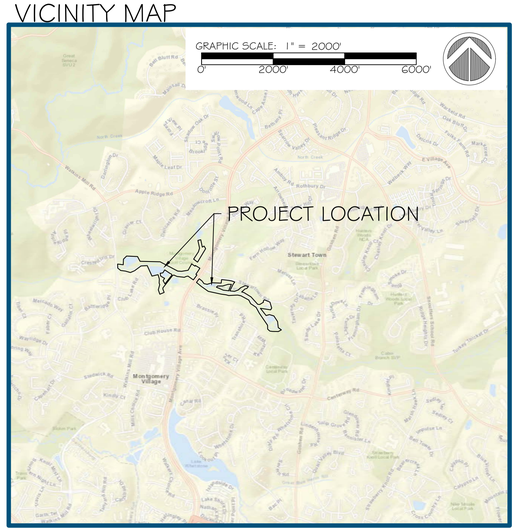
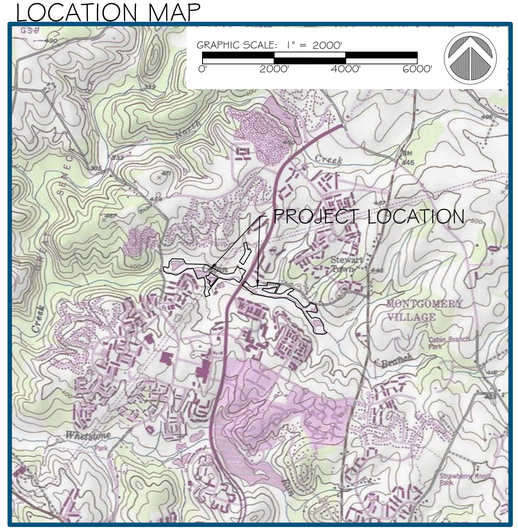
RFP-2 CABIN BRANCH STREAM RESTORATION AND WETLAND MITIGATION PHASE II EROSION & SEDIMENT CONTROL PLAN MONTGOMERY COUNTY, MARYLAND

VICINITY MAP

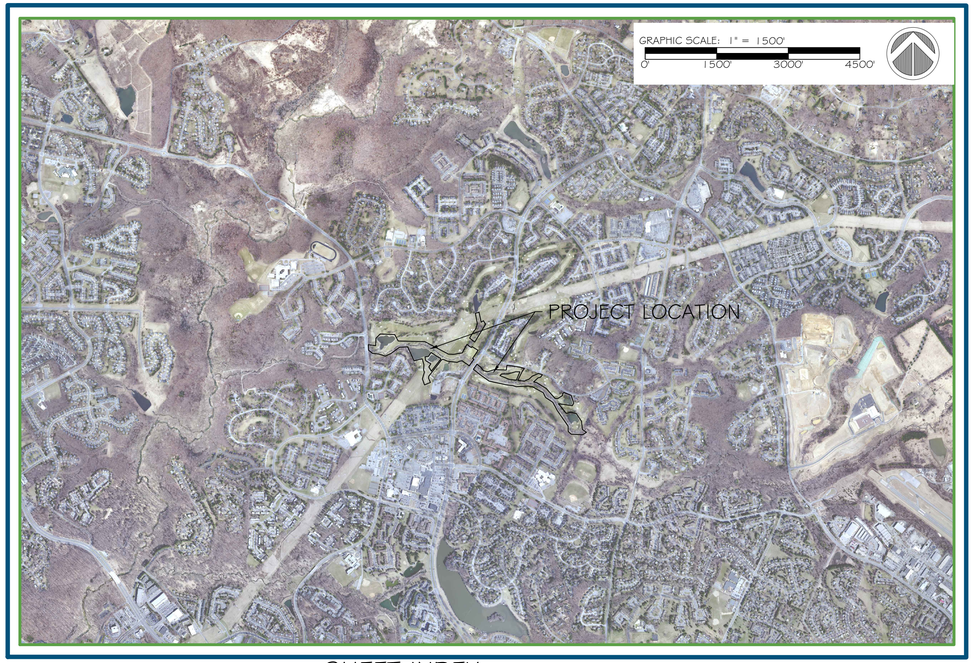


LOCATION MAP



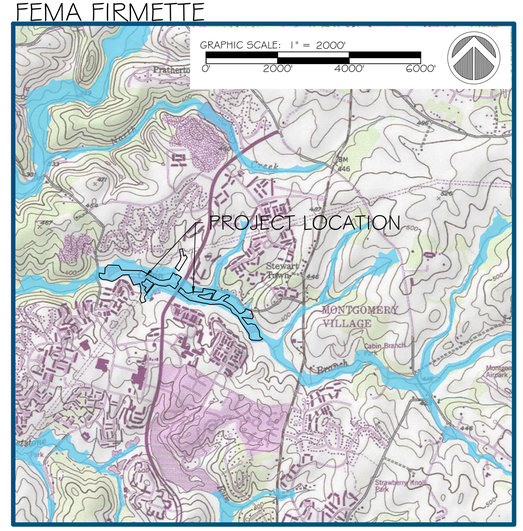
LATITUDE: N 39° 10' 43"
LONGITUDE: W 77° 12' 08"

AERIAL PHOTOGRAPH-PROJECT OVERVIEW



SHEET INDEX:

FEMA FIRMETTE



REFERENCE FEMA MAP: 24031C0187D

APPLICANT/AGENT:
NAME: HGS, LLC A RES COMPANY
ADDRESS: 5367 TELEPHONE ROAD
WARRENTON, VIRGINIA 20187

PROPERTY OWNER #1:
NAME: USL2 MR MONT VILLAGE BUSINESS TR
ADDRESS: 19550 MONTGOMERY VILLAGE AVE
ZONING: TLD, CRN-0.55
ACREAGE: 111.87

PROPERTY OWNER #2:
NAME: POTOMAC ELECTRIC POWER CO
ADDRESS: C/O CORP TAX DEPT STE 5617 701
9TH ST NW WASHINGTON, DC 20068
ZONING: R-200
ACREAGE: 16.52

JOB NUMBER: PRJ102054

RFP-2 CABIN BRANCH

RELATED REQUIRED PERMITS

TYPE OF PERMIT	REQD	NOT REQD	PENDING	APPROVED	NOTES
U.S. ARMY CORP OF ENGINEERS	X				
MARYLAND DEPARTMENT OF THE ENVIRONMENT	X				
LOCAL JURISDICTION (CITY/COUNTY)					
SPECIAL USE		X			
ZONING		X			
LAND DISTURBANCE	X				
FLOODPLAIN	X				
NRI	X			X	#4-20170430
FCP	X				

MONTGOMERY COUNTY DEPARTMENT OF PERMITTING SERVICES APPROVED FOR:

NOTE: MCDPS APPROVAL DOES NOT NEGATE THE NEED FOR A MCDPS ACCESS PERMIT.

Stormwater Management:
Reviewed Date
Approved Date
SM FILE #

Sediment Control Technical Requirements:
Reviewed Date
Approved Date

Administrative Requirements:
Reviewed Date
SEDIMENT CONTROL PERMIT NO.

MCDPS APPROVAL OF THIS PLAN WILL EXPIRE TWO YEARS FROM THE DATE OF APPROVAL IF THE PROJECT HAS NOT STARTED.

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FOR ALL WORK WITHIN THE LIMITS OF THE PARCELS OWNED BY POTOMAC ELECTRIC POWER COMPANY THE FOLLOWING NOTES SHALL APPLY:

GRANTOR's PROPERTIES Workspace Notes

A. Notify GRANTOR at least seventy-two (72) hours prior to start of work on GRANTOR's PROPERTIES. Notify GRANTOR again at the completion of work. Failure to notify GRANTOR may trigger a stop work order.

B. Remove all construction debris from GRANTOR's PROPERTIES at the completion of the work.

C. Stabilize all disturbed areas by grading, seeding and/or mulching.

PROFESSIONAL CERTIFICATION.
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 52852, EXPIRATION DATE: 6/14/2022

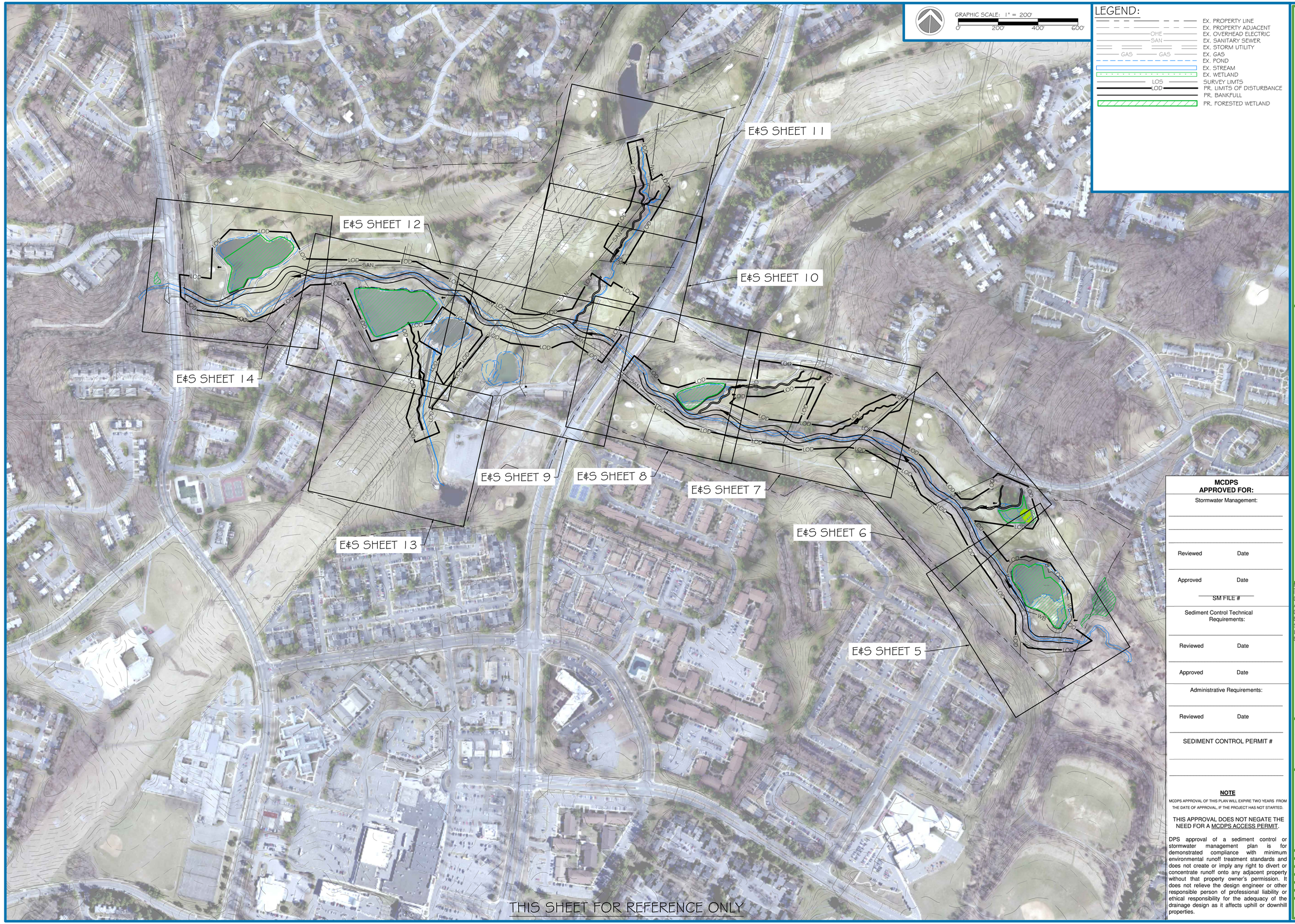
NOT FOR CONSTRUCTION

PROJECT STATUS	
DATE	DESCRIPTION
2/15/2021	65% MITIGATION PLAN
9/8/2021	65% MITIGATION PLAN REV.
3/10/2022	65% MITIGATION PLAN REV. 1

RFP-2 CABIN BRANCH

PROJECT MANAGER: RC	JOB NUMBER: PRJ102054
DESIGNED: KH	DESIGN TYPE: 404 MITIGATION
DRAWN: KH	PLAN DATE: 11/22/2021

HGS, LLC - A RES COMPANY
5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US



MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

NOTE

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res
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P: 703.393.4844 F: 703.393.2934
WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

EROSION AND SEDIMENT CONTROL KEY SHEET

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE#: 52852
EXP. DATE: 07/14/2022

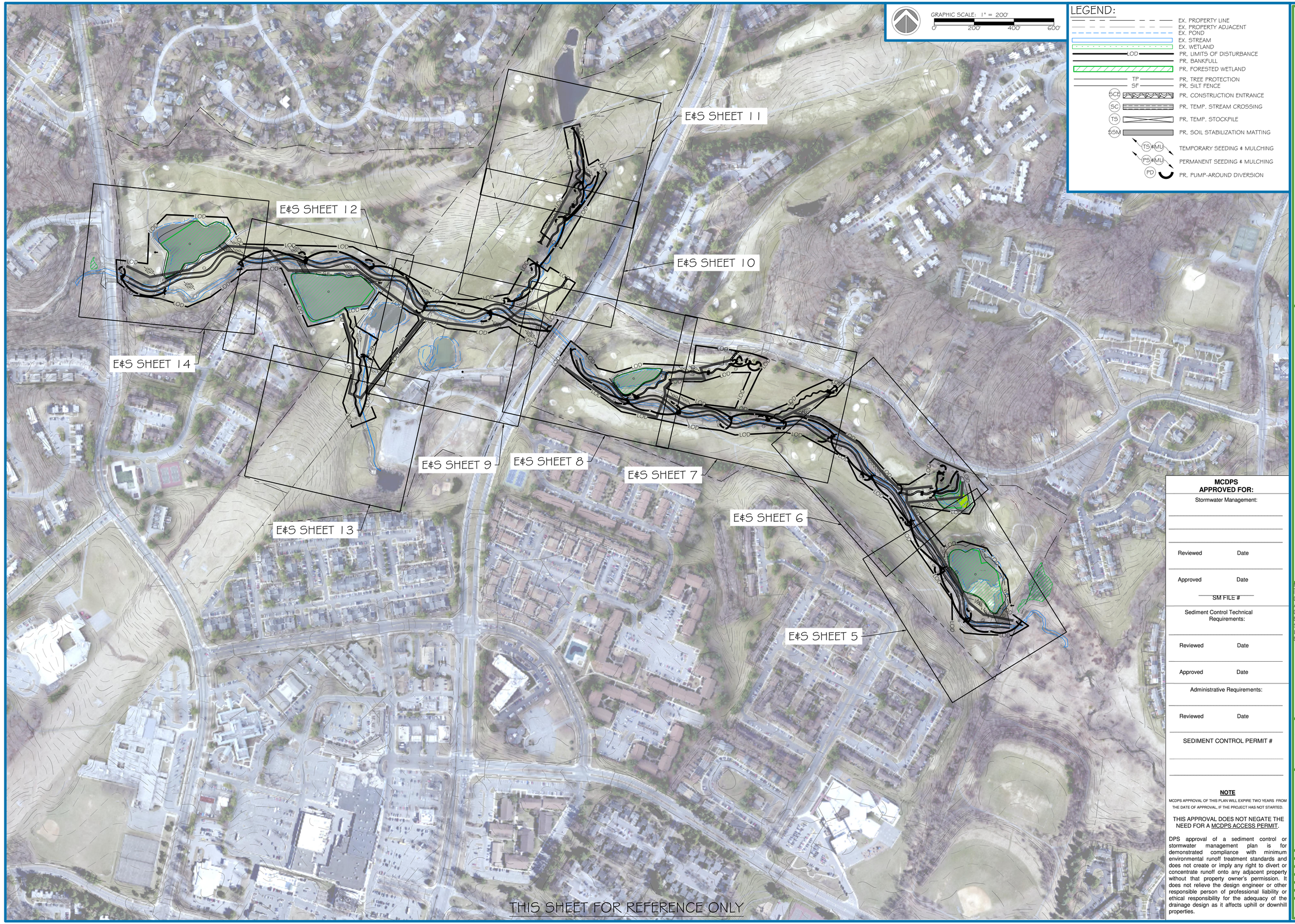
NOT FOR CONSTRUCTION

REVISIONS:
1

PROJECT STATUS:

11/9/2020	65% MIT. PLAN
3/10/2022	65% MIT. PLAN REV. 1

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	2 OF 18



MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

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P: 703.393.4844 F: 703.393.2934
WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

ESC COMPOSTIE SHEET

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
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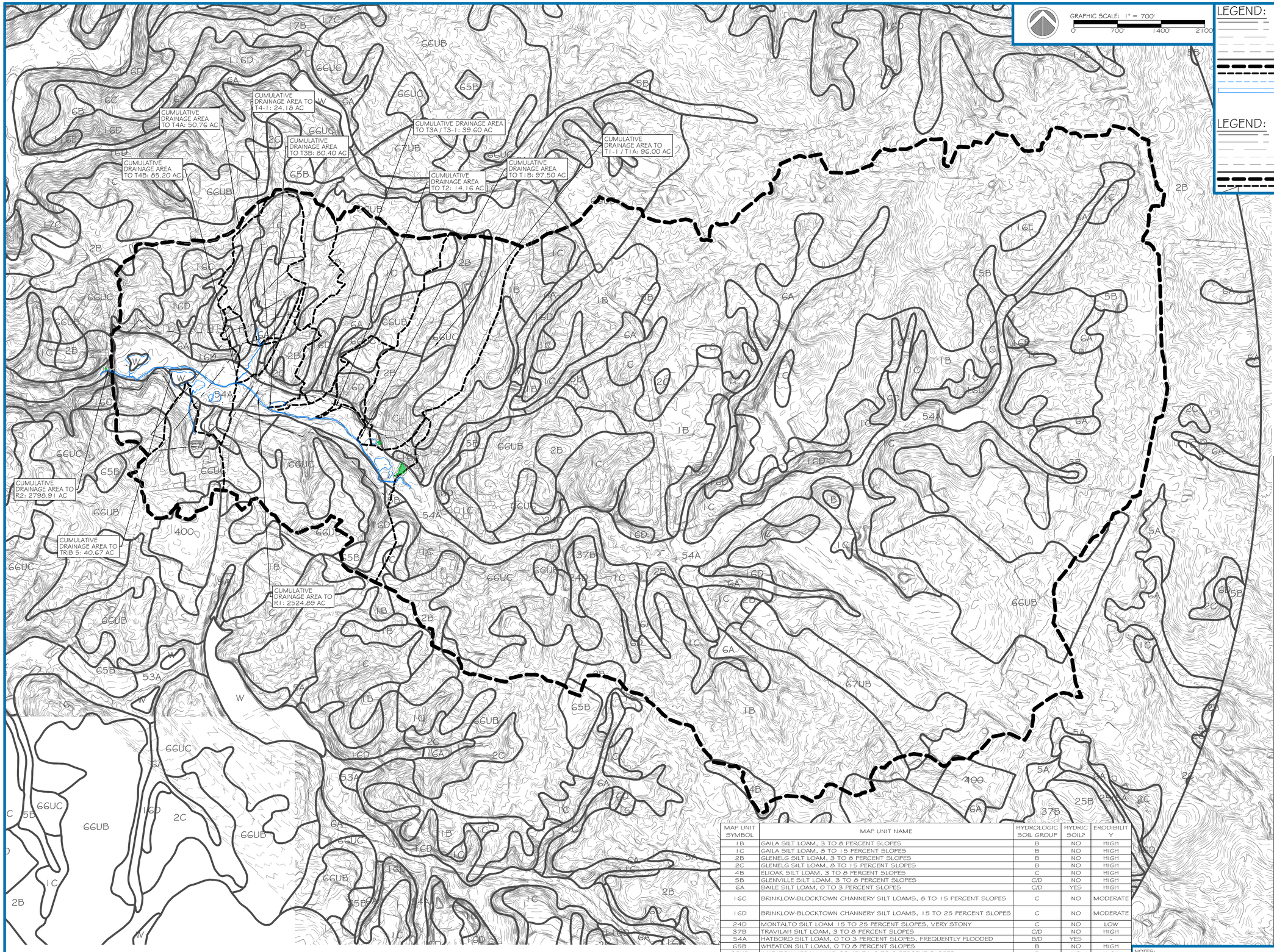
LICENSE#: 52852
EXP. DATE: 6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
1

PROJECT STATUS:
11/9/2020 65% MIT. PLAN
3/10/2022 65% MIT. PLAN REV. 1

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	3 OF 18



LEGEND:

- EX. PROPERTY LINE
- EX. PROPERTY ADJACENT
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EX. EDGE OF PAVEMENT
- EX. SOILS BOUNDARY
- EX. DRAINAGE DIVIDE
- EX. SUB DRAINAGE DIVIDE
- EX. POND
- EX. STREAM

LEGEND:

- EX. PROPERTY LINE
- EX. PROPERTY ADJACENT
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EX. EDGE OF PAVEMENT
- EX. SOILS BOUNDARY
- EX. DRAINAGE DIVIDE
- EX. SUB DRAINAGE DIVIDE

MAP UNIT SYMBOL	MAP UNIT NAME	HYDROLOGIC SOIL GROUP	HYDRIC SOIL?	ERODIBILITY
1B	GAILA SILT LOAM, 3 TO 8 PERCENT SLOPES	B	NO	HIGH
1C	GAILA SILT LOAM, 8 TO 15 PERCENT SLOPES	B	NO	HIGH
2B	GLENELG SILT LOAM, 3 TO 8 PERCENT SLOPES	B	NO	HIGH
2C	GLENELG SILT LOAM, 8 TO 15 PERCENT SLOPES	B	NO	HIGH
4B	ELIOAK SILT LOAM, 3 TO 8 PERCENT SLOPES	C	NO	HIGH
5B	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C/D	NO	HIGH
6A	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	YES	HIGH
16C	BRINKLOW-BLOCKTOWN CHANNERY SILT LOAMS, 8 TO 15 PERCENT SLOPES	C	NO	MODERATE
16D	BRINKLOW-BLOCKTOWN CHANNERY SILT LOAMS, 15 TO 25 PERCENT SLOPES	C	NO	MODERATE
24D	MONTALTO SILT LOAM 15 TO 25 PERCENT SLOPES, VERY STONY	C	NO	LOW
37B	TRAVILAH SILT LOAM, 3 TO 8 PERCENT SLOPES	C/D	NO	HIGH
54A	HATBORO SILT LOAM, 0 TO 3 PERCENT SLOPES, FREQUENTLY FLOODED	B/D	YES	-
65B	WHEATON SILT LOAM, 0 TO 8 PERCENT SLOPES	B	NO	HIGH
66UB	WHEATON-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	B	NO	HIGH
66UC	WHEATON-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES	B	NO	HIGH
67UB	URBAN LAND-WHEATON COMPLEX, 0 TO 8 PERCENT SLOPES	D	NO	-
116D	BLOCKTOWN CHANNERY SILT LOAM, 15 TO 25 PERCENT SLOPES, VERY ROCKY	D	NO	MODERATE
116E	BLOCKTOWN CHANNERY SILT LOAM, 25 TO 45 PERCENT SLOPES, VERY ROCKY	D	NO	MODERATE
400	URBAN LAND	D	NO	-

NOTES:
1. TOPOGRAPHY SHOWN IS BASED ON GIS, CONTOUR INTERVAL 5'.
2. WETLAND DELINEATION PERFORMED IN SEPTEMBER 2020 BY RES.

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

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res
HGS, LLC - A RES COMPANY
5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

DRAINAGE AREA MAP

MONTGOMERY COUNTY, MARYLAND

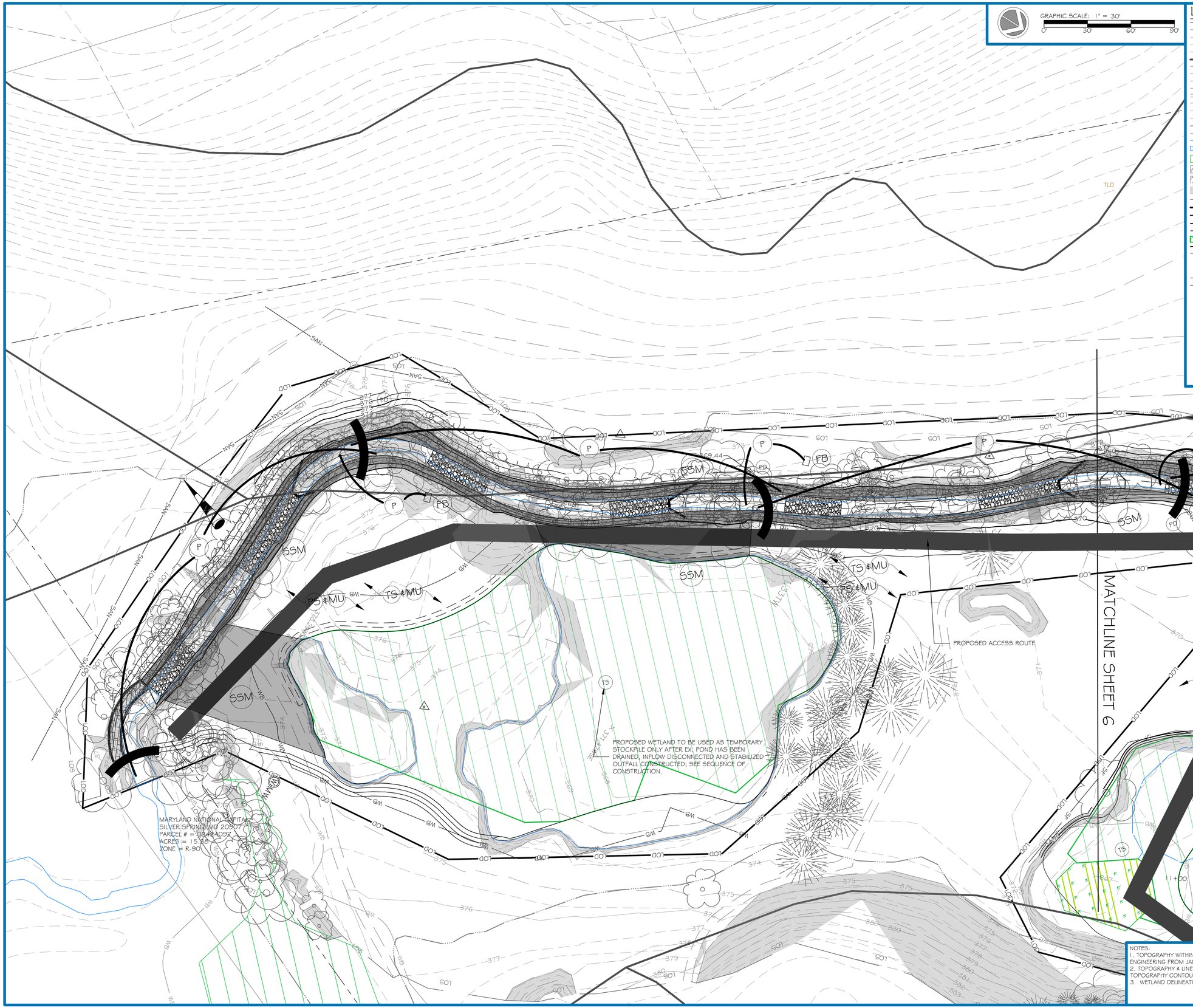
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE#:52852
EXP. DATE:6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
1

PROJECT STATUS:
11/9/2020 65% MIT. PLAN
3/10/2022 65% MIT. PLAN REV. 1

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	4 OF 18



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Approved Date

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NOTES:
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2. TOPOGRAPHY & LINEWORK OUTSIDE THE SURVEY LIMITS IS BASED ON AVAILABLE GIS DATA. GIS TOPOGRAPHY CONTOUR INTERVAL 2'.
3. WETLAND DELINEATION PERFORMED IN SEPTEMBER 2020 BY RES.

res
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WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

EROSION & SEDIMENT CONTROL PLAN

MONTGOMERY COUNTY, MARYLAND

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LICENSE#: 52852
EXP. DATE: 6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
1 X

PROJECT STATUS:
11/9/2020 65% MIT. PLAN

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	5 OF 18

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

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Reviewed Date

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WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

EROSION & SEDIMENT CONTROL PLAN

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
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EXP. DATE: 6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
1

PROJECT STATUS:
11/9/2020 65% MIT. PLAN

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	6 OF 18

GRAPHIC SCALE: 1" = 30'
0' 30' 60' 90'

LEGEND:

- EX. PROPERTY LINE
- EX. PROPERTY ADJACENT
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EX. EDGE OF PAVEMENT
- EX. SOILS BOUNDARY
- EX. ROAD CENTERLINE
- EX. EASEMENT
- OHE — EX. OVERHEAD ELECTRIC
- SAN — EX. SANITARY SEWER
- EX. STORM UTILITY
- GAS — GAS — EX. GAS
- EX. BUILDING
- EX. CURB
- EX. 100 YR WSE
- EX. STREAM THALWEG
- EX. POND
- EX. STREAM
- EX. WETLAND
- EX. RIP RAP
- EX. CONCRETE SWALE
- EX. STEEP SLOPE (> 15%)
- LOS — SURVEY LIMITS
- LOD — LIMITS OF DISTURBANCE
- PR. FLOODPLAIN GRADING LIMITS
- PR. MAJOR CONTOUR
- PR. MINOR CONTOUR
- PR. FORESTED WETLAND
- PR. BANKFULL
- PR. STREAM CENTERLINE
- PR. ROCK STRUCTURE
- PR. ROCK SILL
- TP — PR. TREE PROTECTION
- SF — PR. SILT FENCE
- SCE — PR. CONSTRUCTION ENTRANCE
- SC — PR. TEMP. STREAM CROSSING
- SSM — PR. SOIL STABILIZATION MATTING
- TS & MU — TEMPORARY SEEDING & MULCHING
- PS & MU — PERMANENT SEEDING & MULCHING
- PD — PR. PUMP-AROUND DIVERSION

MATCHLINE SHEET 6

MATCHLINE SHEET 8

USL2 MR MONT VILLAGE BUSINESS TR
19550 MONTGOMERY VILLAGE AVE
GAITHERSBURG, MD 20879
PARCEL # = 00772244
ZONE = TLD, CRN-0.55

PROPOSED ACCESS ROUTE

STAGING & LAYDOWN

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

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res
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P: 703.393.4844 F: 703.393.2934
WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

EROSION & SEDIMENT CONTROL PLAN

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
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EXP. DATE: 6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
1

PROJECT STATUS:
11/9/2020 65% MIT. PLAN

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	7 OF 18

GRAPHIC SCALE: 1" = 30'
0 30' 60' 90'

LEGEND:

- EX. PROPERTY LINE
- EX. PROPERTY ADJACENT
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EX. EDGE OF PAVEMENT
- EX. SOILS BOUNDARY
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- TS & MU — TEMPORARY SEEDING & MULCHING
- PS & MU — PERMANENT SEEDING & MULCHING
- PD — PR. PUMP-AROUND DIVERSION

PROPOSED ACCESS ROUTE

PROPOSED WETLAND TO BE USED AS TEMPORARY STOCKPILE ONLY AFTER EX. POND HAS BEEN DRAINED, INFLOW DISCONNECTED AND STABILIZED OUTFALL CONSTRUCTED; SEE SEQUENCE OF CONSTRUCTION.

MATCHLINE SHEET 7

MATCHLINE SHEET 9

STAGING & LAYDOWN

MONTGOMERY VILLAGE AVE.

STEWARTOWN RD.

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

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2. TOPOGRAPHY & LINEWORK OUTSIDE THE SURVEY LIMITS IS BASED ON AVAILABLE GIS DATA. GIS TOPOGRAPHY CONTOUR INTERVAL 2'.
3. WETLAND DELINEATION PERFORMED IN SEPTEMBER 2020 BY RES.

res
HGS, LLC - A RES COMPANY
5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

EROSION & SEDIMENT CONTROL PLAN

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE#: 52852
EXP. DATE: 6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
1

PROJECT STATUS:
11/9/2020 65% MIT. PLAN

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	8 OF 18

GRAPHIC SCALE: 1" = 30'
0' 30' 60' 90'

LEGEND:

- EX. PROPERTY LINE
- EX. PROPERTY ADJACENT
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EX. EDGE OF PAVEMENT
- EX. SOILS BOUNDARY
- EX. ROAD CENTERLINE
- EX. EASEMENT
- OHE — EX. OVERHEAD ELECTRIC
- SAN — EX. SANITARY SEWER
- EX. STORM UTILITY
- GAS — GAS — EX. GAS
- EX. BUILDING
- EX. CURB
- EX. 100 YR WSE
- EX. STREAM THALWEG
- EX. POND
- EX. STREAM
- EX. WETLAND
- EX. RIP RAP
- EX. CONCRETE SWALE
- EX. STEEP SLOPE (> 15%)
- LOS — SURVEY LIMITS
- LOD — LIMITS OF DISTURBANCE
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- PR. ROCK SILL
- TP — PR. TREE PROTECTION
- SF — PR. SILT FENCE
- SCE — PR. CONSTRUCTION ENTRANCE
- SC — PR. TEMP. STREAM CROSSING
- SSM — PR. SOIL STABILIZATION MATTING
- TS&MU — TEMPORARY SEEDING & MULCHING
- PS&MU — PERMANENT SEEDING & MULCHING
- PD — PR. PUMP-AROUND DIVERSION

MATCHLINE SHEET 8

MATCHLINE SHEET 10

MATCHLINE SHEET 12

PROPOSED ACCESS ROUTE

STAGING & LAYDOWN

CRN0.55

42490-000010

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

NOTE

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Approved Date

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EROSION & SEDIMENT CONTROL PLAN

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PROJECT: RFP-2 CABIN BRANCH
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EROSION & SEDIMENT CONTROL PLAN

MONTGOMERY COUNTY, MARYLAND

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JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	11 OF 18

MATCHLINE SHEET 13

MATCHLINE SHEET 9

MATCHLINE SHEET 14

PROPOSED ACCESS ROUTE

PROPOSED WETLAND TO BE USED AS TEMPORARY STOCKPILE ONLY AFTER EX. POND HAS BEEN DRAINED, INFLOW DISCONNECTED AND STABILIZED OUTFALL CONSTRUCTED, SEE SEQUENCE OF CONSTRUCTION.

#7414906193

#7414895284

#7414895193

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MCDPS APPROVED FOR:

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Approved Date

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res
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PROJECT: RFP-2 CABIN BRANCH
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PROPOSED ACCESS ROUTE

MATCHLINE SHEET 12

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

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PROJECT: RFP-2 CABIN BRANCH
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MATCHLINE SHEET 12

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WATKINS MILL

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DATE:	11/22/2021
SHEET NO:	14 OF 18

E&S NARRATIVE:

PROJECT DESCRIPTION:
THE PURPOSE OF THIS PROJECT IS TO CREATE A PERMITTEE RESPONSIBLE MITIGATION BANK FOR THE I-270/495 EXPANSION. THE PROJECT SITE IS LOCATED OFF OF MONTGOMERY VILLAGE AVE IN MONTGOMERY COUNTY, MARYLAND. THE CONSTRUCTION OF THIS PROJECT WILL DISTURB 33.32 ACRES.

EXISTING SITE CONDITIONS:
THE EXISTING SITE IS ON AN ABANDONED GOLF COURSE. THE PROJECT SITE IS BISECTED BY MONTGOMERY VILLAGE AVENUE AND TERMINATES AT WATKINS MILL ROAD. DUE TO THE PREVIOUS DEVELOPMENT OF THE SITE, THE SITE CONSISTS MOSTLY OF OPEN FIELDS, WITH LARGE TREES LINING THE EXISTING STREAM AND NINE GOLF COURSE PONDS IN VARIOUS CONDITIONS. THE SITE IS MOSTLY WITHIN THE FLAT VALLEY FLOODPLAIN, SURROUNDED BY STEEP VALLEY WALLS.

ADJACENT AREAS:
THE PROPERTY IS SURROUNDED BY EXISTING AND PROPOSED URBAN RESIDENTIAL AREAS.

