Site is able to be protected long-term through the recordation of an appropriate site protection instrument or other mechanism that will support the long-term protection of the site**
- ☑ **k. Site is expected to provide in-kind compensation (similar hydrologic regime)**

2. Watershed Scale Features (check all that apply)

- ☑ **a. Site activities will contribute to habitat diversity ****
- ☑ **b. Site activities will remove pollutants from waters ****
- ☐ **c. Site activities will remediate inputs of substantial amounts of sediment****
- ☑ **d. Site will contribute to habitat connectivity**

****Explanation required. Provide supplemental information in an attachment to this Checklist**

3. Development Trends in the Watershed Where Site is Located
(check all that apply)

****Explanation required. Provide supplemental information in an attachment to this Checklist**

- ☐ **a. Site will address watershed needs for habitat protection as identified in a wildlife action plan, compensation planning framework, habitat Conservation Plan, etc.****
- ☑ **b. Site will address watershed needs for water quality improvement/reduction in sediment loads as identified in the 303(d) list****
- ☑ **c. Less than 50% of land use within the watershed is residential/commercial/industrial**
- ☐ **d. Less than 50% of land use within the watershed is agricultural**
- ☑ **e. Future land use plans (ie local comprehensive plans, conservation plans) show minimal or no change**
- ☑ **f. No water withdrawal permits issued within the vicinity of the site**
- ☑ **g. No point source permits within the vicinity of the site**

4. Watershed vs. Site Specific Water Quality Goals
(check all that apply)

****Explanation required. Provide supplemental information in an attachment to this Checklist**

- ☑ **a. Site is likely to contribute to improved water quality within the watershed and not solely within the site boundaries****
- ☐ **b. Site will include preservation/establishment/rehabilitation of the entire watershed upstream of the project to the drainage divide**
- ☑ **c. No downstream impoundments (excluding drinking water) that would limit the watershed benefits derived from site activities**
- ☐ **d. Site will improve water quality conditions of existing wetlands identified by VDEQ (WetCAT) as "Somewhat Severely Stressed" or "Severely Stressed"****

5.Site Compatibility with Adjacent Land Use
(check all that apply)

****Explanation required. Provide supplemental information in an attachment to this Checklist**

- ☐ **a. Site is within an area identified as meriting conservation in an approved watershed management plan, wildlife action plan, national forest management plan, or conservation plan****
- ☑ **b. Site is not likely to be affected by current activities occurring on adjacent properties**
- ☑ **c. Site will not be affected by likely future activities occurring on adjacent properties**
- ☑ **d. Site activities will not affect adjacent properties****
- ☑ **e. Site is not adjacent to silvicultural operations**
- ☐ **f. Site is not adjacent of agricultural land**
- ☐ **g. Properties adjacent to the site do not have the potential to spread INU species to the site****

6. Positive Effects Site will have on Ecological/Cultural Resources (check all that apply)

****Explanation required. Provide supplemental information in an attachment to this Checklist**

- ☐ **b. Site activities will conserve/restore natural communities identified by VDCR as imperiled****
- ☐ **c. Site activities will conserve/restore karst resources identified by VDCR as imperiled****
- ☐ **d. Site activities are within areas that have been identified by VDGIF as meriting improvement****
- ☐ **e. Site activities will conserve/restore areas designated by VDGIF as wild trout streams****
- ☐ **d. Site activities will conserve/restore areas designated by VDGIF as anadromous fish use areas****
- ☐ **e. Site activities will restores/preserve/enhance areas designated by VDGIF as Threatened and Endangered Species Waters****
- ☐ **f. Site activities will protect state or federal threatened and/or endangered species****
- ☐ **g. Site contains historical cultural resources that will be preserved****
- ☐ **h. Site activities will establish new or expand existing wildlife corridors****
- ☐ **i. Site activities will result in removal of barriers to fish passage****
- ☐ **j. Site results in score of 1 or greater for potential wetland, riparian, or upland restoration or preservation as identified by the Watershed Resource Registry (WRR)****
- ☐ **k. Site will improve habitat conditions of existing wetlands identified by VDEQ (WetCAT) as “Somewhat Severely Stressed” or “Severely Stressed”****

