POLLUTION REDUCTION PLAN (PRP)

LEHIGH TOWNSHIP
NORTHAMPTON COUNTY
PENNSYLVANIA

SEPTEMBER 16, 2017
LAST REVISED June 11, 2021

DRAFT

Prepared for:

Lehigh Township
1069 Municipal Road
Walnutport, PA 18088

Prepared by:

HanoverEngineering
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Hanover Project LT17-26

Table of Contents

Appendices

I. Introduction

Lehigh Township, Northampton County has prepared this Pollutant Reduction Plan (PRP) in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit to Discharge Stormwater from Small Municipal Separate Storm Sewer Systems (MS4). This PRP has been created to specifically address impaired waters of the Commonwealth in which the Township's MS4 currently discharge to. Lehigh Township's MS4 currently discharges to three watersheds: The Lehigh River, the Bertsch Creek, and the Hockendaqua Creek. The Hockendauqua Creek is impaired for Siltation, Suspended Solids. **The Lehigh River Impairment is approximately 5 miles away from Lehigh Township (Hockendaqua Creek in Coplay), therefore only 3 tributaries along the southern border of the Township have been included in the PRP calculations by way of this revision.**

Approximately 50% of the Township drains each to the Hockendaqua Creek, and Bertsch Creek/Lehigh River, respectively. This plan provides BMPs and supporting calculations necessary to reduce pollutant levels contributing to the Hockendaqua Creek and three (3) tributaries to the Lehigh River within five (5) miles of the downstream impairment. **Lehigh Township will submit a revised Individual Permit application, along with this PRP, pending settlement of ongoing litigation.**

II. Public Participation

As part of the requirements for this Plan, public participation is required. The Township has advertised the development of the PRP via Public Notice during the first quarter of 2018 in a newspaper of general circulation in the area. The notice stated the PRP was available for review and comment at the Township Municipal Building for 30-days prior to a publicly held meeting. A copy of all written public comments will be added to this plan. The Township will use the public comments to update the PRP as follows:

At this time, the public has not provided any input on the actual PRP during the public meeting. Any future comments or concerns will be added to this plan.

A. Copy of Public Notice (REVISED PUBLIC NOTICE TO BE PROVIDED WHEN AVAILABLE)

NOTICE

NOTICE IS HEREBY GIVEN that the Lehigh Township will receive public comments on the proposed **Pollutant Reduction Plan (PRP)** required for the **2018-2023 NPDES Municipal Separate Storm Sewer Systems (MS4) Permit**.

The proposed PRP is available for review at the Township Municipal Building.

The Township will accept written comments for 30 calendar days from the date of this public notice. Interested parties may submit written comments to Ms. Alice Rehrig, Township Manager.

B. List of Public Comments

None at this time

C. List of Comments and Record of Consideration

Board of Supervisors (BOS) Meeting Minutes April 10, 2018 **(REVISED MINUTES TO BE PROVIDED WHEN AVAILABLE)**

III. MS4 Mapping

The included mapping identifies the existing land uses and the storm sewershed boundaries. The PRP Planning area is comprehensive of the Urbanized Areas of the Township, which falls within the drainage areas to the Hockendaqua Creek and Lehigh River. The total area contributing to the impaired areas of the MS4 (4,342 acres) was divided into developed and undeveloped land. Any area not collected by the impaired areas of the Township MS4, was omitted from the areas contributing to the MS4 calculations. Of the 3,425 acres of developed land, GIS mapping shows approximately 10% as impervious cover. The existing loading calculations have been based on this mapping.

Mapping for the BMPs proposed to effectively reduce sediment loading has also been prepared and provided with this PRP (refer to the appendix).

IV. Existing Pollutant Loads

In watersheds where sediment is listed as a concern, the MS4 permittee must reduce sediment loading by 10 percent; where nutrients are listed as a concern, the MS4 permittee must reduce phosphorus by 5 percent and nitrogen by 3 percent. PA DEP assumes that the 5 percent reduction for phosphorus to be met with the 10 percent reduction in sediment.

Existing loading has been calculated and reported in pounds per year for the pollutants of concern. There are several accepted methods to calculate the existing loads. For this PRP, the calculations are based on the Department's Simplified Method, which we have calculated the overall percentages of impervious and non-impervious cover within the urbanized area and multiplied them by their associated pollutant loading rates (lbs/acre/year). A reduced loading rate was applied to the undeveloped land outside of the urbanized areas.

The total minimum sediment reduction required for the MS4 was determined to be 155,220 lbs/year.

LEHIGH TOWNSHIP POLLUTANT REDUCTION PLAN

Existing BMPs

Existing BMP	Year	Permit Number	TOT DA (AC.)	Impervious (AC.)	Pervious (AC.)	Latitude	Longitude
Bella Vista Estates	2003	PAR10U166	63.97	15.99	47.98	40.7598166	-75.5271955
Foxdale Subdivision	1998	PAR10U083	48.96	7.34	41.62	40.7557147	-75.5147248
Oakdale Manor	1985	NA	43.77	10.94	32.83	40.7480059	-75.5314302
Lehigh Elementary School	2018	PAC480054	11.76	3.15	8.61	40.7647326	-75.5334067
Tara Woods	1987	NA	15.12	1.81	13.31	40.7453029	-75.5280886
Cherryville Self Storage	NA	NA	1.17	0.18	0.99	40.75991	-75.5356184
South View Estates	NA	NA	20.34	4.07	16.27	40.7895197	-75.506672
Cottonwood Crest PHIII	2008	NA	17.83	1.78	16.05	40.7648022	-75.4779703
Michael Haberern	NA	NA	26.27	2.63	23.64	40.7307654	-75.5471113
Willow Run	NA	NA	14.53	2.91	11.62	40.7280801	-75.5468683
Twin Berry Acres	NA	NA	11.03	2.21	8.82	40.7523555	-75.5406631
Total =			274.75	53.01	221.74		

Infiltration Practices	Year	Permit Number	TOT DA (AC.)	Impervious (AC.)	Pervious (AC.)	Latitude	Longitude
Delps Park	2015	PAG02004815012	29.16	1.46	27.70	40.789765	-75.4892378
Lehigh Elementary School	2018	PAC480054	5.62	3.9	1.723	40.762728	-75.5339796
Total =				5.36	29.43		

Existing BMP (Infilltration)	Impervious AC.	Pervious Acres	Total Reduction
Delps Park	1.458	27.702	9019.07
Lehigh Elementary School	3.9	1.723	6865.76
Total =	5.358	29.425	15884.83

BMP Effectiveness (Basin)	BMP Effecitveness (Infilltration)
0.6	0.9

Existing BMP (Basin)	Impervious Acres	Pervious Acres	Total Reduction
Bella Vista Estates	15.99	47.98	25273.40
Foxdale Subdivision	7.34	41.62	14719.31
Oakdale Manor	10.94	32.83	17292.74
Lehigh Elementary School	3.15	8.61	4844.49
Tara Woods	1.81	13.31	4117.28
Cherryville Self Storage	0.18	0.99	351.75
South View Estates	4.07	16.27	7075.49
Cottonwood Crest PHIII	1.78	16.05	4518.45
Michael Haberern	2.63	23.64	6657.30
Willow Run	2.91	11.62	5054.42
Twin Berry Acres	2.21	8.82	3836.90
Total =	53.01	221.74	93741.53

CATEGORY	TSS (SEDIMENT) LBS/AC/YR
UNDEVELOPED	234.6
*DEVELOPED IMPERVIOUS	1839
DEVELOPED PERVIOUS	264.96

OPERATION AND MAINTENANCE ACTIVITY AND FREQUENCY

OPERATION AND MAINTENANCE SCHEDULE FOR SUBSURFACE/ INFILTRATION BED:

THE OWNER SHALL BE RESPONSIBLE FOR ALL MAINTENANCE AND OPERATIONS OF THE INFILTRATION AND SUBSURFACE SEEPAGE PITS AND BEDS. THE OWNER SHALL INSPECT THE BEDS REGULARLY TO ENSURE THAT PONDING WATER DOES NOT CREATE NUISANCE CONDITIONS. SIGNS OF CONCENTRATED FLOW AND OTHER SURFACE EROSION SHOULD BE REPAIRED TO PROMOTE SHEETFLOW. THE OWNER SHALL ENSURE A DENSE STAND OF VEGETATION IS PRESENT AT ALL TIMES.

FREQUENCY	MAINTENANCE ACTIVITY	REMEDY
WEEKLY OR AS NEEDED	1. INSPECT SURFACE VEGETATION	1. WATER, WEED, AND SEED AS NECESSARY
	2. MOW SURFACE VEGETATION	2. MOW ONLY AS APPROPRIATE FOR VEGETATIVE COVER SPECIES
	3. INSPECT OUTLET STRUCTURES	3. REMOVE AND ACCUMULATED SEDIMENT OR DEBRIS TO ENSURE PROPER DRAINAGE
SEMI-YEARLY	1. INSPECT CATCH BEDS AND INLETS	1. REMOVE DEBRIS AS NECESSARY

OPERATION AND MAINTENANCE SCHEDULE FOR VEGETATED SWALE:

FREQUENCY	MAINTENANCE ACTIVITY	REMEDY
ANNUALLY/AS NEEDED	1. INSPECT VEGETATION	1. PLANT ALTERNATE SPECIES IN EVENT OF UNSUCCESSFUL ESTABLISHMENT
	2. MOW VEGETATION	2. CUT IN ACCORDANCE WITH CHOSEN VEGETATION
WITHIN 48HRS AFTER STORM EVENT	1. INSPECT FOR DEBRIS/EROSION, ETC.	1. REMOVE DEBRIS/ SEED BARE SPOTS, ETC

MAINTENANCE AND OPERATION SCHEDULE FOR STREET SWEEPING:

OWNER SHALL BE RESPONSIBLE FOR STREET SWEEPING PER THE INDICATED SCHEDULE, USING A4000 STREET SWEEPER OR EQUIVALENT.

FREQUENCY	MAINTENANCE ACTIVITY	REMEDY
25 TIMES ANNUALLY	SWEEP PAVED AREAS	EMPTY OF TRASH AND DISPOSE OF AT AN APPROVED MUNICIPAL DISPOSAL AREA.

V. BMPs Selected to Achieve the Minimum Required Reductions in Pollutant Loading

For the Hockendaqua Creek Watershed and included Lehigh River tributaries, the sediment pollution was managed by setting the minimum proposed pollutant reduction at 10%. To control this volume of material, a combination of several BMPs will be necessary. The following is a brief description of the BMPs that have been chosen to achieve the required sediment reduction:

Existing BMPs:

Dry Extended Detention Basin
Lehigh Township will inspect and maintain/ensure maintenance of several existing detention basins, in conformance with the Operation and Maintenance (O&M) provisions of the Ordinance. With an effectiveness of 60% removal, this BMP will provide a reduction of 93,742 lbs/yr from the existing load within the watershed.

Infiltration Practices
Lehigh Township will inspect and maintain/ensure maintenance of existing infiltration facilities, in conformance with the Operation and Maintenance (O&M) provisions of the Ordinance. With an effectiveness of 90% removal, this BMP will provide a reduction of 15,885 lbs/yr from the existing load within the watershed.

Proposed BMPs:

Street Sweeping
Lehigh Township will increase the street sweeping schedule to 25 times annually. With an effectiveness of 9% removal, this BMP will provide a reduction of 16,717 lbs/yr.

Sediment Filter Bags
Lehigh Township will install, inspect and maintain sediment filter bags on 88 inlets in conformance with the Operation and Maintenance (O&M) provisions of the Ordinance. With an effectiveness of 80% removal, this BMP will provide a reduction of 21,903 lbs/yr.

Vegetated Open Channels
Lehigh Township will strategically select various roadside improvement projects to reduce sediment load to local watercourses by installing and/or enhancing roadside drainage channels. Several sample sites are provided for within the Appendix and with a removal rate of 70%, approximately 513 acres of drainage area to such projects will provide a reduction of approximately 138,256 lbs/yr. Given the anticipated size/locale of these projects we would anticipate 9-11 projects being required to treat 513 acres of upstream drainage area.

Stream Restoration

Lehigh Township has proposed to undertake a stream bank restoration project within Indian Trail Park., which will stabilize and vegetate approximately 667 linear feet of eroding stream bank over the permit term. This BMP will provide a reduction of 18,970 lbs/yr. This project has been designed and received Chapter 105 approval from the Department. Copies of the project plans and authorization are included within the Appendix.

In combination, the above listed BMPs will provide a sediment reduction of 184,011 lbs/yr which exceeds the minimum 10% required reduction within the impaired watershed.

The Township's Stormwater Management Ordinance requires legally binding Operation and Maintenance (O&M) provisions which must be completed for BMP facilities not dedicated or accepted by the Township. The Township's MS4 permit indicates and requires regular inspection by the facility owner and Township staff at least one (1) time during each 5-year permit term. The Stormwater Management Ordinance also specifies regular inspection intervals by the owner, who is responsible for maintenance under various situations.

Proposed funding for implementation of the proposed BMPs will be acquired through the municipal tax base.

A. Proposed BMP Implementation Schedule

TO BE DETERMINED PENDING SETTLEMENT OF ONGOING LITIGATION.

A. Proposed BMP implementation Schedule 2021-TBD

Street Sweeping	Ongoing throughout all Township Roads Bi-Monthly
Inlet Filter bags/screens	2021-2022 Field locate and identify storm structures at key locations to receive filters
	2022 Acquire funding approval, Prepare bid documents for procurement of filters
	2022-TBD Installation of 20-30 filter bags per year, begin maintenance following the first year of installation.
Stream Restoration	2020-2021 Project design and Chapter 105 acquisition (COMPLETE)
	2021-2022 Prepare Contracts, award bids, and begin construction
Vegetated Open Channels	2021-2022 Project location selection & design
	2022-TBD Prepare Contracts, award bids (as necessary), and begin construction

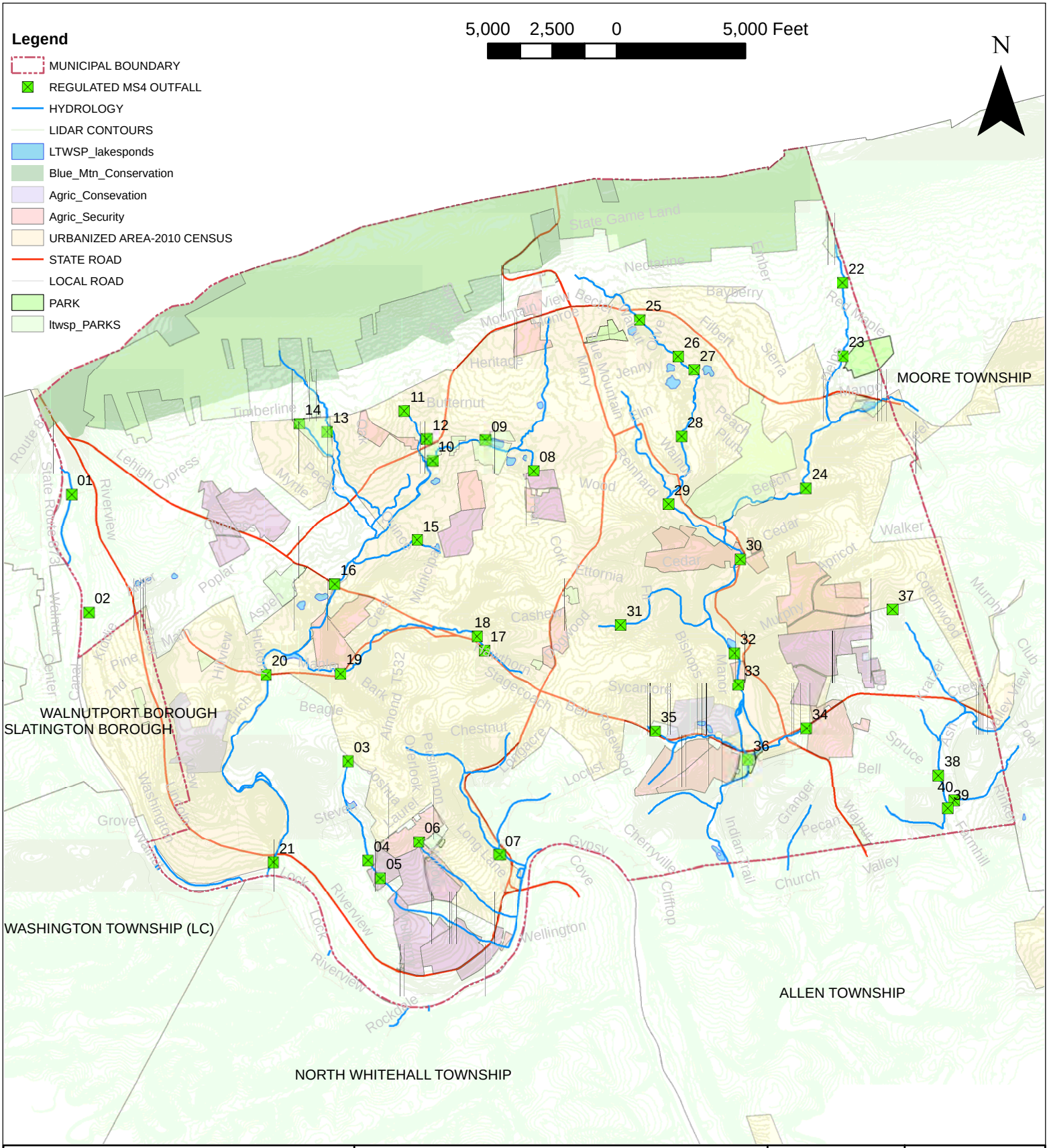
VI. Summary

Additional BMPs will be added to the plan, as necessary or as opportunities present, to improve stormwater management within the Township. Updates on each of the proposed BMPs and the implementation status of the PRP will be included in all future MS4 reporting submitted to PA DEP. The following page includes a summary of the overall existing loading to be treated and also the sediment reduction provided by each individual BMP.

Appendix A

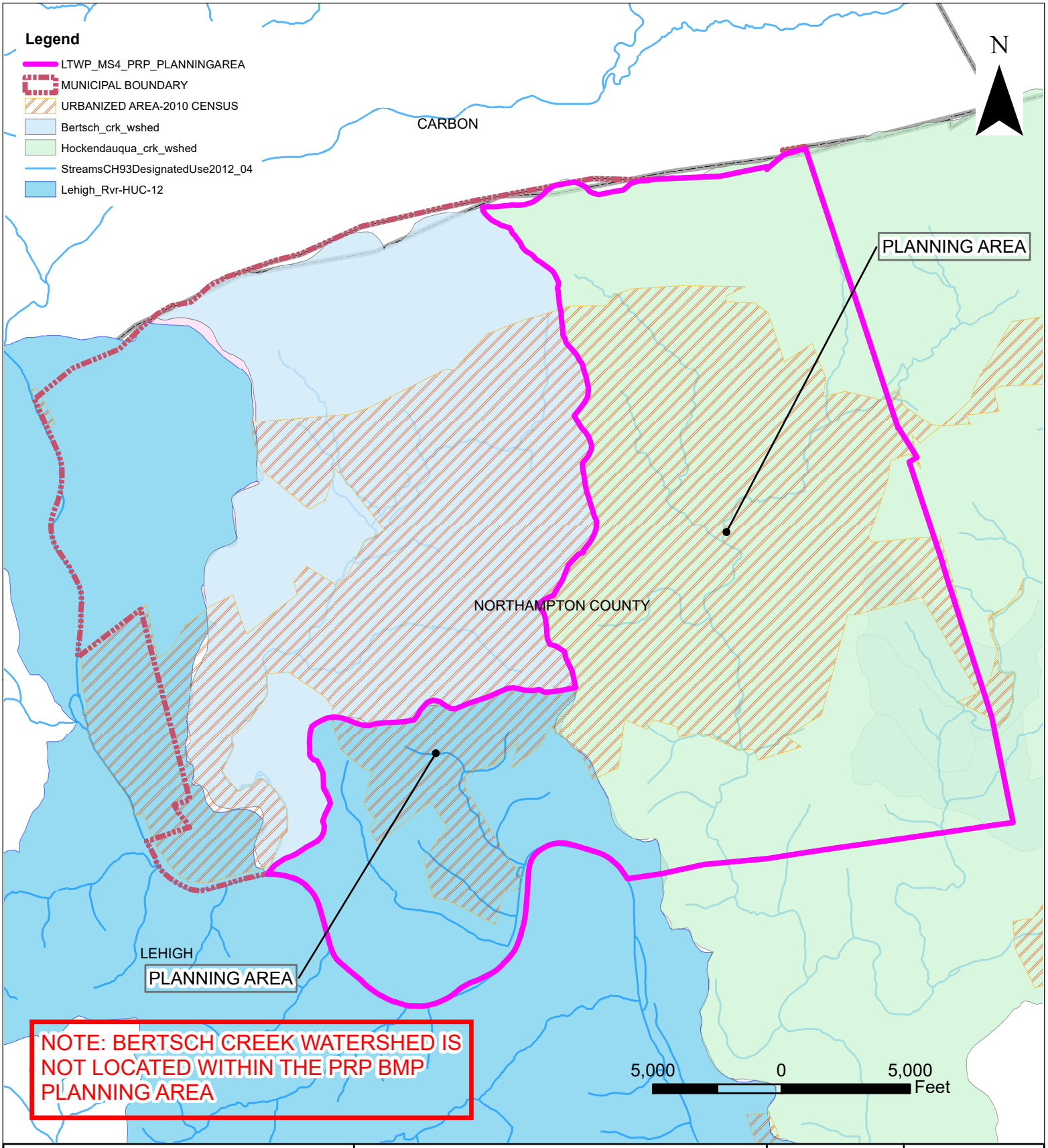
Landuse and MS4 Planning Area

X:\Projects\Municipal\Lehigh Township\2017 MS4 UA MAPREV.mxd



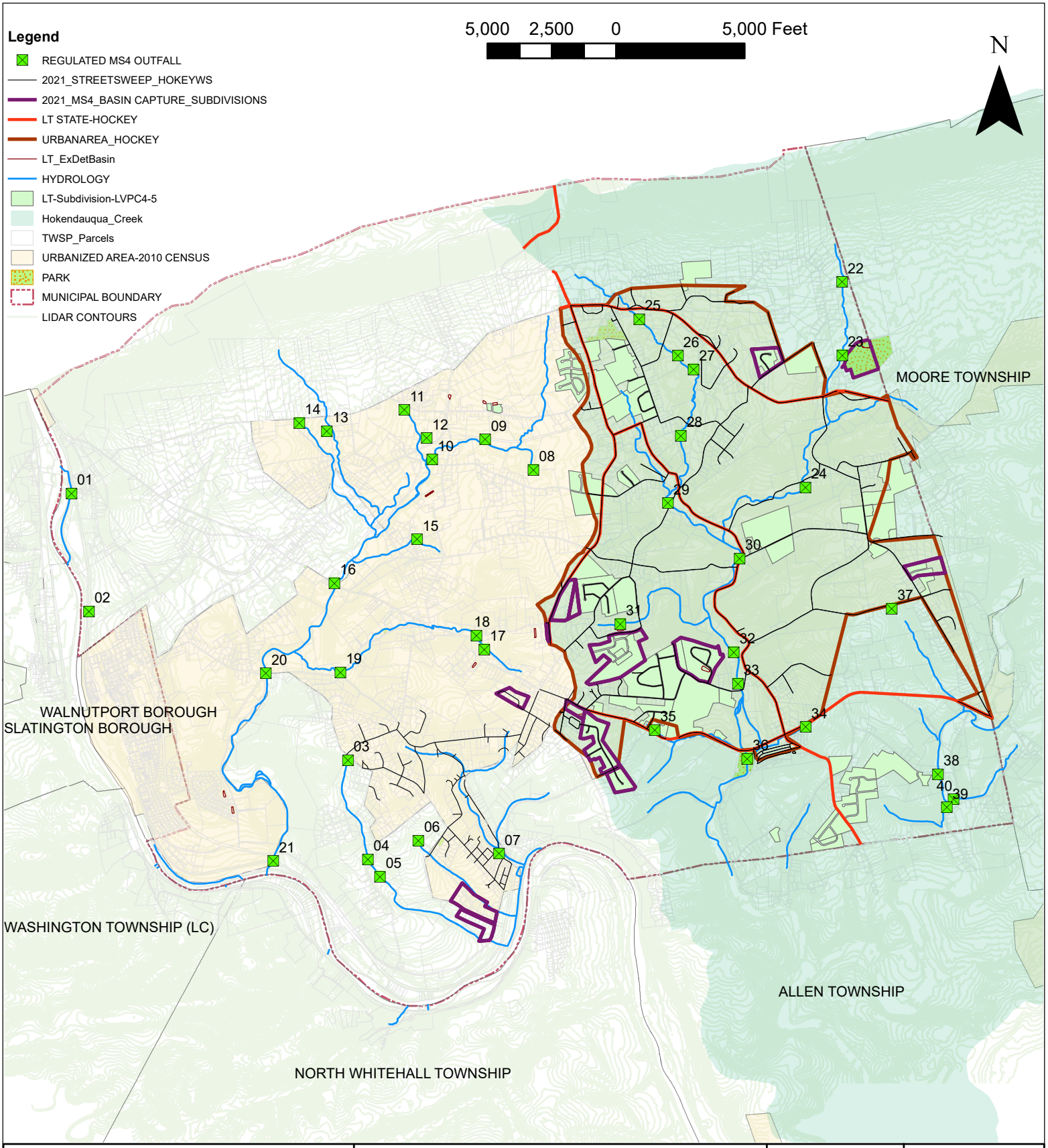
HanoverEngineering	PLAN TITLE: **MAP OF URBANIZED AREA (UA) LANDUSE**	DRAWN BY: **JDC**	CHECKED BY: **JER**
	PROJECT TITLE: **MS4 PROGRAM-2018**	SCALE: **1:60,000**	DATE: **03/29/2021**
Allentown Office 5920 Hamilton Blvd., Suite 108 P:610.395.9222 Allentown, PA 18106-8942 f:610.395.9262 HanoverEng.com	**LEHIGH TOWNSHIP NORTHHAMPTON COUNTY PENNSYLVANIA**	PROJECT NO. **LT17-26**	
		SHEET NO. **1** OF **3**	