OFFSITE AREAS:
NO OFFSITE AREAS WILL BE DISTURBED FOR THIS PROJECT.

SOILS:
REFER TO ESC PLAN SHEET FOR SOILS MAP; THE SOILS WITHIN THE LIMITS OF DISTURBANCE ARE SUMMARIZED BELOW:

MAP UNIT SYMBOL	MAP UNIT NAME	HYDROLOGIC SOIL GROUP	HYDRIC SOIL?	ERODIBILITY
1B	GAILA SILT LOAM, 3 TO 8 PERCENT SLOPES	B	NO	HIGH
1C	GAILA SILT LOAM, 8 TO 15 PERCENT SLOPES	B	NO	HIGH
2B	GLENELG SILT LOAM, 3 TO 8 PERCENT SLOPES	B	NO	HIGH
2C	GLENELG SILT LOAM, 8 TO 15 PERCENT SLOPES	B	NO	HIGH
4B	ELIOAK SILT LOAM, 3 TO 8 PERCENT SLOPES	C	NO	HIGH
5B	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C/D	NO	HIGH
6A	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	YES	HIGH
16C	BRINKLOW-BLOCKTOWN CHANNERY SILT LOAMS, 8 TO 15 PERCENT SLOPES	C	NO	MODERATE
16D	BRINKLOW-BLOCKTOWN CHANNERY SILT LOAMS, 15 TO 25 PERCENT SLOPES	C	NO	MODERATE
24D	MONTALTO SILT LOAM 15 TO 25 PERCENT SLOPES, VERY STONY	C	NO	LOW
37B	TRAVILAH SILT LOAM, 3 TO 8 PERCENT SLOPES	C/D	NO	HIGH
54A	HATBORO SILT LOAM, 0 TO 3 PERCENT SLOPES, FREQUENTLY FLOODED	B/D	YES	-
65B	WHEATON SILT LOAM, 0 TO 8 PERCENT SLOPES	B	NO	HIGH
66UB	WHEATON-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES	B	NO	HIGH
66UC	WHEATON-URBAN LAND COMPLEX, 8 TO 15 PERCENT SLOPES	B	NO	HIGH
67UB	URBAN LAND-WHEATON COMPLEX, 0 TO 8 PERCENT SLOPES	D	NO	-
116D	BLOCKTOWN CHANNERY SILT LOAM, 15 TO 25 PERCENT SLOPES, VERY ROCKY	D	NO	MODERATE
116E	BLOCKTOWN CHANNERY SILT LOAM, 25 TO 45 PERCENT SLOPES, VERY ROCKY	D	NO	MODERATE
400	URBAN LAND	D	NO	-

CRITICAL AREAS:
THERE ARE CRITICAL ENVIRONMENTAL AREAS LOCATED WITHIN THE PROJECT AREA. THESE AREAS INCLUDE STREAMS, FLOODPLAINS, PONDS, AND STEEP SLOPES (> 15%). ADDITIONALLY, THERE ARE EXISTING WETLANDS ADJACENT TO THE WORK AREA. THESE AREAS WILL EXPERIENCE SERIOUS DEGRADATION IF SEDIMENT LEAVES THE SITE AND DRAINS INTO THESE FEATURES. THEREFORE, EXTRA CARE WILL BE TAKEN TO MINIMIZE THE EXPOSURE OF THESE WATER FEATURES TO SEDIMENT AND TO PREVENT EROSION OF THE ADJACENT BANK. ADDITIONALLY, THESE AREAS SHOULD BE INSPECTED MORE FREQUENTLY FOR SIGNS OF EROSION.

EROSION & SEDIMENT CONTROL MEASURES:
UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. THE MINIMUM STANDARD OF THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL AND EROSION AND SEDIMENT CONTROL SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE. THE E&S INSPECTOR HAS THE AUTHORITY TO ADD OR DELETE E&S CONTROLS AS NECESSARY IN THE FIELD AS SITE CONDITIONS CHANGE. IN ADDITION, NO E&S CONTROLS, INCLUDING SEDIMENT BASINS OR TRAPS, CAN BE REMOVED WITHOUT WRITTEN AUTHORIZATION. ADDITIONALLY, NO EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED UNTIL ALL UPSLOPE AREAS HAVE BEEN STABILIZED.

SAFETY FENCE:
SAFETY FENCING EITHER POLYETHYLENE SECURED TO CONVENTIONAL METAL T OR U POSTS OR CHAIN LINK METAL SAFETY FENCING SHALL BE INSTALLED AS SHOWN ON THE PLANS. SIGNS NOTING POTENTIAL HAZARDS SHALL BE USED AND POSTED SUCH THAT THEY ARE EASILY VISIBLE TO ANYONE APPROACHING THE PROTECTED AREA. FENCES AND GATES SHOULD BE CHECKED REGULARLY TO ENSURE STABILITY AND LOCKS USED WHEN THE SITE IS CLOSED.

STABILIZED CONSTRUCTION ENTRANCE (B-1):
A STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED WHERE INDICATED ON THE PLANS. IT WILL BE NEEDED TO CLEAN THE TIRES OF VEHICLES AND EQUIPMENT DURING WET CONDITIONS IN ORDER TO PREVENT MUD/ROCKS/DEBRIS FROM BEING TRACKED OFF SITE OR INTO PUBLIC ROADWAYS.

SILT FENCE (E-1):
SILT FENCE SEDIMENT BARRIERS WITHOUT WIRE BACKING SHALL BE INSTALLED ON THE DOWNSLOPE SIDE OF AREAS WITH MINIMAL GRADES TO FILTER SEDIMENT-LADEN RUNOFF FROM SHEET FLOW.

CULVERT INLET PROTECTION:
CULVERT INLETS WILL NEED TO BE PROTECTED TO PREVENT SEDIMENT-LADEN RUNOFF FROM DRAINING INTO THE CULVERT DURING CONSTRUCTION. CULVERT INLET PROTECTION SHOULD BE USED AT EACH INLET UNTIL UPLAND AREAS ARE STABILIZED.

PUMP-AROUND PRACTICE (THE MARYLAND GUIDELINES TO WATERWAY CONSTRUCTION; MGWC 1.2):
A PUMP-AROUND SYSTEM SHALL BE INSTALLED TO TEMPORARILY DIVERT FLOW AROUND IN-STREAM CONSTRUCTION SITES. THIS FORM OF DIVERSION IS NECESSARY WHEN RESTORATION PRACTICES SPAN THE ENTIRE WIDTH OF THE STREAM CHANNEL AND/OR A LINEAR REACH OF STREAM SEGMENT IS TO BE SIMULTANEOUSLY WORKED ON. THIS PRACTICE ALSO LIMITS POTENTIAL FOR DOWNSTREAM SEDIMENTATION BECAUSE IN-STREAM WORK WILL BE COMPLETED IN THE DRY AND ALL DENUDED AREAS WILL BE STABILIZED BEFORE RE-INTRODUCTION OF WATER BACK INTO STREAM CHANNEL. THE TOTAL WORK AREA OF THE PUMP-AROUND SHOULD NOT EXCEED THE LENGTH OF AREA THAT CAN BE COMPLETED AND STABILIZED IN ONE (1) WORKING DAY. THE PUMP-AROUND LOCATIONS SHOWN ON THE PLAN ARE SCHEMATIC AND SHOULD BE PLACED IN THE FIELD BASED ON THE CONSTRUCTION SCHEDULE. THE COFFERDAM RESTRICTING BASEFLOW SHOULD BE REMOVED AT THE END OF EACH DAY; IF TIME TO COMPLETE WORK AREA WILL EXCEED ONE (1) DAY ALTERNATIVE PRACTICES SHOULD BE USED. THIS PRACTICE SHOULD ALSO BE LIMITED TO BASE OR LOW FLOW CONDITIONS WERE APPLICABLE TO ENSURE ADEQUACY OF PUMP EQUIPMENT. PRACTICE IS MOST APPLICABLE IN SMALL TO MEDIUM WATERSHEDS WITH RELATIVELY SMALL BASE FLOW DISCHARGES. THIS ALLOWS FOR MULTIPLE PUMPING OPTIONS AND EQUIPMENT TO SUFFICIENTLY HANDLE NECESSARY PUMP CAPACITY. USE OF PRACTICE NOT LIMITED TO WATERSHED SIZE BUT BY CAPACITY OF PUMP AND HEIGHT OF IN-STREAM BARRIERS. PUMP SELECTION SHALL BE SIZED TO ADEQUATELY PUMP BASE FLOW AT A HEAD GREATER THAN THE IN-STREAM BARRIER HEIGHT. DOWN STREAM GEOTEXTILE LINED FLOW TRANSITION POINT MAY BE USED. THIS FEATURE ALLOWS FOR DISPERSION OF PUMP DISCHARGE TO A NON-EROSIVE VELOCITY WITHIN THE EXISTING STREAM CHANNEL. ALL OTHER APPLICABLE ESC MEASURES SHALL BE USED IN CONJUNCTION WITH PUMP AROUND.

TEMPORARY ACCESS BRIDGE (H-4-1):
TEMPORARY ACCESS BRIDGE SHOULD BE INSTALLED WHEN IT IS NECESSARY FOR CONSTRUCTION TRAFFIC TO CROSS A WATERCOURSE. A STRUCTURAL CROSSING IS NECESSARY TO PREVENT VEHICLES FROM DAMAGING STREAMBANKS AND CONTINUALLY TRACKING SEDIMENT AND OTHER POLLUTANTS INTO THE FLOW REGIME. HOWEVER, THESE STRUCTURES ARE CONSIDERED CHANNEL CONSTRICTIONS AND SHOULD BE PLANNED TO BE IN SERVICE FOR THE SHORTEST PRACTICAL PERIOD OF TIME AND REMOVED AS SOON AS THEIR FUNCTION IS COMPLETED.

VEGETATIVE STABILIZATION (B-4):
ALL DISTURVED AREAS OUTSIDE OF THE STREAM AREA TO BE PERMANENTLY SEEDED UPON THE REMOVAL OF TEMPORARY STABILIZATION PRACTICES. PERMANENT SEEDING PER B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING AND IN ACCORDANCE WITH B-4-5 PERMANENT SEEDING SHALL BE UTILIZED IN UPLAND AREAS. STREAM BANKS SHALL BE STABILIZED WITH A RIPARIAN SEED MIX PER THE TABLE PROVIDED.

COIR 700 SOIL STABILIZATION BLANKETS & MATTING (B-4-6):
SOIL STABILIZATION BLANKETS/MATTING SHALL BE INSTALLED WHERE INDICATED ON THE PLANS TO AID IN CONTROLLING EROSION IN CRITICAL AREAS AS WELL AS AIDING IN THE ESTABLISHMENT OF VEGETATION FOR PERMANENT STABILIZATION ON PREVIOUSLY DISTURBED SLOPES. BLANKETS/MATTING SHALL BE INSTALLED PER SPECIFICATION B-4-6.

TREE PROTECTION:
A FENCE BARRIER IS TO BE PLACED AROUND THE TREES AND VEGETATED AREAS WHICH WILL NOT BE DISTURBED TO PROTECT THE TREES AND OTHER VEGETATION FROM CONSTRUCTION EQUIPMENT AND SOIL COMPACTION.

MANAGEMENT STRATEGIES:
1. CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
2. SEDIMENT TRAPPING / DIVERTING MEASURES WILL BE INSTALLED AS A FIRST STEP IN GRADING AND WILL BE SEEDED & MULCHED IMMEDIATELY FOLLOWING INSTALLATION.
2. TEMPORARY SEEDING OR OTHER STABILIZATION WILL FOLLOW IMMEDIATELY AFTER GRADING.
3. AREAS WHICH ARE NOT TO BE DISTURBED WILL BE CLEARLY MARKED BY FLAGS, SIGNS, ETC.
4. THE JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL PRACTICES.
5. AFTER ACHIEVING ADEQUATE STABILIZATION OF PERMANENT SEEDING, THE TEMPORARY E&S CONTROLS WILL BE CLEANED UP AND REMOVED.

PERMANENT STABILIZATION:
ALL DISTURBED AREAS ARE TO BE STABILIZED WITH PERMANENT SEEDING AND MULCHING IN ACCORDANCE WITH THE SITE SPECIFIC PLANTING PLAN AFTER LAND DISTURBING ACTIVITIES ARE COMPLETED.

MAINTENANCE:
IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL. THE SILT FENCE BARRIERS WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALF WAY TO THE TOP OF THE BARRIER. FILTERING DEVICES WILL BE INSPECTED FREQUENTLY AND REPAIRED/REPLACED ONCE THE SEDIMENT BUILD-UP PREVENTS THE STRUCTURE FROM FUNCTIONING AS DESIGNED. ALL SOIL STABILIZATION MATTING SHOULD BE INSPECTED PERIODICALLY FOLLOWING INSTALLATION, PARTICULARLY AFTER RAINSTORMS TO CHECK FOR EROSION AND UNDERMINING. ANY DISLOCATION OR FAILURE SHOULD BE REPAIRED IMMEDIATELY. IF WASHOUTS OR BREAKAGE OCCURS, REINSTALL THE MATERIAL AFTER REPAIRING THE DAMAGE TO THE SLOPE OR DITCH. SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEEDED AS NEEDED.

CONSTRUCTION SEQUENCE:
1. PRIOR TO CLEARING OF TREES, INSTALLING SEDIMENT CONTROL MEASURES, OR GRADING, A PRECONSTRUCTION MEETING MUST BE CONDUCTED ON-SITE WITH THE MONTGOMERY COUNTY SEDIMENT CONTROL INSPECTOR (48 HOURS' NOTICE REQUIRED), THE OWNER'S REPRESENTATIVE, AN MDE NON-TIDAL REPRESENTATIVE AND THE ENGINEER.
2. THE LIMITS OF DISTURBANCE MUST BE FIELD MARKED PRIOR TO CLEARING OF TREES, INSTALLATION OF SEDIMENT CONTROL MEASURES, CONSTRUCTION, OR OTHER LAND DISTURBING ACTIVITIES.
WITH APPROVAL OF THE MONTGOMERY COUNTY SEDIMENT CONTROL INSPECTOR STEPS 3-8 CAN BE PHASED ACROSS THE LIMITS OF DISTURBANCE.
3. CLEAR AND GRUB AS NECESSARY FOR THE INSTALLATION OF PERIMETER CONTROLS.
4. CONSTRUCT AND STABILIZE PERIMETER CONTROLS.
5. CLEAR, GRUB, AND GRADE FOR INSTALLATION OF SEDIMENT CONTROL DEVICES.
6. ONCE THE SEDIMENT CONTROL DEVICES ARE INSTALLED, THE PERMITTEE MUST OBTAIN WRITTEN APPROVAL FROM THE INSPECTOR BEFORE PROCEEDING WITH ANY ADDITIONAL CLEARING, GRUBBING, OR GRADING.
7. PERFORM REMAINING CLEARING/GRUBBING AS NECESSARY TO INSTALL REMAINING EROSION & SEDIMENT (E&S) MEASURES AND PERFORM CONSTRUCTION OPERATIONS.
8. STAKE OUT THE PROPOSED ALIGNMENT OF THE STREAM CHANNEL IN THE FIELD AND REVIEW WITH THE ENGINEER PRIOR TO GROUND DISTURBANCE. THE DOWNSTREAM &UPSTREAM TIE-IN TO THE EXISTING STREAM SHOULD BE REVIEWED TO DETERMINE IF MODIFICATIONS ARE REQUIRED TO ADJUST THE DESIGN TO CURRENT STREAM CONDITIONS.
9. WETLAND AND STREAM RESTORATION COORDINATION:
   a. STREAM RESTORATION AND WETLAND RESTORATION ARE EXPECTED TO HAPPEN SIMULTANEOUSLY.
   b. SOIL STOCKPILES ARE SHOWN WITHIN THE PROPOSED WETLAND FOOTPRINTS, THESE STOCKPILES CAN NOT BE UTILIZED UNTIL THE COMPLETION OF STEP 10.D FOR ANY GIVEN STOCKPILE/PROPOSED WETLAND LOCATION.
10. PERFORM WETLAND RESTORATION OPERATION:
NOTE: THE FOLLOWING SEQUENCE SHOULD BE REPEATED FOR EACH WETLAND LOCATION. ALL WETLAND CONSTRUCTION MUST BE COMPLETED "IN THE DRY."
   a. INSTALL DEWATERING PUMP AND SILT BAG TO DEWATER EXISTING POND.
   b. DISCONNECT UPSTREAM STORMWATER INFLOWS, CONNECT TO PROPOSED STREAM CHANNELS.
   c. DEWATER POND AND EXCAVATE SUMP HOLE IN WETLAND CELL ADJACENT TO STABILIZED OVERFLOW WEIR TO PLACE PUMP FOR MAINTENANCE OF DEWATERED CONDITION OF THE WETLAND CELL DURING CONSTRUCTION.
   d. RIP CLAY BOTTOM OF POND TO DEPTH NECESSARY TO RESTORE FREE GROUNDWATER MOVEMENT; WETLAND DESIGNER TO PROVIDE APPROVAL PRIOR TO FILLING WITHIN THE PROPOSED WETLAND.
   e. FILL POND BOTTOM WITH SOIL SALVAGED FROM ON SITE TO ACHIEVE SUBGRADE ELEVATIONS 6" BELOW FINAL GRADE ELEVATION IN THE WETLAND PLANTING ZONES. ALL OTHER AREAS TO BE FILLED/EXCAVATED AND GRADED TO FINAL ELEVATIONS.
   h. PROVIDE WETLAND DESIGNER WITH SURVEY OF SUB GRADE ELEVATIONS OF THE WETLAND PLANTING ZONES PRIOR TO SPREADING OF TOPSOIL AND INCORPORATION OF ORGANIC COMPOST INTO THE SOIL.
   i. CONSTRUCT AND STABILIZE PASSIVE OVERFLOW WEIRS TO ELEVATIONS SHOWN ON THE PLANS / CONNECT WITH ADJACENT STREAM RESTORATION AND GRADING.
   j. UPON APPROVAL OF SUB GRADES BY WETLAND DESIGNER, PLACE 6" OF CLASS A TOPSOIL ACROSS THE WETLAND PLANTING ZONES TO ACHIEVE FINAL GRADE. ONLY LOW-GROUND PRESSURE EQUIPMENT TO BE USED TO SPREAD TOPSOIL.
   k. SPREAD ORGANIC COMPOST ON SURFACE OF WETLAND PLANTING ZONES AT A QUANTITY OF 60 CY PER ACRE, AND INCORPORATE INTO THE SOIL TO A MINIMUM DEPTH OF 8" BY DISKING OR RIPPING, USING ONLY LOW GROUND PRESSURE EQUIPMENT.
   l. PLACE LARGE WOODY DEBRIS IN THE WETLAND CELL AS SHOWN IN THE DESIGN PLANS.
   m. IF CONSTRUCTION IS COMPLETED OUTSIDE OF THE RECOMMENDED PLANTING SEASON, ALL AREAS OF DISTURBED SOIL ARE TO BE SEEDED WITH TEMPORARY SEED MIXES SPECIFIED IN THE PLANTING PLANS. NO SEEDING OF THE PERMANENT WETLAND SEED MIX OR PLANTING OF THE WETLAND PLANTS SHALL BE CONDUCTED UNTIL THE APPROPRIATE SEASON, AS APPROVED BY THE WETLAND DESIGNER.
   n. WETLAND PLANTING AND PERMANENT SEEDING NOTES AND DETAILS ARE INCLUDED IN THE DESIGN PLANS.
11. PERFORM STREAM RESTORATION OPERATION:
NOTE: THE FOLLOWING SEQUENCE SHOULD BE REPEATED DAILY ALONG A SECTION OF STREAM THAT CAN BE COMPLETED WITHIN ONE DAY. ALL STREAM CONSTRUCTION MUST BE COMPLETED "IN THE DRY," WHEN POSSIBLE NEW SEGMENTS OF CHANNEL SHALL BE CONSTRUCTED OFF-LINE AND STREAM FLOW WILL BE MAINTAINED IN THE ORIGINAL STREAM CHANNEL WHILE THE PROPOSED CHANNEL IS BEING CONSTRUCTED. THE PROPOSED STREAM CHANNEL MUST BE GRADED, SEEDED AND MATTED TO CONTROL EROSION PRIOR TO INTRODUCTION OF FLOW INTO THE PROPOSED CHANNEL. THE CONSTRUCTION OF THE PROPOSED CHANNEL SHALL GENERALLY FOLLOW THE SEQUENCE BELOW:
   a. SETUP PUMP-AROUND DIVERSION: INSTALL PUMP AROUND DIVERSION FOR THE SECTION OF STREAM UNDER ACTIVE CONSTRUCTION. DIVERTING ONLY THE NECESSARY PORTION OF THE STREAM AS NEEDED TO EXPOSE THE CONSTRUCTION AREA. THE PUMP INTAKE MUST BE FLOATED ABOVE THE STREAM BOTTOM AT ALL TIMES, THE OUTFALL OF THE PIPE MUST BE STABILIZED AND ALL SEDIMENT LADEN WATER SHALL BE PUMPED THROUGH AN APPROVED FILTERING DEVICE. WORK SHALL BE PLANNED SUCH THAT PUMP-AROUNDS ARE SET UP BEFORE WORK EACH DAY AND TAKEN OUT AFTER ALL WORK HAS BEEN COMPLETED FOR THAT DAY, SO THAT FLOW MAY RETURN TO A STABILIZED CHANNEL.
   b. SALVAGE TOPSOIL: STRIP TOPSOIL FROM AREA TO BE GRADED AND STOCKPILE FOR REUSE ACROSS THE DISTURBED STREAM BANKS & RIPARIAN AREAS.
   c. CHANNEL EXCAVATION: EXCAVATE THE CHANNEL PER THE PLANS. DURING EXCAVATION OF THE CHANNEL ANY ACCUMULATION OF GROUND WATER SHALL BE PUMPED OUT OF THE CHANNEL THROUGH AN APPROVED FILTERING DEVICE ONTO A STABILIZED AREA ENSURING NO EROSION OCCURS AROUND THE OUTFALL OF THE FILTERING DEVICE.
   d. INSTALLATION OF STRUCTURES (LOG OR ROCK): USING LOGS (SALVAGED FROM SITE CLEARING IF AVAILABLE) OR ROCKS INSTALL THE STRUCTURES PER THE PLANS, ENSURING THAT THE TOP OF THE LOG/HEADER ROCK EXPOSED IN THE CHANNEL IS EVEN WITH THE INVERT OF THE STREAM CHANNEL.
   e. BANK STABILIZATION: INSTALL TOPSOIL, SEEDING & COIR MATTING ON THE STREAM BANKS, AS SHOWN IN THE PLANTING/STREAM DETAILS SECURING THE MATTING AS SHOWN.
   f. CHANNEL STABILIZATION: STABILIZE THE STREAM BED WITH STONE AS INDICATED IN THE PLANS, ENSURING THAT THE SURFACE OF THE STONE MATCHES THE PROFILE ELEVATION.
   g. DOWNSTREAM TIE-IN: COMPLETE THE GRADING OF THE CHANNEL ON THE DOWNSTREAM END, ENSURING A GRADUAL TRANSITION INTO THE DIMENSIONS OF THE EXISTING STREAM CHANNEL. INSTALL TOPSOIL, SEEDING, COIR MATTING & BED MATERIAL TO STABILIZE CHANNEL TIE-IN.
   h. UPSTREAM TIE-INS: AFTER THE COMPLETION ALL OTHER DOWNSTREAM GRADING, GRADE THE STREAM CHANNEL UPSTREAM TO THE EXISTING STREAM CHANNEL (OR PREVIOUSLY COMPLETED SECTION), ENSURING A GRADUAL TRANSITION FROM THE DIMENSIONS OF THE EXISTING STREAM CHANNEL TO THE PROPOSED CHANNEL. INSTALL TOPSOIL, SEEDING, COIR MATTING & BED MATERIAL TO STABILIZE CHANNEL TIE-IN.
   i. RETURNING FLOW TO CHANNEL: AFTER THE ENTIRE STREAM CHANNEL (OR SECTION) HAS BEEN CONSTRUCTED AND STABILIZED, AND ALL TIE-INS COMPLETED, OPEN THE PROPOSED CHANNEL TO STREAM FLOW REMOVING COFFERDAMS AND STREAM DIVERSION PUMPS.
   j. TOPSOILING AND SEEDING FLOODPLAIN: APPLY SALVAGED TOPSOIL, SPREAD SEEDING AS SPECIFIED ON THE PLANTING PLAN, AND INSTALL MATTING WHERE SHOWN TO THE DISTURBED RIPARIAN & UPLAND AREA.
   k. PLANTING: IN THE APPROVED PLANTING SEASON, INSTALL ADDITIONAL TREE/SHRUB PLANTINGS AS INCLUDED IN THE PLANTING PLAN.
12. INSPECT AND PERFORM MAINTENANCE (AS REQUIRED) OF E&S CONTROLS ON A WEEKLY BASIS AND THE NEXT DAY AFTER EACH RAIN EVENT.
13. OBTAIN WRITTEN APPROVAL OF MONTGOMERY COUNTY SEDIMENT CONTROL INSPECTOR TO REMOVE E&S CONTROLS.
14. INSTALL PERMANENT SEEDING AND MULCH IN DISTURBED AREAS NOT ALREADY STABILIZED.
15. DAILY INSPECTION AND MAINTENANCE OF PERMANENT SEEDING AND MULCHING IS REQUIRED UNTIL PERMANENT SEEDING IS ESTABLISHED, AND A GOOD STAND IS MAINTAINED.

*CONCURRENT WORK IN DIFFERING AREAS MAY TAKE PLACE AS LONG AS THE CONSTRUCTION SEQUENCE IS FOLLOWED PROPERLY FOR ALL WORK SITES AND THE NECESSARY PERMITS ARE OBTAINED AND ABIDED BY.

**ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

MAINTENANCE:
IN GENERAL, ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL. THE SILT FENCE BARRIERS WILL BE CHECKED REGULARLY FOR UNDERMINING OR DETERIORATION OF THE FABRIC. SEDIMENT SHALL BE REMOVED WHEN THE LEVEL OF SEDIMENT DEPOSITION REACHES HALF WAY TO THE TOP OF THE BARRIER. FILTERING DEVICES WILL BE INSPECTED FREQUENTLY AND REPAIRED/REPLACED ONCE THE SEDIMENT BUILD-UP PREVENTS THE STRUCTURE FROM FUNCTIONING AS DESIGNED. ALL SOIL STABILIZATION MATTING SHOULD BE INSPECTED PERIODICALLY FOLLOWING INSTALLATION, PARTICULARLY AFTER RAINSTORMS TO CHECK FOR EROSION AND UNDERMINING. ANY DISLOCATION OR FAILURE SHOULD BE REPAIRED IMMEDIATELY. IF WASHOUTS OR BREAKAGE OCCURS, REINSTALL THE MATERIAL AFTER REPAIRING THE DAMAGE TO THE SLOPE OR DITCH. SEEDED AREAS WILL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED AND RESEEDED AS NEEDED.

DISTURBED SURFACE AREA: 33.32 AC
VEGETATIVELY STABILIZED AREA: 33.32 AC
VOLUME OF SPOIL MATERIAL: 12,672.28 CY
VOLUME OF CUT: 21,454.29 CY
VOLUME OF BORROW MATERIAL: 0 CY
VOLUME OF FILL: 34,126.57 CY

SEDIMENT CONTROL/STORMWATER MANAGEMENT CERTIFICATIONS

CERTIFICATIONS ON THIS SHEET MUST BE ON EVERY SEDIMENT CONTROL/STORMWATER MANAGEMENT PLAN.

OWNER'S/DEVELOPER'S CERTIFICATION

I/We hereby certify that all clearing, grading, construction, and or development will be done pursuant to this plan and that any responsible personnel involved in the construction project will have a Certificate of Attendance at a Department of Natural Resources approved training program for the control of sediment and erosion before beginning the project.

Signature ____________ Date ____________

Printed Name and Title ____________

DESIGN CERTIFICATION

I hereby certify that this plan has been prepared in accordance with the "2011 Maryland Standards and Specification for Soil Erosion and Sediment Control," Montgomery County Department of Permitting Services Executive Regulations 5-90, 7-02AM and 36-90, and Montgomery County Department of Public Works and Transportation "Storm Drain Design Criteria" dated August 1988.

Design Engineer Signature ____________ Date ____________

Printed Name ____________ Registration Number ____________

CERTIFICATION OF THE QUANTITIES

I hereby certify that the estimated total amount of excavation and fill as shown on these plans has been computed to __________ cubic yards of excavation, ______________ cubic yards of fill and the total area to be disturbed as shown on these plans has been determined to be _______________square feet.

Signature ____________ Date ____________

Printed Name and Title ____________ Registration Number ____________

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
3. DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIALS FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6. RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7. ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES:
ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOLA SP.) AND/OR ~~RYE (SECALE CEREALE)~~. THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9. TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:
   A. USE I WATERS (WITHOUT YELLOW PERCH): IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE DURING ANY YEAR.
   B. USE I WATERS (WITH YELLOW PERCH): IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD FEBRUARY 15 THROUGH JUNE 15, INCLUSIVE DURING ANY YEAR.
   C. USE III WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD OCTOBER 1 THORUGH APRIL 30, INCLUSIVE, DURING ANY YEAR.
   D. USE IV WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH MAY 31, INCLUSIVE, DURING ANY YEAR.
10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11. CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed ____ Date ____

Approved ____ Date ____

SM FILE #

Sediment Control Technical Requirements:

Reviewed ____ Date ____

Approved ____ Date ____

Administrative Requirements:

Reviewed ____ Date ____

SEDIMENT CONTROL PERMIT #

NOTE

MCDPS APPROVAL OF THIS PLAN WILL EXPIRE TWO YEARS FROM THE DATE OF APPROVAL, IF THE PROJECT HAS NOT STARTED.

THIS APPROVAL DOES NOT NEGATE THE NEED FOR A MCDPS ACCESS PERMIT.

DPS approval of a sediment control or stormwater management plan is for demonstrated compliance with minimum environmental runoff treatment standards and does not create or imply any right to divert or concentrate runoff onto any adjacent property without that property owner's permission. It does not relieve the design engineer or other responsible person of professional liability or ethical responsibility for the adequacy of the drainage design as it affects uphill or downhill properties.

HGS, LLC - A RES COMPANY
5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

NOTES

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE#:52852
EXP. DATE:6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
X

PROJECT STATUS:
11/9/2020 65% MIT. PLAN
3/10/2022 65% MIT. PLAN REV. 1

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	15 OF 18

MGWC 1.2: PUMP-AROUND PRACTICE

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

The work should consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction sites.

IMPLEMENTATION SEQUENCE

Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

1. Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.

2. The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.

3. The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.

4. Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.

5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.

6. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.

MGWC 1.2: PUMP-AROUND PRACTICE

7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.

8. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (*See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction*).

9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross- sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.

10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.

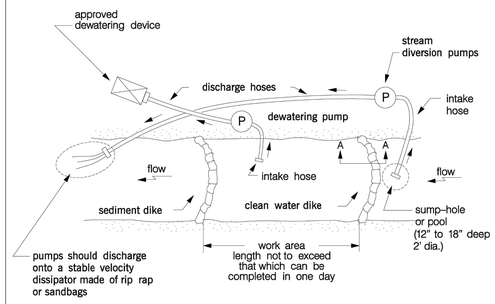
11. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.

12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.

13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.

14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

Maryland's Guidelines To Waterway Construction
DETAIL 1.2: PUMP–AROUND PRACTICE



TEMPORARY INSTREAM CONSTRUCTION MEASURES	*REVISED NOVEMBER 2000* *PAGE 1.2 - 3*	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

B-3 STANDARDS AND SPECIFICATIONS

FOR

LAND GRADING

Definition

Reshaping the existing land surface to provide suitable topography for building facilities and other site improvements.

Purpose

To provide erosion control and vegetative establishment for extreme changes in grade.

Conditions Where Practice Applies

Earth disturbances or extreme grade modifications on steep or long slopes.

Design Criteria

The grading plan should be based on the incorporation of building designs and street layouts that fit and utilize existing topography and desirable natural surroundings to avoid extreme grade modifications. Information submitted must provide sufficient topographic surveys and soil investigations to determine limitations that must be imposed on the grading operation related to slope stability, adjacent properties, drainage patterns, measures for water removal, and vegetative treatment, etc.

Many jurisdictions have regulations and design procedures already established for land grading that must be followed. The plan must show existing and proposed contours for the area(s) to be graded including practices for erosion control, slope stabilization, and safe conveyance of runoff (e.g., waterways, lined channels, reverse benches, grade stabilization structures). The grading/construction plans are to include the phasing of these practices and consideration of the following:

1. Provisions to safely convey surface runoff to storm drains, protected outlets or stable water courses to ensure that surface runoff will not damage slopes or other graded areas.

2. Cut and fill slopes, stabilized with grasses, no steeper than 2:1. (Where the slope is to be mowed, the slope should be no steeper than 3:1, but 4:1 is preferred because of safety factors related to mowing steep slopes.) Slopes steeper than 2:1 require special design and stabilization considerations to be shown on the plans.

3. Benching per Detail B-3-1 whenever the vertical interval (height) of any 2:1 slope exceeds 20 feet; for 3:1 slopes, when it exceeds 30 feet; and for 4:1 slopes, when it exceeds 40 feet. Locate benches to divide the slope face as equally as possible and to convey the water to a stable outlet. Soils, seeps, rock outcrops, etc. are to be taken into consideration when designing benches.

   a. Provide benches with a minimum width of six feet for ease of maintenance.

   b. Design benches with a reverse slope of 6:1 or flatter to the toe of the upper slope and with a minimum of one foot in depth. Grade the longitudinal slope of the bench between 2 percent and 3 percent, unless accompanied by appropriate design and computations.

   c. The maximum allowable flow length within a bench is 800 feet unless accompanied by appropriate design and computations.

4. Diversion of surface water from the face of all cut and fill slopes using earth dikes or swales. Convey surface water down slope using a designed structure, and:

   a. Protect the face of all graded slopes from surface runoff until they are stabilized.

   b. Do not subject the slope's face to any concentrated flow of surface water such as from natural drainage ways, graded swales, downspouts, etc.

   c. Protect the face of the slope by special erosion control materials to include, but not be limited to, approved vegetative stabilization practices, riprap or other approved stabilization methods.

5. Serrated slope as shown in Detail B-3-2. The steepest allowable slope for ripable rock is 1.5:1. For non rock surfaces, the slopes are to be 2:1 or flatter. These steps will weather and act to hold moisture, lime, fertilizer and seed thus producing a much quicker and longer lived vegetative cover and better slope stabilization.

6. Subsurface drainage provisions. Provide subsurface drainage where necessary to intercept seepage that would otherwise adversely affect slope stability or create excessively wet site conditions.

7. Proximity to adjacent property. Slopes must not be created close to property lines without adequate protection against sedimentation, erosion, slippage, settlement, subsidence, or other related damages.

8. Quality of fill material. Fill material must be free of brush, rubbish, logs, stumps, building debris, and other objectionable material. Do not place frozen materials in the fill nor place the fill material on a frozen foundation.

9. Stabilization. Stabilize all disturbed areas structurally or vegetatively in compliance with Section B-4 Standards and Specifications for Stabilization Practices.

Maintenance

The line, grade, and cross section of benching and serrated slopes must be maintained. Benches and serrated slopes must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization.

B-4 STANDARDS AND SPECIFICATIONS

FOR

VEGETATIVE STABILIZATION

Definition

Using vegetation as cover to protect exposed soil from erosion.

Purpose

To promote the establishment of vegetation on exposed soil.

Conditions Where Practice Applies

On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

Effects on Water Quality and Quantity

Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.

Adequate Vegetative Establishment

Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

1. Adequate vegetative stabilization requires 95 percent groundcover.

2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.

3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.

4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

NOTE

MCDPS APPROVAL OF THIS PLAN WILL EXPIRE TWO YEARS FROM THE DATE OF APPROVAL, IF THE PROJECT HAS NOT STARTED.

THIS APPROVAL DOES NOT NEGATE THE NEED FOR A MCDPS ACCESS PERMIT.

DPS approval of a sediment control or stormwater management plan is for demonstrated compliance with minimum environmental runoff treatment standards and does not create or imply any right to divert or concentrate runoff onto any adjacent property without that property owner's permission. It does not relieve the design engineer or other responsible person of professional liability or ethical responsibility for the adequacy of the drainage design as it affects uphill or downhill properties.

res
HGS, LLC - A RES COMPANY
5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934
WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

ESC DETAILS

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE#: 52852
EXP. DATE: 6/14/2022

NOT FOR CONSTRUCTION

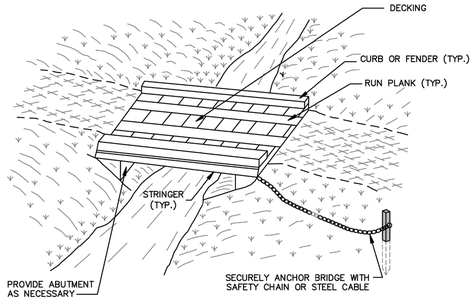
REVISIONS:
1

PROJECT STATUS:
11/9/2020 65% MIT. PLAN
3/10/2022 65% MIT. PLAN REV. 1

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	16 OF 18

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB



LOCATION PLAN

NOTE:
TIME OF YEAR RESTRICTIONS DO NOT APPLY TO THE CONSTRUCTION OR REMOVAL OF A TEMPORARY ACESS BRIDGE UNLESS THERE IS DISTURBANCE TO THE STREAM CHANNEL.

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TEMPORARY BRIDGE STRUCTURE AT OR ABOVE THE BANK ELEVATION TO PREVENT IMPACTS FROM FLOATING MATERIALS AND DEBRIS.
2. PLACE ABUTMENTS PARALLEL TO, AND ON, STABLE BANKS.
3. CONSTRUCT BRIDGE TO SPAN ENTIRE CHANNEL UNLESS OTHERWISE INDICATED ON APPROVED PLAN.
4. USE STRINGERS CONSISTING OF LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
5. SELECT DECKING MATERIALS TO PROVIDE SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. PLACE ALL DECKING MEMBERS PERPENDICULAR TO THE STRINGERS, BUTT TIGHTLY, AND SECURELY FASTEN. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY BELOW.
6. SECURELY FASTEN OPTIONAL RUN PLANKING FOR THE LENGTH OF THE SPAN. PROVIDE A RUN PLANK FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
7. INSTALL CURBS THE ENTIRE LENGTH OF THE OUTER SIDES OF THE DECK TO PREVENT SEDIMENT FROM ENTERING THE STREAM CHANNEL.
8. ANCHOR BRIDGE SECURELY AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL POSTS. ANCHOR MUST BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
9. AREAS DISTURBED DURING BRIDGE INSTALLATION AND\OR REMOVAL MUST NOT BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
10. STABILIZE APPROACH TO BRIDGE AND KEEP FREE OF EROSION. CLEAN SEDIMENT FROM DECKING AND CURBS DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. ENSURE THAT DECKING AND CURBS REMAIN TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY BRIDGE. MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
11. AFTER THE TEMPORARY CROSSING IS NO LONGER NEEDED, REMOVE IT WITHIN 14 CALENDAR DAYS. IF SUBJECT TO THE USE DESIGNATION CLOSURE, REMOVE AT THE END OF CLOSURE PERIOD. PROTECT STREAM BANKS DURING BRIDGE REMOVAL AND STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MATTING. ACCOMPLISH REMOVAL OF THE BRIDGE AND CLEAN UP OF THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL. STORE ALL REMOVED MATERIALS IN AN APPROVED STAGING AREA.

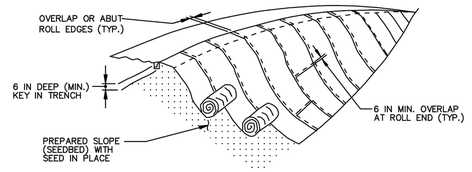
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-4-6-B TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION

STANDARD SYMBOL: TSSMS – * lb/ft² (* INCLUDE SHEAR STRESS)



ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "I" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "I" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
5. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
7. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

B-4-8 STANDARDS AND SPECIFICATIONS

FOR

STOCKPILE AREA

Definition

A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose

To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria

1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

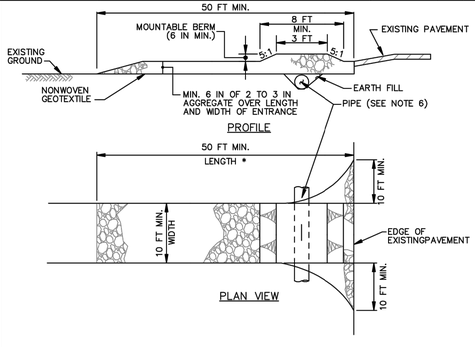
Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

B.43

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

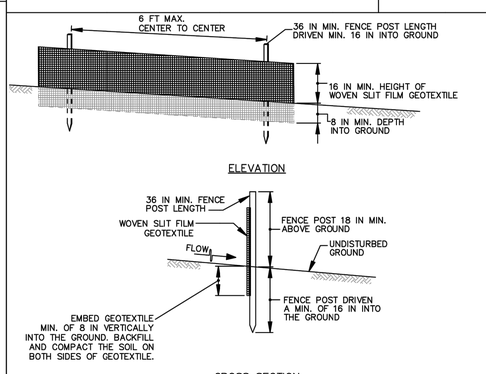
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF



JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅜ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

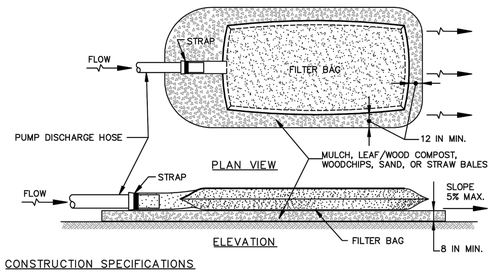
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: ☒FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D-4491
PERMITTIVITY (SEC⁻¹)	1.2 SEC⁻¹	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15–0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

NOTE

MCDPS APPROVAL OF THIS PLAN WILL EXPIRE TWO YEARS FROM THE DATE OF APPROVAL, IF THE PROJECT HAS NOT STARTED.

THIS APPROVAL DOES NOT NEGATE THE NEED FOR A MCDPS ACCESS PERMIT.

DPS approval of a sediment control or stormwater management plan is for demonstrated compliance with minimum environmental runoff treatment standards and does not create or imply any right to divert or concentrate runoff onto any adjacent property without that property owner's permission. It does not relieve the design engineer or other responsible person of professional liability or ethical responsibility for the adequacy of the drainage design as it affects uphill or downhill properties.

res
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5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4644 F: 703.393.2934
WWW.RES.US

PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

ESC DETAILS

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE#: 52852
EXP. DATE: 6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
1 X

PROJECT STATUS:
11/9/2020 65% MIT. PLAN
3/10/2022 65% MIT. PLAN REV. 1

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	17 OF 18

Table H.3: Compost

Parameters[1]	Acceptable Range
pH	5.0 - 8.5
Moisture content	30% - 60%, wet weight basis
Organic matter content	25% - 65%, dry weight basis
Particle size	% passing a selected mesh size, dry weight basis 3 in (75 mm), 100% passing 1 in (25 mm), 90 – 100% passing 0.75 in (19 mm), 70 – 100% passing 0.25 in (6.4 mm), 30 – 60% passing 0.04 in (1 mm), 30% min. passing
Physical contaminants (manmade inerts)	<1% dry weight basis

Adapted from AASHTO Standards Specs for Compost Filter Socks and EPA Example Compost Filter Parameters.

[1] Recommended test methodologies are provided in Test Methods for the Examination of Composting and Compost (TMEC, The U.S Composting Council).

Table H.2: Stone Size

TYPE	SIZE RANGE	d_{50}	d_{100}	AASHTO	MIDSIZE WEIGHT[3]
NUMBER 57[1]	3/8 to 1 ½ inch	½ in	1 ½ in	M-43	N/A
NUMBER 1	2 to 3 inch	2 ½ in	3 in	M-43	N/A
RIPRAP[2] (CLASS 0)	4 to 7 inch	5 ½ in	7 in	N/A	N/A
CLASS I	N/A	9 ½ in	15 in	N/A	40 lb
CLASS II	N/A	16 in	24 in	N/A	200 lb
CLASS III	N/A	23 in	34 in	N/A	600 lb

[1] This classification is to be used on the upstream face of stone outlets and check dams.

[2] This classification is to be used for gabions.

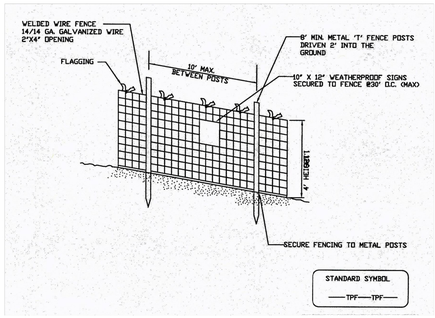
[3] Optimum gradation is 50 percent of the stone being above and 50 percent below the midsize.

Stone must be composed of a well graded mixture of stone sized so that fifty (50) percent of the pieces by weight are larger than the size determined by using the charts. A well graded mixture, as used herein, is defined as a mixture composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone in such a mixture must not exceed the respective d_{100} selected from Table H.2. The d_{50} refers to the median diameter of the stone. This is the size for which 50 percent, by weight, will be smaller and 50 percent will be larger.

Note: Recycled concrete equivalent may be substituted for all stone classifications for temporary control measures only. Concrete broken into the sizes meeting the appropriate classification, containing no steel reinforcement, and having a minimum density of 150 pounds per cubic foot may be used as an equivalent.

Tree Protection Fence Detail

Not to scale



NOTES

1. Practice may be combined with sediment control fencing.
2. Location and limits of fencing should be coordinated in field with arborist.
3. Boundaries of protection area should be staked prior to installing protective device.
4. Root damage should be avoided.
5. Protection signage is required.
6. Fencing shall be maintained throughout construction.

H-1 STANDARDS AND SPECIFICATIONS

FOR

MATERIALS

Table H.1: Geotextile Fabrics

		WOVEN SLIT FILM GEOTEXTILE		WOVEN MONOFILAMENT GEOTEXTILE		NONWOVEN GEOTEXTILE	
		MINIMUM AVERAGE ROLL VALUE[1]					
PROPERTY	TEST METHOD	MD	CD	MD	CD	MD	CD
Grab Tensile Strength	ASTM D-4632	200 lb	200 lb	370 lb	250 lb	200 lb	200 lb
Grab Tensile Elongation	ASTM D-4632	15%	10%	15%	15%	50%	50%
Trapezoidal Tear Strength	ASTM D-4533	75 lb	75 lb	100 lb	60 lb	80 lb	80 lb
Puncture Strength	ASTM D-6241	450 lb		900 lb		450 lb	
Apparent Opening Size[2]	ASTM D-4751	U.S. Sieve 30 (0.59 mm)		U.S. Sieve 70 (0.21 mm)		U.S. Sieve 70 (0.21 mm)	
Permittivity	ASTM D-4491	0.05 sec^{-1}		0.28 sec^{-1}		1.1 sec^{-1}	
Ultraviolet Resistance Retained at 500 hours	ASTM D-4355	70% strength		70% strength		70% strength	

[1] All numeric values except apparent opening size (AOS) represent minimum average roll values (MARV). MARV is calculated as the typical minus two standard deviations. MD is machine direction; CD is cross direction.

[2] Values for AOS represent the average maximum opening.

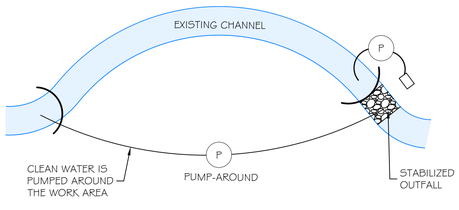
Geotextiles must be evaluated by the National Transportation Product Evaluation Program (NTPEP) and conform to the values in Table H.1.

The geotextile must be inert to commonly encountered chemicals and hydrocarbons and must be rot and mildew resistant. The geotextile must be manufactured from fibers consisting of long chain synthetic polymers and composed of a minimum of 95 percent by weight of polyolefins or polyesters, and formed into a stable network so the filaments or yarns retain their dimensional stability relative to each other, including selvages.

When more than one section of geotextile is necessary, overlap the sections by at least one foot. The geotextile must be pulled taut over the applied surface. Equipment must not run over exposed fabric. When placing riprap on geotextile, do not exceed a one foot drop height.

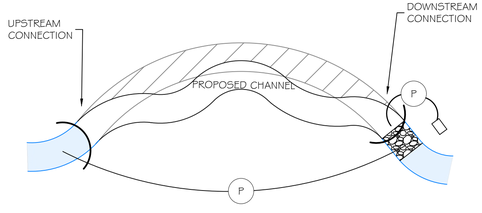
ON-LINE CONSTRUCTION

STEP 1 - SET UP



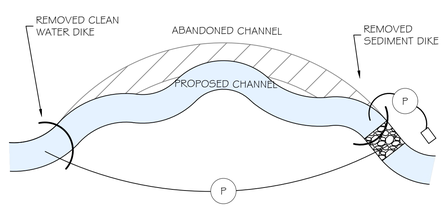
- INSTALL CLEAN WATER DIKE & PUMP-AROUND SPANNING CONNECTION POINTS
- INSTALL DOWNSTREAM SEDIMENT DIKE ABOVE CLEAN WATER DISCHARGE
- INSTALL DEWATERING DEVICE TO FILTERING DEVICE

STEP 2- CONSTRUCT CHANNEL



- CONSTRUCT SECTION OF PROPOSED CHANNEL WITHIN WORK AREA ENSURING A TRANSITION BACK TO THE EXISTING CHANNEL DOWNSTREAM
- FILL ABANDONED CHANNEL
- STABILIZE THE PROPOSED CHANNEL AND TRANSITION WITH COIR MATTING, RIFFLE MIX, ETC PER PLAN

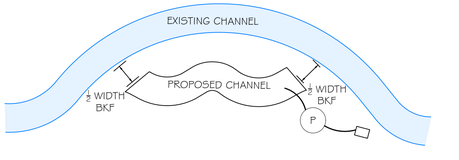
STEP 3- INTRODUCE FLOW



- REMOVE DOWNSTREAM DIKE, UPSTREAM DIKE AND PUMP-AROUND, INTRODUCING FLOW TO THE NEW CHANNEL
- PERFORM ANY REMAINING FLOODPLAIN GRADING OUTSIDE THE STREAM CHANNEL

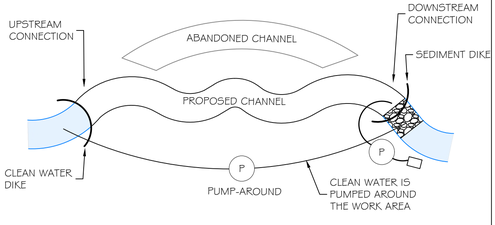
OFF-LINE CONSTRUCTION

STEP 1 - CONSTRUCT CHANNEL



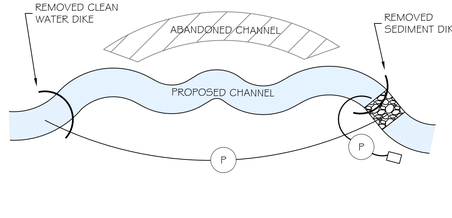
- EXCAVATE PROPOSED CHANNEL SEGMENT OFF-LINE STOPPING AT LEAST ½ BANKFULL WIDTH FROM EX. CHANNEL
- ANY GROUNDWATER IN PROPOSED CHANNEL SHOULD BE PUMPED OUT THROUGH A FILTERING DEVICE

STEP 2- CONNECT CHANNEL



- INSTALL CLEAN WATER DIKE & PUMP-AROUND SPANNING CONNECTION POINTS
- INSTALL DOWNSTREAM SEDIMENT DIKE ABOVE CLEAN WATER DISCHARGE
- CONSTRUCT & STABILIZE DOWNSTREAM AND UPSTREAM CONNECTIONS

STEP 3- INTRODUCE FLOW



- REMOVE DOWNSTREAM DIKE, UPSTREAM DIKE AND PUMP-AROUND, INTRODUCING FLOW TO THE NEW CHANNEL.
- GRADE THE FLOODPLAIN AND FILL THE ABANDONED CHANNEL PER THE PLANS.

1 ONLINE/OFFLINE CONSTRUCTION
NOT TO SCALE

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date

Approved Date

SM FILE #

Sediment Control Technical Requirements:

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

NOTE

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res
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PROJECT: RFP-2 CABIN BRANCH
CLIENT: MARYLAND STATE HIGHWAY ADMINISTRATION

ESC DETAILS

MONTGOMERY COUNTY, MARYLAND

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE#: 52852
EXP. DATE: 6/14/2022

NOT FOR CONSTRUCTION

REVISIONS:
1

PROJECT STATUS:
11/9/2020 65% MIT. PLAN
3/10/2022 65% MIT. PLAN REV. 1

PROJECT MANAGER:	RC
DESIGNED:	KH
DRAWN:	KH
JOB NUMBER:	102054
DESIGN TYPE:	STREAM
DATE:	11/22/2021
SHEET NO:	18 OF 18

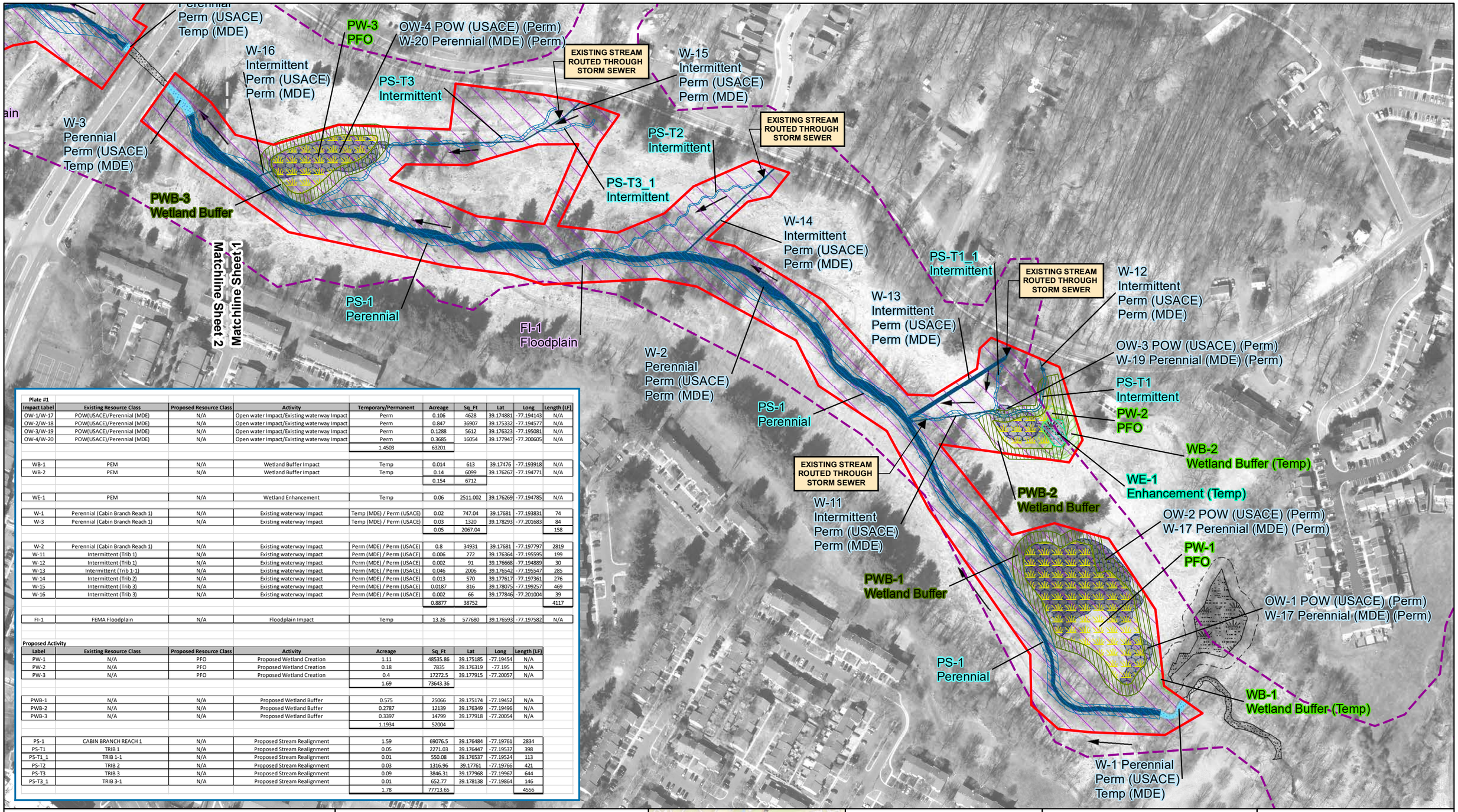


Plate #1

Impact Label	Existing Resource Class	Proposed Resource Class	Activity	Temporary/Permanent	Acreage	Sq_Ft	Lat	Long	Length (LF)
OW-1/W-17	POW(USACE)/Perennial (MDE)	N/A	Open water Impact/Existing waterway Impact	Perm	0.106	4628	39.174881	-77.194143	N/A
OW-2/W-18	POW(USACE)/Perennial (MDE)	N/A	Open water Impact/Existing waterway Impact	Perm	0.847	36907	39.175332	-77.194577	N/A
OW-3/W-19	POW(USACE)/Perennial (MDE)	N/A	Open water Impact/Existing waterway Impact	Perm	0.1288	5612	39.176323	-77.195081	N/A
OW-4/W-20	POW(USACE)/Perennial (MDE)	N/A	Open water Impact/Existing waterway Impact	Perm	0.3685	16054	39.177947	-77.200605	N/A
					1.4503	63201			
WB-1	PEM	N/A	Wetland Buffer Impact	Temp	0.014	613	39.17476	-77.193918	N/A
WB-2	PEM	N/A	Wetland Buffer Impact	Temp	0.14	6099	39.176267	-77.194771	N/A
					0.154	6712			
WE-1	PEM	N/A	Wetland Enhancement	Temp	0.06	2511.002	39.176269	-77.194785	N/A
W-1	Perennial (Cabin Branch Reach 1)	N/A	Existing waterway Impact	Temp (MDE) / Perm (USACE)	0.02	747.04	39.17681	-77.193831	74
W-3	Perennial (Cabin Branch Reach 1)	N/A	Existing waterway Impact	Temp (MDE) / Perm (USACE)	0.03	1320	39.178293	-77.201683	84
					0.05	2067.04			158
W-2	Perennial (Cabin Branch Reach 1)	N/A	Existing waterway Impact	Perm (MDE) / Perm (USACE)	0.8	34931	39.17681	-77.197797	2819
W-11	Intermittent (Trib 1)	N/A	Existing waterway Impact	Perm (MDE) / Perm (USACE)	0.006	272	39.176364	-77.195595	199
W-12	Intermittent (Trib 1)	N/A	Existing waterway Impact	Perm (MDE) / Perm (USACE)	0.002	91	39.176668	-77.194889	30
W-13	Intermittent (Trib 1-1)	N/A	Existing waterway Impact	Perm (MDE) / Perm (USACE)	0.046	2006	39.176542	-77.195547	285
W-14	Intermittent (Trib 2)	N/A	Existing waterway Impact	Perm (MDE) / Perm (USACE)	0.013	570	39.177617	-77.197361	276
W-15	Intermittent (Trib 3)	N/A	Existing waterway Impact	Perm (MDE) / Perm (USACE)	0.0187	816	39.178075	-77.199257	469
W-16	Intermittent (Trib 3)	N/A	Existing waterway Impact	Perm (MDE) / Perm (USACE)	0.002	66	39.177846	-77.201004	39
					0.8877	38752			4117
FI-1	FEMA Floodplain	N/A	Floodplain Impact	Temp	13.26	577680	39.176593	-77.197582	N/A

Proposed Activity

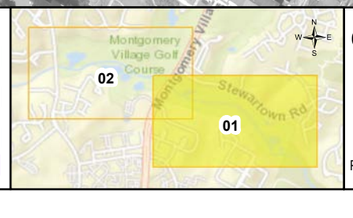
Label	Existing Resource Class	Proposed Resource Class	Activity	Acreage	Sq_Ft	Lat	Long	Length (LF)
PW-1	N/A	PFO	Proposed Wetland Creation	1.11	48535.86	39.175185	-77.19454	N/A
PW-2	N/A	PFO	Proposed Wetland Creation	0.18	7835	39.176319	-77.195	N/A
PW-3	N/A	PFO	Proposed Wetland Creation	0.4	17272.5	39.177915	-77.20057	N/A
				1.69	73643.36			
PWB-1	N/A	N/A	Proposed Wetland Buffer	0.575	25066	39.175174	-77.19452	N/A
PWB-2	N/A	N/A	Proposed Wetland Buffer	0.2787	12139	39.176349	-77.19496	N/A
PWB-3	N/A	N/A	Proposed Wetland Buffer	0.3397	14799	39.177918	-77.20054	N/A
				1.1934	52004			
PS-1	CABIN BRANCH REACH 1	N/A	Proposed Stream Realignment	1.59	69076.5	39.176484	-77.19761	2834
PS-T1	TRIB 1	N/A	Proposed Stream Realignment	0.05	2271.03	39.176447	-77.19537	398
PS-T1_1	TRIB 1-1	N/A	Proposed Stream Realignment	0.01	550.08	39.176537	-77.19524	113
PS-T2	TRIB 2	N/A	Proposed Stream Realignment	0.03	1316.96	39.17761	-77.19766	421
PS-T3	TRIB 3	N/A	Proposed Stream Realignment	0.09	3846.31	39.177968	-77.19967	644
PS-T3_1	TRIB 3-1	N/A	Proposed Stream Realignment	0.01	652.77	39.178138	-77.19864	146
				1.78	77713.65			4556

LEGEND

- Limits of Disturbance
- Proposed Stream Realignment
- 100 Year Floodplain
- Proposed PFO Wetland
- Proposed PFO Wetland Buffer
- Existing Wetlands
- Existing Waterways
- Wetland Buffer
- Flow Direction

IMPACTS

- Waterway (Perm)
- Waterway (Temp)
- Waterway (Outside)
- Wetland Buffer (Temp)
- Wetland Enhancement
- Open Water (USACE) (Perm) Perennial (MDE) (Perm)
- Open Water (Temp)
- Floodplain



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Scale: 1 " = 200 '

February 2021

RFP-2

Wetland and Waterway Impact Plates

Plate 01 of 02

270 495 MANAGED LANES STUDY

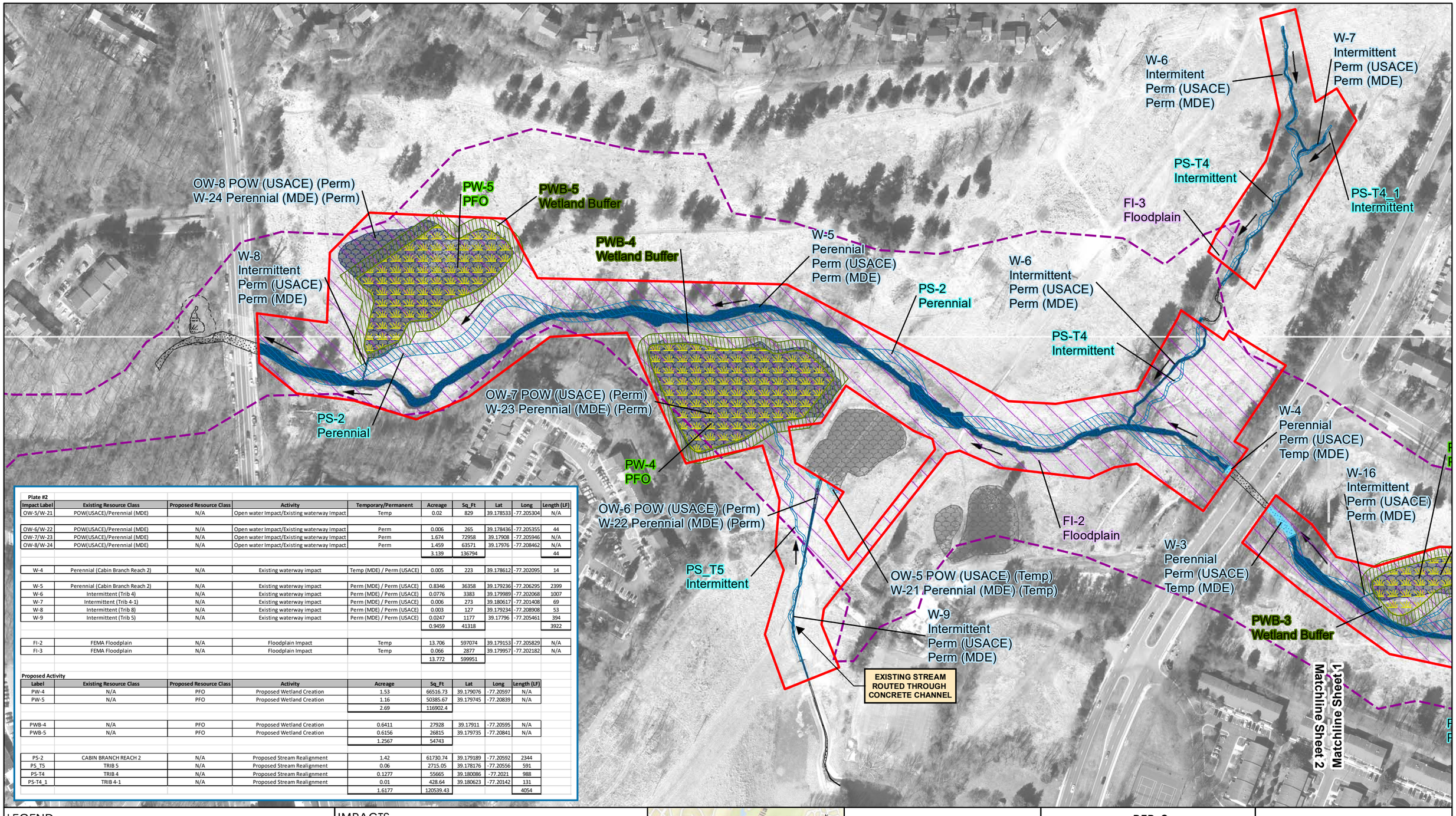


Plate #2

Impact Label	Existing Resource Class	Proposed Resource Class	Activity	Temporary/Permanent	Acreage	Sq_Ft	Lat	Long	Length (LF)
OW-5/W-21	POW(USACE)/Perennial (MDE)	N/A	Open water Impact/Existing waterway Impact	Temp	0.02	829	39.178533	-77.205304	N/A
OW-6/W-22	POW(USACE)/Perennial (MDE)	N/A	Open water Impact/Existing waterway Impact	Perm	0.006	265	39.178436	-77.205355	44
OW-7/W-23	POW(USACE)/Perennial (MDE)	N/A	Open water Impact/Existing waterway Impact	Perm	1.674	72958	39.17908	-77.205946	N/A
OW-8/W-24	POW(USACE)/Perennial (MDE)	N/A	Open water Impact/Existing waterway Impact	Perm	1.459	63571	39.17976	-77.208462	N/A
					3.139	136794			44
W-4	Perennial (Cabin Branch Reach 2)	N/A	Existing waterway impact	Temp (MDE) / Perm (USACE)	0.005	223	39.178612	-77.202095	14
W-5	Perennial (Cabin Branch Reach 2)	N/A	Existing waterway impact	Perm (MDE) / Perm (USACE)	0.8346	36358	39.179236	-77.206295	2399
W-6	Intermittent (Trib 4)	N/A	Existing waterway impact	Perm (MDE) / Perm (USACE)	0.0776	3383	39.179989	-77.202068	1007
W-7	Intermittent (Trib 4-1)	N/A	Existing waterway impact	Perm (MDE) / Perm (USACE)	0.006	273	39.180617	-77.201408	69
W-8	Intermittent (Trib 8)	N/A	Existing waterway impact	Perm (MDE) / Perm (USACE)	0.003	127	39.179234	-77.208908	53
W-9	Intermittent (Trib 5)	N/A	Existing waterway impact	Perm (MDE) / Perm (USACE)	0.0247	1177	39.17796	-77.205461	394
					0.9459	41318			3922
FI-2	FEMA Floodplain	N/A	Floodplain Impact	Temp	13.706	597074	39.179153	-77.205829	N/A
FI-3	FEMA Floodplain	N/A	Floodplain Impact	Temp	0.066	2877	39.179957	-77.202182	N/A
					13.772	599951			

Proposed Activity

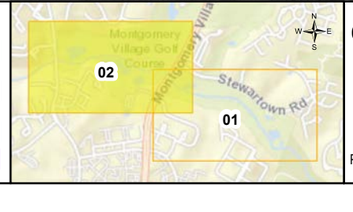
Label	Existing Resource Class	Proposed Resource Class	Activity	Acreage	Sq_Ft	Lat	Long	Length (LF)
PW-4	N/A	PFO	Proposed Wetland Creation	1.53	66516.73	39.179076	-77.20597	N/A
PW-5	N/A	PFO	Proposed Wetland Creation	1.16	50385.67	39.179745	-77.20839	N/A
				2.69	116902.4			
PWB-4	N/A	PFO	Proposed Wetland Creation	0.6411	27928	39.17911	-77.20595	N/A
PWB-5	N/A	PFO	Proposed Wetland Creation	0.6156	26815	39.179735	-77.20841	N/A
				1.2567	54743			
PS-2	CABIN BRANCH REACH 2	N/A	Proposed Stream Realignment	1.42	61730.74	39.179189	-77.20592	2344
PS_T5	TRIB 5	N/A	Proposed Stream Realignment	0.06	2715.05	39.178176	-77.20556	591
PS-T4	TRIB 4	N/A	Proposed Stream Realignment	0.1277	55665	39.180086	-77.2021	988
PS-T4_1	TRIB 4-1	N/A	Proposed Stream Realignment	0.01	428.64	39.180623	-77.20142	131
				1.6177	120539.43			4054

LEGEND

- Limits of Disturbance
- Proposed Stream Realignment
- 100 Year Floodplain
- Proposed PFO Wetland
- Proposed PFO Wetland Buffer
- Existing Wetlands
- Existing Waterways
- Wetland Buffer
- Flow Direction

IMPACTS

- Waterway (Perm)
- Waterway (Temp)
- Waterway (Outside)
- Wetland Buffer (Temp)
- Wetland Enhancement
- Open Water (USACE) (Perm)
- Perennial (MDE) (Perm)
- Open Water (Temp)
- Floodplain



0 100 200 400

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February 2021

RFP-2

Wetland and Waterway Impact Plates

Plate 02 of 02

270 495 MANAGED LANES STUDY

Great Seneca Creek
Long Draught Branch
Park Acce
119
e Ford Rd
Morning Light Ter
Horn Point Dr
119
Marmary Rd
Longdraft Rd
Pavilion Dr
Marquis Dr
Diamond Dr
Cullinan Dr
Bayswater Rd
Galesville Dr
Westbourne Ter
Bradbury Dr
Fernshire Rd
119
Beacon Hill Ter
Suffolk Ter
Quince Orchard Valley Neighborhood Park
PLATE 1
PLATE 2
Sioux Ln
Sioux Ln Sioux Ln
Sioux Ln
Sioux Ln
Allenhurst Ct
Roundabout Dr
Longdraft Rd
Bostwick Ln
Raven Rock Dr
Longpoint Way
124
119
Riffle Ford Rd
ntecrest Ln
Pueblo Rd
Apache Ln
Cheyenne Rd
Little Quarry Park
Kentlands Blvd
Booth St
Kentlands Square Shoppin Center
Pawnee Dr
124
Chestertown St
Chestertown St
Kentlands
Ponds Way
McDo

Legend

Impact Plate

Baltir
Columbia
Germantown
An
Washington

0 300 600 1,200
feet
Scale: 1" = 600"
November 2021

CA-5
Wetland and Waterway Impact Plates

Key Sheet

270
495
MANAGED LANES STUDY

WC4
Intermittent

WL3
PFO

WC5
Intermittent

WC7
Perennial

WC10

WC8
Intermittent

WL5
PFO

WL4
PFO

WL7
PEM

WL8
PEM

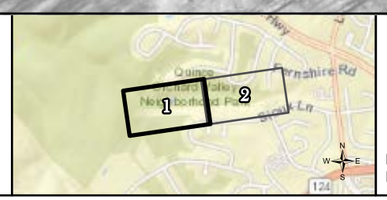
WC6
Perennial

SIOUX LA

Legend

- Limit of Disturbance
- Limit of Grading Area
- Sheet Boundary
- Wetland Buffer
- Wetland, Outside LOD
- Water, Outside LOD
- Modeled 100-Year Floodplain

Impacts	Temporary	Permanent
Waterway		N/A
Wetland		
Buffer		



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feet
Scale: 1" = 100"

November 2021
Revised: March 2022

CA-5
Wetland and Waterway Impact Plates

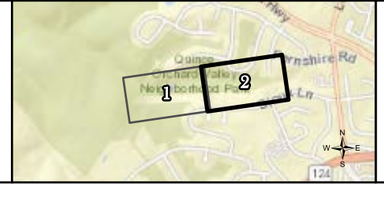
Plate 1 of 2

270 495 MANAGED LANES STUDY

Legend

- Limit of Disturbance
- Limit of Grading Area
- Sheet Boundary
- Wetland Buffer
- Wetland, Outside LOD
- Water, Outside LOD
- Modeled 100-Year Floodplain

Impacts	Temporary	Permanent
Waterway		N/A
Wetland		
Buffer		



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feet
Scale: 1" = 100'
November 2021

CA-5
Wetland and Waterway Impact Plates

Plate 2 of 2

270 495 MANAGED LANES STUDY

UNNAMED TRIBUTARY TO GREAT SENICA CREEK (CA-5) MITIGATION SITE IMPACTS

Table E-1: MDE Waterway Impacts Summary

RESOURCE TYPE	TEMPORARY IMPACT (LF)	TEMPORARY IMPACT (SF)	PERMANENT IMPACT (LF)	PERMANENT IMPACT (SF)
Perennial	3,605	65,994	0	0
Intermittent	322	2126	0	0
Total:	**3,927**	**68,120**	**0**	**0**

Table E-2: USACE Waterway Impacts Summary

RESOURCE TYPE	TEMPORARY IMPACT (LF)	TEMPORARY IMPACT (SF)	PERMANENT IMPACT (LF)	PERMANENT IMPACT (SF)
Perennial	0	0	3,605	54,392
Intermittent	0	0	322	2,126
Open Water	0	0	0	11602
Ephemeral	0	0	0	0
Total:	**0**	**0**	**3,927**	**68,120**

Table E-3: MDE & USACE Wetland Impacts Summary

RESOURCE TYPE	TEMPORARY WETLAND IMPACT (SF)	TEMPORARY WETLAND BUFFER IMPACT (SF)	PERMANENT WETLAND IMPACT (SF)	PERMANENT WETLAND BUFFER IMPACT (SF)
PFO	2,343	11,100	1,172	2,929
PSS	0	0	0	0
PEM	0	0	2378	6689
Total:	**2,343**	**11,100**	**3,550**	**9,618**

UNNAMED TRIBUTARY TO GREAT SENICA CREEK (CA-5) MITIGATION SITE IMPACTS

Table E-4: MDE Waterway Feature Impacts

IMPACT ID	CLASSIFICATION	CHANNEL TYPE	TEMPORARY IMPACT (LF)	TEMPORARY IMPACT (SF)	PERMANENT IMPACT (LF)	PERMANENT IMPACT (SF)	IMPACT TYPE
WC2	Perennial	Open Channel	47	327	0	0	Restoration
WC3	Intermittent	Open Channel	139	667	0	0	Restoration
WC5	Intermittent	Open Channel	21	112	0	0	Restoration
WC6	Perennial	Open Channel	759	7,369	0	0	Restoration
WC7	Perennial	Open Channel	2799	46,696	0	0	Restoration
WC8	Intermittent	Open Channel	30	95	0	0	Restoration
WC9	Intermittent	Open Channel	132	1,252	0	0	Restoration
WC10	Perennial	Waterway	0	11,602	0	0	Enhancement
Total:			**3,927**	**68,120**	**0**	**0**	

Table E-5: USACE Waterway Feature Impacts

IMPACT ID	CLASSIFICATION	CHANNEL TYPE	TEMPORARY IMPACT (LF)	TEMPORARY IMPACT (SF)	PERMANENT IMPACT (LF)	PERMANENT IMPACT (SF)	IMPACT TYPE
WC2	Perennial	Open Channel	0	0	47	327	Restoration
WC3	Intermittent	Open Channel	0	0	139	667	Restoration
WC5	Intermittent	Open Channel	0	0	21	112	Restoration
WC6	Perennial	Open Channel	0	0	759	7,369	Restoration
WC7	Perennial	Open Channel	0	0	2799	46,696	Restoration
WC8	Intermittent	Open Channel	0	0	30	95	Restoration
WC9	Intermittent	Open Channel	0	0	132	1,252	Restoration
WC10	Open Water	Pond	0	0	0	11,602	Enhancement
Total:			**0**	**0**	**3,927**	**68,120**	

UNNAMED TRIBUTARY TO GREAT SENICA CREEK (CA-5) MITIGATION SITE IMPACTS

Table E-6: MDE & USACE Wetland Feature Impacts

IMPACT ID	CLASSIFICATION	TEMPORARY WETLAND IMPACT (SF)	TEMPORARY WETLAND BUFFER IMPACT (SF)	PERMANENT WETLAND IMPACT (SF)	PERMANENT WETLAND BUFFER IMPACT (SF)	IMPACT TYPE
WL1	PFO	0	85	0	0	Restoration
WL2	PFO	618	5,332	0	0	Restoration
WL3	PFO	1,042	2,953	0	0	Restoration
WL4	PFO	0	0	177	1,645	Restoration
WL5	PFO	0	1,338	0	0	Restoration
WL6	PFO	683	1,392	995	1,284	Restoration
WL7	PEM	0	0	349	2,183	Restoration
WL8	PEM	0	0	2,029	4,506	Restoration
Total:		**2,343**	**11,100**	**3,550**	**9,618**	

100-Year Floodplain Temporary Impacts - 198,330 SF (4.55 AC)

Permanent wetland impacts will be replaced onsite via oxbow wetland creation.

ATTACHMENT II

RARE, THREATENED, AND ENDANGERED SPECIES COORDINATION

United States Department of the Interior
U.S. Fish & Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573 4575

Online Certification Letter

Today's date: July 9, 2019

Project: SHA Full Delivery of Cabin Branch Stream Restoration

Dear Applicant for online certification:

Thank you for using the U.S. Fish and Wildlife Service (Service) Chesapeake Bay Field Office online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the referenced project in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA).This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

Based on this information and in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), we certify that except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project area. Therefore, no Biological Assessment or further section 7 consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

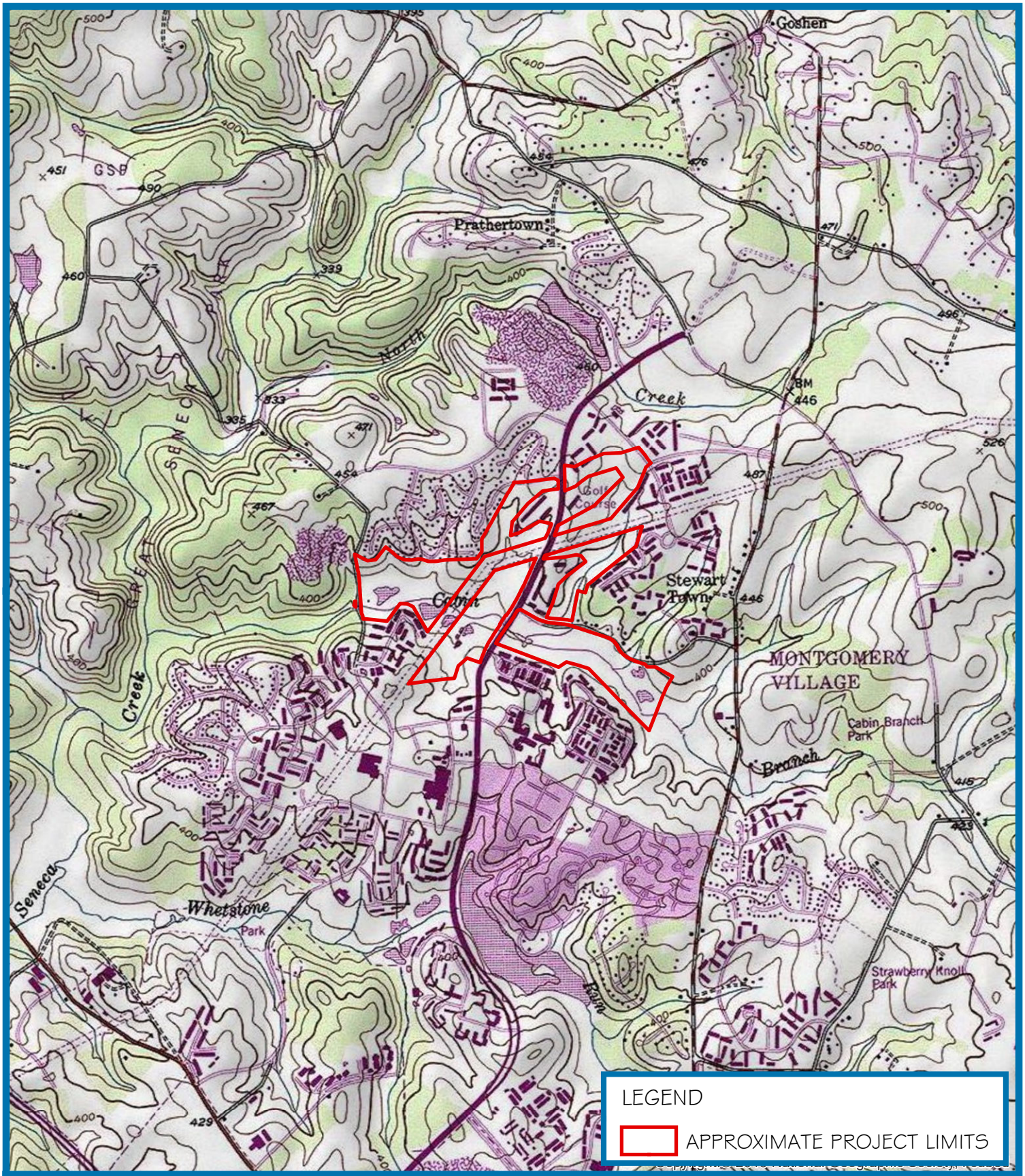
This response relates only to federally protected threatened or endangered species under our jurisdiction. For additional information on threatened or endangered species in Maryland, you should contact the Maryland Wildlife and Heritage Division at (410) 260-8573. For information in Delaware you should contact the Delaware Division of Fish and Wildlife, Wildlife Species Conservation and Research Program at (302) 735-8658. For information in the District of Columbia, you should contact the National Park Service at (202) 339-8309.

The U.S. Fish and Wildlife Service also works with other Federal agencies and states to minimize loss of wetlands, reduce impacts to fish and migratory birds, including bald eagles, and restore habitat for wildlife. Information on these conservation issues and how development projects can avoid affecting these resources can be found on our website (www.fws.gov/chesapeakebay)

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Chesapeake Bay Field Office Threatened and Endangered Species program at (410) 573-4527.

Sincerely,

Genevieve LaRouche
Field Supervisor



res

CORPORATE | 5020 MONTROSE BLVD., SUITE 650, HOUSTON, TX 77006
P: 713.520.5400

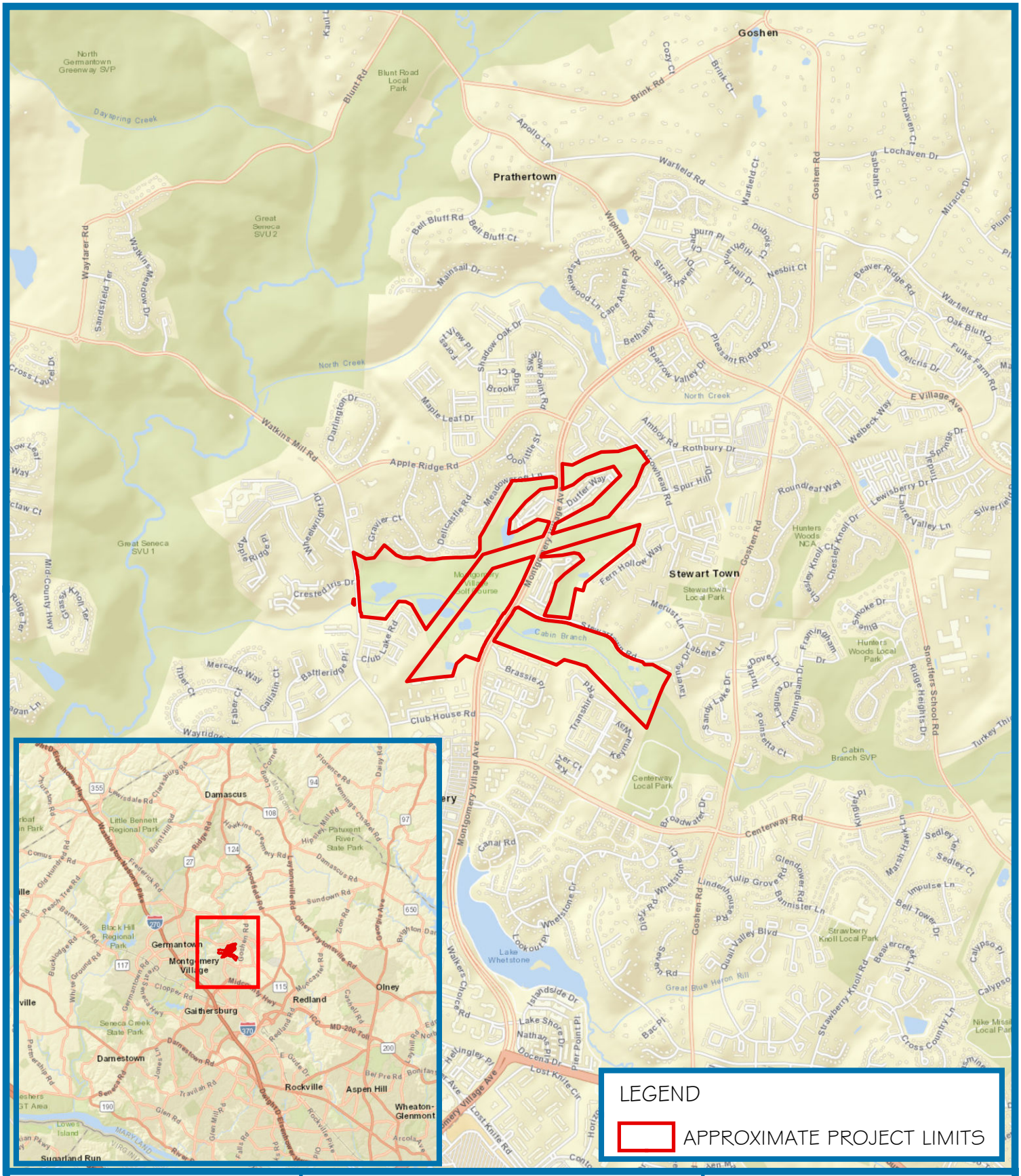
www.res.us

PROJECT LOCATION MAP

MDSHA 495-270 PRM
MONTGOMERY VILLAGE SITE
MONTGOMERY COUNTY, MARYLAND

USGS Topo Quads: Gaithersburg
Latitude: 39.1792
Longitude: -77.2093
Approx. Project Area: 146.07 acres
Elevation: 283 - 448 feet
Scale: 1 inch = 2,000 feet
Source: http://resources.arcgis.com/ USA Topo Maps

N



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CORPORATE | 5020 MONTROSE BLVD., SUITE 650, HOUSTON, TX 77006
P: 713.520.5400
www.res.us

VICINITY MAP

MDSHA 495-270 PRM
MONTGOMERY VILLAGE SITE
MONTGOMERY COUNTY, MARYLAND

Street Map Source:
World Street Map
ESRI ArcGIS Online

N

1 inch = 2,000 feet

CORPORATE | 6575 WEST LOOP SOUTH, SUITE 300 BELLAIRE, TX. 77401
P: 713.520.5400
www.res.us

AERIAL IMAGERY

MDSHA 495-270 PRM
MONTGOMERY VILLAGE SITE

MONTGOMERY COUNTY, MD

Digital Orthophoto Source:
VBMP Most Recent Imagery
Virginia Lambert (VGIN)

N

1 inch = 750 feet

Document Path: G:\GIS_work\Active_jobs\MDSHA_495_270_PRM\maps\BaseMapping\101690_Montgomery_Village_Aerial_Imagery.mxd - Date Saved: 6/26/2019

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127
http://www.fws.gov/chesapeakebay/
http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html

In Reply Refer To: July 09, 2019
Consultation Code: 05E2CB00-2019-SLI-1709
Event Code: 05E2CB00-2019-E-04280
Project Name: Cabin Branch Stream Mitigation Bank

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
(410) 573-4599

Project Summary

Consultation Code: 05E2CB00-2019-SLI-1709

Event Code: 05E2CB00-2019-E-04280

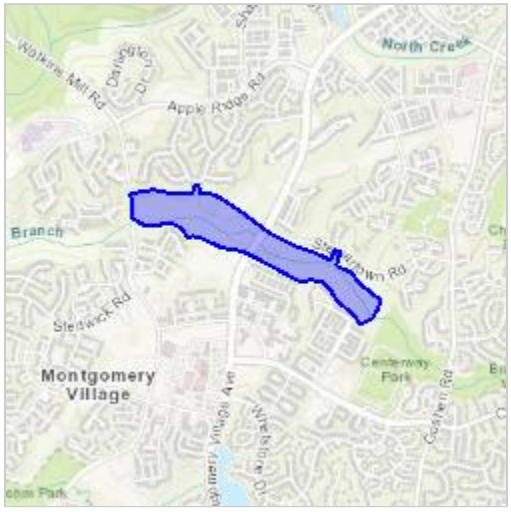
Project Name: Cabin Branch Stream Mitigation Bank

Project Type: STREAM / WATERBODY / CANALS / LEVEES / DIKES

Project Description: The proposed project is a stream restoration along approximately 2,143 linear feet of Cabin Branch east of Watkins Mill Road and terminating just west of Centerway Local Park in Montgomery County, Maryland. The stream is a Use-I-P perennial tributary. The project will support the Maryland Department of Transportation State Highway Administration's (SHA) efforts to generate permittee- responsible compensatory stream and wetland mitigation credits for unavoidable impacts associated with construction of SHA's highway development projects.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.177741219976554N77.20014874795342W



Counties: Montgomery, MD

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis*	Threatened

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

- Projects with a federal nexus that have tree clearing = to or > 15 acres: 1. REQUEST A SPECIES LIST 2. NEXT STEP: EVALUATE DETERMINATION KEYS 3. SELECT EVALUATE under the Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency key

Species profile: https://ecos.fws.gov/ecp/species/9045

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- PUBHx

RIVERINE

- R5UBH

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Larry Hogan, *Governor*
Boyd Rutherford, *Lt. Governor*
Mark Belton, *Secretary*
Joanne Throwe, *Deputy Secretary*

19-MIS-009

August 30th, 2018

Juliette Giordano
RES
2750 Prosperity Ave. Suite 220
Fairfax, VA 22031

Subject: Fisheries Information for the Cabin Branch Mitigation Bank
Montgomery County, Maryland

Dear Ms. Giordano;

The above referenced project has been reviewed to determine fisheries species near the proposed project. The proposed activities include the restoration of approximately 4,236 linear feet of Cabin Branch and its tributaries, enhancement along approximately 1,522 linear feet of Cabin Branch, restoration of 3.12 acres of wetlands, and enhancement of 0.38 acres of wetlands.

This project will impact Cabin Branch which is classified as a Use I-P (public water supply) stream. In general, no in-stream work is allowed in Use I-P streams from March 1st to June 15th of any given year to protect spawning fish. The applicant is encouraged to strictly adhere to the approved sediment and erosion control plan during construction to prevent sedimentation downstream. In addition, part of the project area looks to be within a Sensitive Species Project Review Area so the MDDNR Wildlife & Heritage Service should be contacted in order to see if they have any further comments or concerns about this project.

DNR has documented resident fish species from Cabin Branch and its tributaries by our Maryland Biological Stream Survey. MBSS data can be accessed via the MDDNR web page at http://streamhealth.maryland.gov, allowing access to resource surveys.

Please note that these comments do not constitute a full review by the Maryland Dept. of Natural Resources. Once the final permit is submitted with a full set of plans, a detailed project review will occur.

If you have any further questions, please feel free to contact me at 410 260-8736.

Sincerely;

Christopher Aadland

Christopher Aadland
Environmental Review Program

2750 Prosperity Avenue, Suite 220
Fairfax, VA 22031

Corporate Headquarters
5020 Montrose Blvd. Suite 650
Houston, TX 77006
Main: 713.520.5400

July 13, 2018

Mr. Tony Redman, Director
Environmental Review Program
Department of Natural Resources
Tawes State Office Building, E-1
Annapolis, MD 21401

Re: Cabin Branch Mitigation Bank
Montgomery County, Maryland

Sent Via Email: environmentalreview.dnr@maryland.gov

Dear Mr. Redman:

Resource Environmental Solutions, LLC (RES) is pleased to submit a project scoping request for a proposed stream and wetland compensatory mitigation bank in Montgomery Village, Montgomery County. The project location is identified on the attached mapping and site description table. The project limits depicted on the maps represent the bank's easement area and the area of potential effect ("APE"). The purpose of the project is to establish a stream and wetland compensatory mitigation bank that will provide stream and wetland credits to offset authorized unavoidable impacts to wetlands and streams within the bank's approved service area. Proposed project activities and existing site conditions are described in more detail below.

The proposed bank project includes the restoration of +/- 4,236 linear feet of Cabin Branch and its tributaries, enhancement along +/- 1,522 linear feet of Cabin Branch, as well as the restoration of 3.12 acres of wetlands and enhancement of 0.38 acres of wetlands. Located at 19550 Montgomery Village Avenue, the project site exists within the former Montgomery Village Golf Club. The project site is in the Great Seneca Stream watershed (Maryland Department of Environment Hydrologic Unit Code ("HUC") 02140208), which is part of the Federal 8-digit HUC 02070008 – Middle Potomac-Catoctin. Restoration activities will occur along the stream corridor between the eastern side of Watkins Mill Road and the western edge of Centerway Park. A 250-foot wide cleared, overhead transmission line right-of-way owned by Pepco extends southwest to northeast across Cabin Branch in the west-central reach of the project site. Restoration activities will likely not occur within this easement.

Cabin Branch is a third-order major tributary with a drainage area of 4.4 square miles of urban development (39% impervious surface) with little or no stormwater management. A non-operational golf course occupies the stream valley along the channel. Conditions within the stream channel exhibit significant bank erosion. The stream is incised with steep, vertical banks (4-foot to 6-foot tall) and is overly wide (~20 feet). A four-foot tall dam exists within the middle portion of the restoration reach disrupting the hydrology and hydraulics of the stream, as well as precluding passage of fish and other aquatic organisms. Development within the watershed has increased the hydrology of the stream resulting in frequent out of bank flooding events.

Most of the tributaries to the main channel flow out of small (<100 acre) watersheds that drain adjacent neighborhoods. A few of the tributaries have stormwater management facilities located along them but most of these facilities are undersized and in need of improvement. Several other streams are piped directly into the main channel without any treatment. Many of the tributaries are experiencing active head cuts and erosion.

Compensatory mitigation credits along the Cabin Branch corridor will be generated using natural channel design methods to restore the targeted stream reach and by restoring former golf course water features into wetlands. Stream credits will be generated through a combination of stream restoration and enhancement by employing natural channel design techniques (e.g. increasing channel sinuosity; reconnecting channel to active floodplain); daylighting piped tributaries; restoring the riparian buffer to 35 feet along each bank; and removing non-native material and former golf course infrastructure. Select areas of wetlands will be established along the restoration reach where existing ponds will be restored to wetland conditions. The site will be operated as a private mitigation bank and will go through the Interagency Review Team ("IRT") approval process.

The bank site's location within a historic golf course landscape provides an opportunity for relocating the stream channel and restoring an active floodplain and stream connectivity with minimal impacts to forested area or other natural resources, since the historic fairway contains few native trees or other resources. In addition, Centerway Park, Cabin Branch Stream Valley Park, and Green Farm Park are located immediately upstream of the site, and Great Seneca Stream Valley Park is located just +/- 0.3-mile downstream of the site. Thus, creating a protected compensatory mitigation bank along this stretch of Cabin Branch will create a continuous, protected stream valley park system.

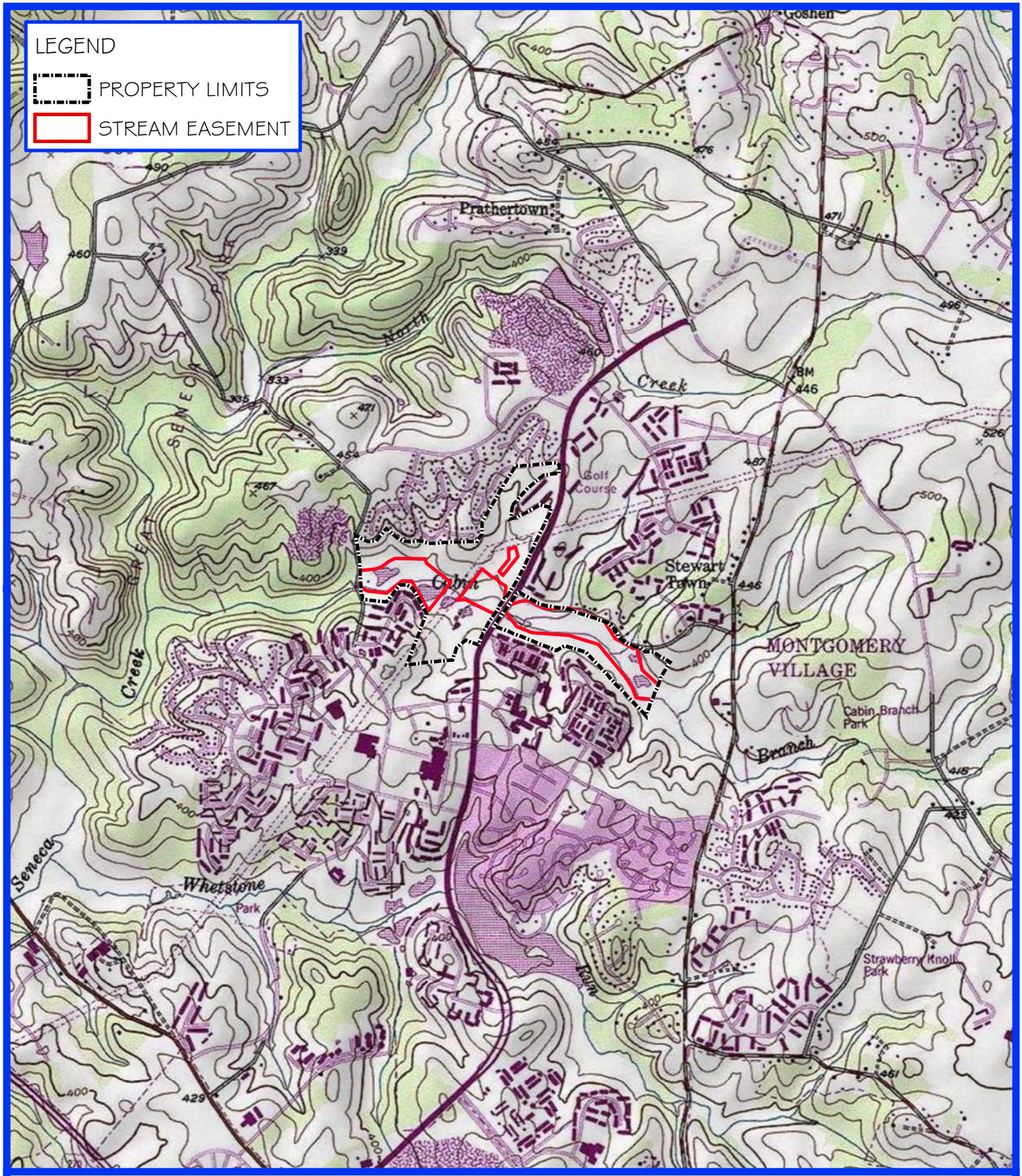
Please feel free to contact me at (571) 489-0210, or at jgiordano@res.us if you have any questions or need any additional information regarding this project. Thank you for your attention to this matter.

Sincerely,

Juliette Giordano
Environmental Specialist

Enclosures:

1) Project Location and Vicinity Maps and Aerial Imagery
2) Concept Design Map
3) U.S. Fish and Wildlife Information Planning, and Coordination List



res

5367 TELEPHONE ROAD, WARRENTON, VIRGINIA 20187
P: 703.393.4844 | F: 703.393.2934

www.RES.us

PROJECT LOCATION MAP

CABIN BRANCH MITIGATION BANK

MONTGOMERY COUNTY, MD

USGS Topo Quads: Gaithersburg, VA
Latitude: 39°10'43"
Longitude: -77°12'8"
Approx. Project Area: 126.77 acres
Elevation: 350' – 430'
Scale: 1 inch = 2,000 feet
Source: http://resources.arcgis.com/ USA Topo Maps

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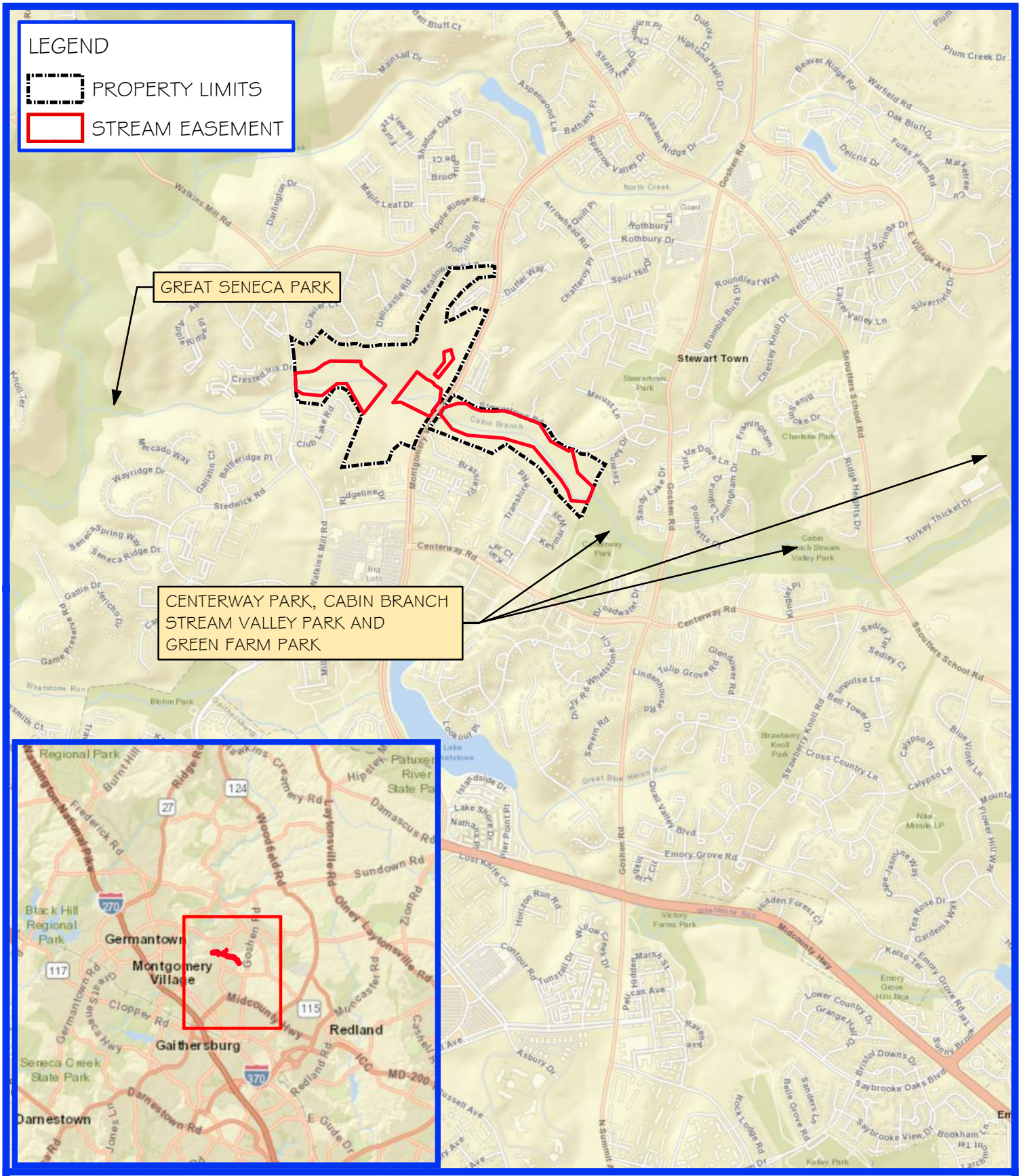

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P: 703.393.4844 | F: 703.393.2934

www.RES.us

VICINITY MAP

CABIN BRANCH MITIGATION BANK

MONTGOMERY COUNTY, MD

Street Map Source:
World Street Map
ESRI ArcGIS Online

N

1 inch = 2,000 feet

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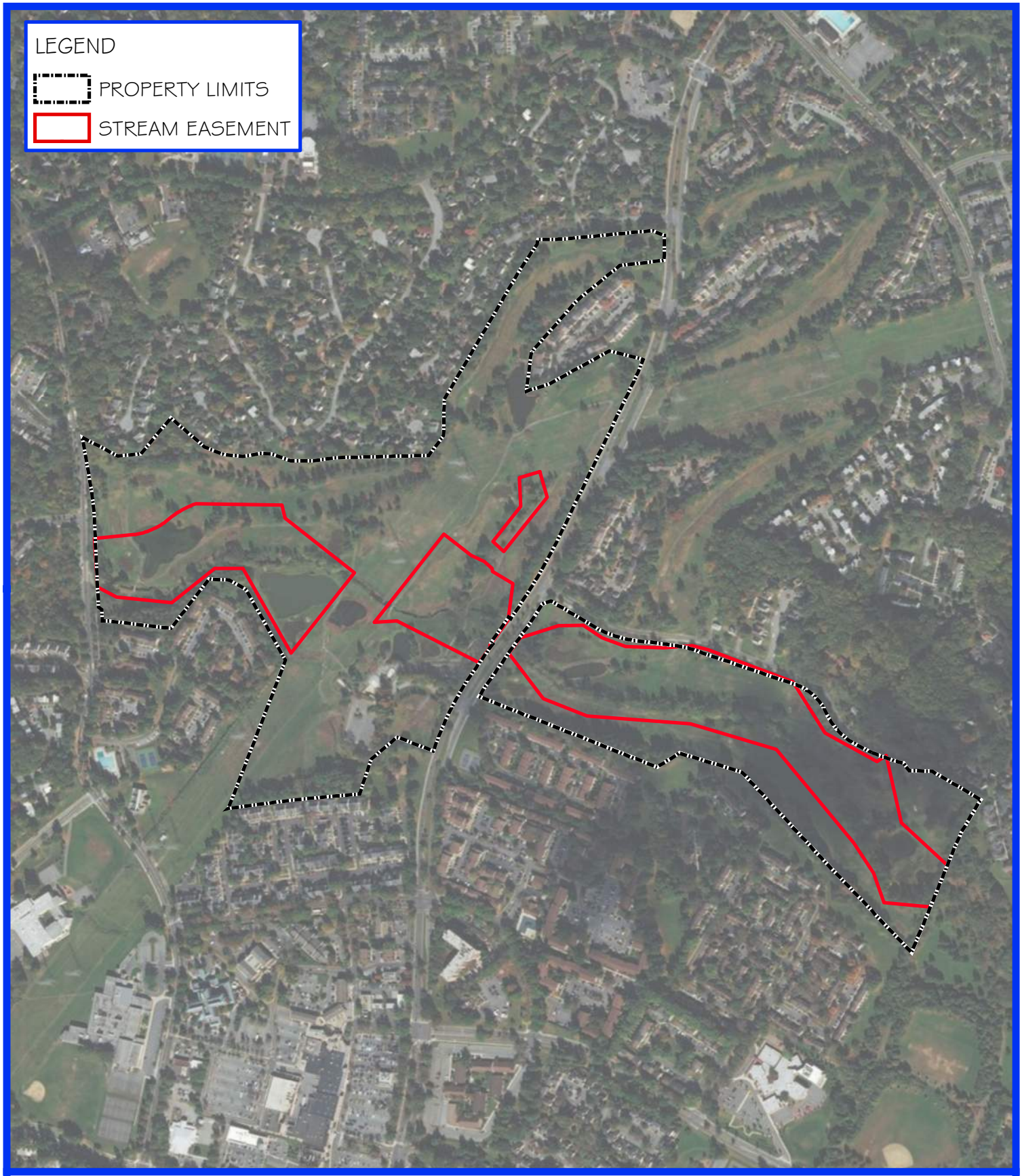

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AERIAL IMAGERY

CABIN BRANCH MITIGATION BANK

MONTGOMERY COUNTY, MD

Digital Orthophoto Source:
World Imagery
ESRI ArcGIS Online

N

1 inch = 700 feet

Document Path: \\Hgs-svr22\gis2\GIS_work\Active_jobs\0456_Montgomery_Village\maps\0456_Aerial_Imagery.mxd - Date Saved: 7/9/2018

CONCEPTUAL PLANS DATED JULY 11, 2018* SUBMITTED WITH REVIEW REQUEST

OMITTED HERE FOR LENGTH PURPOSES

SEE CONCEPTUAL PLANS IN ATTACHMENT IV

July 31, 2018

Ms. Juliette Giordano
Resource Environmental Solutions, LLC
3000 Falls Road
Suite 300A, Mill No. 1
Baltimore, MD 21211

RE: Environmental Review for Cabin Branch Mitigation Bank, Montgomery Village, 19550 Montgomery Village Avenue, Montgomery County, Maryland.

Dear Ms. Giordano:

The Wildlife and Heritage Service has determined that there are no official State or Federal records for listed plant or animal species within the delineated area shown on the map provided. As a result, we have no specific concerns regarding potential impacts or recommendations for protection measures at this time. Please let us know however if the limits of proposed disturbance or overall site boundaries change and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

Lori A. Byrne

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2018.1088.mo

3000 Falls Road, Suite 300A
Mill No. 1
Baltimore, MD 21211

Corporate Headquarters
5020 Montrose Blvd. Suite 650
Houston, TX 77006
Main: 713.520.5400

July 13, 2018

Ms. Lori Byrne
Wildlife & Heritage Service
Department of Natural Resources
Tawes State Office Building, E-1
Annapolis, MD 21401

Re: Cabin Branch Mitigation Bank
Montgomery County, Maryland

Sent Via Email: lori.byrne@maryland.gov

Dear Ms. Byrne:

Resource Environmental Solutions, LLC (RES) is pleased to submit a project review request for a proposed stream and wetland compensatory mitigation bank in Montgomery Village, Montgomery County. The project location is identified on the attached mapping and site description table. The project limits depicted on the maps represent the bank's easement area and the area of potential effect ("APE"). The purpose of the project is to establish a stream and wetland compensatory mitigation bank that will provide stream and wetland credits to offset authorized unavoidable impacts to wetlands and streams within the bank's approved service area. Proposed project activities and existing site conditions are described in more detail below.

The proposed bank project includes the restoration of +/- 4,236 linear feet of Cabin Branch and its tributaries, enhancement along +/- 1,522 linear feet of Cabin Branch, as well as the restoration of 3.12 acres of wetlands and enhancement of 0.38 acres of wetlands. Located at 19550 Montgomery Village Avenue, the project site exists within the former Montgomery Village Golf Club. The project site is in the Great Seneca Stream watershed (Maryland Department of Environment Hydrologic Unit Code ("HUC") 02140208), which is part of the Federal 8-digit HUC 02070008 – Middle Potomac-Catoctin. Restoration activities will occur along the stream corridor between the eastern side of Watkins Mill Road and the western edge of Centerway Park. A 250-foot wide cleared, overhead transmission line right-of-way owned by Pepco extends southwest to northeast across Cabin Branch in the west-central reach of the project site. Restoration activities will likely not occur within this easement.

Cabin Branch is a third-order major tributary with a drainage area of 4.4 square miles of urban development (39% impervious surface) with little or no stormwater management. A non-operational golf course occupies the stream valley along the channel. Conditions within the stream channel exhibit significant bank erosion. The stream is incised with steep, vertical banks (4-foot to 6-foot tall) and is overly wide (~20 feet). A four-foot tall dam exists within the middle portion of the restoration reach disrupting the hydrology and hydraulics of the stream, as well as precluding passage of fish and other aquatic organisms. Development within the watershed has increased the hydrology of the stream resulting in frequent out of bank flooding events.

Most of the tributaries to the main channel flow out of small (<100 acre) watersheds that drain adjacent neighborhoods. A few of the tributaries have stormwater management facilities located

along them but most of these facilities are undersized and in need of improvement. Several other streams are piped directly into the main channel without any treatment. Many of the tributaries are experiencing active head cuts and erosion.

Compensatory mitigation credits along the Cabin Branch corridor will be generated using natural channel design methods to restore the targeted stream reach and by restoring former golf course water features into wetlands. Stream credits will be generated through a combination of stream restoration and enhancement by employing natural channel design techniques (e.g. increasing channel sinuosity; reconnecting channel to active floodplain); daylighting piped tributaries; restoring the riparian buffer to 35 feet along each bank; and removing non-native material and former golf course infrastructure. Select areas of wetlands will be established along the restoration reach where existing ponds will be restored to wetland conditions. The site will be operated as a private mitigation bank and will go through the Interagency Review Team ("IRT") approval process.

The bank site's location within a historic golf course landscape provides an opportunity for relocating the stream channel and restoring an active floodplain and stream connectivity with minimal impacts to forested area or other natural resources, since the historic fairway contains few native trees or other resources. In addition, Centerway Park, Cabin Branch Stream Valley Park, and Green Farm Park are located immediately upstream of the site, and Great Seneca Stream Valley Park is located just +/- 0.3-mile downstream of the site. Thus, creating a protected compensatory mitigation bank along this stretch of Cabin Branch will create a continuous, protected stream valley park system.

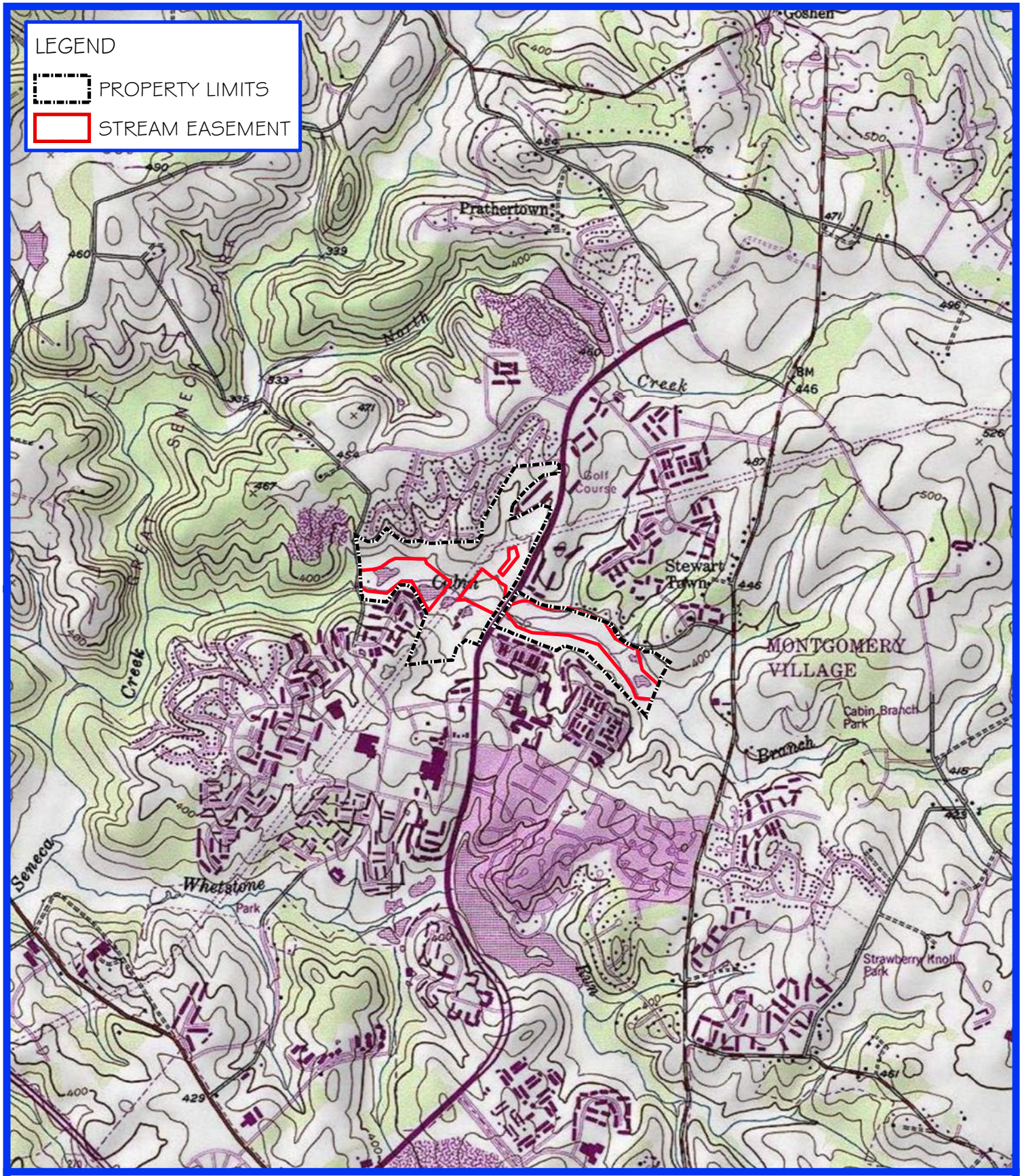
Please feel free to contact me at (571) 489-0210, or at jgiordano@res.us if you have any questions or need any additional information regarding this project. Thank you for your attention to this matter.

Sincerely,

Juliette Giordano
Environmental Specialist

Enclosures:

1) Project Location and Vicinity Maps and Aerial Imagery
2) Concept Design Map
3) USFWS Trust Resources List



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PROJECT LOCATION MAP

CABIN BRANCH MITIGATION BANK

MONTGOMERY COUNTY, MD

USGS Topo Quads: Gaithersburg, VA
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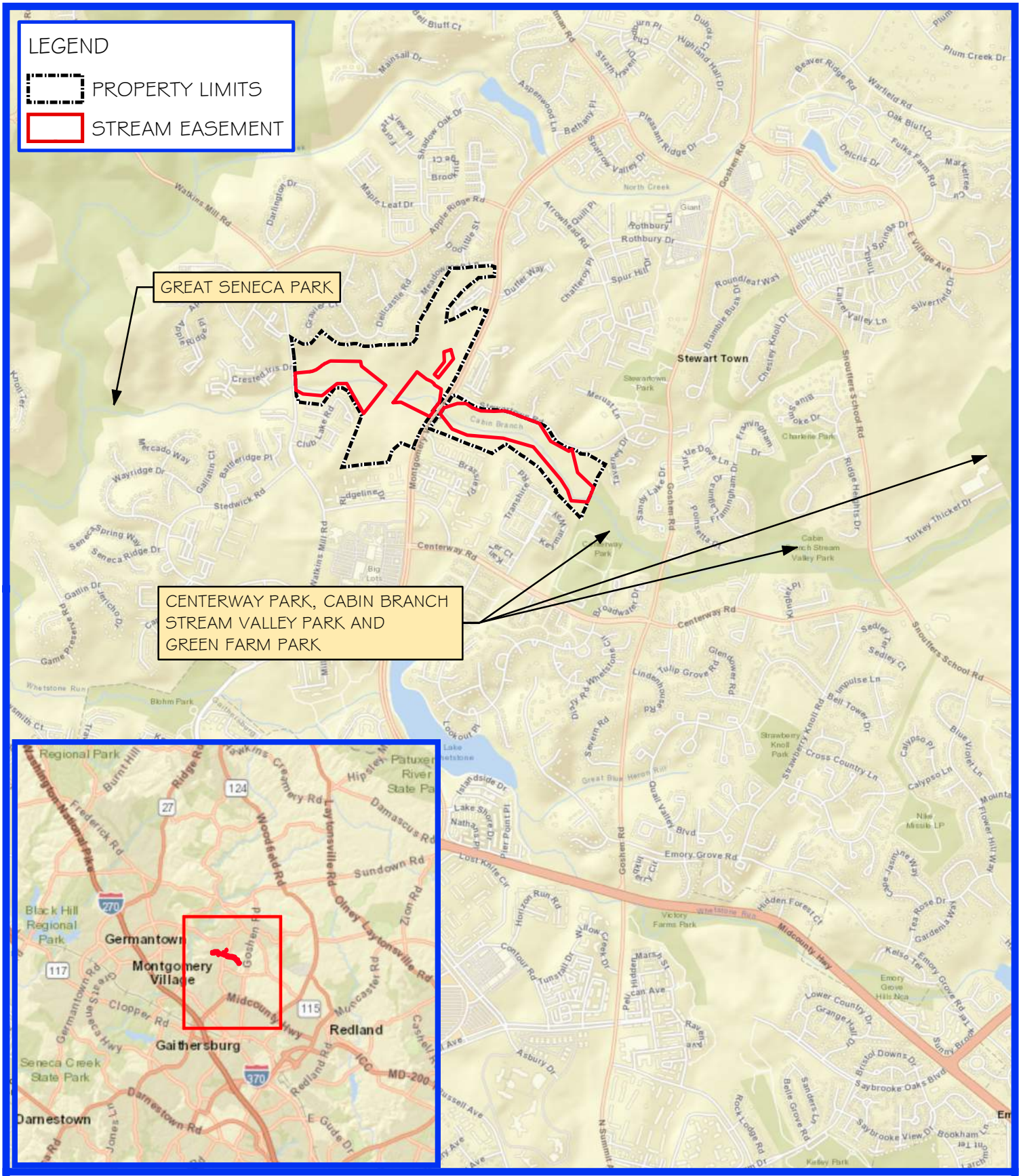

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VICINITY MAP

CABIN BRANCH MITIGATION BANK

MONTGOMERY COUNTY, MD

Street Map Source:
World Street Map
ESRI ArcGIS Online

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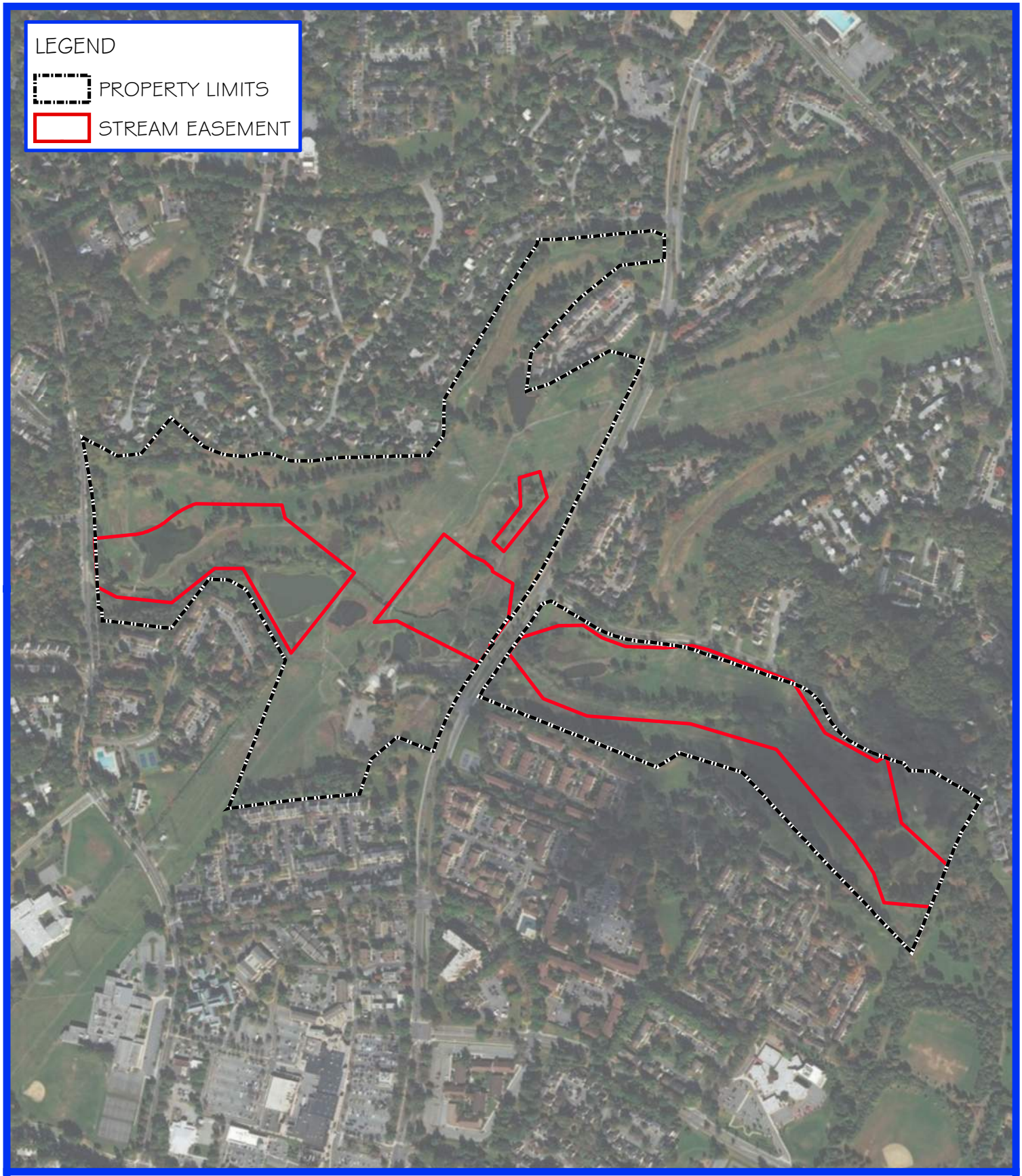

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AERIAL IMAGERY

CABIN BRANCH MITIGATION BANK

MONTGOMERY COUNTY, MD

Digital Orthophoto Source:
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CONCEPTUAL PLANS DATED JULY 11, 2018* SUBMITTED WITH REVIEW REQUEST

OMITTED HERE FOR LENGTH PURPOSES

SEE CONCEPTUAL PLANS IN ATTACHMENT IV

IPaC **U.S. Fish & Wildlife Service**

Last login May 31, 2018 08:46 AM MDT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Cabin Branch Stream Mitigation Bank

LOCATION

Montgomery County, Maryland

DESCRIPTION

The project entails a proposed stream compensatory mitigation bank consisting of stream restoration activities along approximately 7,000 linear feet of Cabin Branch east of Watkins Mill Road and terminating just west of Centerway Local Park in Montgomery County, Maryland.

Local office

Chesapeake Bay Ecological Services Field Office

(410) 573-4599
(410) 266-9127

177 Admiral Cochrane Drive

Annapolis, MD 21401-7307

http://www.fws.gov/chesapeakebay/
http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

THERE ARE NO ENDANGERED SPECIES EXPECTED TO OCCUR AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Blue-winged Warbler *Vermivora pinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30

Cerulean Warbler Dendroica cerulea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 28 to Jul 20
Kentucky Warbler Oporornis formosus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and

that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

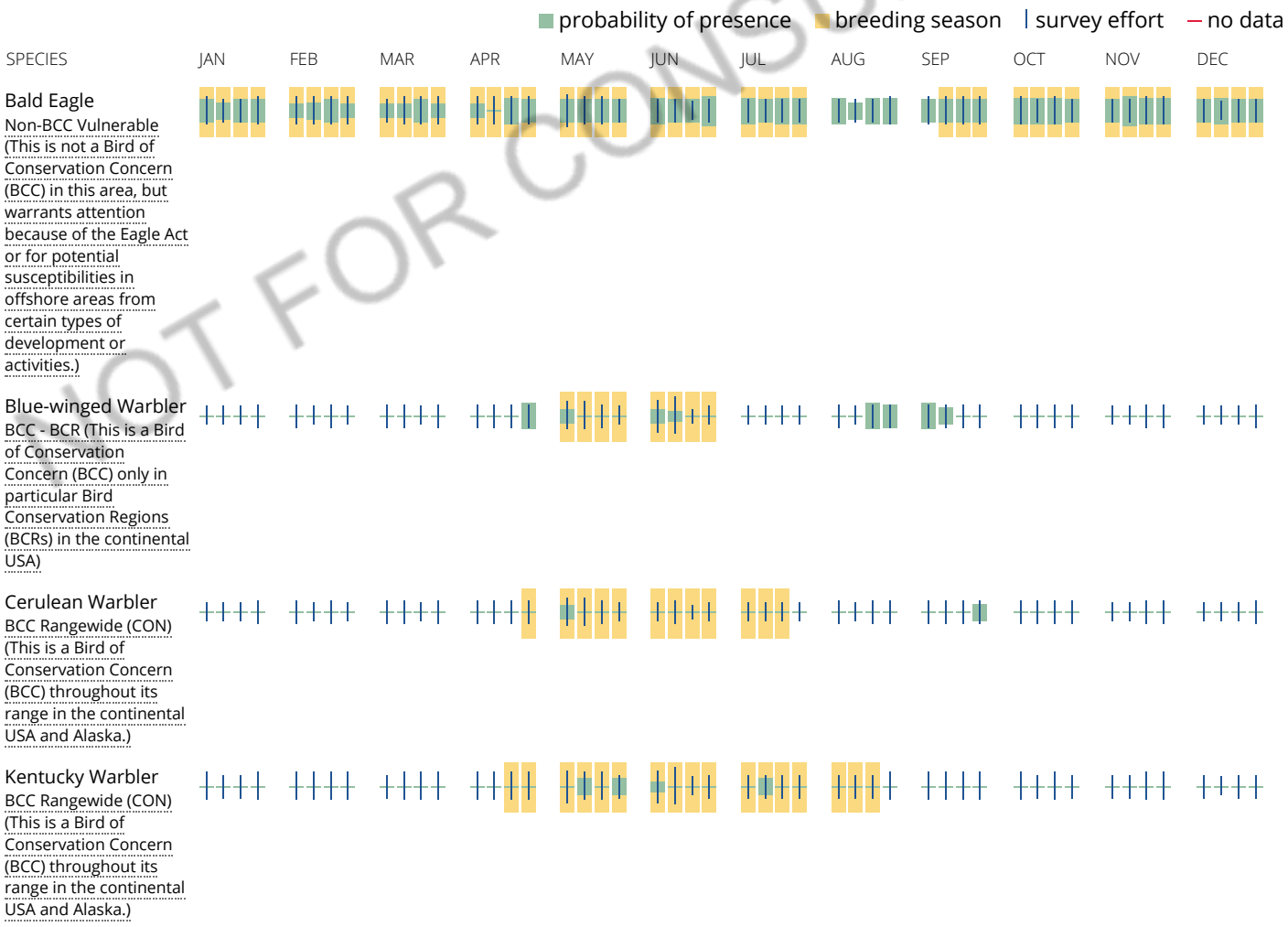
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

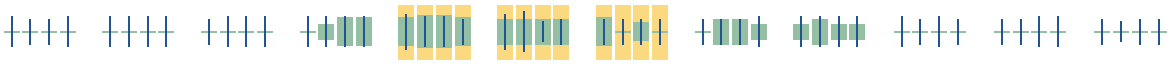
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

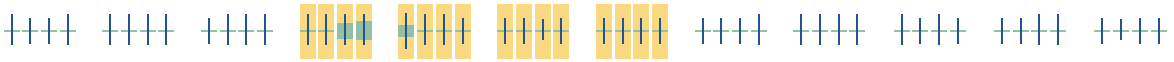
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



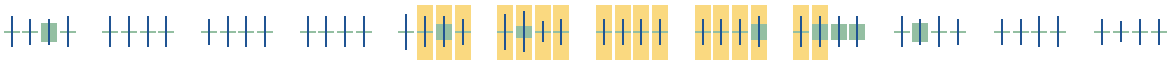
Prairie Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Prothonotary Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Red-headed Woodpecker
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Rusty Blackbird
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts

from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or

adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

July 23, 2020

Ms. Elizabeth Hughes
State Historic Preservation Officer
Maryland Historical Trust
100 Community Place
Crownsville, MD 21032-2023

Ms. Julie Langan
State Historic Preservation Officer
Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Dear Ms. Hughes and Ms. Langan:

This letter serves to continue consultation under Section 106 of the National Historic Preservation Act with the Maryland Historical Trust (MHT) and the Virginia Department of Historic Resources (DHR) for Project No. AW073A11, I-495 & I-270 Managed Lanes Study (MLS). The MLS is the first element of a broader I-495 & I-270 Public-Private Partnership (P3) Program which considers improvements along the entire length of I-495 (Capital Beltway) in Maryland, connecting into Virginia's portion of I-495, as well as the entire length of I-270 (Dwight D. Eisenhower Memorial Highway) up to I-70 in Frederick County, Maryland.

MDOT SHA coordinated the project's effect on historic properties and submitted the Cultural Resources Technical Report by letter dated January 10, 2020, with responses received from MHT and DHR dated March 12, 2020, and February 14, 2020, respectively. Per that, and subsequent correspondence with DHR, we understand DHR is awaiting resolution of National Register eligibility of resources in Virginia prior to commenting on the effect determination.

This update includes:

- An expansion of the Area of Potential Effects (APE) to encompass stream and wetland mitigation sites in Maryland
- New and revised eligibility determinations for three architectural resources in Maryland;
- New and revised effect determinations for six historic properties in Maryland;

Revised Area of Potential Effects

The APE for this project was previously defined as a 250-foot buffer of consideration on either side of the widest proposed alternative's Limits of Disturbance (LOD) (Alt 10). The APE includes additional buffer areas at the American Legion Bridge and elsewhere to capture setting, feeling, and viewshed effects. MDOT SHA has since identified potential environmental mitigation sites where stream and wetland restoration is proposed. Due to the nature of the work at these locations (restoration of existing natural features), the APE is confined to the LOD for each mitigation site, as no substantive visual elements are proposed that would be new or inconsistent with the existing character of these locations. The current known LOD of these sites have been added to the APE (**Attachment 1**).

Architecture

New and Updated Eligibility Determinations

Using the APE coordinated January 10, 2020, MDOT SHA identified two additional unrecorded architectural resources in Montgomery County, as documented in the attached Determination of Eligibility (DOE) forms (**Attachment 2**). The Forest Glen Tower (M: 31-81) is a steel lattice tower at Seminary Road and Forest Glen Road (MD 192); MDOT SHA has determined that this former Cold War-era air raid siren tower lacks integrity and is not eligible for listing in the National Register of Historic Places (NRHP). The Morningstar Tabernacle No. 88 Moses Hall and Cemetery (M: 35-212), at I-495 and Seven Locks Road, was the site of a late nineteenth-century African American benevolent society. MDOT SHA has determined that the property is eligible for listing in the NRHP under Criterion A for its association with the African American community in Cabin John and under Criterion C for its example of a vernacular African American cemetery.

Additionally, MDOT SHA updated the B&O Railroad, Metropolitan Branch (M: 37-16), DOE to provide additional information that expands upon previous surveys of the line (first surveyed in 1979 and determined eligible in 2000) to clarify the period of significance, revise the boundary, and provide a list of contributing and noncontributing resources. The Metropolitan Branch remains eligible for the NRHP. It is significant under Criterion A for its association with transportation and the agricultural and residential development of Frederick and Montgomery counties and under Criterion C for its engineering, representative of nineteenth and twentieth century railroad technology.

The new and updated eligibility determinations are summarized in **Table 1, Attachment 3**.

Updated Effect Assessments

Both physical effects as well as potential visual, atmospheric, or audible effects were considered within the entire APE. The effect assessment coordinated in the January 10, 2020, letter and

described in the Cultural Resources Technical Report found no adverse effect to 34 architectural historic properties and an adverse effect on 10 architectural historic properties. MDOT SHA has identified one additional architectural historic property in the APE: the Morningstar Tabernacle No. 88 Moses Hall and Cemetery, which will experience an adverse effect. In addition, new information in the updated DOE has resulted in a revised effect assessment for the B&O Railroad, Metropolitan Branch, which was previously determined to be adverse. In the January 10, 2020, letter, MDOT SHA also identified seven architectural historic properties where effects could not be fully determined. Ongoing project development has resulted in sufficient information to determine effects for four of the seven undetermined properties. Architectural historic properties with new or updated effect determinations are described below.

- ***Morningstar Tabernacle No. 88 Moses Hall and Cemetery (M: 35-212)***: Pending MHT concurrence that the resource is NRHP-eligible, MDOT SHA has determined that the project will adversely affect Morningstar Tabernacle No. 88 Moses Hall and Cemetery. The work proposed at this location includes widening along the outside of the I-495 inner loop to construct two new managed lanes and a new ramp to connect the managed lanes with MD 190 at the existing interchange. The width of new pavement beyond the existing edge of the outside shoulder is approximately 55 feet. A retaining wall is proposed along the edge of the proposed outside shoulder to minimize impacts to the property. The wall would retain fill for the widened roadway section. The limits of disturbance (LOD) are offset ten feet behind the proposed retaining wall to accommodate construction and maintenance of the wall, erosion and sediment control, drainage, and landscaping. A noise wall would be constructed within the LOD. As currently designed, the LOD would impact the historic property. Contributing elements within the LOD include portions of the Moses Hall foundation wall, a section of the former access road from Seven Locks Road, and at least one depression possibly marking a grave location. MDOT is continuing to examine engineering avoidance alternatives at this location, but based on current design an adverse effect is expected.

- ***B&O Railroad, Metropolitan Branch (M: 37-16)***: Activities at this location are unchanged, but new information in the DOE and further analysis of the LOD have resulted in a revised finding of no adverse effect for the property, pending MHT's concurrence with the revised DOE. The updated DOE form for the Metropolitan Branch demonstrates that the segment of the railroad within the LOD was realigned to the east during the construction of I-495 between 1957 and 1964, and the railroad bridge over I-495 was also completed at this time. The Metropolitan Branch's period of significance is 1873 to 1945, and the bridge and railroad alignment within the project area do not contribute to the significance of the branch. The current LOD include one contributing element of the Metropolitan Branch: Small Structure No. 15046X0, a stone arch culvert which carries Forest Glen Creek beneath the Metropolitan Branch and the adjacent Capitol View Avenue. The structure's southern spandrel wall appears within LOD on some imagery but is excluded from the limits and will not be affected. The project will cross the underground segment of Small Structure No. 15046X0 at the Metropolitan Branch tracks. The LOD at this location represent above-grade impacts, and no physical impacts to the historic property are anticipated; the vertical aspect

of the LOD remains at the surface. Current project engineering is not expected to alter the character of the property, and MDOT SHA is committed to both avoiding physical impacts to the aboveground spandrel wall and limiting ground disturbance along the underground segment of the small structure. Based upon the information presented in the updated DOE and the absence of impacts to Small Structure No. 15046X0, MDOT SHA has determined the project will not adversely affect the B&O Railroad, Metropolitan Branch.

- ***Carsondale (PG:73-36)***: Carsondale, one of the earliest suburban residential developments in Maryland to offer Veterans Administration (VA) financing for African American veterans, is eligible for the NRHP under Criterion A. Updated design information has allowed MDOT SHA to make a finding of adverse effect for the property. To accommodate widening along US 50 associated with realigning the US 50/I-495 interchange and replacement of the bridge carrying Whitfield Chapel Road over US 50, the LOD in Carsondale include: a narrow linear area that extends approximately 550 feet where the northern edge of the historic district meets US 50; and a narrow strip that extends 150 along the east side of Whitfield Chapel Road. Activities within Carsondale would consist of tree removal, grading, construction of a retaining wall, and access for construction vehicles and materials. Along Whitfield Chapel Road, the roadway height would be adjusted to meet the elevation of the new bridge across US 50. There are no physical impacts to contributing dwellings, but the LOD encompass minor portions of front or rear yards, including some secondary structures, of nine dwellings that contribute to the district's significance. These include the rear yards of seven dwellings along the north side of Wallace Road (9004, 9010, 9016, 9018, 9104, 9112, 9114) and the front yards of two dwellings on Whitfield Chapel Road (4907 and 4909). These multiple minor impacts to contributing resources will result in a cumulative diminishment of the property's integrity of setting and design.

- ***Capitol View Park Historic District (M: 31-7)***: Activities at this location are unchanged, but a detailed review of design needs have resulted in a revised finding of no adverse effect for the property. The LOD are in close proximity to contributing stone walls surrounding the parking lot for the Castle of Forest Glen at 10 Post Office Road. However, MDOT SHA has determined the stone walls will be avoided and no LOD impacts will occur, and the project will not adversely affect the Capitol View Park Historic District.

- ***Washington Aqueduct (M: 24-49)***: Activities at this location are unchanged, but MDOT SHA's design development has resulted in a revised finding of no adverse effect for the property. The LOD at this location represent above-grade impacts, and no physical impacts to the historic property are anticipated; the vertical aspect of the APE and LOD remains at the surface at this location, and ground disturbance that would affect the Aqueduct will be prohibited. The project will cross an underground segment of the aqueduct at MacArthur Boulevard. Current project engineering is not expected to alter the character of the property. The project will not adversely affect the Washington Aqueduct.

- ***Suitland Parkway (PG:76A-22)***: Suitland Parkway is listed on the NRHP under Criteria A and C in the areas of transportation and landscape architecture. MDOT SHA has determined that the project will not adversely affect Suitland Parkway. In addition to the widening of the I-495 bridge over Suitland Parkway, activities at this location include grading, tree removal, landscape plantings, erosion and sediment control, construction of an auxiliary pipe to augment the existing culvert conveying Henson Creek beneath I-495, and access for construction vehicles and materials. These activities will not affect any structures that contribute to the significance of Suitland Parkway, including bridges, culverts, stone-lined ditches, stone curbing, and drop inlets. The proposed pipe extension will occur at a pipe constructed for I-495. Improvement and maintenance of the outfall will direct water away from the historic property and reduce environmental degradation along the north side of the parkway, preserving its character. In areas affected by grading and tree removal, landscape plantings consistent with the original design and character of the parkway will be used to replace vegetation and will be maintained. The existing bridges carrying I-495 over Suitland Parkway are currently being widened and replaced by MDOT SHA. The bridges, currently under construction as part of a separate project and not part of the parkway itself, will accommodate the MLS improvements by the reduction of the median on the inside of I-495. The highway over Suitland Parkway will not be additionally widened, and no diminishment of the integrity of those characteristics that qualify the 9.18-mile long parkway for inclusion in the NRHP will result.

  MDOT SHA's use of the area impacted by the undertaking (I-495, bridges, relocated creek under I-495 and the proposed additional storm drain/culvert) will be authorized by a highway easement deed. NPS does not have the authority to authorize MDOT SHA use of NPS lands by way of a long-term maintenance agreement or other mechanism. NPS understands the highway easement deed will be issued by FHWA on behalf of the USA in accordance with 23 U.S.C. 107. The highway easement deed will provide MDOT SHA with an easement for their facilities, but NPS will retain the underlying ownership of the land. No character defining features of Suitland Parkway exist within the proposed area of transfer; furthermore, MDOT SHA and FHWA are subject to state (Maryland Historical Trust Act) and federal (Section 106) historic preservation requirements, which would ensure consideration of any impacts resulting from future actions related to these small MDOT SHA easement areas within Suitland Parkway.

The remaining three properties where effects cannot be fully determined will be subject to stipulations of the proposed Programmatic Agreement to avoid, minimize, or mitigate adverse effects as design advances. Updated property effect assessments are summarized in **Attachment 3**. MDOT SHA has determined the project continues to have an adverse effect on architectural historic properties.

Expanded APE in Maryland

MDOT SHA has conducted a preliminary review of the APE and has determined that the following mitigation sites will either not affect or will have no adverse effect on architectural historic properties.

- ***AN-1 (No Architectural Properties Affected)***: This site is a natural area within Crabbs Branch Stream Valley Park and includes no architectural resources
- ***AN-3 (No Architectural Properties Affected)***: This site is a natural area within Northwest Branch Stream Valley Park and includes no architectural resources.
- ***CA-2 (No Architectural Properties Affected)***: This site is a natural area within Great Seneca Stream Valley Park and includes no architectural resources.
- ***CA-3 (No Architectural Properties Affected)***: This site is a natural area within Magruder Branch Stream Valley Park and includes no architectural resources.
- ***RFP-1 (No Architectural Properties Affected)***: Includes multiple MIHP resources, all of which have been evaluated and determined not eligible, demolished, or both. The only remaining resource, the Bond Property (PG:60-10), was determined not eligible in November 2001. The Turner/Bond Family Cemetery (PG:60-2) was relocated to Union Cemetery in the 1980s by the Donaldson Funeral Home of Laurel; the cemetery location was field checked by MDOT SHA as below and confirmed to have been completely destroyed by gravel mining.
- ***RFP-4 (No Architectural Properties Affected)***: North of Greenock Road, Wilson Owens Branch passes through the golf course of the 1990 Cannon Country Club. A horse shed and fence at 5563 Greenock Road are within an area of proposed grading; however, these structures were constructed after 1981 (according to historical aerials). South of Greenock Road, the work will be confined to wooded areas along the stream bank, and the pre-1978 resources at 5461 and 5339 Greenock Road will not be affected by stream access areas.
- ***AN-6 and AN-7 (No Adverse Effect to Architectural Properties)***: These sites include the Beltsville Agricultural Research Center (BARC; PG:62-14), which is listed in the NRHP under Criteria A and C. The restoration of the existing stream will occur within a small portion of the 6500-acre resource and will not introduce new visual or physical elements out of character with the surrounding agricultural landscape; furthermore, no buildings or structures associated with BARC are within the APE. MDOT SHA's proposed stream restoration activities will not alter the characteristics that qualify BARC for the NRHP and do not meet the requirements of 36 CFR §800.5(1), Criteria of Adverse Effect.

MDOT SHA will undertake additional architectural historic property identification efforts at the remaining sites within the expanded APE, and the results will be coordinated during future consultation.

Archaeology

Maryland
The Study has identified proposed locations of stream restoration and mitigation, wetland creation, and fish passage improvements at eight sites on public lands and eight sites being developed on private lands by design consultants. MDOT SHA archaeologist Richard Ervin assessed the archaeological potential of the public and private mitigation sites, and additional archaeological investigations are being planned as follows. MDOT SHA will provide the results of these investigations when they are available.

MDOT SHA proposes the following archaeological evaluation approaches to the mitigation locations:

Mitigation Site	County	Proposed Work
AN-6 Paint Branch Fish Passage, South Farm	PG	Phase I archaeology will be undertaken at this site on BARC property; it is considered to have high archaeological potential based on prior sites recorded close to, but outside the LOD, and a favorable topographic setting.
AN-7 Paint Branch, South Farm	PG	Phase I archaeology will be undertaken at this site on BARC property, which is considered to have high archaeological potential based on prior sites recorded close to and within the LOD, and a favorable topographic setting. One site is recorded within the LOD: 18PR113 is a precontact short-term resource procurement site, and its status will be evaluated as part of the Phase I.
PA-1 Back Branch	PG	Phase I archaeological recordation will be undertaken at 18PR605, the Chesapeake Beach Railway. Most of the remaining portions of the mitigation site are considered to have low archaeological potential based on prior disturbance and poorly drained soils. However, limited Phase IA archaeological survey will be done in undisturbed, well-drained, high potential portions of the LOD.
RFP-3 Tuscarora Creek (Hope Site)	FR	Phase I archaeology will be undertaken based on high archaeological potential. One possible archaeological site is within the LOD, an Archaic Period quad file site BUCKEY-QF02. One standing structure is recorded in the survey area, the Hebb-Kline Farmstead (F-1-202).
RFP-4 Cabin-Branch (Bristol), Surplus Area, Surplus Streams	AA	Phase I archaeology will be undertaken at portions of the site that are considered to have high archaeological potential based on prior sites recorded nearby, and favorable topographic setting.

RFP-6 Mill Swamp Cr	CA	Phase I archaeology will be undertaken at portions of the site that are considered to have high archaeological potential based on favorable topographic setting. No sites are recorded in the LOD, but numerous sites have been recorded nearby, especially near the confluence of Pomonkey Creek and the Potomac River. One of these is 18CH73, a large pre-contact period site along the Potomac River 0.8 miles southwest of the LOD. Historic structures are shown in and near the project area on historic maps.
RFP-1 Indian Creek Tributaries at Konterra	PG	Based on prior disturbance, no further work is warranted at this time. The proposed LOD has been destroyed by sand and gravel quarrying. The Turner/Bond Family Cemetery (PG:60-2) was within Mitigation Area 5, located adjacent to but outside the proposed design. It was situated on a bluff overlooking the stream and its floodplain, but the cemetery has been moved. Its location has been destroyed by sand and gravel quarrying, as verified by a field visit by MDOT SHA. MDOT SHA will monitor project plans as the design progresses.
RFP-2 Cabin Branch Gaithersburg quad	MO	Based on prior disturbance and low archaeological potential, no further work is warranted at this time. Aerial imagery shows that the site has been disturbed by construction of a golf course. Most of the LOD is on frequently flooded soils within the active stream floodplain, or slopes steeper than 15%, settings where significant archaeological resources are not expected to occur. MDOT SHA will monitor project plans as the design progresses.
RFP-5 Henson Creek (Hovermale)	PG	Based on prior disturbance, no further work is warranted at this time. Most of the project is within areas of Urban land where significant archaeological resources are unlikely to occur. One standing structure is recorded in the survey area: Hovermale's Tastes Best Ice Cream (PG:80-25). No structures are depicted on historic maps (PG Co 1861; USGS East Washington 1886, Washington Vicinity 1917). MDOT SHA will monitor project plans as the design progresses.
AN-1 Crabbs Branch	MO	Based on low archaeological potential, no further work is warranted at this time. The LOD would mostly be confined to areas immediately adjacent to the stream channel, where significant archaeological resources are unlikely to occur. MDOT SHA will monitor project plans as the design progresses. Site 18PR320 (a Late Archaic short-term site) is documented approximately 1800 feet upstream of the proposed stream site.

AN-3 Northwest Branch Pebblestone Dr.	MO	Based on low archaeological potential and the negative results of prior survey, no further work is warranted at this time. Prior archaeological work indicates that the LOD is largely limited to terrain along Rolling Stone Creek that would have been too wet and low for occupation (Wagner 2014:131; in Mikolik and Reed [2014]). MDOT SHA will monitor project plans as the design progresses. The Bonifant Cemetery on North Sherwood Forest Lane, about 750 feet northwest of the stream, would not be impacted by the current design. Site 18MO596 (Late Archaic) is recorded approximately 2000 feet to the west of the study area.
CA-2 Lower Magruder Branch	MO	Based on low archaeological potential, no further work is warranted at this time. The results of prior archaeological survey at the adjacent SC-19 mitigation site (Emory 2011) suggest that the APE of CA-2, Lower Magruder Branch, is too wet for habitation, and is unlikely to contain significant archaeological resources. MDOT SHA will monitor project plans as the design progresses.
CA-3 Upper Magruder Branch	MO	Based on low archaeological potential, no further work is warranted at this time. The results of prior archaeological survey at the nearby SC-19 mitigation site (Emory 2011) suggest that the APE of CA-3, Lower Magruder Branch, is too wet for habitation, and is unlikely to contain significant archaeological resources. MDOT SHA will monitor project plans as the design progresses.
CA-5 Seneca Creek Tributary	MO	Based on low archaeological potential, no further work is warranted at this time. The LOD is mostly confined to areas of occasionally flooded soils on the active floodplain, or slopes greater than 15%. MDOT SHA will monitor project plans as the design progresses.

MDOT SHA noted several locations requiring additional archaeological study in our January 10, 2020 letter, and those will continue to be proposed as actions to be completed under the proposed Programmatic Agreement. To the extent feasible, limited additional investigations are being conducted at two cemetery locations, the Montgomery County Poor Farm and the Morningstar Tabernacle No. 88 Moses Hall and Cemetery. Preliminary mapping and recordation is underway at the Morningstar Tabernacle No. 88 Moses Hall and Cemetery to identify and record known interments, possible grave sites and depressions, and formal and informal grave markers. The foundation of the lodge building was also partially mapped. Completion of this initial work is pending required legal access to clear bamboo that obscures portions of the cemetery property. The technical report of the results of this work will be provided when it is available; MDOT

SHA will continue consultation including appropriate consulting parties on additional work expected beyond this surface mapping.

Virginia

No changes to the project, including the APE or effects assessments within Virginia are included in this letter, and it is informational for DHR, although any comments are welcome. MDOT SHA, National Park Service, and DHR will continue to coordinate on the outstanding eligibility and effects issues related to the George Washington Memorial Parkway (GWMP) and archaeological sites within the GWMP park boundaries under separate cover. MDOT SHA has requested an eligibility determination from the Keeper of the National Register regarding the proposed Dead Run Ridges Archaeological District in Fairfax County.

Ongoing Preliminary Engineering

For the overall project, MDOT SHA may require geotechnical borings or other minimally invasive preliminary engineering studies as part of project development prior to completion of Section 106 review. Consistent with MDOT SHA's statewide programmatic agreement, MDOT SHA will ensure cultural resources staff review proposed boring locations to avoid impacts to known archaeological sites. Geotechnical borings are assumed to have minimal potential to affect historic properties, and may inform on the potential for deeply buried surfaces within the LOD. For borings occurring outside MDOT SHA right-of-way, MDOT SHA will coordinate as appropriate with land-managing agencies on such borings.

MDOT SHA respectfully requests any comments on the revised APE, review by MHT of the enclosed information supporting the analysis, and concurrence on the following determinations:

- The Morningstar Tabernacle No. 88 Moses Hall and Cemetery is eligible for the NRHP and will be adversely affected
- The B&O Railroad, Metropolitan Branch, as revised, continues to be eligible for the NRHP but will not experience an adverse effect
- The Forest Glen Tower is **not** eligible for the NRHP
- There will be no adverse effect to the NRHP-eligible properties in Attachment 3, Table 4
- Properties in Attachment 3, Table 2 **will** experience an adverse effect
- Properties in Attachment 3, Table 3 should be subject to provisions of the proposed Programmatic Agreement to avoid, minimize or mitigate potential adverse effects
- No historic properties will be affected within the expanded APE at the following proposed mitigation sites: AN-1, AN-3, CA-2, CA-3, and RFP-1 (Table 5, Attachment 3).

We request the above responses from MHT by **August 24, 2020**. We look forward to working with the respective State Historic Preservation Offices and additional consulting parties on continued development of the proposed Programmatic Agreement for the MLS undertaking.

Please feel free to contact Steve Archer, MDOT SHA Cultural Resources Team Leader at 410-545-8508 or sarcher@mdot.maryland.gov with any questions or information needs on this project.

Sincerely,

Digitally signed by Steve Archer
Adobe Acrobat version: 2017.011.30171

Julie M. Schablitsky
for Chief Archaeologist/Assistant Division Chief
Environmental Planning Division

Attachments

cc:

Mr. Marc Holma, Virginia DHR
Ms. Jeanette Mar, Environmental Manager, FHWA Maryland Division
Mr. Tony Opperman, VDOT
Ms. Mandy Ranslow, ACHP
Mr. John Simkins, FHWA Virginia Division
Mr. Steve Archer, MDOT SHA-EPLD
Ms. Lisa B. Choplin, DBIA, Director, I-495 & I-270 P3 Office, MDOT SHA
Mr. Richard Ervin, MDOT SHA-EPLD
Mr. Jeffrey Folden, P.E., DBIA, Deputy Director, I-495 & I-270 P3 Office, MDOT SHA
Mr. Matt Manning, MDOT SHA-EPLD
Dr. Julie Schablitsky, MDOT SHA-EPLD
I-495 & I-270 MLS Section 106 Consulting Parties

-For Maryland Historical Trust Use Only-

Concurrence with the MDOT State Highway Administration's Determination(s) of Eligibility and/or Effects

Project Number: AW073A11 **MHT Log No.**_____
Project Name: I-495 & I-270 Managed Lanes Study (MLS)
County: Montgomery and Prince George's
Letter Date: July 23, 2020

The Maryland Historical Trust has reviewed the documentation attached to the referenced letter and concurs with the MDOT State Highway Administration's determinations as follows:

Appropriate Area of Potential Effects (Attachment 1)

[ ] Concur
[ ] Do Not Concur

Eligibility (as noted in the Eligibility Table [Attachment 3]):

[ ] Concur
[ ] Do Not Concur

Effect (as noted in the Effects Table [Attachment 3]):

[ ] No Properties Affected
[ ] No Adverse Effect
[ ] Conditioned upon the following action(s) (see comments below)
[ ] Adverse Effect

Comments:

_____
_____
_____
_____
_____
_____

By: _____ _____
MD State Historic Preservation Office/ Maryland Historical Trust — Date

Return by U.S. Mail or Facsimile to:
Dr. Julie M. Schablitsky, Assistant Division Chief, Environmental Planning Division,
MDOT State Highway Administration, P.O. Box 717, Baltimore, MD 21203-0717
Telephone: 410-545-8870 and Facsimile: 410-209-5046
A_Proj Number: 11729

Attachment 3

Table 1: New and Updated Eligibility Determinations

MIHP#	Name	Type	SHA NR Det.	SHPO Concurrence	Remarks
M: 37-16	B&O Railroad, Metropolitan Branch	Structure	Remains Eligible	Requested 7/2020	Updated DOE provides additional information that expands upon previous surveys (first surveyed in 1979 and determined eligible in October 2000) to clarify the period of significance, revise the boundary, and provide a list of contributing and noncontributing resources.
M: 31-81	Forest Glen Tower	Structure	Not Eligible	Requested 7/2020	Cold War-era air raid siren tower lacks integrity
M: 35-212	Morningstar Tabernacle No. 88 Moses Hall and Cemetery	District	Eligible	Requested 7/2020	Significant under Criteria A for its association with the African American community in Cabin John and under Criterion C for its example of a vernacular African American cemetery. Meets Criteria Consideration D.

Table 2: Properties Experiencing an Adverse Effect

MIHP#/DHR#	Name	Type	Impact	SHPO Concurrence	Period of Significance	NRHP Criteria	Remarks
PG:73-36	Carsondale	District	Adverse	Requested 7/2020	1955-1962	A	Eligible
M: 35-212	Morningstar Tabernacle No. 88 Moses Hall and Cemetery	Landscape	Adverse	Requested 7/2020	1887-1973	A, C, Criteria Consideration D	Eligible

Table 3: Properties Where Effects Cannot Be Fully Determined

MIHP#/DHR#	Name	Type	Impact	SHPO Concurrence	Period of Significance	NRHP Criteria	Remarks
M: 29-59	Carderock Springs Historic District	District	Effects Cannot Be Fully Determined	Concurred 3/2020	1962-1967	A, C	Listed
M: 29-39	Gibson Grove A.M.E. Zion Church	Building	Effects Cannot Be Fully Determined	Concurred 3/2020	1923	A, Criteria Consideration A	Eligible
M: 32-5	Polychrome Historic District	District	Effects Cannot Be Fully Determined	Concurred 3/2020	1934-1935	A, C	Listed

Table 4: Properties Experiencing No Adverse Effect

MIHP#/DHR#	Name	Type	Impact	SHPO Concurrence	Period of Significance	NRHP Criteria	Remarks
M: 37-16	B&O Railroad, Metropolitan Branch	Structure	No Adverse	Requested 7/2020	1873-1945	A, C	Eligible; project will avoid contributing resources
PG:62-14	Beltsville Agricultural Research Center (BARC)	District	No Adverse	Requested 7/2020	Not established		Listed; stream restoration
M: 31-7	Capitol View Park Historic District	District	No Adverse	Requested 7/2020	1887-1941	A, C	Eligible; project will avoid contributing resources
PG:76A-22	Suitland Parkway	District	No Adverse	Requested 7/2020	1942-1944	A, C	Listed
M: 29-49	Washington Aqueduct	Structure	No Adverse	Requested 7/2020	1853-1939	A, C	Listed (NHL); project will avoid below-ground impacts

Attachment 3

Table 5: Stream and Wetland Mitigation Site Summary

Site Number	County	Architecture	Archaeology	Effect	Remarks
AN-1	Montgomery	No architectural resources present	Low potential; no further work is warranted	**NPA**	
AN-3	Montgomery	No architectural resources present	Low potential, negative results of prior survey; no further work is warranted	**NPA**	
AN-6	Prince George's	No adverse effect	Phase I archaeology will be undertaken	**TBD**	Within Beltsville Agricultural Research Center (PG:62-14)
AN-7	Prince George's	No adverse effect	Phase I archaeology will be undertaken	**TBD**	Within Beltsville Agricultural Research Center (PG:62-14)
CA-2	Montgomery	No architectural resources present	Low potential, negative results of prior survey; no further work is warranted	**NPA**	
CA-3	Montgomery	No architectural resources present	Low potential, negative results of prior survey; no further work is warranted	**NPA**	
CA-5	Montgomery	Additional evaluation to be completed	Low potential; no further work is warranted	**TBD**	
PA-1	Prince George's	Additional evaluation to be completed	Phase I archaeology will be undertaken	**TBD**	
RFP-1	Prince George's	No architectural resources present	Prior disturbance; no further work is warranted	**NPA**	
RFP-2	Montgomery	Additional evaluation to be completed	Prior disturbance and low potential; no further work is warranted	**TBD**	
RFP-3	Frederick	Additional evaluation to be completed	Phase I archaeology will be undertaken	**TBD**	
RFP-4	Anne Arundel	No architectural resources present	Phase I archaeology will be undertaken	**TBD**	
RFP-5	Prince George's	Additional evaluation to be completed	Prior disturbance; no further work is warranted	**TBD**	
RFP-6	Calvert	Additional evaluation to be completed	Phase I archaeology will be undertaken	**TBD**	

Maryland
DEPARTMENT OF PLANNING
MARYLAND HISTORICAL TRUST

September 4, 2020

Dr. Julie M. Schablitsky
MDOT State Highway Administration
707 North Calvert Street
Baltimore, MD 21202

Re: I-495 & I-270 Managed Lanes Study (MLS)
Montgomery and Prince George's Counties, Maryland
MDOT SHA Project No. AW073A11

Dear Dr. Schablitsky:

Thank you for providing the Maryland Historical Trust (Trust), the Maryland State Historic Preservation Office, with additional information regarding the above-referenced undertaking. The Maryland Department of Transportation State Highway Administration's (MDOT SHA) submittal represents ongoing consultation to assess the project's effects on historic properties, pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the Maryland Historical Trust Act of 1985, as amended, State Finance and Procurement Article §§ 5A-325 and 5A-326 of the Annotated Code of Maryland. Trust staff have conducted a thorough review of the materials and we are writing to provide our comments and concurrence.

Revised Area of Potential Effects (APE): Based on ongoing design development, MDOT SHA has expanded the undertaking's APE to include potential environmental mitigation sites and additional buffer areas in the vicinity of the American Legion Bridge. The Trust agrees that the MDOT SHA's redefined APE encompasses the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties.

Additional Identification and Evaluation of Historic Properties within the APE: MDOT SHA conducted additional assessments of the APE to identify historic properties. Determination of Eligibility (DOE) Forms were prepared for two newly identified architectural resources and an existing DOE was updated to identify the property's areas of significance.

The Trust concurs with MDOT SHA that the following properties are eligible for listing in the National Register:

MIHP No. M: 35-212	Morningstar Tabernacle No. 88 Moses Hall and Cemetery This property is eligible for the National Register under Criteria A and C as the site of a 19th century African American benevolent society and cemetery.
MIHP No. M: 37-16	B&O Railroad, Metropolitan Branch The Metropolitan Branch of the B&O Railroad was determined eligible in 2000. The Trust concurs with the MDOT SHA's updated documentation to identify a period of significance, National Register boundary, and contributing/non-contributing features.

The Trust concurs with MDOT SHA that the following property is not eligible for listing in the National Register:

MIHP No. M: 31-81	Forest Glen Tower The Trust agrees that the steel lattice tower lacks integrity and is not eligible for National Register-listing.

The potential for significant archeological resources was assessed by MDOT SHA within the expanded APE, including the environmental mitigations sites. We agree with MDOT SHA's recommendations on Pages 7-9 of your letter that additional Phase I investigations are warranted for several environmental mitigation areas. We look forward to receiving the results of this work, along with the analysis of several other locations requiring archeological study as noted in MDOT SHA's 10 January 2020 letter, as project planning continues.

Revised Assessment of Effects: The Trust concurs with MDOT SHA's determination that the overall proposed undertaking will have an adverse effect on historic properties, including archeological properties, in Maryland. Furthermore, the Trust agrees with the following specific findings stated in MDOT SHA's submittal letter dated 23 July 2020 and accompanying attachments:

- In addition to the properties noted as adversely affected in our previous correspondence, we agree that the undertaking will also adversely affect the Carsondale Historic District (MIHP No. PG:73-36) and the Morningstar Tabernacle No. 88 Moses Hall and Cemetery (MIHP No. M: 35-212).
- We agree that the undertaking may affect the historic properties listed in Table 3 (Attachment #3) and further consultation will be needed during design development to consider and address effects.
- We concur that the undertaking will have no adverse effect on the historic properties listed in Table 4 (Attachment #3).

The Trust appreciates MDOT SHA's robust and continuous coordination with our office and other consulting parties in accordance with Section 106. We look forward to working with your office as the project advances to develop and refine avoidance and minimization efforts.

If you have questions or need further assistance, please contact Tim Tamburrino (for historic structures) at tim.tamburrino@maryland.gov or Beth Cole (for archeology) at beth.cole@maryland.gov. Thank you for providing us this opportunity to comment.

Sincerely,

Elizabeth Hughes
Director/State Historic Preservation Officer
EH/BC/TJT/202003475

cc: Caryn Brookman (SHA)
Jeanette Masr (FHWA)
Rebeccah Ballo (Montgomery County Planning)
Joey Lampl (Montgomery County Parks)
Sarah Rogers (Heritage Tourism Alliance of Montgomery County, Inc.)
Howard Berger (Prince George's County Planning Department)
Aaron Marcavitch (Anacostia Trails Heritage Area, Inc.)
Friends of Moses Hall

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127
http://www.fws.gov/chesapeakebay/
http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html

In Reply Refer To: April 26, 2022
Project Code: 2022-0036153
Project Name: Cabin Branch Stream Mitigation Bank

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of

this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
(410) 573-4599

Project Summary

Project Code: 2022-0036153
Event Code: None
Project Name: Cabin Branch Stream Mitigation Bank
Project Type: Mitigation Development/Review - Mitigation or Conservation Bank
Project Description: The project entails a proposed stream compensatory mitigation bank consisting of stream restoration
activities along approximately 7,000 linear feet of Cabin Branch east of Watkins Mill Road and terminating
just west of Centerway Local Park in Montgomery County, Maryland.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.17871265,-77.20419629049644,14z

Counties: Montgomery County, Maryland

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis*	Threatened

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

- Projects with a federal nexus that have tree clearing = to or > 15 acres: 1. REQUEST A SPECIES LIST 2. NEXT STEP: EVALUATE DETERMINATION KEYS 3. SELECT EVALUATE under the Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency key

Species profile: https://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

- The monarch is a candidate species and not yet listed or proposed for listing. There are generally no section 7 requirements for candidate species (FAQ found here: https://www.fws.gov/savethemonarch/FAQ-Section7.html).

Species profile: https://ecos.fws.gov/ecp/species/9743

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

WETLAND INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE VISIT HTTPS://WWW.FWS.GOV/WETLANDS/DATA/MAPPER.HTML OR CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

IPaC User Contact Information

Agency: Maryland State Highway Administration
Name: Laura Callens
Address: 6958 Aviation Blvd, Suite C
City: Glen Burnie
State: MD
Zip: 21061
Email lcallens@res.us
Phone: 2402066732

Lead Agency Contact Information

Lead Agency: Maryland State Highway Administration

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Cabin Branch Stream Mitigation Bank

LOCATION

Montgomery County, Maryland

DESCRIPTION

Some(The project entails a proposed stream compensatory mitigation bank consisting of stream restoration
activities along approximately 7,000 linear feet of Cabin Branch east of Watkins Mill Road

and terminating
just west of Centerway Local Park in Montgomery County, Maryland.)

Local office

Chesapeake Bay Ecological Services Field Office

(410) 573-4599
(410) 266-9127

177 Admiral Cochrane Drive
Annapolis, MD 21401-7307

http://www.fws.gov/chesapeakebay/
http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of

Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found	Threatened

This species only needs to be considered if the following condition applies:

- Projects with a federal nexus that have tree clearing = to or > 15 acres: 1. REQUEST A SPECIES LIST 2. NEXT STEP: EVALUATE DETERMINATION KEYS 3. SELECT EVALUATE under the Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency key

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9045

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found	Candidate

This species only needs to be considered if the following condition applies:

- The monarch is a candidate species and not yet listed or proposed for listing. There are generally no section 7 requirements for candidate species (FAQ found here: https://www.fws.gov/savethemonarch/FAQ-Section7.html).

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9743

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY

BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Cerulean Warbler Dendroica cerulea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 28 to Jul 20
Kentucky Warbler Oporornis formosus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

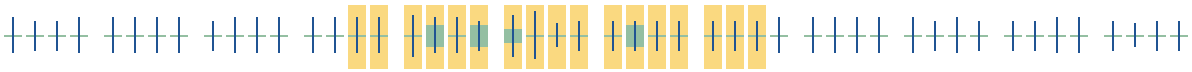
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

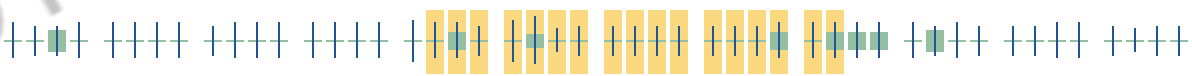
Kentucky Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Prairie Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

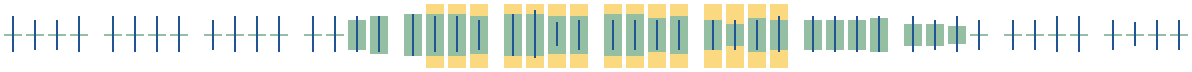
Prothonotary Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Red-headed Woodpecker BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Rusty Blackbird BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Wood Thrush BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or

products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

STREAM MITIGATION CALCULATOR

BACKGROUND INFORMATION

Corps Project ID #:		Corps PM:	
Project Name:	RFP-2 Cabin Branch	Date:	3/10/2022
Lat/Long:	N 39D 10' 43", W 77D 12' 08"	Sponsor:	MDOT SHA
County:	Montgomery	Collaborators:	HGS, LLC/MLA

Total Stream Gains (Functional Feet): 5583

Reach Name	Physiographic Region	Evaluation	Activity	Resource Type	Length (Feet)	Stream Quality	Channel Thread	Drainage Area (sqmi)	Raw Reach Value (Functional Feet)	Raw Change in Value (Functional Feet)	Site Sensitivity	Site Protection	Buffer Adjustment	Buffer Area (Acres)	Buffer Quality	Stream Gains (Functional Feet)	REMARKS
Cabin Branch	Piedmont	Existing	Preliminary Resource Evaluation	Perennial Wadeable	4670	35%	Primary	4.33	2895	3653	1	Easement	Evaluation			4236	
							1	1.77			0.1	0.03	Existing Buffer	6.08	63%		
	Piedmont	Proposed	Restoration/Enhancement	Perennial Wadeable	4680	79%	Primary	4.33	6548		374	123	Proposed Buffer	6.08	94%		
							1	1.77					Functional Feet		86		
Tributary 1	Piedmont	Existing	Preliminary Resource Evaluation	Intermittent	0	14%	Primary	0.15	0	190	1	Easement	Evaluation			225	
							1	0.48			0.1	0.03	Existing Buffer	0.58	60%		
	Piedmont	Proposed	Restoration/Enhancement	Intermittent	497.5	80%	Primary	0.15	190		20	7	Proposed Buffer	0.58	94%		
							1	0.48					Functional Feet		9		
Tributary 2	Piedmont	Existing	Preliminary Resource Evaluation	Intermittent	0	14%	Primary	0.02	0	154	1	Easement	Evaluation			184	
							1	0.41			0.1	0.03	Existing Buffer	0.54	60%		
	Piedmont	Proposed	Restoration/Enhancement	Intermittent	471	80%	Primary	0.02	154		16	5	Proposed Buffer	0.54	94%		
							1	0.41					Functional Feet		8		
Tributary 3	Piedmont	Existing	Preliminary Resource Evaluation	Intermittent	0	14%	Primary	0.08	0	237	1	Easement	Evaluation			283	
							1	0.41			0.1	0.03	Existing Buffer	0.83	60%		
	Piedmont	Proposed	Restoration/Enhancement	Intermittent	723.6	80%	Primary	0.08	237		25	8	Proposed Buffer	0.83	94%		
							1	0.41					Functional Feet		13		
Tributary 4	Piedmont	Existing	Preliminary Resource Evaluation	Intermittent	713	39%	Primary	0.13	125	168	1	Easement	Evaluation			206	
							1	0.45			0.1	0.03	Existing Buffer	0.93	60%		
	Piedmont	Proposed	Restoration/Enhancement	Intermittent	812.6	80%	Primary	0.13	293		18	6	Proposed Buffer	0.93	94%		
							1	0.45					Functional Feet		14		
Tributary 5	Piedmont	Existing	Preliminary Resource Evaluation	Intermittent	0	14%	Primary	0.06	0	13	1	Easement	Evaluation			15	
							1	0.41			0.1	0.03	Existing Buffer	0.04	60%		
	Piedmont	Proposed	Restoration/Enhancement	Intermittent	38.6	80%	Primary	0.06	13		1	0	Proposed Buffer	0.04	94%		
							1	0.41					Functional Feet		1		
Cabin Branch (PEPCO)	Piedmont	Existing	Preliminary Resource Evaluation	Perennial Wadeable	252	35%	Primary	4.3	156	235	1	Improved Protection	Evaluation			256	
							1	1.77			0.1	-0.03	Existing Buffer	0.33	63%		
	Piedmont	Proposed	Restoration/Enhancement	Perennial Wadeable	280	79%	Primary	4.3	391		24	-8	Proposed Buffer	0.33	94%		
							1	1.77					Functional Feet		5		
Trib 4 (PEPCO)	Piedmont	Existing	Preliminary Resource Evaluation	Intermittent	122	39%	Primary	0.13	21	23	1	Improved Protection	Evaluation			27	
							1	0.45			0.1	-0.03	Existing Buffer	0.16	60%		
	Piedmont	Proposed	Restoration/Enhancement	Intermittent	123	80%	Primary	0.13	44		3	-1	Proposed Buffer	0.16	94%		
							1	0.45					Functional Feet		2		
Trib 5 (PEPCO)	Piedmont	Existing	Preliminary Resource Evaluation	Intermittent	0	14%	Primary	0.06	0	133	1	Improved Protection	Evaluation			150	
							1	0.41			0.1	-0.03	Existing Buffer	0.46	60%		
	Piedmont	Proposed	Restoration/Enhancement	Intermittent	407	80%	Primary	0.06	133		14	-5	Proposed Buffer	0.46	94%		
							1	0.41					Functional Feet		7		
	Not Selected	Existing	Preliminary Resource Evaluation	NA	0	0%	NA	0	0	0	0	Select From List	Evaluation			NA	
							0	FALSE			0	0	Existing Buffer				
	Not Selected	Proposed	NA	NA	0		NA	0	0		0	NA	Proposed Buffer				

Maryland Stream Mitigation Framework Version 1: Stream Buffer Quality Assessment

Project Name:	RFP-2 Cabin Branch	**SBAA (Acres):**	6.08
CSBA Name:	Cabin Branch	*Infrastructure Area (Acres):*	0
Assessor(s):	RC	*Wetland Area (Acres):*	0
Date:	3/10/2022	*Area Credited By Other Prog:*	0
Latitude(*dec. deg*):	39.177353	**CSBA (Acres):**	6.08
Longitude (*dec. deg*):	-77.199137	**Existing Buffer Quality (%)*:**	*62.9*
Corps Permit Number:		**Proposed Buffer Quality (%)*:**	*94.3*

General Notes: Cabin Branch riparian conditions are similar throughout the project site so were scored with a composite score for the entire reach.

General Instructions: Identify your ***Stream Buffer Assessment Area*** *(****SBAA****). The Stream Buffer Assessment Area is the area where the Stream Buffer Quality Assessment Metrics 1 and 2 will occur. The SBAA includes the project area (future conservation easement area) for a given stream reach and any inholdings (Easements/infrastructure, credited wetlands, etc between the SBAA boundary and the stream). The SBAA may not exceed 200 feet from the baseflow channel edge. To determine the* ***Credited Stream Buffer Area (CSBA)****, subtract the Infrastructure Area and Area Credited by other Programs (TMDL, Wetland Credits, Forest Conservation, etc.) from the SBAA. A CSBA should be selected where vegetation or topography changes significantly. Please use the Wetland Delineation Forms applying the appropriate regional supplement to determine the extent of wetlands in the SBAA and to collect vegetation data. In the metrics below, circle the most applicable metric for your assessed area. Please use the comments box below each metric for any discussion items. Mapping is required showing landscape and project context for the SBAA and CSBA. More information can be found in the* ***MSMF Version 1: Stream Buffer Assessment Detailed Instructions****.*
Highlighted cells above are MSMF V.1. Mitigation Calculator input values.

Metrics Applied to Stream Buffer Assessment Area (SBAA)

Metric 1: % SBAA as wetlands

Ranges	50%+	30-49%	15-30%	5-15%	0%
Existing	4	3	2	1	0
Proposed	4	3	2	1	0

Notes: Only POW within the existing buffer. Areas will be converted to PFO to increase wetlands within the buffer area.

Metric 2: % of SBAA as Utilities/Infrastructure

Ranges	0	1-5%	5-10%	10-15%	>15%
Existing	4	3	2	1	0
Proposed	4	3	2	1	0

Notes: All utilities have been removed from the credit calculations and buffer scores.

Metrics Applied to Credited Stream Buffer Area (CSBA)

Metric 3: Plant Species Richness in CSBA (MDWAM 2022)

Ranges	11+	9-10	6-8	2-5	2 or less

Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes: Historic golf course with limited existing plant species.					
Metric 4: % Canopy Cover in the CSBA3 (VA Unified 2008)					
Ranges	>60%	30-60%	10%-29%	1-9%	0%
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes: Very limited existing trees on the site and are situated primarily along Cabin Branch and randomly throughout the historic fairways.					
Metric 5: # of Strata in CSBA1 (MDWAM 2022)					
Ranges	4+	3	2	1	0
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					
Metric 6: Total Cover of herbaceous, emergent, and submergent plants in CSBA1 (MDWAM 2022)					
Ranges	>75%	51-74%	26-50%	<25%	NA
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes: Since the golf course has been out of operation for several years there is very little bare areas outside of the eroding stream banks.					
Metric 7: Invasive Plant Species (Total Relative % Cover) in CSBA1 (MDWAM 2022)					
Ranges	<1%	1-10%	11-25%	26-50%	51-100%
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes: Typical invasive species found throughout the region. Due to the large watershed of Cabin Branch it will be very difficult to maintain invasive species cover below 1%.					
Metric 8: Mircotopgraphy and Woody Debris in CSBA 1,2 (MDWAM 2022 & MDE 2021)					
Description	Woody debris and topographic deviations widespread, covering >15% of the CSBA. Multiple types of woody debris (Snags, downed wood, etc)	Woody debris and topographic deviations common, covering 10-15% of CSBA. Woody debris may lack diversity.	Occasional woody debris and topographic deviations present (Covering 5-9% CSBA) and/or woody debris lacking diversity.	Woody debris and topographic deviations very limited (<5% CSBA coverage) and/or Either woody debris or topographic deviations absent or scarce.	Woody debris and deviations in topography very scarce or not present
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes: Limited diversity in the riparian condition due to the historic land use as a golf course and the area being maintained over those years.					
Metric 9: Height Above Nearest Drainage in CSBA4 (Nobre et al. 2011)					
Ranges	0-2 ft	2.1-3 ft	3.1-4 ft	4.1-6 ft	>6 ft
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					

Maryland Stream Mitigation Framework Version 1: Stream Buffer Quality Assessment

Project Name:	RFP-2 Cabin Branch	**SBAA (Acres):**	2.8
CSBA Name:	Tributaries	*Infrastructure Area (Acres):*	0
Assessor(s):	RC	*Wetland Area (Acres):*	0
Date:	3/10/2022	*Area Credited By Other Prog:*	0
Latitude(*dec. deg*):	39.177353	**CSBA (Acres):**	2.8
Longitude (*dec. deg*):	-77.199137	**Existing Buffer Quality (%)*:**	*60*
Corps Permit Number:		**Proposed Buffer Quality (%)*:**	*94.3*

General Notes: Tributaries are primarily piped so scored the surrounding buffer in the vicinity of the piped channel.

General Instructions: Identify your ***Stream Buffer Assessment Area*** *(* ***SBAA****). The Stream Buffer Assessment Area is the area where the Stream Buffer Quality Assessment Metrics 1 and 2 will occur. The SBAA includes the project area (future conservation easement area) for a given stream reach and any inholdings (Easements/infrastructure, credited wetlands, etc between the SBAA boundary and the stream). The SBAA may not exceed 200 feet from the baseflow channel edge. To determine the* ***Credited Stream Buffer Area (CSBA)****, subtract the Infrastructure Area and Area Credited by other Programs (TMDL, Wetland Credits, Forest Conservation, etc.) from the SBAA. A CSBA should be selected where vegetation or topography changes significantly. Please use the Wetland Delineation Forms applying the appropriate regional supplement to determine the extent of wetlands in the SBAA and to collect vegetation data. In the metrics below, circle the most applicable metric for your assessed area. Please use the comments box below each metric for any discussion items. Mapping is required showing landscape and project context for the SBAA and CSBA. More information can be found in the* ***MSMF Version 1: Stream Buffer Assessment Detailed Instructions****.*
Highlighted cells above are MSMF V.1. Mitigation Calculator input values.

Metrics Applied to Stream Buffer Assessment Area (SBAA)

Metric 1: % SBAA as wetlands

Ranges	50%+	30-49%	15-30%	5-15%	0%
Existing	4	3	2	1	0
Proposed	4	3	2	1	0

Notes:

Metric 2: % of SBAA as Utilities/Infrastructure

Ranges	0	1-5%	5-10%	10-15%	>15%
Existing	4	3	2	1	0
Proposed	4	3	2	1	0

Notes:

Metrics Applied to Credited Stream Buffer Area (CSBA)

Metric 3: Plant Species Richness in CSBA (MDWAM 2022)

Ranges	11+	9-10	6-8	2-5	2 or less

Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					

Metric 4: % Canopy Cover in the CSBA3 (VA Unified 2008)					
Ranges	>60%	30-60%	10%-29%	1-9%	0%
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					

Metric 5: # of Strata in CSBA1 (MDWAM 2022)					
Ranges	4+	3	2	1	0
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					

Metric 6: Total Cover of herbaceous, emergent, and submergent plants in CSBA1 (MDWAM 2022)					
Ranges	>75%	51-74%	26-50%	<25%	NA
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					

Metric 7: Invasive Plant Species (Total Relative % Cover) in CSBA1 (MDWAM 2022)					
Ranges	<1%	1-10%	11-25%	26-50%	51-100%
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					

Metric 8: Mircotopgraphy and Woody Debris in CSBA 1,2 (MDWAM 2022 & MDE 2021)					
Description	Woody debris and topographic deviations widespread, covering >15% of the CSBA. Multiple types of woody debris (Snags, downed wood, etc)	Woody debris and topographic deviations common, covering 10-15% of CSBA. Woody debris may lack diversity.	Occasional woody debris and topographic deviations present (Covering 5-9% CSBA) and/or woody debris lacking diversity.	Woody debris and topographic deviations very limited (<5% CSBA coverage) and/or Either woody debris or topographic deviations absent or scarce.	Woody debris and deviations in topography very scarce or not present
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					

Metric 9: Height Above Nearest Drainage in CSBA4 (Nobre et al. 2011)					
Ranges	0-2 ft	2.1-3 ft	3.1-4 ft	4.1-6 ft	>6 ft
Existing	4	3	2	1	0
Proposed	4	3	2	1	0
Notes:					

EXISTING and PROPOSED REACH LEVEL STREAM FUNCTION-BASED RAPID ASSESSMENT FIELD DATA SHEET

Watershed:	Middle Potomac - Catoctin	Rater(s):	RC/BW
Stream:	Cabin Branch	Date:	3/10/2022
Reach Length:	5008 linear feet	Latitude:	39.177353
Photo(s):	See Attached	Longitude:	-77.199137
Reach ID:	Cabin Branch	**Reach Score/Reach Total**	**Ex. 60/170 Prop.: 134/170**
			Quality: Ex: 0.35 Prop:0.79

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Runoff	**Stream Function Pyramid Level 1 Hydrology**			
	1. Concentrated Flow	No potential for concentrated flow/impairments from adjacent land use	Some potential for concentrated flow/impairments to reach restoration site, however, measures are in place to protect resources	Potential for concentrated flow/impairments to reach restoration site and no treatments are in place
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	2. Flashiness	Non-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover less than 6%	Semi-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover 7 - 15%	Flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover greater than 15%
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1
	Stream Function Pyramid Level 1 Hydrology Overall EXISTING Condition		**F FAR NF**	**Score:7**
	Stream Function Pyramid Level 1 Hydrology Overall PROPOSED Condition		**F FAR NF**	**Score:14**
Floodplain Connectivity (Vertical Stability)	**Stream Function Pyramid Level 2 Hydraulics**			
	3. Bank Height Ratio (BHR)	<1.20	1.21 - 1.50	>1.50
	Existing Condition	10 9 8	7 6 5 4	3 **2** 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4a. Entrenchment (Meandering streams in alluvial valleys or Rosgen C, E, DA Streams)	>2.2	2.1 - 1.4	<1.4
	Existing Condition	10 9 8	7 6 **5** 4	3 2 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4b. Entrenchment (Non meandering streams in colluvial valleys or Rosgen B Streams)	>1.4	1.3 - 1.1	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	5. Floodplain Drainage	no concentrated flow; runoff is primarily sheet flow; hillslopes < 10%; hillslopes >200 ft from stream; ponding or wetland areas and litter or debris jams are well represented	runoff is equally sheet and concentrated flow (minor gully and rill erosion occurring); hillslopes 10 - 40%; hillslopes 50 - 200 ft from stream; ponding or wetland areas and litter or debris jams are minimally represented	concentrated flows present (extensive gully and rill erosion); hillslopes >40%; hillslopes <50 ft from stream; ponding or wetland areas and litter or debris jams are not well represented or absent
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	6. Vertical Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	Stream Function Pyramid Level 2 Hydraulics Overall EXISTING Condition		**F FAR NF**	**Score:14**
	Stream Function Pyramid Level 2 Hydraulics Overall PROPOSED Condition		**F FAR NF**	**Score:36**

Reach ID:	Cabin Branch	Reach Score/Reach Total Ex. 60/170 Prop.: 134/170	Quality: Ex: 0.35 Prop:0.79

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 3 Geomorphology				
Riparian Vegetation (Score = Average of Left and Right bank, max score of 10)	7. Riparian Vegetation Zone (EPA, 1999, modified)	Riparian zone extends to a width of >100 feet; good vegetation community diversity and density; human activities do not impact zone; invasive species not present or sparse	Riparian zone extends to a width of 25-100 feet; species composition is dominated by 2 or 3 species; human activities greatly impact zone; invasive species well represented and alter the community	Riparian zone extends to a width of <25 feet; little or no riparian vegetation due to human activities; majority of vegetation is invasive
	Left Bank Existing	10 9 8	7 6 5 4	3 **2** 1
	Left Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
	Right Bank Existing	10 9 8	7 6 5 4	3 **2** 1
	Right Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
Lateral Stability (Score =Average of Left and right bank, max score of 10)	8. Dominant Bank Erosion Rate Potential	Dominate bank erosion rate potential is low or BEHI/NBS Rating: L/VL, L/L, L/M, L/H, L/VH, M/VL	Dominate bank erosion rate potential is moderate or BEHI/NBS Rating: M/L, M/M, M/H, L/Ex, H/L, M/VH, M/Ex, H/L, H/M, VH/VL, Ex/VL	Dominate bank erosion rate potential is high or BEHI/NBS Rating: H/H, H/Ex, VH/H, Ex/M, Ex/H, Ex/VH, VH/VH, Ex/Ex
	Existing Condition (Right bank)	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition (Right Bank)	10 **9** 8	7 6 5 4	3 2 1
	Existing Condition (Left bank)	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition (Left Bank)	10 **9** 8	7 6 5 4	3 2 1
	9. Lateral Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
Bedform Diversity (Do not complete if stream is ephemeral)	10. Shelter for Fish and Macroinvertebrates (EPA 1999)	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, rubble, gravel, cobble and large rocks, or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	20-70% mix of stable habitat; suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale)	Less than 20% mix of stable habitat; lack of habitat availability less than desirables obvious; substrate unstable or lacking
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11a. Pool-to-Pool Spacing Ratio (Watersheds < 10 mi^2)	4.0 - 5.0	3.0 - 4.0 ***or*** 5.0 - 7.0	< 3.0 ***or*** >7.0
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	11b. Pool-to-Pool Spacing Ratio (Watersheds > 10 mi^2)	5.0 - 7.0	3.5 - 5.0 ***or*** 7.0 - 8.0	<3.5 ***or*** >8.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12a. Pool Max Depth Ratio/Depth Variability (Gravel Bed Streams)	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	12b. Pool Max Depth Ratio/Depth Variability (Sand Bed Streams)	>1.2	1.1 - 1.2	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
Bedform Diversity (Do not complete if stream is ephemeral)	**Moderate Gradient Perennial Streams in Colluvial Valleys**			
	11. Pool-to-Pool Spacing Ratio (3-5% Slope)	2.0 - 4.0	4.0 - 6.0	>6.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12. Pool Max Depth Ratio/Depth Variability	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1

Stream Function Pyramid Level 3 Geomorphology Overall EXISTING Condition F **FAR** NF **Score:17**

Stream Function Pyramid Level 3 Geomorphology Overall PROPOSED Condition **F** FAR NF **Score:53**

Reach ID:	Cabin Branch	Reach Score/Reach Total	Ex. 60/170 Prop.: 134/170	Quality: Ex: 0.35 Prop:0.79

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 4 Physicochemical				
Water Quality and Nutrients (Do not complete if stream is ephemeral)	13. Water Appearance and Nutrient Enrichment (USDA 1999)	Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks. Clear water along entire reach; diverse aquatic plant community includes low quantities of many species of macrophytes; little algal growth present	Frequent cloudiness especially after storm events; objects visible to depth 0.5 to 3.0 ft; may have slight green color; no oil sheen on water surface. Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrate	Very turbid or muddy appearance most of the time; objects visible at depth< 0.5 ft; slow moving water maybe bright green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface; or strong odor of chemicals, oil, sewage, or other pollutants. Pea-green, gray, or brown water along entire reach; dense stands of macrophytes clogging stream; severe algal blooms creating thick algal
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 8	7 6 **5** 4	3 2 1
	14. Detritus (Petersen, 1992)	Mainly consisting of leaves and wood without sediment covering it	Leaves and wood scarce; fine organic debris without sediment	Fine organic sediment - black in color and foul odor (anaerobic) or detritus absent
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1

Stream Function Pyramid Level 4 Physicochemical Overall EXISTING Condition F **FAR** **NF** **Score:7**

Stream Function Pyramid Level 4 Physicochemical Overall PROPOSED Condition F **FAR** NF **Score:11**

Biology (Do not complete if stream is ephemeral)				
Stream Function Pyramid Level 5 Biology				
	15. Macroinvertebrate	Abundant	Rare	Not present
	Existing Condition	10 9 8	7 6 **5** 4	3 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1
	16. Macroinvertebrate Tolerance	Abundant intolerant species	Limited intolerant species	Only tolerant species
	Existing Condition	10 9 8	7 6 **5** 4	3 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1
	17. Fish Presence	Abundant	Rare	Not present
	Existing Condition	10 9 8	7 6 **5** 4	3 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	If existing biology is FAR or NF, provide description of cause(s)			

Stream Function Pyramid Level 5 Biology Overall EXISTING Condition F **FAR** **NF** **Score: 15**

Stream Function Pyramid Level 5 Biology Overall PROPOSED Condition **F** **FAR** **NF** **Score: 20**

Reach ID:	Cabin Branch	Reach Score/Reach Total	Ex. 60/170 Prop.: 134/170	Quality: Ex: 0.35 Prop:0.79

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning

Bankfull Determination and Rosgen Stream Classification

Rosgen Stream Type (Observation): EX - F PRO - C/Bc

Regional Curve (circle one): **Piedmont** Coastal Plain Allegheny Plateau/Ridge and Valley Urban Karst

DA (sqmi)	4.32		
BF Width (ft)	26.2-27.0	BF Area (sqft)	40.6-50.7
BF Depth (ft)	1.5-1.94	Percent Impervious (%)	21.3

Field Measurements

Parameter	Measurements and Ratios			
Water surface to geomorphic feature elevation difference	Existing Min:1.6, Max: 2.5, Avg.:2.0			
Riffle Mean Depth at Bankfull Stage (dbkf)	Existing Min:1.7, Max: 2.29, Avg.:2.09	Proposed: 1.73 & 1.84		
Riffle Width at Bankfull Stage (Wbkf)	Existing Min:17.1, Max:22.5, Avg.:20.2	Proposed: 23.2 & 25.6		
Riffle XS Area at Bankfull Stage (Abkf = dbkf*Wbkf)	Existing Min: 34.4, Max: 45.8, Avg.:40.3	Proposed: 40.18 & 41.12		
Floodprone Area Width (Wfpa) (Wfpa=Width at elevation determined by 2xDmax)	Existing Not calculated at all XS Minimum 28.23	Target: 92.8 & 102.4		
Entrenchment Ratio (ER) (ER=Wfpa/Wbkf)	Existing Min: 1.4, Max: 1.93 Avg: 1.6	Target 4.0		
Low Bank Height (LBH)	Existing Min: 4.09, Max: 5.52, Avg.:4.53	Proposed: 2.3 & 2.4		
Riffle Maximum Depth at Bankfull Stage (Dmax)	Existing Min: 1.95, Max: 3.35, Avg.:2.56	Proposed: 2.3 & 2.4		
Bank Height Ratio (BHR) (BHR=LBH/Dmax)	Existing Min: 1.46, Max: 2.24, Avg.:1.79	Proposed: 1.0		
BEHI/NBS Ratings and Lengths	H/M, H/L, M/M, M/L, L/L	L/L		
Pool to Pool Spacing (P-P)	Ranges from 47-168	Proposed: Min:104, Max:168, Avg.:136.6		
Pool to Pool Spacing Ratio (P-P Ratio) (P-P Ratio=P-P/Wbkf)	Range from 2.4-8.4	Proposed: Min:4.4, Max:7.0, Avg.:5.7		
Pool Maximum Depth at Bankfull Stage (Dmbkfp)	n/a	Proposed: 4.3 & 4.6		
Pool Depth Ratio (Dmbkfp Ratio) (Dmbkfp Ratio=Dmbkfp/dbkf)	n/a	Proposed: 2.5		
Macroinvertebrate Taxa Observed	n/a	n/a		

EXISTING and PROPOSED REACH LEVEL STREAM FUNCTION-BASED RAPID ASSESSMENT FIELD DATA SHEET

Watershed:	Middle Potomac - Catoctin	Rater(s):	RC/BW
Stream:	Un -Named Tributary to Cabin Branch	Date:	3/10/2022
Reach Length:	542 linear feet	Latitude:	39.177353
Photo(s):	See Attached	Longitude:	-77.199137
Reach ID:	Trib 1	**Reach Score/Reach Total**	**Ex. 24/170 Prop.: 136/170** **Quality: Ex: 0.14 Prop:0.8**

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Runoff	**Stream Function Pyramid Level 1 Hydrology**			
	1. Concentrated Flow	No potential for concentrated flow/impairments from adjacent land use	Some potential for concentrated flow/impairments to reach restoration site, however, measures are in place to protect resources	Potential for concentrated flow/impairments to reach restoration site and no treatments are in place
	Existing Condition	10 9 8	7 6 5 4	3 **2** 1
	Proposed Condition	10 9 8	7 6 **5** 4	3 2 1
	2. Flashiness	Non-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover less than 6%	Semi-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover 7 - 15%	Flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover greater than 15%
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1
	Stream Function Pyramid Level 1 Hydrology Overall EXISTING Condition	**F FAR NF**		**Score:5**
	Stream Function Pyramid Level 1 Hydrology Overall PROPOSED Condition	**F FAR NF**		**Score:11**
Floodplain Connectivity (Vertical Stability)	**Stream Function Pyramid Level 2 Hydraulics**			
	3. Bank Height Ratio (BHR)	<1.20	1.21 - 1.50	>1.50
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4a. Entrenchment (Meandering streams in alluvial valleys or Rosgen C, E, DA Streams)	>2.2	2.1 - 1.4	<1.4
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4b. Entrenchment (Non meandering streams in colluvial valleys or Rosgen B Streams)	>1.4	1.3 - 1.1	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	5. Floodplain Drainage	no concentrated flow; runoff is primarily sheet flow; hillslopes < 10%; hillslopes >200 ft from stream; ponding or wetland areas and litter or debris jams are well represented	runoff is equally sheet and concentrated flow (minor gully and rill erosion occurring); hillslopes 10 - 40%; hillslopes 50 - 200 ft from stream; ponding or wetland areas and litter or debris jams are minimally represented	concentrated flows present (extensive gully and rill erosion); hillslopes >40%; hillslopes <50 ft from stream; ponding or wetland areas and litter or debris jams are not well represented or absent
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	6. Vertical Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	Stream Function Pyramid Level 2 Hydraulics Overall EXISTING Condition	**F FAR NF**		**Score:4**
	Stream Function Pyramid Level 2 Hydraulics Overall PROPOSED Condition	**F FAR NF**		**Score:26**

Reach ID:	Trib 1	Reach Score/Reach Total Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 3 Geomorphology				
Riparian Vegetation (Score = Average of Left and Right bank, max score of 10)	7. Riparian Vegetation Zone (EPA, 1999, modified)	Riparian zone extends to a width of >100 feet; good vegetation community diversity and density; human activities do not impact zone; invasive species not present or sparse	Riparian zone extends to a width of 25-100 feet; species composition is dominated by 2 or 3 species; human activities greatly impact zone; invasive species well represented and alter the community	Riparian zone extends to a width of <25 feet; little or no riparian vegetation due to human activities; majority of vegetation is invasive
	Left Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Left Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
	Right Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Right Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
Lateral Stability (Score =Average of Left and right bank, max score of 10)	8. Dominant Bank Erosion Rate Potential	Dominate bank erosion rate potential is low or BEHI/NBS Rating: L/VL, L/L, L/M, L/H, L/VH, M/VL	Dominate bank erosion rate potential is moderate or BEHI/NBS Rating: M/L, M/M, M/H, L/Ex, H/L, M/VH, M/Ex, H/L, H/M, VH/VL, Ex/VL	Dominate bank erosion rate potential is high or BEHI/NBS Rating: H/H, H/Ex, VH/H, Ex/M, Ex/H, Ex/VH, VH/VH, Ex/Ex
	Existing Condition (Right bank)	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition (Right Bank)	10 **9** 8	7 6 5 4	3 2 1
	Existing Condition (Left bank)	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition (Left Bank)	10 **9** 8	7 6 5 4	3 2 1
	9. Lateral Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
Bedform Diversity (Do not complete if stream is ephemeral)	10. Shelter for Fish and Macroinvertebrates (EPA 1999)	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, rubble, gravel, cobble and large rocks, or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	20-70% mix of stable habitat; suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale)	Less than 20% mix of stable habitat; lack of habitat availability less than desirables obvious; substrate unstable or lacking
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11a. Pool-to-Pool Spacing Ratio (Watersheds < 10 mi^2)	4.0 - 5.0	3.0 - 4.0 ***or*** 5.0 - 7.0	< 3.0 ***or*** >7.0
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11b. Pool-to-Pool Spacing Ratio (Watersheds > 10 mi^2)	5.0 - 7.0	3.5 - 5.0 ***or*** 7.0 - 8.0	<3.5 ***or*** >8.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12a. Pool Max Depth Ratio/Depth Variability (Gravel Bed Streams)	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	12b. Pool Max Depth Ratio/Depth Variability (Sand Bed Streams)	>1.2	1.1 - 1.2	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
Moderate Gradient Perennial Streams in Colluvial Valleys				
Bedform Diversity (Do not complete if stream is ephemeral)	11. Pool-to-Pool Spacing Ratio (3-5% Slope)	2.0 - 4.0	4.0 - 6.0	>6.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12. Pool Max Depth Ratio/Depth Variability	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1

Stream Function Pyramid Level 3 Geomorphology Overall EXISTING Condition F FAR NF Score:8

Stream Function Pyramid Level 3 Geomorphology Overall PROPOSED Condition F FAR NF Score:51

Reach ID:	Trib 1	Reach Score/Reach Total	Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning

Stream Function Pyramid Level 4 Physicochemical

Water Quality and Nutrients (Do not complete if stream is ephemeral)

13. Water Appearance and Nutrient Enrichment (USDA 1999)	Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks. Clear water along entire reach; diverse aquatic plant community includes low quantities of many species of macrophytes; little algal growth present			Frequent cloudiness especially after storm events; objects visible to depth 0.5 to 3.0 ft; may have slight green color; no oil sheen on water surface. Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrate				Very turbid or muddy appearance most of the time; objects visible at depth< 0.5 ft; slow moving water maybe bright green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface; or strong odor of chemicals, oil, sewage, or other pollutants. Pea-green, gray, or brown water along entire reach; dense stands of macrophytes clogging stream; severe algal blooms creating thick algal		
Existing Condition	10	9	8	7	6	5	4	**3**	2	1
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1
14. Detritus (Petersen, 1992)	Mainly consisting of leaves and wood without sediment covering it			Leaves and wood scarce; fine organic debris without sediment				Fine organic sediment - black in color and foul odor (anaerobic) or detritus absent		
Existing Condition	10	9	8	7	6	5	4	3	2	**1**
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1

Stream Function Pyramid Level 4 Physicochemical Overall EXISTING Condition F FAR **NF** **Score:4**

Stream Function Pyramid Level 4 Physicochemical Overall PROPOSED Condition **F** FAR NF **Score:16**

Stream Function Pyramid Level 5 Biology

Biology (Do not complete if stream is ephemeral)

15. Macroinvertebrate	Abundant			Rare				Not present		
Existing Condition	10	9	8	7	6	5	4	3	2	**1**
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1
16. Macroinvertebrate Tolerance	Abundant intolerant species			Limited intolerant species				Only tolerant species		
Existing Condition	10	9	8	7	6	5	4	3	2	**1**
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1
17. Fish Presence	Abundant			Rare				Not present		
Existing Condition	10	9	8	7	6	5	4	3	2	**1**
Proposed Condition	10	9	**8**	7	6	5	4	4	2	1
If existing biology is FAR or NF, provide description of cause(s)	Stream is currently piped.									

Stream Function Pyramid Level 5 Biology Overall EXISTING Condition F FAR **NF** **Score: 3**

Stream Function Pyramid Level 5 Biology Overall PROPOSED Condition **F** FAR NF **Score:24**

Reach ID:	Trib 1	Reach Score/Reach Total	Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning

Bankfull Determination and Rosgen Stream Classification

Rosgen Stream Type (Observation) EX - Stream is currently piped PRO - C

Regional Curve (circle one): **Piedmont** Coastal Plain Allegheny Plateau/Ridge and Valley Urban Karst

DA (sqmi)	0.15		
BF Width (ft)	5.6-7.1	BF Area (sqft)	2.7-4.4
BF Depth (ft)	0.48-0.62	Percent Impervious (%)	21.3

Field Measurements

Parameter	Measurements and Ratios			
Water surface to geomorphic feature elevation difference	Ex- Channel is piped Upstream Reference: 0.3-0.7; avg: 0.51			
Riffle Mean Depth at Bankfull Stage (dbkf)	Ex- Channel is piped Upstream Reference: 0.32-0.65; avg.: 0.54	Proposed: 0.39 & 0.49		
Riffle Width at Bankfull Stage (Wbkf)	Ex- Channel is piped Upstream Reference: 4.7-8.1; avg.: 6.48	Proposed: 5.0 & 6.6		
Riffle XS Area at Bankfull Stage (Abkf = dbkf*Wbkf)	Ex- Channel is piped Upstream Reference: 2.5-4.3; avg.: 3.40	Proposed: 1.95 & 3.24		
Floodprone Area Width (Wfpa) (Wfpa=Width at elevation determined by 2xDmax)	Ex- Channel is piped Upstream Reference: 6.0-9.1; avg.: 8.4	Target: 20 & 26.4		
Entrenchment Ratio (ER) (ER=Wfpa/Wbkf)	Ex- Channel is piped Upstream Reference: 1.12-1.45; avg.: 1.31	Target 4.0		
Low Bank Height (LBH)	Ex- Channel is piped Upstream Reference: 0.96-3.75; avg.: 2.51	Proposed: 2.3 & 2.4		
Riffle Maximum Depth at Bankfull Stage (Dmax)	Ex- Channel is piped Upstream Reference: 0.42-1.10; avg.: 0.82	Proposed: 0.5 & 0.6		
Bank Height Ratio (BHR) (BHR=LBH/Dmax)	Ex- Channel is piped Upstream Reference: 2.3-3.6; avg.: 2.9	Proposed: 1.0		
BEHI/NBS Ratings and Lengths	Ex- Channel is piped	L/L		
Pool to Pool Spacing (P-P)	Ex- Channel is piped	Proposed: Min: 21, Max: 46, Avg.: 34		
Pool to Pool Spacing Ratio (P-P Ratio) (P-P Ratio=P-P/Wbkf)	Ex- Channel is piped	Proposed: Min:3.2, Max:7.3, Avg.:5.6		
Pool Maximum Depth at Bankfull Stage (Dmbkfp)	Ex- Channel is piped	Proposed: 1.0 & 1.2		
Pool Depth Ratio (Dmbkfp Ratio) (Dmbkfp Ratio=Dmbkfp/dbkf)	Ex- Channel is piped	Proposed: 2.5		
Macroinvertebrate Taxa Observed	Ex- Channel is piped	n/a		

EXISTING and PROPOSED REACH LEVEL STREAM FUNCTION-BASED RAPID ASSESSMENT FIELD DATA SHEET

Watershed:	Middle Potomac - Catoctin	Rater(s):	RC/BW
Stream:	Un -Named Tributary to Cabin Branch	Date:	3/10/2022
Reach Length:	421 linear feet	Latitude:	39.177353
Photo(s):	See Attached	Longitude:	-77.199137
Reach ID:	Trib 2	**Reach Score/Reach Total**	**Ex. 24/170 Prop.: 136/170** **Quality: Ex: 0.14 Prop:0.8**

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Runoff	**Stream Function Pyramid Level 1 Hydrology**			
	1. Concentrated Flow	No potential for concentrated flow/impairments from adjacent land use	Some potential for concentrated flow/impairments to reach restoration site, however, measures are in place to protect resources	Potential for concentrated flow/impairments to reach restoration site and no treatments are in place
	Existing Condition	10 9 8	7 6 5 4	3 **2** 1
	Proposed Condition	10 9 8	7 6 **5** 4	3 2 1
	2. Flashiness	Non-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover less than 6%	Semi-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover 7 - 15%	Flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover greater than 15%
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1
	Stream Function Pyramid Level 1 Hydrology Overall EXISTING Condition	**F FAR NF**		**Score:5**
	Stream Function Pyramid Level 1 Hydrology Overall PROPOSED Condition	**F FAR NF**		**Score:11**
Floodplain Connectivity (Vertical Stability)	**Stream Function Pyramid Level 2 Hydraulics**			
	3. Bank Height Ratio (BHR)	<1.20	1.21 - 1.50	>1.50
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4a. Entrenchment (Meandering streams in alluvial valleys or Rosgen C, E, DA Streams)	>2.2	2.1 - 1.4	<1.4
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4b. Entrenchment (Non meandering streams in colluvial valleys or Rosgen B Streams)	>1.4	1.3 - 1.1	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	5. Floodplain Drainage	no concentrated flow; runoff is primarily sheet flow; hillslopes < 10%; hillslopes >200 ft from stream; ponding or wetland areas and litter or debris jams are well represented	runoff is equally sheet and concentrated flow (minor gully and rill erosion occurring); hillslopes 10 - 40%; hillslopes 50 - 200 ft from stream; ponding or wetland areas and litter or debris jams are minimally represented	concentrated flows present (extensive gully and rill erosion); hillslopes >40%; hillslopes <50 ft from stream; ponding or wetland areas and litter or debris jams are not well represented or absent
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	6. Vertical Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	Stream Function Pyramid Level 2 Hydraulics Overall EXISTING Condition	**F FAR NF**		**Score:4**
	Stream Function Pyramid Level 2 Hydraulics Overall PROPOSED Condition	**F FAR NF**		**Score:26**

Reach ID:	Trib 2	Reach Score/Reach Total Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 3 Geomorphology				
Riparian Vegetation (Score = Average of Left and Right bank, max score of 10)	7. Riparian Vegetation Zone (EPA, 1999, modified)	Riparian zone extends to a width of >100 feet; good vegetation community diversity and density; human activities do not impact zone; invasive species not present or sparse	Riparian zone extends to a width of 25-100 feet; species composition is dominated by 2 or 3 species; human activities greatly impact zone; invasive species well represented and alter the community	Riparian zone extends to a width of <25 feet; little or no riparian vegetation due to human activities; majority of vegetation is invasive
	Left Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Left Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
	Right Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Right Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
Lateral Stability (Score =Average of Left and right bank, max score of 10)	8. Dominant Bank Erosion Rate Potential	Dominate bank erosion rate potential is low or BEHI/NBS Rating: L/VL, L/L, L/M, L/H, L/VH, M/VL	Dominate bank erosion rate potential is moderate or BEHI/NBS Rating: M/L, M/M, M/H, L/Ex, H/L, M/VH, M/Ex, H/L, H/M, VH/VL, Ex/VL	Dominate bank erosion rate potential is high or BEHI/NBS Rating: H/H, H/Ex, VH/H, Ex/M, Ex/H, Ex/VH, VH/VH, Ex/Ex
	Existing Condition (Right bank)	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition (Right Bank)	10 **9** 8	7 6 5 4	3 2 1
	Existing Condition (Left bank)	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition (Left Bank)	10 **9** 8	7 6 5 4	3 2 1
	9. Lateral Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
Bedform Diversity (Do not complete if stream is ephemeral)	10. Shelter for Fish and Macroinvertebrates (EPA 1999)	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, rubble, gravel, cobble and large rocks, or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	20-70% mix of stable habitat; suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale)	Less than 20% mix of stable habitat; lack of habitat availability less than desirables obvious; substrate unstable or lacking
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11a. Pool-to-Pool Spacing Ratio (Watersheds < 10 mi^2)	4.0 - 5.0	3.0 - 4.0 ***or*** 5.0 - 7.0	< 3.0 ***or*** >7.0
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11b. Pool-to-Pool Spacing Ratio (Watersheds > 10 mi^2)	5.0 - 7.0	3.5 - 5.0 ***or*** 7.0 - 8.0	<3.5 ***or*** >8.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12a. Pool Max Depth Ratio/Depth Variability (Gravel Bed Streams)	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	12b. Pool Max Depth Ratio/Depth Variability (Sand Bed Streams)	>1.2	1.1 - 1.2	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
Moderate Gradient Perennial Streams in Colluvial Valleys				
Bedform Diversity (Do not complete if stream is ephemeral)	11. Pool-to-Pool Spacing Ratio (3-5% Slope)	2.0 - 4.0	4.0 - 6.0	>6.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12. Pool Max Depth Ratio/Depth Variability	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1

Stream Function Pyramid Level 3 Geomorphology Overall EXISTING Condition F FAR NF Score:8

Stream Function Pyramid Level 3 Geomorphology Overall PROPOSED Condition F FAR NF Score:51

Reach ID:	Trib 2	Reach Score/Reach Total Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 4 Physicochemical				
Water Quality and Nutrients (Do not complete if stream is ephemeral)	13. Water Appearance and Nutrient Enrichment (USDA 1999)	Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks. Clear water along entire reach; diverse aquatic plant community includes low quantities of many species of macrophytes; little algal growth present	Frequent cloudiness especially after storm events; objects visible to depth 0.5 to 3.0 ft; may have slight green color; no oil sheen on water surface. Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrate	Very turbid or muddy appearance most of the time; objects visible at depth< 0.5 ft; slow moving water maybe bright green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface; or strong odor of chemicals, oil, sewage, or other pollutants. Pea-green, gray, or brown water along entire reach; dense stands of macrophytes clogging stream; severe algal blooms creating thick algal
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	14. Detritus (Petersen, 1992)	Mainly consisting of leaves and wood without sediment covering it	Leaves and wood scarce; fine organic debris without sediment	Fine organic sediment - black in color and foul odor (anaerobic) or detritus absent
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1

Stream Function Pyramid Level 4 Physicochemical Overall EXISTING Condition F FAR **NF** **Score:4**

Stream Function Pyramid Level 4 Physicochemical Overall PROPOSED Condition **F** FAR NF **Score:16**

Stream Function Pyramid Level 5 Biology

Biology (Do not complete if stream is ephemeral)										
	15. Macroinvertebrate	Abundant			Rare				Not present	
	Existing Condition	10	9	8	7	6	5	4	3	2 **1**
	Proposed Condition	10	9	**8**	7	6	5	4	3	2 1
	16. Macroinvertebrate Tolerance	Abundant intolerant species			Limited intolerant species				Only tolerant species	
	Existing Condition	10	9	8	7	6	5	4	3	2 **1**
	Proposed Condition	10	9	**8**	7	6	5	4	3	2 1
	17. Fish Presence	Abundant			Rare				Not present	
	Existing Condition	10	9	8	7	6	5	4	3	2 **1**
	Proposed Condition	10	9	**8**	7	6	5	4	4	2 1
	If existing biology is FAR or NF, provide description of cause(s)	Stream is currently piped.								

Stream Function Pyramid Level 5 Biology Overall EXISTING Condition F FAR **NF** **Score: 3**

Stream Function Pyramid Level 5 Biology Overall PROPOSED Condition **F** FAR NF **Score:24**

Reach ID:	Trib 2	Reach Score/Reach Total	Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning

Bankfull Determination and Rosgen Stream Classification

Rosgen Stream Type (Observation) EX - Stream is currently piped PRO - C

Regional Curve (circle one): **Piedmont** Coastal Plain Allegheny Plateau/Ridge and Valley Urban Karst

DA (sqmi)	0.02		
BF Width (ft)	2.3-3.3	BF Area (sqft)	0.6-1.1
BF Depth (ft)	0.25-0.32	Percent Impervious (%)	21.3

Field Measurements

Parameter	Measurements and Ratios			
Water surface to geomorphic feature elevation difference	Ex- Channel is piped			
Riffle Mean Depth at Bankfull Stage (dbkf)	Ex- Channel is piped	Proposed: 0.24		
Riffle Width at Bankfull Stage (Wbkf)	Ex- Channel is piped	Proposed: 3.2		
Riffle XS Area at Bankfull Stage (Abkf = dbkf*Wbkf)	Ex- Channel is piped	Proposed: 0.78		
Floodprone Area Width (Wfpa) (Wfpa=Width at elevation determined by 2xDmax)	Ex- Channel is piped	Target: 12.8		
Entrenchment Ratio (ER) (ER=Wfpa/Wbkf)	Ex- Channel is piped	Target 4.0		
Low Bank Height (LBH)	Ex- Channel is piped	Proposed: 0.35		
Riffle Maximum Depth at Bankfull Stage (Dmax)	Ex- Channel is piped	Proposed: 0.35		
Bank Height Ratio (BHR) (BHR=LBH/Dmax)	Ex- Channel is piped	Proposed:1.0		
BEHI/NBS Ratings and Lengths	Ex- Channel is piped	L/L		
Pool to Pool Spacing (P-P)	Ex- Channel is piped	Proposed: Min: 16, Max: 24, Avg.: 20		
Pool to Pool Spacing Ratio (P-P Ratio) (P-P Ratio=P-P/Wbkf)	Ex- Channel is piped	Proposed: Min:5, Max:7.5, Avg.:6.3		
Pool Maximum Depth at Bankfull Stage (Dmbkfp)	Ex- Channel is piped	Proposed: 0.6		
Pool Depth Ratio (Dmbkfp Ratio) (Dmbkfp Ratio=Dmbkfp/dbkf)	Ex- Channel is piped	Proposed:2.5		
Macroinvertebrate Taxa Observed	Ex- Channel is piped	n/a		

EXISTING and PROPOSED REACH LEVEL STREAM FUNCTION-BASED RAPID ASSESSMENT FIELD DATA SHEET

Watershed:	Middle Potomac - Catoctin	Rater(s):	RC/BW
Stream:	Un -Named Tributary to Cabin Branch	Date:	3/10/2022
Reach Length:	8016 linear feet	Latitude:	39.177353
Photo(s):	See Attached	Longitude:	-77.199137
Reach ID:	Trib 3	**Reach Score/Reach Total**	**Ex. 24/170 Prop.: 136/170** **Quality: Ex: 0.14 Prop:0.8**

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Runoff	**Stream Function Pyramid Level 1 Hydrology**			
	1. Concentrated Flow	No potential for concentrated flow/impairments from adjacent land use	Some potential for concentrated flow/impairments to reach restoration site, however, measures are in place to protect resources	Potential for concentrated flow/impairments to reach restoration site and no treatments are in place
	Existing Condition	10 9 8	7 6 5 4	3 **2** 1
	Proposed Condition	10 9 8	7 6 **5** 4	3 2 1
	2. Flashiness	Non-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover less than 6%	Semi-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover 7 - 15%	Flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover greater than 15%
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1
	Stream Function Pyramid Level 1 Hydrology Overall EXISTING Condition	**F FAR NF**		**Score:5**
	Stream Function Pyramid Level 1 Hydrology Overall PROPOSED Condition	**F FAR NF**		**Score:11**
Floodplain Connectivity (Vertical Stability)	**Stream Function Pyramid Level 2 Hydraulics**			
	3. Bank Height Ratio (BHR)	<1.20	1.21 - 1.50	>1.50
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4a. Entrenchment (Meandering streams in alluvial valleys or Rosgen C, E, DA Streams)	>2.2	2.1 - 1.4	<1.4
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4b. Entrenchment (Non meandering streams in colluvial valleys or Rosgen B Streams)	>1.4	1.3 - 1.1	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	5. Floodplain Drainage	no concentrated flow; runoff is primarily sheet flow; hillslopes < 10%; hillslopes >200 ft from stream; ponding or wetland areas and litter or debris jams are well represented	runoff is equally sheet and concentrated flow (minor gully and rill erosion occurring); hillslopes 10 - 40%; hillslopes 50 - 200 ft from stream; ponding or wetland areas and litter or debris jams are minimally represented	concentrated flows present (extensive gully and rill erosion); hillslopes >40%; hillslopes <50 ft from stream; ponding or wetland areas and litter or debris jams are not well represented or absent
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	6. Vertical Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	Stream Function Pyramid Level 2 Hydraulics Overall EXISTING Condition	**F FAR NF**		**Score:4**
	Stream Function Pyramid Level 2 Hydraulics Overall PROPOSED Condition	**F FAR NF**		**Score:26**

Reach ID:	Trib 3	Reach Score/Reach Total Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 3 Geomorphology				
Riparian Vegetation (Score = Average of Left and Right bank, max score of 10)	7. Riparian Vegetation Zone (EPA, 1999, modified)	Riparian zone extends to a width of >100 feet; good vegetation community diversity and density; human activities do not impact zone; invasive species not present or sparse	Riparian zone extends to a width of 25-100 feet; species composition is dominated by 2 or 3 species; human activities greatly impact zone; invasive species well represented and alter the community	Riparian zone extends to a width of <25 feet; little or no riparian vegetation due to human activities; majority of vegetation is invasive
	Left Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Left Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
	Right Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Right Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
Lateral Stability (Score =Average of Left and right bank, max score of 10)	8. Dominant Bank Erosion Rate Potential	Dominate bank erosion rate potential is low or BEHI/NBS Rating: L/VL, L/L, L/M, L/H, L/VH, M/VL	Dominate bank erosion rate potential is moderate or BEHI/NBS Rating: M/L, M/M, M/H, L/Ex, H/L, M/VH, M/Ex, H/L, H/M, VH/VL, Ex/VL	Dominate bank erosion rate potential is high or BEHI/NBS Rating: H/H, H/Ex, VH/H, Ex/M, Ex/H, Ex/VH, VH/VH, Ex/Ex
	Existing Condition (Right bank)	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition (Right Bank)	10 **9** 8	7 6 5 4	3 2 1
	Existing Condition (Left bank)	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition (Left Bank)	10 **9** 8	7 6 5 4	3 2 1
	9. Lateral Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
Bedform Diversity (Do not complete if stream is ephemeral)	10. Shelter for Fish and Macroinvertebrates (EPA 1999)	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, rubble, gravel, cobble and large rocks, or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	20-70% mix of stable habitat; suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale)	Less than 20% mix of stable habitat; lack of habitat availability less than desirables obvious; substrate unstable or lacking
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11a. Pool-to-Pool Spacing Ratio (Watersheds < 10 mi^2)	4.0 - 5.0	3.0 - 4.0 ***or*** 5.0 - 7.0	< 3.0 ***or*** >7.0
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11b. Pool-to-Pool Spacing Ratio (Watersheds > 10 mi^2)	5.0 - 7.0	3.5 - 5.0 ***or*** 7.0 - 8.0	<3.5 ***or*** >8.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12a. Pool Max Depth Ratio/Depth Variability (Gravel Bed Streams)	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	12b. Pool Max Depth Ratio/Depth Variability (Sand Bed Streams)	>1.2	1.1 - 1.2	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
Moderate Gradient Perennial Streams in Colluvial Valleys				
Bedform Diversity (Do not complete if stream is ephemeral)	11. Pool-to-Pool Spacing Ratio (3-5% Slope)	2.0 - 4.0	4.0 - 6.0	>6.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12. Pool Max Depth Ratio/Depth Variability	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1

Stream Function Pyramid Level 3 Geomorphology Overall EXISTING Condition F FAR NF Score:8

Stream Function Pyramid Level 3 Geomorphology Overall PROPOSED Condition F FAR NF Score:51

Reach ID:	Trib 3	Reach Score/Reach Total	Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning

Stream Function Pyramid Level 4 Physicochemical

Water Quality and Nutrients (Do not complete if stream is ephemeral)

13. Water Appearance and Nutrient Enrichment (USDA 1999)	Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks. Clear water along entire reach; diverse aquatic plant community includes low quantities of many species of macrophytes; little algal growth present			Frequent cloudiness especially after storm events; objects visible to depth 0.5 to 3.0 ft; may have slight green color; no oil sheen on water surface. Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrate				Very turbid or muddy appearance most of the time; objects visible at depth< 0.5 ft; slow moving water maybe bright green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface; or strong odor of chemicals, oil, sewage, or other pollutants. Pea-green, gray, or brown water along entire reach; dense stands of macrophytes clogging stream; severe algal blooms creating thick algal		
Existing Condition	10	9	8	7	6	5	4	**3**	2	1
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1
14. Detritus (Petersen, 1992)	Mainly consisting of leaves and wood without sediment covering it			Leaves and wood scarce; fine organic debris without sediment				Fine organic sediment - black in color and foul odor (anaerobic) or detritus absent		
Existing Condition	10	9	8	7	6	5	4	3	2	**1**
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1

Stream Function Pyramid Level 4 Physicochemical Overall EXISTING Condition F FAR **NF** **Score:4**

Stream Function Pyramid Level 4 Physicochemical Overall PROPOSED Condition **F** FAR NF **Score:16**

Stream Function Pyramid Level 5 Biology

Biology (Do not complete if stream is ephemeral)

15. Macroinvertebrate	Abundant			Rare				Not present			
Existing Condition	10	9	8	7	6	5	4	3	2	**1**	
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1	
16. Macroinvertebrate Tolerance	Abundant intolerant species			Limited intolerant species				Only tolerant species			
Existing Condition	10	9	8	7	6	5	4	3	2	**1**	
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1	
17. Fish Presence	Abundant			Rare				Not present			
Existing Condition	10	9	8	7	6	5	4	3	2	**1**	
Proposed Condition	10	9	**8**	7	6	5	4	4	2	1	
If existing biology is FAR or NF, provide description of cause(s)	Stream is currently piped.										

Stream Function Pyramid Level 5 Biology Overall EXISTING Condition F FAR **NF** **Score: 3**

Stream Function Pyramid Level 5 Biology Overall PROPOSED Condition **F** FAR NF **Score:24**

Reach ID:	Trib 3	Reach Score/Reach Total	Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning

Bankfull Determination and Rosgen Stream Classification

Rosgen Stream Type (Observation) EX - Stream is currently piped PRO - C

Regional Curve (circle one): **Piedmont** Coastal Plain Allegheny Plateau/Ridge and Valley Urban Karst

DA (sqmi)	0.13		
BF Width (ft)	5.2-6.6	BF Area (sqft)	2.3-3.9
BF Depth (ft)	0.45-0.58	Percent Impervious (%)	21.3

Field Measurements

Parameter	Measurements and Ratios			
Water surface to geomorphic feature elevation difference	Ex- Channel is piped Upstream Reference: 0.57			
Riffle Mean Depth at Bankfull Stage (dbkf)	Ex- Channel is piped Upstream Reference: 0.5	Proposed: 0.36 & 0.48		
Riffle Width at Bankfull Stage (Wbkf)	Ex- Channel is piped Upstream Reference: 5.52	Proposed: 4.6 & 6.2		
Riffle XS Area at Bankfull Stage (Abkf = dbkf*Wbkf)	Ex- Channel is piped Upstream Reference: 2.8	Proposed: 1.65 & 2.97		
Floodprone Area Width (Wfpa) (Wfpa=Width at elevation determined by 2xDmax)	Ex- Channel is piped Upstream Reference: 5.9	Target: 18.4 & 24.8		
Entrenchment Ratio (ER) (ER=Wfpa/Wbkf)	Ex- Channel is piped Upstream Reference: 1.1	Target 4.0		
Low Bank Height (LBH)	Ex- Channel is piped Upstream Reference: 2.7	Proposed: 0.5 & 0.66		
Riffle Maximum Depth at Bankfull Stage (Dmax)	Ex- Channel is piped Upstream Reference: 0.7	Proposed: 0.5 & 0.66		
Bank Height Ratio (BHR) (BHR=LBH/Dmax)	Ex- Channel is piped Upstream Reference: 3.9	Proposed: 1.0		
BEHI/NBS Ratings and Lengths	Ex- Channel is piped	L/L		
Pool to Pool Spacing (P-P)	Ex- Channel is piped	Proposed: Min: 20, Max: 40, Avg.: 30		
Pool to Pool Spacing Ratio (P-P Ratio) (P-P Ratio=P-P/Wbkf)	Ex- Channel is piped	Proposed: Min:4.3, Max:8.3, Avg.:5.4		
Pool Maximum Depth at Bankfull Stage (Dmbkfp)	Ex- Channel is piped	Proposed: 0.9 & 1.2		
Pool Depth Ratio (Dmbkfp Ratio) (Dmbkfp Ratio=Dmbkfp/dbkf)	Ex- Channel is piped	Proposed: 2.5		
Macroinvertebrate Taxa Observed	Ex- Channel is piped	n/a		

EXISTING and PROPOSED REACH LEVEL STREAM FUNCTION-BASED RAPID ASSESSMENT FIELD DATA SHEET

Watershed:	Middle Potomac - Catoctin	Rater(s):	RC/BW
Stream:	Un -Named Tributary to Cabin Branch	Date:	3/10/2022
Reach Length:	1033 linear feet	Latitude:	39.177353
Photo(s):	See Attached	Longitude:	-77.199137
Reach ID:	Trib 4	**Reach Score/Reach Total**	**Ex. 66/170 Prop.: 136/170**
		Quality:	**Ex: 0.39 Prop:0.8**

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Runoff	**Stream Function Pyramid Level 1 Hydrology**			
	1. Concentrated Flow	No potential for concentrated flow/impairments from adjacent land use	Some potential for concentrated flow/impairments to reach restoration site, however, measures are in place to protect resources	Potential for concentrated flow/impairments to reach restoration site and no treatments are in place
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 8	7 6 **5** 4	3 2 1
	2. Flashiness	Non-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover less than 6%	Semi-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover 7 - 15%	Flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover greater than 15%
	Existing Condition	10 9 8	7 6 **5** 4	3 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1
	Stream Function Pyramid Level 1 Hydrology Overall EXISTING Condition		**F FAR NF**	**Score:9**
	Stream Function Pyramid Level 1 Hydrology Overall PROPOSED Condition		**F FAR NF**	**Score:11**
Floodplain Connectivity (Vertical Stability)	**Stream Function Pyramid Level 2 Hydraulics**			
	3. Bank Height Ratio (BHR)	<1.20	1.21 - 1.50	>1.50
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4a. Entrenchment (Meandering streams in alluvial valleys or Rosgen C, E, DA Streams)	>2.2	2.1 - 1.4	<1.4
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4b. Entrenchment (Non meandering streams in colluvial valleys or Rosgen B Streams)	>1.4	1.3 - 1.1	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	5. Floodplain Drainage	no concentrated flow; runoff is primarily sheet flow; hillslopes < 10%; hillslopes >200 ft from stream; ponding or wetland areas and litter or debris jams are well represented	runoff is equally sheet and concentrated flow (minor gully and rill erosion occurring); hillslopes 10 - 40%; hillslopes 50 - 200 ft from stream; ponding or wetland areas and litter or debris jams are minimally represented	concentrated flows present (extensive gully and rill erosion); hillslopes >40%; hillslopes <50 ft from stream; ponding or wetland areas and litter or debris jams are not well represented or absent
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	6. Vertical Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	Stream Function Pyramid Level 2 Hydraulics Overall EXISTING Condition		**F FAR NF**	**Score:15**
	Stream Function Pyramid Level 2 Hydraulics Overall PROPOSED Condition		**F FAR NF**	**Score:34**

Reach ID:	Trib 4	Reach Score/Reach Total	Ex. 66/170 Prop.: 136/170	Quality: Ex: 0.39 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 3 Geomorphology				
Riparian Vegetation (Score = Average of Left and Right bank, max score of 10)	7. Riparian Vegetation Zone (EPA, 1999, modified)	Riparian zone extends to a width of >100 feet; good vegetation community diversity and density; human activities do not impact zone; invasive species not present or sparse	Riparian zone extends to a width of 25-100 feet; species composition is dominated by 2 or 3 species; human activities greatly impact zone; invasive species well represented and alter the community	Riparian zone extends to a width of <25 feet; little or no riparian vegetation due to human activities; majority of vegetation is invasive
	Left Bank Existing	10 **9** 8	7 6 5 4	**3** 2 1
	Left Bank Proposed	10 9 8	7 6 5 4	3 2 1
	Right Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Right Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
Lateral Stability (Score =Average of Left and right bank, max score of 10)	8. Dominant Bank Erosion Rate Potential	Dominate bank erosion rate potential is low or BEHI/NBS Rating: L/VL, L/L, L/M, L/H, L/VH, M/VL	Dominate bank erosion rate potential is moderate or BEHI/NBS Rating: M/L, M/M, M/H, L/Ex, H/L, M/VH, M/Ex, H/L, H/M, VH/VL, Ex/VL	Dominate bank erosion rate potential is high or BEHI/NBS Rating: H/H, H/Ex, VH/H, Ex/M, Ex/H, Ex/VH, VH/VH, Ex/Ex
	Existing Condition (Right bank)	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition (Right Bank)	10 **9** 8	7 6 5 4	3 2 1
	Existing Condition (Left bank)	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition (Left Bank)	10 **9** 8	7 6 5 4	3 2 1
	9. Lateral Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 **8**	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
Bedform Diversity (Do not complete if stream is ephemeral)	10. Shelter for Fish and Macroinvertebrates (EPA 1999)	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, rubble, gravel, cobble and large rocks, or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	20-70% mix of stable habitat; suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale)	Less than 20% mix of stable habitat; lack of habitat availability less than desirables obvious; substrate unstable or lacking
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11a. Pool-to-Pool Spacing Ratio (Watersheds < 10 mi^2)	4.0 - 5.0	3.0 - 4.0 ***or*** 5.0 - 7.0	< 3.0 ***or*** >7.0
	Existing Condition	10 9 8	7 6 5 **4**	3 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11b. Pool-to-Pool Spacing Ratio (Watersheds > 10 mi^2)	5.0 - 7.0	3.5 - 5.0 ***or*** 7.0 - 8.0	<3.5 ***or*** >8.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12a. Pool Max Depth Ratio/Depth Variability (Gravel Bed Streams)	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	12b. Pool Max Depth Ratio/Depth Variability (Sand Bed Streams)	>1.2	1.1 - 1.2	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
Moderate Gradient Perennial Streams in Colluvial Valleys				
Bedform Diversity (Do not complete if stream is ephemeral)	11. Pool-to-Pool Spacing Ratio (3-5% Slope)	2.0 - 4.0	4.0 - 6.0	>6.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12. Pool Max Depth Ratio/Depth Variability	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1

Stream Function Pyramid Level 3 Geomorphology Overall EXISTING Condition F **FAR** NF **Score:22**

Stream Function Pyramid Level 3 Geomorphology Overall PROPOSED Condition **F** FAR NF **Score:51**

Reach ID:	Trib 4	Reach Score/Reach Total	Ex. 66/170 Prop.: 136/170	Quality: Ex: 0.39 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning

Stream Function Pyramid Level 4 Physicochemical

Water Quality and Nutrients (Do not complete if stream is ephemeral)

13. Water Appearance and Nutrient Enrichment (USDA 1999)	Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks. Clear water along entire reach; diverse aquatic plant community includes low quantities of many species of macrophytes; little algal growth present			Frequent cloudiness especially after storm events; objects visible to depth 0.5 to 3.0 ft; may have slight green color; no oil sheen on water surface. Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrate				Very turbid or muddy appearance most of the time; objects visible at depth< 0.5 ft; slow moving water maybe bright green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface; or strong odor of chemicals, oil, sewage, or other pollutants. Pea-green, gray, or brown water along entire reach; dense stands of macrophytes clogging stream; severe algal blooms creating thick algal		
Existing Condition	10	9	8	7	6	5	**4**	3	2	1	
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1	
14. Detritus (Petersen, 1992)	Mainly consisting of leaves and wood without sediment covering it			Leaves and wood scarce; fine organic debris without sediment				Fine organic sediment - black in color and foul odor (anaerobic) or detritus absent			
Existing Condition	10	9	8	7	6	5	**4**	3	2	1	
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1	

Stream Function Pyramid Level 4 Physicochemical Overall EXISTING Condition F FAR NF **Score:8**

Stream Function Pyramid Level 4 Physicochemical Overall PROPOSED Condition F FAR NF **Score:16**

Stream Function Pyramid Level 5 Biology

Biology (Do not complete if stream is ephemeral)

15. Macroinvertebrate	Abundant			Rare				Not present			
Existing Condition	10	9	8	7	6	5	**4**	3	2	1	
Proposed Condition	10	9	**8**	7	6	5	4	3	2	1	
16. Macroinvertebrate Tolerance	Abundant intolerant species			Limited intolerant species				Only tolerant species			
Existing Condition	10	9	8	7	6	5	4	3	2	1	
Proposed Condition	10	9	**8**	7	6	5	**4**	3	2	1	
17. Fish Presence	Abundant			Rare				Not present			
Existing Condition	10	9	8	7	6	5	4	3	2	1	
Proposed Condition	10	9	**8**	7	6	5	**4**	3	2	1	
If existing biology is FAR or NF, provide description of cause(s)											

Stream Function Pyramid Level 5 Biology Overall EXISTING Condition F **FAR** NF **Score: 12**

Stream Function Pyramid Level 5 Biology Overall PROPOSED Condition **F** FAR NF **Score:24**

Reach ID:	Trib 4	Reach Score/Reach Total	Ex. 66/170 Prop.: 136/170	Quality: Ex: 0.39 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning

Bankfull Determination and Rosgen Stream Classification

Rosgen Stream Type (Observation): EX - C/F PRO - C

Regional Curve (circle one): **Piedmont** Coastal Plain Allegheny Plateau/Ridge and Valley Urban Karst

DA (sqmi)	0.13		
BF Width (ft)	5.3-6.7	BF Area (sqft)	2.4-4.0
BF Depth (ft)	0.46-0.59	Percent Impervious (%)	21.3

Field Measurements

Parameter	Measurements and Ratios			
Water surface to geomorphic feature elevation difference	Existing Min:0.39, Max: 0.55, Avg.: 0.48			
Riffle Mean Depth at Bankfull Stage (dbkf)	Existing Min:0.44, Max: 0.55, Avg.: 0.48	Proposed: 0.31, 0.47 & 0.39		
Riffle Width at Bankfull Stage (Wbkf)	Existing Min:2.93, Max: 4.59, Avg.: 3.82	3.8, 5.0 & 6.0		
Riffle XS Area at Bankfull Stage (Abkf = dbkf*Wbkf)	Existing Min:1.53, Max: 2.18, Avg.: 1.83	Proposed: 1.18, 1.95 & 2.82		
Floodprone Area Width (Wfpa) (Wfpa=Width at elevation determined by 2xDmax)	Existing Min:4.44, Max: 7.80, Avg.: 5.56	Target: 8.4, 20 & 24		
Entrenchment Ratio (ER) (ER=Wfpa/Wbkf)	Existing Min:1.10, Max: 1.84, Avg.: 1.47	Target 2.2 / 4.0		
Low Bank Height (LBH)	Existing Min:1.0, Max: 1.95, Avg.: 1.29	Proposed: 0.42, 0.5 & 0.6		
Riffle Maximum Depth at Bankfull Stage (Dmax)	Existing Min:0.56, Max: 0.72, Avg.: 0.63	Proposed: 0.42, 0.5 & 0.6		
Bank Height Ratio (BHR) (BHR=LBH/Dmax)	Existing Min:1.38, Max:2.86, Avg.: 1.98	Proposed: 1.0		
BEHI/NBS Ratings and Lengths	H/M, H/L, M/M, M/L, L/L	L/L		
Pool to Pool Spacing (P-P)	Existing Avg.: 39.4	Proposed: Min: 12, Max: 49, Avg.: 25		
Pool to Pool Spacing Ratio (P-P Ratio) (P-P Ratio=P-P/Wbkf)	Existing Avg.: 10.32	Proposed: Min:2.3, Max:5.1, Avg.:5.0		
Pool Maximum Depth at Bankfull Stage (Dmbkfp)	Existing Avg.: 1.29	Proposed: 0.8, 1.0 & 1.2		
Pool Depth Ratio (Dmbkfp Ratio) (Dmbkfp Ratio=Dmbkfp/dbkf)	Existing Avg.: 2.7	Proposed: 2.5		
Macroinvertebrate Taxa Observed	n/a	n/a		

EXISTING and PROPOSED REACH LEVEL STREAM FUNCTION-BASED RAPID ASSESSMENT FIELD DATA SHEET

Watershed:	Middle Potomac - Catoctin	Rater(s):	RC/BW
Stream:	Un -Named Tributary to Cabin Branch	Date:	3/10/2022
Reach Length:	554 linear feet	Latitude:	39.177353
Photo(s):	See Attached	Longitude:	-77.199137
Reach ID:	Trib 5	**Reach Score/Reach Total**	**Ex. 24/170 Prop.: 136/170** **Quality: Ex: 0.14 Prop:0.8**

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Runoff	**Stream Function Pyramid Level 1 Hydrology**			
	1. Concentrated Flow	No potential for concentrated flow/impairments from adjacent land use	Some potential for concentrated flow/impairments to reach restoration site, however, measures are in place to protect resources	Potential for concentrated flow/impairments to reach restoration site and no treatments are in place
	Existing Condition	10 9 8	7 6 5 4	3 **2** 1
	Proposed Condition	10 9 8	7 6 **5** 4	3 2 1
	2. Flashiness	Non-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover less than 6%	Semi-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover 7 - 15%	Flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover greater than 15%
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 8	7 **6** 5 4	3 2 1
	Stream Function Pyramid Level 1 Hydrology Overall EXISTING Condition	**F FAR NF**		**Score:5**
	Stream Function Pyramid Level 1 Hydrology Overall PROPOSED Condition	**F FAR NF**		**Score:11**
Floodplain Connectivity (Vertical Stability)	**Stream Function Pyramid Level 2 Hydraulics**			
	3. Bank Height Ratio (BHR)	<1.20	1.21 - 1.50	>1.50
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4a. Entrenchment (Meandering streams in alluvial valleys or Rosgen C, E, DA Streams)	>2.2	2.1 - 1.4	<1.4
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	4b. Entrenchment (Non meandering streams in colluvial valleys or Rosgen B Streams)	>1.4	1.3 - 1.1	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	5. Floodplain Drainage	no concentrated flow; runoff is primarily sheet flow; hillslopes < 10%; hillslopes >200 ft from stream; ponding or wetland areas and litter or debris jams are well represented	runoff is equally sheet and concentrated flow (minor gully and rill erosion occurring); hillslopes 10 - 40%; hillslopes 50 - 200 ft from stream; ponding or wetland areas and litter or debris jams are minimally represented	concentrated flows present (extensive gully and rill erosion); hillslopes >40%; hillslopes <50 ft from stream; ponding or wetland areas and litter or debris jams are not well represented or absent
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
	6. Vertical Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	Stream Function Pyramid Level 2 Hydraulics Overall EXISTING Condition	**F FAR NF**		**Score:4**
	Stream Function Pyramid Level 2 Hydraulics Overall PROPOSED Condition	**F FAR NF**		**Score:26**

Reach ID:	Trib 5	Reach Score/Reach Total Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 3 Geomorphology				
Riparian Vegetation (Score = Average of Left and Right bank, max score of 10)	7. Riparian Vegetation Zone (EPA, 1999, modified)	Riparian zone extends to a width of >100 feet; good vegetation community diversity and density; human activities do not impact zone; invasive species not present or sparse	Riparian zone extends to a width of 25-100 feet; species composition is dominated by 2 or 3 species; human activities greatly impact zone; invasive species well represented and alter the community	Riparian zone extends to a width of <25 feet; little or no riparian vegetation due to human activities; majority of vegetation is invasive
	Left Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Left Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
	Right Bank Existing	10 9 8	7 6 5 4	**3** 2 1
	Right Bank Proposed	10 **9** 8	7 6 5 4	3 2 1
Lateral Stability (Score =Average of Left and right bank, max score of 10)	8. Dominant Bank Erosion Rate Potential	Dominate bank erosion rate potential is low or BEHI/NBS Rating: L/VL, L/L, L/M, L/H, L/VH, M/VL	Dominate bank erosion rate potential is moderate or BEHI/NBS Rating: M/L, M/M, M/H, L/Ex, H/L, M/VH, M/Ex, H/L, H/M, VH/VL, Ex/VL	Dominate bank erosion rate potential is high or BEHI/NBS Rating: H/H, H/Ex, VH/H, Ex/M, Ex/H, Ex/VH, VH/VH, Ex/Ex
	Existing Condition (Right bank)	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition (Right Bank)	10 **9** 8	7 6 5 4	3 2 1
	Existing Condition (Left bank)	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition (Left Bank)	10 **9** 8	7 6 5 4	3 2 1
	9. Lateral Stability Extent	Stable	Localized Instability	Widespread Instability
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 **9** 8	7 6 5 4	3 2 1
Bedform Diversity (Do not complete if stream is ephemeral)	10. Shelter for Fish and Macroinvertebrates (EPA 1999)	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, rubble, gravel, cobble and large rocks, or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)	20-70% mix of stable habitat; suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale)	Less than 20% mix of stable habitat; lack of habitat availability less than desirables obvious; substrate unstable or lacking
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11a. Pool-to-Pool Spacing Ratio (Watersheds < 10 mi^2)	4.0 - 5.0	3.0 - 4.0 ***or*** 5.0 - 7.0	< 3.0 ***or*** >7.0
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	11b. Pool-to-Pool Spacing Ratio (Watersheds > 10 mi^2)	5.0 - 7.0	3.5 - 5.0 ***or*** 7.0 - 8.0	<3.5 ***or*** >8.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12a. Pool Max Depth Ratio/Depth Variability (Gravel Bed Streams)	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	12b. Pool Max Depth Ratio/Depth Variability (Sand Bed Streams)	>1.2	1.1 - 1.2	<1.1
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
Moderate Gradient Perennial Streams in Colluvial Valleys				
Bedform Diversity (Do not complete if stream is ephemeral)	11. Pool-to-Pool Spacing Ratio (3-5% Slope)	2.0 - 4.0	4.0 - 6.0	>6.0
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1
	12. Pool Max Depth Ratio/Depth Variability	>1.5	1.2 - 1.5	<1.2
	Existing Condition	10 9 8	7 6 5 4	3 2 1
	Proposed Condition	10 9 8	7 6 5 4	3 2 1

Stream Function Pyramid Level 3 Geomorphology Overall EXISTING Condition F FAR NF Score:8

Stream Function Pyramid Level 3 Geomorphology Overall PROPOSED Condition F FAR NF Score:51

Reach ID:	Trib 5	Reach Score/Reach Total Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Stream Function Pyramid Level 4 Physicochemical				
Water Quality and Nutrients (Do not complete if stream is ephemeral)	13. Water Appearance and Nutrient Enrichment (USDA 1999)	Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks. Clear water along entire reach; diverse aquatic plant community includes low quantities of many species of macrophytes; little algal growth present	Frequent cloudiness especially after storm events; objects visible to depth 0.5 to 3.0 ft; may have slight green color; no oil sheen on water surface. Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrate	Very turbid or muddy appearance most of the time; objects visible at depth< 0.5 ft; slow moving water maybe bright green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface; or strong odor of chemicals, oil, sewage, or other pollutants. Pea-green, gray, or brown water along entire reach; dense stands of macrophytes clogging stream; severe algal blooms creating thick algal
	Existing Condition	10 9 8	7 6 5 4	**3** 2 1
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	14. Detritus (Petersen, 1992)	Mainly consisting of leaves and wood without sediment covering it	Leaves and wood scarce; fine organic debris without sediment	Fine organic sediment - black in color and foul odor (anaerobic) or detritus absent
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1

Stream Function Pyramid Level 4 Physicochemical Overall EXISTING Condition F FAR **NF** **Score:4**

Stream Function Pyramid Level 4 Physicochemical Overall PROPOSED Condition **F** FAR NF **Score:16**

Biology (Do not complete if stream is ephemeral)				
Stream Function Pyramid Level 5 Biology				
	15. Macroinvertebrate	Abundant	Rare	Not present
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	16. Macroinvertebrate Tolerance	Abundant intolerant species	Limited intolerant species	Only tolerant species
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	3 2 1
	17. Fish Presence	Abundant	Rare	Not present
	Existing Condition	10 9 8	7 6 5 4	3 2 **1**
	Proposed Condition	10 9 **8**	7 6 5 4	4 2 1
	If existing biology is FAR or NF, provide description of cause(s)	Stream is currently a concrete channel.		

Stream Function Pyramid Level 5 Biology Overall EXISTING Condition **F** **FAR** **NF** **Score: 3**

Stream Function Pyramid Level 5 Biology Overall PROPOSED Condition **F** **FAR** **NF** **Score:24**

Reach ID:	Trib 5	Reach Score/Reach Total	Ex. 24/170 Prop.: 136/170	Quality: Ex: 0.14 Prop:0.8

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning

Bankfull Determination and Rosgen Stream Classification

Rosgen Stream Type (Observation) EX - Stream is currently concrete channel PRO - C

Regional Curve (circle one): **Piedmont** Coastal Plain Allegheny Plateau/Ridge and Valley Urban Karst

DA (sqmi)	0.06		
BF Width (ft)	3.6-4.9	BF Area (sqft)	1.3-2.2
BF Depth (ft)	0.35-0.45	Percent Impervious (%)	21.3

Field Measurements

Parameter	Measurements and Ratios			
Water surface to geomorphic feature elevation difference	Ex- Channel is in concrete channel			
Riffle Mean Depth at Bankfull Stage (dbkf)	Ex- Channel is in concrete channel	Proposed: 0.36		
Riffle Width at Bankfull Stage (Wbkf)	Ex- Channel is in concrete channel	Proposed: 4.6		
Riffle XS Area at Bankfull Stage (Abkf = dbkf*Wbkf)	Ex- Channel is in concrete channel	Proposed: 1.65		
Floodprone Area Width (Wfpa) (Wfpa=Width at elevation determined by 2xDmax)	Ex- Channel is in concrete channel	Target: 18.4		
Entrenchment Ratio (ER) (ER=Wfpa/Wbkf)	Ex- Channel is in concrete channel	Target 4.0		
Low Bank Height (LBH)	Ex- Channel is in concrete channel	Proposed: 0.5		
Riffle Maximum Depth at Bankfull Stage (Dmax)	Ex- Channel is in concrete channel	Proposed: 0.5		
Bank Height Ratio (BHR) (BHR=LBH/Dmax)	Ex- Channel is in concrete channel	Proposed: 1.0		
BEHI/NBS Ratings and Lengths	Ex- Channel is in concrete channel	L/L		
Pool to Pool Spacing (P-P)	Ex- Channel is in concrete channel	Proposed: Min: 21, Max: 30, Avg.: 26		
Pool to Pool Spacing Ratio (P-P Ratio) (P-P Ratio=P-P/Wbkf)	Ex- Channel is in concrete channel	Proposed: Min:4.6, Max:6.5, Avg.:5.7		
Pool Maximum Depth at Bankfull Stage (Dmbkfp)	Ex- Channel is in concrete channel	Proposed: 0.9		
Pool Depth Ratio (Dmbkfp Ratio) (Dmbkfp Ratio=Dmbkfp/dbkf)	Ex- Channel is in concrete channel	Proposed: 2.5		
Macroinvertebrate Taxa Observed	Ex- Channel is in concrete channel	n/a		

Cabin Branch

Cabin Branch

Tributary 1, 2, and 3 (general riparian conditions)

Tributary 4

Tributary 5