7. Hydrologic Sources/ Ecological Features (check all that apply)

- ☑ **a. Site activities do not consist of wetland creation in the uplands unless adjacent to existing streams or wetlands**
- ☑ **b. Site activities do not consist of stream creation**
- ☑ **c. Site activities do not entail impounding or diverting water from other areas to the project site**
- ☑ **d. Site activities do not entail excavation to reach groundwater**

8. Physical/Chemical Characteristics (check all that apply)

****Explanation required. Provide supplemental information in an attachment to this Checklist**

- ☐ **a. Sites receiving waters are 303(d) listed**
- ☐ **b. Site qualifies for preservation only, as 1) the resources provide important physical, chemical, or biological functions to the watershed, 2) the resource contribute significantly to the ecological sustainability of the watershed, 3) the IRT has determined that preservation is appropriate and practicable, 4) the resources are under threat of destruction or adverse modification, and 5) the site will be permanently protected through an appropriate real estate instrument****
- ☑ **c. Site activities will not result in the construction of artificial or unnatural wetlands that will have limited opportunity to provide the desired functions**
- ☐ **d. Past land use was PC crop or ditched wetlands**
- ☑ **e. Past land use was agriculture/silviculture****
- ☐ **f. Past land use was commercial or industrial****
- ☑ **g. No impoundments exist upstream of the site that will cause thermal increases in water temperature, decreases in dissolved oxygen, erosion and degradation of the channel downstream from the impoundment, or dam failure from a storm event****
- ☐ **h. Site activities will result in all onsite impoundments being removed and streams re-established/ rehabilitated**

Snow Creek Mitigation Site
Site Selection Criteria
Supplemental Information

2. Watershed Scale Features

a. Site activities will contribute to habitat diversity

The existing wetlands on the Mitigation Site have been negatively impacted by agricultural activities, including cattle grazing. The proposed restoration will restore degraded wetlands, create new wetlands, and establish forested buffers which will contribute to habitat diversity throughout the Snow Creek floodplain.

b. Site activities will remove pollutants from waters

The restoration will focus on areas currently dominated by agricultural uses (livestock grazing). The restoration will include planting native herbaceous and woody species, reducing erosion and allowing for storage of floodwaters, reducing the amount of pollutants into Snow Creek, the receiving water body. Cattle will also be excluded from the Mitigation Site, removing pollutants from the water.

3. Development Trends in the Watershed where Site is Located

b. Site will address watershed needs for water quality improvement/reduction in sediment loads as identified in the 303(d) list

The wetland proposed for restoration drains into Snow Creek, which was classified during the 2022 cycle as an impaired water (Category 4A) for E. Coli. The restoration of the Mitigation Site will remove cattle from the wetland system, reducing the livestock waste load to Snow Creek.

4. Watershed vs. Site Specific Water Quality Goals

a. Site is likely to contribute to improved water quality within the watershed and not solely within the site boundaries

The Mitigation Plan focuses on the restoration of a large wetland area in the floodplain of Snow Creek. The wetland restoration and creation will have direct benefits to Snow Creek and all downstream waterways connected to Snow Creek by reducing pollutants to downstream receiving waters.

5. Site Compatibility with Adjacent Land Use

d. Site activities will not affect adjacent properties

No work is being proposed outside of the proposed mitigation easement.

8. Past/ Chemical Characteristics

a. Past land use was agriculture/ silviculture

Per a review of Google Earth imagery, the site has been in agricultural use since at least 1994.

g. No impoundments exist upstream of the site that will cause thermal increases in water temperature, decreases in dissolved oxygen, erosion and degradation of the channel downstream from the impoundment, or dam failure from a storm event

Upon review of the WetCAT tool, there are no impoundments upstream of the Mitigation Site that would cause thermal increases in water temperature, decreases in dissolved oxygen, erosion and degradation of the channel downstream from the impoundment, or dam failure from a storm event.