3150-PM-BWEW0500 Rev. 2/2014
Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

RECEIVED
APR 2 2 2016
BY: MDM
N.C.C.D.

CHAPTER 105
GENERAL PERMIT REGISTRATION

TYPE OF GENERAL PERMIT: ☒ **New Permit**
PLEASE MARK ("X") ONE: ☐ **Transfer of Existing Permit** *(Complete Section A, C & H below and all of form 3150-PM-BWEW0016)*

PLEASE MARK ("X") ALL THAT APPLY:

- ☐ GP- 1 Fish Habitat Enhancement Structures
- ☐ GP- 2 Small Docks & Boat Launching Ramps
  - **Please mark ("X") the specific type of project:**
  - ☐ private recreational dock
  - ☐ public access facility
  - ☐ public service facility
  - ☐ other private or commercial facility
- ☐ GP- 3 Bank Rehabilitation, Bank Protection and Gravel Bar Removal
- ☐ GP- 4 Intake and Outfall Structures
- ☐ GP- 5 Utility Line Stream Crossing
- ☐ GP- 6 Agricultural Crossings & Ramps
- ☒ GP- 7 Minor Road Crossings
- ☐ GP- 8 Temporary Road Crossings
- ☐ GP- 9 Agricultural Activities
- ☐ GP-10 Abandoned Mine Reclamation
- ☐ GP-11 Maintenance, Testing, Repair, Rehabilitation, or Replacement of Water Obstructions and Encroachments (reviewed by DEP Regional Office only)
- ☐ GP-15 Private Residential Construction in Wetlands

☐ **Activity Related to Oil and Gas Exploration, Production or Transmission**

☐ **Activity Subject to FERC approval (Docket number _____)** ☐ **FERC Natural Gas Act Facility**

SECTION A. APPLICANT INFORMATION

Applicant's Name / Client	**DEP Client ID#** (if known)	**Employer ID#** (EIN)
Northumberland Borough		

Client Information - Please select Client Type / Code from drop down box under the correct entity shown to the right (or may be written in) →	**Government**	**Non-Government**	**Individual**
	MUNI Municipality		

Mailing Address	**City**	**State**	**ZIP + 4**
175 Orange Street	Northumberland	PA	17857

Contact Person – Last Name	First	MI	Suffix	**Telephone**	**Email Address**
August	Ann			(570) 473-3414	newsletter@northumberlandborough.com

SECTION B. CONSULTANT INFORMATION (Complete if different than above) ☐ N/A

Contact Person – Last Name	First	MI	Suffix	**Consultant's Title**	**Consulting Firm**
Shaffer	Chad			Project Manager	Stahl Sheaffer Engineering, LLC

Mailing Address	**City**	**State**	**ZIP + 4**
106 North High Street	Selinsgrove	PA	17870

Telephone	**Fax**	**Email**	**Employer ID#** (EIN)
(570) 374-4813	(814) 689-1885	cshaffer@sse-llc.com	

SECTION C. PROJECT INFORMATION

Project /Site Name:	**DEP Site ID#** (if known or leave blank)
Liberty Hollow Trail	

Client Relationship - Please select Site-to-Client Relationship / Code from drop down box to the right (or may be written in)→	Double-click on shaded area below to select correct Site-to-Client Relationship / Code ↓

County	**Municipality** ☐ City ☒ Borough ☐ Township	**OWNOP Owner/Operator**
Northumberland	Northumberland	

Site Location / Address	**City**	**State**	**ZIP + 4**
Liberty Hollow Park	Northumberland	PA	17857

Collection Method: ☐ EMAP ☐ HGIS ☐ GISDR* ☐ ITPMP ☒ GPS ☐ WAAS ☐ LORAN

Check the horizontal reference datum (or projection datum) employed in the collection method.
EMAP and HGIS (PNDI) have known datum and do not require checking here. ☐ NAD27 ☒ NAD83 ☐ WGS84 (GEO84)

Enter the date of collection if coordinates were derived from GPS, WAAS or LORAN. 10 mm 29 dd 2015 yyyy

Applicant's Name Northumberland Borough	GENERAL PERMIT REGISTRATION	

SECTION D. RESOURCE IDENTIFICATION

Please place an "X" in the appropriate box next to each item to indicate the applicant has identified any of these resources which may be present at the project site.

Each General Permit (GP) has a specific set of restrictions and some resources may require certain actions or prohibit the project from being eligible to register use of the GP. *This list is not all-inclusive, please see GPs for details.*

YES	NO		YES	NO	
☐	☒	National Register of Historic Places	☐	☒	Threatened and Endangered Species
☐	☒	National Registry of Natural Landmarks	☐	☒	Wild or Stocked Trout Streams
☐	☒	Local historical site	☐	☒	Wild and Scenic Rivers
☐	☒	Exceptional Value (EV) Waters	☒	☐	Wetlands
☐	☒	High Quality (HQ) Waters	☐	☐	Other _____

SECTION E. REGISTRATION CHECK LIST AND REQUIREMENTS

Please place an "X" next to each item (1 - 16) to ensure it is completed and/or provided. Unless otherwise specified, all items are ***required*** to ensure a complete Registration package. ****Provide ONE (1) ORIGINAL and ONE (1) COPY of the Registration package****	Applicant Entry	DEP Use Only
1. **General Permit Registration form** properly completed and signed	☒	☐
☒ I have read the terms and conditions of the GP(s) indicated above.	☒	☐
2. **General Permit Registration Fee and Chapter 105 Fee Calculation Worksheet**	☒	☐
3. Notification sent to the Municipality & County (copy of **General Permit Registration form**)	☒	☐
4. **PASPGP-4 Cumulative Impact Project Screening Form** properly completed	☒	☐
5. **Location Map** (USGS quad map) with project site marked	☒	☐
6. **Color Photographs** with dates and descriptions *(see instructions)* ☐ ***N/A***	☒	☐
7. **Stream Name and Chapter 93 Classification** (example: UNT to #40637 HOUSE RUN, HQ-WWF/EV) Liberty Hollow Run WWF-MF	☒	☐
8. **Project Description** including proposed impacts and PNDI Avoidance Measures (if applicable) Construction of 1900 lf walking trail within Libery Hollow, construction will include crossing of Liberty Hollow Run. Stormwater will be conveyed under the trail at this location with a 36' pipe culvert. No wetlands will be impacted during construction.	☒	☐
9. **Site Specific and/or Standard Drawings** depicting the project's GP activities	☒	☐
10. **Site Plan** depicting the site of the project's GP activities *(see Section F.)*	☒	☐
11. **Erosion & Sediment Control Plan (E&S Plan)** *(required for GP-11 only - see instructions)*	☒	☐
12. **Written Directions to Project Site:** From Pineknotter Park Route 11 north 1/2 mile, left on Hanover Street 1300 feet right on Church Avenue, 600 feet to Washington Avenue and beginning of trail	☒	☐
13. **Pennsylvania Natural Diversity Inventory (PNDI):** **Please place an "X" next to the appropriate box indicating the information provided:**		
☒ Completed PNDI Project Planning & Environmental Review Form	☒	☐
☒ Initialed PNDI Project Environmental Review Search Receipt showing "No Known Impacts"	☒	☐
☐ Initialed PNDI Project Environmental Review Search Receipt showing "Avoidance Measures" which have ALSO been incorporated into the project description	☐	☐
☐ Initialed PNDI Project Environmental Review Search Receipt showing "Potential Impacts" AND documentation of appropriate agency coordination required on PNDI Receipt	☐	☐
14. **Bog Turtle Habitat Screening:** **Please place an "X" next to the appropriate box indicating the information provided:**		
☐ Completed Request for a Bog Turtle Habitat Screening Form	☐	☐
☐ "No Effect" determination from the Army Corp of Engineers	☐	☐
☐ Documented clearance from the US Fish and Wildlife Services	☐	☐
☒ N/A	☒	☐

Applicant's Name Northumberland Borough	GENERAL PERMIT REGISTRATION	

15. Activities which impact wetlands: **Please place an "X" next to the appropriate box indicating the information provided:**	☒	☐
☒ N/A because no wetland impacts are proposed or no compensatory mitigation is necessary.	☐	☐
☐ A wetland delineation with complete data sheets in accordance with the 1987 Corps of Engineers Wetland Delineation Manual AND the appropriate Regional Supplements to the Corps of Engineers Wetland Delineation Manual for use in Pennsylvania.	☐	☐
☐ If direct or indirect wetland impacts are greater than 0.05 acres, a compensatory mitigation plan in accordance with the Department's Replacement criteria which provides compensation at a minimum one to one acre ratio.	☐	☐
☐ **If compensatory mitigation onsite is determined not feasible:** A check, number _____, in the amount of $_____ payable to the National Fish and Wildlife Foundation, N.A. 1237, as compensatory mitigation for _____ acres of impact in wetlands, in accordance with the Pennsylvania Wetland Replacement Project.	☐	☐
16. Registration of a GP-11: **Please place an "X" next to the appropriate box indicating the worksheet(s) provided:**		
☒ N/A because not registering use of GP-11	☒	☐
☐ E&S Plan	☐	☐
☐ Project Inventory	☐	☐
☐ Bridge and/or Culvert Replacement Projects or Projects That Change the Waterway Opening	☐	☐

SECTION F. SITE PLAN

Please place an "X" next to each item to ensure it is shown on the site plan. Unless otherwise specified in the permit, all items are ***required*** to ensure a complete Registration package.

YES	NO		YES	NO	
☒	☐	Stream Name: Liberty Hollow Run	☐	☒	100 year Flood Elevation OR FEMA map
☒	☐	Stream Limits and Flow Direction	☒	☐	Limits of Earth Disturbance Associated with Activity
☒	☐	Stream Impacts on site (including dimensions)	☒	☐	Location of Property Lines Relative to the Project
☒	☐	Wetlands on site (including acres)	☒	☐	Existing Utilities, ROWs, Easements
☒	☐	Wetland Impacts on site (including acres)	☒	☐	Existing Buildings, Roadway, etc.
☒	☐	Other Waters (i.e. pond, lakes, wetlands)	☒	☐	Proposed Buildings, Roadways, ROW etc.
☒	☐	Site Specific / Standard Drawings location(s)	☐	☒	Other _____
☒	☐	Photograph location(s)	☐	☒	Other _____

SECTION G. IMPACTS ASSOCIATED WITH PROJECT WORK SITE

Please provide the project's total impacts for each category in the table provided below.

Please complete and provide a separate chart detailing the information for each impact to waters and wetlands. Include the identifier developed in Section E.9. for each location. All impact acreages and number of impacts should be totaled on each page and then the project's total impacts provided in the table below.

The Additional Impacts Associated with Project Work Site (3150-PM-BWEW0554) worksheet may be used but is not required.

Total Impacts for the Project	Temporary Impacts (acreage & number of impacts)		Permanent Impacts (acreage & number of impacts)	
Total Waters Impacts	_____ ac	_____ number	0.002 ac	1 number
Total Impacts to Wetlands	_____ ac	_____ number	_____ ac	_____ number
Total Impacts for this Project	_____ ac	_____ number	_____ ac	_____ number

3150-PM-BWEW0500 Rev. 2/2014
Form

Applicant's Name Northumberland Borough	GENERAL PERMIT REGISTRATION	

SECTION H. CERTIFICATION

I certify under penalty of law that the information provided in this permit registration is true and correct to the best of my knowledge and information and that I possess the authority to undertake the proposed action. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (If any of the information and/or plans is found to be in error, falsified, and/or incomplete, this authorization/verification may be subject to modification, suspension, or revocation in accordance with applicable regulations.)

Ann August — Signature of Applicant — Date: 3/23/16

Ann August — Typed / Printed Name

PA Fish and Boat Commission Approval (for GP-1 only)

Signature of Reviewer — Date

Reviewer's Typed / Printed Name — ( ) Phone Number

Reviewer's Typed / Printed Title — Email Address

This General Permit shall not be effective until the owner has had their E&S Plan reviewed by the appropriate Regional Office or District, obtained Federal Authorization and, where required, obtained an SLLA from DEP.

AN ACKNOWLEDGED COPY OF THIS GENERAL PERMIT REGISTRATION PACKAGE (INCLUDING THE ACKNOWLEDGEMENT LETTER AND TERMS AND CONDITIONS), REQUIRED FEDERAL AUTHORIZATION, AND THE E&S PLAN MUST BE AVAILABLE AT THE PROJECT SITE DURING CONSTRUCTION.

SECTION I. ACKNOWLEDGEMENT – DEP USE ONLY

Signatures authorizing acknowledgment to use and register:

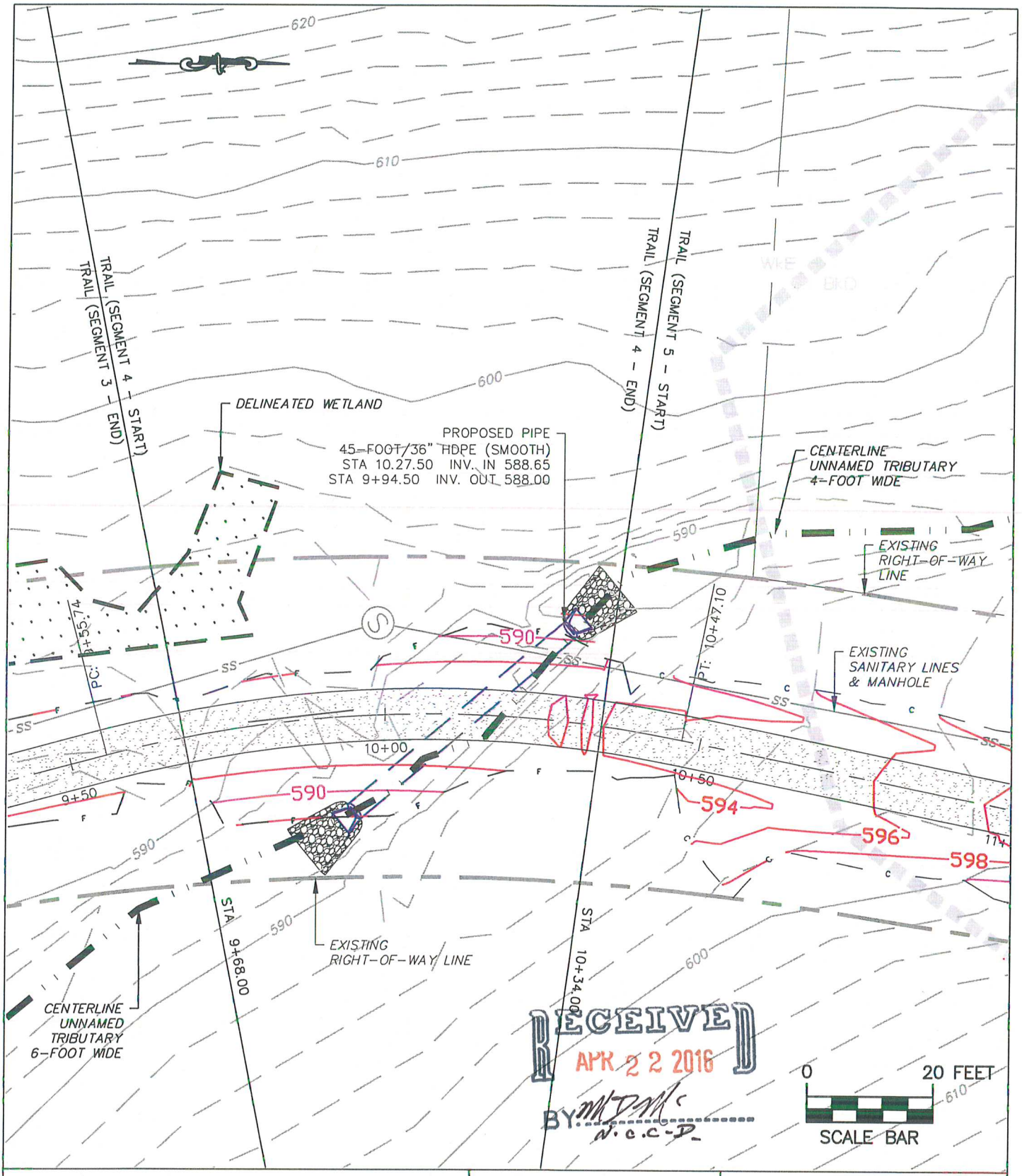
A. Completeness Review:
Michael D. McCleary — DEP / District Reviewer Signature
Michael D. McCleary — Reviewer's Typed / Printed Name
Begin Date: 4/22/16
Incomplete Date:
Response Date:
End Date: 4/27/16
Completeness Status ☒ YES ☐ NO

B. Eligibility Review:
Michael D. McCleary — DEP / District Reviewer Signature
Michael D. McCleary — Reviewer's Typed / Printed Name
Begin Date: 4/27/16
Incomplete Date:
Response Date:
End Date: 4/27/16
☐ Deficient - **DENIED**

C. Decision Review:
Judith M. Buker — DEP / District Manager Signature
Judith M. Buker — Reviewer's Typed / Printed Name
Begin Date: 4/27/16
End Date: 4/27/16
Disposition Status ☐ WITHDRAWN ☒ **APPROVED** ☐ RETURNED ☐ **DENIED**

D. Contact Information:
Michael D McCleary — Typed / Printed Name
570 495-4665 x-302 — Phone Number
mmccleary@nccdpa.org — Email Address

E. Permit Tracking:
Received 4/22/16 Acknowledged 4/27/16 SLLA required: ☒ NO ☐ YES PASPGP-4: ☐ NO ☒ YES ☒ CAT 1 ☐ CAT 3
GP 0749/16501 GP - GP - GP - GP -
Notes:



PLAN VIEW

STREAM CROSSING

BOROUGH OF NORTHUMBERLAND
NORTHUMBERLAND COUNTY, PA

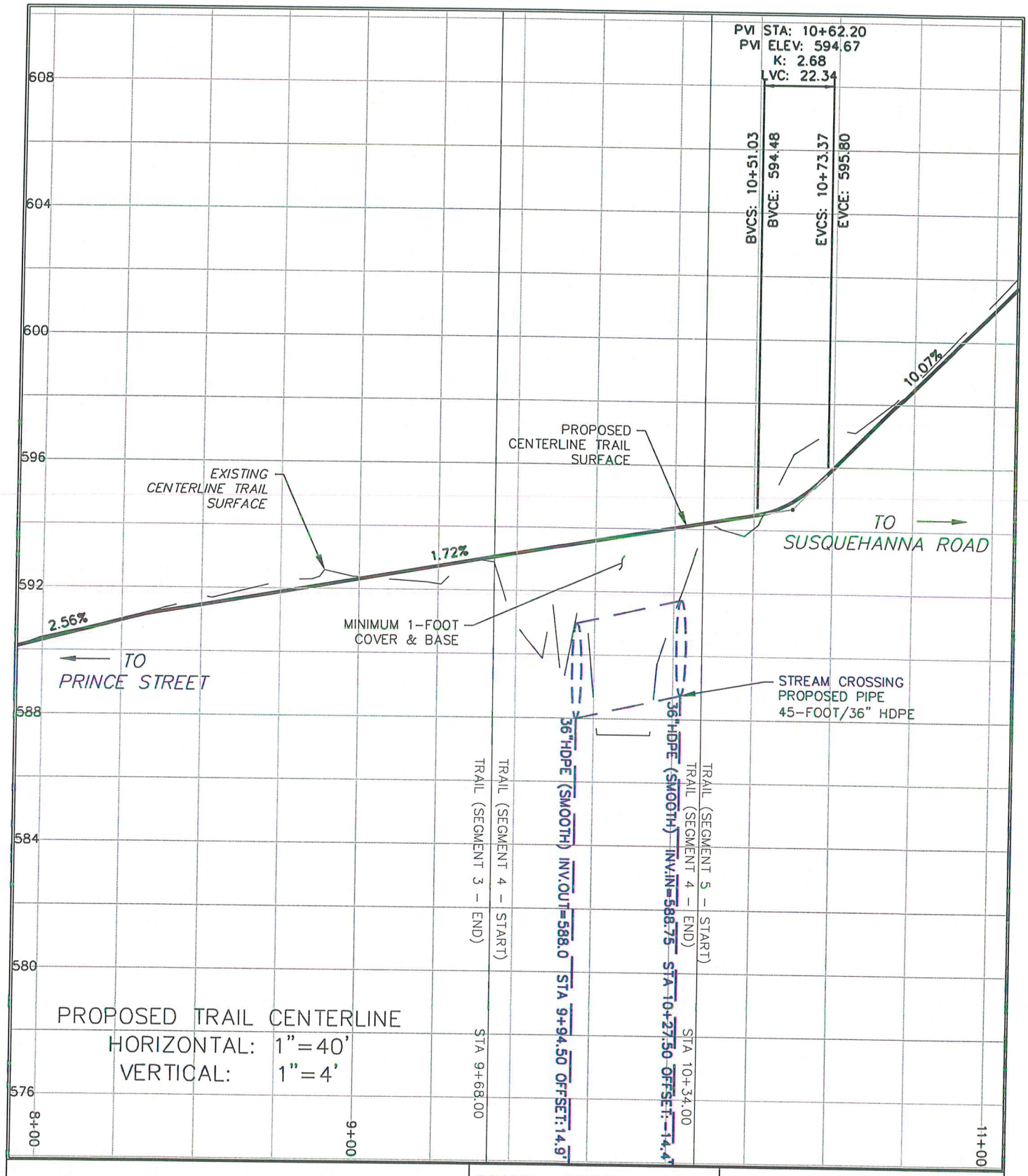
SCALE: 1" = 20'

SOURCE:
15-144 LIBERTY HOLLOW
TRAIL BASEMAP & DESIGN

SSE PROJECT NO: 15-144

DATE: MARCH 22, 2016

STAHL SHEAFFER ENGINEERING
301 SCIENCE PARK ROAD, SUITE 333
STATE COLLEGE, PA 16803
PH: 814-689-1562
FAX: 814-689-1885
WWW.SSE-LLC.COM



SECTION A

STREAM CROSSING
PROFILE VIEW

BOROUGH OF NORTHUMBERLAND
NORTHUMBERLAND COUNTY, PA

SCALE: AS NOTED

SOURCE:
15-144 LIBERTY HOLLOW
TRAIL BASEMAP & DESIGN

SSE PROJECT NO: 15-144

DATE: MARCH 22, 2016

STAHL SHEAFFER ENGINEERING
301 SCIENCE PARK ROAD, SUITE 333
STATE COLLEGE, PA 16803
PH: 814-689-1562
FAX: 814-689-1885
WWW.SSE-LLC.COM

3150-PM-BWEW0050 9/2012

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERWAYS ENGINEERING AND WETLANDS

DEP USE ONLY
☐ Category I
☐ Category II
☐ Category III

Applicant / Project Name: Northumberland Boro Liberty Hollow	County(s): Northumberland County

PASPGP-4 CUMULATIVE IMPACTS PROJECT SCREENING FORM

The following questionnaire must be completed and submitted to determine the appropriate Pennsylvania State Programmatic General Permit-4 (PASPGP-4) review procedure. Incomplete submissions will be returned. An "Overall Project," as defined for this form, includes all regulated activities that are reasonably related and necessary to accomplish the "Overall Project" purpose. An "Overall Project" must have a clear purpose, be able to function, and have independent utility. All regulated activities, including the direct and indirect impacts occurring as a result of the regulated activities, which are associated with the "Overall Project", should be considered cumulatively when completing this form. For linear projects, all impacts to waters and wetlands associated with the "Overall Project" should be added together and cumulatively viewed as impacts associated with the "Overall Project", which must have a defined beginning and end point. For linear projects, the application shall include a plan that depicts the location of the beginning and end points of the overall project, and all proposed crossings. See the PASPGP-4 permit document at: www.nab.usace.army.mil/Wetlands%20Permits and Part II, for the definition of Independent Utility and Single and Complete Project (discussion of "Overall Project").

The PASPGP-4authorizes the discharge of dredged or fill materials and/or the placement of structures, for a single and complete project, including all attendant features, both temporary and/or permanent, which individually or cumulatively results in impacts to 1.0 acre or less of waters of the United States including jurisdictional wetlands. These discharges and placement of structures must comply with all the terms, conditions, and processing procedures identified in this PASPGP-4. Refer to the definitions and sketches in PASPGP-4, Part II for calculating the 1.0-acre eligibility threshold for linear projects.

Determination of PASPGP-4 eligibility – For Category I and II Activities, PADEP/County Conservation Districts will review the applications, if applicable, and verify if work is authorized by PASPGP-4. For Category III Activities, the Corps reviews applications and makes a case by case determination that work is eligible for authorization under PASPGP-4.

Applications for activities that individually or cumulatively impact more than 1.0 acre of waters of the United States, including jurisdictional wetlands, including all attendant features, both temporary and permanent, for a single and complete project; or that impact greater than 250 linear feet of streams, rivers, or other watercourses, except fish habitat enhancement structures authorized under PADEP GP-1 and bank rehabilitation and protection, authorized under PADEP GP-3 that affect 500 linear feet or less, are sent to the Corps as a Category III Activity, under PASPGP-4, Part IV, C, 2. The 1.0 acre area measurement includes the sum total of all waters of the United States including both jurisdictional wetlands and streams, rivers, other watercourses.

- For linear projects, the 250 linear foot Category III Activity threshold for stream impacts is applied to the total cumulative impacts of all crossings associated with the overall linear project, regardless of the type of PADEP authorization or combination of authorizations used to approve the overall project.
- Overall linear projects that have cumulative permanent and temporary impacts to waters of the United States, including jurisdictional wetlands, which exceed 1.0 acre, may still be eligible for PASPGP-4 authorization through a Category III review, provided no single and complete project exceeds the 1 acre threshold (see PASPGP-4, Part II for definition of single and complete project and acreage calculations). This verification of eligibility will be made by the Corps of Engineers.
- For phased projects, including phased linear projects, an overall project plan depicting all previously authorized or proposed impacts to waters and/or wetland is required as part of the application. A plan depicting phase I of the overall project would be submitted with any applications associated with phase I. At a later date, when applications associated with phase II are submitted, an overall plan that depicts the impacts for phase I and phase II is required. For example, if a utility line was previously authorized to run from point A to point B, and the permittee now wants to expand the utility line to point C, the plan will depict from point A to point C. In such a case, the overall project has been expanded to extend from point A to point C; the portion from point A to point B is needed for the section from point B to point C to function and meet the overall project purpose. If plan is not submitted as part of application, the application for the purposes of PASPG-4 will be considered incomplete and the application may be sent to the Corps as a Category III Activity.

SECTION A: PROPOSED IMPACTS

Provide the size of impacts to waters and/or wetlands associated with your application, including temporary and/or permanent impacts, and direct and indirect impacts.

Included in this calculation are the areas directly and indirectly affected by the regulated activities, including the area of waters and/or wetlands filled, drained and/or flooded as a result of the regulated activities. See PASPGP-4, Part II, Definitions, for calculation of linear footage of stream impact, and Part IV, C, 2 for thresholds which require a Corps review of application (Category III Activity).

PADEP GP–11 allows for the registration of multiple overall projects at one time through submission of a project/work site table that identifies each of the separate overall projects. For work associated with PADEP GP-11 registrations, impacts associated with each project/work site should be list separately. This can be done through a separate PASPGP-4 Project Screening Form for each project/work site, or submission of a separate document/table that identifies each separate project/work site, the proposed work and impact information, as required by this section.

		square feet	linear feet
Permanent Impacts	to waters:	120	40
	to wetlands:	0	
Temporary Impacts	to waters:	0	0
	to wetlands:	0	

SECTION B: OTHER CHAPTER 105/SECTION 10/404 AUTHORIZATIONS

YES NO

☐ ☒ 1. If known, has any work associated with the Overall Project been previously authorized by the Corps or DEP? If YES, please complete the table below. If additional space is needed, please attach the applicable information. Include the type of authorization or permit, permit or authorization number(s), date(s) of issuance, and permitted impacts (including square feet and/or linear footage), if applicable, with your application/registration form(s).Types of authorizations or permits may be abbreviated and include: Corps Nationwide Permit, Corps Individual Permit, Corps PASPGP, DEP General Permit, DEP Individual Permit (Dam and/or Encroachment) or DEP Environmental Assessment. See PASPGP-4, Part IV, C, 3 for applications which require a Corps review (Category III Activity).

EXAMPLES:

a. If application is associated with the expansion of a residential development, i.e., construction of phase II, the authorizations and impacts, if applicable, associated with construction of phase I are to be identified and listed.

b. If application is associated with a linear project, i.e., sewer line, waterline, utility line, etc., and the proposed work is an extension or additional phase being added to a previous segment, the authorizations, and impacts, if applicable, associated with construction of the previous segment(s) are to be identified and listed. For example, if a utility line is constructed from point A to point B, and a year later an extension of the line to point C is proposed, the authorizations and impacts associated with construction of point A to point B should be listed/identified. In this case, the overall project is from point A to point C, as the portion from point A to point B is needed for the section from point B to point C to function and meet the overall project purpose.

Authorization Type	Authorization Number	Date (mm/dd/yyyy)	Permitted Impacts	
			wetlands	waters

YES NO

☐ ☒ 2. Are additional Corps and/or DEP authorizations required for your proposed work to function and have independent utility? If YES, please complete the table below. If additional space is needed, please attach the applicable information.

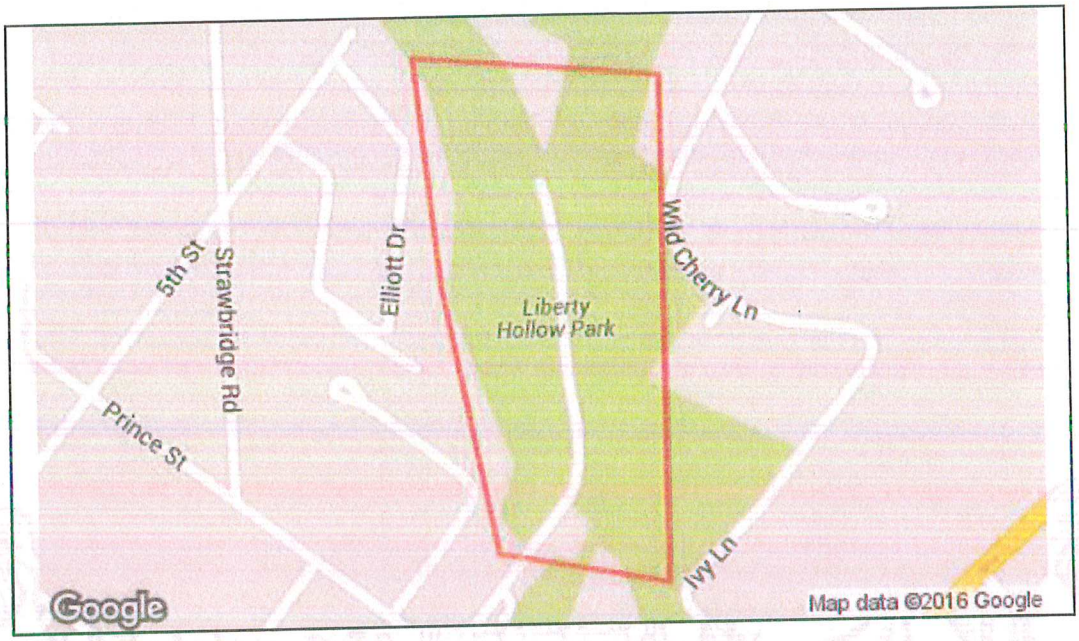
EXAMPLES:

a. Development of a residential subdivision may require the filling of waters and/or wetlands for the construction of access roads, utility line crossings, and/or lot development. In such a case, if application is only for the utility lines, the work and impacts associated with the road crossings and lot development need to be identified. For the overall development to function, the road crossings and lot development are needed, not just utilities.

b. If widening of a road for construction of a turn lane is needed to facilitate an industrial development, applications associated for the industrial development to construct utility lines and lot development need to include the work and impacts associated with the construction of the turn lane. The construction of the turn lane is needed for the industrial development to function; the two projects are not separate independent projects.

1. PROJECT INFORMATION

Project Name: **Liberty Hollow**
Date of review: **1/21/2016 10:32:13 AM**
Project Category: **Development,Other**
Project Length: **4177.3** feet
County: **Northumberland** Township/Municipality: **Northumberland**
Quadrangle Name: **NORTHUMBERLAND** ~ ZIP Code: **17857**
Decimal Degrees: **40.897843 N, -76.791977 W**
Degrees Minutes Seconds: **40° 53' 52^2" N, -76° 47' 31.1" 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.

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. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at http://www.naturalheritage.state.pa.us.

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
Fax:(717) 772-0271

U.S. Fish and Wildlife Service

Pennsylvania Field Office
110 Radnor Rd; Suite 101, State College, PA 16801
NO Faxes Please.

PA Fish and Boat Commission

Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

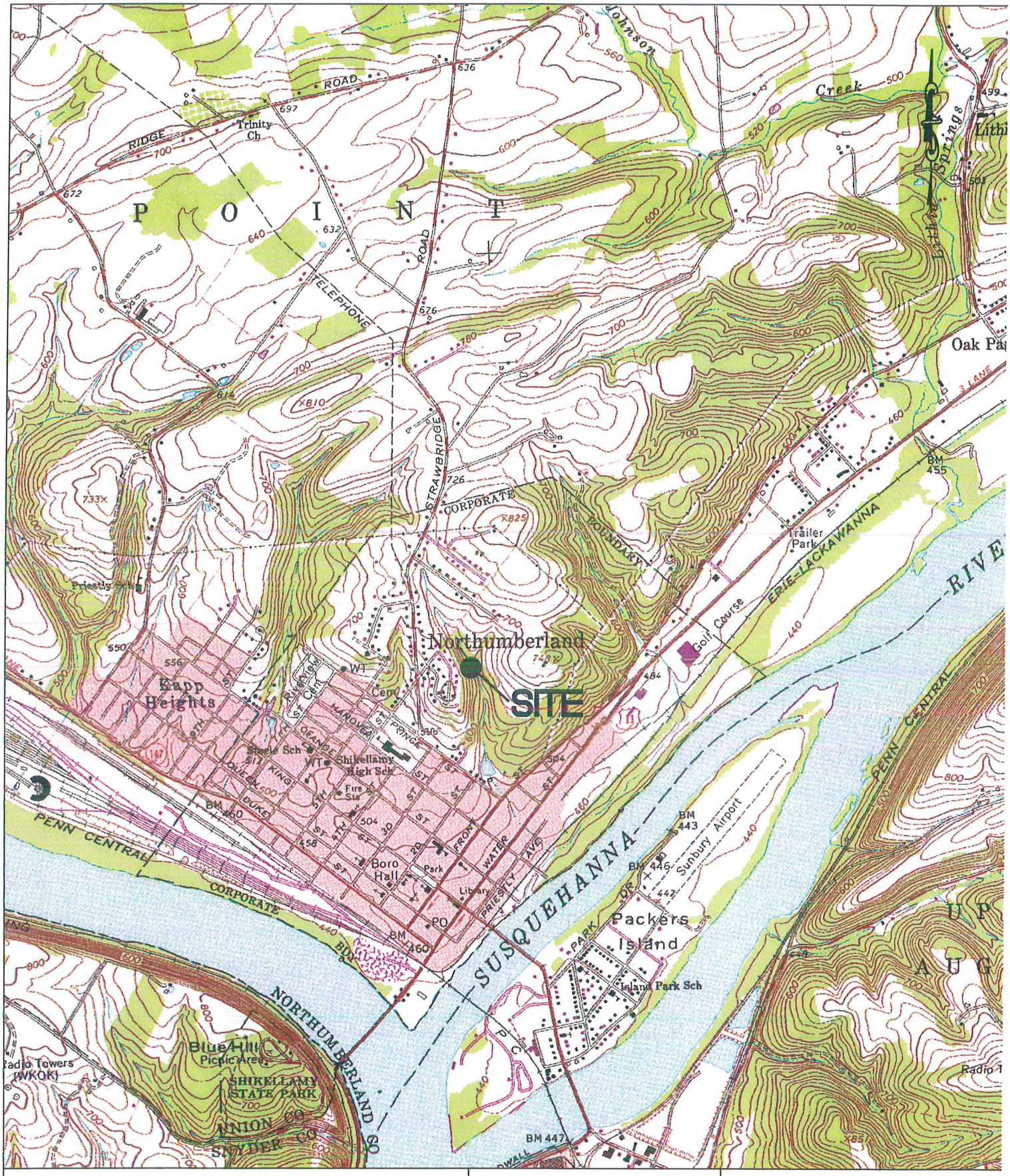
Name: Chad E. Shaffer
Company/Business Name: Stahl Sheaffer Engineering LLC
Address: 106 N. High Street
City, State, Zip: Selinsgrove PA 17870
Phone:(570) 374-4813 Fax:(814) 689-1885
Email: cshaffer@ssc-llc.com

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.

Chad Shaffer 3-11-16

applicant/project proponent signature date



LOCATION MAP

LIBERTY HOLLOW TRAIL

BOROUGH OF NORTHUMBERLAND
NORTHUMBERLAND COUNTY, PA

SCALE: 1"=2000'

STAHL SHEAFFER ENGINEERING, LLC

WWW.SSE-LLC.COM

Project Narrative

The Liberty Hollow Trail project is located in Northumberland Borough, Northumberland County. The project will consist of the construction of a trail through Liberty Hollow Park. The project is meant to construct a walking path from an upper road of the park through the park down to where it will connect on Washington Avenue to access Liberty Splashland.

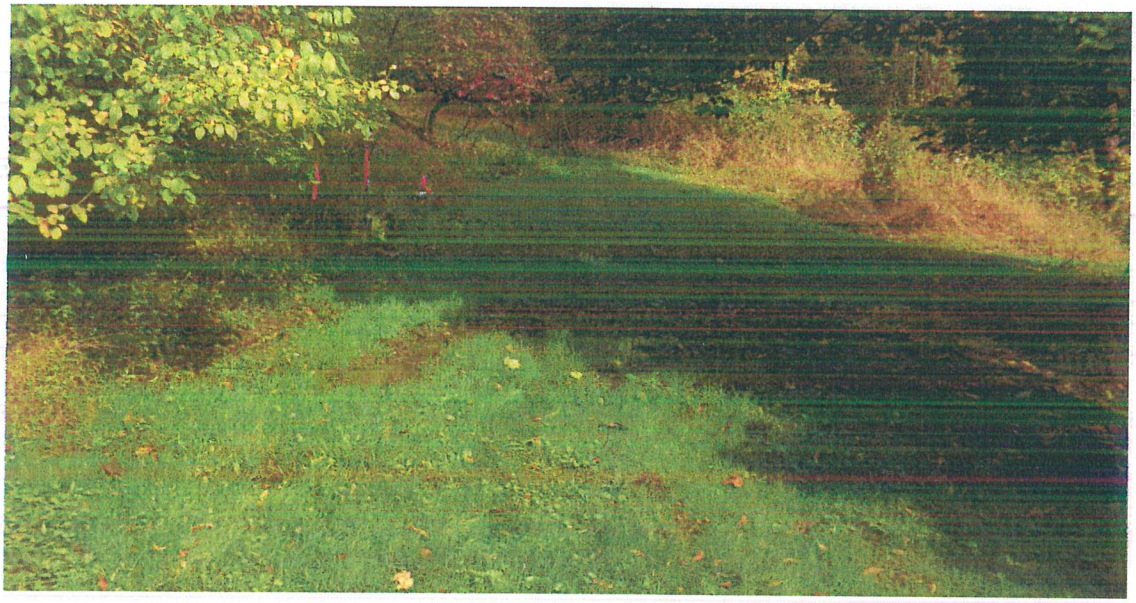
The area the path that will be constructed is completely wooded so some clearing will need to be done to provide adequate area to construct the path. The path surfacing will be done with Trail Surface Aggregate (TSA). The project will have minimal impacts to the regimen and ecology of the local watercourse area. We do not anticipate any impacts to riparian rights of any adjacent or nearby properties with this project.

The results of this proposed trail project will enhance the public's enjoyment of the park area and also an easy access to Liberty Splashland for the surrounding public within walking distance.

STAHL
SHEAFFER
ENGINEERING, LLC

301 Science Park Road, Suite 333
State College, PA 16803
Phone: 814-689-1562
Fax: 814-689-1885
www.sse-llc.com

Project Photographs



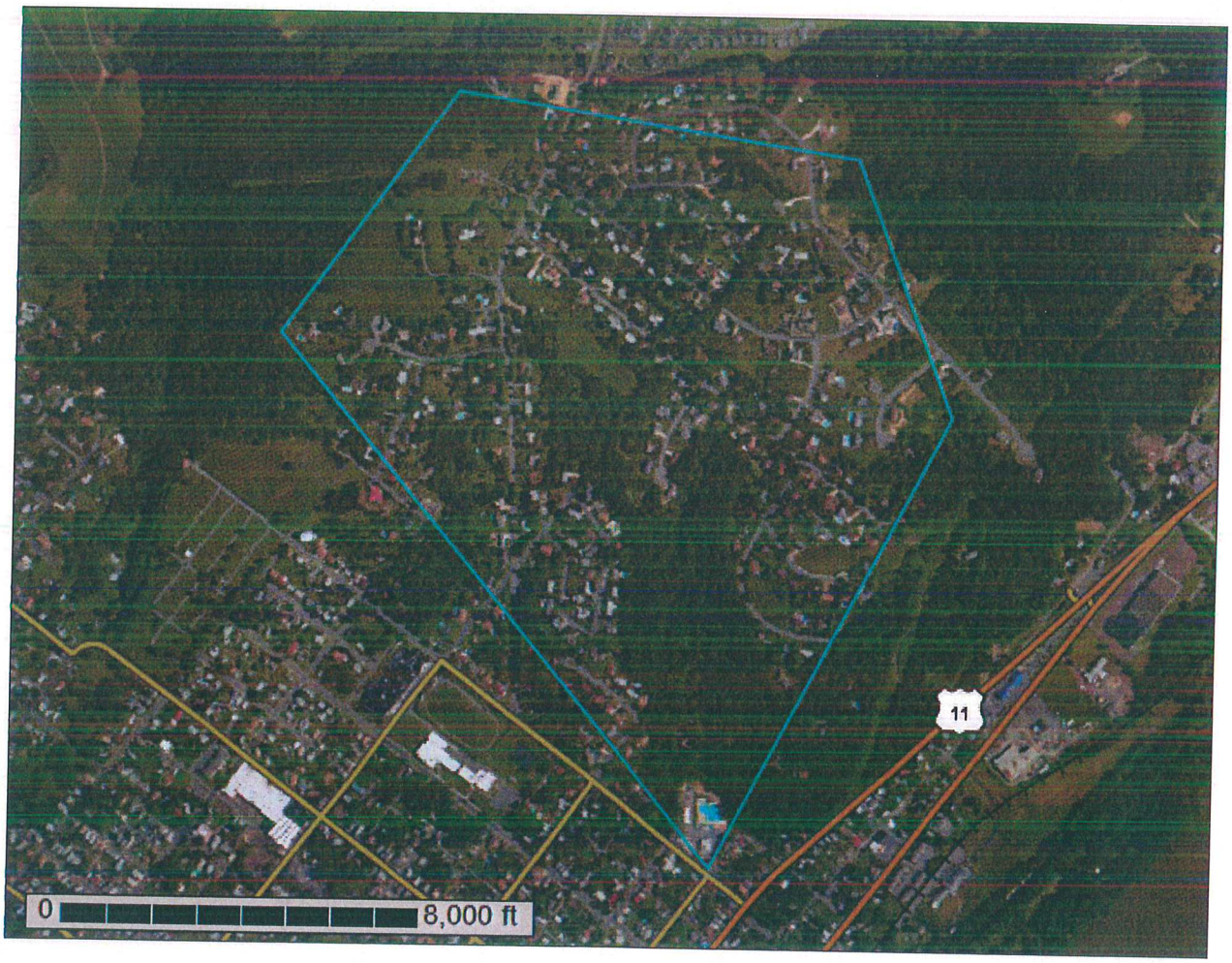
United States Department of Agriculture

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 Northumberland County, Pennsylvania



February 1, 2016

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 (http://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

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....7
Soil Map.....8
Legend.....9
Map Unit Legend.....10
Map Unit Descriptions.....10
Northumberland County, Pennsylvania.....13
AoC—Allenwood and Washington soils, 8 to 15 percent slopes.....13
BeB—Bedington silt loam, 3 to 8 percent slopes.....15
BkB—Berks channery silt loam, 3 to 8 percent slopes.....16
BkC—Berks channery silt loam, 8 to 15 percent slopes.....18
BkD—Berks channery silt loam, 15 to 25 percent slopes.....19
HtB—Hartleton channery silt loam, 3 to 8 percent slopes.....21
HtC—Hartleton channery silt loam, 8 to 15 percent slopes.....22
HtD—Hartleton channery silt loam, 15 to 25 percent slopes.....23
WeB—Weikert channery silt loam, 3 to 8 percent slopes.....24
WeD—Weikert channery silt loam, 15 to 25 percent slopes.....26
WkE—Weikert and Klinesville shaly silt loams, steep.....27
WsB—Wheeling soils, 3 to 8 percent slopes.....29
References.....31

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: 1:9,120 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

N

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 INFOR

The soil surveys that comprise your

Warning: Soil Map may not be valid

Enlargement of maps beyond the sc
misunderstanding of the detail of ma
placement. The maps do not show t
soils that could have been shown at

Please rely on the bar scale on each
measurements.

Source of Map: Natural Resource
Web Soil Survey URL: http://webs
Coordinate System: Web Mercatc

Maps from the Web Soil Survey are
projection, which preserves directior
distance and area. A projection that
Albers equal-area conic projection, s
calculations of distance or area are

This product is generated from the U
the version date(s) listed below.

Soil Survey Area: Northumberlanc
Survey Area Data: Version 8, Nov

Soil map units are labeled (as space
or larger.

