APPENDIX B:

ENVIRONMENTAL, CULTURAL RESOURCES
AND NON-FEDERAL SPONSOR COORDINATION

pennsylvania
DEPARTMENT OF TRANSPORTATION

December 27, 2021

Susquehanna County
Thompson Township
State Route 1005

District Engineer
U.S. Army Engineer District, Baltimore
10 South Howard Street
Baltimore, Maryland 21201

Dear Sir:

In accordance with the provisions of Section 14 of the Flood Control Act of 1946, as amended, which authorizes the Federal government to initiate investigations and studies to be made in the interest of emergency streambank and shoreline protection, the Pennsylvania Department of Transportation makes formal application for a study of Starucca Creek which is located near the Department's roadway, State Route (SR) 1005, segment 0100, offset 1348 in Thompson Township, Susquehanna County.

State Route 1005, segment 0100, offset 1348 in Thompson Township, Susquehanna County is experiencing accelerated erosion of the roadway embankment due to Starucca Creek meandering into the roadway embankment. If this problem is not addressed, the Department's roadway will eventually fail and become a danger to our travelling public.

The Pennsylvania Department of Transportation understands that the problem will be assessed through the conduct of a feasibility study. The Federal government will pay 100 percent of the costs of the study up to the Federal-funding limit of $100,000. If the cost exceeds the $100,000, the Pennsylvania Department of Transportation can provide 50 percent of this amount in excess of $100,000, which will be provided during construction of the project.

In addition, the Pennsylvania Department of Transportation can provide the following local cooperation and participation:

1. Provide without cost to the United States all lands, easements, rights-of-way, relocations, including suitable borrow and dredged material placement areas (LERRD), as determined by the Federal government to be necessary for the construction of the project. The value of the LERRD will be included in the total project costs and credited toward the sponsor's share of project costs, as defined in the local cooperation agreement.
2. Hold and save the United States free from claims and damages that may result from the construction and subsequent maintenance of the project,

except damages due to the fault or negligence of the United States or its contractors.

3. Assume full responsibility for all project costs in excess of the Federal cost limitation of $5,000,000.
4. Ensure maintenance and repair of the project during the useful life of the works as required to serve the project's intended purpose, with no additional cost to the Federal government.
5. Provide a minimum cash contribution of 5 percent of the project cost.
6. If the value of the sponsor's contribution above does not exceed the minimum 35 percent of the project cost, provide a cash contribution to make the sponsor's total contributions equal to 35 percent. Note that the Federal Government reserves right to raise the required contribution to 50 percent, at any time prior to beginning design and implementation phase.

Sincerely,

Richard N. Roman

Richard N. Roman, P.E.
District Executive

Enclosures

0400/RNR/sh/lcs/ss

CIRC:
R.N. Roman, P.E.
S.E. Hazelton, P.E.
J.A. Eboli, P.E.
H.S. Hill, P.E.
J. Lawson, P.E.
T. Opalka, P.E.
R. Bohr, P.E.
J. Borino, P.E.
L. Shalkowski, P.E. (retain)

OS-2C (12-24)

Pennsylvania
Department of Transportation

February 20, 2026

Sent VIA Email

Susquehanna County
Thompson Township
State Route 1005, Segment 0010
Starrucca Creek Project, MPMS 117060
USACE – Letter of Intent

Colonel Francis B. Pera, District Commander
U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, Maryland 21201
Joseph.W.Chandler@usace.army.mil

Dear Colonel Pera:

I am writing this letter to confirm our support for the Starrucca Creek Susquehanna County, Pennsylvania Continuing Authorities Program, Section 14 Study. The Pennsylvania Department of Transportation (PennDOT) supports the Recommended Plan described in the final feasibility report.

PennDOT is willing and prepared to participate in the Design and Implementation (D&I) phase of the project, and, at the appropriate time, will enter into a Project Partnership Agreement with the U.S. Army Corps of Engineers to share D&I costs. PennDOT is financially capable of providing the anticipated non-federal cost share.

We understand that this letter constitutes an expression of intent to participate in the project's development (through the execution of the Project Partnership Agreement when appropriate) and is not a contractual obligation.

Should you have any questions regarding this submittal, please contact the Project Manager, Summer Koziel, P.E. at 570.963.4048 or skoziel@pa.gov.

Sincerely,

Susan E. Hazelton, P.E.
Assistant District Executive - Design

0400/SEH/sh/sk/dmh

CIRC:
J.A. Eboli, P.E.
S.E. Hazelton, P.E.
L.C. Tomaine, P.E.
H.S. Hill, P.E.
J. Lawson, P.E.
R. Bohr, P.E.
K. Drumheller, P.E.
C. Tomaszewski
S. Koziel, P.E. (retain)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
Phone: (814) 234-4090 Fax: (814) 234-0748

In Reply Refer To: 02/03/2026 21:40:40 UTC
Project Code: 2025-0065993
Project Name: Starrucca Creek Streambank Restoration & Stabilization

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 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 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:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.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 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/program/migratory-bird-permit/what-we-do.

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/library/collections/threats-birds.

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/partner/council-conservation-migratory-birds.

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

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:

Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
(814) 234-4090

PROJECT SUMMARY

Project Code: 2025-0065993
Project Name: Starrucca Creek Streambank Restoration & Stabilization
Project Type: Modification Stream or Waterbody
Project Description: Stabilization of Starrucca Creek's south streambank adjacent to SR 1005 and relocation of the stream to its historical course further north.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.87450735,-75.48776987469238,14z

Counties: Susquehanna County, Pennsylvania

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.

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.

CLAMS

NAME	STATUS
Green Floater *Lasmigona subviridis* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7541	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

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.

IPAC USER CONTACT INFORMATION

Agency:	Army Corps of Engineers
Name:	Grant Cunningham
Address:	2 Hopkins Plaza
Address Line 2:	10-E-27
City:	Baltimore
State:	MD
Zip:	21201
Email	grant.m.cunningham@usace.army.mil
Phone:	4107905628

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
Phone: (814) 234-4090 Fax: (814) 234-0748

In Reply Refer To: 02/24/2026 18:18:30 UTC
Project code: 2025-0065993
Project Name: Starrucca Creek Streambank Restoration & Stabilization

Federal Nexus: yes
Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for 'Starrucca Creek Streambank Restoration & Stabilization'

Dear Grant Cunningham:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on February 24, 2026, for “Starrucca Creek Streambank Restoration & Stabilization” (here forward, Project). This project has been assigned Project Code 2025-0065993 and all future correspondence should clearly reference this number.

The Service developed the IPaC system and associated species’ determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northeast Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative effect(s)), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (See § 402.17). Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no further consultation with, or concurrence from, the Service is

required (ESA §7). If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13]).

The IPaC results indicated the following species is (are) potentially present in your project area and, based on your responses to the Service's Northeast DKey, you determined the proposed Project will have the following effect determinations:

Species	Listing Status	Determination
Green Floater (*Lasmigona subviridis*)	Proposed Threatened	No effect

Conclusion

If there are no updates on listed species, no further consultation/coordination for this project is required for the species identified above.

However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional consultation with the Service should take place before project implements any changes which are final or commits additional resources.

Other Species and Critical Habitat that May be Present in the Action Area

In addition to the species listed above, the following species and/or critical habitats may also occur in your project area and are not covered by this conclusion:

- Monarch Butterfly *Danaus plexippus* Proposed Threatened

Please Note: If the Action may impact bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) by the prospective permittee may be required. Please contact the Migratory Birds Permit Office, (413) 253-8643, or PermitsR5MB@fws.gov, with any questions regarding potential impacts to Eagles.

If you have any questions regarding this letter or need further assistance, please contact the Pennsylvania Ecological Services Field Office and reference the Project Code associated with this Project.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Starrucca Creek Streambank Restoration & Stabilization

2. Description

The following description was provided for the project 'Starrucca Creek Streambank Restoration & Stabilization':

> Stabilization of Starrucca Creek's south streambank adjacent to SR 1005 and relocation of the stream to its historical course further north.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.87452785,-75.48775061738894,14z

QUALIFICATION INTERVIEW

1. As a representative of this project, do you agree that all items submitted represent the complete scope of the project details and you will answer questions truthfully?

   Yes

2. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed species?

   Note: This question could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered, or proposed species.

   No

3. Is the action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   Note: for projects in Pennsylvania: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer ‘yes’ to this question.

   Yes

4. Are you including in this analysis all impacts to federally listed species that may result from the entirety of the project (not just the activities under federal jurisdiction)?

   Note: If there are project activities that will impact listed species that are considered to be outside of the jurisdiction of the federal action agency submitting this key, contact your local Ecological Services Field Office to determine whether it is appropriate to use this key. If your Ecological Services Field Office agrees that impacts to listed species that are outside the federal action agency's jurisdiction will be addressed through a separate process, you can answer yes to this question and continue through the key.

   Yes

5. Are you the lead federal action agency or designated non-federal representative requesting concurrence on behalf of the lead Federal Action Agency?

   Yes

6. Is the lead federal action agency the Natural Resources Conservation Service?

   No

7. Will the proposed project involve the use or storage of herbicide?

   No

8. Will the proposed project involve herbaceous native vegetation removal (including prescribed fire that would result in burning of plants) or mowing?

   Yes

9. Does any component of the project associated with this action include activities or structures that may pose a collision risk to **birds** (e.g., plane-based surveys, new or enlarged communication towers or broadcast towers, high voltage transmission lines, any type of towers with or without guy wires)?

   No

10. Will the proposed project involve demolition, rehabilitation, property elevation, renovation, and/or rebuilding of one or more existing buildings (e.g., residential, commercial and industrial buildings, or utilities)? Note: if project activities include modification of bridges and/or culverts, answer this question "No".

    No

11. Are federally listed freshwater mussels known to be present in the action area?

    Note: If unsure, contact the appropriate Ecological Services Field Office for additional information or answer "NO" and continue through the key.

    Yes

12. Will the proposed project result in **permanent** changes to surface water or groundwater quantity, retention, quality or timing?

    Note: Projects may affect stream flow, surface water, or groundwater through various activities such as; water withdrawal, water recharge, well drilling, infiltration impacts, stormwater outlets, hydropower production, water impoundments, intake structures, stream diversion, mining operations, dams, surface water drainage, or hydroelectric turbines.

    If a project only involves temporary and limited reductions in water that will not displace listed species or significantly alter their water availability (meaning there are no changes to their feeding, breeding, or sheltering), you can answer "No" to this question.

    This question specifically addresses the quantity of water in a stream. Other water quality issues, such as sedimentation and turbidity, will be covered in subsequent questions.

    No

13. Does the project include activity in or within 300 feet of a freshwater wetland?

    Note: This encompasses various project activities related to wetlands, including activities taking place within wetlands, activities occurring within 300 feet of wetlands that could impact them, and water withdrawals and/or discharge of contaminants, even if covered by a National Pollutant Discharge Elimination System (NPDES) permit.

    Examples of such activities include, but are not limited to; wetland draining, ditching, tilling, filling, excavation, stream diversion, impoundments, mowing, grazing vegetation, construction of access roads, creation of detention basins, installation of water or sewer lines, irrigation, increase of impervious surfaces, and application of pesticides, deicing agents, or fertilizers..

    Yes

14. Will the proposed project directly affect a streambed (below ordinary high water mark (OHWM)) of the stream?

    Yes

15. Will the proposed project bore underneath (directional bore or horizontal directional drill) a stream where listed species may be present?

    No

16. Will the proposed project involve a new point source discharge into a stream or change an existing point source discharge (e.g., outfalls; leachate ponds, fracking fluid) including changes to pH, temperature and/or chemical composition (e.g., choloride, nickel,etc.)?

    No

17. Will the proposed project involve the removal of sediment or debris, dredging or in-stream gravel mining where listed species may be present?

    Yes

18. Will the proposed project involve the creation of a new water-borne contaminant source where listed species may be present?

    Note: New water-borne contaminant sources occur through improper storage, usage, or creation of chemicals. For example: leachate ponds and pits containing chemicals that are not NSF/ANSI 60 compliant have contaminated waterways. Sedimentation will be addressed in a separate question.

    No

19. Will the proposed project involve perennial stream loss, in a stream or tributary of a stream where listed species may be present, that would require an individual permit under 404 of the Clean Water Act?

    No

20. Will the proposed project involve pesticide use or storage within 200 feet of a karst feature or perennial stream bank where aquatic listed species may be present?

    No

21. Will the proposed project include activities that could negatively affect fish movement temporarily or permanently (including fish stocking, harvesting, or creation of barriers to fish passage).

    Yes

22. Will the proposed project involve earth moving or other ground disturbance that could cause erosion and sedimentation, and/or contamination within 300 feet of a freshwater wetland or along a stream?

    Note: Answer "Yes" to this question if erosion and sediment control measures will be used.

    Yes

23. Will the proposed project impact streams or tributaries of streams where aquatic listed species may be present through activities such as, but not limited to, valley fills, large-scale vegetation removal that could result in ground destabilization, and/or change in site topography?

    No

24. Will the proposed project involve vegetation removal within 300 feet of a perennial stream bank where aquatic listed species may be present?

    Yes

25. Will erosion and sedimentation control Best Management Practices (BMPs) associated with applicable state and/or Federal permits, be applied to the project?

    Note: If BMPs have been provided by and/or coordinated with and approved by the appropriate Ecological Services Field Office, answer "Yes" to this question.

    Yes

26. Is the project being funded, lead, or managed in whole or in part by U.S Fish and Wildlife Restoration and Recovery Program (e.g., Partners, Coastal, Fisheries, Wildlife and Sport Fish Restoration, Refuges)?

    No

27. Does the proposed project involve construction or installation of a non-commercial boat dock on a stream?

    No

28. Does the project area intersect the Species List Area of the Green Floater Mussel?

    Automatically answered
    Yes

29. Do you have any other documents that you want to include with this submission?

    No

PROJECT QUESTIONNAIRE

1. Approximately how many acres of trees would the proposed project remove?

   0.1

2. Approximately how many total acres of disturbance are within the disturbance/ construction limits of the proposed project?

   1

3. Briefly describe the habitat within the construction/disturbance limits of the project site.

   Sedimented streambed and vegetated streambanks.

IPAC USER CONTACT INFORMATION

Agency:	Army Corps of Engineers
Name:	Grant Cunningham
Address:	2 Hopkins Plaza
Address Line 2:	10-E-27
City:	Baltimore
State:	MD
Zip:	21201
Email	grant.m.cunningham@usace.army.mil
Phone:	4107905628

1. PROJECT INFORMATION

Project Name: **Starrucca Creek CAP 14 Emergency Streambank Stabilization**
Date of Review: **2/3/2026 04:47:56 PM**
Project Category: **Habitat Conservation and Restoration, Streambank stabilization (with riprap)**
Project Area: **5.04 acres**
County(s): **Susquehanna**
Township/Municipality(s): **Thompson Township**
ZIP Code:
Quadrangle Name(s): **ORSON; STARRUCCA**
Watersheds HUC 8: **Upper Susquehanna**
Watersheds HUC 12: **Upper Starrucca Creek**
Decimal Degrees: **41.874572, -75.487789**
Degrees Minutes Seconds: **41° 52' 28.4601" N, 75° 29' 16.398" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

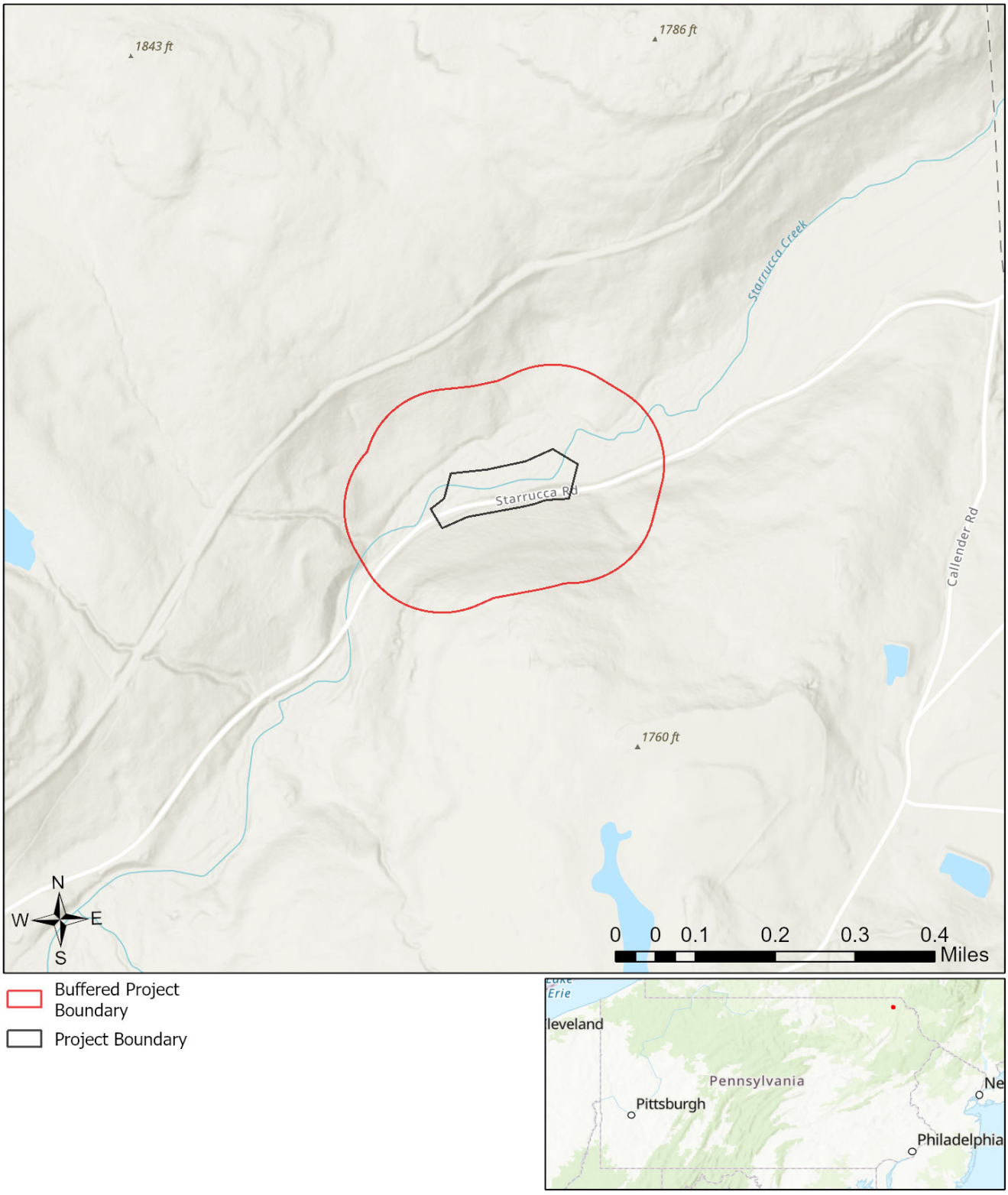
Starrucca Creek CAP 14 Emergency Streambank Stabilization

Buffered Project Boundary

Project Boundary

Sources: Esri, Vantor, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community

Starrucca Creek CAP 14 Emergency Streambank Stabilization



Sources: Esri, Vantor, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Management
Division of Environmental Review
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: GRANT CUNNINGHAM
Company/Business Name: U.S. ARMY CORPS OF ENGINEERS, BALTIMORE
Address: 2 HOPKINS PLACE
City, State, Zip: BALTIMORE, MD 21201
Phone:(___)___ Fax:(___)___
Email: grant.m.cunningham@usace.army.mil

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

3 FEBRUARY 2026
date

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

18 March 2026

CENAB-PL-P

Pennsylvania Ecological Services Field Office
United States Fish and Wildlife Service
110 Radnor Road #101, State College, PA 16801
IR1_ESPenn@fws.gov

RE: Fish and Wildlife Coordination Act, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

To Whom It May Concern:

The purpose of this letter is to initiate coordination with your office in accordance with the Fish and Wildlife Coordination Act (FWCA), regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program, which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove approximately 1,160 cubic yards of gravel sedimentation from within Starrucca Creek and realign approximately 245 feet of the channel further north away from the roadway, as well as stabilize the streambank and reinforce the road foundation with riprap armoring (Enclosure 2).

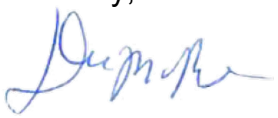
The segment of Starrucca Creek located within the project area is classified by the Pennsylvania Fish and Boat Commission (PFBC) as Wild Trout Waters for Natural Reproduction, which entails a time-of-year restriction on instream work from 1 October to 31 December in any given calendar year. The stream is also classified by the Pennsylvania Department of Environmental Protection (PADEP) as a Chapter 93 waterbody for cold-water fishes and migratory fishes. USACE, therefore, will not carry out project activities during the period between 1 October and 31 December and will apply for a Chapter 105 Water Encroachment and Obstruction Permit from PADEP, as well as a Section 401 Water Quality Certification.

USACE reviewed the USFWS *Information for Planning and Consultation* (IPaC) online tool to identify federally listed threatened or endangered species potentially occurring within the project area. The Official Species List identified the proposed threatened green floater (*Lasmigona subviridis*) and proposed threatened monarch butterfly (*Danaus plexippus*) as potentially occurring (Enclosure 3). USACE completed

the IPaC *Northeast Endangered Species Determination Key* and received a “no effect” determination for the green floater and a technical assistance letter (Enclosure 4). USACE also determined that the project would have no effect on the monarch butterfly, given the geographic extent of the project area and the limited amount of vegetation that would be permanently removed by the project.

I am reaching out to request information and comments your agency may have pursuant to the FWCA that may assist us with the Starrucca Creek Streambank Stabilization Project. Thank you for your assistance with this project. I kindly request your feedback (or quick indication of no input) by **28 April 2026**. Please provide comments or direct any questions to Grant M. Cunningham, project environmental planner, at Grant.M.Cunningham@usace.army.mil.

Sincerely,



Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

May 5, 2025

Sent Via PA-SHARE

RE: ER Project # 2025PR02263.001, Starrucca Creek Continuing Authorities Program (CAP) Section 14 Emergency Streambank Stabilization Project, Army Corps of Engineers, Thompson Township, Susquehanna County

Dear Submitter,

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Above Ground Resources
No Above Ground Concerns - Environmental Review - No Historic Properties - Above Ground

Based on the information received and available in our files, it is our opinion that there are no above ground historic properties (resources listed in or eligible for listing in the National Register) present in the project area of potential effect. Therefore, no above ground historic properties will be affected by the proposed project. Should the scope of the project change and/or new information be brought to your attention regarding historic properties located within the project area of potential effect, please reinitiate consultation with our office using PA-SHARE.

For questions concerning above ground resources, please contact Sara-Ladd Manley at samanley@pa.gov.

Archaeological Resources
No Archaeological Concerns - Environmental Review - No Effect - Archaeological

Based on the information received and available in our files, in our opinion, the proposed project should have No Effect on archaeological resources. Should the scope of the project be amended to include additional ground-disturbing activity and/or should you be made aware of historic property concerns regarding archaeological resources, you will need to reinitiate consultation with our office using PA-SHARE.

For questions concerning archaeological resources, please contact Sara-Ladd Manley at samanley@pa.gov.

Sincerely,

Barbara Frederick
Environmental Review Division Manager

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Andrea Lowery, SHPO
Pennsylvania Historical and Museum Commission
400 North Street
Harrisburg, PA 17120-0093

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

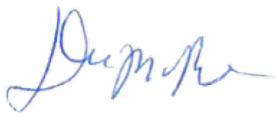
Dear Ms. Lowery:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

The project's area of potential effect (APE) may be defined as the area of direct construction impacts and the areas within which the undertaking may directly or indirectly cause alterations to the character or use of historic properties, including visual effects. A draft APE is included in Enclosure 1 for your review. A preliminary review of the Pennsylvania State Historic and Archaeological Resources Exchange (PA-SHARE) indicates that no historic properties have been identified within the APE. Additionally, the APE boundaries fall within an area that was surveyed in February 2016 by Circa CRM (*Phase I Cultural Resources Survey of Starruca Creek Mitigation Project* [Report No. 2016RP00224]). The investigation did not document any resources and recommended no additional cultural resources investigations. Given the lack of previously identified resources within the APE, the proposed project would have no effects on historic properties.

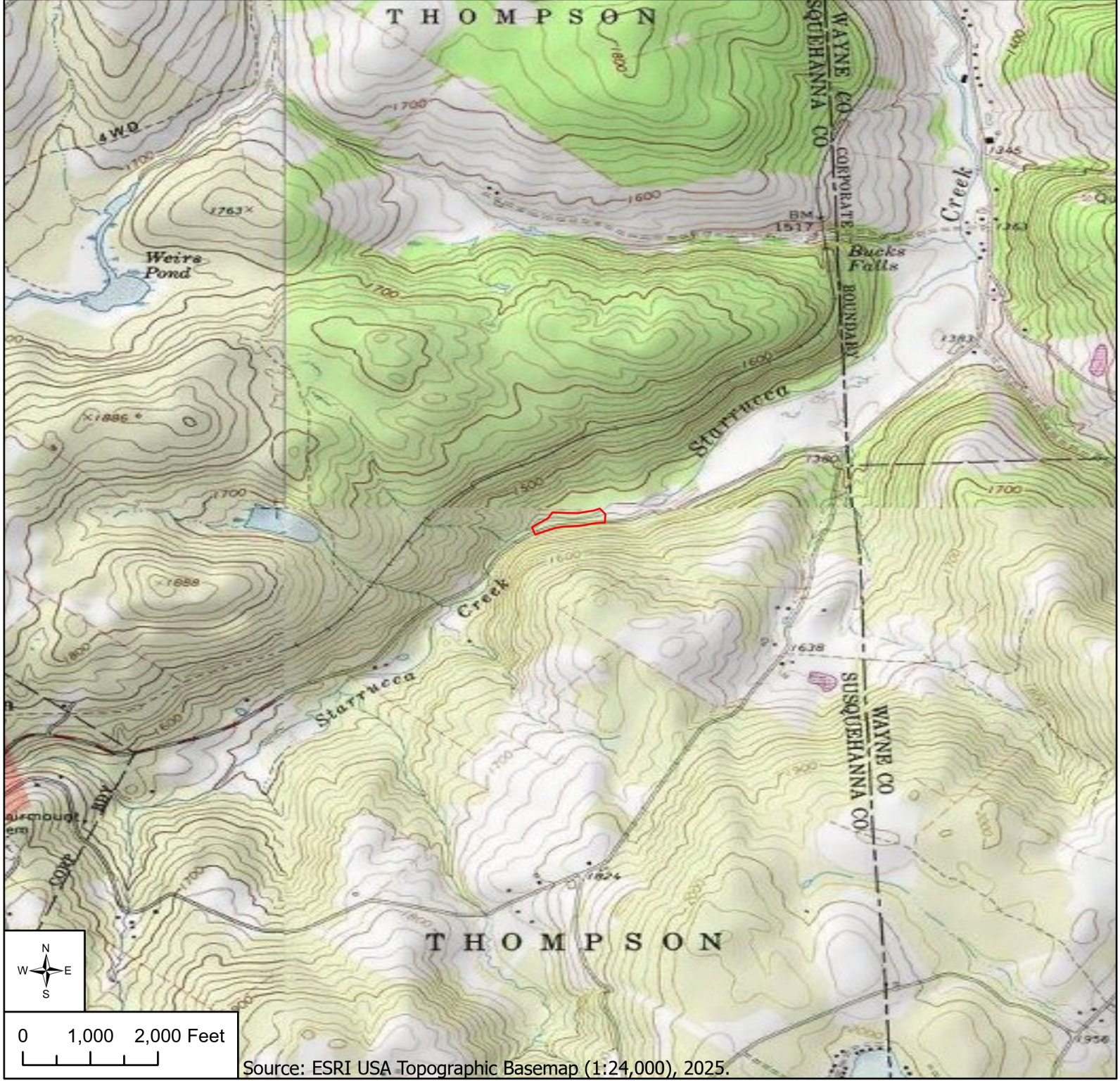
Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,



Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures



Source: ESRI USA Topographic Basemap (1:24,000), 2025.

Area of Potential Effect


Source: NAIP Imagery, 2025.
0
200
400 Feet
N
W
E
S
Access Lane
Staging Area
Area of Potential Effect

From: Bonnie Yuscavage
To: Bean, Ethan A CIV USARMY CENAB (USA)
Subject: [Non-DoD Source] Re: Section 106 Review – Starrucca Creek Streambank Stabilization Project
Date: Thursday, May 8, 2025 9:48:49 AM
Attachments: image001.png

Dear Mr. Bean,

Thank you for your note. At this time, we likewise know of no specific historic threats to that spot. We have an archeologist on our board and I will continue to be in communication with him. You may certainly call on us if you have any questions or concerns.

Bonnie Yuscavage
Curator
bonnie.yuscavage@susqcohistsoc.org

On Mon, May 5, 2025 at 7:54 AM Bean, Ethan A CIV USARMY CENAB (USA) <ETHAN.A.BEAN@usace.army.mil> wrote:

> Good morning,
>
> Please find attached for your review and comment information regarding the proposed Starrucca Creek Streambank Stabilization Project in Thompson Township, Susquehanna County, Pennsylvania. Please let me know if you are interested in consulting on this project, or if you have any questions or comments.
>
> Respectfully,
>
> Ethan Bean
>
> _____
>
> Ethan A. Bean, M.S.
>
> Cultural Resources Specialist
>
> History Program Manager
>
> U.S. Army Corps of Engineers
>
> Baltimore District

Work - Desk: (410) 962-2173

Work - Cell: (443) 742-8048

--
Bonnie Yuscavage
Curator
Susquehanna County Historical Society
18 Monument St.
Montrose, PA 18801
570-278-1622

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Bonnie Yuscavage
Susquehanna County Historical Society
18 Monument Street
Montrose, PA 18801

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Ms. Yuscavage:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

The project's area of potential effect (APE) may be defined as the area of direct construction impacts and the areas within which the undertaking may directly or indirectly cause alterations to the character or use of historic properties, including visual effects. A draft APE is included in Enclosure 1 for your review. A preliminary review of the Pennsylvania State Historic and Archaeological Resources Exchange (PA-SHARE) indicates that no historic properties have been identified within the APE. Additionally, the APE boundaries fall within an area that was surveyed in February 2016 by Circa CRM (*Phase I Cultural Resources Survey of Starruca Creek Mitigation Project* [Report No. 2016RP00224]). The investigation did not document any resources and recommended no additional cultural resources investigations. Given the lack of previously identified resources within the APE, the proposed project would have no effects on historic properties.

Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Cain Chamberlin, Executive Director
Endless Mountains Heritage Region
602 Main Street, Suite 7
Towanda, PA 18848

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Mr. Chamberlin:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

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Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Katelyn Lucas, THPO
Delaware Nation
P.O. Box 825
Anadarko, OK 73005

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Ms. Lucas:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

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Please let us know if you are interested in consulting on this project on a Government-to-Government basis, and the extent to which you wish to participate. We will provide a USACE representative at consultation meetings, and we will fully consider any information you wish to provide.

Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Martina Thomas, Interim THPO
Delaware Tribe of Indians
5100 Tuxedo Boulevard
Bartlesville, OK 74006

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Ms. Thomas:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

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Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Clint Halftown
Nation Representative
Cayuga Nation
256 Cayuga Street
Union Springs, NY 13160

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Representative Halftown:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

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Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Tony Gonyea, THPO
Onondaga Nation
4040 Route 11
Nedrow, NY 13120

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Mr. Gonyea:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

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Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

William Tarrant, THPO
Seneca-Cayuga Nation
P.O. Box 453220
Grove, OK 74345

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Mr. Tarrant:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

The project's area of potential effect (APE) may be defined as the area of direct construction impacts and the areas within which the undertaking may directly or indirectly cause alterations to the character or use of historic properties, including visual effects. A draft APE is included in Enclosure 1 for your review. A preliminary review of the Pennsylvania State Historic and Archaeological Resources Exchange (PA-SHARE) indicates that no historic properties have been identified within the APE. Additionally, the APE boundaries fall within an area that was surveyed in February 2016 by Circa CRM (*Phase I Cultural Resources Survey of Starruca Creek Mitigation Project* [Report No. 2016RP00224]). The investigation did not document any resources and recommended no additional cultural resources investigations. Given the lack of previously identified resources within the APE, the proposed project would have no effects on historic properties.

Please let us know if you are interested in consulting on this project on a Government-to-Government basis, and the extent to which you wish to participate. We will provide a USACE representative at consultation meetings, and we will fully consider any information you wish to provide.

Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Jeff Bendremer, THPO
Stockbridge Munsee Community
86 Spring Street
Williamstown, MA 01267

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Mr. Bendremer:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

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Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MD 21201

April 16, 2025

CENAB-PL-P

Bryan Printup, Tribal Representative
Tuscarora Nation
5226 Walmore Road
Lewiston, NY 14092

RE: Section 106 National Historic Preservation Act Consultation, Starrucca Creek Streambank Stabilization, Thompson Township, Susquehanna County, Pennsylvania

Dear Mr. Printup:

The purpose of this letter is to initiate consultation with your office in accordance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 Code of Federal Regulations Part 800, regarding the Starrucca Creek Streambank Stabilization Project. The U.S. Army Corps of Engineers, Baltimore District (USACE) is evaluating alternatives to implement streambank stabilization along State Route 1005 near Thompson, Susquehanna County, Pennsylvania (Enclosure 1). The project is being implemented under Section 14 of the Continuing Authorities Program which authorizes USACE to develop and construct or repair streambank and shoreline protection projects to protect endangered roadways, bridge approaches, and public facilities. USACE is proposing to remove gravel bars from within Starrucca Creek and stabilize the streambank with R-7 rip rap (18-inch to 30-inch stone) and reinforce/stabilize the road foundation with AASHTO #57 (quarter inch to 1.5-inch stone) (Enclosure 2).

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Thank you for your assistance with this project. We ask that your office review the enclosed information and assist us in identifying and assessing the project's effect on historic properties. If you have any questions about this project, please contact Ethan A. Bean at ethan.a.bean@usace.army.mil.

Sincerely,

Daniel M. Bierly, P.E.
Chief, Civil Project Development Branch
Planning Division

Enclosures

Pennsylvania
Department of Transportation

MEMO

DATE: 5/21/2025

SUBJECT: S.R. 1005 Starrucca Creek Wetland Field View Results

TO: Summer Koziel
Civil Engineer Consultant
PA Department of Transportation | Engineering District 4-0

FROM: Kevin Hendrickson
Senior Civil Engineer Supervisor | Environmental Unit
PA Department of Transportation | Engineering District 4-0
55 Keystone Industrial Park Rd | Dunmore, PA18512
Tele: 570-963-3214

The Environmental Unit reviewed the project location for wetlands on Monday May 12th, 2025. The area investigated included approximately 650-linear-foot segment of Starrucca Creek, extending 200 feet upstream and downstream of the project limits.

This project is located in Thompson Township, Susquehanna County, Pennsylvania along Starrucca creek adjacent to SR 1005. The work will consist of streambank realignment & streambank restoration activities along Starrucca Creek.

Following the guidelines in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, multiple wetlands were identified within the project area. Wetland & Upland data forms are attached.

Upland A (SS-UPLA) soil sample was taken on the upstream North side of Starrucca Creek. Soil in this area was dry and well drained. No restrictive layer was observed in this area. Plant species around the sample location include Eastern Hemlock, Goldenrod, Bedstraw and Japanese Knotweed. The soil profile consisted of one matrix color with a total depth of 18 inches. 0-18" contained a matrix color of 7.5YR 4/3 at 100%. No indications of wetland hydrology or hydric soil were observed in the upland testing area.

Upland B (SS-UPLB) soil sample was taken on the downstream North side of Starrucca Creek. Soil in this area was dry and well drained. No restrictive layer was observed in this area. Plant species around the sample location include Eastern Hemlock, Ironwood, Christmas Fern, Canada Mayflower, Wood Anemone, and Wood Aster. The soil profile consisted of two matrix colors with a total depth of 18 inches. 0-4” contained a matrix color of 10YRYR 4/2 at 100%. 4”-18” contained a matrix color of 10YR 5/4 at 100% No indications of wetland hydrology or hydric soil were observed in the upland testing area.

Upland C (SS-UPLC) soil sample was taken on the downstream North side of Starrucca Creek. Soil in this area was dry and well drained. No restrictive layer was observed in this area. Plant species around the sample location include Eastern Hemlock, Ironwood, Hop-hornbeam,

Canada Mayflower, Christmas Fern, and Rattlesnake Root. The soil profile consisted of one matrix color with a total depth of 18 inches. 0-18" contained a matrix color of 7.5YR 3/3 at 100%. No indications of wetland hydrology or hydric soil were observed in the upland testing area.

Upland D (SS-UPLD) soil sample was taken on the upstream North side of Starrucca Creek. Soil in this area was dry and well drained. No restrictive layer was observed in this area. Plant species around the sample location include Eastern Hemlock, Ironwood, Hop-hornbeam, Japanese barberry, Canada Mayflower, Christmas Fern, and Rattlesnake Root. The soil profile consisted of one matrix color with a total depth of 18 inches. 0-18" contained a matrix color of 7.5YR 3/3 at 100%. No indications of wetland hydrology or hydric soil were observed in the upland testing area.

Upland E (SS-UPLE) soil sample was taken on the downstream South side of Starrucca Creek. Soil in this area was dry and well drained. A restrictive layer was observed at 8” in this area due to hardpan. Plant species around the sample location include Eastern Hemlock, Ironwood, Lady Fern, Christmas Fern and Meadow Rue. The soil profile consisted of one matrix color with a total depth of 8 inches. 0-8" contained a matrix color of 7.5YR 3/3 at 100%. No indications of wetland hydrology or hydric soil were observed in the upland testing area.

Wetland A (SS-WA) is a Palustrine Emergent Wetland (PEM) system located along the floodplain of Starrucca Creek. This wetland is an open-ended wetland that parallels Starrucca Creek. The wetland system contains vegetation such as Eastern Hemlock, Yellow Birch, Sensitive Fern, Fox Sedge, Creeping Buttercup, Creeping Jenny, and Grass-leaved Goldenrod. The soil profile consists of two matrix colors with total depth of 18 inches. 0-4” contains a matrix color of 7.5YR 4/2 at 100%. 4”-18” contains a matrix color of 7.5YR 4/1 at 80% with a redox concentration color of 7.5YR 5/6 at 20%. Hydrology Indicators observed were Surface Water at a depth of 2”, Saturation at a depth of 0” and High-Water Table at a depth of 2”. The source of hydrology for the wetland is from surface water runoff and over-bank flooding from Starrucca Creek.

Wetland B (SS-WB) is a Palustrine Emergent Wetland (PEM) system located along the floodplain of Starrucca Creek. This wetland is an open-ended wetland that parallels Starrucca Creek. The wetland system contains vegetation such as Eastern Hemlock, Yellow Birch, False Hellbore, Creeping Jenny, Jewel Weed, and Buttercup. The soil profile consists of one matrix color with total depth of 18 inches. 0-18” contains a matrix color of 10YR 4/2 at 85% with a redox concentration color of 10YR 6/8 at 15%. Hydrology Indicators observed were Surface Water at a depth of 1”, Water Table at a depth of 2”, Saturation at a depth of 0”, Geomorphic Position, Drainage Patters, and Water Marks. The source of hydrology for the wetland is from stormwater runoff and over-bank flooding from Starrucca Creek.

Wetland C (SS-WC) is a Palustrine Emergent Wetland (PEM) system located along the floodplain of Starrucca Creek. This wetland is an isolated wetland that parallels Starrucca Creek. The wetland system contains vegetation such as American Basswood, False Hellbore Foam Flower, Meadow Rue, Wood Leek, and Sensitive Fern. The soil profile consists of one matrix color with total depth of 14 inches. 0-14” contains a matrix color of 10YR 4/1 at 80% with a redox color of 10YR 5/6 at 20%. A restrictive layer was observed at 14" due to Hardpan. No surface water or water table observed. The hydrology indicator of soil Saturation was observed at a depth of 8 inches. The source of hydrology for the wetland is from stormwater runoff and over-bank flooding from Starrucca Creek.

One watercourse was identified within the project limits. Starrucca Creek is classified as perennial streams with a chapter 93 designation of Cold-Water Fishes, Migratory Fishes (CWF, MF). Starrucca Creek channel contains an average width of 18 feet and a depth of 6-12 inches. The creek bed contains silt, gravel, and cobble. The source of hydrology for the creek is Roberts Pond which is located Southwest outside the project area. Starrucca Creek is classified as a Wild Trout stream, therefore, there is an in-stream construction time of year restriction from October 1st to December 31st of any given calendar year.

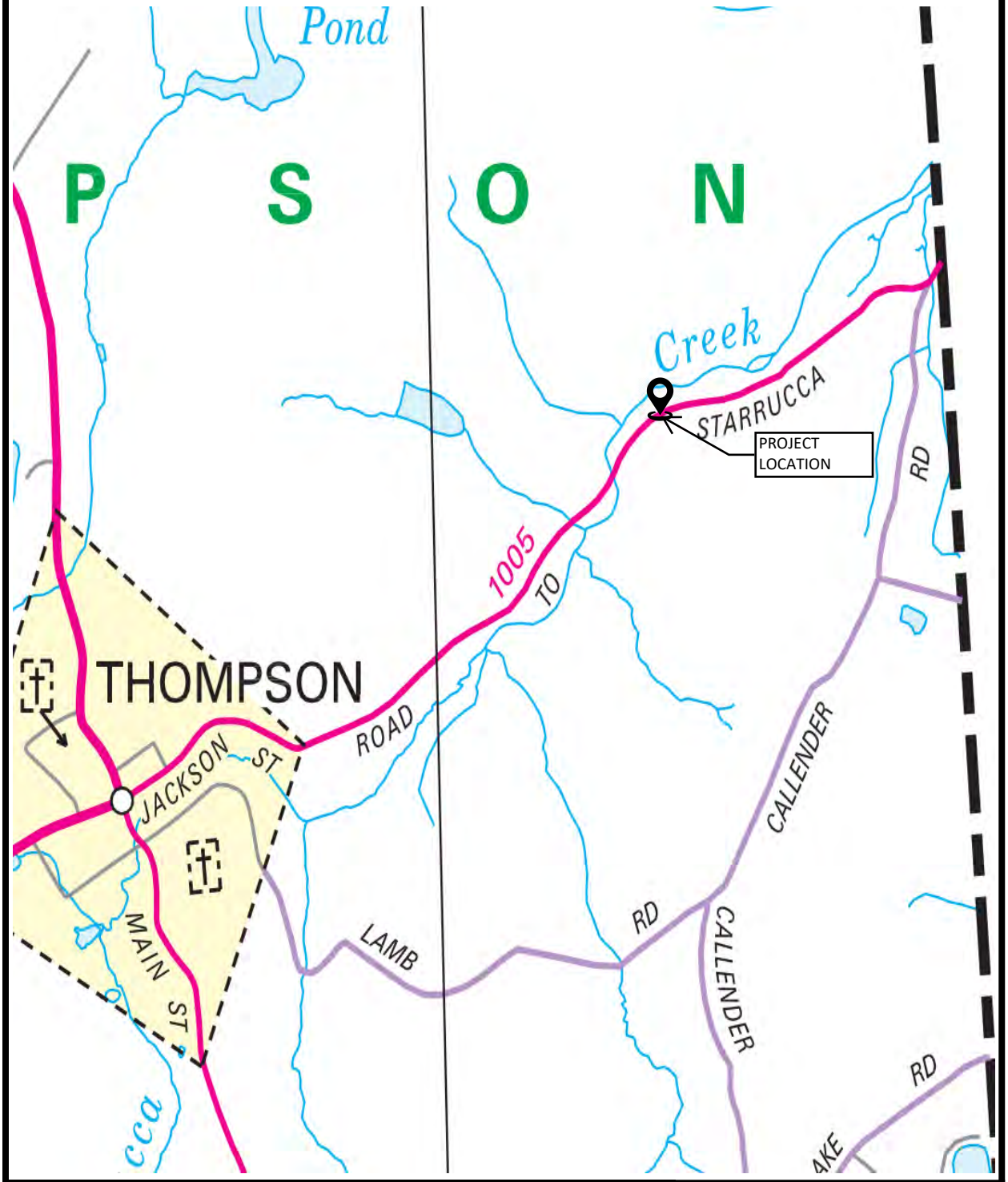
Should you have any questions or need further information please contact the Environmental Unit.

Prepared by:
Nicholas Freethy PWS
Nicholas Freethy PWS

Reviewed By:
Kevin Hendrickson
Kevin Hendrickson

Pennsylvania
Department of Transportation

LOCATION MAP



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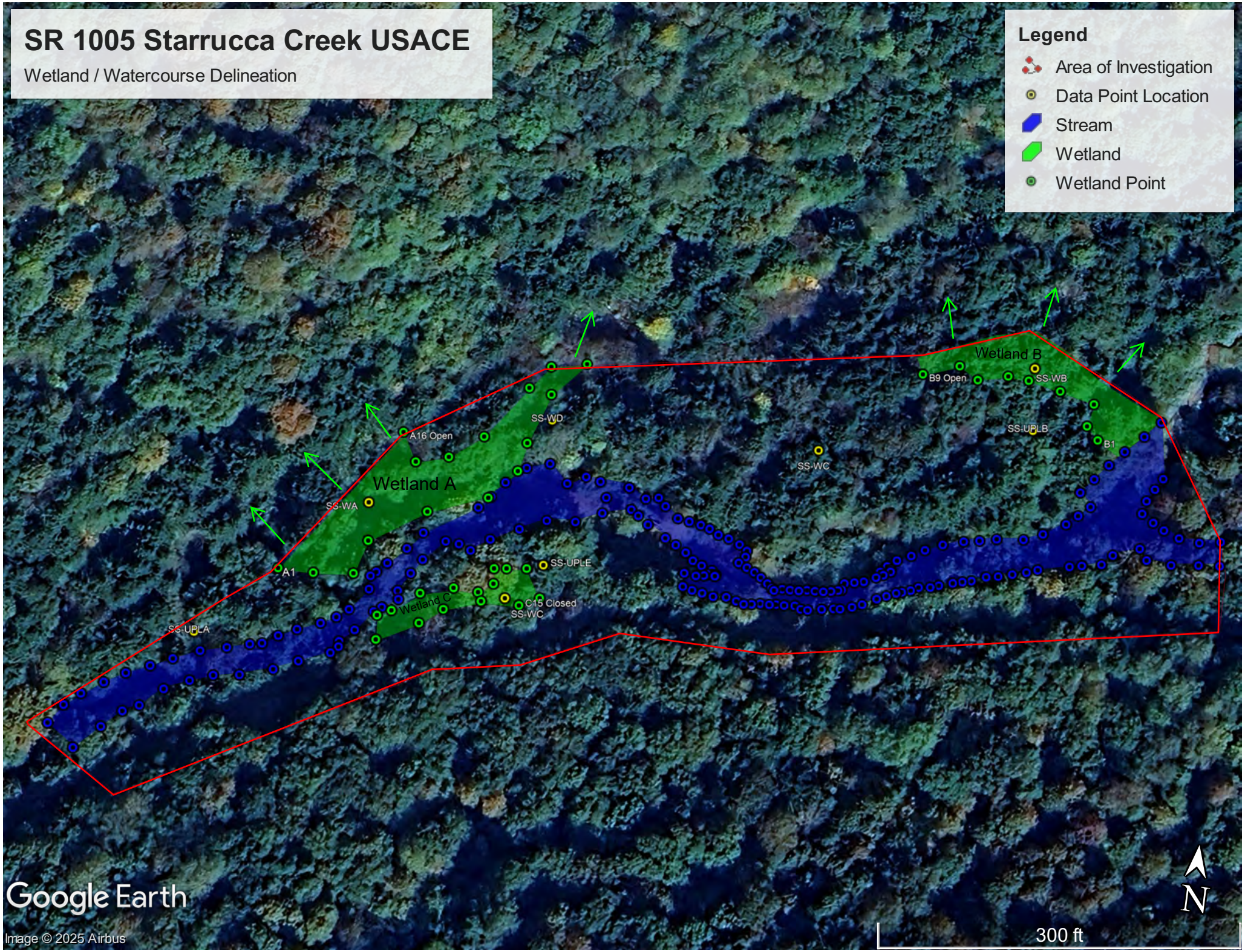
SR. 1005 STARRUCCA CREEK
THOMPSON TOWNSHIP,
SUSQUEHANNA COUNTY
41.87447, -75.48790

PROJECT LOCATION


SR 1005 Starrucca Creek USACE
Wetland / Watercourse Delineation
Legend
Area of Investigation
Data Point Location
Stream
Wetland
Wetland Point
Wetland A
Wetland B
Wetland C
A1
A16 Open
SS-WA
SS-WD
SS-UPLA
SS-UPLE
C15 Closed
SS-WC
B9 Open
SS-WB
SS-UPLB
B1
SS-WC
Google Earth
Image © 2025 Airbus
N
300 ft

Wetland A		
Point Name	**Lattitude**	**Longitude**
WB A1	41.87435633	-75.4893756
WB A2	41.8743561	-75.48926259
WB A3	41.87436665	-75.48913607
WB A4	41.87444728	-75.48910592
WB A5	41.87453334	-75.48893319
WB A6	41.8745843	-75.48874633
WB A7	41.87465695	-75.48866454
WB A8	41.87472724	-75.48864702
WB A9	41.87485198	-75.48859127
WB A10	41.87493761	-75.48848967
WB A11	41.87492013	-75.48860395
WB A12	41.87486188	-75.48866528
WB A13	41.87472964	-75.48878784
WB A14	41.87467005	-75.48889089
WB A15	41.87464887	-75.48899431
WB A16	41.87471618	-75.48904823
SS WA	41.87453774	-75.48912331

Wetland B		
Point Name	**Lattitude**	**Longitude**
WB B1	41.87490623	-75.48682448
WB B2	41.87493738	-75.4868617
WB B3	41.87499313	-75.48684453
WB B4	41.87501471	-75.48695591
WB B5	41.87503167	-75.48705968
WB B6	41.8750362	-75.48712697
WB B7	41.87501775	-75.48722432
WB B8	41.87504649	-75.48728622
WB B9	41.87501516	-75.48740276
SS WB	41.8750636	-75.4870428

Wetland C		
Point Name	**Lattitude**	**Longitude**
WB C1	41.87436404	-75.48853947
WB C2	41.8744291	-75.48859324
WB C3	41.87442324	-75.48865645
WB C4	41.87441966	-75.48869606
WB C5	41.87438378	-75.488691
WB C6	41.87435979	-75.48873532
WB C7	41.87436234	-75.48881425
WB C8	41.87434034	-75.48891678
WB C9	41.87429202	-75.48899851
WB C10	41.87427678	-75.48904125
WB C11	41.87422034	-75.48903307
WB C12	41.87427096	-75.48890637
WB C13	41.87430973	-75.4888364
WB C14	41.87433964	-75.48872214
WB C15	41.87434114	-75.48860138
SS WC	41.8743536	-75.4886487

Upland Points		
Point Name	**Lattitude**	**Longitude**
SS UPLA	41.87418497	-75.48960447
SS UPLB	41.87491023	-75.48703393
SS UPLC	41.87479757	-75.48771341
SS UPLD	41.8747897	-75.4885774
SS UPLE	41.87444207	-75.48854215

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 Susquehanna County, Pennsylvania

May 14, 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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.

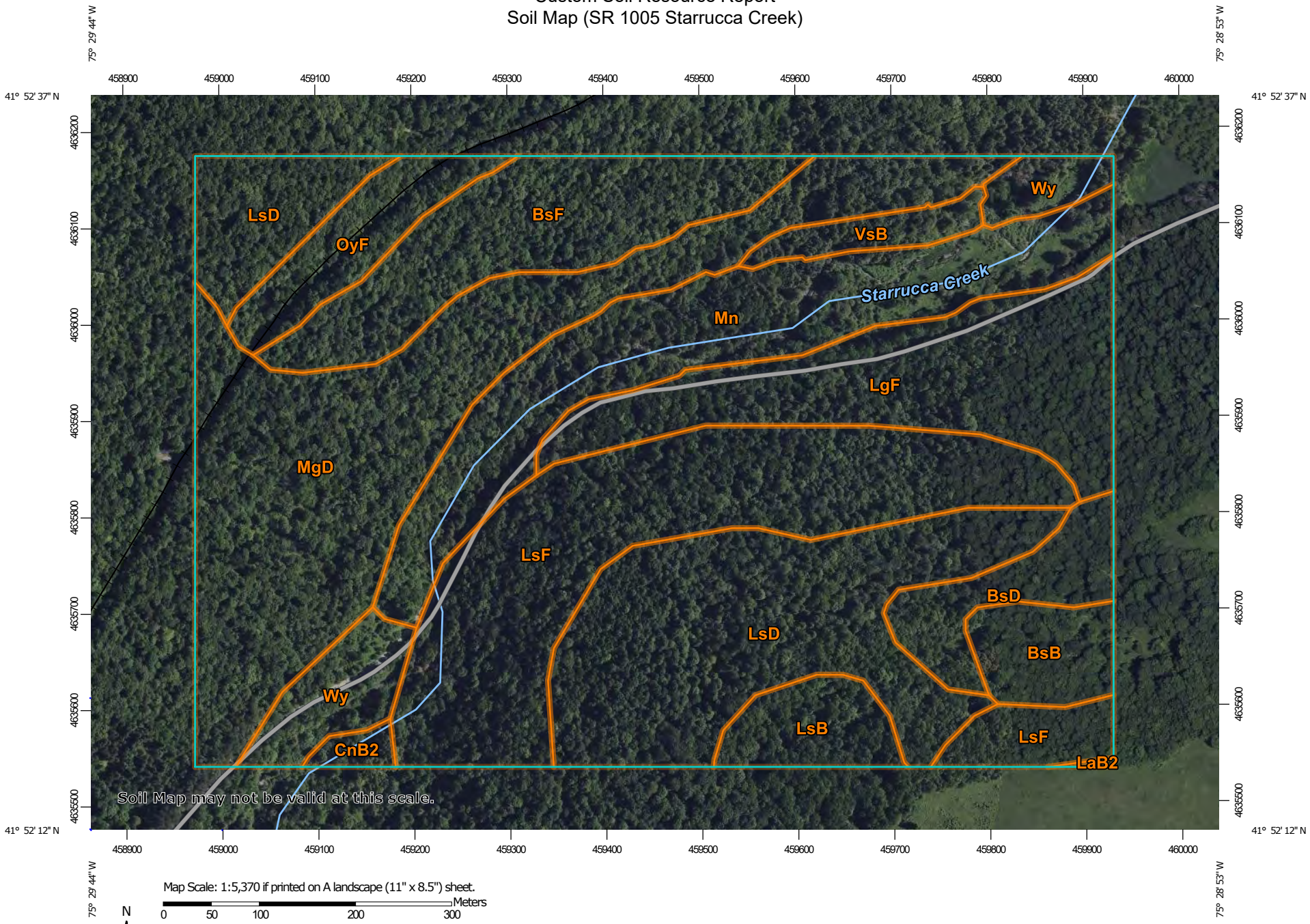
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 (SR 1005 Starrucca Creek)



Map Scale: 1:5,370 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

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 1:20,000.

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: Susquehanna County, Pennsylvania
Survey Area Data: Version 21, Sep 5, 2024

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

Date(s) aerial images were photographed: May 21, 2022—Jun 5, 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 (SR 1005 Starrucca Creek)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BsB	Bath very stony loam, 0 to 12 percent slopes	3.7	2.4%
BsD	Bath very stony loam, 12 to 30 percent slopes	4.6	3.0%
BsF	Bath very stony loam, 30 to 60 percent slopes	12.2	8.1%
CnB2	Chenango gravelly silt loam, 3 to 12 percent slopes, moderately eroded	0.8	0.5%
LaB2	Lackawanna channery silt loam, 3 to 12 percent slopes, eroded	0.1	0.1%
LgF	Lackawanna very stony silt loam, 30 to 50 percent slopes, very stony	15.4	10.2%
LsB	Lordstown, Oquaga, and Cadosia soils, 3 to 15 percent slopes, extremely bouldery	3.6	2.4%
LsD	Lordstown, Oquaga, and Cadosia soils, 15 to 25 percent slopes, extremely bouldery	25.8	17.1%
LsF	Lordstown, Oquaga, and Cadosia soils, 25 to 60 percent slopes, extremely bouldery	25.6	17.0%
MgD	Mardin channery silt loam, 8 to 25 percent slopes, very stony	28.9	19.2%
Mn	Mixed alluvial land	17.9	11.9%
OyF	Oquaga and Lordstown channery loams, 25 to 70 percent slopes, rubbly	4.7	3.1%
VsB	Volusia channery silt loam, 0 to 8 percent slopes, extremely stony	2.1	1.4%
Wy	Wyalusing silt loam	5.4	3.6%
Totals for Area of Interest		**150.6**	**100.0%**

Map Unit Descriptions (SR 1005 Starrucca Creek)

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.

Susquehanna County, Pennsylvania

BsB—Bath very stony loam, 0 to 12 percent slopes

Map Unit Setting

National map unit symbol: 9z2j
Elevation: 800 to 1,800 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Bath and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bath

Setting

Landform: Mountains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Upper third of mountainflank, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile

H1 - 0 to 8 inches: channery loam
H2 - 8 to 27 inches: channery silt loam
H3 - 27 to 60 inches: very flaggy sandy loam
H4 - 60 to 64 inches: very channery loam

Properties and qualities

Slope: 0 to 12 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 21 to 38 inches to fragipan
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 21 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

BsD—Bath very stony loam, 12 to 30 percent slopes

Map Unit Setting

National map unit symbol: 9z2k
Elevation: 800 to 1,800 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Bath and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bath

Setting

Landform: Mountains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Upper third of mountainflank, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile

H1 - 0 to 8 inches: channery loam
H2 - 8 to 27 inches: channery silt loam
H3 - 27 to 60 inches: very flaggy sandy loam
H4 - 60 to 64 inches: very channery loam

Properties and qualities

Slope: 12 to 30 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 21 to 38 inches to fragipan
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 21 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

BsF—Bath very stony loam, 30 to 60 percent slopes

Map Unit Setting

National map unit symbol: 9z2l
Elevation: 800 to 1,800 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Bath and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bath

Setting

Landform: Mountains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Upper third of mountainflank, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile

H1 - 0 to 8 inches: channery loam
H2 - 8 to 27 inches: channery silt loam
H3 - 27 to 60 inches: very flaggy sandy loam
H4 - 60 to 64 inches: very channery loam

Properties and qualities

Slope: 30 to 60 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 21 to 38 inches to fragipan
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 21 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

CnB2—Chenango gravelly silt loam, 3 to 12 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 9z2n
Elevation: 600 to 1,800 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chenango and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Outwash terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Gravelly outwash

Typical profile

H1 - 0 to 5 inches: gravelly silt loam
H2 - 5 to 35 inches: gravelly silt loam
H3 - 35 to 85 inches: very gravelly sandy loam

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

LaB2—Lackawanna channery silt loam, 3 to 12 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2w09v
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Lackawanna, eroded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lackawanna, Eroded

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and shale

Typical profile

Ap - 0 to 7 inches: channery silt loam
Bw1 - 7 to 17 inches: channery silt loam
Bw2 - 17 to 26 inches: channery loam
Bx - 26 to 60 inches: channery loam
C - 60 to 72 inches: very channery loam

Properties and qualities

Slope: 3 to 12 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 17 to 36 inches to fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 16 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

Minor Components

Wellsboro

Percent of map unit: 10 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Morris

Percent of map unit: 3 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Oquaga

Percent of map unit: 2 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Upper third of mountainflank, crest, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

LgF—Lackawanna very stony silt loam, 30 to 50 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w09l
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lackawanna, very stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lackawanna, Very Stony

Setting

Landform: Mountains, hills

Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Interfluve, side slope, nose slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and shale

Typical profile

A - 0 to 4 inches: very stony silt loam
Bw1 - 4 to 17 inches: very stony silt loam
Bw2 - 17 to 26 inches: flaggy loam
Bx - 26 to 60 inches: flaggy loam
C - 60 to 72 inches: very flaggy loam

Properties and qualities

Slope: 30 to 50 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 17 to 36 inches to fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 16 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

Minor Components

Cadosia, very stony

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Wellsboro, very stony

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Interfluve, side slope, head slope
Down-slope shape: Concave, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Oquaga, extremely stony

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, summit, backslope

Landform position (three-dimensional): Mountaintop, upper third of mountainflank, side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

LsB—Lordstown, Oquaga, and Cadosia soils, 3 to 15 percent slopes, extremely bouldery

Map Unit Setting

National map unit symbol: 2ywlm
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lordstown, extremely bouldery, and similar soils: 35 percent
Oquaga, extremely bouldery, and similar soils: 30 percent
Cadosia, extremely bouldery, and similar soils: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown, Extremely Bouldery

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainflank, nose slope, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Brownish loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 4 inches: channery highly organic loam
Bw1 - 4 to 17 inches: channery loam
Bw2 - 17 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 5.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Oquaga, Extremely Bouldery

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Mountainflank, nose slope, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Reddish loamy till derived from sandstone and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic loam
Bw1 - 5 to 15 inches: very channery loam
Bw2 - 15 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 5.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Cadosia, Extremely Bouldery

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave

Across-slope shape: Linear
Parent material: Channery loamy local colluvium derived from sedimentary rock and/or channery loamy till derived from sedimentary rock

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 4 inches: channery silt loam
Bw1 - 4 to 17 inches: very channery loam
Bw2 - 17 to 30 inches: very channery loam
BC - 30 to 48 inches: very channery loam
C - 48 to 72 inches: very channery loam

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 5.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Arnot, extremely stony

Percent of map unit: 10 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, mountainflank, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Greene

Percent of map unit: 4 percent
Landform: Benches, ridges, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

LsD—Lordstown, Oquaga, and Cadosia soils, 15 to 25 percent slopes, extremely bouldery

Map Unit Setting

National map unit symbol: 2ywln
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lordstown, extremely bouldery, and similar soils: 35 percent
Oquaga, extremely bouldery, and similar soils: 30 percent
Cadosia, extremely bouldery, and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown, Extremely Bouldery

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Brownish loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 4 inches: channery highly organic loam
Bw1 - 4 to 17 inches: channery loam
Bw2 - 17 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 6.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Oquaga, Extremely Bouldery

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Mountainflank, nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Reddish loamy till derived from sandstone and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic loam
Bw1 - 5 to 15 inches: very channery loam
Bw2 - 15 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 6.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Cadosia, Extremely Bouldery

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear

Parent material: Channery loamy local colluvium derived from sedimentary rock and/or channery loamy till derived from sedimentary rock

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 4 inches: channery silt loam
Bw1 - 4 to 17 inches: very channery loam
Bw2 - 17 to 30 inches: very channery loam
BC - 30 to 48 inches: very channery loam
C - 48 to 72 inches: very channery loam

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 6.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Arnot, extremely stony

Percent of map unit: 9 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

LsF—Lordstown, Oquaga, and Cadosia soils, 25 to 60 percent slopes, extremely bouldery

Map Unit Setting

National map unit symbol: 2ywlp
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lordstown, extremely bouldery, and similar soils: 35 percent
Oquaga, extremely bouldery, and similar soils: 30 percent
Cadosia, extremely bouldery, and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lordstown, Extremely Bouldery

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Brownish loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 4 inches: channery highly organic loam
Bw1 - 4 to 17 inches: channery loam
Bw2 - 17 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 25 to 60 percent
Surface area covered with cobbles, stones or boulders: 6.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Oquaga, Extremely Bouldery

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Mountainflank, nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Reddish loamy till derived from sandstone and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic loam
Bw1 - 5 to 15 inches: very channery loam
Bw2 - 15 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 25 to 60 percent
Surface area covered with cobbles, stones or boulders: 6.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Cadosia, Extremely Bouldery

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear

Parent material: Channery loamy local colluvium derived from sedimentary rock and/or channery loamy till derived from sedimentary rock

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 4 inches: channery silt loam
Bw1 - 4 to 17 inches: very channery loam
Bw2 - 17 to 30 inches: very channery loam
BC - 30 to 48 inches: very channery loam
C - 48 to 72 inches: very channery loam

Properties and qualities

Slope: 25 to 60 percent
Surface area covered with cobbles, stones or boulders: 6.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Arnot, extremely stony

Percent of map unit: 8 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

MgD—Mardin channery silt loam, 8 to 25 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2v2zx
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Mardin, very stony, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mardin, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope, head slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

A - 0 to 4 inches: channery silt loam
BE - 4 to 12 inches: channery silt loam
Bw1 - 12 to 16 inches: channery silt loam
Bw2 - 16 to 20 inches: channery silt loam
Bx1 - 20 to 36 inches: channery silt loam
Bx2 - 36 to 57 inches: channery silt loam
C - 57 to 72 inches: channery silt loam

Properties and qualities

Slope: 8 to 25 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F140XY024NY - Moist Dense Till
Hydric soil rating: No

Minor Components

Volusia, very stony

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Lordstown, very stony

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Bath, very stony

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mn—Mixed alluvial land

Map Unit Setting

National map unit symbol: 9z3p
Elevation: 200 to 1,000 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvents, mixed alluvium, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvents, Mixed Alluvium

Setting

Landform: Flood-plain steps
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Alluvium

Typical profile

H1 - 0 to 6 inches: gravelly sandy loam
H2 - 6 to 60 inches: very cobbly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 60 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F140XY014NY - Low Floodplain
Hydric soil rating: No

Minor Components

Wyalusing

Percent of map unit: 15 percent
Landform: Depressions
Hydric soil rating: Yes

OyF—Oquaga and Lordstown channery loams, 25 to 70 percent slopes, rubbly

Map Unit Setting

National map unit symbol: 2zxql
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Oquaga, rubbly, and similar soils: 50 percent
Lordstown, rubbly, and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oquaga, Rubbly

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Mountainflank, nose slope, crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Reddish loamy till derived from sandstone and shale

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic loam
Bw1 - 5 to 15 inches: very channery loam
Bw2 - 15 to 24 inches: very channery loam
C - 24 to 30 inches: extremely channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 25 to 70 percent
Surface area covered with cobbles, stones or boulders: 30.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Description of Lordstown, Rubbly

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Mountaintop, interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived from sandstone and siltstone

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: channery highly organic loam
Bw1 - 5 to 17 inches: channery loam
Bw2 - 17 to 26 inches: channery loam
C - 26 to 30 inches: very channery loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 25 to 70 percent
Surface area covered with cobbles, stones or boulders: 30.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY027NY - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 8 percent

Cadosia, rubbly

Percent of map unit: 6 percent
Landform: Ridges
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Arnot, rubbly

Percent of map unit: 6 percent
Landform: Mountains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountaintop, mountainflank, side slope, nose slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F140XY023NY - Shallow Till Uplands
Hydric soil rating: No

VsB—Volusia channery silt loam, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2srfw
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Volusia, extremely stony, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Volusia, Extremely Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope, interfluve, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loamy till derived from interbedded sedimentary rock

Typical profile

A - 0 to 4 inches: channery silt loam
Bw - 4 to 15 inches: channery silt loam
Eg - 15 to 17 inches: channery silt loam
Bx1 - 17 to 29 inches: channery loam
Bx2 - 29 to 54 inches: channery loam
C - 54 to 72 inches: channery silt loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 7.0 percent
Depth to restrictive feature: 10 to 22 inches to fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D
Ecological site: F140XY024NY - Moist Dense Till
Hydric soil rating: No

Minor Components

Chippewa, extremely stony
Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Mardin, extremely stony
Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Wy—Wyalusing silt loam

Map Unit Setting
National map unit symbol: 9z4r
Elevation: 400 to 800 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Wyalusing and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wyalusing

Setting
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Concave

Typical profile
H1 - 0 to 9 inches: silt loam
H2 - 9 to 34 inches: fine sandy loam
H3 - 34 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F140XY015NY - Wet Low Floodplain
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

SR 1005 USACE STARRUCCA CREEK PHOTOGRAPHS THOMPSON TOWNSHIP SUSQUEHANNA COUNTY


Photo #1
Looking Southeast
Wetland WA


Photo #2
Looking East
Wetland WA


Photo #3
Looking North
Wetland WA


Photo #4
Soil Sample
SS-WA


Photo #5
Looking Northeast
Wetland WB


Photo #6
Soil Sample
SS-WB


Photo #7
Looking East
Wetland WC


Photo #8
Looking East
Wetland WC


Photo #9
Looking East
Wetland WC


Photo #10
Soil Sample
SS-WC


Photo #11
Soil Sample
SS-UPLA

Photo #12
Soil Sample
SS-UPLB


Photo #13
Soil Sample
SS-UPLC


Photo #14
Soil Sample
SS-UPLD


Photo #15
Soil Sample
SS-UPLE

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 9/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: SR 1005 Starrucca Creek City/County: Thompson/Susquehanna Sampling Date: 5-12-25

Applicant/Owner: PennDot District 4-0 State: PA Sampling Point: UPLA

Investigator(s): Nick F., Kim L., Kevin H., Ryan Z., Christain S. Section, Township, Range: Thompson Township

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope %: 2

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 41.87447 Long: -75.48790 Datum: WGS 84

Soil Map Unit Name: Mixed Alluvial Land NWI classification: NA

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ 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 ____	No x	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No x	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No x	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Upland A Datapoint Taken outside of Wetland A Boundary.

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)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ 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)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: UPLA

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	30	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Solidago canadensis*	35	Yes	FACU
2. *Galium aparine*	25	Yes	FACU
3. *Fallopia japonica*	25	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	115	x 4 =	460
UPL species	0	x 5 =	0
Column Totals:	115 (A)		460 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 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 vines – All woody vines greater than 3.28 ft in height.

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

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point UPLA

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 4/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 9/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: SR 1005 Starrucca Creek City/County: Thompson/ Susquehanna Sampling Date: 5-12-25

Applicant/Owner: PennDot District 4-0 State: PA Sampling Point: UPLB

Investigator(s): Nick F., Kevin H., Christain S., Ryan Z., Kim L. Section, Township, Range: Thompson Township

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 2

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 41.87447 Long: -75.48790 Datum: WGS 84

Soil Map Unit Name: Mixed Alluvial Land NWI classification: NA

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ 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 ____	No x	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No x	**within a Wetland?** **Yes** ____ **No** x
Wetland Hydrology Present?	Yes ____	No x	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Upland B Datapoint Taken outside Wetland B Boundary.

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)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ 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)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: UPLB

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	37	Yes	FACU
2. *Carpinus caroliniana*	28	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	65	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Carpinus caroliniana*	28	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	28	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Polystichum acrostichoides*	15	Yes	FACU
2. *Mianthemum canadense*	15	Yes	FAC
3. *Anemone quinquefolia*	10	Yes	FACU
4. *Eurybia divaricata*	10	Yes	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	71	x 3 =	213
FACU species	62	x 4 =	248
UPL species	10	x 5 =	50
Column Totals:	143 (A)		511 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 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 vines – All woody vines greater than 3.28 ft in height.

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

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point UPLB

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	100					Loamy/Clayey	
4-18	10YR 5/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 9/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: SR 1005 Starrucca Creek City/County: Thompson/ Susquehanna Sampling Date: 5-12-25

Applicant/Owner: PennDot District 4-0 State: PA Sampling Point: UPLC

Investigator(s): Nick F., Kevin H., Christain S., Ryan Z., Kim L. Section, Township, Range: Thompson Township

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 2

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 41.87447 Long: -75.48790 Datum: WGS 84

Soil Map Unit Name: Mixed Alluvial Land NWI classification: NA

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ 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 ____	No x	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No x	**within a Wetland?** **Yes** ____ **No** x
Wetland Hydrology Present?	Yes ____	No x	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.
Upland C Datapoint Taken in mixed forested area.

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)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ 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)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: UPLC

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	20	Yes	FACU
2. *Carpinus caroliniana*	20	Yes	FAC
3. *Ostrya virginiana*	20	Yes	FACU
4.			
5.			
6.			
7.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Carpinus caroliniana*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Polystichum acrostichoides*	20	Yes	FACU
2. *Mianthemum canadense*	35	Yes	FAC
3. *Nabalus trifoiliatus*	20	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	155 (A)		545 (B)

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 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 vines – All woody vines greater than 3.28 ft in height.

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

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point UPLC

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 9/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: SR 1005 Starrucca Creek City/County: Thompson/ Susquehanna Sampling Date: 5-12-25

Applicant/Owner: PennDot District 4-0 State: PA Sampling Point: UPLD

Investigator(s): Nick F., Kevin H., Christain S., Ryan Z., Kim L. Section, Township, Range: Thompson Township

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 2

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 41.87447 Long: -75.48790 Datum: WGS 84

Soil Map Unit Name: Mixed Alluvial Land NWI classification: NA

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ 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 ____	No x	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No x	**within a Wetland?** **Yes** ____ **No** x
Wetland Hydrology Present?	Yes ____	No x	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Upland D Datapoint Taken in mixed forested area.

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)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ 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)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: UPLD

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	20	Yes	FACU
2. *Carpinus caroliniana*	20	Yes	FAC
3. *Ostrya virginiana*	20	Yes	FACU
4.			
5.			
6.			
7.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Carpinus caroliniana*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Polystichum acrostichoides*	20	Yes	FACU
2. *Mianthemum canadense*	35	Yes	FAC
3. *Nabalus trifoiliatus*	20	Yes	FACU
4. *Berberis thunbergii*	20	Yes	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 37.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	175 (A)		625 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 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 vines – All woody vines greater than 3.28 ft in height.

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

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point UPLD

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 9/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: SR 1005 Starrucca Creek City/County: Thompson/ Susquehanna Sampling Date: 5-13-25

Applicant/Owner: PennDot District 4-0 State: PA Sampling Point: UPLE

Investigator(s): Kevin H., Christain S., Ryan Z., Kim L. Section, Township, Range: Thompson Township

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope %: 2

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 41.87447 Long: -75.48790 Datum: WGS 84

Soil Map Unit Name: Mixed Alluvial Land NWI classification: NA

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ 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 ____	No x	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No x	**within a Wetland?** **Yes** ____ **No** x
Wetland Hydrology Present?	Yes ____	No x	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

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)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ 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)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: UPLE

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	43	Yes	FACU
2. *Carpinus caroliniana*	11	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	54	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Carpinus caroliniana*	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Polystichum acrostichoides*	20	Yes	FACU
2. *Athyrium filix-femina*	15	Yes	FACU
3. *Thalictrum dioicum*	5	No	
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	21	x 3 =	63
FACU species	78	x 4 =	312
UPL species	0	x 5 =	0
Column Totals:	99 (A)		375 (B)

Prevalence Index = B/A = 3.79

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 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 vines – All woody vines greater than 3.28 ft in height.

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

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point UPLE

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Hardpan

Depth (inches): 8

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 9/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: SR 1005 Starrucca Creek City/County: Thompson/Susquehanna Sampling Date: 5-12-25

Applicant/Owner: PennDot District 4-0 State: PA Sampling Point: WA

Investigator(s): Nick F., Kim L., Kevin H., Ryan Z., Christain S. Section, Township, Range: Thompson Township

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

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 41.87447 Long: -75.48790 Datum: WGS 84

Soil Map Unit Name: Mixed Alluvial Land NWI classification: NA

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

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

Are Vegetation , Soil , or Hydrology 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	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** x **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)
Wetland is located near multiple channels that sees mutliple flooding events.

HYDROLOGY

Wetland Hydrology Indicators:

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

- xx Surface Water (A1)
- High Water Table (A2)
- x Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- 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)
- x Drainage Patterns (B10)
- x Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches): 2
Water Table Present?	Yes X	No	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches): 0

Wetland Hydrology Present? **Yes** x **No**

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: WA

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	10	Yes	FACU
2. *Betula alleghaniensis*	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	25	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Onoclea sensibilis*	25	Yes	FACW
2. *Carex vulpinoidea*	25	Yes	OBL
3. *Ranunculus repens*	20	Yes	FAC
4. *Lysimachia nummularia*	20	Yes	FACW
5. *Euthamia graminifolia*	10	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	45	x 2 =	90
FAC species	45	x 3 =	135
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	125 (A)		290 (B)

Prevalence Index = B/A = 2.32

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

_X_ 2 - Dominance Test is >50%

_X_ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 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 vines – All woody vines greater than 3.28 ft in height.

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

Remarks: (Include photo numbers here or on a separate sheet.)
Eastern Hemlock forest present outsdie of wetland.

SOIL

Sampling Point WA

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 4/2	100					Loamy/Clayey	
4-18	7.5YR 4/1	80	7.5YR 5/6	20	D	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- x Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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** X **No** ___

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 9/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: SR 1005 Starrucca Creek City/County: Thompson/Susquehanna Sampling Date: 5-12-25

Applicant/Owner: PennDot District 4-0 State: PA Sampling Point: WB

Investigator(s): Nick F., Kim L., Kevin H., Ryan Z., Christain S. Section, Township, Range: Thompson Township

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope %: 2

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 41.87447 Long: -75.48790 Datum: WGS 84

Soil Map Unit Name: Mixed Alluvial Land NWI classification: NA

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ 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 ____	**Is the Sampled Area**
Hydric Soil Present?	Yes x	No ____	**within a Wetland?** **Yes** x **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

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

- x Surface Water (A1)
- X High Water Table (A2)
- x Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ 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)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 1
Water Table Present?	Yes X	No ____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

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

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: WB

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	10	Yes	FACU
2. *Betula alleghaniensis*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Veratrum viride*	20	Yes	FACW
2. *Lysimachia nummularia*	30	Yes	FACW
3. *Impatiens capensis*	20	Yes	FACW
4. *Ranunculus hispidus*	20	Yes	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	30	x 3 =	90
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	110 (A)		270 (B)

Prevalence Index = B/A = 2.45

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

_X_ 2 - Dominance Test is >50%

_X_ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 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 vines – All woody vines greater than 3.28 ft in height.

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

Remarks: (Include photo numbers here or on a separate sheet.)
Eastern Hemlock forest present outsdie of wetland.

SOIL

Sampling Point WB

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 %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/2	85	10YR 6/8	15	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Iron Monosulfide (A18)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ 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** X **No** ___

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 9/30/2027
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: SR 1005 Starrucca Creek City/County: Thompson/Susquehanna Sampling Date: 5-13-25

Applicant/Owner: PennDot District 4-0 State: PA Sampling Point: WC

Investigator(s): Kim L., Kevin H., Ryan Z., Christain S. Section, Township, Range: Thompson Township

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope %: 2

Subregion (LRR or MLRA): LRR R, MLRA 140 Lat: 41.87447 Long: -75.48790 Datum: WGS 84

Soil Map Unit Name: Mixed Alluvial Land NWI classification: NA

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

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

Are Vegetation ____, Soil ____, or Hydrology ____ 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 ____	**Is the Sampled Area**
Hydric Soil Present?	Yes x	No ____	**within a Wetland?** **Yes** x **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)
Wetland C is a PEM located between SR 1005 and Starrucca Creek.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ 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)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- x Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches): ____
Water Table Present?	Yes ____	No ____	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 8

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: WC

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. *Tilia americana*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15 =Total Cover		
Herb Stratum (Plot size: 5')			
1. *Veratrum viride*	20	Yes	FACW
2. *Tiarella cordifolia*	10	No	FACU
3. *Thalictrum dioicum*	20	Yes	FACU
4. *Allium tricoccum*	20	Yes	FAC
5. *Onoclea sensibilis*	20	Yes	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 =Total Cover		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	20	x 3 =	60
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	105 (A)		320 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

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

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

Remarks: (Include photo numbers here or on a separate sheet.)
Eastern Hemlock forest present outsdie of wetland.

SOIL

Sampling Point WC

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 %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/1	80	10YR 5/6	20	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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- ___ Red Parent Material (F21) **(MLRA 145)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
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- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Hardpan

Depth (inches): 14

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

Remarks:

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 Susquehanna County, Pennsylvania

Starrucca Creek

October 30, 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: 1:1,180 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 1:20,000.

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: Susquehanna County, Pennsylvania
Survey Area Data: Version 22, Sep 5, 2025

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

Date(s) aerial images were photographed: May 21, 2022—Jun 5, 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
LgF	Lackawanna very stony silt loam, 30 to 50 percent slopes, very stony	0.8	29.3%
Mn	Mixed alluvial land	2.0	70.7%
Totals for Area of Interest		**2.8**	**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.

Susquehanna County, Pennsylvania

LgF—Lackawanna very stony silt loam, 30 to 50 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w09l
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lackawanna, very stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lackawanna, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope, nose slope
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Loamy till derived mainly from reddish sandstone, siltstone, and shale

Typical profile

A - 0 to 4 inches: very stony silt loam
Bw1 - 4 to 17 inches: very stony silt loam
Bw2 - 17 to 26 inches: flaggy loam
Bx - 26 to 60 inches: flaggy loam
C - 60 to 72 inches: very flaggy loam

Properties and qualities

Slope: 30 to 50 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 17 to 36 inches to fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 16 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

Minor Components

Cadosia, very stony
Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Wellsboro, very stony
Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope, head slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, linear
Hydric soil rating: No

Oquaga, extremely stony
Percent of map unit: 5 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountaintop, upper third of mountainflank, side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Linear
Hydric soil rating: No

Mn—Mixed alluvial land

Map Unit Setting
National map unit symbol: 9z3p
Elevation: 200 to 1,000 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition
Fluvents, mixed alluvium, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvents, Mixed Alluvium

Setting
Landform: Flood-plain steps
Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Alluvium

Typical profile

H1 - 0 to 6 inches: gravelly sandy loam
H2 - 6 to 60 inches: very cobbly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 60 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F140XY014NY - Low Floodplain
Hydric soil rating: No

Minor Components

Wyalusing

Percent of map unit: 15 percent
Landform: Depressions
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf