WETLANDS AND SUBAQUEOUS LANDS SECTION PERMIT APPLICATION FORM

For Subaqueous Lands, Wetlands, Marina and 401 Water Quality Certification Projects

State of Delaware
Department of Natural Resources and Environmental Control
Division of Water

Wetlands and Subaqueous Lands Section

APPLICATION FOR APPROVAL OF
SUBAQUEOUS LANDS, WETLANDS, MARINA
AND WATER QUALITY CERTIFICATION PROJECTS

Last Revised on: March 28, 2017

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

Application Instructions:

1. Complete each section of this basic application and appropriate appendices as thoroughly and accurately as possible. Incomplete or inaccurate applications will be returned.

2. All applications must be accompanied by a scaled plan view and cross-section view plans that show the location and design details for the proposed project. Full construction plans must be submitted for major projects.

3. All applications must have an original signature page and proof of ownership or permitted land use agreement.

4. Submit an original and two (2) additional copies of the application (total of 3) with the appropriate application fee and public notice fee* (prepared in separate checks) to:

Department of Natural Resources and Environmental Control
Wetlands and Subaqueous Lands Section
89 Kings Highway
Dover, Delaware 19901

*Application and public notice fees are non-refundable regardless of the Permit decision or application status.

5. No construction may begin at the project site before written approval has been received from this office.

Helpful Information:

1.	Tax Parcel Information:	New Castle County	(302) 395-5400
		Kent County	(302) 736-2010
		Sussex County	(302) 855-7878
2.	Recorder of Deeds:	New Castle County	(302) 571-7550
		Kent County	(302) 744-2314
		Sussex County	(302) 855-7785

3. A separate application and/or approval may be required through the Army Corps of Engineers. Applicants are strongly encouraged to contact the Corps for a determination of their permitting requirements. For more information, contact the Philadelphia District Regulator of the Day at (215) 656-6728 or visit their website at: http://www.nap.usace.army.mil/Missions/Regulatory.aspx.

4. For questions about this application or the Wetlands and Subaqueous Lands Section, contact us at (302) 739-9943 or visit our website at: http://www.dnrec.delaware.gov/wr/Services/Pages/WetlandsAndSubaqueousLands.aspx. Office hours are Monday through Friday 8:00 AM to 4:30 PM, except on State Holidays.

APPLICANT'S REVIEW BEFORE MAILING

DID YOU COMPLETE THE FOLLOWING?

_____ Yes BASIC APPLICATION

_____ Yes SIGNATURE PAGE (Page 3)

_____ Yes APPLICABLE APPENDICES

_____ Yes SCALED PLAN VIEW

_____ Yes SCALED CROSS-SECTION OR ELEVATION VIEW PLANS

_____ Yes VICINITY MAP

_____ Yes COPY OF THE PROPERTY DEED & SURVEY

_____ Yes THREE (3) COMPLETE COPIES OF THE APPLICATION PACKET

_____ Yes APPROPRIATE APPLICATION FEE & PUBLIC NOTICE FEE
(Separate checks made payable to the State of Delaware)

Submit 3 complete copies of the application packet to:

Department of Natural Resources and Environmental Control
Wetlands and Subaqueous Lands Section
89 Kings Highway
Dover, Delaware 19901

Before signing and mailing your application packet, please read the following:

The Department requests that the contractor or party who will perform the construction of your proposed project, if other than the applicant, sign the application signature page along with the applicant in the spaces provided. When the application is signed by the contractor as well as the applicant, the Department will issue the Permit to both parties. For Leases, the contractor will receive a separate construction authorization that will make them subject to all of the terms and conditions of the Lease relating to the construction

Section 1: Applicant Identification

1. Applicant's Name: Melissa Hubert
   Mailing Address: 210309 Berlin Rd. Unit 6
   Georgetown, DE 19947
   Telephone #: 3028551937
   Fax #:
   E-mail: Melissa.hubert@delaware.gov

2. Consultant's Name: Michael Case
   Mailing Address: 210309 Berlin Rd. Unit 6
   Georgetown, DE 19947
   Company Name: State of Delaware, DNREC Drainage Program
   Telephone #: 3028551939
   Fax #:
   E-mail: michael.case@delaware.gov

3. Contractor's Name: Wes Allen
   Mailing Address:
   23818 Shortly Rd, Georgetown, DE 19947
   Company Name: Sussex Conservation District
   Telephone #: (302) 856-2105
   Fax #:
   E-mail: wes.allen@sussexconservation.org

Section 2: Project Description

4. Check those that apply:
☒ New Project/addition to existing project? ☐ Repair/Replace existing structure? (If checked, must answer #16)

5. Project Purpose (attach additional sheets as necessary):
The purpose of the activity is to remove the large amount of bank erosion and sedimentation occurring very close to the pipe crossing of Susan Beach Road through bank stabilization using rip rap. erosion is encroaching on the bank near road with concern for failure if the erosion continues. This project is anticipated to be constructed as soon as possible and within 1 year of obtaining any necessary approvals.

6. Check each Appendix that is enclosed with this application:

	A. Boat Docking Facilities		G. Bulkheads		N. Preliminary Marina Checklist
	B. Boat Ramps		H. Fill		O. Marinas
	C. Road Crossings	X	I. Rip-Rap Sills and Revetments		P. Stormwater Management
	D. Channel Modifications/Dams		J. Vegetative Stabilization		Q. Ponds and Impoundments
	E. Utility Crossings		K. Jetties, Groins, Breakwaters		R. Maintenance Dredging
	F. Intake or Outfall Structures		M. Activities in State Wetlands		S. New Dredging

Section 3: Project Location

7. Project Site Address: Susan Beach Road Crossing at Tussocky Tax ditch Main Channel
   County: ☐ N.C. ☐ Kent ☒ Sussex
   Site owner name (if different from applicant): Tussocky Tax Dltch
   Address of site owner:

8. Driving Directions: Start at 89 Kings Highway, Dover, DE. Head east and turn right onto US-13 S. Continue on US-13 S for about 55 miles. Turn right onto MD-54 W/E State Street in Delmar.Continue for about 1 mile. Turn left onto Susan Beach Road.
(Attach a vicinity map identifying road names and the project location)

9. Tax Parcel ID Number: 432-13.00-5.00
   Subdivision Name:

WSLS Use Only: **Permit #s:** _____ _____ _____ _____

Type **SP** ☐ **SL** ☐ **SU** ☐ **WE** ☐ **WQ** ☐ **LA** ☐ **SA** ☐ **MP** ☐ **WA** ☐

Corps Permit: SPGP 18 ☐ **20** ☐ **Nationwide Permit #:** _____ **Individual Permit #**_____
Received Date: _____ **Project Scientist:** _____
Fee Received? Yes ☐ **No** ☐ **Amt: $**_____ **Receipt #:** _____
Public Notice #: _____ **Public Notice Dates: ON** _____ **OFF**_____

Section 3: Project Location (Continued)

10. Name of waterbody at Project Location: Tussocky Tax DItch waterbody is a tributary to: Broad creek, Nanticoke river

11. Is the waterbody: ☐ Tidal ☒ Non-tidal Waterbody width at mean low or ordinary high water 12 LF

12. Is the project: ☒ On public subaqueous lands? ☐ On private subaqueous lands?*
☐ In State-regulated wetlands? ☐ In Federally-regulated wetlands?

*If the project is on private subaqueous lands, provide the name of the subaqueous lands owner:

(Written permission from the private subaqueous lands owner must be included with this application)

13. Present Zoning: ☒ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other

Section 4: Miscellaneous

14. A. List the names and complete mailing addresses of the immediately adjoining property owners on all sides of the project (attach additional sheets as necessary):
PIASCIK BARBARA J & JOSEPH A PIASCIK - 10 WHITE OAK ACRES, SALISBURY MILLS, NY
HILL JAMES EDWARD-34772 HILL HVN, LAUREL, DE

B. For wetlands and marina projects, list the names and complete mailing addresses of property owners within a 1,000 foot radius of the project (attach additional sheets as necessary):

15. Provide the names of DNREC and/or Army Corps of Engineers representatives whom you have discussed the project with:
Michael Yost - ACOE
Melissa Hubert- DNREC TAX DITCH PROGRAM

A. Have you had a State Jurisdictional Determination performed on the property? ☐ Yes ☒ No
B. Has the project been reviewed in a monthly Joint Permit Processing Meeting? ☐ Yes ☒ No
*If yes, what was the date of the meeting? _____

16. Are there existing structures or fill at the project site in subaqueous lands? ☐ Yes ☒ No
*If yes, provide the permit and/or lease number(s):

*If no, were structures and/or fill in place prior to 1969? ☐ Yes ☒ No

17. Have you applied for or obtained a Federal permit from the Army Corps of Engineers?
☐ No ☒ Pending ☐ Issued ☐ Denied Date: _____

Type of Permit: NWP 13- Bank Stabilization Federal Permit or ID #: TBD

18. Have you applied for permits from other Sections within DNREC?
☒ No ☐ Pending ☐ Issued ☐ Denied Date: _____ Permit or ID #: _____

Type of permit (circle all that apply): Septic Well NPDES Storm Water

Other: _____

Section 5: Signature Page

19. Agent Authorization:

If you choose to complete this section, all future correspondence to the Department may be signed by the duly authorized agent. In addition, the agent will become the primary point of contact for all correspondence from the Department.

I do not wish to authorize an agent to act on my behalf ☐

I wish to authorize an agent as indicated below ☒

I, Melissa Hubert, hereby designate and authorize Michael Case
(Name of Applicant) (Name of Agent)
to act on my behalf in the processing of this application and to furnish any additional information requested by the Department.

Authorized Agent's Name: Michael Case
Mailing Address: 210309 Berlin Rd. Unit 6
Georgetown, DE 19947

Telephone #: 3026975451
Fax #:
E-mail: michael.case@delaware.gov

20. Agent's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application.

Michael Case
Agent's Signature

4/8/2025
Date

21. Applicant's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge and that I am required to inform the Department of any changes or updates to the information provided in this application. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application. I grant permission to authorized Department representatives to enter upon the premises for inspection purposes during working hours.

Melissa Hubert
Applicant's Signature

4/23/2025
Date

Melissa Hubert
Print Name

22. Contractor's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge, and that I am required to inform the Department of any changes or updates to the information provided in this application. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application.

Contractor's Name

Date

Print Name

Rip-Rap Sills and Revetments

Please respond to each question. Questions left blank may result in the application being returned as incomplete. In addition, the answers to all of the questions in this Appendix must correspond accurately to the information on the plan and section view drawings for the project.

1. Will the project be:
   X New Construction (un-stabilized shoreline)
   _____ Repair or Replacement of an Existing Rip-Rap Structure or Rubble
   _____ Repair or Replacement of an Existing Bulkhead
   (If repair or replacement, submit photographs of the entire existing structure).

2. How many linear feet of shoreline are proposed to be stabilized? 130

3. Is the project a: X Standard rip-rap revetment ___ Free-standing sill

4. Describe the existing shoreline:
   Tussocky Tax ditch- channelized drainage ditch with vegetative stabilized banks
   erosion has caused these banks to begin to fail near the road area.

5. What is the total number of cubic yards of rip-rap that will be used? 37.15

6. What is the number of cubic yards of rip-rap per running foot of shoreline? 0.29
   (See page 4 for a guide to calculating total cubic yards and cubic yards per running foot).

7. What will be the average weight of the stone used for the:
   Armor stone: R-4 : approx 20 lbs Core stone: _____
   [If material other than stone, such as prefab geo-grid or other similar product is proposed, please describe here and include photographs or a brochure. The Department strongly discourages the use of broken concrete, cinderblocks or other materials that are less dense than stone, more apt to move off site due to currents or wave action, and/or are not aesthetically pleasing or in keeping with the natural environment.]
   Describe:
   Area will be backfilled with clean fill in 12 inch lifts to original grade and bank slope. Geo-textile fabric will be installed and R-4 rip-rap installed to protect the bank. No rip-rap will block the channel.
   please see attached design for additional details

8. For Standard Revetments answer A–F, below: (for Sill projects, skip to Question #9)
   A. How many linear feet will the structure extend channelward of:
   Mean High Water: _____Mean Low Water: _____
   Ordinary High Water: 12 (for non-tidal waters)

   B. How many square feet of the structure will be located:
   Channelward of Mean High Water: _____Channelward of Mean Low Water: _____
   Channelward of Ordinary High Water: 1560 SF (for non-tidal waters)
   On vegetated wetlands: _____

   C. Will the revetment be backfilled? ___ Yes X No
   If yes, complete Appendix H and include it in your application.

   D. Will filter cloth be used behind the rip-rap structure? X Yes ___ No

   E. What is the average slope of the existing bank? 0.905:1

   F. What is the proposed slope of the rip-rap revetment? 2:1
   (See page 3 for a guide to calculating slopes).
9. Sill Projects:
   A. What is the base width of the proposed structure: _____
   B. What is the top width of the proposed structure: _____
   C. How many square feet of the structure will be located:

   Channelward of Mean High Water: _____ Channelward of Mean Low Water: _____
   Channelward of Ordinary High Water: _____ (for non-tidal waters)
   On vegetated wetlands: _____

   D. What will be the average height of the structure: _____
   E. How much of the structure (in inches) will extend vertically above:

   Mean High Water: _____ Ordinary High Water: _____ (for non-tidal waters)

   F. Are breaks or notches proposed in the sill to allow for greater flushing? ___ Yes___ No
   G. Will fill material be placed behind the sill? ___ Yes ___ No If yes, complete appropriate appendix.

   H. Will wetland vegetation be planted behind the sill? ___ Yes ___ No
   If yes, complete Appendix H and include it in your application.

10. Construction Techniques (Complete for both Revetment and Sill Projects):

A. Will any dredging be required? ___ Yes _X_ No

If yes, please include appropriate dredging Appendix with your application).

B. Please describe the sequence of construction and any techniques that will be utilized to minimize adverse impacts on the aquatic environment, and to preserve existing vegetation (particularly woody vegetation) along the shoreline:

Work to be conducted during normal or low flow conditions to minimize adverse environmental impacts and minimize sedimentation. All disturbed areas will be seeded to reduce erosion and sedimentation from entering the ditch following construction. Additional erosion and sediment control measures will be installed as needed based on site and weather conditions at time of construction. Agencies were consultedfor impacts and no negative impacts were anticipated by the proposed project scope.

out of an abundance of caution to minimize adverse environmental impacts, construction will not occur from April 1 - July 31 to avoid impacts to marsh nesting birds as recommended by F&W. no impact to the surrounding trees will occur.

CALCULATIONS

RUN = Base width of the structure (in feet) RISE = Vertical height of the structure (in feet)

I. How to calculate total cubic yards:

0.5 * RUN * RISE * Linear feet of shoreline stabilized/27 = Total Cubic Yards

II. How to calculate cubic yards per running foot of shoreline:

Total # Cubic Yards/ Linear feet of shoreline = Cubic yards per running foot

III. How to calculate slope: Slope = RUN/RISE

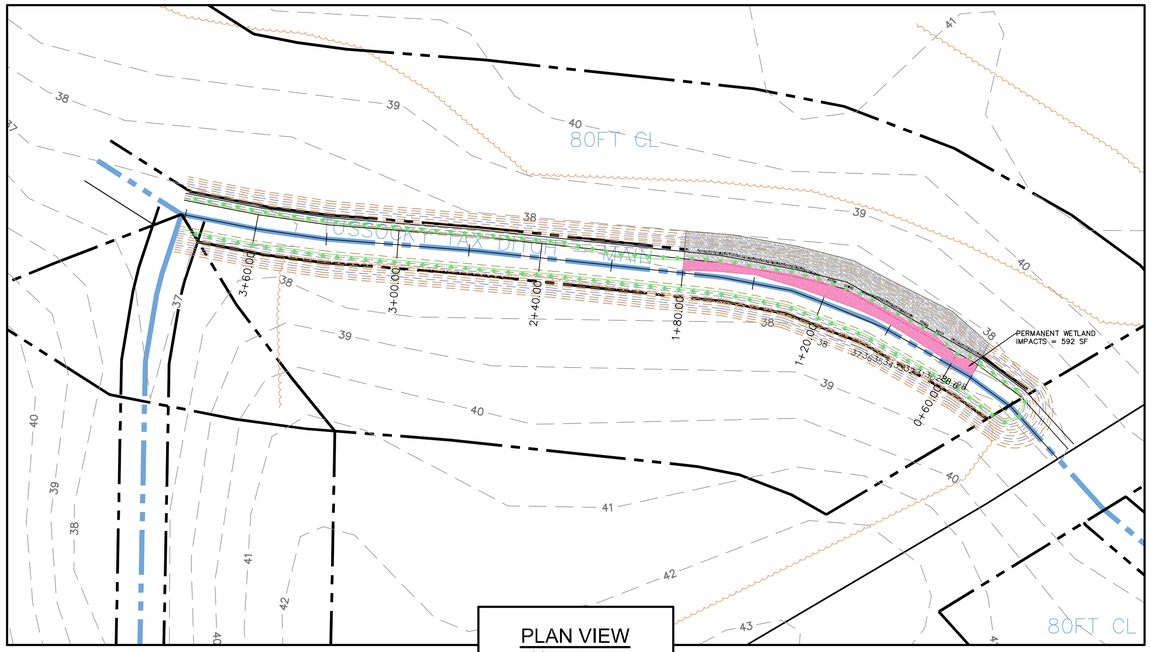
EXAMPLE:

If we propose to stabilize 100 linear feet of shoreline with a rip-rap revetment that has a basewidth of 6 feet and a height of 3 feet:

0.5 * 6 * 3 * 100/27 = 33.33 Total Cubic Yards

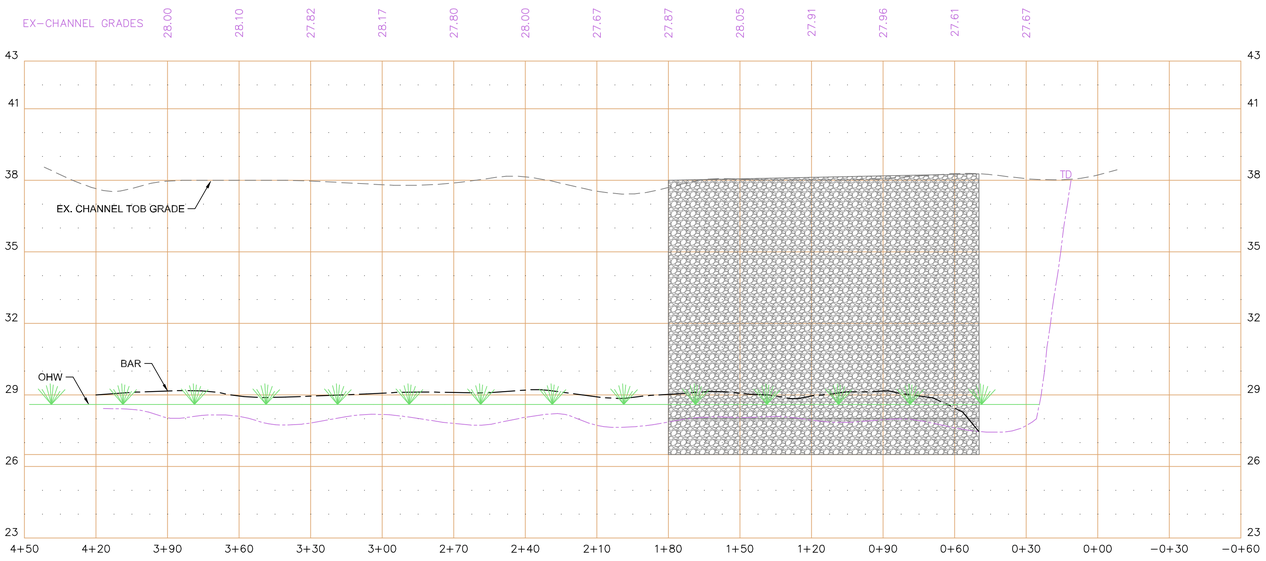
II. 33.33/ 100= 0.333 Cubic Yards per running foot

III. 6/3= Slope of 2



PLAN VIEW
SCALE: 1" = 30'

PERMANENT WETLAND IMPACTS
@ 592 SF



PROFILE VIEW
SCALE: 1" = 30'

0' 15' 30' 60' 90'
SCALE: 1" = 30'

REVISIONS

DATE	DESCRIPTION

SUSSEX CONSERVATION DISTRICT
23818 SHORTLY RD., GEORGETOWN, DE 19957
PHONE: (302)-856-2105 FAX: (302-856-6991)

DNREC - Division of Watershed Stewardship
Drainage Program

Dover Office
285 Beiser Blvd., Suite 102 Phone:(302) 739-9921 Fax:(302) 739-6724
Dover DE, 19901

Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855-1930
Georgetown DE, 19947 Fax:(302) 677-7059

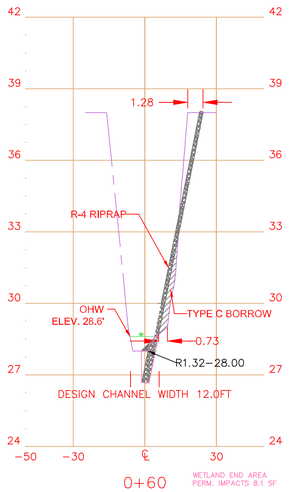
TUSSOCKY TAX DITCH
MAIN - WASHOUT REPAIR
PROJECT
BROAD CREEK / CHESAPEAKE BAY WATERSHED
LAUREL, DELAWARE

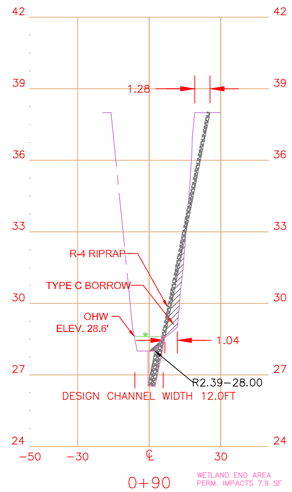
PLAN AND PROFILE VIEW SITE PLAN

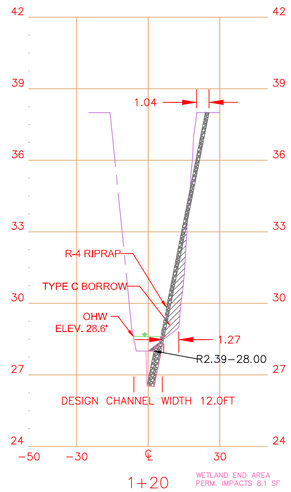
PRELIMINARY
FOR REVIEW ONLY

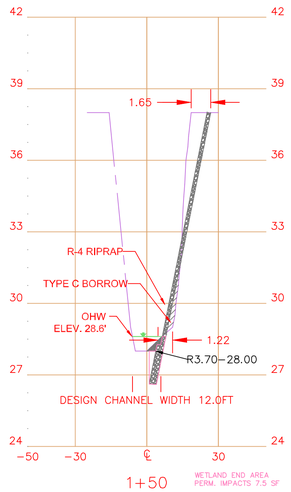
Date: 2.25.2025
Designed: AR - JLE
Planned: TB - KW - JG
Drawn: JLE

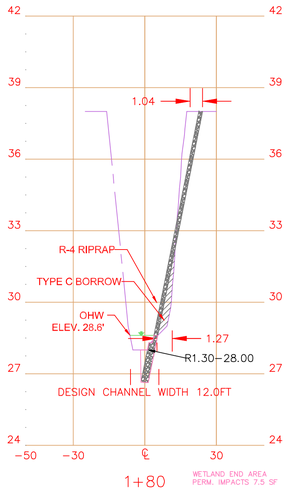
Sheet No. C-100

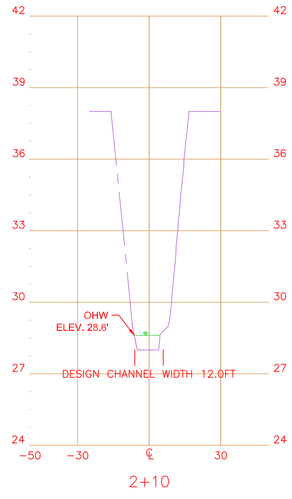




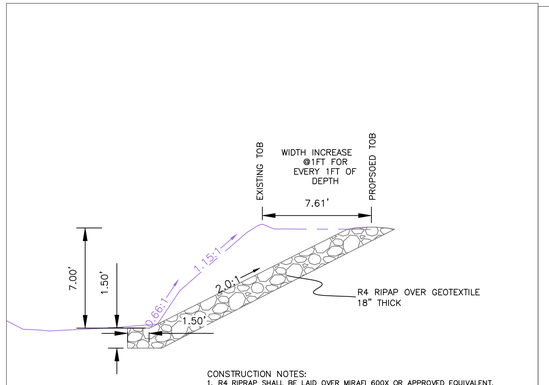








SECTION VIEWS
SCALE: 1" = 30'



RIPRAP BANK REVETMENT TYPICAL DETAIL
NTS

Project Name: TUSSOCKY TAX DITCH

END AREA VOLUME CALCULATION
(from section views)

STATION	END AREA (SF)	VOLUME (CF)
50	7.5	
60	7.4	74.5
90	7.9	229.5
120	8.1	240
150	7.5	234
180	7.5	225

CUM. VOLUME (CF)	1003.00
CY	37.14814815
WETLAND FILL (CY/FT)	0.29

((sf1 + sf2)*length)/2

0' 15' 30' 60' 90'
SCALE: 1" = 30'

REVISIONS

DATE	DESCRIPTION

SUSSEX CONSERVATION DISTRICT
23818 SHORTLY RD., GEORGETOWN, DE 19947
PHONE: (302)-856-2105 FAX: (302)-856-6951

Georgetown Office
21369 Bethel Rd. Unit 6 Phone:(302) 855-1930
Georgetown DE, 19947 Fax:(302) 277-7050

Dover Office
285 Beiser Blvd., Suite 102 Phone:(302) 739-9921
Dover DE, 19901 Fax:(302) 739-6724

DNREC - Division of Watershed Stewardship
Drainage Program

USE/SPEC. CODE AND PE CERTIFICATE NEW LOCKUP

TUSSOCKY TAX DITCH
MAIN - WASHOUT REPAIR
PROJECT
BROAD CREEK / CHESAPEAKE BAY WATERSHED
LAUREL, DELAWARE

SECTION VIEW AND WETLAND IMPACT PLAN

PRELIMINARY FOR REVIEW ONLY

Date: 2.25.2025
Designed: AR - JLE
Planned: TB - KW - JG
Drawn: JLE

Sheet No. C-300

Rip-Rap Sills and Revetments

Please respond to each question. Questions left blank may result in the application being returned as incomplete. In addition, the answers to all of the questions in this Appendix must correspond accurately to the information on the plan and section view drawings for the project.

1. Will the project be:
   X New Construction (un-stabilized shoreline)
   _____ Repair or Replacement of an Existing Rip-Rap Structure or Rubble
   _____ Repair or Replacement of an Existing Bulkhead
   (If repair or replacement, submit photographs of the entire existing structure).

2. How many linear feet of shoreline are proposed to be stabilized? 130

3. Is the project a: X Standard rip-rap revetment ___ Free-standing sill

4. Describe the existing shoreline:
   Tussocky Tax ditch- channelized drainage ditch with vegetative stabilized banks
   erosion has caused these banks to begin to fail near the road area.

5. What is the total number of cubic yards of rip-rap that will be used? 37.15

6. What is the number of cubic yards of rip-rap per running foot of shoreline? 0.29
   (See page 4 for a guide to calculating total cubic yards and cubic yards per running foot).

7. What will be the average weight of the stone used for the:
   Armor stone: R-4 : approx 20 lbs Core stone: _____
   [If material other than stone, such as prefab geo-grid or other similar product is proposed, please describe here and include photographs or a brochure. The Department strongly discourages the use of broken concrete, cinderblocks or other materials that are less dense than stone, more apt to move off site due to currents or wave action, and/or are not aesthetically pleasing or in keeping with the natural environment.]
   Describe:
   Area will be backfilled with clean fill in 12 inch lifts to original grade and bank slope. Geo-textile fabric will be installed and R-4 rip-rap installed to protect the bank. No rip-rap will block the channel.
   please see attached design for additional details

8. For Standard Revetments answer A–F, below: (for Sill projects, skip to Question #9)
   A. How many linear feet will the structure extend channelward of:
   Mean High Water: _____Mean Low Water: _____
   Ordinary High Water: 12 (for non-tidal waters)

   B. How many square feet of the structure will be located:
   Channelward of Mean High Water: _____Channelward of Mean Low Water: _____
   Channelward of Ordinary High Water: 1560 SF (for non-tidal waters)
   On vegetated wetlands: _____

   C. Will the revetment be backfilled? ___ Yes X No
   If yes, complete Appendix H and include it in your application.

   D. Will filter cloth be used behind the rip-rap structure? X Yes ___ No

   E. What is the average slope of the existing bank? 0.905:1

   F. What is the proposed slope of the rip-rap revetment? 2:1
   (See page 3 for a guide to calculating slopes).
9. Sill Projects:
   A. What is the base width of the proposed structure: _____
   B. What is the top width of the proposed structure: _____
   C. How many square feet of the structure will be located:

   Channelward of Mean High Water: _____ Channelward of Mean Low Water: _____
   Channelward of Ordinary High Water: _____ (for non-tidal waters)
   On vegetated wetlands: _____

   D. What will be the average height of the structure: _____
   E. How much of the structure (in inches) will extend vertically above:

   Mean High Water: _____ Ordinary High Water: _____ (for non-tidal waters)

   F. Are breaks or notches proposed in the sill to allow for greater flushing? ___ Yes___ No
   G. Will fill material be placed behind the sill? ___ Yes ___ No If yes, complete appropriate appendix.

   H. Will wetland vegetation be planted behind the sill? ___ Yes ___ No
   If yes, complete Appendix H and include it in your application.

10. Construction Techniques (Complete for both Revetment and Sill Projects):

A. Will any dredging be required? ___ Yes _X_ No

If yes, please include appropriate dredging Appendix with your application).

B. Please describe the sequence of construction and any techniques that will be utilized to minimize adverse impacts on the aquatic environment, and to preserve existing vegetation (particularly woody vegetation) along the shoreline:

Work to be conducted during normal or low flow conditions to minimize adverse environmental impacts and minimize sedimentation. All disturbed areas will be seeded to reduce erosion and sedimentation from entering the ditch following construction. Additional erosion and sediment control measures will be installed as needed based on site and weather conditions at time of construction. Agencies were consultedfor impacts and no negative impacts were anticipated by the proposed project scope.

out of an abundance of caution to minimize adverse environmental impacts, construction will not occur from April 1 - July 31 to avoid impacts to marsh nesting birds as recommended by F&W. no impact to the surrounding trees will occur.

CALCULATIONS

RUN = Base width of the structure (in feet) RISE = Vertical height of the structure (in feet)

I. How to calculate total cubic yards:

0.5 * RUN * RISE * Linear feet of shoreline stabilized/27 = Total Cubic Yards

II. How to calculate cubic yards per running foot of shoreline:

Total # Cubic Yards/ Linear feet of shoreline = Cubic yards per running foot

III. How to calculate slope: Slope = RUN/RISE

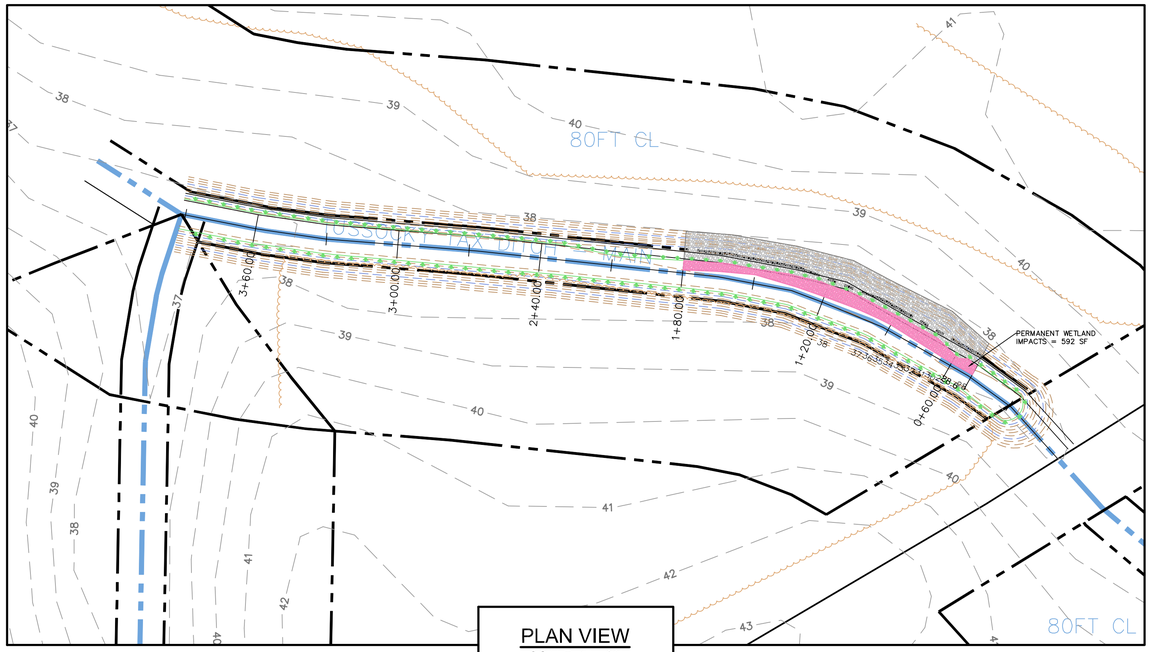
EXAMPLE:

If we propose to stabilize 100 linear feet of shoreline with a rip-rap revetment that has a basewidth of 6 feet and a height of 3 feet:

0.5 * 6 * 3 * 100/27 = 33.33 Total Cubic Yards

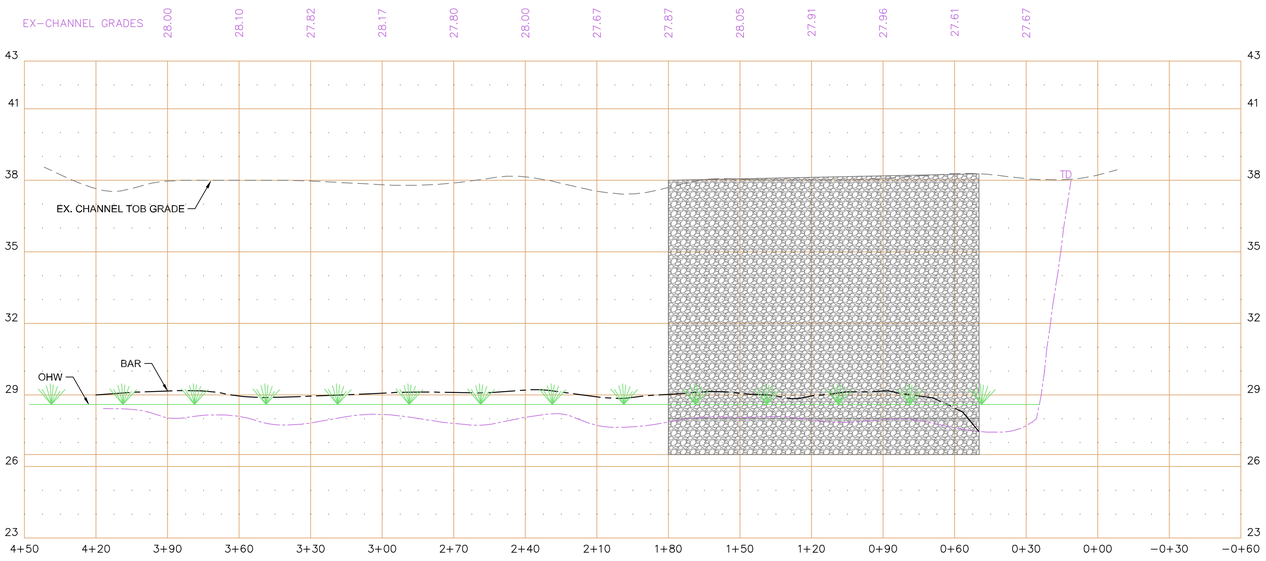
II. 33.33/ 100= 0.333 Cubic Yards per running foot

III. 6/3= Slope of 2



PLAN VIEW
SCALE: 1" = 30'

PERMANENT WETLAND IMPACTS
@ 592 SF



PROFILE VIEW
SCALE: 1" = 30'

0' 15' 30' 60' 90'
SCALE: 1" = 30'

REVISIONS

DATE	DESCRIPTION

SUSSEX CONSERVATION DISTRICT
23818 SHORTLY RD., GEORGETOWN, DE 19957
PHONE: (302)-856-2105 FAX: (302-856-6991)

DNREC - Division of Watershed Stewardship
Drainage Program

Dover Office
285 Beiser Blvd., Suite 102 Phone:(302) 739-9921 Fax:(302) 739-6724
Dover DE, 19901

Georgetown Office
21309 Berlin Rd. Unit 6 Phone:(302) 855-1930
Georgetown DE, 19947 Fax:(302) 677-7059

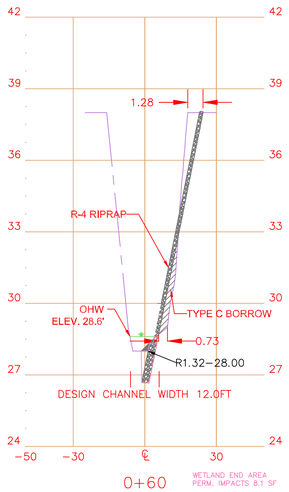
TUSSOCKY TAX DITCH
MAIN - WASHOUT REPAIR
PROJECT
BROAD CREEK / CHESAPEAKE BAY WATERSHED
LAUREL, DELAWARE

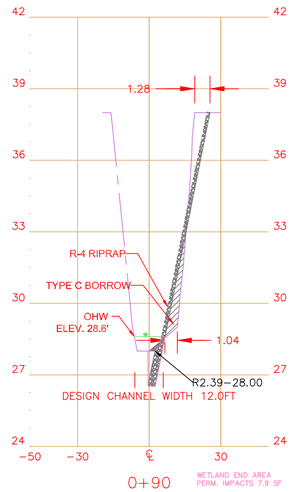
PLAN AND PROFILE VIEW SITE PLAN

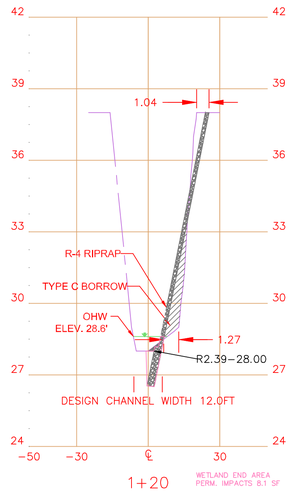
PRELIMINARY
FOR REVIEW ONLY

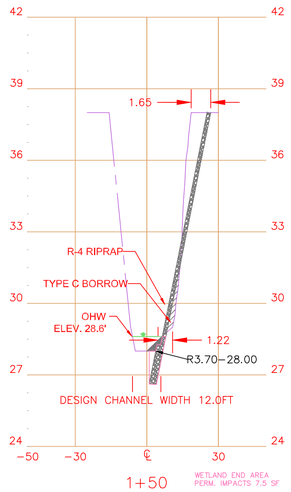
Date: 2.25.2025
Designed: AR - JLE
Planned: TB - KW - JG
Drawn: JLE

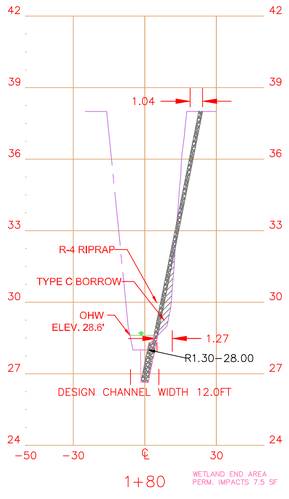
Sheet No. C-100

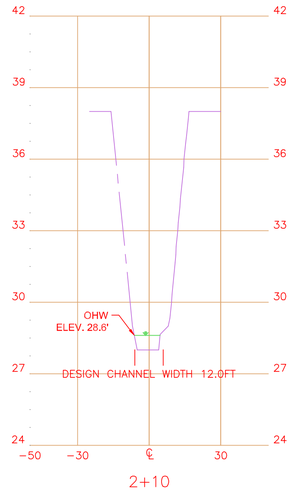




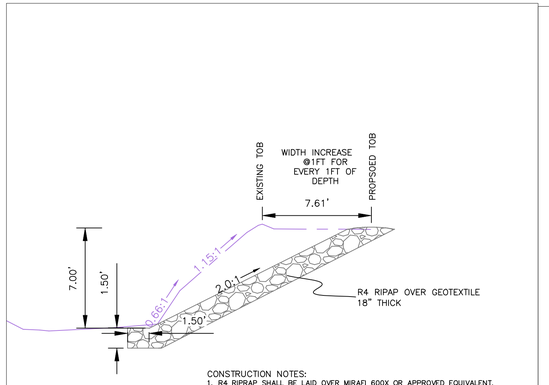








SECTION VIEWS
SCALE: 1" = 30'



RIPRAP BANK REVETMENT TYPICAL DETAIL
NTS

Project Name: TUSSOCKY TAX DITCH

END AREA VOLUME CALCULATION
(from section views)

STATION	END AREA (SF)	VOLUME (CF)
50	7.5	
60	7.4	74.5
90	7.9	229.5
120	8.1	240
150	7.5	234
180	7.5	225

CUM. VOLUME (CF)	1003.00
CY	37.14814815
WETLAND FILL (CY/FT)	0.29

((sf1 + sf2)*length)/2

0' 15' 30' 60' 90'
SCALE: 1" = 30'

REVISIONS

DATE	DESCRIPTION

SUSSEX CONSERVATION DISTRICT
23818 SHORTLY RD., GEORGETOWN, DE 19947
PHONE: (302)-856-2105 FAX: (302)-856-6951

Georgetown Office
21369 Bethel Rd. Unit 6 Phone:(302) 855-1930
Georgetown DE, 19947 Fax:(302) 277-7050

Dover Office
285 Beiser Blvd., Suite 102 Phone:(302) 739-9921
Dover DE, 19901 Fax:(302) 739-6724

DNREC - Division of Watershed Stewardship
Drainage Program

USE/SPEC. CODE AND PE CERTIFICATE NEW LOCKUP

TUSSOCKY TAX DITCH
MAIN - WASHOUT REPAIR
PROJECT
BROAD CREEK / CHESAPEAKE BAY WATERSHED
LAUREL, DELAWARE

SECTION VIEW AND WETLAND IMPACT PLAN

PRELIMINARY FOR REVIEW ONLY

Date: 2.25.2025
Designed: AR - JLE
Planned: TB - KW - JG
Drawn: JLE

Sheet No. C-300

Tussocky TD Drainage Project
PHOTO LOG OF DELINEATED RIGHTS-OF-WAY

Image 1: Example of typical **Habitat A: Maintained grassy ROW**

Image 2: Example of area of construction channel of Tussocky TD

Image 3: Example of area of construction channel of Tussocky TD

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region** See ERDC/EL TR-10-20; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Tussocky Main Bank Stabilization City/County: Delmar, Sussex Sampling Date: 04/02/2025

Applicant/Owner: Tussocky Tax Ditch State: DE Sampling Point: A- Mowed Maintained ROW

Investigator(s): Michael Case Section, Township, Range: x

Landform (hillside, terrace, etc.): Terrrace Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR or MLRA): LRR T Lat: 38.303291368 Long: -75.374212204 Datum:

Soil Map Unit Name: Please see attached soil map NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
The mowed right-of-ways adjacent to the Tax Ditch along the segments planned for stabilizationwere all representative of each other. There was a lack of vegetative diversity in these habitats because of the frequent mowing to maintain access of the Tax Ditch network for maintenance. As such the ROW were mostly grassy buffers. Hydrophtic vegetation was met with most of the species being FAC. No wetland hydrology or hydric soils were found within the AOI.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): 0.5
Water Table Present?	Yes ____	No X	Depth (inches): 24
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): 24

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was observed onsite. Soil borings were dug to a depth of at least 24" and no soil saturation or water table was observed. The vegetated mowed rights-of-way are considered uplands.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: A- Mowed Maintained ROW

Tree Stratum (Plot size: ROW)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	18	Yes	FAC
2. *Ilex opaca*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	28	=Total Cover	
50% of total cover: 14		20% of total cover:	6
Sapling/Shrub Stratum (Plot size: ROW)			
1. *Ilex opaca*	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2
Herb Stratum (Plot size: ROW)			
1. *Festuca*	70	Yes	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14
Woody Vine Stratum (Plot size: ROW)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	48	x 3 =	144
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	48 (A)		144 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)

There was a lack of vegetative diversity within the mowed rights-of-way due to frequent mowing of the Tax Ditch to maintain accessibility for maintenance of the ditch network. The rights-of-way were dominated by a mixture of grasses. Hydrophytic dominance was met most species being FAC..

SOIL

Sampling Point: A- Mowed Maintained ROW

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	7.5YR 3/2	100					Sandy	
6-20	7.5YR 6/2	100					Sandy	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) (**MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
- ___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Coast Prairie Redox (A16) **(outside MLRA 150A)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
- ___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

The soils found within the mowed ROW were considered previously excavated streambed materials. No natural soil formation processes or profile could be observed. Soil classification was considered mixed spoils from prior excavation and piling of sediments within the ROW. No standing water was present and no soil saturation was observed in the soil borings dug to a depth of 24".

Tussocky TD Bank Stabilization Aerial Map

3/17/2025, 3:37:32 PM

Tax Ditch Channels - System
Tax Ditch Channel
Pipe - DelDOT
Extent of Right-of-Way
Approx. Watershed Boundary
Parcels - Sussex
World Imagery
Low Resolution 15m Imagery
High Resolution 60cm Imagery
High Resolution 30cm Imagery
Citations
60cm Resolution Metadata

1:2,410

0 87.5 175 350 ft

0 25 50 100 m

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar

Tussocky TD Bank Stabilization Street Map

3/17/2025, 3:38:55 PM

Tax Ditch Channels - System

Tax Ditch Channel

Pipe - DelDOT

Extent of Right-of-Way

Approx. Watershed Boundary

Parcels - Sussex

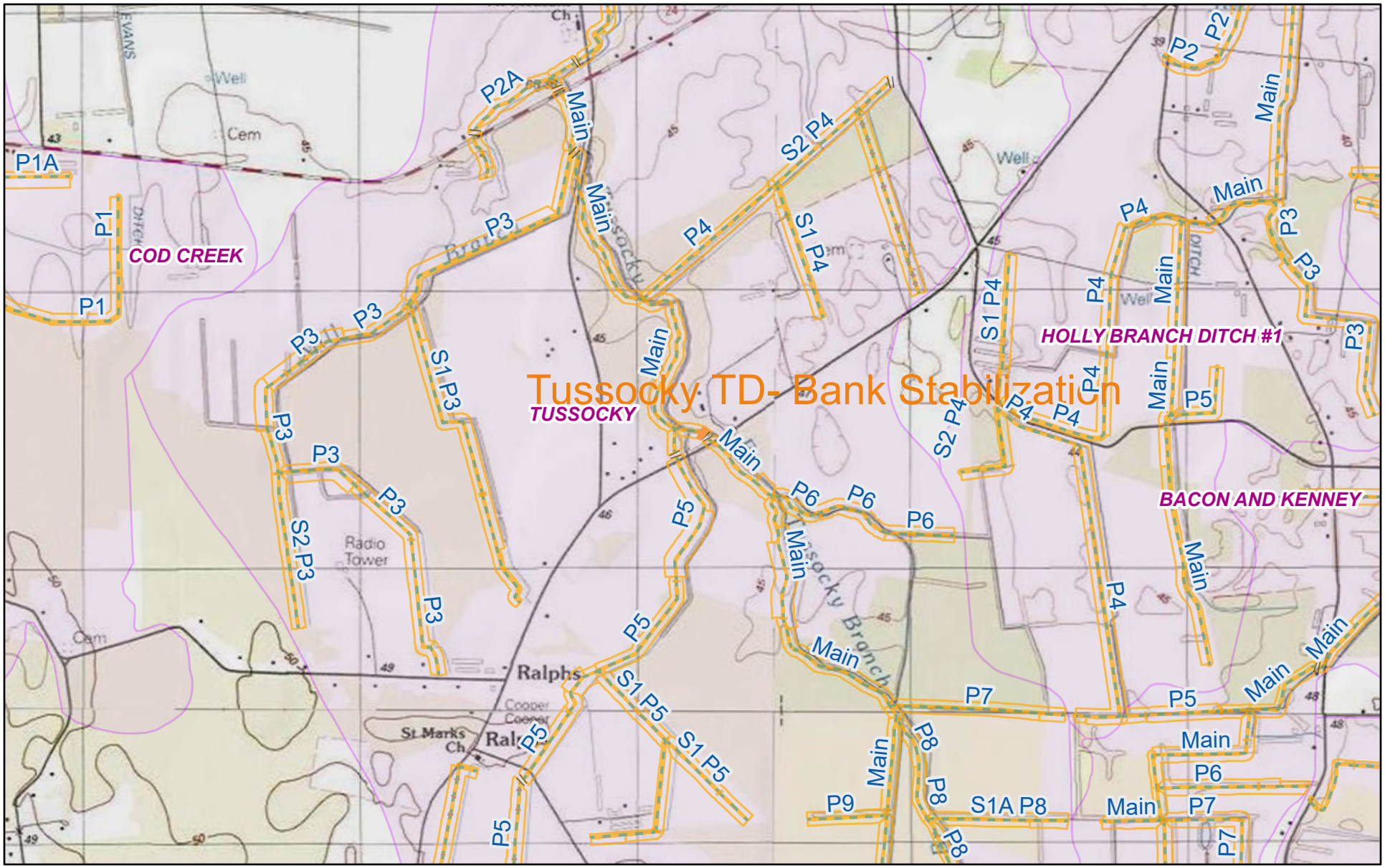
1:2,410

0 87.5 175 350 ft

0 25 50 100 m

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

Tussocky TD Bank Stabilization Topo Map



3/17/2025, 3:40:02 PM

Channels - Overview

Tax Ditch Channel

Pipe - DelDOT

Pipe - Tax Ditch

Pipe - Private

Extent of Right-of-Way

Approx. Watershed Boundary

USA_Topo_Maps

1:25,008

0 500 1,000 2,000 ft

0 270 540 1,080 m

Tax Map and Parcel #: 4-32-13.00-5.00

PREPARED BY:
TOMASETTI LAW LLC
1100 Coastal Hwy., Unit 3
Fenwick Island, DE 19944
File No. 522-136/MP

RETURN TO:
JOSEPH A. PIASCIK and BARBARA J. PIASCIK
10 White Oak Acres
Salisbury Mills, NY 12577

THIS DEED, made this 10th day of October, 2022,

- BETWEEN -

MICHAEL F. CROWE and **JESSICA L. CROWE**, husband and wife, of 34740 Susan Beach Road, Laurel, DE 19956, parties of the first part,

- AND -

BARBARA J. PIASCIK, and **JOSEPH A. PIASCIK**, wife and husband, of 10 White Oak Acres, Salisbury Mills, NY 12577, parties of the second part.

WITNESSETH: That the said parties of the first part, for and in consideration of the sum of **Four Hundred Sixty-Five Thousand and 00/100 Dollars ($465,000.00)**, lawful money of the United States of America, the receipt whereof is hereby acknowledged, hereby grant and convey unto the parties of the second part, and their heirs and assigns, in fee simple, the following described lands, situate, lying and being in Sussex County, State of Delaware, as TENANTS BY THE ENTIRETY :

ALL that certain tract, piece or parcel of land, lying and being situate in Little Creek Hundred, Sussex County and State of Delaware, on the northerly right of way line of County Route #509, adjoining lands now or formerly of Edward Downes, lands now or formerly of

Document# 2022000046833 BK: 5789 PG: 155
Recorder of Deeds, Scott Dailey On 10/12/2022 at 12:10:42 PM Sussex County, DE
Doc Surcharge Paid

Patricia M. Littleton and lands now or formerly of Bonnie C. Hill, and being more particularly described as follows, to wit:

BEGINNING at a found concrete monument on the northerly right of way line of County Route #509, said concrete monument marking a corner for these lands herein and Lot #1; thence turning and running along with the line of these lands herein the following three courses and distances: (1) North 24 degrees 00 minutes 20 seconds West for a distance of 328.69 feet to a found concrete monument; thence (2) North 88 degrees 33 minutes 30 seconds West for a distance of 61.73 feet to a found concrete monument; thence (3) North 20 degrees 45 minutes 00 seconds West for a distance of 401.08 feet to a found concrete monument, said concrete monument marking a corner for these lands, herein, Lot #10 and lands now or formerly of Edward Downes; thence turning and running along and with the line of the lands herein and lands now or formerly of Edward Downes, North 72 degrees 42 minutes 22 seconds East for a distance of 35.11 feet to a found concrete monument in the line of lands now or formerly of Patricia M. Littleton; thence turning and running along with a ling of marked trees between the lands herein and lands now or formerly of Patricia M. Littleton, South 60 degrees 14 minutes 44 seconds East for a distance of 691.38 feet through a set concrete monument to a point said point lying in the centerline of Tussocky Branch; thence running along and with the centerline of said Tussocky Branch the following two courses and distances: (1) South 72 degrees 18 minutes 22 seconds East for a distance of 286.97 feet to a point; thence (2) South 46 degrees 38 minutes 02 seconds East for a distance of 63.41 feet to a point, said point lying on the northerly right of way line of County Route #509; thence turning and running along with the line of the lands herein and the northerly right of way line of County Route #509 along and with a curve to the right having a radius of 4534.87 feet, the central angle or delta being 05 degrees 52 minutes 01 seconds for an arc distance of 347.58 feet along a chord bearing South 69 degrees 51 minutes 22 seconds West for a distance of 347.49 feet to a point; thence, South 72 degrees 03 minutes 09 seconds West for a distance of 304.29 feet to a found concrete monument marking the point and place of beginning, and said to contain 5.84 acres of lands, more or less. The description herein was derived from a survey prepared by Charles E. Adams, Jr. & Associates, Inc., Registered Surveyors, dated May 24, 1990, as filed of record in Plot Book 44, Page 228.

BEING the same lands conveyed to Michael F. Crowe and Jessica L. Crowe by Deed from Linda D. Boda and John E. Boda, dated October 16, 2020 and recorded in the Office of the Recorder of Deeds in and for Sussex County in Deed Book 5369, page 3.

SUBJECT to any and all restrictions, reservations, conditions, easements and agreements of record in the Office of the Recorder of Deeds in and for Sussex County, Delaware.

Document# 20220000046833 BK: 5789 PG: 156
Recorder of Deeds, Scott Dailey On 10/12/2022 at 12:10:42 PM Sussex County, DE
Doc Surcharge Paid

IN WITNESS WHEREOF, the parties of the first part have hereunto set their hands and seals the day and year first above written.

Signed, Sealed and Delivered
in the presence of:

(SEAL)
MICHAEL F. CROWE

(SEAL)
JESSICA L. CROWE

STATE OF DELAWARE, COUNTY OF SUSSEX: to-wit

BE IT REMEMBERED, that on October 10, 2022, personally came before me, the subscriber, MICHAEL F. CROWE and JESSICA L. CROWE, husband and wife, parties of the first part to this Indenture, known to me personally to be such, and acknowledged this Indenture to be their act and deed.

GIVEN under my Hand and Seal of Office the day and year aforesaid.

Notary Public

My Commission Expires: N/A

CHARLES T. ARMBRUSTER, III
ATTORNEY AT LAW
STATE OF DELAWARE
29 DEL. C. SEC. 4323 (a) (5)

United States Department of Agriculture

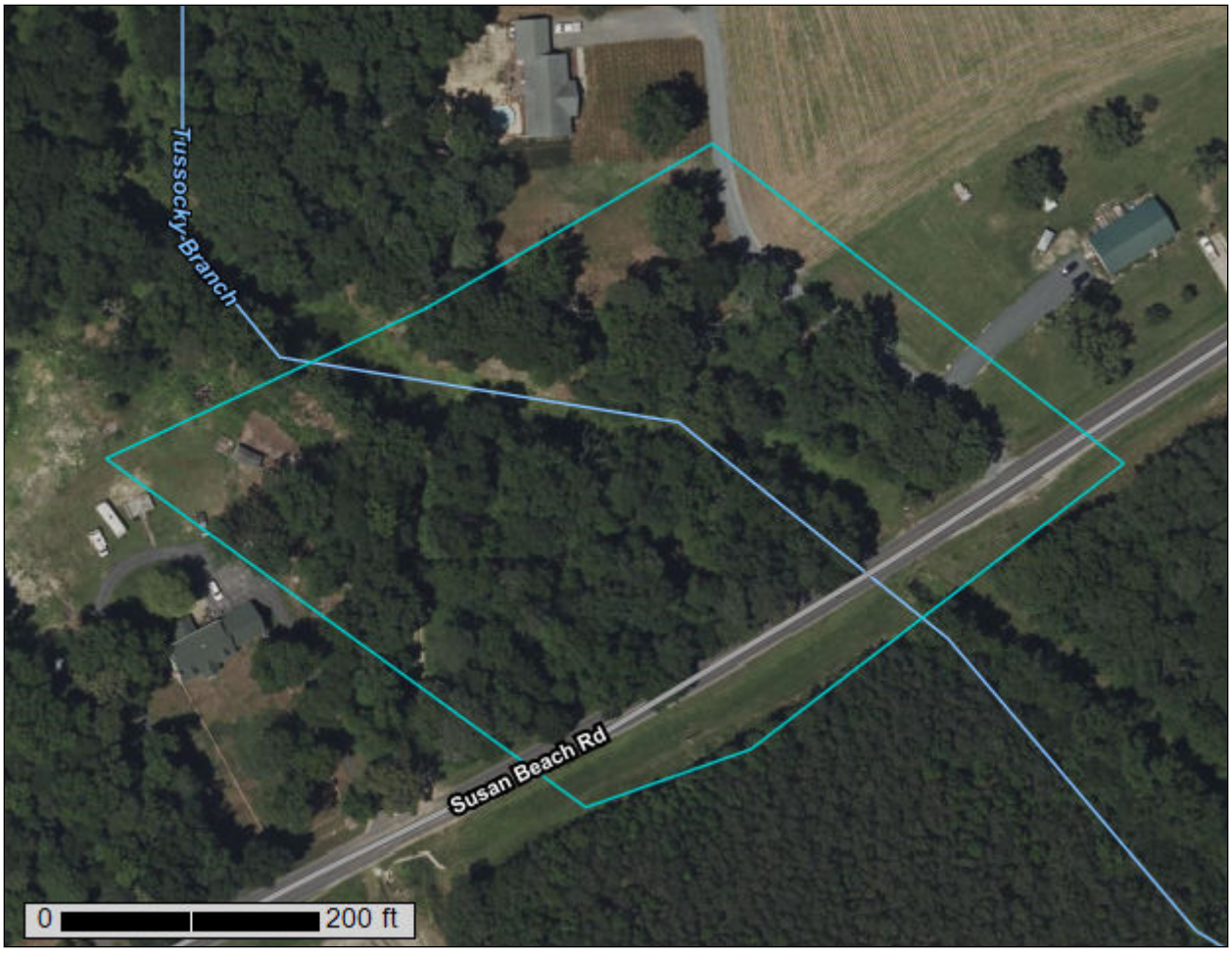
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Sussex County, Delaware

Tussocky TD bank Stabilization



March 5, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,320 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sussex County, Delaware
Survey Area Data: Version 25, Aug 31, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 30, 2022—Jul 4, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MuA	Mullica-Berryland complex, 0 to 2 percent slopes	3.7	77.6%
PsA	Pepperbox-Rosedale complex, 0 to 2 percent slopes	1.1	22.4%
RkA	Rockawalkin loamy sand, 0 to 2 percent slopes	0.0	0.1%
Totals for Area of Interest		**4.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sussex County, Delaware

MuA—Mullica-Berryland complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1qtjb
Elevation: 0 to 100 feet
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Mullica, drained, and similar soils: 26 percent
Berryland, drained, and similar soils: 24 percent
Mullica, undrained, and similar soils: 16 percent
Berryland, undrained, and similar soils: 14 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mullica, Drained

Setting

Landform: Swales, depressions, flats
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

Ap - 0 to 10 inches: mucky sandy loam
A - 10 to 14 inches: mucky sandy loam
Bg - 14 to 24 inches: sandy loam
Cg - 24 to 65 inches: sand
2Ab - 65 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Rare
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F149AY090NJ - Coastal Plain Hardwood Swamp
Hydric soil rating: Yes

Description of Berryland, Drained

Setting

Landform: Swales, depressions, flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits and/or fluviomarine sediments

Typical profile

Ap - 0 to 10 inches: mucky loamy sand
A - 10 to 17 inches: loamy sand
Bh - 17 to 24 inches: loamy sand
C - 24 to 70 inches: sand
2Ab - 70 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Rare
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F153DY120NJ - Sandy, Spodic Coastal Plain Swamp
Hydric soil rating: Yes

Description of Mullica, Undrained

Setting

Landform: Swales, drainageways, depressions, flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy fluviomarine sediments

Typical profile

Oe - 0 to 3 inches: moderately decomposed plant material
A - 3 to 10 inches: mucky sandy loam
Eg - 10 to 14 inches: sandy loam
Bg - 14 to 24 inches: sandy loam
Cg - 24 to 65 inches: sand
2Ab - 65 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)

Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F149AY090NJ - Coastal Plain Hardwood Swamp
Hydric soil rating: Yes

Description of Berryland, Undrained

Setting

Landform: Swales, drainageways, depressions, flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits and/or fluviomarine sediments

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A1 - 2 to 14 inches: mucky loamy sand
A2 - 14 to 17 inches: loamy sand
Bh - 17 to 24 inches: loamy sand
C - 24 to 70 inches: sand
2Ab - 70 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F153DY120NJ - Sandy, Spodic Coastal Plain Swamp
Hydric soil rating: Yes

Minor Components

Klej

Percent of map unit: 10 percent
Landform: Depressions, flats
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F153DY150NJ - Moist Sandy Upland
Hydric soil rating: No

Galloway

Percent of map unit: 5 percent
Landform: Flats, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F153DY150NJ - Moist Sandy Upland
Hydric soil rating: No

Askecksy, drained

Percent of map unit: 5 percent
Landform: Swales, depressions, flats
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Ecological site: F153DY130MD - Sandy Coastal Plain Swamp
Hydric soil rating: Yes

PsA—Pepperbox-Rosedale complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1qtjn
Elevation: 0 to 70 feet
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Pepperbox and similar soils: 46 percent
Rosedale and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pepperbox

Setting

Landform: Depressions, flats
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Sandy eolian deposits over fluviomarine sediments

Typical profile

A - 0 to 10 inches: loamy sand
E - 10 to 25 inches: loamy sand
Bt - 25 to 37 inches: sandy loam
2Btg - 37 to 65 inches: sandy clay loam

2Cg - 65 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 1.98 in/hr)
Depth to water table: About 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

Description of Rosedale

Setting

Landform: Flats
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits over fluviomarine sediments

Typical profile

A - 0 to 9 inches: loamy sand
E - 9 to 25 inches: loamy sand
Bt - 25 to 38 inches: sandy loam
C - 38 to 68 inches: loamy sand
2Cg - 68 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 5.95 in/hr)
Depth to water table: About 40 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F153DY160NJ - Well Drained Coarse-Loamy Upland
Hydric soil rating: No

Minor Components

Fort mott

Percent of map unit: 5 percent
Landform: Flats, knolls
Landform position (three-dimensional): Rise
Ecological site: F153DY160NJ - Well Drained Coarse-Loamy Upland
Hydric soil rating: No

Rockawalkin

Percent of map unit: 5 percent
Landform: Flats
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

RkA—Rockawalkin loamy sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1qtjv
Elevation: 10 to 100 feet
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Rockawalkin and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rockawalkin

Setting

Landform: Depressions, flats
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Sandy eolian deposits over fluviomarine sediments

Typical profile

Ap - 0 to 10 inches: loamy sand
E - 10 to 27 inches: loamy sand
Bt - 27 to 43 inches: sandy loam
BC - 43 to 70 inches: loamy sand
C - 70 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 20 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

Minor Components

Pepperbox

Percent of map unit: 10 percent
Landform: Flats, depressions, swales
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

Klej

Percent of map unit: 5 percent
Landform: Flats, depressions, swales
Ecological site: F153DY150NJ - Moist Sandy Upland
Hydric soil rating: No

Runclint

Percent of map unit: 5 percent
Landform: Flats, knolls, dunes
Landform position (three-dimensional): Rise
Ecological site: F153DY170NJ - Sandy, Excessively Drained Upland
Hydric soil rating: No

Woodstown

Percent of map unit: 5 percent
Landform: Swales, depressions, flats
Ecological site: F149AY130NJ - Moist Loamy Upland
Hydric soil rating: No

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF FISH & WILDLIFE
RICHARDSON & ROBBINS BUILDING
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

DIRECTOR'S OFFICE

PHONE
(302) 739-9910

April 15, 2025

Karyssa Gortz
DNREC Division of Watershed Stewardship
21309 Berlin Road, Unit #6
Georgetown, DE 19947

Re: DNREC-DWS Tussocky Tax Main Ditch Channel Bank Stabilization

Dear Karyssa:

Thank you for contacting the Division of Fish and Wildlife (DFW) Species Conservation and Research Program about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project.

State Natural Heritage Site
A review of our database indicates that there are currently no records of state-rare or federally listed plants, animals or natural communities at this project site. As a result, at present, this project does not lie within a State Natural Heritage Site, nor does it lie within a Delaware National Estuarine Research Reserve which are two criteria used to identify "Designated Critical Resource Waters" in the U.S. Army Corps of Engineers (USACE) Nationwide Permit General Condition No. 22. A copy of this letter shall be included in any permit application or pre-construction notification submitted to the USACE for activities on this property.

Rip-Rap/Shoreline Hardening
We recommend that the applicant consider a more natural material for bank stabilization, such as bio-logs. Rip-rap serves to harden the shoreline and reduce available fish spawning, aquatic invertebrate and plant habitat. Habitat has already been lost to a large number of docks, piers, and artificial shoreline hardening, making efforts to protect what is left important.

High Marsh
Currently, there are no records of state-rare or federally-listed marsh bird species at this site. However, aerial imagery and wetland habitat maps indicate that high marsh habitat (i.e., dominated by plants such as *Spartina patens, Distichlis spicata, and Iva frutescens*) is present. Several state-rare species of conservation concern solely or frequently nest in high marsh habitat, including the saltmarsh sparrow (*Ammospiza caudacutus*), Coastal Plain swamp sparrow

(*Melospiza georgiana nigrescens*), willet (*Tringa semipalmata*), state-listed endangered American oystercatcher (*Haematopus palliates*) and federally-listed threatened black rail (*Laterallus jamaicensis*). We recommend a time of year restriction of **April 1st to July 31st** to avoid impacts to marsh nesting birds.

Forested Wetlands
The forested wetlands on this property could support an array of plants and animals, most notably wetland dependent species such as amphibians. To reduce impacts to these species, we recommend following:

1. Avoid disturbance to and filling of isolated wetlands.
2. Maintain an upland buffer of at least 100 ft along wetlands.
3. Maintain input to natural wetlands at the pre-construction level. Avoid causing an increase or decrease in the naturally occurring water level.
4. Avoid diverting surface water from roadways and stormwater facilities into the wetlands on site. Water quality could be detrimentally affected by run-off, which can contain oil and other pollutants.
5. Avoid installing sewers with grates, which can create a hazard for amphibians and reptiles.
6. Design the development to exclude curbs. If road curbing is part of the design, curbing that allows small animals, such as turtles and salamanders, to climb out of the roadbed (such as Type 2 or Cape Cod curbing) is preferred over steep, vertical curbing.
7. Use open bottom box culverts to allow for natural substrate to remain and in-water passage of aquatic life. Additionally, culverts should be left as wide as possible to ensure that salamanders can travel through them.

For further information, contact Nate Nazdrowicz at Nathan.nazdrowicz@delaware.gov or 302-735-8688. Additional information can also be obtained from the Partners in Amphibian and Reptile Conservation (PARC) 'Habitat management guidelines for amphibians and reptiles of the Northeastern United States' or the PARC website: http://www.parcplace.org.

Key Wildlife Habitat
The forest and stream within the area of proposed development are mapped as Key Wildlife Habitats (KWHs) in the Delaware Wildlife Action Plan (DEWAP) because they are part of a large wetland complex/large forest block that can support an array of plant and animal species across the landscape.

Although designation as KWH is non-regulatory, these maps are intended to help guide site-specific conservation planning efforts. Impacts to KWH should be minimized to the greatest extent practicable.

The DEWAP is a comprehensive strategy for conserving the full array of native wildlife and habitats, common and uncommon, as vital components of the state's natural resources. This document can be viewed via the Division of Fish and Wildlife's website.

Mature Forest
A visual analysis of our historical database indicates that the forest block proposed to be developed has likely maintained some degree of forest cover since 1937. This constitutes the potential for a mature forest and, as such, the potential for rare, threatened, or endangered species that rely on this type of habitat. We recommend that a forest assessment be conducted to determine if mature forest resources exist on the property, including the identification of specimen trees and forest interior, and to delineate their boundaries. If mature forests are found, we then recommend that these areas be conserved to the fullest extent possible.

Fisheries
American Eel
Tussocky Branch is used by large numbers of American eel (*Anguilla rostrata)*. We request that in-stream work not take place from **March 1st to May 15th** to allow upstream passage of elvers (young eels).

We are continually updating our records on Delaware's rare, threatened and endangered species, unique natural communities and other significant natural resources. If the start of the project is delayed more than a year past the date of this letter, please contact us again for the latest information.

Please feel free to contact me with any questions or if you require additional information.

Sincerely,

Faith Garcia
Environmental Review Coordinator
Phone: (302) 735-8665
Email: christinefaith.garcia@delaware.gov
89 Kings Highway
Dover, DE 19901

From: CBFO Project Review, FW5
To: Gortz, Karyssa (DNREC)
Cc: Case, Michael (DNREC)
Subject: Re: [EXTERNAL] Tussocky Tax Ditch Main Channel- Bank Stabilization PCN
Date: Monday, March 31, 2025 1:50:25 PM
Attachments: image001.png

Hi Karyssa-

For your official species list, two proposed species were on the list, tricolored bat (proposed as endangered) and monarch butterfly (proposed as threatened with a 4d rule).

The U.S. Fish and Wildlife Service has reviewed your project submittal form dated March 17, 2025. The ESA does not require conferencing on species proposed to be listed unless the action is likely to jeopardize the continued existence of the species. Our assessment is that the proposed action is not likely to jeopardize the proposed endangered tricolored bat (*Perimyotis subflavus*) or the proposed threatened monarch butterfly (*Danaus plexippus*).

If possible, as a voluntary conservation measure for the tricolored bat, we recommend avoiding tree clearing from May 15 to July 31. No further consultation is required at this time. However, if either of these species are listed under the ESA before this project is completed, please contact the USFWS to reinitiate consultation for this project.

Thank you,

Kathleen

From: Gortz, Karyssa (DNREC) <karyssa.gortz@delaware.gov>
Sent: Monday, March 17, 2025 4:15 PM
To: CBFO Project Review, FW5 <cbfoprojectreview@fws.gov>
Cc: Case, Michael (DNREC) <michael.case@delaware.gov>
Subject: [EXTERNAL] Tussocky Tax Ditch Main Channel- Bank Stabilization PCN

Hello,

Attached is PCN letter, Aerial Map, Street Map, Topographic Map and Soil Survey for the upcoming project Tussocky Tax Ditch Main Channel- Bank Stabilization, Laurel, Sussex County DE. Please let us know if you have any questions or need additional info. this email and letter is being sent out in accordance with ACOE general conditions for Nationwide Permit

acceptance.

Thank You,

Karyssa

Karyssa Gortz
Environmental Scientist II– Permit & Data Specialist
Drainage Program
DNREC Division of Watershed Stewardship
21309 Berlin Rd, Unit #6, Georgetown, DE 19947
Direct (302) 855-1943