Date(s) aerial images were photogra
2011

The orthophoto or other base map o
compiled and digitized probably diffe
imagery displayed on these maps. A
of map unit boundaries may be evid

Map Unit Legend

Northumberland County, Pennsylvania (PA097)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AoC	Allenwood and Washington soils, 8 to 15 percent slopes	0.2	0.1%
BeB	Bedington silt loam, 3 to 8 percent slopes	7.5	3.4%
BkB	Berks channery silt loam, 3 to 8 percent slopes	15.6	6.9%
BkC	Berks channery silt loam, 8 to 15 percent slopes	38.2	17.0%
BkD	Berks channery silt loam, 15 to 25 percent slopes	20.6	9.2%
HtB	Hartleton channery silt loam, 3 to 8 percent slopes	10.1	4.5%
HtC	Hartleton channery silt loam, 8 to 15 percent slopes	62.1	27.7%
HtD	Hartleton channery silt loam, 15 to 25 percent slopes	8.7	3.9%
WeB	Weikert channery silt loam, 3 to 8 percent slopes	3.1	1.4%
WeD	Weikert channery silt loam, 15 to 25 percent slopes	23.0	10.3%
WkE	Weikert and Klinesville shaly silt loams, steep	31.7	14.2%
WsB	Wheeling soils, 3 to 8 percent slopes	3.4	1.5%
Totals for Area of Interest		**224.2**	**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.

Northumberland County, Pennsylvania

AoC—Allenwood and Washington soils, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: l3h5
Elevation: 300 to 2,800 feet
Mean annual precipitation: 34 to 48 inches
Mean annual air temperature: 44 to 57 degrees F
Frost-free period: 130 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Allenwood

Setting

Landform: Valley sides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Old till derived from sedimentary rock

Typical profile

H1 - 0 to 11 inches: gravelly silt loam
H2 - 11 to 56 inches: gravelly silty clay loam
H3 - 56 to 89 inches: very gravelly silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Description of Washington

Setting

Landform: Valley sides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from limestone and/or old glacial drift

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 48 inches: gravelly clay loam
H3 - 48 to 62 inches: clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Minor Components

Bedington

Percent of map unit: 5 percent

Watson

Percent of map unit: 5 percent

Meckesville

Percent of map unit: 5 percent
Landform: Mountain valleys
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Lower third of mountainflank
Down-slope shape: Concave
Across-slope shape: Linear

Hartleton

Percent of map unit: 5 percent
Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

BeB—Bedington silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: l3hg
Elevation: 300 to 1,500 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 140 to 217 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Bedington

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 47 inches: channery silty clay loam
H3 - 47 to 63 inches: very channery clay loam
R - 63 to 67 inches: weathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 48 to 99 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Berks

Percent of map unit: 10 percent

Edom

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex

Hartleton

Percent of map unit: 5 percent
Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

Watson

Percent of map unit: 5 percent
Landform: Valley sides
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear

BkB—Berks channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2sgb5
Elevation: 320 to 3,570 feet
Mean annual precipitation: 37 to 50 inches
Mean annual air temperature: 47 to 56 degrees F
Frost-free period: 148 to 192 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Berks

Setting

Landform: Ridges, mountain slopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Upper third of mountainflank, side slope

Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Residuum weathered from shale and siltstone and/or fine grained sandstone

Typical profile

Ap - 0 to 7 inches: channery silt loam
Bw1 - 7 to 15 inches: channery silt loam
Bw2 - 15 to 28 inches: very channery silt loam
C - 28 to 36 inches: extremely channery silt loam
R - 36 to 46 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Other vegetative classification: Dry Uplands (DU2)

Minor Components

Weikert

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: Droughty Shales (SD2)

Brinkerton

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave

BkC—Berks channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2sgcg
Elevation: 320 to 3,570 feet
Mean annual precipitation: 37 to 50 inches
Mean annual air temperature: 47 to 56 degrees F
Frost-free period: 148 to 192 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Berks

Setting

Landform: Ridges, mountain slopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Upper third of mountainflank, side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Residuum weathered from shale and siltstone and/or fine grained sandstone

Typical profile

Ap - 0 to 8 inches: channery silt loam
Bw1 - 8 to 14 inches: very channery silt loam
Bw2 - 14 to 26 inches: very channery silt loam
C - 26 to 36 inches: extremely channery silt loam
R - 36 to 46 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Other vegetative classification: Dry Uplands (DU2), Dry Uplands (DU3)

Minor Components

Weikert

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: Droughty Shales (SD2)

Brinkerton

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave

BkD—Berks channery silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2sgb7
Elevation: 320 to 3,630 feet
Mean annual precipitation: 37 to 50 inches
Mean annual air temperature: 47 to 56 degrees F
Frost-free period: 148 to 192 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Berks

Setting

Landform: Ridges, mountain slopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Upper third of mountainflank, side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Parent material: Residuum weathered from shale and siltstone and/or fine grained sandstone

Typical profile

Ap - 0 to 7 inches: channery silt loam
Bw1 - 7 to 14 inches: very channery silt loam
Bw2 - 14 to 21 inches: extremely channery silt loam
C - 21 to 36 inches: extremely channery silt loam
R - 36 to 46 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Other vegetative classification: Dry Uplands (DU2)

Minor Components

Weikert

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: Droughty Shales (SD2)

Brinkerton

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave

HtB—Hartleton channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: l3jh
Elevation: 300 to 1,500 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 140 to 217 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Hartleton

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 45 inches: very channery silty clay loam
H3 - 45 to 50 inches: very channery loam
R - 50 to 54 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Natural 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 storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A

Minor Components

Allenwoood
Percent of map unit: 5 percent

Bedington
Percent of map unit: 5 percent

Berks
Percent of map unit: 5 percent

Weikert
Percent of map unit: 5 percent

Leck kill
Percent of map unit: 5 percent

HtC—Hartleton channery silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: l3jj
Elevation: 300 to 1,600 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 217 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Hartleton

Setting

Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 45 inches: very channery silty clay loam
H3 - 45 to 50 inches: very channery loam
R - 50 to 54 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Natural 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 storage in profile: Low (about 4.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Minor Components

Berks
Percent of map unit: 5 percent

Leck kill
Percent of map unit: 5 percent

Allenwood
Percent of map unit: 5 percent

Bedington
Percent of map unit: 5 percent

Weikert
Percent of map unit: 5 percent

HtD—Hartleton channery silt loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: l3jk
Elevation: 300 to 1,600 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 217 days
Farmland classification: Not prime farmland

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

Description of Hartleton

Setting
Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, concave

Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 45 inches: very channery silty clay loam
H3 - 45 to 50 inches: very channery loam
R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
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 storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A

Minor Components

Weikert

Percent of map unit: 10 percent

Berks

Percent of map unit: 5 percent

Bedington

Percent of map unit: 5 percent

Allenwood

Percent of map unit: 5 percent

WeB—Weikert channery silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2v4vr
Elevation: 360 to 1,700 feet
Mean annual precipitation: 37 to 50 inches
Mean annual air temperature: 47 to 56 degrees F
Frost-free period: 148 to 192 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Weikert and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting

Landform: Ridges
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gray and brown acid residuum weathered from shale and siltstone and/or fine grained sandstone

Typical profile

Ap - 0 to 7 inches: channery silt loam
Bw - 7 to 14 inches: very channery silt loam
C - 14 to 18 inches: extremely channery silt loam
R - 18 to 28 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Other vegetative classification: Droughty Shales (SD2)

Minor Components

Berks

Percent of map unit: 9 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear

Bedington

Percent of map unit: 5 percent
Landform: Hills, hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex

Brinkerton

Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave

WeD—Weikert channery silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2v4vs
Elevation: 340 to 4,040 feet
Mean annual precipitation: 37 to 50 inches
Mean annual air temperature: 47 to 56 degrees F
Frost-free period: 148 to 192 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Weikert

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gray and brown acid residuum weathered from shale and siltstone and/or fine grained sandstone

Typical profile

A - 0 to 6 inches: channery silt loam
Bw - 6 to 12 inches: very channery silt loam
C - 12 to 15 inches: extremely channery silt loam
R - 15 to 25 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.0 mmhos/cm)
Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Other vegetative classification: Droughty Shales (SD3)

Minor Components

Berks

Percent of map unit: 9 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear

Ernest

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear

Wharton

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve, side slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave

Hartleton

Percent of map unit: 1 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

WkE—Weikert and Klinesville shaly silt loams, steep

Map Unit Setting

National map unit symbol: l3l4
Elevation: 300 to 1,600 feet
Mean annual precipitation: 36 to 50 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 217 days

Farmland classification: Not prime farmland

Map Unit Composition

Weikert and similar soils: 40 percent
Klinesville and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weikert

Setting

Landform: Hills
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and siltstone

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 15 inches: very channery silt loam
H3 - 15 to 19 inches: bedrock

Properties and qualities

Slope: 25 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D

Description of Klinesville

Setting

Landform: Ridges, valleys
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from siltstone

Typical profile

H1 - 0 to 7 inches: channery silt loam
H2 - 7 to 11 inches: very channery silt loam
H3 - 11 to 15 inches: very channery silt loam
R - 15 to 19 inches: bedrock

Properties and qualities

Slope: 25 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Natural drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D

Minor Components

Hartleton

Percent of map unit: 10 percent
Landform: — error in exists on —
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

Berks

Percent of map unit: 10 percent

Leck kill

Percent of map unit: 5 percent

Rushtown

Percent of map unit: 5 percent

WsB—Wheeling soils, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: l3l6
Elevation: 300 to 1,000 feet
Mean annual precipitation: 35 to 55 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 120 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Wheeling

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread
Parent material: Loamy alluvium derived from sandstone

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 42 inches: loam
H3 - 42 to 60 inches: stratified very gravelly sand to very fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Lakin

Percent of map unit: 10 percent

Monongahela

Percent of map unit: 5 percent

Wheeling

Percent of map unit: 5 percent

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

Client: Northumberland Boro
County: Northumberland State: PA
Practice: Stahl Sheaffer Engineering LLC
Calculated By: CES Date: 1/29/2016
Checked By: _____ Date: _____