X:\Projects\Municipal\Lehigh Township\2021 MS4 BASIN MAPrev.mxd



HanoverEngineering	PLAN TITLE: **WATERSHED BASINS FOR LEHIGH TOWNSHIP**	DRAWN BY: **JDC**	CHECKED BY: **JER**
	PROJECT TITLE: **MS4 PROGRAM-2018**	SCALE: **1:60,000**	DATE: **05/11/21**
Allentown Office 5920 Hamilton Blvd., Suite 108 P:610.395.9222 Allentown, PA 18106-8942 f:610.395.9262 HanoverEng.com	**LEHIGH TOWNSHIP NORTHHAMPTON COUNTY PENNSYLVANIA**	PROJECT NO. **LT17-26**	
		SHEET NO. **2** OF **3**	

X:\Projects\Municipal\Lehigh Township\20210611 MS4 BMP MAP.mxd

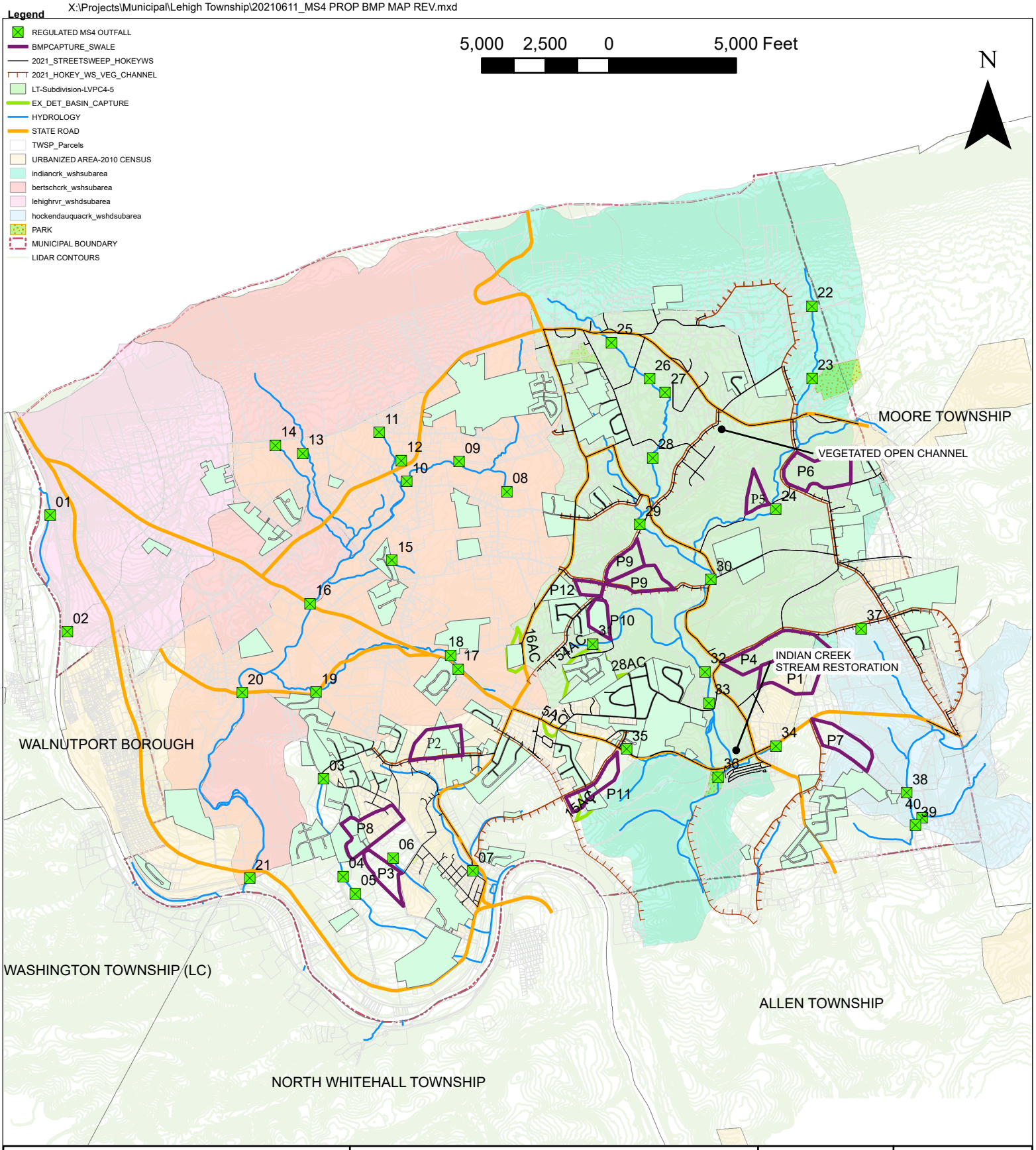


HanoverEngineering	PLAN TITLE: **MAP OF BMP AREAS**	DRAWN BY: **JDC**	CHECKED BY: **PCM**
	PROJECT TITLE: **MS4 PROGRAM-2018**	SCALE: **1:60,000**	DATE: **04/21/21**
Allentown Office 5920 Hamilton Blvd., Suite 108 P:610.395.9222 Allentown, PA 18106-8942 f:610.395.9262 HanoverEng.com	**LEHIGH TOWNSHIP NORTHHAMPTON COUNTY PENNSYLVANIA**	PROJECT NO. **LT17-26**	
		SHEET NO. **3** OF **3**	

Appendix B

BMP Locations and Watersheds

X:\Projects\Municipal\Lehigh Township\20210611_MS4 PROP BMP MAP REV.mxd



HanoverEngineering	PLAN TITLE: **MAP OF PROPOSED BMP AREAS**	DRAWN BY: **JDC**	CHECKED BY: **JER**
	PROJECT TITLE: **MS4 PROGRAM-2018**	SCALE: **1:60,000**	DATE: **03/29/2021**
Allentown Office 5920 Hamilton Blvd., Suite 108 P:610.395.9222 Allentown, PA 18106-8942 f:610.395.9262 HanoverEng.com	**LEHIGH TOWNSHIP NORTHHAMPTON COUNTY PENNSYLVANIA**	PROJECT NO. **LT17-26** SHEET NO. **1** OF **1**	

LEHIGH TOWNSHIP POLLUTANT REDUCTION PLAN

IMPAIRED WATERS	CONTROLLING REQUIREMENTS	TOTAL CONTRIBUTING MS4 AREA (AC)	UNDEVELOPED AREA (AC)	DEVELOPED AREA (AC)	PERCENT IMPERVIOUS (%)	PERCENT PERVIOUS (%)
HOKENDAUQUA CREEK	SILTATION	3,759	845	2914	10	90
LEHIGH RIVER	SILTATION	583	72	511	10	90
	TOTAL	4342		3425		

LOADING RATES FOR NORTHAMPTON COUNTY

CATEGORY	TSS (SEDIMENT) LBS/AC/YR
UNDEVELOPED	234.6
*DEVELOPED IMPERVIOUS	1839
DEVELOPED PERVIOUS	264.96

	PROPOSED BMP
	EXISTING BMP

EXISTING LOADING (LBS/YR) =	1,661,825			
EXISTING BMP	**BMP EFFECTIVENESS**	**IMPERVIOUS AREA TO BMP (AC)**	**PERVIOUS AREA TO BMP (AC)**	**SEDIMENT REDUCTION (LBS/YR)**
DRY ED BASIN	60%	53	222	93,742
VEGETATED OPEN CHANNEL	50%	0	NA	-
INFILTRATION PRACTICES	90%	5	29	15,885
REMOVED EXISTING LOAD (LBS/YEAR)=			**109,626**	

ADJUSTED EXISTING LOADING (LBS/YR) =	1,552,198.48

MINIMUM SEDIMENT REDUCTION REQUIRED (LBS/YR)=	155,220

SELECTED BMP	BMP EFFECTIVENESS	AREA TO BMP (AC)	SEDIMENT REDUCTION (LBS/YR)
STREET SWEEPING**	9%	101	16717
INFILTRATION RETROFIT	90%	0	0
SEDIMENT FILTER BAGS ON 88 INLETS	80%	35	21903
VEGETATED OPEN CHANNEL (A/B Soils) ***	70%	513	138256
	LBS/FT/YR	**STREAM LENGTH (FT)**	
STREAM RESTORATION (Non-Armorment)	44.88	159	7136
STREAM RESTORATION (Armorment)	37.33	317	11834
		TOTAL REDUCTION=	**184011**

**Assumes "Developed Impervious"

***Assumes 10% Developed Impervious / 90% Developed Pervious for Canidate Projects to be Selected to Meet Obligation of 155,220 lbs/yr

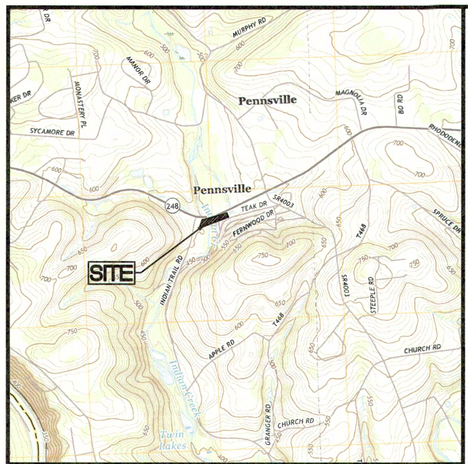
Street Sweeping Credits					
Hockendaqua TWP RDs	Width (FT)	Length (FT)	Lehigh River TWP RDs	Width (FT)	Length (FT)
	22	4317		20	5936
	17	2937		20	2083
	24	5085		20	2154
	22	6880		30	1184
	20	6215			
	30	1612			
	30	3052			
Target 20% of Total Length (FT)	28172.8	30098		11439	11357
Average Width Per Linear Foot (FT)	23			21	
Total Length of Street (FT)		140,864			57,195
Total Area (SF)	**3194329**	**SF**		**1203527**	**SF**
Total Area (Acres)	**73**	**AC**		**28**	**AC**

Indian Creek Stream Bank Restoration Modified Credit Calculation					
Partial and Full Credit Loading Rates					
Stream Bank Type	**Credit Type**	**Linear Feet**	**% Armored**	**Reduction Credit (lb/ft/yr)**	**(LBS/YR)**
Concrete Wall	Non - Creditable Armoring	140	-	-	-
Stone Wall	Non - Creditable Armoring	61	-	-	-
R-5 Riprap Boulder Fill	Non - Creditable Armoring	NA	-	-	-
R-5 Riprap Boulder 24"	Creditable w/Limits Armoring	317	46.82	37.33	11833
Proposed Planting	Non-Armorment	159	-	44.88	7136
Total Project Length (FT)		**677**			
Total Reduction (LBS/YR)					**18969**

Vegetated Open Channel Project Locations			
Project #	Project Location	Aprox. Swale Length (FT)	Aprox. Drainage Area (Acres)
1	Magnolia Drive (3706 Magnolia Dr - 3626 Magnolia Dr)	2303	61
2	Chestnut Drive (4410 Chestnut Dr - 4312 Chestnut Dr)	2116	48.4
3	Willow Road	1414	30.6
4	Murphy Road (3767 Murphy Rd - 3531 Murphy Rd)	3949	73
5	Beech Dr (3651 Beech Dr)	1014	17
6	S Cottonwood Rd & Teel Rd (3446 Teel Rd - 1038 S Cottonwood Rd)	4254	69.7
7	N Granger Road & Spruce Dr (502 N Granger Rd - 3530 Spruce Dr)	3150	44.7
8	Mulberry Dr & Laurel Dr (474 Mulberry Dr - 515 Long Lane Rd)	4330	55.5
9	S Dogwood Rd & Cedar Dr (918 S Dogwood Rd - 3864 Cedar Dr)	5026	62
10	Fir Dr (826 South Dogwood Rd - 755 Fir Dr)	1984	21.6
11	Locust Drive (420 Cherryville Dr - Locust Dr/Lehich Dr Intersection)	3412	29.5
Total		32952	513

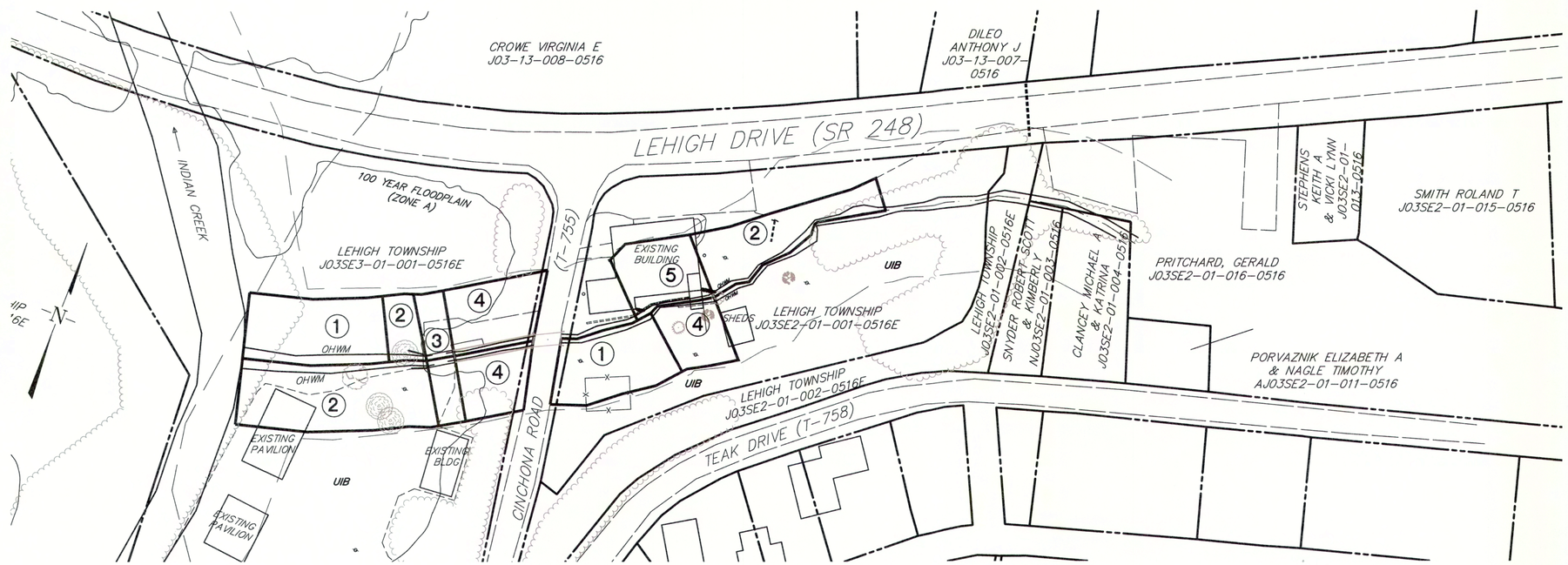
Appendix C

Project Designs
(to be developed during permit term)



LOCATION MAP

SCALE 1" = 2,000'



OVERALL SITE PLAN–EXISTING CONDITIONS AND PROPOSED WORK AREAS

PLAN CERTIFICATION

I, MICHAEL H. MUFFLEY, P.E. DO HEREBY CERTIFY TO THE PENALTIES OF 18 Pa. C.S.A. Sec. 4904 TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF, THAT THE INFORMATION CONTAINED IN THE ACCOMPANYING PLANS, SPECIFICATIONS, AND REPORTS HAS BEEN PREPARED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE, IS TRUE AND CORRECT, AND IS IN CONFORMANCE WITH CHAPTER 105 OF THE RULES AND REGULATIONS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

SIGNATURE _____ DATE 7/13/2020

PROPOSED STREAM STABILIZATION/IMPROVEMENTS

1. PLANTING ONLY PER PLANTING SCHEDULE.
2. STREAMBANK STABILIZATION PER DETAIL A.
3. REMOVE EXISTING PEDESTRIAN BRIDGE AND CONCRETE WALLS, AND REPLACE WITH NEW PEDESTRIAN BRIDGE WITH CONCRETE ABUTMENTS.
4. REMOVE ALL EXISTING CONCRETE RETAINING WALLS AND REPLACE PER DETAIL B STREAMBANK STABILIZATION.
5. REMOVE RETAINING WALL ALONG BUILDING. PLACE R5 RIPRAP STABILIZATION. REMOVE WOOD DECK AND CONCRETE ABUTMENT ON SOUTH SIDE. STABILIZE PER DETAIL C.

SITE DATA:

ADDRESS:	3821 LEHIGH DRIVE BETHLEHEM, PA
TOTAL TRACT AREA (GIS):	1.38 + 4.30 AC. (5.68 AC. TOTAL)
TAX PARCELS:	J3SE2 1 1 0516E J3SE3 1 1 0516E
DEED BOOK REFERENCED:	BK 580 PG 000802

APPLICANT:

LEHIGH TOWNSHIP
1069 MUNICIPAL ROAD
WALNUTPORT, PA 18088
PHONE: 610.767.6771

PROJECT OWNER

LEHIGH TOWNSHIP
1069 MUNICIPAL ROAD
WALNUTPORT, PA 18088
PHONE: 610.767.6771

SOIL CHART

SYMBOL	SOIL TYPE
UIB	URBAN LAND–DELAWARE COMPLEX, 0 TO 8 PERCENT SLOPES

RECEIVING WATERS

TRIBUTARY 03668 TO INDIAN CREEK (CWF, MF)

SHEET INDEX

OVERALL SITE PLAN

NO.	REVISIONS	DATE
1	PER PA DEP COMMENTS	07/13/20

DRAWN BY: JPR
CHECKED BY: MHM
SCALE: 1"=50'
DATE: 08.23.19
PROJECT NO. 4696
SHEET NO. 1 OF 5

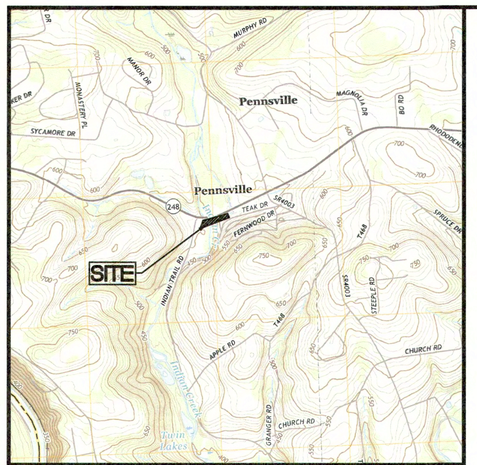
SEAL: COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER MICHAEL HENRY MUFFLEY

PLAN TITLE: STREAM RESTORATION PLAN
PROJECT TITLE: WILDLANDS CONSERVANCY INDIAN TRAIL PARK

1" = 50'

LEHIGH TOWNSHIP
NORTHAMPTON COUNTY
PENNSYLVANIA

HanoverEngineering
Pocono Office
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
P:570.688.9550
F:570.688.9768
HanoverEng.com

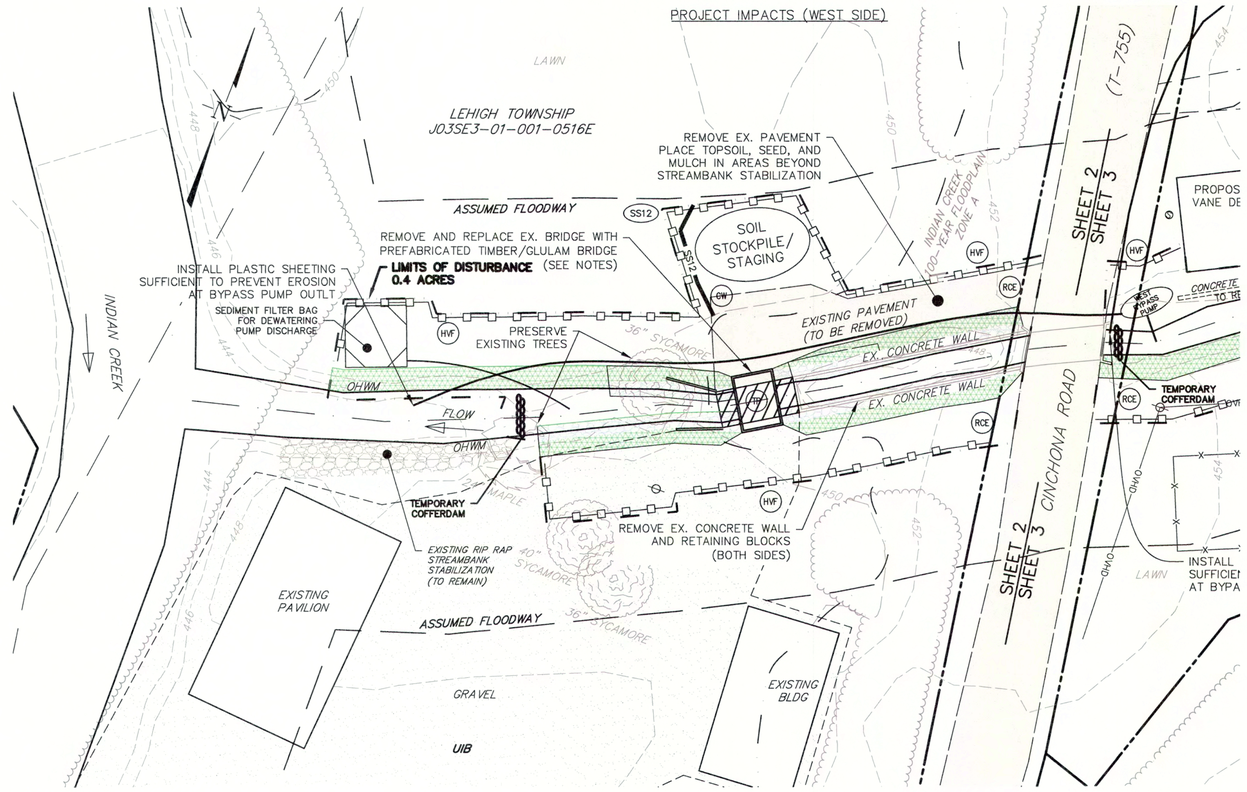


LOCATION MAP

SCALE 1" = 2,000'

LEGEND:

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- LIMIT OF DISTURBANCES
- EDGE OF PAVEMENT
- SOIL TYPE & BOUNDARY
- STREAM CENTERLINE
- ORDINARY HIGH WATER MARK (OHWM)
- FLOODWAY
- 100-YR FLOODPLAIN (1% CHANCE)
- PROPOSED STREAMBANK STABILIZATION R-5 RIPRAP 24" ABOVE BASE STREAM ELEVATION EROSION CONTROL BLANKET AND PLANTINGS ABOVE 24" TO TOP OF BANK. SEE DETAILS ON SHEET 4.
- PROPOSED PLANTING ALONG EXISTING STREAM BANK SEE NOTES ON SHEET 4.
- ROCK CONSTRUCTION ENTRANCE
- HIGH VISIBILITY FENCE
- COMPOST SILTER SOCK 12 IN.
- CONCRETE WASHOUT



PROPOSED BRIDGE NOTES:

PREFABRICATED TIMBER/GLULAM BRIDGE AND APPURTENANT COMPONENTS FOR PEDESTRIAN/LIGHT VEHICULAR TRAFFIC

SPAN = 14'

WIDTH = 10'

INCLUDING RAILING AND ADA ACCESSIBILITY

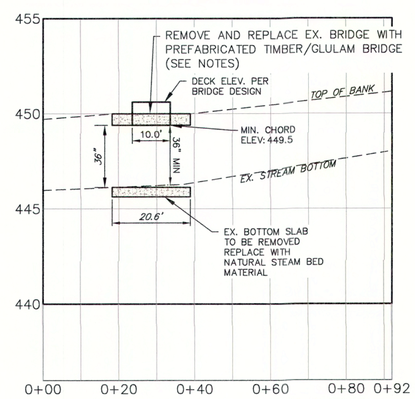
1. MINIMUM LIVE LOAD: 85 PSF, 1,000 LB CONCENTRATED LOAD
2. SOIL BEARING, ABUTMENTS, AND BRIDGE DESIGN BY OTHERS
3. STRUCTURAL DESIGN OF THE BRIDGE STRUCTURE SHALL BE PERFORMED BY OR UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER AND DONE IN ACCORDANCE WITH RECOGNIZED ENGINEERING PRACTICES AND PRINCIPLES. THE ENGINEER SHALL BE LICENSED TO PRACTICE IN STATE OF PENNSYLVANIA.
4. ALL EXISTING CONCRETE SUBSTRUCTURES SHALL BE REMOVED AND DISPOSED OFF SITE. RESTORE STREAM BED WITH NATIVE MATERIAL.
5. MINIMUM LOW CHORD ELEVATION SHALL BE 449.5', AS THE EXACT SHAPE OF THE FINAL BRIDGE DESIGN IS UNKNOWN. A RECTANGULAR OPENING (I.E. NO ARCH) WAS USED FOR THESE PERMIT DRAWINGS. THE MINIMUM CLEARANCE ABOVE THE STREAM SHALL BE THREE FEET (3') FROM ANY POINT OF THE BRIDGE STRUCTURE (I.E. LOW CHORD). THIS CONDITION RETAINS THE SAME LOW CHORD ELEVATION AS THE EXISTING BRIDGE AND INCREASES THE SPAN BY FIVE FEET (5'), PROVIDING IMPROVED HYDRAULIC CAPACITY. THE 25-YEAR PEAK FLOW WILL BE PASSED UNDER THE BRIDGE.

ESPC NOTES

1. SEE SHEET 4 FOR E&SPC PLAN NOTES AND DETAILS.
2. CONSTRUCTION ACCESS SHALL BE FROM CINCHONA ROAD AND S.R. 248 GRAVEL PARKING AREA. MINIMIZE EQUIPMENT TRAFFICKING TO WORK LOCATIONS TO THE GREATEST EXTENT PRACTICABLE. IF EROSIVE OR UNSTABLE CONDITIONS BECOME PRESENT, INSTALL A ROCK CONSTRUCTION ENTRANCE WITHIN THE AVAILABLE PROJECT LIMITS.
3. EQUIPMENT, MATERIALS, & STAGING AREAS SHALL BE UTILIZED AS SHOWN ON THE PLAN WITHIN THE LIMITS OF DISTURBANCE.
4. EARTH AND WATERWAY DISTURBANCE SHALL BE LIMITED TO THE AREA THAT CAN BE RESTORED AT THE END OF EACH WORK DAY. ALL DISTURBED AREAS SHALL BE STABILIZED AT THE END OF EACH WORK DAY.
5. TEMPORARY COFFERDAM SHALL BE INSTALLED UPSTREAM OF THE CINCHONA ROAD CULVERT FOR BYPASS AROUND THE WEST PORTION OF PROJECT. THE COFFERDAM SHALL ALSO SERVE AS A DOWNSTREAM BARRIER FOR WORK DURING THE EAST PORTION OF THE PROJECT, OR MAY BE REPLACED BY A ROCK FILTER.

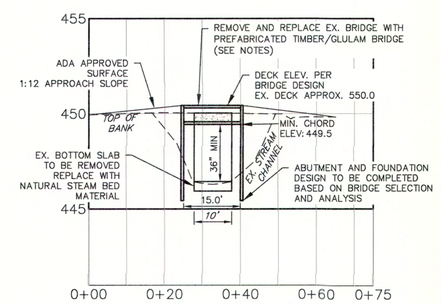
PROJECT IMPACTS (TOTAL)

STREAM (TEMPORARY)	1,708 SQ. FEET
STREAM (PERMANENT)	914 SQ. FEET
FLOODWAY (TEMPORARY)	10,027 SQ. FEET
FLOODWAY (PERMANENT)	4,879 SQ. FEET



STREAM PROFILE AT PROPOSED PEDESTRIAN BRIDGE REPLACEMENT

SCALE: H 1"=20' V 1"=4'

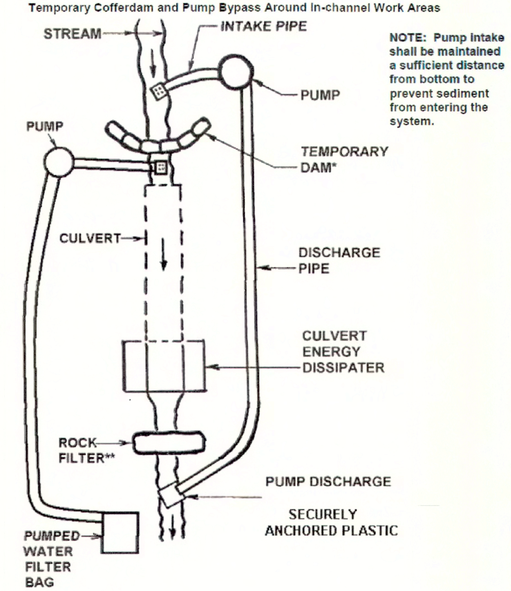


STREAM SECTION AT PROPOSED PEDESTRIAN BRIDGE REPLACEMENT (FACING UPSTREAM)

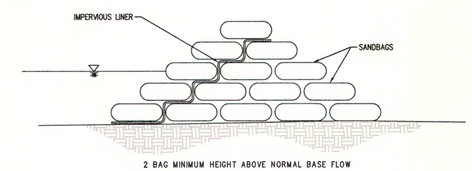
SCALE: H 1"=20' V 1"=4'

FIGURE 3.11

Temporary Cofferdam and Pump Bypass Around In-channel Work Areas



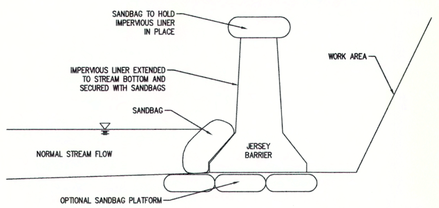
NOTE: Pump intake shall be maintained a sufficient distance from bottom to prevent sediment from entering the system.



2 BAG MINIMUM HEIGHT ABOVE NORMAL BASE FLOW

FIGURE 3.13

JERSEY BARRIER COFFERDAM-END VIEW



STANDARD CONSTRUCTION DETAIL # 3-15

SANDBAG DIVERSION DAM OR COFFERDAM

NOT TO SCALE

APPLICANT:

LEHIGH TOWNSHIP
1069 MUNICIPAL ROAD
WALNUTPORT, PA 18088
PHONE: 610.767.6771

PROJECT OWNER

LEHIGH TOWNSHIP
1069 MUNICIPAL ROAD
WALNUTPORT, PA 18088
PHONE: 610.767.6771

SOIL CHART

SYMBOL	SOIL TYPE
UIB	URBAN LAND-DELAWARE COMPLEX, 0 TO 8 PERCENT SLOPES

RECEIVING WATERS

TRIBUTARY TO INDIAN CREEK (CWF, MF)

NO.	REVISIONS	DATE	DRAWN BY: JPR	CHECKED BY: MHM
1	PER PA DEP COMMENTS	07/13/20	SCALE: 1"=20'	DATE: 3/16/2020

PROJECT NO. 4696

SHEET NO. 2 OF 5

SEAL: COMMONWEALTH OF PENNSYLVANIA MICHAEL HENRY MURTHEY ENGINEER REGISTERED PROFESSIONAL

PLAN TITLE: STREAM RESTORATION PLAN

PROJECT TITLE: WILDLANDS CONSERVANCY INDIAN TRAIL PARK

1" = 50'

LEHIGH TOWNSHIP
NORTHAMPTON COUNTY
PENNSYLVANIA

HanoverEngineering

Pocono Office
3355 Route 611, Suite 1
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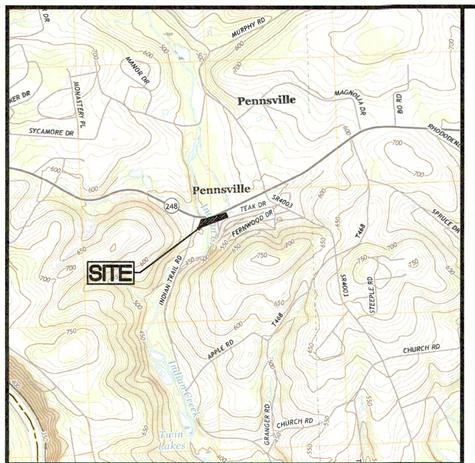

LOCATION MAP

SCALE 1" = 2,000'

LEGEND:

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- LIMIT OF DISTURBANCES
- EDGE OF PAVEMENT
- SOIL TYPE & BOUNDARY
- STREAM CENTERLINE
- ORDINARY HIGH WATER MARK (OHWM)
- FLOODWAY
- 100-YR FLOODPLAIN (1% CHANCE)
- R5 RIPRAP BOULDER FILL
- PROPOSED STREAMBANK STABILIZATION R-5 RIPRAP 24" ABOVE BASE STREAM ELEVATION EROSION CONTROL BLANKET AND PLANTINGS ABOVE 24" TO TOP OF BANK SEE DETAILS ON SHEET 4.
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- ROCK CONSTRUCTION ENTRANCE
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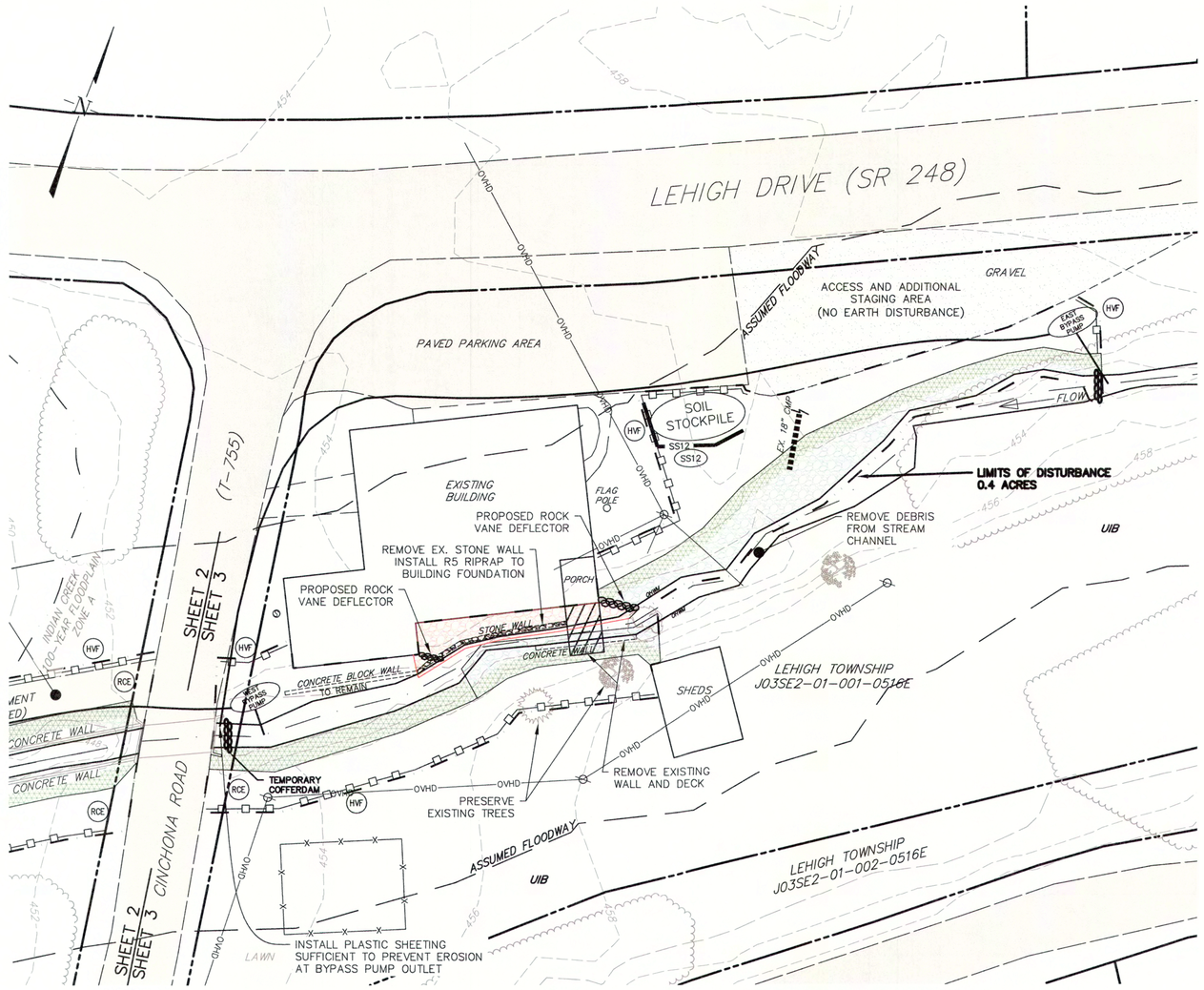

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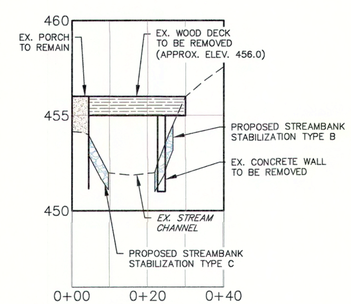

STREAM SECTION AT PROPOSED DECK REMOVAL (FACING UPSTREAM)

SCALE: H 1"=20' V 1"=4'

ESPC NOTES

1. SEE SHEETS 4 & 5 FOR E&SPC PLAN NOTES AND DETAILS.
2. CONSTRUCTION ACCESS SHALL BE FROM CINCHONA ROAD AND S.R. 248 GRAVEL PARKING AREA. MINIMIZE EQUIPMENT TRAFFICKING TO WORK LOCATIONS TO THE GREATEST EXTENT PRACTICABLE. IF EROSIVE OR UNSTABLE CONDITIONS BECOME PRESENT, INSTALL A ROCK CONSTRUCTION ENTRANCE WITHIN THE AVAILABLE PROJECT LIMITS.
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5. TEMPORARY COFFERDAM SHALL BE INSTALLED UPSTREAM OF THE CINCHONA ROAD CULVERT FOR BYPASS AROUND THE WEST PORTION OF PROJECT. THE COFFERDAM SHALL ALSO SERVE AS A DOWNSTREAM BARRIER FOR WORK DURING THE EAST PORTION OF THE PROJECT, OR MAY BE REPLACED BY A ROCK FILTER.

APPLICANT:

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1069 MUNICIPAL ROAD
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PHONE: 610.767.6771

PROJECT OWNER

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SOIL CHART

SYMBOL	SOIL TYPE
UIB	URBAN LAND-DELAWARE COMPLEX, 0 TO 8 PERCENT SLOPES

RECEIVING WATERS

TRIBUTARY TO INDIAN CREEK (CWF, MF)

NO.	REVISIONS	DATE
1	PER PA DEP COMMENTS	07/13/20

DRAWN BY: JPR | CHECKED BY: MHM
SCALE: 1"=20' | DATE: 04/01/2020
PROJECT NO. 4696
SHEET NO. 3 OF 5

SEAL: COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER MICHAEL HENRY MURFLEY

PLAN TITLE: STREAM RESTORATION PLAN
PROJECT TITLE: WILDLANDS CONSERVANCY INDIAN TRAIL PARK

1" = 50'

LEHIGH TOWNSHIP
NORTHAMPTON COUNTY
PENNSYLVANIA

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F:570.688.9768
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CONSTRUCTION NOTES

GENERAL NOTES

1. THIS PLAN IS BASED ON A FIELD EVALUATION PERFORMED BY HANOVER ENGINEERING ASSOCIATES DURING JULY 2019 AND SHOWS THE EXISTING CONDITIONS AS WERE OBSERVABLE ON THE DATE OF THE EVALUATION. FIELD MEASUREMENTS WERE OBTAINED FOR DOCUMENTING EXISTING CONDITIONS AND STRUCTURES PERTINENT TO THE PROPOSED PROJECT ACTIVITIES.
2. PROPERTY BOUNDARIES AND EXISTING FEATURES (E.G., BUILDINGS, ROADS, ETC.) INFORMATION FROM NORTHAMPTON COUNTY GIS.
3. CONTOURS BASED ON LIDAR DATA.
4. THIS PLAN IS NOT TO BE USED AS A BOUNDARY SURVEY OF THE SUBJECT AND SURROUNDING PARCELS.
5. FLOODZONE BOUNDARIES FROM FIRM MAP PANEL 42095C0095E, EFFECTIVE 7/16/2014.
6. THERE ARE NO WETLANDS WITHIN THE PROPOSED PROJECT AREA, BASED ON A FIELD EVALUATION CONDUCTED BY A QUALIFIED WETLAND BIOLOGIST WITH HANOVER ENGINEERING.
7. WATERS BOUNDARIES WERE LOCATED USING A SUB-METER HANDHELD GLOBAL POSITIONING SYSTEMS UNIT AND WERE POST-PROCESSED AND ADDED TO THE PLANS.
8. VEGETATION SHALL BE PRESERVED TO THE GREATEST EXTENT POSSIBLE. CLEARED VEGETATION SHALL BE REMOVED AND DISPOSED OFF SITE AT AN APPROVED UPLAND LOCATION UNLESS OTHERWISE DIRECTED.
9. ALL IN-STREAM WORK SHOULD OCCUR DURING LOW FLOW CONDITIONS, WITH COFFERDAMS, BYPASS PUMPING, AND PUMPING OF SEDIMENT LADEN WATER TO FILTER BAGS IN PLACE, OPERATIONAL, AND PROPERLY MAINTAINED.

EROSION AND SEDIMENT POLLUTION CONTROL GENERAL NOTES

1. IN ORDER TO MINIMIZE THE POTENTIAL FOR SOIL EROSION AND RESULTING SEDIMENT POLLUTION FROM LEAVING THE SITE, THIS CONSTRUCTION SEQUENCE HAS BEEN ESTABLISHED. THE CONTRACTOR SHALL MINIMIZE THE AREA OF DISTURBED SOIL AT ANY ONE TIME BY FOLLOWING THE CONSTRUCTION SEQUENCE AND PREVENT SEDIMENT POLLUTION BY INSTALLING, OPERATING, AND MAINTAINING MEASURES SHOWN ON THE PLAN.
2. A COPY OF THIS EROSION AND SEDIMENT POLLUTION CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.
3. EACH STAGE OF THE CONSTRUCTION SEQUENCE MUST BE COMPLETED PRIOR TO THE INITIATION OF THE NEXT STAGE IN THE SEQUENCE.
4. UPON COMPLETION OR TEMPORARY CESSATION OF EARTH DISTURBANCE ACTIVITIES, OR ANY STAGE THEREOF, THE PROJECT SITE SHALL BE IMMEDIATELY STABILIZED.
5. WHENEVER POSSIBLE, STABILIZATION SHALL BE IMPLEMENTED THE SAME DAY AS THE EARTH DISTURBANCE.
6. ALL BMPS, INCLUDING COMPOST FILTER SOCK, MUST REMAIN INSTALLED AND FUNCTIONAL UNTIL UPSLOPE DISTURBED AREAS ARE STABILIZED WITH A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER STABLE COVER CAPABLE OF WITHSTANDING ACCELERATED EROSION.
7. ALL BMPS SHOULD BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH MEASURABLE STORM EVENT (OR RUNOFF PRODUCING STORM EVENT). REPAIRS TO BMPS SHALL BE IMMEDIATE.
8. THE RECEIVING WATERCOURSE FOR THE PROJECT SITE IS AN UNNAMED TRIBUTARY TO INDIAN CREEK AND IS CLASSIFIED AS COLD WATER FISHES (CWF) AND MIGRATORY FISHES (MF) IN CHAPTER 93 OF TITLE 25 OF THE PENNSYLVANIA CODE. THE INDIAN CREEK AND ITS TRIBUTARIES ARE CLASSIFIED BY THE PENNSYLVANIA FISH AND BOAT COMMISSION AS SUPPORTING WILD TROUT REPRODUCTION, THEREBY IMPOSING A TIMING RESTRICTION FOR IN-STREAM WORK DURING THE PERIOD OF OCTOBER 1 THROUGH DECEMBER 31. THIS CLASSIFICATION ALSO DESIGNATES THAT ALL WETLANDS WITHING THE WATERSHED OF THE INDIAN CREEK AND ITS TRIBUTARIES ARE CLASSIFIED AS EXCEPTIONAL VALUE (EV), REQUIRING THE HIGHEST LEVEL OF PROTECTION FROM PROJECT IMPACTS.
9. ALL WORK IS TO BE DONE IN ACCORDANCE WITH THE EROSION CONTROL REGULATIONS, CHAPTER 102 OF TITLE 25 OF THE PENNSYLVANIA CODE.
10. IN-STREAM WORK SHALL OCCUR DURING LOW FLOW CONDITIONS IN THE UNNAMED TRIBUTARY TO INDIAN CREEK.
11. SCHEDULE A PRE-CONSTRUCTION CONFERENCE AND PROVIDE AT LEAST THREE (3) WORKING DAYS (72 HOURS) NOTICE TO THE FOLLOWING AGENCIES PRIOR TO COMMENCEMENT OF SITE GRADING WORK:
    NORTHAMPTON COUNTY CONSERVATION DISTRICT: (610) 829-6276
    PROJECT ENGINEER (HANOVER ENGINEERING): (610) 691-5644
    PA ONE CALL: (800) 242-1776 (SEE PLAN NOTE)
12. THE OPERATOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1 ET SEQ., AND 287.1 ET SEQ. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES.
    -CONSTRUCTION WASTES GENERATED ON-SITE INCLUDE:
    SEDIMENT COLLECTED IN BMP'S AND EXCESS EXCAVATED EARTH MATERIAL FOR SITE WORK – DISPOSE OF IN THE BORROW AREA ON-SITE OR AT AN APPROVED OFF-SITE LOCATION.
    -PACKAGING MATERIALS FROM MATERIALS DELIVERED TO THE SITE, SUCH AS ESPC & BRIDGE MATERIALS – DISPOSE OF IN AN ACCEPTABLE RESIDUAL WASTE CONTAINER. DO NOT BURY OR LET USED PACKAGING MATERIALS LAY ON SITE AT ANY TIME.
13. CONTRACTOR MUST OBTAIN DEP APPROVAL FOR ALL BORROW OR HAUL SITES PRIOR TO IMPORTING OR EXPORTING ANY FILL MATERIAL FOR THIS PROJECT. BEFORE DISPOSING OF SOIL OR RECEIVING BORROW FOR THE SITE, THE OPERATOR MUST ASSURE THAT EACH SPOIL OR BORROW AREA HAS AN EROSION AND SEDIMENT CONTROL PLAN APPROVED BY PADEP, AND WHICH IS BEING IMPLEMENTED AND MAINTAINED ACCORDING TO CHAPTER 102 REGULATIONS.
14. PRIOR TO REMOVAL OF TOPSOIL, REFER TO PLANS FOR TOPSOIL STOCKPILE LOCATION. TEMPORARY AND PERMANENT SEEDING SHALL BE IN ACCORDANCE WITH REQUIREMENTS LISTED AND AS NOTED IN THE PROJECT NARRATIVE.
15. PRIOR TO ANY SEEDING AND LIME AND FERTILIZE APPLICATION, A SOIL TEST SHALL BE PERFORMED TO DETERMINE THE PH FACTOR. ADDITIONAL LIME AND FERTILIZER MAY BE REQUIRED.
16. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE BMPS TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
17. IF THERE IS THE POTENTIAL FOR CAUSING ACCIDENTAL POLLUTION OF AIR, LAND, OR WATER THROUGH THE ACCIDENTAL RELEASE OF POLLUTING MATERIALS, THE CONTRACTOR MUST DEVELOP A PREPAREDNESS, PREVENTION AND CONTINGENCY (PPC) PLAN IS IN ACCORDANCE WITH 25 PA CODE 101.3 FOR OPERATIONS THAT DISCHARGE STORM WATER FROM CONSTRUCTION ACTIVITIES.
18. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR DISTURB ANY AREAS OUTSIDE OF THE PROJECT DISTURBANCE AREA BOUNDARY.
19. FAILURE TO CORRECTLY INSTALL SEDIMENT CONTROL FACILITIES OR FAILURE TO PREVENT SEDIMENT LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE OR FAILURE TO TAKE CORRECTIVE ACTIONS TO IMMEDIATELY RESOLVE FAILURES OF SEDIMENT CONTROL FACILITIES MAY RESULT IN ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES BEING INSTITUTED BY THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION AS DEFINED IN SECTION 602 OF THE CLEAN STREAMS LAW OF PENNSYLVANIA. THE CLEAN STREAMS LAW PROVIDES FOR UP TO $10,000 PER DAY IN CIVIL PENALTIES, UP TO $10,000 IN SUMMARY CRIMINAL PENALTIES, AND UP TO $25,000 IN MISDEMEANOR CRIMINAL PENALTIES FOR EACH VIOLATION.
20. NOTIFY THE NORTHAMPTON COUNTY CONSERVATION DISTRICT (NCCD) OF PROJECT START.
21. 21. ALL WORK IN THE FOLLOWING SEQUENCE SHALL BE COMPLETED BY THE SITE CONTRACTOR, UNLESS SPECIFICALLY NOTED OTHERWISE

CONSTRUCTION SEQUENCE

1) NOTIFY HANOVER ENGINEERING TO FLAG/REFLAG THE EXACT LOCATION OF THE ORDINARY HIGH WATER MARK BOUNDARY OF WATERCOURSE LOCATED WITHIN THE PROJECT AREA, AS SHOWN ON THE PLANS.

STAGE 1 – UPSTREAM SECTION (ABOVE CINCHOLA ROAD)

2) INSTALL TRAFFIC CONTROL MEASURES AS NECESSARY FOR EQUIPMENT ACCESS. CINCHONA ROAD MAY BE CLOSED DURING WORK HOURS, WITH PRIOR NOTIFICATION AND SCHEDULING WITH THE TOWNSHIP. PARKING AREA MUST BE KEPT OPEN IMMEDIATELY IN FRONT OF THE HISTORICAL SOCIETY BUILDING.
3) INSTALL PERIMETER CONTROLS FOR STAGING AREAS AND MATERIAL STOCKPILE AREAS, IN ACCORDANCE WITH THE TEMPORARY SOIL STOCKPILE STANDARD DETAIL ON THE PLANS, INCLUDING INSTALLATION OF COMPOST FILTER SOCK ALONG THE DOWNSLOPE SIDE OF THE STOCKPILE AREA.
4) INSTALL ROCK CONSTRUCTION ENTRANCE OFF CINCHONA ROAD.
5) CLEAR VEGETATION FOR PROPOSED ACCESS TO THE STREAM, ONLY TO THE EXTENT ABSOLUTELY NECESSARY FOR EQUIPMENT ACCESS.
6) PLACE MATERIALS IN STOCKPILE LOCATIONS NOTED ON THE PLANS AND IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION SO THAT EQUIPMENT TRAFFICKING WITHIN THE STREAM CHANNEL AND RIPARIAN AREA WILL BE MINIMIZED.
7) EXISTING AND PROPOSED ACCESSWAYS SHALL BE MAINTAINED IN STABLE CONDITION THROUGHOUT CONSTRUCTION ACTIVITIES. GEOTEXTILE MATERIAL AND/OR CLEAN STONE SHALL BE ADDED, AS NECESSARY, TO MAINTAIN STABLE ACCESS CONDITIONS.
8) INSTALL SANDBAG COFFERDAMS, PUMPS, BYPASS PIPELINE (WITH PLASTIC SHEETING AT DISCHARGE), AND PIPELINE WITH FILTERBAG. BEGIN BYPASS PUMPING AND DEWATERING OF WORK AREA, NOTING THAT ALL INSTREAM WORK SHALL BE CONDUCTED DURING LOW FLOW CONDITIONS.
9) INSTALL STREAMBANK STABILIZATION MEASURES, WORKING FROM THE UPSTREAM END OF THE PROJECT AREA DOWNSTREAM TO THE WOODEN BRIDGE AT THE HISTORICAL SOCIETY BUILDING.
10) REMOVE WOOD BRIDGE DECKING, SUPPORTS, AND ABUTMENTS. THE ABUTMENT ON THE NORTHERN SIDE OF THE STREAM CHANNEL SHOULD BE REMOVED TO THE EXTENT POSSIBLE WITHOUT DAMAGING THE BUILDING FOUNDATION. IMMEDATELY GRADE THE STREAMBANK TO PROPER SLOPES IN PREPARATION FOR INSTALLATION OF RIP-RAP AND UPPER BANK STABILIZATION. DISPOSE OF REMOVED MATERIAL, PROPERLY, IN ACCORDANCE WITH THE PLAN NOTES.
11) REMOVE ENTIRE FAILING MORTERED STONE RETAINING WALL ALONG THE STREAM CHANNEL AND REAR OF THE HISTORICAL SOCIETY BUILDING. DISPOSE OF REMOVED MATERIAL, PROPERLY, IN ACCORDANCE WITH THE PLAN NOTES.
12) INSTALL ROCK VANE STREAMFLOW DEFLECTORS, AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH PLAN NOTES AND DETAILS. WORK FROM TOP OF BANK TO THE GREATEST EXTENT POSSIBLE, WITH MINIMUM DISTURBANCE AND EQUIPMENT TRAFFICKING WITHIN THE STREAMBED. FOLLOW GENERAL SEQUENCE:
    A) MOVE BOULDERS TO BE USED IN ROCK VANE STREAMFLOW DEFLECTOR TO THE EDGE OF THE STREAMBANK.
    B) BEGINNING AGAINST THE STREAMBANK AT THE ORDINARY HIGH WATER MARK (OHWM), AS FLAGGED BY HANOVER ENGINEERING, EXCAVATE A KEY TRENCH INTO THE STREAMBANK AND STREAMBED FOR THE PLACEMENT OF THE FIRST FEW BOULDERS. THE KEY TRENCH SHOULD BE JUST WIDE ENOUGH TO ACCOMMODATE THE BOULDERS AND APPROXIMATELY ONE (1) FOOT DEEP AT THE STREAMBANK (TO GET DEEPER TOWARD THE CENTER OF THE STREAM CHANNEL IN ORDER TO OBTAIN THE PROPER SLOPE OF THE TOP OF THE STRUCTURE). THE EXCAVATED STREAMBED MATERIALS SHOULD BE USED IN RE-GRADING AND FILLING OF THE UPSTREAM GROIN OF THE STRUCTURE WITH THE STREAMBANK, AND ALSO USED AROUND THE PLACED BOULDERS, INCLUDING GAPS BETWEEN BOULDERS ON THE UPSTREAM SIDE OF THE STRUCTURE. THE UPSTREAM ANGLE OF THE STRUCTURE SHALL BE APPROXIMATLEY THIRTY (30) DEGREES TO THE STREAMBANK, AND THE STRUCTURE SHALL SLOPE DOWNWARD FROM THE BANKFULL ELEVATION OF THE STREAM CHANNEL ALONG THE STREAMBANKS INTO THE CHANNEL TO APPROXIMATELY SIX (6) INCHES ABOVE THE CHANNEL BOTTOM ELEVATION AT THE UPSTREAM END OF THE STRUCTURE (SEE ROCK VANE DETAIL). THE ROCK VANE STRUCTURE SHOULD EXTEND INTO THE CHANNEL TO APPROXIMATELY ONE-QUARTER OF THE TOTAL WIDTH OF THE CHANNEL, AS MEASURED FROM BANKFULL TO BANKFULL MARKS ACROSS THE CHANNEL.
    C) BEGINNING AGAINST THE STREAMBANK, PLACE THE FIRST FEW BOULDERS INTO THE KEY TRENCH, TIGHTLY ABUTTING THEM TO MINIMIZE GAPS. PREVIOUSLY EXCAVATED STREAMBED MATERIAL SHOULD BE USED TO FILL VOIDS AROUND PLACED BOULDERS. INTEGRATE THE ROCK VANE DEFLECTORS WITH THE PROPOSED UPSTREAM AND DOWNSTREAM STREAMBANK STABILIZATION MEASURES.
    D) CONTINUE EXCAVATING THE FOOTER TRENCH AND PLACING BOULDERS, WORKING PROGRESSIVELY TOWARD THE CENTER OF THE STREAM CHANNEL. TEMPORARILY STOCKPILE EXCAVATED MATERIAL FROM FOOTER TO FILL THE GROIN OF THE STRUCTURE (INTERSECTION WITH STREAMBANK), AS WELL AS ANY VOIDS ALONG THE UPSTREAM FACE OF THE BOULDERS.
13) INSTALL REMAINING STREAMBANK STABILIZATION MEASURES TO THE REAR OF THE BUILDING, WORKING DOWNSTREAM TO CINCHONA ROAD. DISTURBE ONLY THE AMOUNT OF STREAMBED AND STREAMBANK WHICH CAN BE STABILIZED DURING THE SAME WORKING DAY, WORKING FROM TOP OF BANK TO THE GREATEST EXTENT POSSIBLE, AS FOLLOWS:
    A) REMOVE EXISTING VEGETATION AND STOCKPILE ANY REMOVED TOPSOIL MATERIAL.
    B) EXCAVATE THE VERTICAL AND STEEPLY SLOPED STREAMBANKS, AS SHOWN ON THE PLANS, TO THE PROPER GRADES, IN ACCORDANCE WITH THE APPLICABLE PLAN DETAILS AND NOTES.
    C) INSTALL GEOTEXTILE MATERIAL IN PREPARATION FOR INSTALLING RIPRAP.
    D) INSTALL RIPRAP MATERIAL UP TO THE PROPER ELEVATIONS ALONG THE STREAMBANKS, AND WITH CARE TAKEN TO NOT DAMAGE THE ADJACENT FOUNDATION OF THE HISTORICAL SOCIETY BUILDING.
    D) FINAL GRADE THE UPPER BANKS TO PROPER SLOPES.
    E) PLACE AND GRADE TOPSOIL ON UPPER BANKS, LIGHTLY COMPACT
    F) APPLY SEED AND MULCH, AND IMMEDIATELY INSTALL EROSION CONTROL BLANKET, IN ACCORDANCE WITH PLAN NOTES AND DETAILS FOR PROPER INSTALLATION AND ANCHORING.
    G) NOTIFY HANOVER ENGINEERING AND WILDLANDS CONSERVANCY TO INSTALL PROPOSED PLANTINGS ALONG THE STREAM CHANNEL.
14) PREPARE WATER MANAGEMENT CONTROLS FOR STAGE 2 TO ALLOW A QUICK TRANSITION OF BYPASS PUMPING, BY MOVING SANDBAG COFFERDAM MATERIALS INTO PLACE AT THE DOWNSTREAM END OF THE PROJECT AREA (FOR STAGE 2).
15) DURING LOW FLOW CONDITIONS, RELOCATE THE BYPASS PUMP AND PUMP TO FILTER BAG FOR DEWATERING FOR STAGE 2 CONSTRUCTION. REMOVE THE UPSTREAM SANDBAG COFFERDAM FOR STAGE 1 AND RESTORE FLOW INTO THE STREAM CHANNEL. BEGIN BYPASS PUMPING FOR STAGE 2.

STAGE 2 – DOWNSTREAM SECTION (BELOW CINCHOLA ROAD)

1) INSTALL TRAFFIC CONTROL MEASURES AS NECESSARY FOR EQUIPMENT ACCESS. CINCHONA ROAD MAY BE CLOSED DURING WORK HOURS, WITH PRIOR NOTIFICATION AND SCHEDULING WITH THE TOWNSHIP. PARKING AREA MUST BE KEPT OPEN IMMEDIATELY IN FRONT OF THE HISTORICAL SOCIETY BUILDING.
2) INSTALL PERIMETER CONTROLS FOR STAGING AREAS AND MATERIAL STOCKPILE AREAS, IN ACCORDANCE WITH THE TEMPORARY SOIL STOCKPILE STANDARD DETAIL ON THE PLANS, INCLUDING INSTALLATION OF COMPOST FILTER SOCK ALONG THE DOWNSLOPE SIDE OF THE STOCKPILE AREA.
3) REMOVE ASPHALT PAVEMENT, AT LOCATION DESIGNATED ON THE PLANS. DISPOSE OF REMOVED MATERIAL PROPERLY, IN ACCORDANCE WITH PLAN NOTES. BEGIN PUMPING TO FILTER BAG, AS NEEDED.
4) INSTALL ROCK CONSTRUCTION ENTRANCES OFF CINCHONA ROAD.
5) CLEAR VEGETATION FOR PROPOSED ACCESS TO THE STREAM, ONLY TO THE EXTENT ABSOLUTELY NECESSARY FOR EQUIPMENT ACCESS AND CONSTRUCTION ACTIVITIES.
6) PLACE CONSTRUCTION MATERIALS IN STOCKPILE LOCATIONS NOTED ON THE PLANS AND IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION SO THAT EQUIPMENT TRAFFICKING WITHIN THE STREAM CHANNEL AND RIPARIAN AREA WILL BE MINIMIZED.
7) EXISTING AND PROPOSED ACCESSWAYS SHALL BE MAINTAINED IN STABLE CONDITION THROUGHOUT CONSTRUCTION ACTIVITIES. GEOTEXTILE MATERIAL AND/OR CLEAN STONE SHALL BE ADDED, AS NECESSARY, TO MAINTAIN STABLE ACCESS CONDITIONS.
8) BEGINNING AT THE UPSTREAM END OF STAGE 2, AT CINCHOLA ROAD, REMOVE THE CONCRETE RETAINING WALLS ALONG THE STREAM CHANNEL DOWNSTREAM TO THE EXISTING BRIDGE WITHIN THE PARK, BEING CAREFUL TO NOT DAMAGE THE CINCHOLA ROAD BERM, BRIDGE, AND WINGWALLS. DISPOSE OF REMOVED MATERIAL, PROPERLY, IN ACCORDANCE WITH THE PLAN NOTES.
9) INSTALL STREAMBANK STABILIZATION MEASURES, WORKING FROM TOP OF BANK TO THE GREATEST EXTENT POSSIBLE, AS FOLLOWS:
    A) REMOVE EXISTING VEGETATION AND STOCKPILE ANY REMOVED TOPSOIL MATERIAL.
    B) EXCAVATE THE VERTICAL AND STEEPLY SLOPED STREAMBANKS IN PREPARATION FOR INSTALLATION OF RIPRAP AND STABILIZATION OF UPPER BANKS, AS SHOWN ON THE PLANS, TO THE PROPER GRADES, IN ACCORDANCE WITH THE APPLICABLE PLAN DETAILS AND NOTES. DISPOSE OF REMOVED MATERIAL, PROPERLY, IN ACCORDANCE WITH THE PLAN NOTES.
    C) INSTALL GEOTEXTILE MATERIAL IN PREPARATION FOR INSTALLING RIPRAP.
    D) INSTALL RIPRAP MATERIAL UP TO THE PROPER ELEVATIONS ALONG THE STREAMBANKS.
    D) FINAL GRADE THE UPPER BANKS TO PROPER SLOPES.
    E) PLACE AND GRADE TOPSOIL ON UPPER BANKS, LIGHTLY COMPACT.
    F) APPLY SEED AND MULCH, AND IMMEDIATELY INSTALL EROSION CONTROL BLANKET, IN ACCORDANCE WITH PLAN NOTES AND DETAILS FOR PROPER INSTALLATION AND ANCHORING.
25) REMOVE THE EXISTING PARK BRIDGE AND CONCRETE ABUTMENTS, FOUNDATIONS, AND WINGWALLS, TAKING CARE NOT TO DAMAGE THE LARGE SYCAMORE TREE LOCATED IMMEDIATELY DOWNSTREAM. DISPOSE OF REMOVED MATERIAL, PROPERLY, IN ACCORDANCE WITH THE PLAN NOTES.
26) INSTALL ALL REMAINING STREAMBANK STABILIZATION MEASURES, WORKING FROM TOP OF BANK TO THE GREATEST EXTENT POSSIBLE, AS FOLLOWS:
    A) REMOVE EXISTING VEGETATION AND STOCKPILE ANY REMOVED TOPSOIL MATERIAL.
    B) EXCAVATE THE VERTICAL AND STEEPLY SLOPED STREAMBANKS IN PREPARATION FOR INSTALLATION OF RIPRAP AND STABILIZATION OF UPPER BANKS, AS SHOWN ON THE PLANS, TO THE PROPER GRADES, IN ACCORDANCE WITH THE APPLICABLE PLAN DETAILS AND NOTES. DISPOSE OF REMOVED MATERIAL, PROPERLY, IN ACCORDANCE WITH THE PLAN NOTES.
    C) INSTALL GEOTEXTILE MATERIAL IN PREPARATION FOR INSTALLING RIPRAP.
    D) INSTALL RIPRAP MATERIAL UP TO THE PROPER ELEVATIONS ALONG THE STREAMBANKS. RIPRAP SHOULD BE CAREFULLY PLACED AROUND THE ROOT SYSTEM OF THE EXISTING LARGE SYCAMORE TREES LOCATED DOWNSTREAM OF THE BRIDGE.
    D) FINAL GRADE THE UPPER BANKS TO PROPER SLOPES.
    E) PLACE AND GRADE TOPSOIL ON UPPER BANKS, LIGHTLY COMPACT.
    F) APPLY SEED AND MULCH, AND IMMEDIATELY INSTALL EROSION CONTROL BLANKET, IN ACCORDANCE WITH PLAN NOTES AND DETAILS FOR PROPER INSTALLATION AND ANCHORING.
    G) NOTIFY HANOVER ENGINEERING AND WILDLANDS CONSERVANCY TO INSTALL PROPOSED PLANTINGS ALONG THE STREAM CHANNEL.
27) INSTALL NEW CONCRETE BRIDGE ABUTMENTS. INSTALL CONCRETE WASHOUT AREA IF POURED-IN-PLACE CONCRETE WILL BE NEEDED.
28) ADJUST RIPRAP AROUND THE NEW ABUTMENTS, AS NEEDED, AND FINAL GRADE SOILS, APPLYING SEED, STRAW MULCH, AND EROSION CONTROL BLANKENT, IN ACCORDANCE WITH THE PLAN NOTES AND DETAILS.
29) SET AND SECURE NEW PEDESTRIAN BRIDGE ON NEW ABUTMENTS.
30) REMOVE SANDBAG COFFERDAMS, PUMPS, PUMP PIPELINES, AND SEDIMENT FILTER BAG. SEDIMENT CONTAINED IN SEDIMENT FILTER BAG SHALL BE REUSED FOR THE PROJECT OR DISPOSED AT A LOCATION WITH AN APPROVED EROSION AND SEDIMENT POLLUTION CONTROL PLAN.
31) REMOVE ANY REMAINING STOCKPILES. ONCE THE STOCKPILE AREAS AND ANY OTHER DISTURBED AREAS ARE STABILIZED, REMOVE THE COMPOST FILTER SOCK. COMPLETE REMAINING PERMANENT STABILIZATION MEASURES (I.E. SEEDING, MULCHING, AND EROSION CONTROL BLANKET) FOR ENTIRE SITE AND DAMAGED AREAS AS NEEDED.
32) ONCE 70% OF THE AREA UPSLOPE OF EACH EROSION CONTROL MEASURE CONTAINS PERMANENT PERENNIAL VEGETATION OR IMPERVIOUS COVER, THE RESPECTIVE EROSION CONTROL MEASURES MAY BE REMOVED. IMMEDIATELY STABILIZE ALL AREAS DISTURBED BY THE REMOVAL OF THESE MEASURES WITH TOPSOIL, FERTILIZER, LIME AND PERMANENT STABILIZATION (I.E. MULCH AND EROSION CONTROL BLANKET)

SPECIFICATIONS

1. COMPOST FILTER SOCK SHALL BY SILT SOXX BY FILTREXX, OR EQUIVALENT. ALL COMPOST FILTER SOCK SHALL BE 12" DIAMETER UNLESS SPECIFIED OTHERWISE.
2. STONE USED FOR STREAMBANK STABILIZATION SHALL BE R5 RIPRAP PER PENNDOT PUB. 408, SECTION 703.2 (C), TABLE C., OR NATIVE STONE OF EQUIVALENT SIZE, IF AVAILABLE AND APPROVED BY THE TOWNSHIP. STONE PLACEMENT THICKNESS AS PER DETAIL. STONE TO BE UNDERLAID BY GEOTEXTILE MATERIAL – MIRAFI 400 FILTERWEAVE OR APPROVED EQUIVALENT.
3. STONE USED FOR ROCK VANE FLOW DEFLECTORS SHALL BE LARGE BOULDERS, GENERALLY WITH MINIMUM DIAMETER OF 3 FEET, BUT NOT LARGER THAN 5 FEET IN ANY DIMENSION. INSTALL PER PLAN NOTES AND DETAILS.
4. SEED FOR UPLAND RESTORATION SHALL BE PENNDOT FORMULA B OR SIMILAR NATIVE SPECIES.
5. AS NECESSARY, BASED ON FIELD CONDITIONS AND/OR RECOMMENDATIONS FROM SOIL TESTS, SOIL AMENDMENTS FOR TEMPORARY SOIL STABILIZATION SHALL INCLUDE LIME (EQUIVALENT TO 50% CALCIUM PLUS MAGNESIUM OXIDES) APPLIED AT A RATE OF 2 TONS/AC AND FERTILIZER APPLIED AT A RATE OF 500 LBS/AC OF 10-20-10 OR EQUIVALENT.
6. STRAW MULCH SHALL BE FREE OF GROWTH OR GERMINATION-INHIBITING INGREDIENTS AND SHALL BE APPLIED OVER THE SEEDED AREA AT A RATE OF 3 TONS/AC (1,200 LBS PER 1,000 SQUARE YARDS), IMMEDIATELY AFTER SEEDING.
7. EROSION CONTROL BLANKET SHALL BE ROLANKA BIOD-OCF OR EQUIVALENT, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS ON ANY DISTURBED AND SEEDED/MULCHED SLOPES OF 3:1 SLOPE OR GREATER AND FLOODPLAIN AREAS.
8. TREE AND SHRUB PLANTINGS LISTED ON THE PLANS SHALL BE PROVIDED BY AND PLANTED BY WILDLANDS CONSERVANCY, FOLLOWING NOTICE BY THE CONTRACTOR OF COMPLETION OF EACH STAGE OF CONSTRUCTION FOR THE PROJECT.
9. THE PEDESTRIAN BRIDGE SHALL BE DESIGNED, FABRICATED, AND CONSTRUCTED AS SPECIFIED ON SHEET 2.
10. FOOTINGS FOR THE PEDESTRIAN BRIDGE SHALL BE DESIGNED, FABRICATED, AND CONSTRUCTED AS SPECIFIED ON SHEET 2.

MAINTENANCE NOTES

THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PROPER CONSTRUCTION, STABILIZATION, AND MAINTENANCE OF ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND RELATED ITEMS INCLUDED WITHIN THIS PLAN. THE CONTRACTOR WILL ALSO BE RESPONSIBLE FOR THE PROPER CONSTRUCTION AND STABILIZATION OF PERMANENT CONTROL MEASURES AND RELATED ITEMS INCLUDED WITHIN THIS PLAN.

SOIL SEDIMENT REMOVED FROM ANY TEMPORARY CONTROL MEASURE DURING REGULAR MAINTENANCE WILL BE INCORPORATED BACK INTO THE EARTHWORK AS FILL ON THE SITE. SOIL SEDIMENT MATERIAL SHALL BE DISTURBED ON-SITE IN SUCH A WAY AS NOT TO CHANGE DRAINAGE PATTERNS AS THEY EXIST ON THAT PARTICULAR DAY.

ALL COMPOST FILTER SOCKS INSTALLED ON THE PROJECT SITE SHALL BE MAINTAINED AS FOLLOWS:

1) THE CONDITION OF COMPOST FILTER SOCKS WILL BE INSPECTED ONCE A WEEK OR AFTER EVERY STORM EVENT, WHICHEVER COMES FIRST. ANY NECESSARY REPAIRS WILL BE MADE IMMEDIATELY.
2) ACCUMULATED SEDIMENTS WILL BE REMOVED AS REQUIRED TO KEEP THE FILTER SOCK FUNCTIONAL. IN ALL CASES, REMOVE DEPOSITS WHERE ACCUMULATIONS REACH ONE HALF OF THE EFFECTIVE HEIGHT OF THE SOCK.
3) COMPOST FILTER SOCK WILL BE MAINTAINED UNTIL THE DISTURBED AREA HAS BEEN PERMANENTLY STABILIZED AND THE CONSTRUCTION ACTIVITY HAS CEASED.
4) FOR LONG-TERM USE, THE COMPOST FILTER SOCK CAN BE SEEDED AT THE TIME OF INSTALLATION TO CREATE A VEGETATIVE FILTERING SYSTEM FOR PROLONGED AND INCREASED FILTRATION OF SEDIMENT.
5) REFER TO MANUFACTURER'S GUIDELINES AND SPECIFICATIONS FOR ADDITIONAL MAINTENANCE INFORMATION RELATED TO COMPOST FILTER SOCKS.

SEDIMENTS CONTAINED WITHIN THE FILTER BAG SHALL BE REMOVED FROM THE SITE FOR DISPOSAL AT AN APPROVED UPLAND LOCATION WITH AN EROSION AND SEDIMENT POLLUTION CONTROL PLAN OR SHALL BE DISPOSED PROPERLY IN AN APPROVED ON-SITE UPLAND LOCATION, AND SHALL BE SEEDED AND MULCHED FOR TEMPORARY AND/OR PERMANENT STABILIZATION.

AT THE END OF EACH CONSTRUCTION DAY, ANY SEDIMENT DEPOSITED ON PUBLIC ROADWAYS WILL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE. WASHING OF THE ROADWAY WITH WATER IS NOT PERMITTED.

THE CONTRACTOR SHALL HAVE ON SITE A WRITTEN REPORT DOCUMENTING INSPECTIONS AND REPAIRS.

PLANTING SCHEDULE

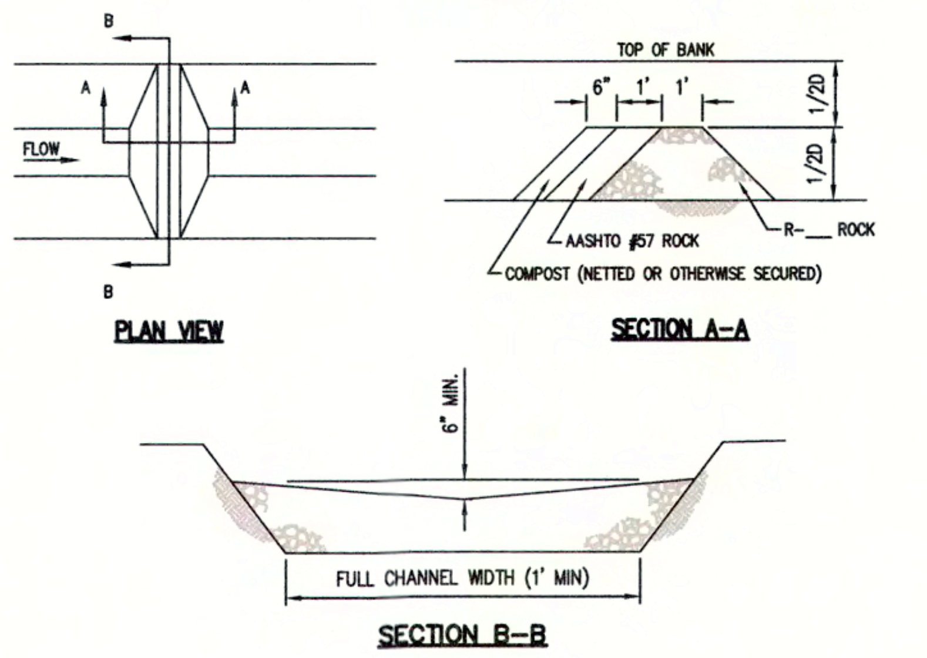
Common Name	Scientific Name	Size	Spacing
Flowering dogwood	*Cornus florida*	3-7 gal.	10-20' O.C.
Eastern redbud	*Cercis canadensis*	3-7 gal.	10-20' O.C.
Shadbush serviceberry	*Amelanchier canadensis*	3-7 gal.	10-20' O.C.
Swamp white oak	*Quercus bicolor*	3-7 gal.	10-20' O.C.
Black gum	*Nyssa sylvatica*	3-7 gal.	10-20' O.C.
River birch	*Betula nigra*	3-7 gal.	10-20' O.C.
Winterberry	*Ilex verticillata*	2-5 gal.	3-8' O.C.
Red osier dogwood	*Cornus sericea*	2-5 gal.	3-8' O.C.
Sweet pepperbush	*Clethra alnifolia*	2-5 gal.	3-8' O.C.
Black chokeberry	*Photinia melanocarpa*	2-5 gal.	3-8' O.C.
Pussy willow	*Salix discolor*	2-5 gal.	3-8' O.C.

Specifications and Notes:
-The planting site is characterized by floodplain soils typical along waterways.
-Trees and shrubs shall be nursery grown in a climate similar to that of the locality of the project.
-All plants shall be planted so that the top of the root ball has approximately 1-2' of soil covering and is at ground level.
-Planting pits shall be dug with level bottoms, with the width twice the diameter of the root ball.
-All trees and shrubs shall have normal habit of growth, be sound, healthy and vigorous, and be free from disease, insects, insect eggs, and larvae.
-The final combination of quantity, species, and size to be installed may vary based on availability and spacing.
-Tree tubes, stakes, and netting shall be installed to protect plantings from deer browse, rodent damage, and to prevent birds nesting in tubes.

STANDARD CONSTRUCTION DETAIL # 4-14

ROCK FILTER

NOT TO SCALE

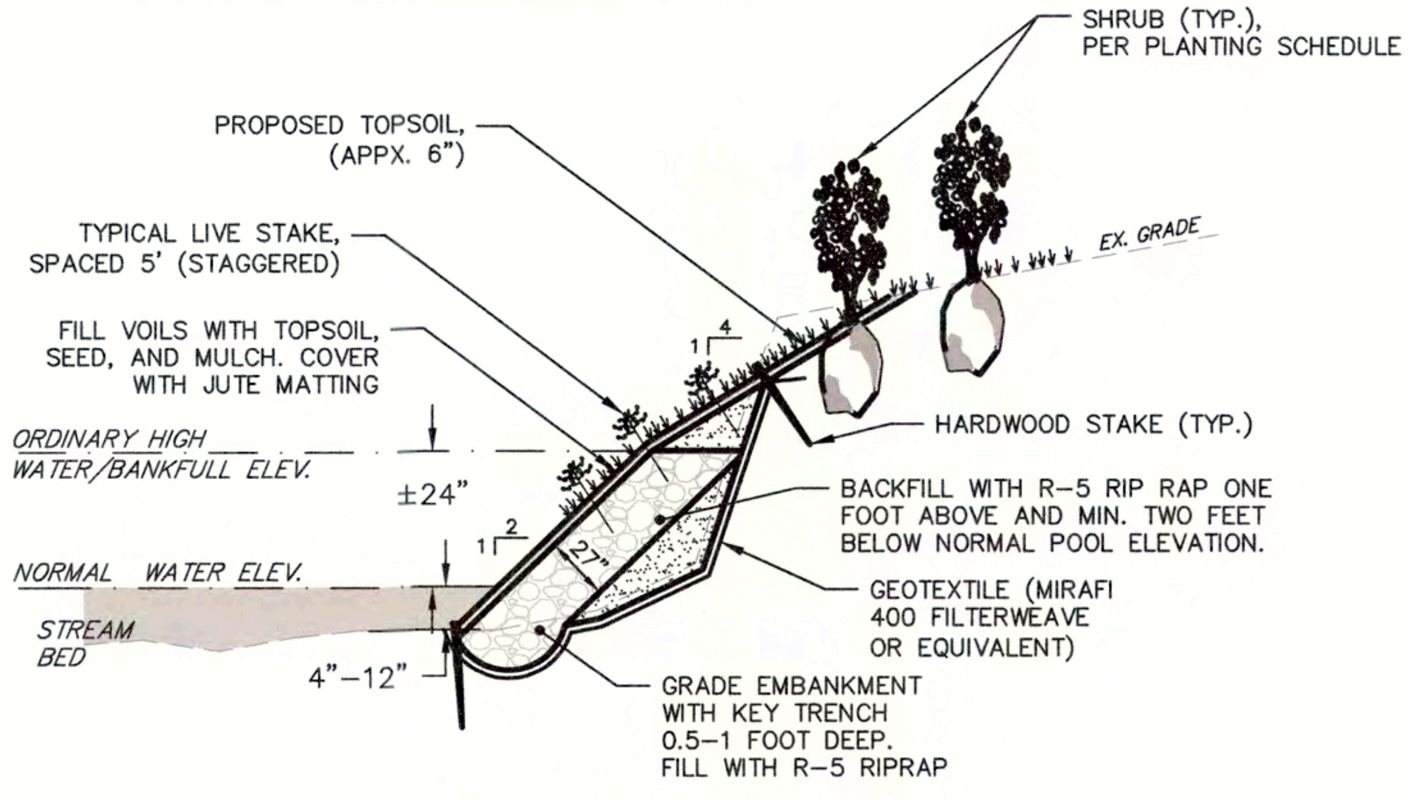


FOR 3' ≤ D USE R-4
FOR 2' ≤ D < 3' USE R-3
NOT APPLICABLE FOR D < 2'

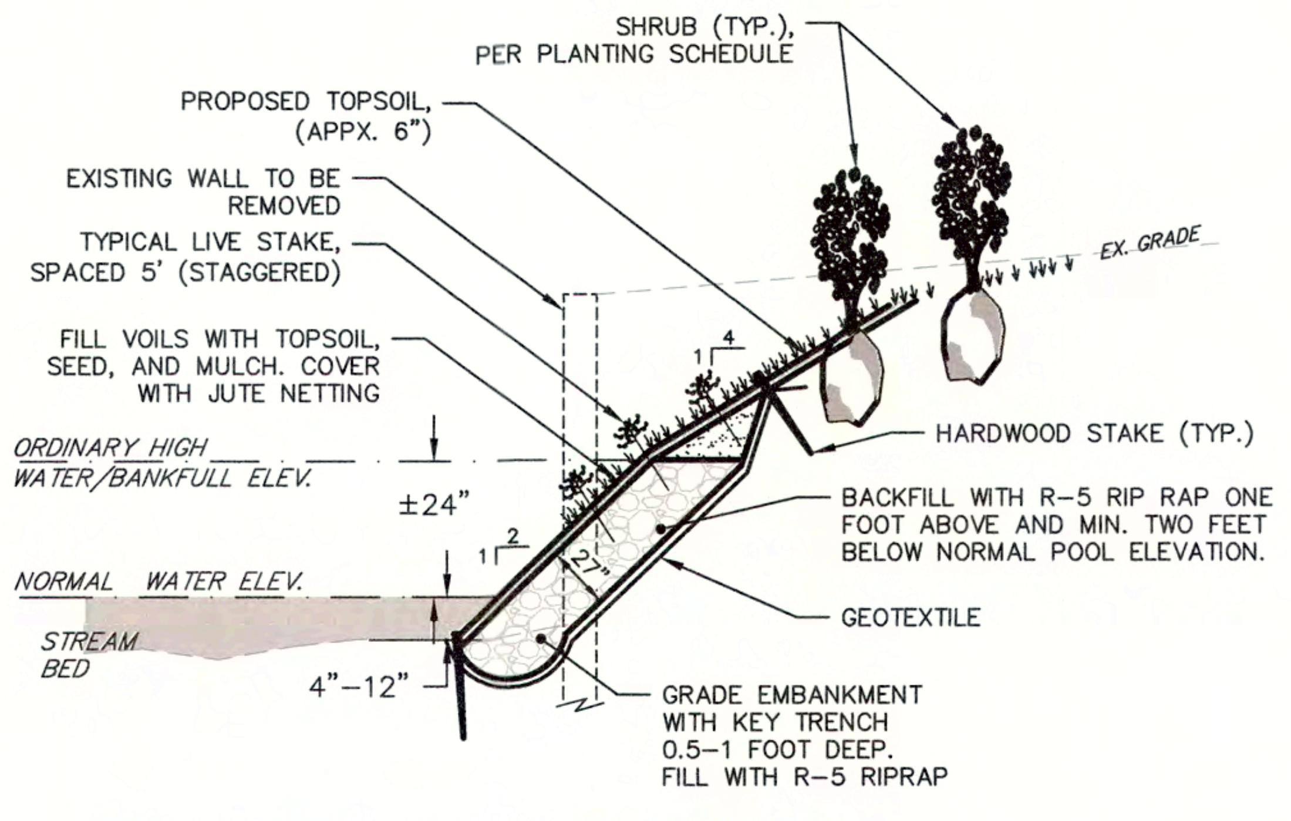
ROCK FILTER NO.	LOCATION	D (FT.)	RIPRAP SIZE
ALL	STREAM	12	R4

GENERAL NOTES:

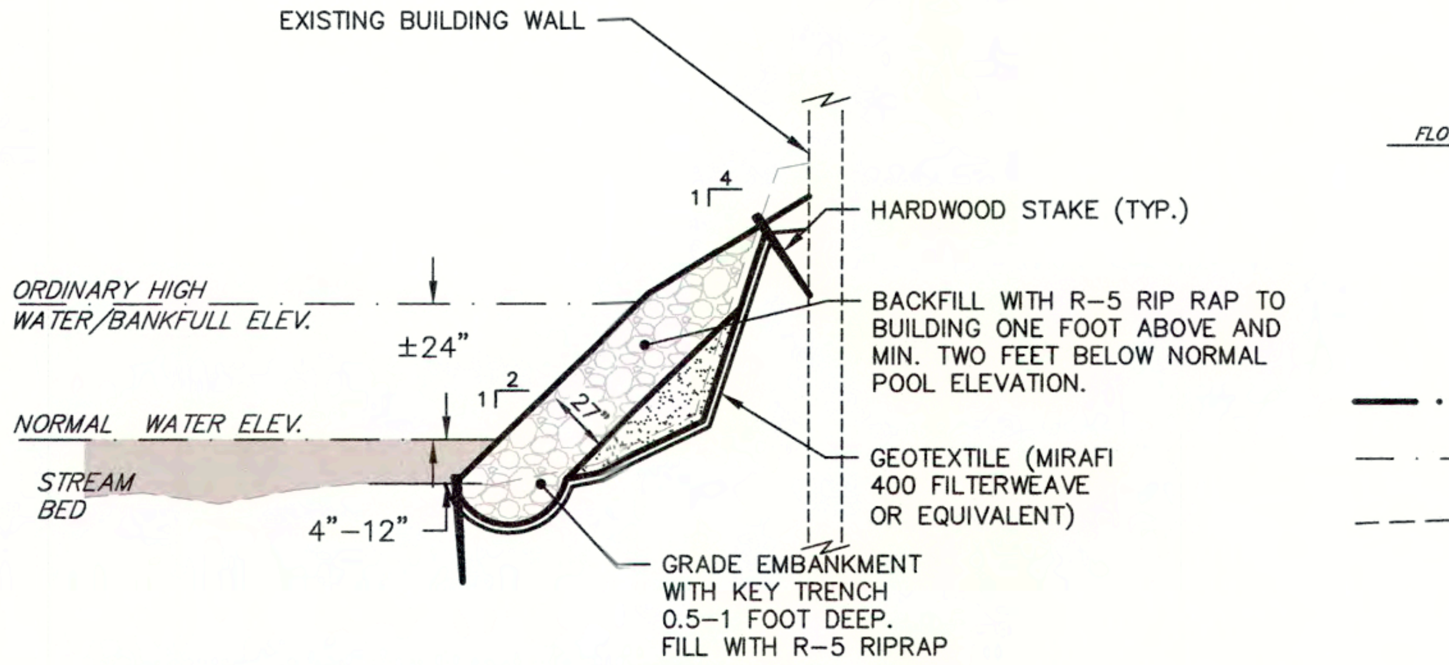
1. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE HEIGHT OF THE FILTER.
2. IMMEDIATELY UPON STABILIZATION OF EACH CHANNEL, INSTALLER SHALL REMOVE ACCUMULATED SEDIMENT, REMOVE ROCK FILTER, AND STABILIZE DISTURBED AREAS.



TYPICAL STREAMBANK STABILIZATION TYPE A (EXISTING BANK)
N.T.S.



TYPICAL STREAMBANK STABILIZATION TYPE B (EXISTING WALL/STRUCTURE)
N.T.S.

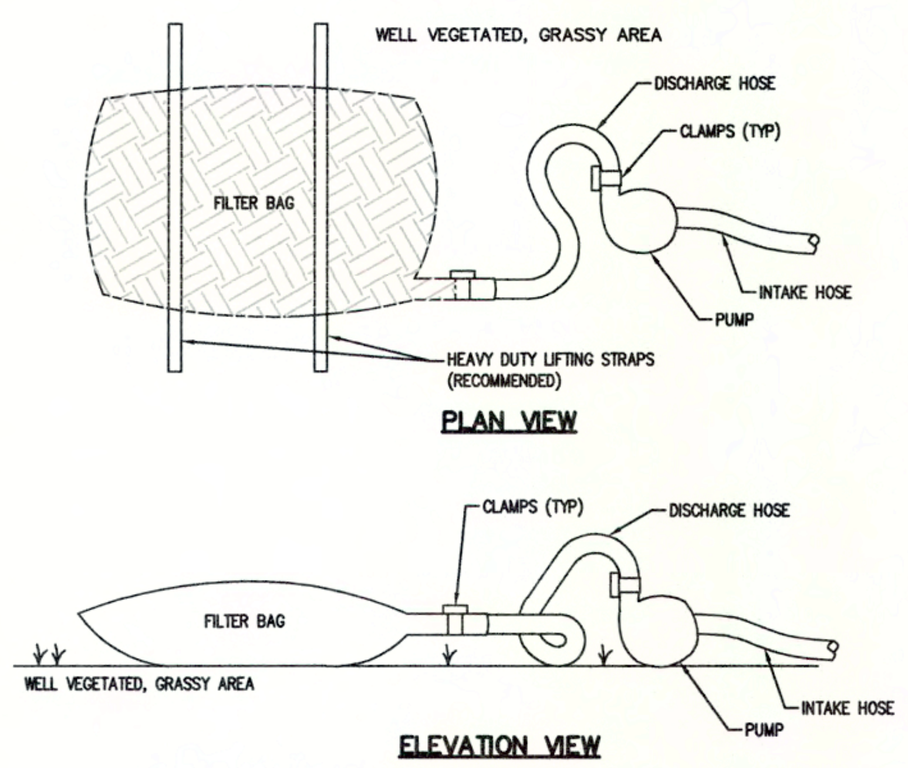


TYPICAL STREAMBANK STABILIZATION TYPE C (ALONG BUILDING)
N.T.S.

STANDARD CONSTRUCTION DETAIL # 3-16

PUMPED WATER FILTER BAG

NOT TO SCALE

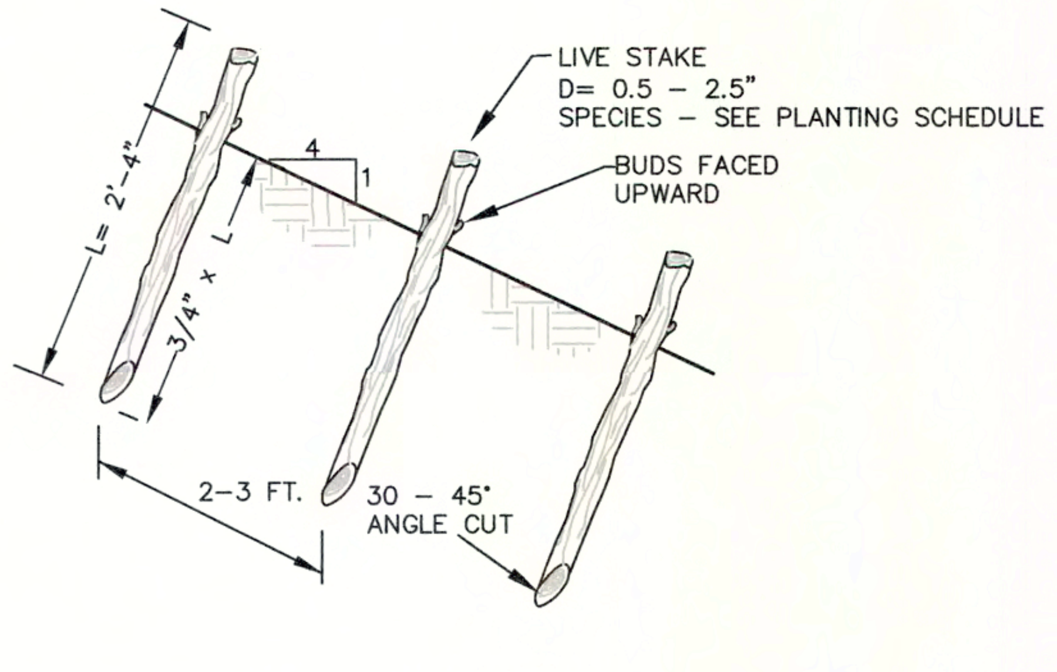


LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

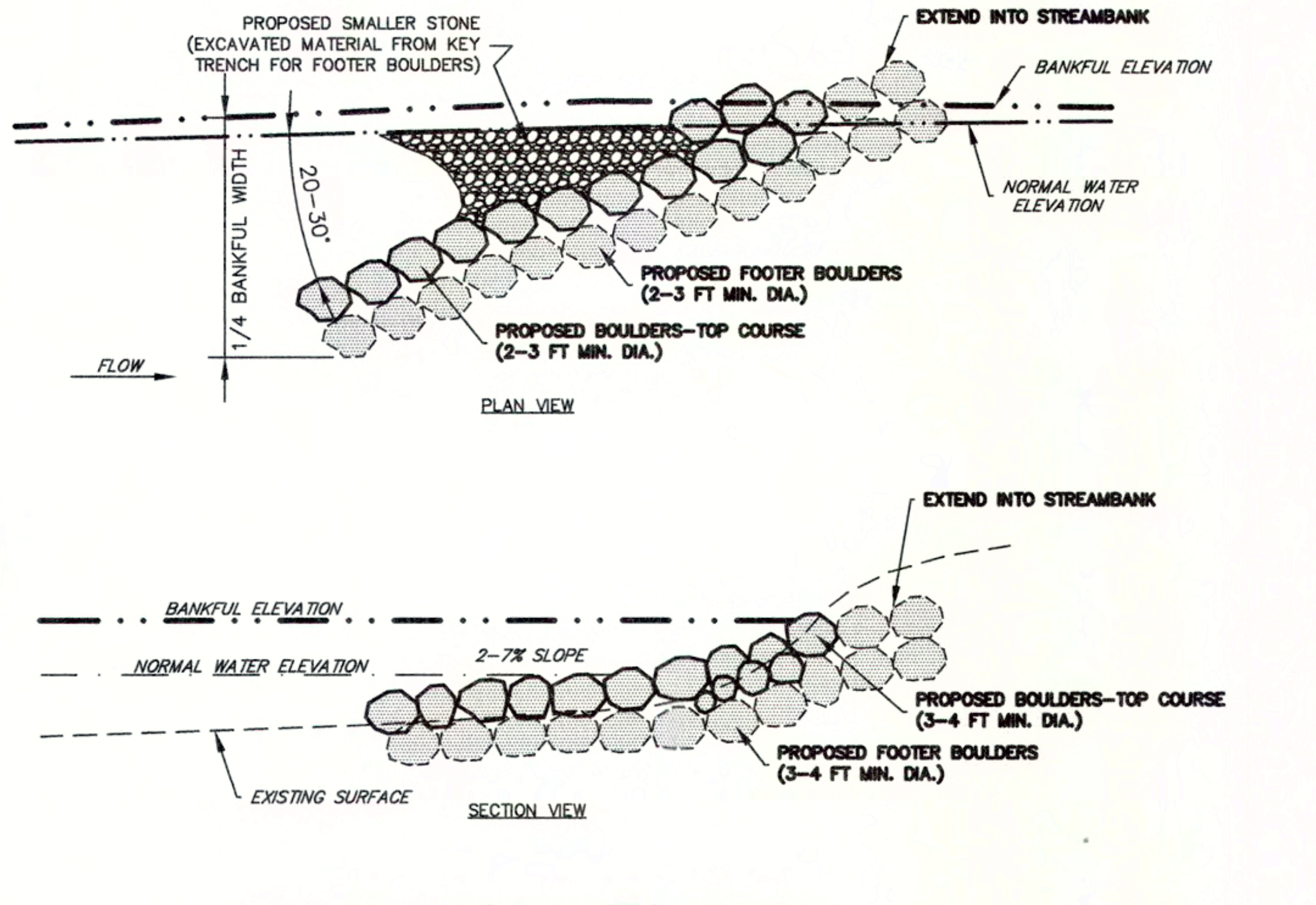
PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 lb/in
GRAB TENSILE	ASTM D-4632	205 lb
PUNCTURE	ASTM D-4833	110 lb
MULLEN BURST	ASTM D-3786	350 psi
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 Sieve

GENERAL NOTES:

1. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
2. BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
3. NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER ROCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.
4. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.
5. THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.
6. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.



LIVE STAKE DETAIL
N.T.S.



TYPICAL ROCK VANE FLOW DEFLECTOR DETAIL
N.T.S.

HanoverEngineering

Pocono Office
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
P:570.688.9550
F:570.688.9768
HanoverEng.com

LEHIGH TOWNSHIP
NORTHAMPTON COUNTY
PENNSYLVANIA

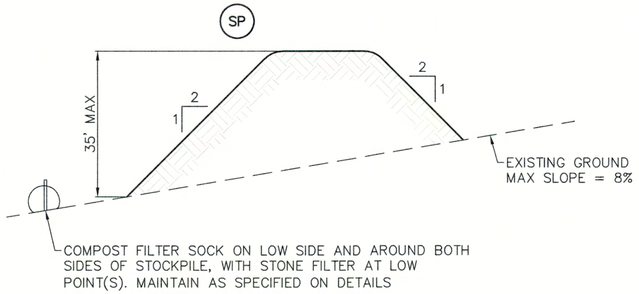
PLAN TITLE:
STREAM RESTORATION PLAN

PROJECT TITLE:
WILDLANDS CONSERVANCY
INDIAN TRAIL PARK

SEAL:
MICHAEL HENRY MUFFLEY
ENGINEER
PE076508

NO.	REVISIONS	DATE
1	PER PA DEP COMMENTS	07/13/20

DRAWN BY: JPR
CHECKED BY: MHM
SCALE:
DATE: 04/1/2020
PROJECT NO. 4696
SHEET NO. 4 OF 5

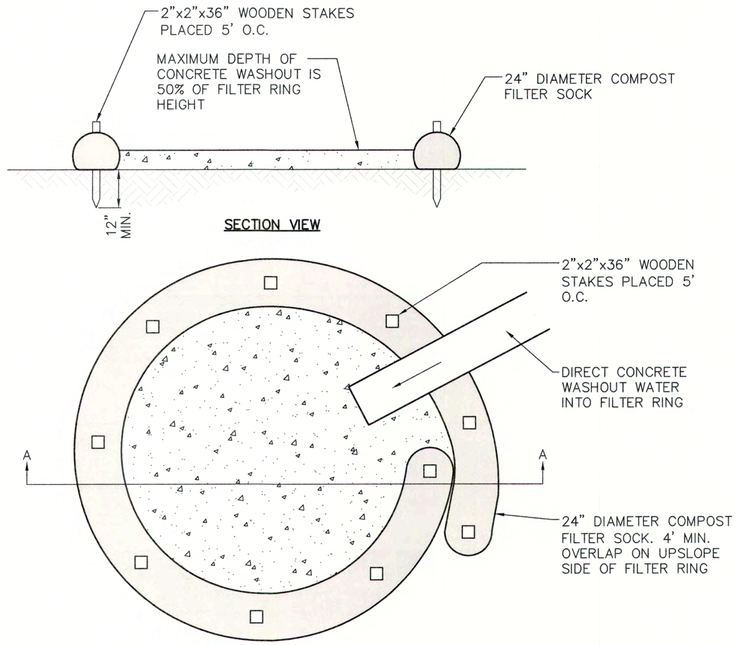


SOIL STOCKPILE MAINTENANCE:

1. STOCKPILE TOPSOIL OR EXCAVATED SOIL MATERIAL AT LOCATIONS SHOWN FOR EACH PHASE OF CONSTRUCTION.
2. HEIGHT AND SIDESLOPES SHALL NOT EXCEED MAXIMUM VALUES SHOWN ON DETAIL.
3. INSTALL COMPOST FILTER SOCK PRIOR TO STOCKPILING OF MATERIAL. REPLACE ANY CONTROLS REMOVED FOR VEHICULAR ACCESS AFTER EACH WORK DAY.
4. APPLY A TEMPORARY SEED MIX AND MULCH WHEN PILE WILL REMAIN FOR 4 DAYS OR MORE.

TYPICAL SOIL STOCKPILE

NOT TO SCALE



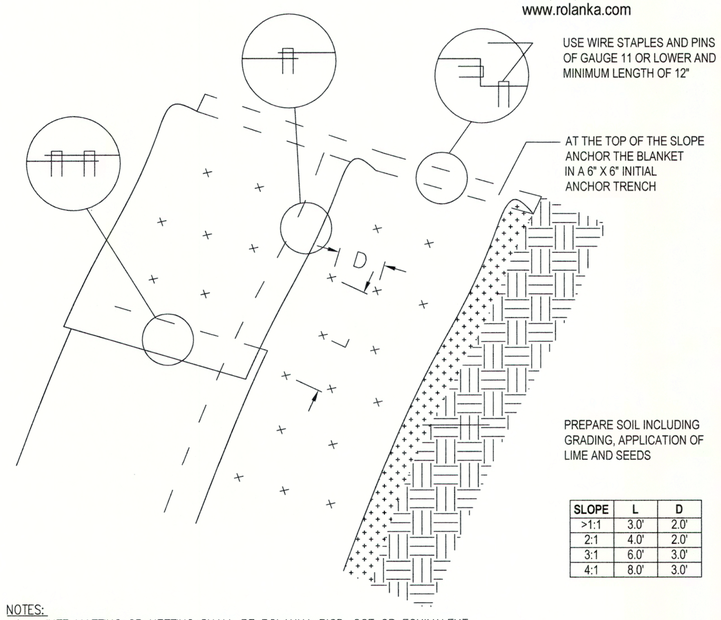
NOTES:

1. INSTALL ON FLAT GRADE FOR OPTIMUM PERFORMANCE.
2. 18" DIAMETER FILTER SOCK MAY BE STACKED ONTO DOUBLE 24" DIAMETER SOCKS IN PYRAMIDAL CONFIGURATION FOR ADDED HEIGHT.
3. A SUITABLE IMPERVIOUS GEOMEMBRANE SHALL BE PLACED AT THE LOCATION OF THE WASHOUT PRIOR TO INSTALLING THE SOCKS.
4. REDRAWN FROM FIGURE 3.18 P. 58 OF THE MARCH 2012 PA DEP EROSION & SEDIMENT POLLUTION CCONTROL PROGRAM MANUAL.

CONCRETE WASHOUT

NOT TO SCALE

ROLANKA INTERNATIONAL INC.
155 ANDREW DRIVE
STOCKBRIDGE, GA 30281
TOLL FREE: 1-800-760-3215
PHONE: (770) 506-8211
FAX: (770) 506-0391
www.rolanka.com



SLOPE	L	D
>1:1	3.0'	2.0'
2:1	4.0'	2.0'
3:1	6.0'	3.0'
4:1	8.0'	3.0'

NOTES:

1. JUTE MATTING OR NETTING SHALL BE ROLANKA BIOD-OCF OR EQUIVALENT
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

COIR BLANKETS AND LOGS ON STREAMBANKS

SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL (MAR. 2012). COMPOST SHALL MEET THE FOLLOWING STANDARDS:	
ORGANIC MATTER CONTENT	80% – 100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5 – 8.0
MOISTURE CONTENT	35% – 55%
PARTICLE SIZE	98% PASS THROUGH 1" SCREEN
SOLUBLE SALT CONCENTRATION	5.0 dS/m (mmhos/cm) MAXIMUM

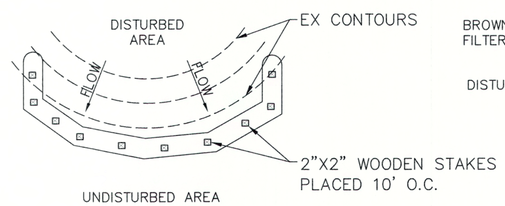
TABLE 4.1
COMPOST SOCK FABRIC MINIMUM SPECIFICATIONS

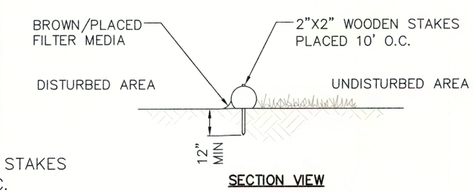
MATERIAL TYPE	3 MIL HDPE	5 MIL HDPE	5 MIL HDPE	MULTI-FILAMENT POLYPROPYLENE (MFPP)	HEAVY DUTY MULTI-FILAMENT POLYPROPYLENE (HDMFPP)
MATERIAL CHARACTERISTICS	PHOTO – DEGRADABLE	PHOTO – DEGRADABLE	BIO – DEGRADABLE	PHOTO – DEGRADABLE	PHOTO – DEGRADABLE
SOCK DIAMETERS	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
MESH OPENING	3/8"	3/8"	3/8"	3/8"	1/8"
TENSILE STRENGTH		26 PSI	26 PSI	44 PSI	202 PSI
ULTRAVIOLET STABILITY % ORIGINAL STRENGTH (ASTM G-155)	23% AT 1000 HR.	23% AT 1000 HR.		100% AT 1000 HR.	100% AT 1000 HR.
MINIMUM FUNCTIONAL LONGEVITY	6 MONTHS	9 MONTHS	6 MONTHS	1 YEAR	2 YEARS
TWO-PLY SYSTEMS					
INNER CONTAINMENT NETTING			HDPE BIAXIAL NET		
			CONTINUOUSLY WOUND		
			FUSION-WELD JUNCTURES		
			3/4" X 3/4" MAX. APERTURE SIZE		
OUTER FILTRATION MESH			COMPOSITE POLYPROPYLENE FABRIC (WOVEN LAYER & NON-WOVEN FLEECE MECHANICALLY FUSED VIA NEEDLE PUNCH)		
			3/16" MAX. APERTURE SIZE		
SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS.					

STANDARD CONSTRUCTION DETAIL #4-1

COMPOST FILTER SOCK

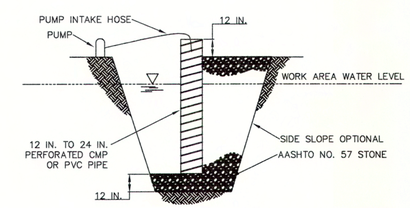
NOT TO SCALE





GENERAL NOTES:

1. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT (SEE FIGURE 4.1 OF THE PA DEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL, MAR. 2012). MAXIMUM SLOPE LENGTH ABOVE ANY SOCK SHALL NOT EXCEED THAT SHOWN OF FIGURE 4.2 OF THE PA DEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL (MAR. 2012). STAKES MAY BE INSTALLED IMMEDIATELY DOWNSLOPE OF THE SOCK IF SO SPECIFIED BY THE MANUFACTURER.
2. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE ABOVEGROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
4. SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
5. BIODEGRADABLE FILTER SOCK SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
6. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.



SECTION VIEW

NOTES:

LOCATE SUMP AT LOW POINT IN WORK AREA AND OUTSIDE OF CONSTRUCTION ACTIVITY. WHEREVER RUNOFF FROM A WORK AREA FLOWS DIRECTLY TO THE SUMP AREA, A FILTER BAG SHALL BE ATTACHED AT THE DISCHARGE POINT UNLESS PUMPING TO A SEDIMENT BASIN OR SEDIMENT TRAP.

MINIMUM DIAMETER OF PIT BOTTOM SHALL BE 24" LARGER THAN PIPE DIAMETER. MINIMUM DEPTH OF PIT SHALL BE 24" BELOW WATER LEVEL IN WORK AREA (INCLUDING THE AASHTO #57 STONE). 12" TO 24" PERFORATED CMP OR PVC PIPE SHALL BE SET ON 12" OF CLEAN AASHTO # 57 STONE.

VOID SPACE AROUND PIPE SHALL BE FILLED WITH AASHTO # 57 STONE. PIPE TO EXTEND 12" MIN. ABOVE TOP OF STONE AND/OR WATER BEING PUMPED FROM WORK AREA.

SET PUMP INTAKE INSIDE STANDPIPE.

DISCHARGE FROM PUMP SHALL BE TO A STABLE AREA BELOW DISTURBANCES FROM THE WORK ZONE.

SUMP MAY BE USED IN CONJUNCTION WITH FILTER BAG WHERE ADDITIONAL FILTERING IS NEEDED.

STANDARD CONSTRUCTION DETAIL #3-17

SUMP PIT

NOT TO SCALE

NO.	REVISIONS	DATE	DRAWN BY: JPR	CHECKED BY: MHM
1	PER PA DEP COMMENTS	07/13/20	SCALE:	DATE: 04/1/2020

PROJECT NO. 4696

SHEET NO. 5 OF 5

SEAL:

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL MICHAEL HENRY MUFFLEY PROVINCE OF PENNSYLVANIA

PLAN TITLE: STREAM RESTORATION PLAN

PROJECT TITLE: WILDLANDS CONSERVANCY INDIAN TRAIL PARK

LEHIGH TOWNSHIP
NORTHAMPTON COUNTY
PENNSYLVANIA

HanoverEngineering
Pocono Office
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
P:570.688.9550
F:570.688.9768
HanoverEng.com

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

July 20, 2020

Via Email: arehrig@lehightownship.com

Alice Rehrig, Township Manager
Lehigh Township
1069 Municipal Road
Walnutport, PA 18088

Re: General Permit (GP) Acknowledgment Notification
Indian Trail Park Stream Restoration Project
DEP Registration # GP114802220-023, GP034802220-021
APS ID# 1017010, AUTH ID# 1315435
Lehigh Township,
Northampton County

Dear Permittee:

This letter acknowledges receipt of your notification to use and registers your use of above authorized General Permit(s) (GP(s)) under the authority of the Dam Safety and Encroachments Act (32 P. S. § 693.1 et. seq.) and 25 Pa. Code Chapter 105. You are responsible for assuring the work is done in accordance with the drawings, terms and conditions contained in the GP(s). Please direct special attention to all time sensitive issues associated with the GP authorization(s). You may proceed with your project after making the required notifications stipulated in the GP(s) and securing all other approvals that may be necessary.

Enclosed is an acknowledged copy of your GP Registration Form. Please place this letter and the acknowledged GP Registration form with your copy of the GP Registration package, the applicable GP terms and conditions, required Federal authorizations, and the Erosion and Sediment Control plan and maintain on site during construction. Please review the complete permit authorization package so that you are aware of the extent of the authorization(s).

We have determined that your proposed work, if accomplished in accordance with the enclosed terms and conditions, is authorized by the Pennsylvania State Programmatic General Permit-5 (PASPGP-5). This PASPGP-5 verification provides U.S. Army Corps of Engineers authorization pursuant to Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act. This authorization may be subject to modification, suspension, or revocation if any of the information contained in the application, including the plans, is later found to be in error.

The enclosed list of conditions must be followed for purposes of the PASPGP-5 (Enclosure 1). A PASPGP-5 Permit Compliance, Self-Certification Form must be completed and returned to the appropriate Corps of Engineers office upon completion of construction (Enclosure 2).

If you have additional questions about your registration, please contact Brian Mackowski at 570.830.3090 and refer to Application No. GP114802220-023, GP034802220-021, Authorization No. 1315435.

Sincerely,

Robert Jevin

Robert J. Jevin III, P.E.
Environmental Group Manager
Waterways & Wetlands Program

cc: Jason Smith (via email: jesmith@hanovereng.com)
Michael Muffley, P.E. (via email: mmuffley@hanovereng.com)
Northampton CCD (via email)
US Army Corps of Engineers, Philadelphia District (via email)

PENNSYLVANIA STATE PROGRAMMATIC GENERAL PERMIT – 5
(PASPGP-5)
July 1, 2018
Revised July 30, 2018

Please note: the full text of the PASPGP-5 may be viewed on the Baltimore District web site at http://www.nab.usace.army.mil/Missions/Regulatory/PermitTypesandProcess.aspx **or by calling the Corps at 814-235-0570**

Permittee: Lehigh Township
Date of PASPGP-5 Verification: July 20, 2020
State Authorization(s): GP114802220-023, GP034802220-021

Corps District:

☒ **Philadelphia**
U.S. Army Corps of Engineers,
Philadelphia District
Regulatory Branch
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

☐ **Baltimore**
U.S. Army Corps of Engineers,
Baltimore District
Regulatory Branch
1631 South Atherton Street
Suite 101
State College, PA 16801-6260

☐ **Pittsburgh**
U.S. Army Corps of Engineers,
Pittsburgh District
Regulatory Branch
Federal Building, 20th floor
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

It has been determined that your proposed project, which includes the discharge of dredged and/or fill material and/or the placement of structures into waters of the United States, including wetlands, qualifies for Federal authorization under the provisions of Section 404 of the Clean Water Act and /or Section 10 of the River and Harbor Act of 1899, under the terms and conditions of the PASPGP-5.

All activities authorized under PASPGP-5 must comply with all conditions of the authorization, including General, Procedural, and Special Conditions. Failure to comply with all the conditions of the authorization, including project special conditions, will constitute a permit violation and may be subject to criminal, civil, or administrative penalties, and /or restoration.

The authorized activity must be performed in compliance with the following General Conditions to be authorized under PASPGP-5:

General Conditions:

1. **Permit Conditions:** The permittee shall comply with all terms and conditions set forth in the PADEP authorization, including all conditions of the State Water Quality Certification as required by Section 401 of the CWA, and any subsequent amendments or modifications to such authorizations. The permittee shall conduct all work and activities in strict compliance with all approved maps, plans, profiles, and specifications used by PADEP and/or the Corps in issuing their authorization/verification.

2. **Aquatic Life Movements:** No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be appropriately depressed to maintain aquatic life movement and low flow conditions.

3. **Threatened and Endangered Species:** By signing the PNDI receipt, the permittee has agreed to comply with all avoidance measures identified by the PNDI receipt. As such, those avoidance

measures associated with Federally-listed threatened or endangered species are a condition of the PASPGP-5 verification, unless modified by the Corps.

If an activity is verified under the PASPGP-5, and a Federally-listed threatened or endangered species, or proposed species, is subsequently found to be present, all work must cease, and the Corps and USFWS (or NMFS) must be notified. The PASPGP-5 verification is suspended and will not be re-issued until consultation pursuant to Section 7 of the ESA is concluded and adverse effects to Federally-listed threatened, endangered and proposed species are avoided.

Furthermore, persons have an independent responsibility under Section 9 of the ESA to not engage in any activity that could result in the "take" of a Federally-listed species.

4. **Spawning Areas:** The permittee shall comply with all time-of-year-restrictions associated with spawning areas as set forth by the PFBC or other designated agency. Discharges or structures in spawning or nursery areas shall not occur during spawning seasons, unless written approval is obtained from the PFBC or other designated agency. In addition, work in areas used for other time sensitive life span activities of fish and wildlife (such as hibernation or migration) may necessitate the use of seasonal restrictions for avoidance of adverse impacts to vulnerable species. Impacts to these areas shall be avoided or minimized to the maximum extent practicable during all other times of the year.

5. **Migratory Bird Breeding Areas:** Activities in waters of the United States, including jurisdictional wetlands, that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable. Recommendations pertaining to the conservation of migratory birds can be found at the following USFWS web site: http://www.fws.gov/northeast/pafo/

6. **Shellfish Production:** No discharge of dredged and/or fill material and/or the placement of structures may occur in areas of concentrated shellfish production, unless the discharge is directly related to an authorized shellfish harvesting activity.

7. **Adverse Effects From Impoundment:** If the activity, including the discharge of dredged and/or fill material or the placement of a structure, creates an impoundment of water, the adverse effects on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow, including impacts to wetlands, shall be minimized to the maximum extent practicable.

8. **Obstruction of High Flows:** To the maximum extent practicable, the activity must be designed to maintain pre-construction downstream flow conditions (i.e., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters), and the structure or discharge of dredged and/or fill material shall be designed to withstand expected high flows.

9. **Erosion and Sediment Controls:** During construction, appropriate erosion and sedimentation controls must be used and maintained in effective operating condition in accordance with State regulations. All disturbed soil and other fill material must be permanently stabilized.

10. **Suitable Material:** No activities, including discharges of dredged and/or fill material or the placement of structures, may consist of unsuitable material (i.e., asphalt, trash, debris, car bodies, etc.). No material discharged shall contain toxic pollutants in amounts that would violate the effluent limitation standards of § 307 of the CWA.

11. **Temporary Fill:** Temporary fill (i.e., access roads and cofferdams) in waters and/or wetlands verified by the PASPGP-5 shall be properly constructed and stabilized during use to prevent erosion and accretion. Temporary fill in wetlands shall be placed on geotextile fabric laid on existing wetland grade, unless such requirement is specifically waived by the Corps. Whenever possible, rubber or wooden mats should be used for equipment access through wetlands to the project area. Temporary fills shall be removed, in their entirety, to an upland site, and suitably contained to prevent erosion and transport to a waterway or wetland. Temporary fill areas shall be

restored to their preconstruction contours, elevations, and hydrology, and revegetated with a wetland seed mix that contains non-invasive, native species, as soon as practicable.

12. **Equipment Working in Wetlands:** Measures must be taken to minimize soil disturbance when heavy equipment is used in wetlands. These measures include, but are not limited to, avoiding the use of such equipment, use of timber mats or geotextile fabric, and use of low pressure tire vehicles.

13. **Installation and Maintenance:** Any structure or fill verified shall be properly installed and maintained to ensure public safety.

14. **PASPGP-5 Authorization:**

    a. The PASPGP-5 expires June 30, 2021, unless suspended or revoked.

    b. Verifications of PASPGP-5 expire June 30, 2021, unless the PASPGP-5 permit is suspended, revoked, or the PADEP authorization expires, whichever date occurs sooner. Activities authorized under the PASPGP-5 that have commenced construction or are under contract to commence construction will remain authorized provided the activity is completed within 12 month of the date of the PASPGP-5's expiration, modification, or revocation; or until the expiration date of the project specific verification, whichever is sooner.

15. **One-Time Use:** A PASPGP-5 verification is valid to construct the project, or perform the activity, one time only, except for PASPGP-5 verification specifically issued for reoccurring maintenance activities.

16. **Water Supply Intakes:** No activity, including discharges of dredged and/or fill material and/or placement of structures, may occur in the proximity of a public water supply intake and adversely impact the public water supply.

17. **Cultural Resources:** For all activities verified under a PASPGP-5, upon the unanticipated discovery of any previously unknown historic properties (historic or archeological), all work must cease and the permittee must notify the SHPO and the Corps of Engineers. The Corps will contact the Tribes they routinely consult with within 24 hours in accordance with each District's tribal Consultation process. The PASPGP-5 verification is not valid until it is determined, through the Section 106 consultation process, whether the activity will have an effect on the historic property. The PASPGP-5 may be re-verified and special conditions added if necessary, after an effects determination on historic properties and/or Tribal resource is made, in consultation with the SHPO, the Tribes and other interested parties. The PASPGP-5 verification may be modified and/or rescinded for the specific activity if an adverse effect on the historic property cannot be avoided, minimized, or mitigated.

18. **Tribal Rights:** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting grounds.

19. **Corps Civil Works Projects:** The PASPGP-5 does not authorize any work which will interfere with an existing or proposed Corps Civil Works project (i.e., flood control projects, dams, reservoirs, and navigation projects), unless specifically waived by the Corps in writing.

20. **Navigation:** No activity verified under PASPGP-5 may cause more than minimal adverse effect on navigation. No attempt shall be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the activity authorized herein. In addition, activities that require temporary causeways that prohibit continued navigational use of a waterway (i.e., temporary causeways extending greater than ¾ the width across the waterway) shall be removed in their entirety upon completion of their use. Any safety lights and signals prescribed by the U.S. Coast Guard, through regulation or otherwise, must be installed and maintained at the permittee's

expense on authorized facilities in navigable waters of the United States. The permittee understands and agrees that, if further operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

21. **Inspections:** The permittee shall allow a District Engineer or his authorized representative(s) to make periodic inspections at any time deemed necessary in order to ensure that the work is being performed in accordance with all the terms and conditions of the PASPGP-5. The District Engineer may also require post-construction engineering drawings (as-built plans) for completed work.

22. **PASPGP-5 Permit Compliance Self Certification Form:** A Self Certification Form, will be forwarded to each permittee with a PASPGP-5 verification. Every permittee, who receives a written PASPGP-5 verification, shall submit a signed Self Certification Form upon completion of the verified work and required mitigation, to the appropriate Corps District.

23. **Monitoring of Temporary Wetland Impacts:** For all temporary wetland impacts greater than 0.10 acre per Single and Complete Project, a monitoring report using the standard monitoring form (including preconstruction photographs as described on the monitoring form) will be submitted to the Corps, unless this requirement is specifically waived by the Corps in writing, or such monitoring is superseded by more stringent monitoring required by the Corps as a Special Condition of a PASPGP-5 verification. To obtain a waiver from the Corps the applicant must contact the appropriate Corps district with a written request to be relieved of the monitoring requirement. Such request shall include the state authorization, and the Corps permit numbers if known, and a rationale as to why the monitoring should not be required.

    The permittee shall inspect the subject areas within 7 days after restoration of the temporary impact is completed, and again at the end of the first full growing season (no later than October 31) after the site has been restored. The standard monitoring form is available on the Baltimore District web site at: http://www.nab.usace.army.mil/Missions/Regulatory/PermitTypesandProcess.aspx or by contacting the applicable Corps District office. When more than one temporary wetland impact is authorized as part of a Single and Complete Project, separate monitoring forms shall be filled out for each temporarily impacted wetland.

    The completed report shall be submitted to the appropriate Corps District within two weeks of the final inspection of the temporarily impacted wetland. If the initial monitoring event reveals that the temporarily impacted area is not restored to preconstruction contours, the permittee shall take corrective measures to return the area back to preconstruction grades. The permittee shall document the actions taken to restore the area back to preconstruction grades on the monitoring form.

    This condition is not applicable to any project authorized as a grandfathered PASPGP-4 (see Part IV A. 30. “Grandfathered Activities”

24. **Permit Modifications:** Any proposed modification of a verified Single and Complete Project that results in a change in the verified impact to, or use of waters of the United States, including jurisdictional wetlands, must be approved by PADEP. Corps approval is also required if the Single and Complete Project had been previously reviewed by the Corps, or if the proposed modification is a reporting activity under PASPGP-5. Project modifications that cause a Single and Complete Project to exceed 1.0 acre of waters of the United States, including jurisdictional wetlands, or greater than 1,000 linear feet of permanent stream loss will not be eligible for PASPGP-5 and will be forwarded to the Corps for review.

25. **Recorded Conservation Instruments:** As per Part IV.A.28 and Part IV.B.9 of this permit, proposed Draft Conservation Instruments may be submitted by the applicant as part of the permit application package for review and approval. When such proposed Conservation Instruments are submitted by the applicant, proof of the recorded deed restriction, conservation easement, or deed restricted open space area shall be forwarded to the appropriate Corps District and appropriate PADEP offices, prior to the initiation of any permitted work, unless specifically waived by the Corps in writing. Conservation Instrument templates can be found at: http://www.nab.usace.army.mil/Missions/Regulatory/PermitTypesandProcess.aspx

26. **Property Rights:** The PASPGP-5 does not obviate the need to obtain other Federal, state, or local authorizations required by law, nor does the permit grant any property rights or exclusive privileges, or authorize any injury to the property or rights of others.

27. **Navigable Waters of the United States (Section 10 Waters):**

    a. The PASPGP-5 may be used to authorize work in the following navigable waters of the United States:

        i. Codorus Creek – from the confluence with the Susquehanna River 11.4 miles upstream to the Richland Avenue Bridge in York, Pennsylvania;

        ii. Main Stem Susquehanna River – from the confluence with the Chesapeake Bay upstream to Athens , Pennsylvania (approximately 4 miles south from the New York State line);

        iii. West Branch of the Susquehanna River – from the confluence with the main stem Susquehanna River upstream to the dam at Lock Haven, Pennsylvania;

        iv. Chester Creek – from the confluence with the Delaware River 2 miles upstream;

        v. Crum Creek – from the confluence with the Delaware River 1 mile upstream to the upstream side of the Dam at Eddystone;

        vi. Darby Creek – from the confluence with the Delaware River 5 miles upstream to the upstream side of the 84th Street Bridge in Philadelphia, Pennsylvania;

        vii. Delaware River – from U.S. Route 202 Bridged in New Hope, Pennsylvania, including the West Branch of the Delaware River, upstream to the Pennsylvania/New York border at the 42nd parallel;

        viii. Lehigh River – from the confluence with the Delaware River 72 miles upstream to the downstream side of the PA Route 940 Bridge;

        ix. Neshaminy Creek – the confluence with the Delaware River, including Neshaminy State Park Harbor Project at the mouth of Neshaminy Creek, 4 miles upstream to the downstream side of the Newportville Bridge;

        x. Pennypack Creek – from the confluence with the Delaware River 2 miles upstream to the downstream side of the Frankford Avenue Bridge in Philadelphia, Pennsylvania;

        xi. Ridley Creek – from the confluence with the Delaware River 1 mile upstream to the upstream side of the Baltimore and Ohio Railroad Bridge in Chester, Pennsylvania;

        xii. Schuylkill River – from the Fairmont Dam, 104 miles upstream to Port Carbon, Pennsylvania;

xiii. Schuylkill Navigation Channel (Manayunk Canal) – along the Schuylkill River for 2 miles from the Flat Rock Dam to Lock Street in the Manayunk Section of Philadelphia, Pennsylvania;

xiv. Delaware Canal;

xv. Lehigh Canal; and

xvi. All other waters not specifically exempted in the PASPGP-5, Part III, A, 5, that are subject to the ebb and flow of the tide. Such waters are considered navigable waters of the United States to the head of tidal influence.

b. In addition to the other general conditions, the following conditions are applicable for navigable waters of the United States eligible for PASPGP-5.

i. For aerial transmission lines, the following minimum clearances are required for aerial electric power transmission lines crossing navigable waters of the United States. These clearances are related to the clearances over the navigable channel provided by the existing fixed bridges, or the clearances which would be required by the United States Coast Guard (USCG) for new fixed bridges, in the vicinity of the proposed aerial transmission line. These clearances are based on the low point of the line under conditions producing the greatest sag, taking into consideration temperature, load, wind, length of span, and type of supports as outlines in the National Electric Safety Code:

Nominal System Voltage (kV)	Minimum Additional Clearance (ft.) Above Clearance Required for Bridges
115 and below	20
138	22
161	24
230	26
350	30
500	35
700	42
750-765	45

a. Clearances for communication lines, stream gauging cables, ferry cables, and other aerial crossings must be a minimum of ten feet above clearances required for bridges, unless specifically authorized otherwise by the District Engineer.

b. Corps of Engineers regulation ER 1110-2-4401 prescribes minimum vertical clearances for power communication lines over Corps lake projects. In instances where both regulation and ER 1110-2-4401 apply, the greater minimum clearance is required.

ii. Encasement: The top of the cable, encasement, or pipeline shall be located a minimum of three feet below the existing bottom elevation of the streambed and shall be backfilled with suitable heavy material to the preconstruction bottom elevation. Where the cable, encasement, or pipeline is placed in rock, a minimum depth of one foot from the lowest point in the natural contour of the streambed shall be maintained. When crossing a maintained navigation channel, the requirements are a minimum of eight feet between the top of the cable, encasement, or pipeline and the authorized depth of the navigation channel. For maintained navigational channels, where the utility line is placed in rock, a minimum depth of two feet from the authorized depth of the navigation channel shall be maintained.

iii. As-Built Drawings: Within 60 days of completing an activity that involves an aerial transmission line, submerged cable, or submerged pipeline across a navigable water of the United States (i.e., Section 10 waters), where the permittee shall furnish the Corps and the National Oceanic and Atmospheric Administration, Nautical Data Branch, N/CS26, Station 7317, 1315 East-West Highway, Silver Spring, Maryland, 20910 with professional, certified as-built drawings, to scale, with control (i.e., latitude/longitude, state plane coordinates), depicting the alignment and minimum clearance of the aerial wires above the MHWL at the time of survey or depicting the elevations and alignment of the buried cable or pipeline across the navigable waterway.

iv. Aids to Navigation: The permittee must prepare and provide for USCG approval, a Private Aids to Navigation Application (CG-2554). The form can be found at: http://www.uscg.mil/forms/cg/CG_2554.pdf . Within 30 days of the date of receipt of the USCG approval, the permittee must provide a copy to the applicable Corps District.

28. **PADEP Waiver:** If the Corps determines a specific activity, which is eligible for a PADEP Non-reporting Waiver, has a significant adverse impact on life, property or important aquatic resources, the Corps may require the owner to modify the activity to eliminate the adverse condition or to obtain an Individual Permit.

29. **Corps Water Releases:** For projects located downstream of a Corps dam, the permittee should contact the appropriate Corps of Engineers, Area Engineer Office, to obtain information on potential water releases and to provide contact information for notification of unscheduled water releases. It is recommended that no in-water work be performed during periods of high water flow velocities. Any work performed at the project site is at the permittee's own risk.

30. **State Authorization:** The activity must receive State authorization. For the purpose of this requirement, any one of the following would be considered as a State authorization:

    a. A PADEP Chapter 105 Water Obstruction and Encroachment Permit, including PADEP approved Environmental Assessment pursuant to 25 Pa. Code § 105.15; or

    b. A PADEP GP issued pursuant to 25 Pa. Code § §105.441-105.449; or

    c. A PADEP approved Environmental Assessment for activities not otherwise requiring a PADEP permit pursuant to 25 Pa. Code § 105.12; or

    d. A State Water Quality Certification issued by PADEP consistent with Section 401 of the CWA for activities which qualify for waiver of PADEP permit requirement per 25 Pa. Code §105.12; or

    e. A PADEP Dam Permit, including maintenance or repairs of existing authorized dams, including maintenance dredging; or

    f. A PADEP Emergency Permit issued pursuant to 25 Pa. Code § 105.64; or

    g. A PADEP permit for the construction of a bridge or culvert (including bridges and culverts authorized by PADEP prior to implementations of the PASPGP-1 in March 1995), which allows for maintenance activities of bridges and culvert; or

    h. A PADEP Chapter 105 Dam Safety and Encroachment Enforcement Action; or

i. A programmatic/project specific State Water Quality Certification issued by PADEP consistent with Section 401 of the CWA where no other State authorization, as listed above, is required.

31. **Other Authorizations:** Additional Federal, State, and/or local authorizations or approvals may be required and where applicable must be secured by the applicant, prior to initiating any discharge of dredged and/or fill material, and/or the placement of structures into waters of the United States, including jurisdictional wetlands. These approvals include, but are not limited to:

    a. A State Water Quality Certification issued by PADEP consistent with Section 401 of the CWA;

    b. A Consistency Determination issued by PADEP pursuant to Section 307 of the Federal Coastal Zone Management Act for activities located within the designated Coastal Zone Management Area; and

    c. Fills within the 100-year floodplains. This activity must comply with applicable FEMA approved State or local floodplain management requirements.

32. **Federal Liability:** In issuing this permit, the Federal Government does not assume any liability for the following:

    a. Damages to permitted project or users, thereof, as a result of other permitted or unpermitted activities or from natural causes;

    b. Damages to the permitted project or uses, thereof, as a result of current or future activities undertaken by or on behalf of the United States in the public interest;

    c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit;

    d. Design or construction deficiencies associated with the permitted work; and

    e. Damage claims associated with any future modification, suspension, or revocation of the PASPGP-5.

33. **False and Incomplete Information:** The Corps may modify or rescind a previously issued project specific verification, if determined that the original verification was issued based on false, incomplete and/or inaccurate information; or other information becomes available whereby such action is necessary to ensure compliance with other federal laws and regulations.

34. **Essential Fish Habitat:** No work can take place in the following waterways from March 15th to June 30th unless approved in writing by the Corps. Questions on the applicability of this condition should be directed to the Corps of Engineers, Philadelphia District.

    a. Delaware River (within Pennsylvania, upstream from the U.S. Route 202 Bridge in New Hope, Pennsylvania,); and

    b. Lehigh River (from the mouth to Francis E. Walter Dam, located in Carbon and Luzerne County, Pennsylvania)

35. **Conservation Measures for Atlantic and Shortnose Sturgeon:** All work proposed in the following listed waters must comply with the below Conservation Measures, unless specifically waived by the Corps in writing. Questions on the applicability of this condition should be directed to the Corps of Engineers, Philadelphia District.

Waterway	Action Area (From Point Specified to the Confluence with the Delaware River)	Latitude	Longitude
Marcus Hook Creek	US Route 13 Bridge	39.822054	-75.409873
Stoney Creek	US Route 13 Bridge	39.828408	-75.400953
Chester Creek	Kerlin Street Bridge	39.855846	-75.37641
Ridley Creek	McDade Boulevard	39.869522	-75.356692
Crum Creek	US Route 13 Bridge	39.866799	-75.340677
Darby Creek	Pine Street Bridge	39.914006	-75.259994
Frankford Creek	Frankford Avenue/US 13 Bridge	40.005314	-75.070173
Frankford Creek (Original Mouth)	End of Channel	40.004912	-75.070173
Pennypack Creek	Route 13 Bridge	40.043421	-75.020638
Poquessing Creek	Mill Road Bridge	40.043421	-75.982076
Neshaminy Creek	Rapids just below Hulmeville Road Bridge (SR 513), Bucks County	40.141393	-74.911899
Unnamed Tributary 1, located in Croydon, PA	River Road crossing	40.085774	-74.8856
Otter/Mill Creek	US 13 (Bristol Pike) Bridge	40.100424	-74.866976
Unnamed Tributary 2, located in Bristol, PA	Wood Street Bridge	40.102044	-74.845682
Martins Creek	Main Street (Tulleytown)	40.141975	-74.812026
Scott's Creek	End of creek	40.12921	-74.793879
Scott's Creek Relocated Channel, located at Money Island, Bucks County, PA	First culvert crossing	40.125578	-74.776886
Non-Tidal Tributaries			
Buck Creek	Delaware Canal	40.243699	-74.838279
Dyers Creek	Delaware Canal	40.267098	-74.858495
Houghs Creek	Delaware Canal	40.28148	-74.865783
Jericho Creek	Delaware Canal	40.313984	-74.902899
Pidcock Creek	Delaware Canal	40.331508	-74.935788

Conservation Measures:

a. No work shall occur from March 15 to November 15, of any given year.

b. All Dredging shall be performed by a mechanical dredge and/or techniques (clamshell bucket etc.).

c. All work, including the installation of turbidity curtains and dewatering cofferdams, shall be performed during low tide or when the tide is waterward of the proposed work in all tidal waterbodies listed, or during periods of low or no flow in the non-tidal waterbodies listed.

d. Blasting is not authorized by the PASPGP-5 within the listed waterbodies.

e. Pile Driving:

   i. Piles shall not be greater than 12 inches in diameter;

   ii. Piles shall be installed using a vibratory hammer or an impact hammer provided noise attenuation devices (cushion blocks, etc.) are used, and a "soft start" is performed each day of pile driving. A "soft start" is the building up of power slowly during pile driving activities to allow for fish and other wildlife to leave the area; and

   iii. Pile driving activities shall be limited to no more than 12 hours per day.

   Any activity that cannot meet these conditions will be sent to the Corps as a Reporting Activity at which time the Corps will conduct project specific Section 7 Endangered Species Act consultation with NMFS.

36. **Migratory Birds and Bald and Golden Eagles:** The permittee is responsible for obtaining any "take" permits required under the U.S. Fish and Wildlife Service's regulation governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such "take" permits are required for a particular activity. Information on the conservation of migratory birds and Bald and Golden Eagles can be found at the following USFWS web site: http://www.fws.gov/northeast/pafo/

By Authority of the Secretary of the Army:

Edward P. Chamberlayne
Colonel, Corps of Engineers
District Engineer, Baltimore

Michael A. Bliss
Lieutenant Colonel, Corps of Engineers
District Engineer, Philadelphia

Bernard R. Lindstrom
Colonel, Corps of Engineers
District Engineer, Pittsburgh

Acknowledgment and Agreement for Compliance with Terms & Conditions of PASPGP-5

Project Number:

Project Location:

I hereby accept and agree to comply with the terms and conditions, of the PASPGP-5 authorizations, as stated.

_____ _____

Applicant's Signature Date

I hereby accept and agree to comply with the terms and conditions, of the PASPGP-5 authorizations, as stated.

_____ _____

Applicant's Contractor's Signature Date

_____

Contractor Name (please print)

_____

AREA CODE/TELEPHONE NO.

_____

_____

_____

_____

_____

ADDRESS

Please return form to

Philadelphia
U.S. Army Corps of Engineers
Philadelphia District
Regulatory Branch
Wanamaker Building 1631
100 Penn Square East
Philadelphia, PA 19107-3390

Baltimore
U.S. Army Corps of Engineers
Baltimore District
Regulatory Branch
South Atherton Street
Suite 101
State College, PA 16801-6260

Pittsburgh
U.S. Army Corps of Engineers
Pittsburgh District
Regulatory Branch
Federal Building, 20th floor
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

PASPGP-5 PERMIT COMPLIANCE, SELF-CERTIFICATION FORM

Project Name:	Indian Trail Park Stream Restoration Project	County:	Northampton
PADEP Permit No:	GP114802220-023, GP034802220-021	Date of Issuance:	July 20, 2020
Corps Permit Number:		Date of Issuance:	

In accordance with the compliance certification condition of your PASPGP-5 authorization, you are required to complete and sign this certification form and return it to the appropriate Corps of Engineers District in which the work is located. This can be done either by mailing to the below address, or through electronic submission to the e-mail address below.

☒ U.S. Army Corps of Engineers
Philadelphia District
Regulatory Branch
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390
or
NAPREGULATORY@usace.army.mil

☐ U.S. Army Corps of Engineers
Baltimore District
1631 South Atherton Street
Suite 101
State College, PA 16801-6260
or
NAB-Regulatory@usace.army.mil

☐ U.S. Army Corps of Engineers
Pittsburgh District
Regulatory Branch
Federal Building, 20th Floor
1000 Liberty Avenue
Pittsburgh, PA 15222-4186
or
Regulatory.permits@usace.army.mil

Please note that the permitted activity is subject to compliance inspections by U.S. Army Corps of Engineers representatives. As a condition of this permit, failure to return this notification form, provide the required information below, or to perform the authorized work in compliance with the permit, can result in suspension, modification or revocation of your authorization in accordance with 33 CFR Part 325.7 and/or administrative, civil, and/or criminal penalties, in accordance with 33 CFR part 326.

Please provide the following information:

1. Date authorized work commenced: _____

2. Date authorized work completed: _____

3. Was all work, including any required mitigation, completed in accordance with your PASPGP-5 authorization?
   ☐YES ☐ NO

4. Explain any deviations (use additional sheets if necessary)
   _____
   _____

5. Was compensatory wetland/stream mitigation accomplished through an approved Mitigation Bank and/or In-Lieu fee program?
   ☐YES ☐NO (if **YES,** attach proof of transaction, if **NO** complete Number 6 and 7 below).

6. Was permittee compensatory wetland and/or stream mitigation required? ☐ YES ☐ NO If **YES,** was the required compensatory mitigation completed in accordance with the permit and mitigation plan requirements? ☐ YES ☐ NO

7. Attach labeled color photographs showing completed work including any mitigation area(s).

I hereby certify that, except as noted above, that all work, including mitigation, has been completed in accordance with the terms and conditions, including special conditions of the above referenced permit.

(Permittee Signature): _____ (Telephone Number): _____

(Address): _____ (Email): _____
_____
_____

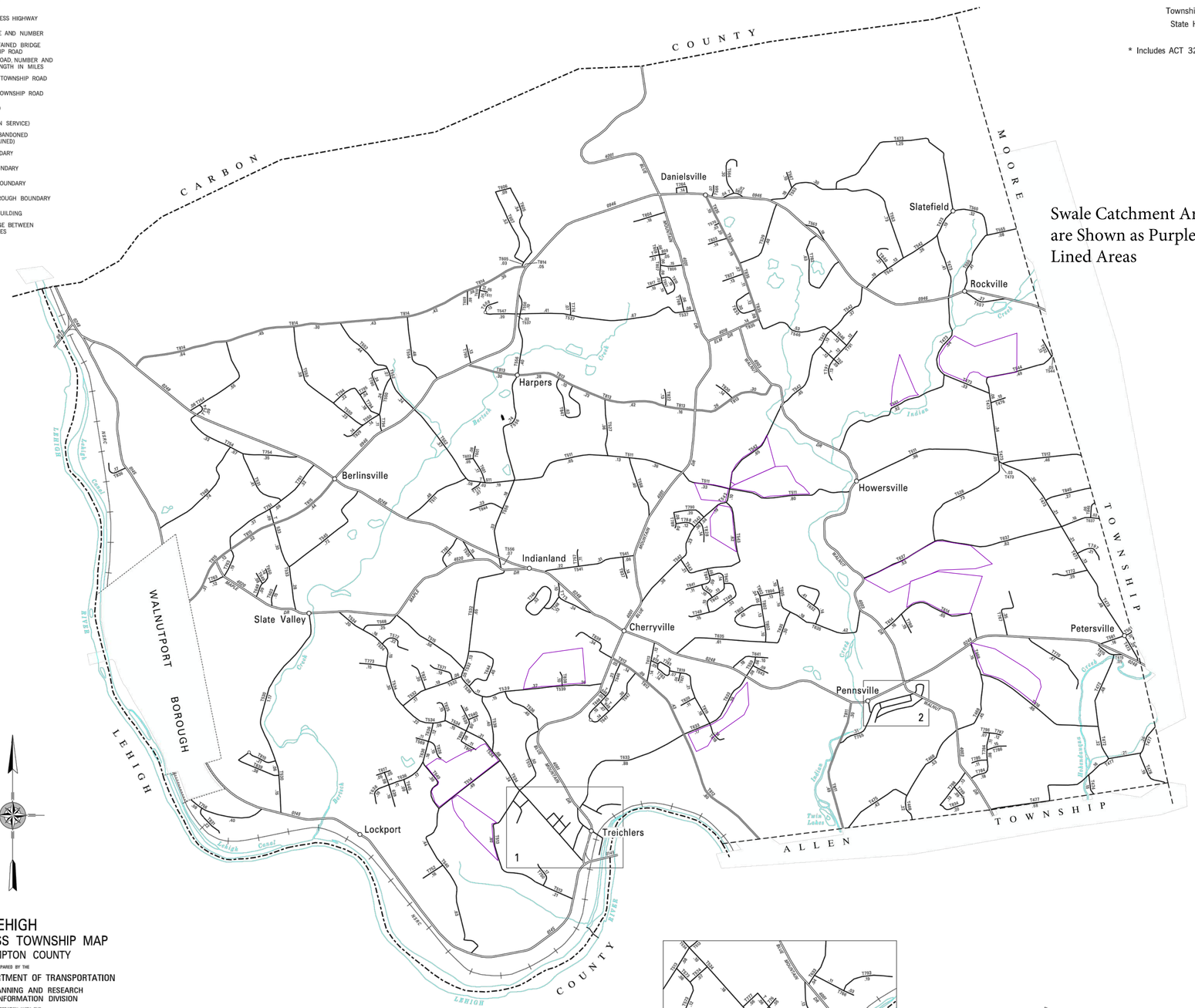
LEGEND

- LIMITED ACCESS HIGHWAY
- 0944 — STATE ROUTE AND NUMBER
- 3002 — STATE MAINTAINED BRIDGE ON TOWNSHIP ROAD
- T719 .34 — TOWNSHIP ROAD, NUMBER AND SEGMENT LENGTH IN MILES
- IMPASSABLE TOWNSHIP ROAD
- TURNBACK TOWNSHIP ROAD
- OTHER ROAD
- RAILROAD (IN SERVICE)
- RAILROAD ABANDONED (TRACK RETAINED)
- STATE BOUNDARY
- COUNTY BOUNDARY
- TOWNSHIP BOUNDARY
- CITY OR BOROUGH BOUNDARY
- MUNICIPAL BUILDING
- .70 / 2 — SPLIT MILEAGE BETWEEN MUNICIPALITIES

TOTAL MILES

Township Road System	91.00 *
State Highway System	31.79
Total	122.79

* Includes ACT 32 Turnback Mileage of 9.23



LEHIGH
SECOND CLASS TOWNSHIP MAP
NORTHAMPTON COUNTY

PREPARED BY THE

PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING AND RESEARCH
GEOGRAPHIC INFORMATION DIVISION

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

MUNICIPAL CODE 48 207

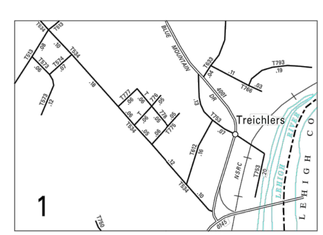
REVISED PER FORM 990 DATED 7-12-17

SCALE

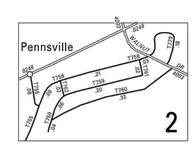
0 1500 3000 4500 FEET

0 375 750 1125 1500 METERS

(RECREATED BY RPL 08-08-01) (REVISED: 8-30-17)



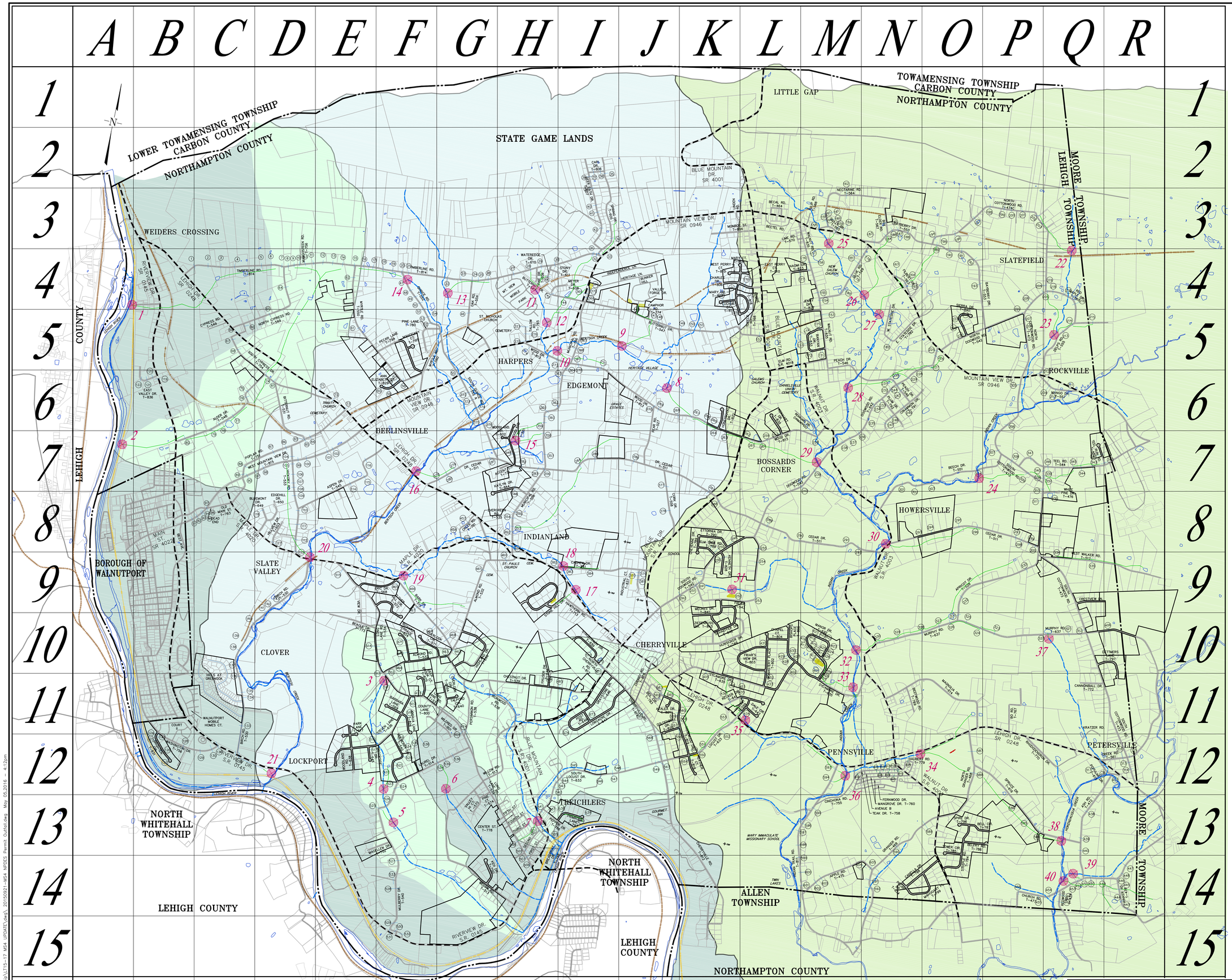
2:1



2:1

468 GRANGER RD
472 ASH RD
473 COTTONWOOD RD
474 REDWOOD RD
475 APPLE RD
476 WHITE PINE DR
477 CHURCH RD
478 RIMMER RD
511 CEDAR DR
512 WEST WALKER RD
513 WILLOW RD
514 LAUREL DR
515 BARK DR
527 PEAR RD
528 APRICOT DR
529 OLIVE RD
530 BIRCH RD
531 WALNUT RD
532 ALMOND RD
533 HICKORY RD
534 LONG LANE RD
535 EVERGREEN RD
536 IRONWOOD RD
537 BUTTERNUT DR
538 PERSIMMON RD
539 CHESTNUT DR
540 MULBERRY DR
541 CASHEW DR
542 DOGWOOD DR
543 FIR DR
544 TEEL RD
545 ASPEN DR
546 PEACH DR
547 ALDER DR
548 ALDER DR
550 MYRTLE RD
551 BEECH DR
552 QUINCE RD
553 BAYBERRY DR
554 OAK RD
555 DELPS RD
556 MUNICIPAL RD
557 MANGO DR
558 CORK RD
559 HICKORY RD
560 RED MAPLE DR
561 CREEK RD
563 FILBERT DR
564 NECTARINE RD
565 HOLLY DR
566 TULIP
567 BLACK ELDER RD
568 ERIC DR
569 BARBARA LA
570 LIME RD
571 OVERLOOK CIR
572 CLOVER HILL CIR
573 VALLEY HI CT
574 PINE CT
601 WOODLAND DR
602 WOODLAND CIR
603 HILLVIEW DR
604 MONROE ST
605 SPRING DR
606 CARL DR
607 DEER PATH DR
608 MEYER DR
609 ELM ST
610 MAYENBEIGE DR
611 STONY DR
612 SECOND ST
613 CHERRY RD
614 MAGNOLIA DR
615 POPLAR DR
616 SPRUCE DR
617 PARK LA
632 MANOR DR
633 LOCUST DR
635 SYCAMORE DR
636 STEVEN LA
637 MURPHY RD
638 WOODLAND RD
639 OVERLOOK CIR
640 TALFORD CIR
641 BECKER DR
643 GALE CIR
644 HIGHLAND DR
645 WOODLAND DR
646 GRAYSTONE DR
647 LONGACRE DR
648 OLD POST RD
649 BLUEMONT DR
650 EDGEHILL DR
713 HAWTHORN RD
748 STONE HILL DR
749 HUNSICKER DR
750 KERR DR
751 POPLAR DR
752 MAGELLAN DR
753 BREADFRUIT DR
754 CYPRESS DR
755 CINCHONA RD
756 WASHINGTON DR
757 BETHANY PL
758 ROSE DR
759 REGBUD DR
760 MANGROVE DR
761 FERNWOOD DR
762 KOLA RD
763 MAIN ST
764 BETEL RD
765 TALLOW RD
766 PEPPER DR
767 BO RD
768 TUPELO DR
769 BEEFWOOD RD
770 RHODODENDRON DR
771 ACCENT CT
772 CANNONBALL DR
773 BEAGLE DR
774 SECOND RD
775 THIRD ST
776 FOURTH ST
777 FIFTH ST
778 CENTER ST
779 DAUBERT RD
780 PINE LA
781 CREEK RD
782 SEASIDE DR
783 BELL CIR
784 STEEPLE RD
785 TOWER CIR
786 BELFRY RD
787 BELL CIR
788 ELM TREE RD
789 CHEYENNE DR
790 EXTONIA DR
791 CINNAMON DR
792 ROSE DR
793 PRIMROSE LA
794 PECAN LA
795 MAHOGANY CT
796 SPIRE DR
797 DEETWEES LA
798 CAMELLA DR
799 MAHOGANY PL
800 COUNTRY LA
801 WILDRED DR
802 MONASTERY PL
803 FRIARS VIEW DR
804 CHAPEL CT
805 BISHOPS PL
806 CHARLES DR
807 MARY DR
808 MARY DR
809 PERRY CT
810 YORKSHIRE RD
811 INDIAN TRAIL RD
812 CHERRYVILLE RD
813 WOOD DR
814 TIMBERLINE RD
815 MOUNTAIN VIEW DR
816 DEBBY CT
817 LUCILLE CT
818 HEATHER CT
819 ROSEWOOD DR
820 COLDENBELL DR
821 AZALEA DR
822 HONEYSUCKLE DR
823 NAOMI DR
824 RICHARD TER
825 DEER BROOK CT
826 SUNSET LA
827 JENNY DR
828 KENNETH DR
829 ANN ELIZABETH CT
830 REINHARD DR
831 BRIGHTON CIR
832 TEEL RUN RD
833 BANYAN DR
834 PECAN DR
835 WALNUT DR
836 EAST VALLEY DR
837 INDUSTRIAL CT
838 HAUSER DR
839 COATSBRIDGE LA
839 STAGECOACH DR
840 SIERRA DR
841 SCHAEFFER DR
842 SCHAEFFER DR
843 ZIEGENFUSS DR
844 KAELYN ESTATES DR
845 CRESTVIEW LA
846 RIDGEVIEW LA
847 DEL DR

TYPE 5 MAP LEHIGH TOWNSHIP NORTHAMPTON COUNTY PENNSYLVANIA



PLAN REPRODUCTION WARNING

THE PLAN HAS BEEN CREATED ON AN 36"x42" SHEET. FOR REDUCTIONS, REFER TO GRAPHIC SCALE.

THE PLANS HAVE BEEN CREATED FOR FULL COLOR PLOTTING. ANY SET OF THE PLANS THAT IS NOT PLOTTED IN FULL COLOR SHALL NOT BE CONSIDERED ADEQUATE FOR CONSTRUCTION PURPOSES.

WARNING: INFORMATION MAY BE LOST IN COPYING AND/OR GRAY SCALE PLOTTING.

MS4 OUTFALL LIST

MS4#	CREEK NAME	DESCRIPTION
1	LEHIGH RIVER	SURFACE CONVEYANCE
2	LEHIGH RIVER	SURFACE CONVEYANCE
3	TRIBUTARY TO LEHIGH RIVER	SURFACE CONVEYANCE
4	TRIBUTARY TO LEHIGH RIVER	SURFACE CONVEYANCE
5	TRIBUTARY TO LEHIGH RIVER	SURFACE CONVEYANCE
6	TRIBUTARY TO LEHIGH RIVER	SURFACE CONVEYANCE
7	TRIBUTARY TO LEHIGH RIVER	RELIEF CULVERT
8	BERTSCH CREEK	SURFACE CONVEYANCE
9	BERTSCH CREEK	SURFACE CONVEYANCE
10	BERTSCH CREEK	SURFACE CONVEYANCE
11	TRIBUTARY TO BERTSCH CREEK	SURFACE CONVEYANCE
12	TRIBUTARY TO BERTSCH CREEK	SURFACE CONVEYANCE
13	TRIBUTARY TO BERTSCH CREEK	SURFACE CONVEYANCE
14	TRIBUTARY TO BERTSCH CREEK	SURFACE CONVEYANCE
15	TRIBUTARY TO BERTSCH CREEK	SURFACE CONVEYANCE
16	BERTSCH CREEK	SURFACE CONVEYANCE
17	TRIBUTARY TO BERTSCH CREEK	SURFACE CONVEYANCE
18	TRIBUTARY TO BERTSCH CREEK	SURFACE CONVEYANCE
19	TRIBUTARY TO BERTSCH CREEK	SURFACE CONVEYANCE
20	BERTSCH CREEK	SURFACE CONVEYANCE
21	BERTSCH CREEK	RELIEF CULVERT
22	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
23	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
24	INDIAN CREEK	SURFACE CONVEYANCE
25	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
26	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
27	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
28	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
29	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
30	INDIAN CREEK	SURFACE CONVEYANCE
31	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
32	INDIAN CREEK	SURFACE CONVEYANCE
33	INDIAN CREEK	SURFACE CONVEYANCE
34	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
35	TRIBUTARY TO INDIAN CREEK	SURFACE CONVEYANCE
36	INDIAN CREEK	SURFACE CONVEYANCE
37	TRIBUTARY TO HOKENDAUQUA CREEK	RELIEF CULVERT
38	HOKENDAUQUA CREEK	SURFACE CONVEYANCE
39	TRIBUTARY TO HOKENDAUQUA CREEK	SURFACE CONVEYANCE
40	HOKENDAUQUA CREEK	SURFACE CONVEYANCE

LEGEND

- LOCAL ROAD
- INACTIVE RAILROAD
- ACTIVE RAILROAD
- DETENTION / RETENTION BASIN
- RELIEF CULVERT
- MS4 OUTFALL
- SURFACE WATER CONVEYANCE
- TRIBUTARY STREAM
- WATER BODY (POND, CREEK, RIVER)
- TOWNSHIP BOUNDARY

WATERSHEDS

- HOKENDAUQUA CREEK
- BERTSCH CREEK
- INTERMITTENT STREAM
- LEHIGH RIVER

GRAPHIC SCALE

1000 0 500 1000 2000 4000

(IN FEET)
1 inch = 1000 ft.

DRAFT

NO.	REVISIONS	DATE

LEHIGH TOWNSHIP MS4 WATERSHED MAP

LEHIGH TOWNSHIP
NORTHAMPTON COUNTY
PENNSYLVANIA

DRAWN BY: JDC
CHECKED BY: JER
DATE: 09-21-15
SCALE: 1" = 1000'
PROJECT NO. LT15-17
SHEET NO. 1 OF 1

Hanover Engineering Associates Inc
252 Brodhead Road, Suite 100
Bethlehem, PA 18017-8944
610.691.5644
Fax 610.691.6968

H:\Projects\Municipal\Lehigh Township\LT15-17 MS4 UPDATE\dwg\ 20150921-MS4 NPDES Permit Outfall.dwg May 05,2016 - 4:12pm

StreamStats Report Project 1

Region ID: PA
Workspace ID: PA20210611173553069000
Clicked Point (Latitude, Longitude): 40.75592, -75.50056
Time: 2021-06-11 13:36:26 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.093	square miles
CARBON	Percentage of area of carbonate rock		percent

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.093	square miles	1.42	1280
CARBON	Percent Carbonate		percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	8.05	ft^3/s
20-percent AEP flood	16.8	ft^3/s
10-percent AEP flood	24.8	ft^3/s
4-percent AEP flood	37.5	ft^3/s
2-percent AEP flood	48.9	ft^3/s
1-percent AEP flood	62	ft^3/s
0.5-percent AEP flood	76.9	ft^3/s
0.2-percent AEP flood	NaN	ft^3/s

Peak-Flow Statistics Citations

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 2

Region ID: PA
Workspace ID: PA20210611181630919000
Clicked Point (Latitude, Longitude): 40.74923, -75.54824
Time: 2021-06-11 14:17:04 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0756	square miles
CARBON	Percentage of area of carbonate rock	0	percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0756	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	8.73	ft^3/s
20-percent AEP flood	18.1	ft^3/s
10-percent AEP flood	26.8	ft^3/s
4-percent AEP flood	40.5	ft^3/s
2-percent AEP flood	52.7	ft^3/s
1-percent AEP flood	66.8	ft^3/s
0.5-percent AEP flood	82.8	ft^3/s
0.2-percent AEP flood	108	ft^3/s

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0478	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	4.13	ft^3/s
20-percent AEP flood	8.82	ft^3/s
10-percent AEP flood	13.2	ft^3/s
4-percent AEP flood	20.2	ft^3/s
2-percent AEP flood	26.5	ft^3/s
1-percent AEP flood	33.7	ft^3/s
0.5-percent AEP flood	42	ft^3/s
0.2-percent AEP flood	54.9	ft^3/s

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 4

Region ID: PA
Workspace ID: PA20210611182942355000
Clicked Point (Latitude, Longitude): 40.75904, -75.50620
Time: 2021-06-11 14:30:16 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.114	square miles
CARBON	Percentage of area of carbonate rock	0	percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.114	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	10.4	ft^3/s
20-percent AEP flood	21.5	ft^3/s
10-percent AEP flood	31.6	ft^3/s
4-percent AEP flood	47.6	ft^3/s
2-percent AEP flood	61.9	ft^3/s
1-percent AEP flood	78.4	ft^3/s
0.5-percent AEP flood	97	ft^3/s
0.2-percent AEP flood	126	ft^3/s

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 5

Region ID: PA
Workspace ID: PA20210611183524067000
Clicked Point (Latitude, Longitude): 40.77530, -75.50242
Time: 2021-06-11 14:35:58 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.026	square miles
CARBON	Percentage of area of carbonate rock	0	percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.026	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	1.5	ft^3/s
20-percent AEP flood	3.33	ft^3/s
10-percent AEP flood	5.06	ft^3/s
4-percent AEP flood	7.88	ft^3/s
2-percent AEP flood	10.4	ft^3/s
1-percent AEP flood	13.4	ft^3/s
0.5-percent AEP flood	16.8	ft^3/s
0.2-percent AEP flood	22.1	ft^3/s

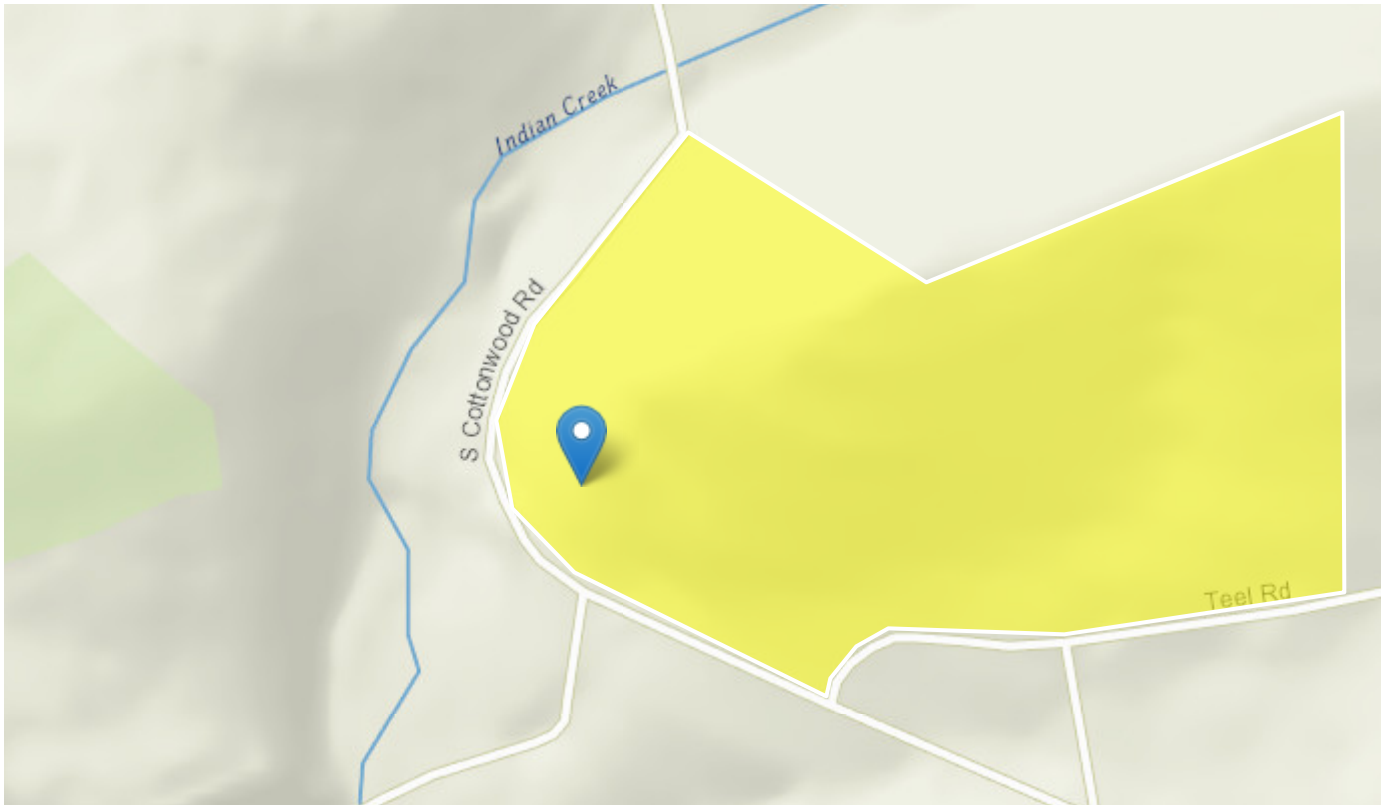
Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 6

Region ID: PA
Workspace ID: PA20210611184005431000
Clicked Point (Latitude, Longitude): 40.77825, -75.49850
Time: 2021-06-11 14:40:40 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.108	square miles
CARBON	Percentage of area of carbonate rock		percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.108	square miles	1.42	1280
CARBON	Percent Carbonate		percent	0	100

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit

Peak-Flow Statistics Citations

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 7

Region ID: PA
Workspace ID: PA20210611184504656000
Clicked Point (Latitude, Longitude): 40.74965, -75.49430
Time: 2021-06-11 14:45:37 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.069	square miles
CARBON	Percentage of area of carbonate rock	0	percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.069	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	7.27	ft^3/s
20-percent AEP flood	15.2	ft^3/s
10-percent AEP flood	22.5	ft^3/s
4-percent AEP flood	34.1	ft^3/s
2-percent AEP flood	44.5	ft^3/s
1-percent AEP flood	56.5	ft^3/s
0.5-percent AEP flood	70.1	ft^3/s
0.2-percent AEP flood	91.3	ft^3/s

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 8

Region ID: PA
Workspace ID: PA20210611184953880000
Clicked Point (Latitude, Longitude): 40.73898, -75.56223
Time: 2021-06-11 14:50:27 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.086	square miles
CARBON	Percentage of area of carbonate rock	0	percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.086	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	9.41	ft^3/s
20-percent AEP flood	19.5	ft^3/s
10-percent AEP flood	28.7	ft^3/s
4-percent AEP flood	43.4	ft^3/s
2-percent AEP flood	56.5	ft^3/s
1-percent AEP flood	71.6	ft^3/s
0.5-percent AEP flood	88.7	ft^3/s
0.2-percent AEP flood	115	ft^3/s

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 9

Region ID: PA
Workspace ID: PA20210611185638562000
Clicked Point (Latitude, Longitude): 40.76709, -75.52212
Time: 2021-06-11 14:57:11 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.096	square miles
CARBON	Percentage of area of carbonate rock	0	percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.096	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	10.4	ft^3/s
20-percent AEP flood	21.5	ft^3/s
10-percent AEP flood	31.6	ft^3/s
4-percent AEP flood	47.6	ft^3/s
2-percent AEP flood	61.9	ft^3/s
1-percent AEP flood	78.4	ft^3/s
0.5-percent AEP flood	97	ft^3/s
0.2-percent AEP flood	126	ft^3/s

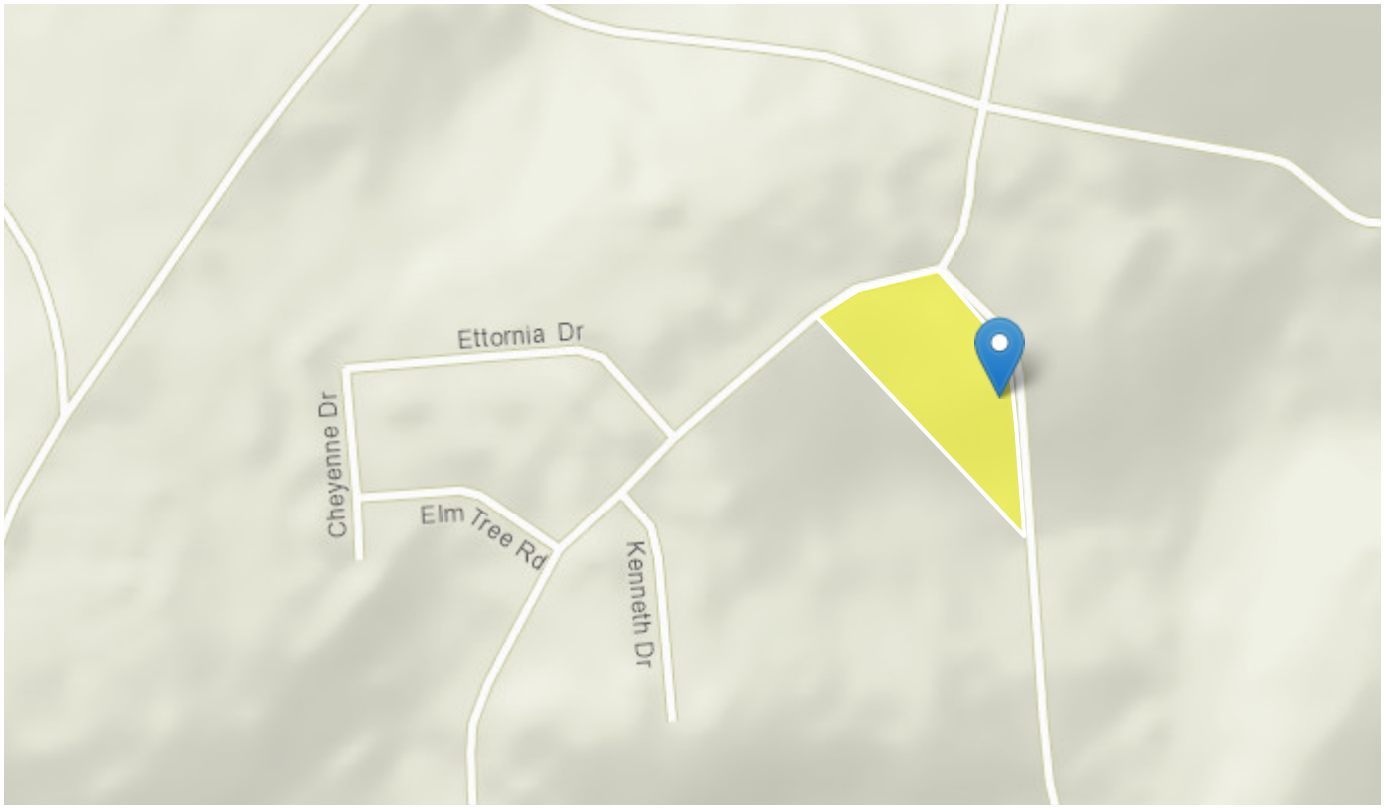
Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 10

Region ID: PA
Workspace ID: PA20210611190106238000
Clicked Point (Latitude, Longitude): 40.76486, -75.52508
Time: 2021-06-11 15:01:38 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.033	square miles
CARBON	Percentage of area of carbonate rock	0	percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.033	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	1.15	ft^3/s
20-percent AEP flood	2.57	ft^3/s
10-percent AEP flood	3.92	ft^3/s
4-percent AEP flood	6.13	ft^3/s
2-percent AEP flood	8.12	ft^3/s
1-percent AEP flood	10.5	ft^3/s
0.5-percent AEP flood	13.1	ft^3/s
0.2-percent AEP flood	17.3	ft^3/s

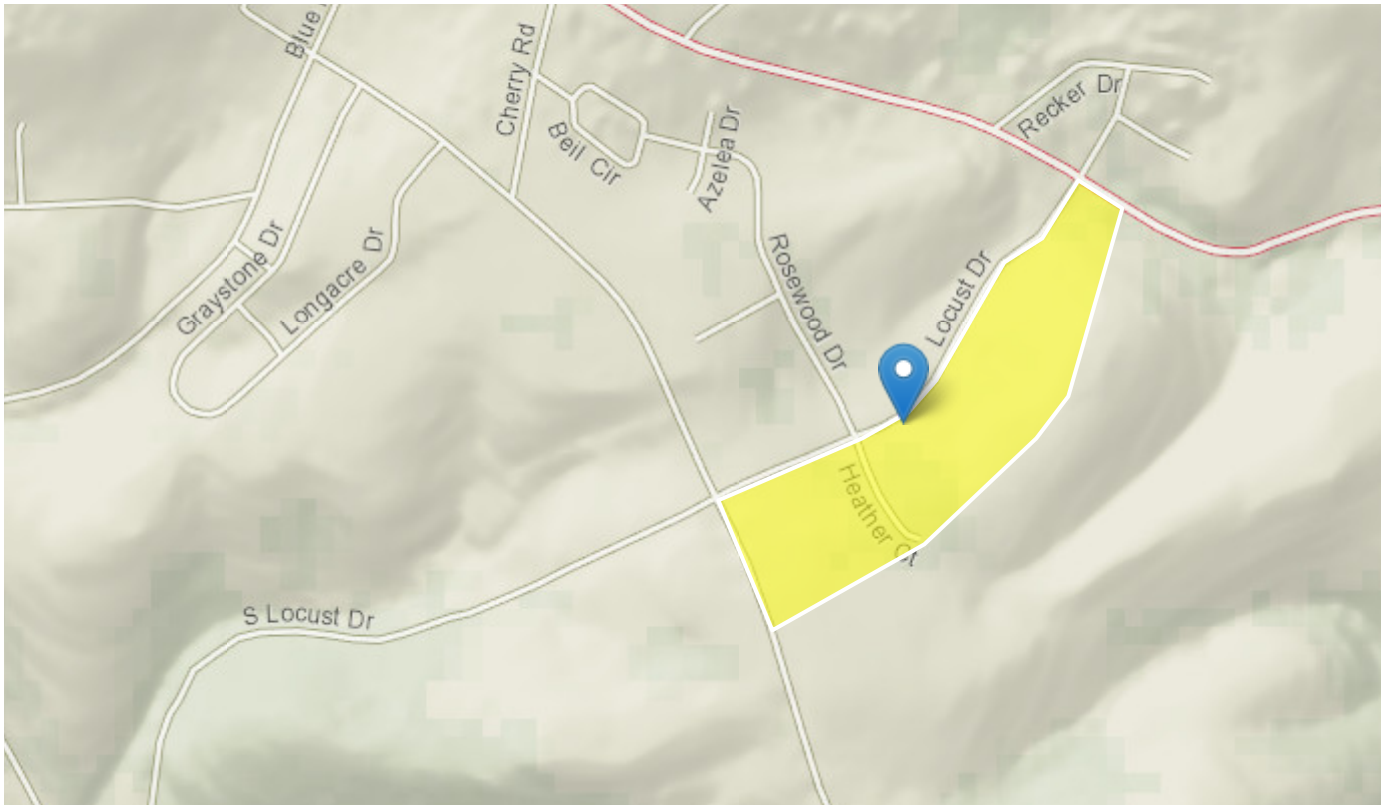
Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2

StreamStats Report Project 11

Region ID: PA
Workspace ID: PA20210611190637140000
Clicked Point (Latitude, Longitude): 40.74555, -75.52747
Time: 2021-06-11 15:07:10 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.046	square miles
CARBON	Percentage of area of carbonate rock	0	percent

General Disclaimers

Peak-Flow Statistics Parameters [Peak Flow Region 3 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.046	square miles	1.42	1280
CARBON	Percent Carbonate	0	percent	0	100

Peak-Flow Statistics Disclaimers [Peak Flow Region 3 SIR 2019 5094]

Peak-Flow Statistics Flow Report [Peak Flow Region 3 SIR 2019 5094]

Statistic	Value	Unit
50-percent AEP flood	7.51	ft^3/s
20-percent AEP flood	15.7	ft^3/s
10-percent AEP flood	23.2	ft^3/s
4-percent AEP flood	35.2	ft^3/s
2-percent AEP flood	45.9	ft^3/s
1-percent AEP flood	58.2	ft^3/s
0.5-percent AEP flood	72.3	ft^3/s
0.2-percent AEP flood	94.1	ft^3/s

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https:// doi.org/10.3133/sir20195094)

Application Version: 4.5.3
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2