Drainage Area:	87.18	Acres (user entered value)
Curve Number:	62	(user entered value)
Watershed Length:	3502	Feet
Watershed Slope:	6.60	Percent
Time of Concentration:	0.92	Hours (calculated value)
Rainfall Type:	II	

Storm Number	1	2	3	4	5	6	7
Frequency (yrs)	25	100					
24-Hr rainfall (in)	5.02	6.95					
Ia/P Ratio	0.24	0.18	0.00	0.00	0.00	0.00	0.00
Used	0.24	0.18	0.00	0.00	0.00	0.00	0.00
Runoff (in)	1.45	2.76					
(ac-ft)	10.53	20.05	0.00	0.00	0.00	0.00	0.00
Unit Peak Discharge (cfs/acre/in)	0.509	0.545	0.000	0.000	0.000	0.000	0.000
Peak Discharge (cfs)	64	131					

STAHL SHEAFFER ENGINEERING, LLC

106 N. High Street
Selinsgrove, PA 17870
Phone: (570) 374-4813
Fax: (814) 689-1885

Project: Liberty Hollow Trail
Subject: Hydrology Information
Page: 1 of 1 Date: 2/2/2016
By: CES Chk'd:

Drainage Area Information

Soils

Soil Name	*Slope (%)*	*Soil Symbol*	*Hydrologic Group*	*Area (acres)*
Bedington silt loam	3 to 8	BeB	B	7.7
Berks channery silt loam	3 to 8	BkB	B	7.08
Berks channery silt loam	8 to 15	BkC	B	5.84
Berks channery silt loam	15 to 25	BkD	B	7.31
Hartleton channery silt loam	3 to 8	HtB	A	5.05
Hartleton channery silt loam	8 to 15	HtC	A	43.41
Hartleton channery silt loam	15 to 25	HtD	A	4.02
Weikert and Klinesville shaly silt loam	steep	WkE	D	6.77
			Total Area =	87.18

**Area of water was not included in the total area.*

Composite Curve Number				
	A	B	C	D
0.5 Acre lots:	54	70	80	86
CN:	62			

Hydrologic Group:				
	A:	52.48	acres	60.20%
	B:	27.93	acres	32.04%
	C:	0.00	acres	0.00%
	D:	6.77	acres	7.77%

Site Information

Channel Length: 1040 ft (from PAMap)
Max. Elevation: 656 ft (from PAMap)
Min. Elevation: 590 ft (from PAMap)

Channel Slope: 6.35%

Shallow Conc. Flow Length: 2362 ft (from PAMap)
Max. Elevation: 818 ft (from PAMap)
Min. Elevation: 656 ft (from PAMap)

Shallow Flow Slope: 6.86%

Sheet Flow Length: 100 ft (from PAMap)
Max. Elevation: 821 ft (from PAMap)
Min. Elevation: 818 ft (from PAMap)

Sheet Flow Slope: 3.00%

Overall Flow Length: 3502 ft

Overall Slope: 6.60%

NOAA Atlas 14, Volume 2, Version 3
Location name: Northumberland, Pennsylvania, US*
Latitude: 40.8953°, Longitude: -76.7920°
Elevation: 534 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.339 (0.307-0.374)	0.402 (0.364-0.444)	0.468 (0.423-0.518)	0.516 (0.466-0.570)	0.575 (0.518-0.635)	0.619 (0.556-0.685)	0.663 (0.593-0.733)	0.707 (0.631-0.783)	0.770 (0.684-0.856)	0.817 (0.721-0.911)
10-min	0.527 (0.477-0.582)	0.627 (0.568-0.693)	0.728 (0.658-0.804)	0.797 (0.719-0.880)	0.879 (0.792-0.971)	0.939 (0.843-1.04)	0.998 (0.893-1.10)	1.06 (0.942-1.17)	1.13 (1.00-1.26)	1.19 (1.05-1.33)
15-min	0.646 (0.584-0.713)	0.767 (0.694-0.848)	0.894 (0.808-0.988)	0.980 (0.885-1.08)	1.08 (0.978-1.20)	1.16 (1.04-1.28)	1.24 (1.11-1.37)	1.31 (1.17-1.45)	1.41 (1.25-1.57)	1.49 (1.31-1.66)
30-min	0.855 (0.773-0.943)	1.03 (0.929-1.13)	1.22 (1.11-1.35)	1.36 (1.23-1.50)	1.53 (1.38-1.69)	1.66 (1.49-1.84)	1.79 (1.60-1.98)	1.92 (1.71-2.12)	2.09 (1.86-2.33)	2.23 (1.97-2.48)
60-min	1.04 (0.944-1.15)	1.26 (1.14-1.39)	1.54 (1.39-1.70)	1.73 (1.56-1.91)	1.99 (1.79-2.20)	2.19 (1.97-2.42)	2.39 (2.14-2.65)	2.60 (2.32-2.88)	2.90 (2.57-3.22)	3.13 (2.76-3.49)
2-hr	1.21 (1.09-1.34)	1.45 (1.31-1.61)	1.78 (1.60-1.98)	2.05 (1.84-2.28)	2.45 (2.18-2.71)	2.78 (2.47-3.09)	3.16 (2.79-3.50)	3.58 (3.13-3.98)	4.21 (3.65-4.71)	4.77 (4.09-5.35)
3-hr	1.30 (1.17-1.46)	1.56 (1.41-1.75)	1.92 (1.73-2.15)	2.23 (2.00-2.49)	2.68 (2.39-3.00)	3.08 (2.72-3.44)	3.53 (3.09-3.95)	4.04 (3.51-4.52)	4.83 (4.13-5.43)	5.53 (4.67-6.24)
6-hr	1.62 (1.45-1.81)	1.94 (1.75-2.18)	2.38 (2.14-2.68)	2.76 (2.47-3.10)	3.32 (2.95-3.72)	3.81 (3.36-4.27)	4.37 (3.83-4.90)	5.00 (4.33-5.61)	5.98 (5.11-6.75)	6.85 (5.77-7.76)
12-hr	1.99 (1.79-2.23)	2.38 (2.14-2.67)	2.93 (2.64-3.28)	3.41 (3.05-3.81)	4.13 (3.67-4.59)	4.76 (4.20-5.30)	5.49 (4.81-6.12)	6.33 (5.49-7.07)	7.65 (6.52-8.57)	8.83 (7.42-9.94)
24-hr	2.34 (2.15-2.59)	2.80 (2.58-3.10)	3.48 (3.19-3.84)	4.08 (3.72-4.48)	5.02 (4.55-5.49)	5.91 (5.31-6.43)	6.95 (6.18-7.53)	8.19 (7.21-8.84)	10.2 (8.86-11.0)	12.1 (10.3-12.9)
2-day	2.73 (2.49-3.03)	3.27 (2.98-3.64)	4.05 (3.68-4.49)	4.74 (4.29-5.24)	5.84 (5.25-6.42)	6.86 (6.12-7.52)	8.07 (7.14-8.82)	9.50 (8.32-10.4)	11.8 (10.2-12.9)	14.0 (11.9-15.2)
3-day	2.91 (2.65-3.24)	3.48 (3.17-3.88)	4.29 (3.90-4.77)	5.00 (4.53-5.54)	6.13 (5.51-6.77)	7.19 (6.42-7.90)	8.43 (7.46-9.24)	9.90 (8.68-10.8)	12.3 (10.6-13.4)	14.5 (12.4-15.8)
4-day	3.09 (2.82-3.45)	3.69 (3.36-4.12)	4.53 (4.11-5.05)	5.26 (4.76-5.85)	6.43 (5.78-7.11)	7.51 (6.71-8.29)	8.79 (7.79-9.66)	10.3 (9.04-11.3)	12.8 (11.0-13.9)	15.0 (12.8-16.3)
7-day	3.63 (3.33-3.99)	4.32 (3.97-4.76)	5.25 (4.82-5.77)	6.08 (5.56-6.66)	7.38 (6.70-8.06)	8.56 (7.72-9.33)	9.94 (8.90-10.8)	11.6 (10.3-12.5)	14.2 (12.4-15.3)	16.6 (14.3-17.9)
10-day	4.18 (3.87-4.56)	4.97 (4.59-5.42)	5.97 (5.51-6.51)	6.84 (6.30-7.45)	8.19 (7.50-8.89)	9.41 (8.57-10.2)	10.8 (9.78-11.7)	12.4 (11.1-13.4)	15.0 (13.3-16.2)	17.3 (15.2-18.6)
20-day	5.75 (5.38-6.18)	6.78 (6.34-7.29)	7.93 (7.40-8.51)	8.92 (8.30-9.56)	10.4 (9.66-11.1)	11.7 (10.8-12.5)	13.2 (12.1-14.1)	14.9 (13.6-15.9)	17.4 (15.8-18.6)	19.7 (17.7-20.9)
30-day	7.17 (6.74-7.70)	8.41 (7.89-9.02)	9.68 (9.07-10.4)	10.8 (10.1-11.5)	12.3 (11.5-13.2)	13.7 (12.8-14.7)	15.3 (14.2-16.3)	17.0 (15.7-18.1)	19.5 (17.9-20.8)	21.7 (19.8-23.2)
45-day	9.07 (8.56-9.66)	10.6 (10.0-11.3)	12.0 (11.3-12.7)	13.1 (12.4-14.0)	14.9 (14.0-15.8)	16.3 (15.4-17.4)	17.9 (16.8-19.1)	19.7 (18.4-20.9)	22.2 (20.7-23.6)	24.4 (22.5-25.9)
60-day	10.9 (10.3-11.6)	12.7 (12.0-13.4)	14.2 (13.5-15.1)	15.5 (14.7-16.5)	17.5 (16.5-18.5)	19.1 (18.0-20.2)	20.9 (19.6-22.1)	22.8 (21.3-24.1)	25.6 (23.8-27.1)	27.9 (25.9-29.5)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

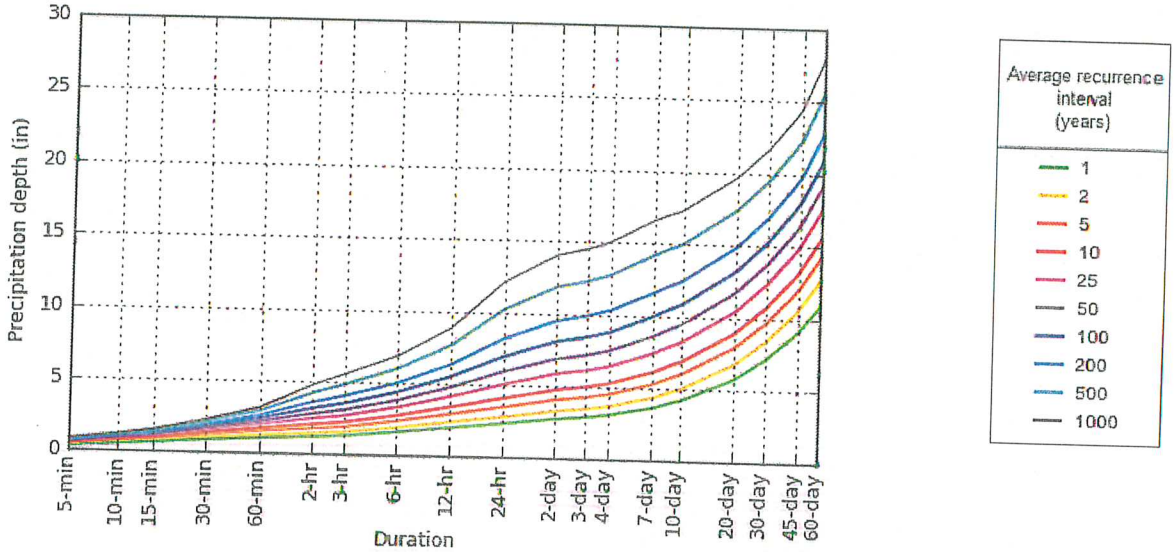
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

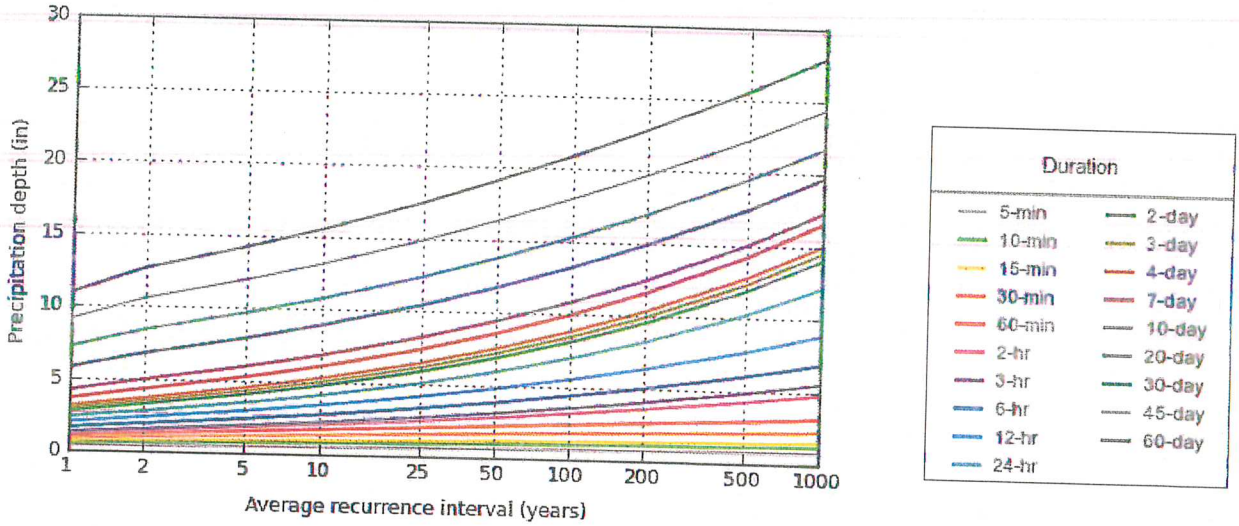
Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 40.8953°, Longitude: -76.7920°





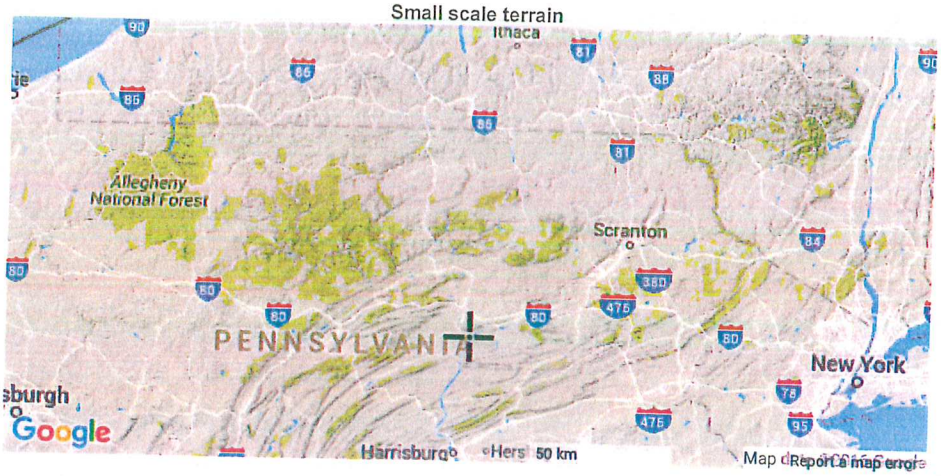
NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Tue Feb 2 16:05:00 2016

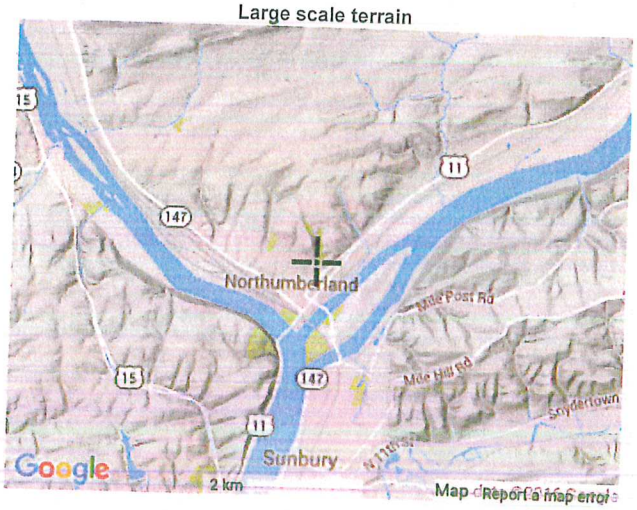
Back to Top

Maps & aerials

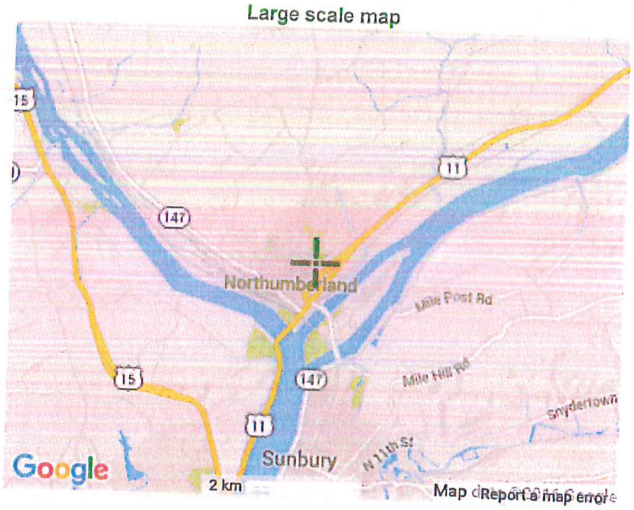
Small scale terrain



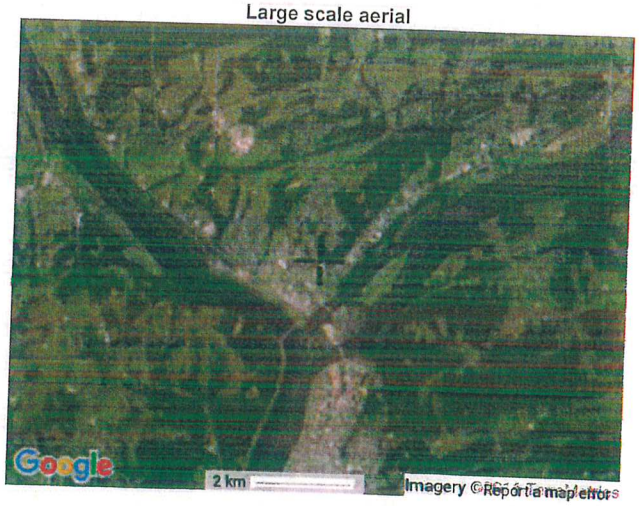
Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer