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AUGUST 2017

**NPDES STORMWATER DISCHARGES FROM SMALL MS4s
POLLUTANT REDUCTION PLAN**

**FALLOWFIELD TOWNSHIP
WASHINGTON COUNTY, PENNSYLVANIA**

HRG Project No. 006048.0431

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**POLLUTANT REDUCTION PLAN
FALLOWFIELD TOWNSHIP
WASHINGTON COUNTY, PENNSYLVANIA**

A. Public Participation

The PRP was made available to the public on TBD via TBD (Appendix A).

A public notice was published by Fallowfield Township in TBD on TBD (Appendix B). The notice contained a statement describing the PRP, where it may be reviewed by the public, and the length of time the municipality would provide for the receipt of comments.

Comments from the public were received by mail, email, and at TBD on TBD (Appendix C). Most of the comments noted: TBD.

Once the comments were reviewed by the municipality and engineer, the PRP was adjusted by TBD.

B. Map

The map for the PRP is attached in Appendix D. All relevant information pertaining to the PRP is presented on the map. The map is in GIS format and contains data from reliable sources: Fallowfield Township, DCNR, PA EMAP, PASDA, and PennDOT.

The drainage areas for the MS4 outfalls are shown on the map, but the drainage areas are not extended past the municipal boundary of Fallowfield Township and do not include state/railroad right-of-ways in order to define the MS4 planning area. Drainage areas for private and state storm sewer systems were not determined.

C. Pollutants of Concern

A breakdown of the MS4 outfalls, drainage areas, stream names, impairments, and subsequent sediment/nutrients loading designations are available in Appendix E. A summary of Appendix E is shown below in Table No. 1. Please see Appendix F, G, and H for more information regarding the relevant watersheds and streams for the permit.

The pollutants of concern are sediment and nutrients. Sediment and nutrients are the pollutant of concern for Maple Creek and Pigeon Creek while sediment is the pollutant of concern for Trib 39804 to the Monongahela River. Fallowfield Township's MS4 outfalls discharge to Maple Creek, Trib 39812/39816 to Maple Creek, Trib 39804 to the Monongahela River, Pigeon Creek, and Trib 39676/39677 to Pigeon Creek.

Table No. 1 Outfall Drainage Areas				
Stream Name	Impairments	Sediment/Nutrients Loading Designation	Number of MS4 Outfalls	Total Drainage Area (acres)
Maple Creek	Small Residential Runoff – Organic Enrichment/Low D.O. ; Abandoned Mine Drainage – Metals ; Road Runoff – Siltation ; Natural Sources – Water/Flow Variability	Sediment and Nutrients	20	126.941
Trib 39812 to Maple Creek			5	31.790
Trib 39816 to Maple Creek			2	8.607
Monongahela River	Source Unknown – PCB	None	N/A for PRP	N/A for PRP
Trib 39804 to Monongahela River	Road Runoff – Siltation	Sediment	2	6.949
Pigeon Creek	None	Sediment and Nutrients (Pigeon Creek)	1	1.606
Trib 39676 to Pigeon Creek			1	1.373
Trib 39677 to Pigeon Creek			7	44.856

D. Determining Existing Loading for Pollutants of Concern

The existing loading rate was determined in July 2017 based on the available data at the time. DEP’s simplified method was used to calculate the existing loading rate.

The planning area is defined as the drainage areas of the MS4 outfalls, as shown in Appendix D. The drainage areas shown on the map are not extended past the municipal boundary of Fallowfield Township and do not include state/railroad right-of-ways in order to define the MS4 planning area. The planning area for Fallowfield Township is 222.121 acres (sum of total drainage areas from Table No. 1). However, some of the planning area is located outside of the urbanized area. The planning area inside the urbanized area is 197.135 acres and the planning area outside of the urbanized area is 24.986 acres.

Only the existing loading rate for sediment was analyzed for Fallowfield Township – the loading rate for nutrients was ignored. As stated in the PRP instructions, “PRPs may use a presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% TP reduction.” The total existing sediment loading rate for Fallowfield Township is approximately 113,963 lbs/year (see Appendix I and J for loading rates and land cover estimates).

Table No. 2				
Existing Loading Rate				
Category	Land Cover	Existing Sediment Loading Rate (lbs/acre/yr)	Area (acres)	Existing Sediment Loading Rate (lbs/year)
Inside Urbanized Area	17% Impervious Developed	1,839	33.513	61,630
Inside Urbanized Area	83% Pervious Developed	264.96	163.622	43,353
Outside Urbanized Area	6% Impervious Developed	1,839	1.499	2,757
Outside Urbanized Area	94% Pervious Developed	264.96	23.487	6,223

E. Select BMPs to Achieve the Minimum Required Reductions in Pollutant Loading

The minimum required reduction in pollutant loading for Fallowfield Township is 10% of the existing sediment loading rate for the municipality. Therefore, the required reduction is 10% of 113,963 lbs/year (11,396 lbs/year).

One BMP is proposed to achieve the minimum required reduction in pollutant loading: Vegetated Open Channels (C/D Soils).

Vegetated Open Channels (C/D Soils) are proposed as a BMP and will require grading/widening, rototilling of the soil, an erosion control liner (most likely straw net), and seeding. Additional cross pipes under driveways are considered incidental to the BMP. C/D soils are assumed due to the proximity of the channels to roadway runoff. The sediment loading reduction for vegetated open channels was calculated by multiplying the BMP effectiveness value by the distribution of impervious/pervious developed sediment loading rate (per the simplified method) and by the drainage area of the proposed channels. The vegetated channels will treat runoff that discharges to Maple Creek and Pigeon Creek.

Table No. 3						
Vegetated Open Channels (C/D Soils)						
Location	Drainage Area (acres)	Impervious Developed (lbs/year)	Pervious Developed (lbs/year)	Sediment Loading Rate (lbs/year)	BMP Effectiveness Value	Sediment Loading Reduction (lbs/year)
Colvin Road	40.303	6.852 (17%)	33.451 (83%)	21,464	50%	10,732
Kennedy Road	54.251	3.255 (6%)	50.996 (94%)	19,498	50%	9,749

In total, the proposed BMPs will reduce Fallowfield Township's sediment loading by 20,481 lbs/year (18.0%). The proposed reduction is larger than the required reduction in order to provide redundancy when the proposed channels are constructed.

Table No. 4	
Pollutant Loading Reduction Summary	
Existing Sediment Loading (lbs/year)	113,963
Minimum Required Reduction (lbs/year)	11,396
Vegetated Open Channels (C/D Soils) (lbs/year)	20,481
Total Proposed Reduction (lbs/year)	20,481
Difference Between Proposed and Required Reduction (lbs/year)	9,085

F. Identify Funding Mechanisms

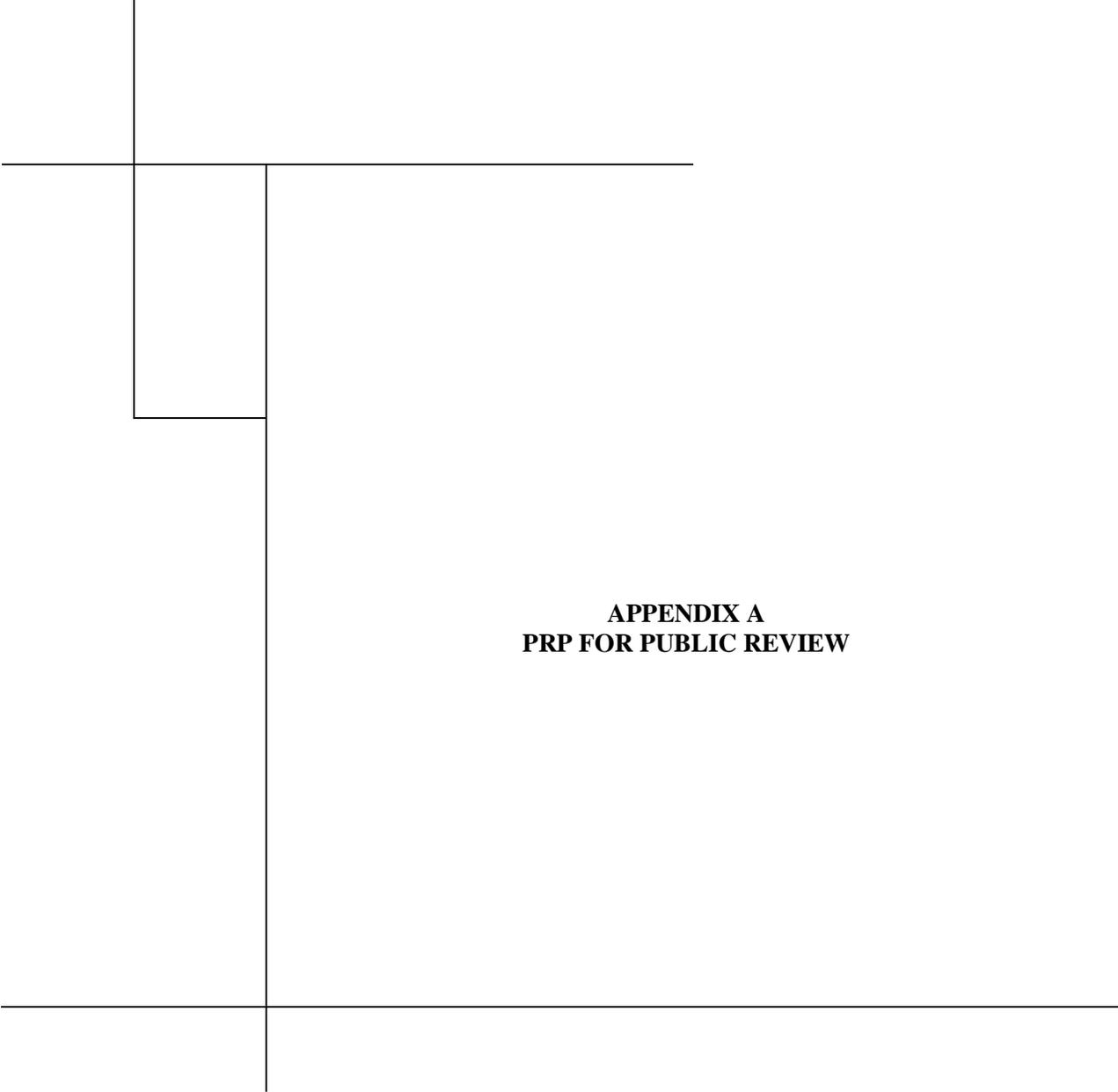
Several funding opportunities are available for the proposed BMP (see below). The estimated initial cost and estimated yearly O&M cost of the proposed BMP were determined by information provided in the Pennsylvania Stormwater Best Management Practices Manual. Please see Appendix M for a breakdown of the cost estimates and Appendix N for more information regarding potential funding sources.

Table No. 5			
Funding Opportunities			
BMP	Estimated Initial Cost	Estimated Yearly O&M Cost	Potential Funding Source
Vegetated Open Channels (C/D Soils)	\$39,600	\$6,600	Stormwater Fee BMP Construction – PENNVEST Growing Greener Grants

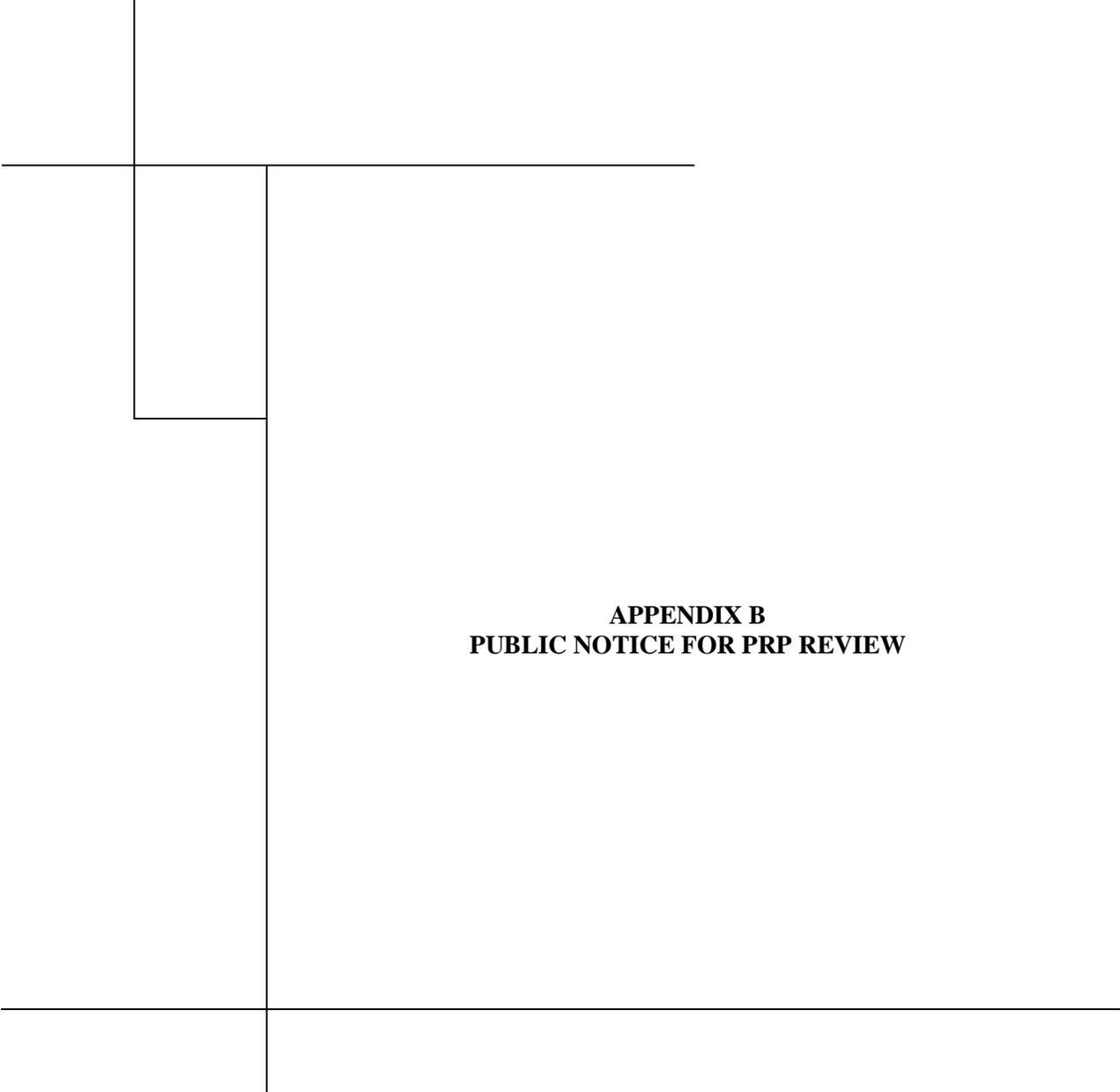
G. Identify Responsible Parties for Operation and Maintenance (O&M) of BMPs

The proposed BMP will require operation and maintenance schedules in order for the BMP to produce the expected pollutant reductions. The parties responsible for ongoing O&M, the activities involved with O&M for the BMP, and the frequency at which O&M activities will occur are listed below. Please see Appendix O and the Pennsylvania Stormwater BMP Manual for more information regarding O&M activity and frequency for the BMP.

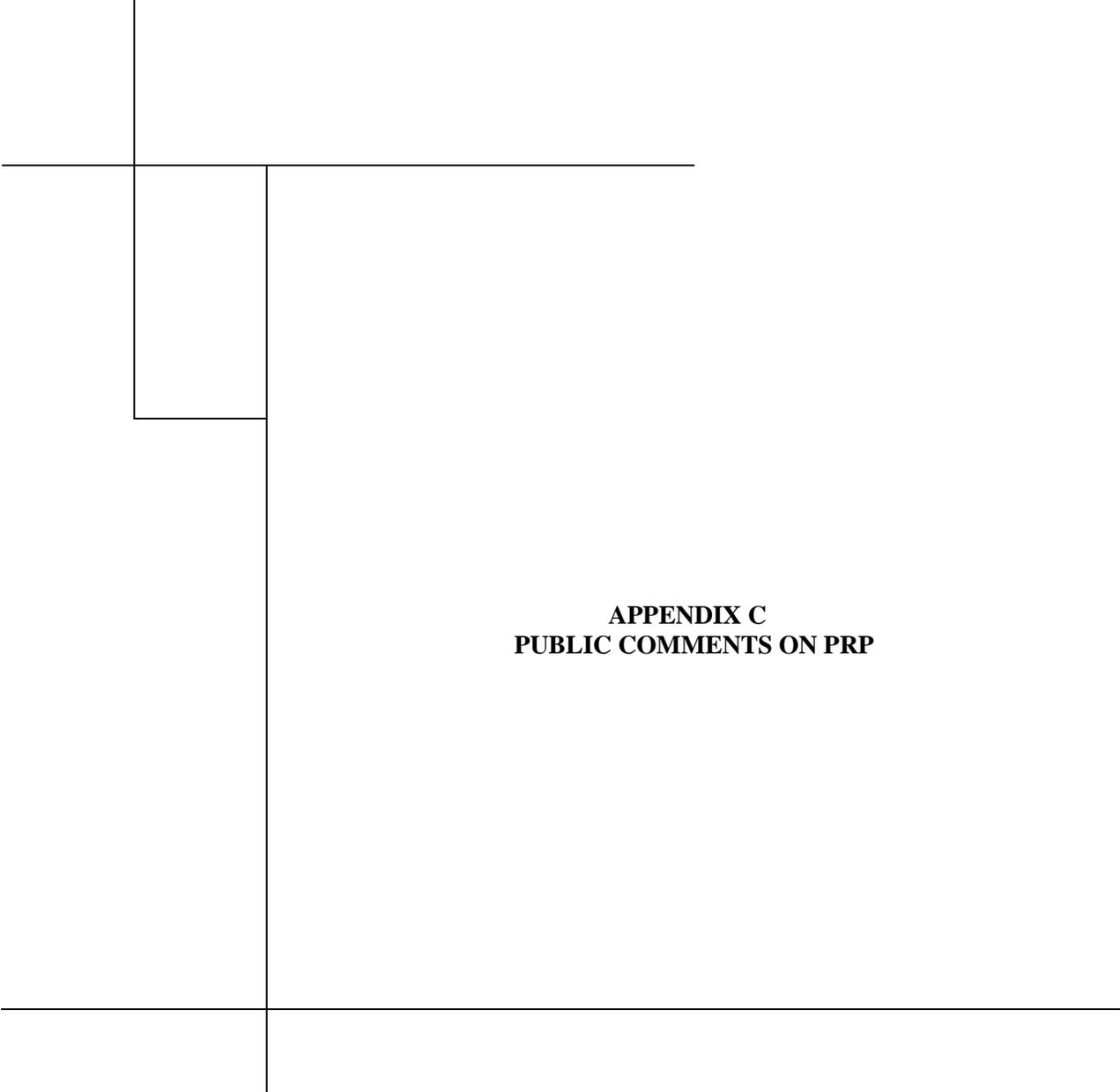
Table No. 6		
Operation and Maintenance of BMPs		
BMP	Responsible Party	O&M Activity and Frequency
Vegetated Open Channels (C/D Soils)	Fallowfield Township DPW Staff	See Appendix O and Pennsylvania Stormwater BMP Manual Section 6.4.8



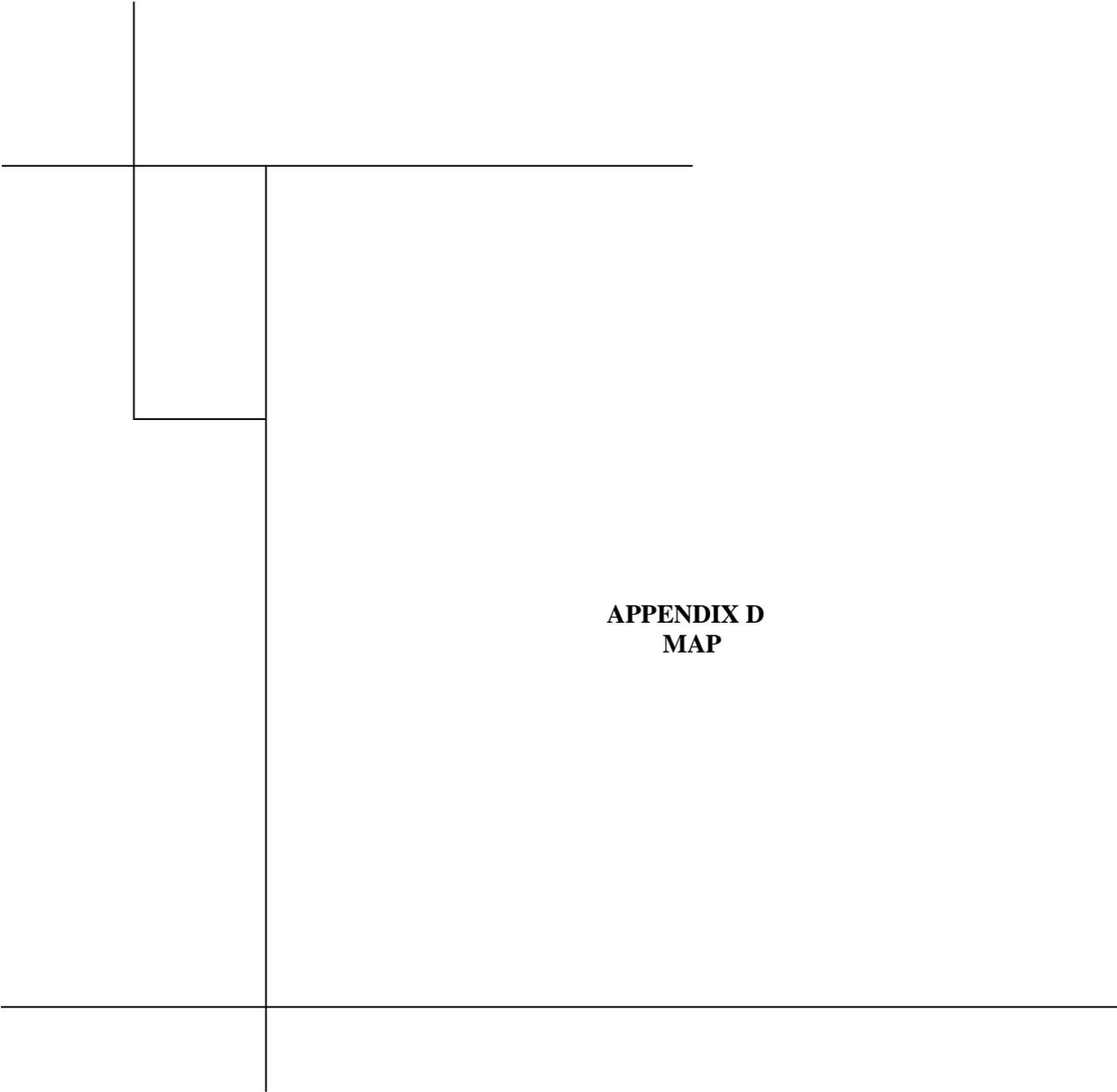
APPENDIX A
PRP FOR PUBLIC REVIEW



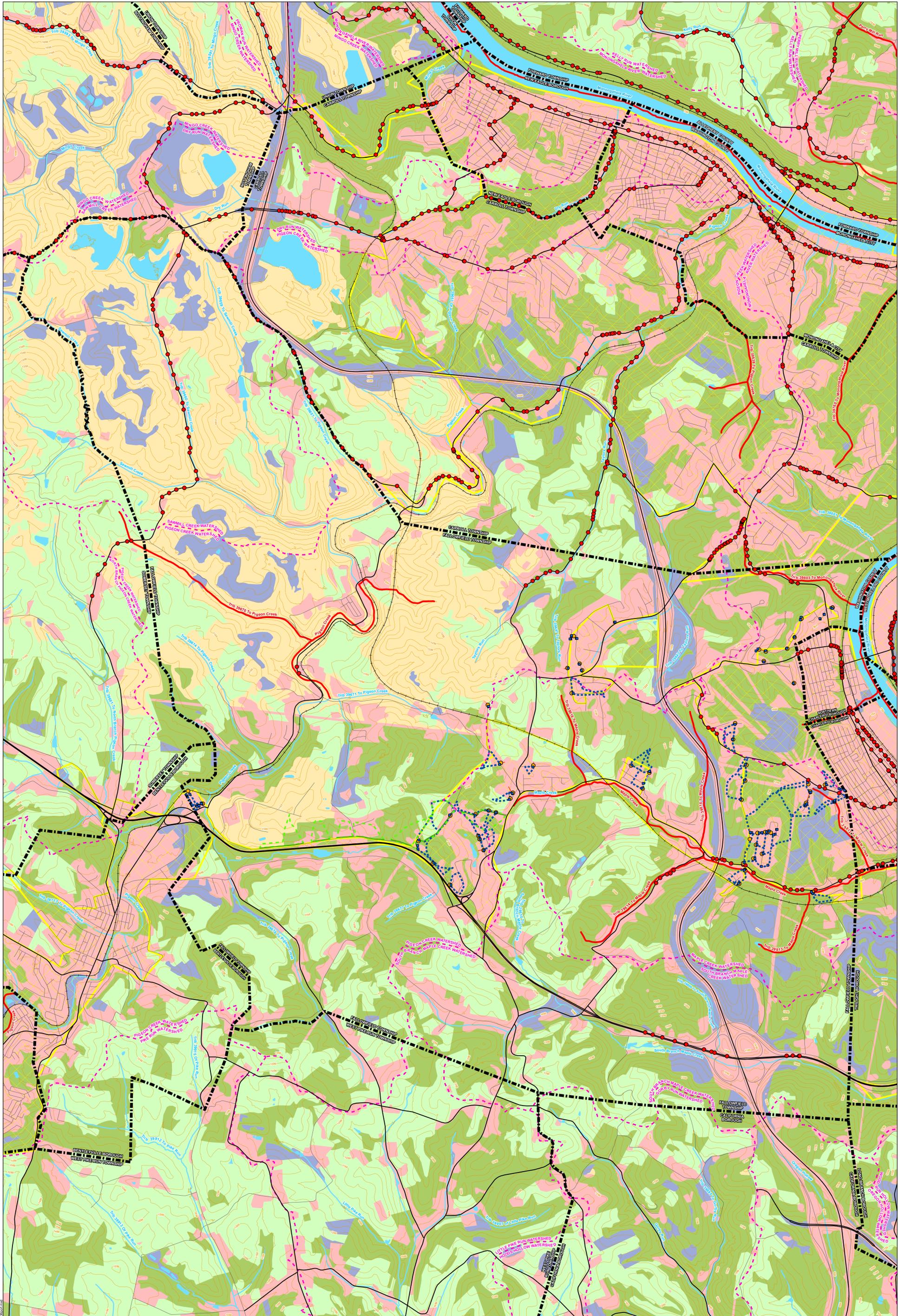
**APPENDIX B
PUBLIC NOTICE FOR PRP REVIEW**



**APPENDIX C
PUBLIC COMMENTS ON PRP**



**APPENDIX D
MAP**



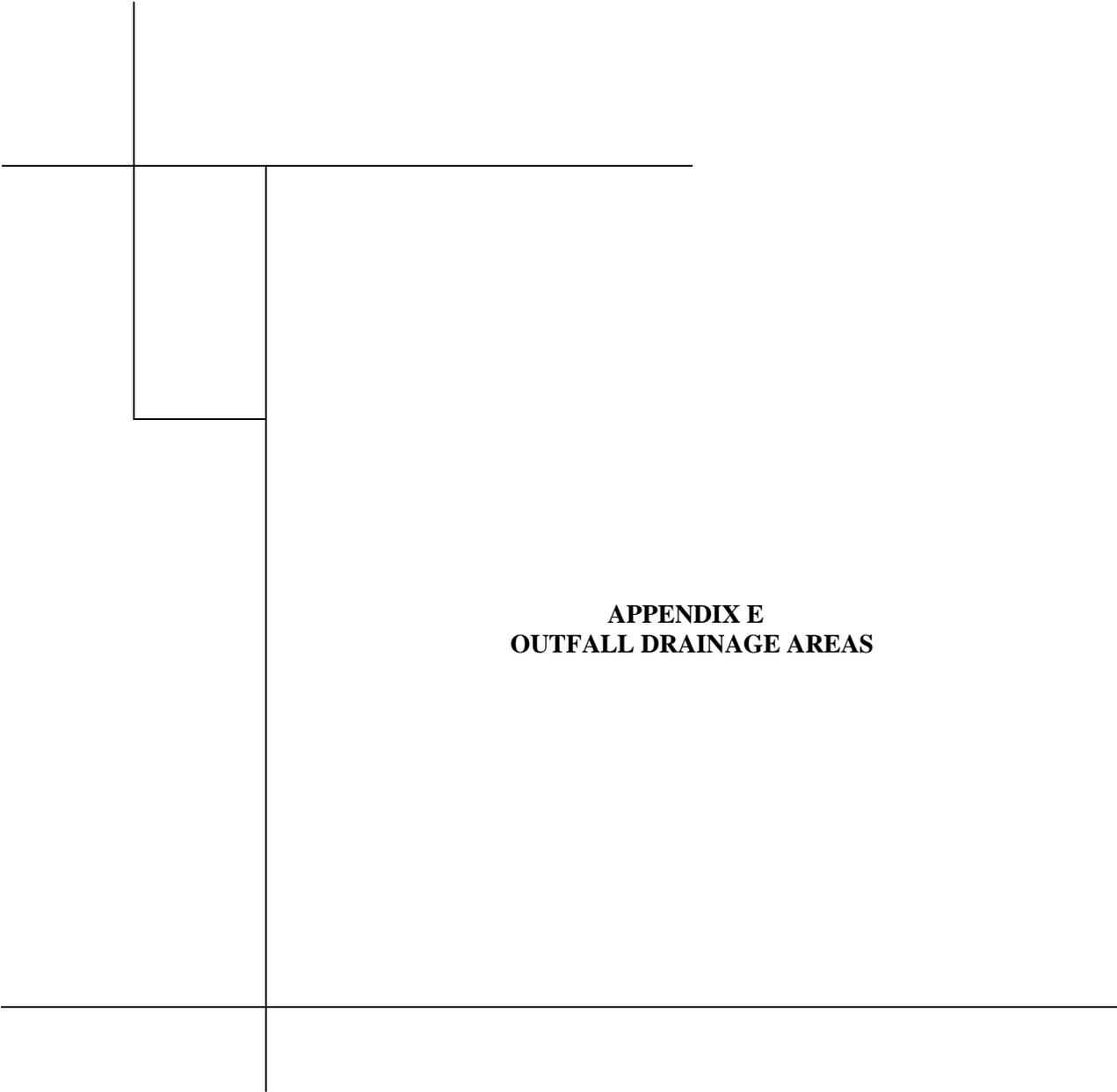
1:500
0 1,500 Feet

Mapping derived from data provided by EPCAMR, PA DEP, PAMAP, PennDOT, SPC, US Census, and USGS
7/28/2017 | PM:RLA | GIS:HMG | QA:BSL | R006048.0431

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<ul style="list-style-type: none"> ■ Inlet ● Outfall ● State Drainage Feature — Pipe — Culvert 	<ul style="list-style-type: none"> — Swale — Vegetated Channel — Vegetated Channel Drainage Area — Storm Sewer Shed — Watershed 	<ul style="list-style-type: none"> — 50' Contour — Local Road — State Road — Railroad — Impaired Stream 	<ul style="list-style-type: none"> — County Boundary — Municipal Boundary — Urban Area (2010) 	<p>Land Use</p> <ul style="list-style-type: none"> ■ Agricultural ■ Barren Land ■ Forest 	<ul style="list-style-type: none"> ■ Rangeland ■ Urban Built-Up ■ Water
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MS4 Map
Fallowfield Township
Washington County, Pennsylvania



APPENDIX E
OUTFALL DRAINAGE AREAS

Outfall Drainage Areas

Stream Name		Maple Creek			
Impairments		Small Residential Runoff – Organic Enrichment/Low D.O. ; Abandoned Mine Drainage – Metals ; Road Runoff – Siltation ; Natural Sources – Water/Flow Variability			
Sediment/Nutrients Loading Designation		Sediment and Nutrients			
Number of MS4 Outfalls		20			
Total Drainage Area		126.941 acres			
Structure ID	Area (acres)	Structure ID	Area (acres)	Structure ID	Area (acres)
OF10	4.528	OF8	0.419	P23	4.266
OF11	3.242	OF9	4.367	P24	4.441
OF12	7.526	P13	3.804	P26	3.754
OF13	48.543	P14	6.235	P27	5.767
OF14	7.499	P15	2.517	P32	3.145
OF15	1.183	P18	2.107	P42	10.680
OF16	2.572	P19	0.345		

Stream Name		Trib 39812 to Maple Creek			
Impairments		Small Residential Runoff – Organic Enrichment/Low D.O. ; Abandoned Mine Drainage – Metals ; Road Runoff – Siltation ; Natural Sources – Water/Flow Variability			
Sediment/Nutrients Loading Designation		Sediment and Nutrients			
Number of MS4 Outfalls		5			
Total Drainage Area		31.790 acres			
Structure ID	Area (acres)	Structure ID	Area (acres)	Structure ID	Area (acres)
OF17	18.892	OF19	2.537	P44	4.309
OF18	2.809	OF200	3.243		

Stream Name		Trib 39816 to Maple Creek			
Impairments		Small Residential Runoff – Organic Enrichment/Low D.O. ; Abandoned Mine Drainage – Metals ; Road Runoff – Siltation ; Natural Sources – Water/Flow Variability			
Sediment/Nutrients Loading Designation		Sediment and Nutrients			
Number of MS4 Outfalls		2			
Total Drainage Area		8.607 acres			
Structure ID	Area (acres)	Structure ID	Area (acres)	Structure ID	Area (acres)
OF28	7.457	OF7	1.149		

Stream Name			Trib 39804 to Monongahela River		
Impairments			Road Runoff – Siltation		
Sediment/Nutrients Loading Designation			Sediment		
Number of MS4 Outfalls			2		
Total Drainage Area			6.949 acres		
Structure ID	Area (acres)	Structure ID	Area (acres)	Structure ID	Area (acres)
OF20	4.350	OF21	2.599		

Stream Name			Pigeon Creek		
Impairments			None		
Sediment/Nutrients Loading Designation			Sediment and Nutrients (Pigeon Creek)		
Number of MS4 Outfalls			1		
Total Drainage Area			1.606 acres		
Structure ID	Area (acres)	Structure ID	Area (acres)	Structure ID	Area (acres)
OF1	1.606				

Stream Name			Trib 39676 to Pigeon Creek		
Impairments			None		
Sediment/Nutrients Loading Designation			Sediment and Nutrients (Pigeon Creek)		
Number of MS4 Outfalls			1		
Total Drainage Area			1.373 acres		
Structure ID	Area (acres)	Structure ID	Area (acres)	Structure ID	Area (acres)
P6	1.373				

Stream Name			Trib 39677 to Pigeon Creek		
Impairments			None		
Sediment/Nutrients Loading Designation			Sediment and Nutrients (Pigeon Creek)		
Number of MS4 Outfalls			7		
Total Drainage Area			44.856 acres		
Structure ID	Area (acres)	Structure ID	Area (acres)	Structure ID	Area (acres)
OF201	5.788	OF6	6.157	P17	2.676
OF3	8.481	P12	15.141		
OF5	1.437	P16	5.176		



Patrick McDonnell, Secretary

Tom Wolf, Governor

MS4 Requirements

MS4 Requirements

BACKGROUND

Municipalities and other entities such as universities and prisons that meet certain standards must obtain NPDES permit coverage for discharges of stormwater from their municipal separate storm sewer systems (MS4s).

A municipal separate storm sewer is any conveyance or system of conveyances (including but not limited to streets, ditches, and pipes) that is: owned by a municipality or other public body (created under state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater or other wastes; designed or used for collecting or conveying stormwater; not a combined sewer (i.e., not intended for both sewage and stormwater); AND not part of a publicly owned treatment works (POTW).

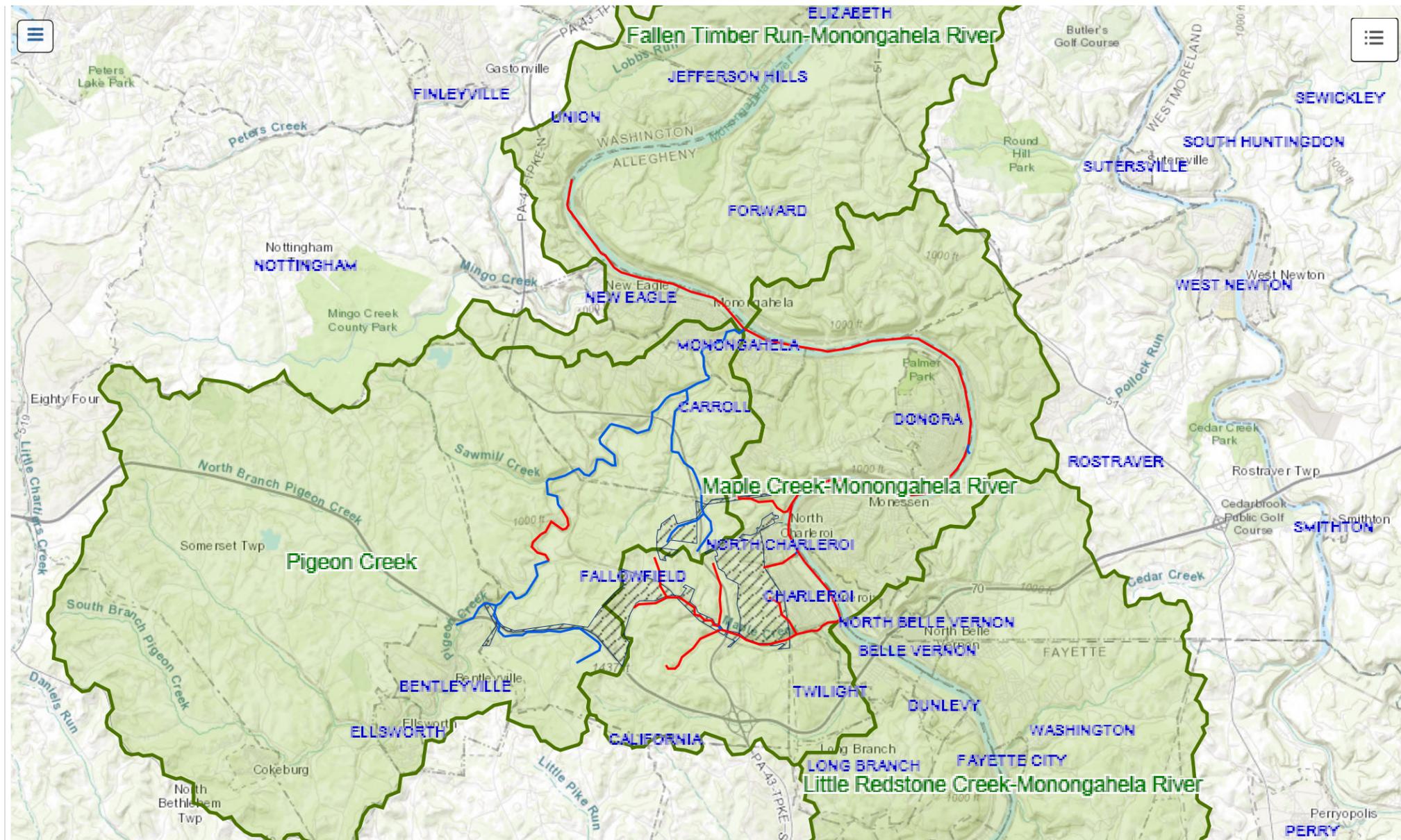
Additional information regarding permitting requirements can be found at the [Pennsylvania Municipal Stormwater Homepage](#).

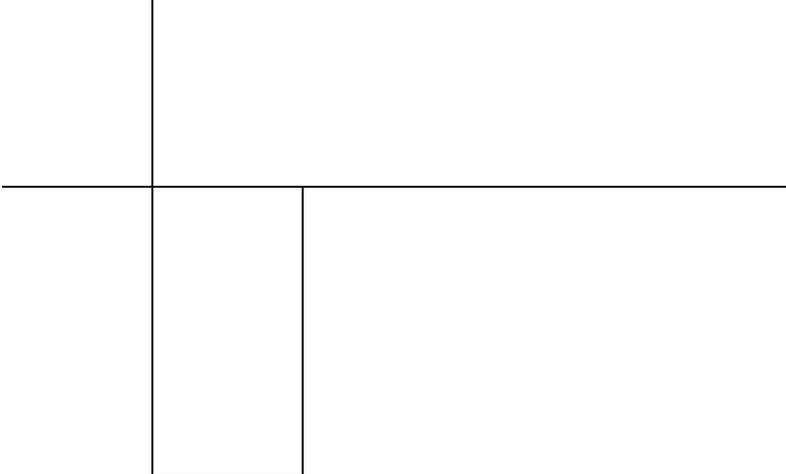
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Select a County

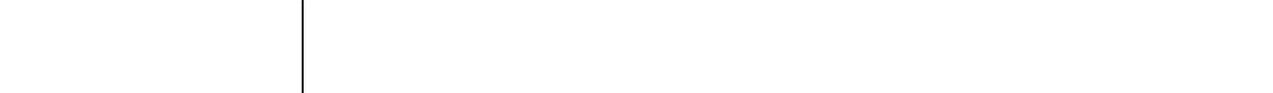
WASHINGTON ▼

Select a Municipality

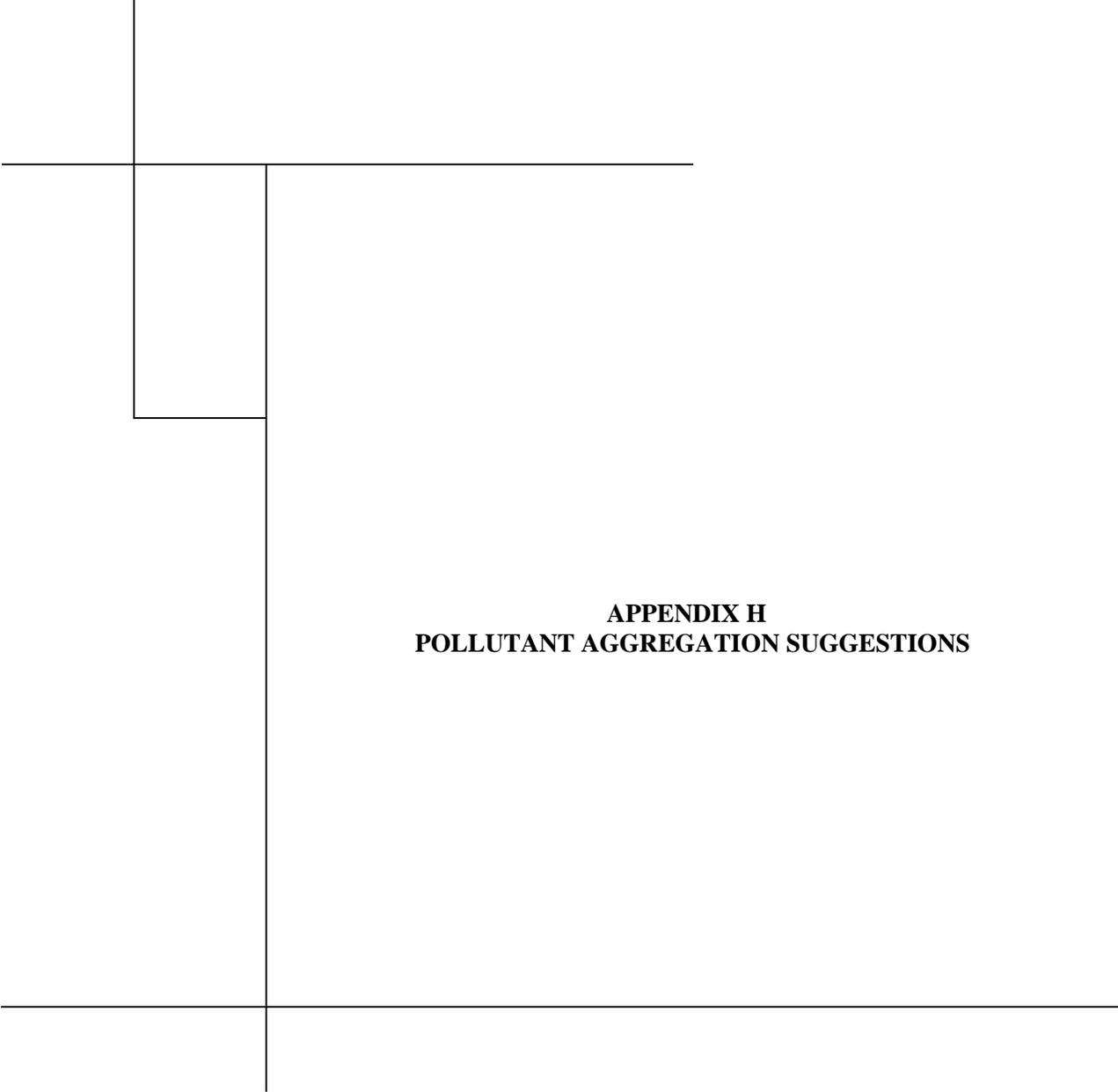




**APPENDIX G
REQUIREMENTS TABLE**

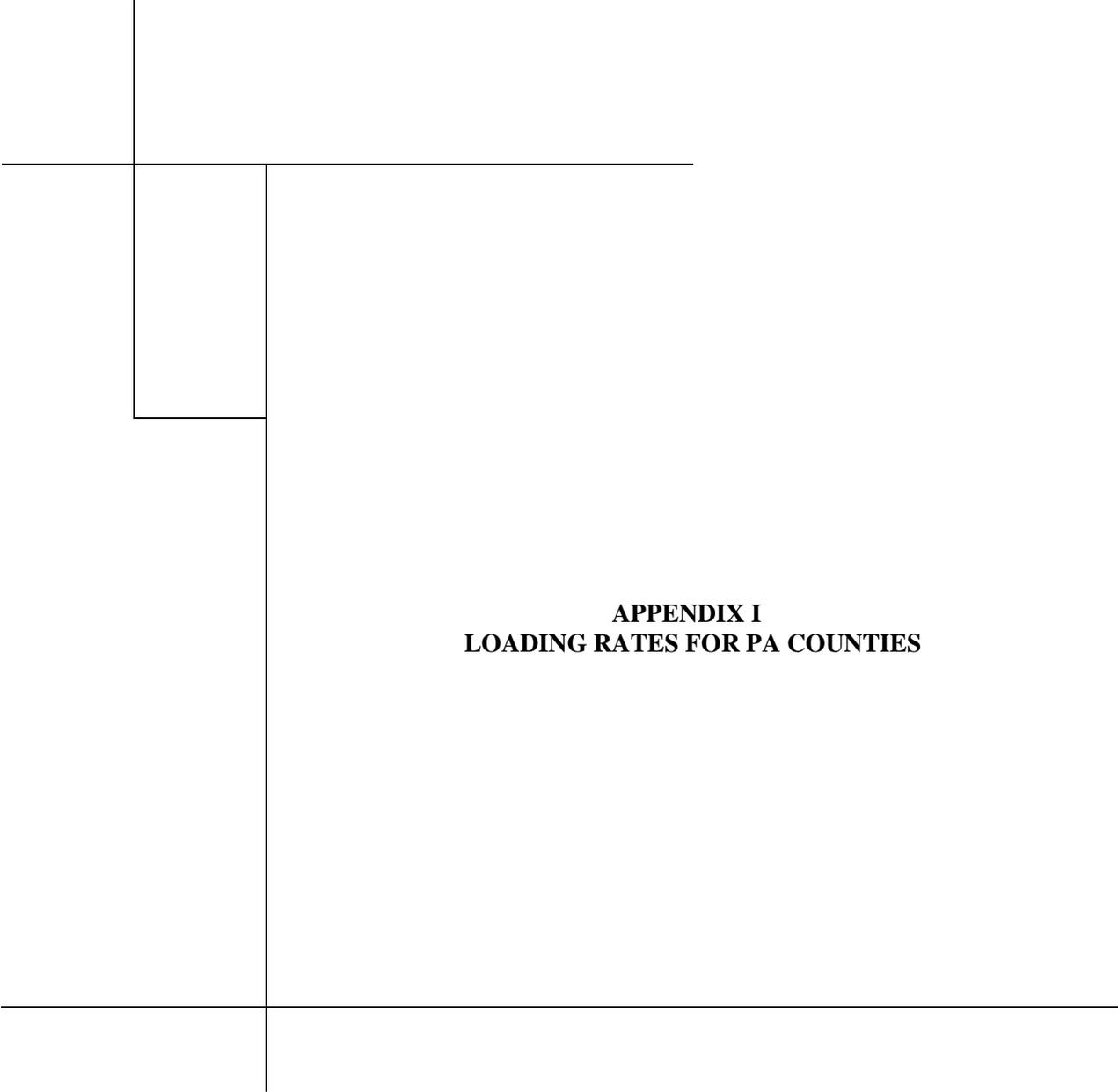


MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Washington County						
FALLOWFIELD TWP	PAG136105	No		Monongahela River	Appendix C-PCB (4a)	
				Pigeon Creek	Appendix E-Organic Enrichment/Low D.O., Siltation (5)	
				Maple Creek	Appendix A-Metals (5), Appendix E-Organic Enrichment/Low D.O., Siltation (5)	Water/Flow Variability (4c)
				Unnamed Tributaries to Monongahela River	Appendix A-Metals (5), Appendix E-Siltation (5)	
FINLEYVILLE BORO	PAG136347*	No		Peters Creek	Appendix A-Metals (4a), Appendix B-Pathogens (5), Appendix E-Nutrients (5)	Cause Unknown (5)
HANOVER TWP	PAG136265	No			No known water quality impairments at this time. Must comply with all other permit requirements.	
HOUSTON BORO	PAG136213	No		Unnamed Tributaries to Chartiers Creek		Other Habitat Alterations (4c)
				Chartiers Creek	Appendix A-Metals (4a), Appendix C-PCB (4a), Appendix E-Suspended Solids (4a), Appendix B-Pathogens (5), Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation (5)	TDS, Turbidity (5)
				Chartiers Run	Appendix A-Metals (4a), Appendix E-Suspended Solids (4a), Appendix B-Pathogens (5), Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation (5)	Turbidity (5)
				Plum Run	Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation (4a)	Other Habitat Alterations (4c)
MCDONALD BORO	PAG136235	No		Robb Run	Appendix A-Metals (4a)	
				Robinson Run	Appendix A-Metals (4a), Appendix E-Nutrients, Organic Enrichment/Low D.O. (5)	Cause Unknown (5)
MIDWAY BORO		No		Robinson Run	Appendix A-Metals (4a), Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation (5)	
MONONGAHELA CITY	PAG136129	No		Unnamed Tributaries to Pigeon Creek	Appendix A-Metals (5), Appendix E-Organic Enrichment/Low D.O., Siltation (5)	
				Unnamed Tributaries to Monongahela River	Appendix A-Metals (5)	
				Monongahela River	Appendix C-PCB (4a)	
MOUNT PLEASANT TWP		No		Millers Run	Appendix A-Metals (4a), Appendix E-Suspended Solids (4a), Appendix E-Nutrients, Siltation (5)	Cause Unknown, TDS, Turbidity (5)
				Robinson Run	Appendix A-Metals (4a), Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation (5)	
NEW EAGLE BORO	PAG136262	No		Monongahela River	Appendix C-PCB (4a)	



APPENDIX H
POLLUTANT AGGREGATION SUGGESTIONS

MS4 Name	Permit Number	HUC 12 Name	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)
Washington County				
COAL CENTER BORO		Little Redstone Creek-Monongahela River, Maple Creek-Monongahela River	Monongahela River	Appendix C-PCB
DONORA BORO	PAG136256	Fallen Timber Run-Monongahela River, Maple Creek-Monongahela River	Monongahela River	Appendix C-PCB
		Maple Creek-Monongahela River	Unnamed Tributaries to Monongahela River	Appendix E-Organic Enrichment/Low D.O., Siltation
DUNLEVY BORO	PAG136132	Little Redstone Creek-Monongahela River, Maple Creek-Monongahela River	Monongahela River	Appendix C-PCB
EAST WASHINGTON BORO	PAG136364	Middle Chartiers Creek, Upper Chartiers Creek	Catfish Creek, Chartiers Creek	Appendix B-Pathogens, Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation, Suspended Solids
		Middle Chartiers Creek	Chartiers Creek	Appendix C-PCB
		Upper Chartiers Creek	Catfish Creek, Chartiers Creek	Appendix A-Metals
ELCO BORO	PAG136319	Little Redstone Creek-Monongahela River	Unnamed Tributaries to Monongahela River	Appendix E-Organic Enrichment/Low D.O., Siltation
		Little Redstone Creek-Monongahela River, Maple Creek-Monongahela River	Monongahela River	Appendix C-PCB
ELLSWORTH BORO	PAG136350	Pigeon Creek	Pigeon Creek	Appendix E-Organic Enrichment/Low D.O., Siltation
FALLOWFIELD TWP	PAG136105	Little Redstone Creek-Monongahela River, Maple Creek-Monongahela River	Maple Creek, Unnamed Tributaries to Monongahela River	Appendix A-Metals
		Fallen Timber Run-Monongahela River, Maple Creek-Monongahela River	Monongahela River	Appendix C-PCB
		Little Redstone Creek-Monongahela River, Maple Creek-Monongahela River, Pigeon Creek	Maple Creek, Pigeon Creek, Unnamed Tributaries to Monongahela River	Appendix E-Organic Enrichment/Low D.O., Siltation
FINLEYVILLE BORO	PAG136347	Piney Fork-Peters Creek	Peters Creek	Appendix A-Metals, Appendix B-Pathogens, Appendix E-Nutrients
HOUSTON BORO	PAG136213	Chartiers Run, Middle Chartiers Creek	Chartiers Creek, Chartiers Run	Appendix B-Pathogens
		Chartiers Run, Middle Chartiers Creek, Upper Chartiers Creek	Chartiers Creek, Chartiers Run, Plum Run	Appendix A-Metals, Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation, Suspended Solids
		Middle Chartiers Creek	Chartiers Creek	Appendix C-PCB
MCDONALD BORO	PAG136235	Robinson Run	Robb Run, Robinson Run	Appendix A-Metals, Appendix E-Nutrients, Organic Enrichment/Low D.O.
MIDWAY BORO		Robinson Run	Robinson Run	Appendix A-Metals, Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation
MONONGAHELA CITY	PAG136129	Maple Creek-Monongahela River, Pigeon Creek	Unnamed Tributaries to Monongahela River, Unnamed Tributaries to Pigeon Creek	Appendix A-Metals
		Fallen Timber Run-Monongahela River, Maple Creek-Monongahela River	Monongahela River	Appendix C-PCB
		Pigeon Creek	Unnamed Tributaries to Pigeon Creek	Appendix E-Organic Enrichment/Low D.O., Siltation



**APPENDIX I
LOADING RATES FOR PA COUNTIES**

ATTACHMENT B

DEVELOPED LAND LOADING RATES FOR PA COUNTIES^{1,2,3}

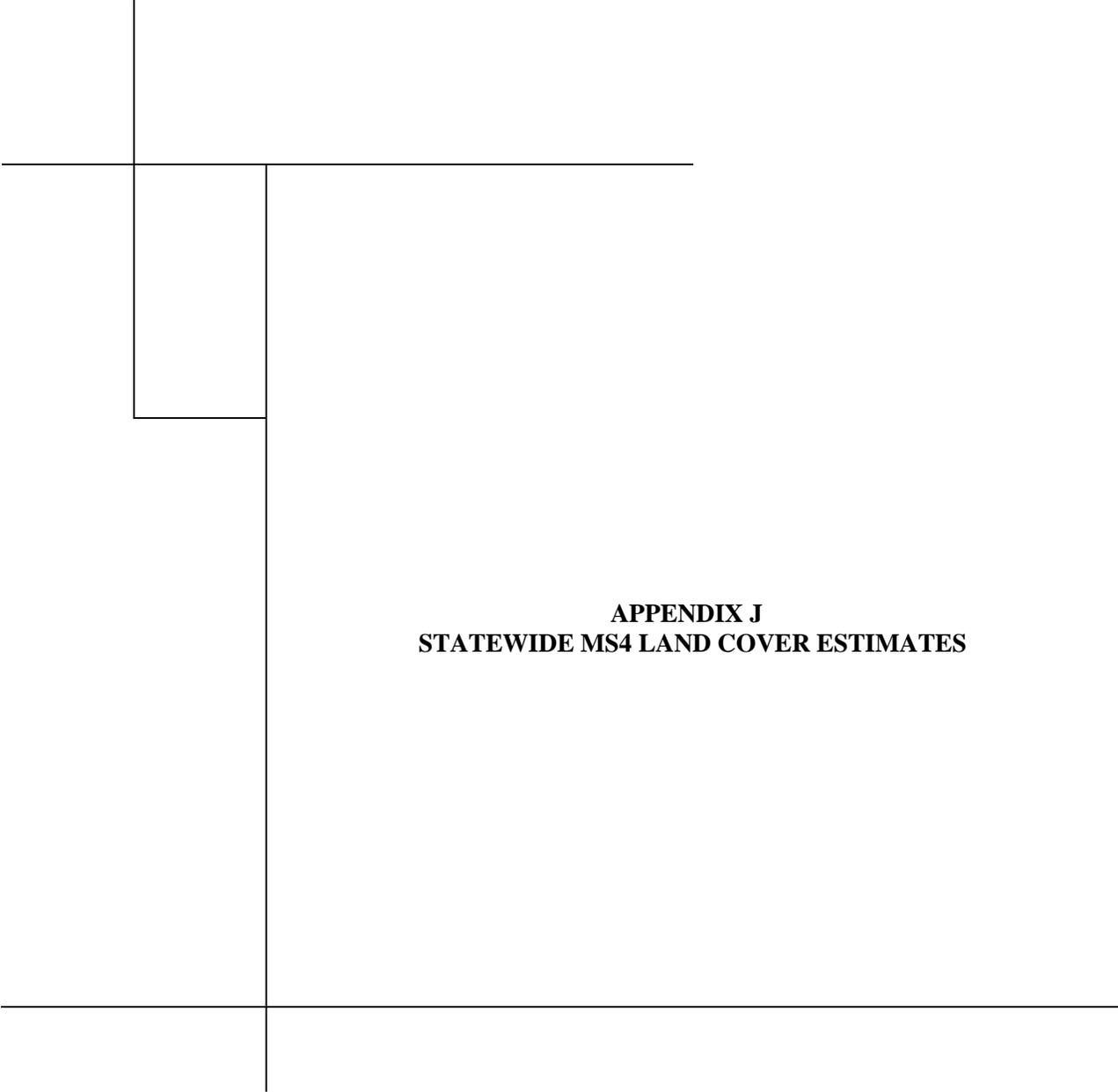
County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
Adams	impervious developed	10,373.2	33.43	2.1	1,398.77
	pervious developed	44,028.6	22.99	0.8	207.67
Bedford	impervious developed	9,815.2	19.42	1.9	2,034.34
	pervious developed	19,425	17.97	0.68	301.22
Berks	impervious developed	1,292.4	36.81	2.26	1,925.79
	pervious developed	5,178.8	34.02	0.98	264.29
Blair	impervious developed	3,587.9	20.88	1.73	1,813.55
	pervious developed	9,177.5	18.9	0.62	267.34
Bradford	impervious developed	10,423	14.82	2.37	1,880.87
	pervious developed	23,709.7	13.05	0.85	272.25
Cambria	impervious developed	3,237.9	20.91	2.9	2,155.29
	pervious developed	8,455.4	19.86	1.12	325.3
Cameron	impervious developed	1,743.2	18.46	2.98	2,574.49
	pervious developed	1,334.5	19.41	1.21	379.36
Carbon	impervious developed	25.1	28.61	3.97	2,177.04
	pervious developed	54.2	30.37	2.04	323.36
Centre	impervious developed	7,828.2	19.21	2.32	1,771.63
	pervious developed	15,037.1	18.52	0.61	215.84
Chester	impervious developed	1,838.4	21.15	1.46	1,504.78
	pervious developed	10,439.8	14.09	0.36	185.12
Clearfield	impervious developed	9,638.5	17.54	2.78	1,902.9
	pervious developed	17,444.3	18.89	1.05	266.62
Clinton	impervious developed	7,238.5	18.02	2.80	1,856.91
	pervious developed	11,153.8	16.88	0.92	275.81
Columbia	impervious developed	7,343.1	21.21	3.08	1,929.18
	pervious developed	21,848.2	22.15	1.22	280.39
Cumberland	impervious developed	8,774.8	28.93	1.11	2,065.1
	pervious developed	26,908.6	23.29	0.34	306.95
Dauphin	impervious developed	3,482.4	28.59	1.07	1,999.14
	pervious developed	9,405.8	21.24	0.34	299.62
Elks	impervious developed	1,317.7	18.91	2.91	1,556.93
	pervious developed	1,250.1	19.32	1.19	239.85
Franklin	impervious developed	13,832.3	31.6	2.72	1,944.85
	pervious developed	49,908.6	24.37	0.76	308.31
Fulton	impervious developed	3,712.9	22.28	2.41	1,586.75
	pervious developed	4,462.3	18.75	0.91	236.54
Huntington	impervious developed	7,321.9	18.58	1.63	1,647.53
	pervious developed	11,375.4	17.8	0.61	260.15
Indiana	impervious developed	589	19.29	2.79	1,621.25
	pervious developed	972	20.1	1.16	220.68
Jefferson	impervious developed	21.4	18.07	2.76	1,369.63
	pervious developed	20.4	19.96	1.24	198.60
Juniata	impervious developed	3,770.2	22.58	1.69	1,903.96
	pervious developed	8,928.3	17.84	0.55	260.68
Lackawana	impervious developed	2,969.7	19.89	2.84	1,305.05
	pervious developed	7,783.9	17.51	0.76	132.98
Lancaster	impervious developed	4,918.7	38.53	1.55	1,480.43
	pervious developed	21,649.7	22.24	0.36	190.93
Lebanon	impervious developed	1,192.1	40.58	1.85	1,948.53
	pervious developed	5,150	27.11	0.4	269.81
Luzerne	impervious developed	5,857	20.43	3	1,648.22
	pervious developed	13,482.9	19.46	0.98	221.19
Lycoming	impervious developed	10,031.7	16.48	2.57	1,989.64
	pervious developed	19,995.5	16	0.84	277.38

County	Category	Acres	TN lbs/acre/yr	TP lbs/acre/yr	TSS (Sediment) lbs/acre/yr
McKean	impervious developed	38.7	20.93	3.21	1,843.27
	pervious developed	5.3	22.58	1.45	249.26
Mifflin	impervious developed	5,560.2	21.83	1.79	1,979.13
	pervious developed	16,405.5	21.13	0.71	296.07
Montour	impervious developed	5,560.2	21.83	1.79	1,979.13
	pervious developed	16,405.5	21.13	0.71	296.07
Northumberland	impervious developed	8,687.3	25.73	1.54	2,197.08
	pervious developed	25,168.3	24.63	0.54	367.84
Perry	impervious developed	5,041.1	26.77	1.32	2,314.7
	pervious developed	9,977	23.94	0.51	343.16
Potter	impervious developed	2,936.3	16.95	2.75	1,728.34
	pervious developed	2,699.3	17.11	1.09	265.2
Schuylkill	impervious developed	5,638.7	30.49	1.56	1,921.08
	pervious developed	14,797.2	29.41	0.57	264.04
Snyder	impervious developed	4,934.2	28.6	1.11	2,068.16
	pervious developed	14,718.1	24.35	0.4	301.5
Somerset	impervious developed	1,013.6	25.13	2.79	1,845.7
	pervious developed	851.2	25.71	1.14	293.42
Sullivan	impervious developed	3,031.7	19.08	2.85	2,013.9
	pervious developed	3,943.4	21.55	1.31	301.58
Susquehanna	impervious developed	7,042.1	19.29	2.86	1,405.73
	pervious developed	14,749.7	20.77	1.21	203.85
Tioga	impervious developed	7,966.9	12.37	2.09	1,767.75
	pervious developed	18,090.3	12.22	0.76	261.94
Union	impervious developed	4,382.6	22.98	2.04	2,393.55
	pervious developed	14,065.3	20.88	0.69	343.81
Wayne	impervious developed	320.5	18.69	2.89	1,002.58
	pervious developed	509	21.14	1.31	158.48
Wyoming	impervious developed	3,634.4	16.03	2.53	2,022.32
	pervious developed	10,792.9	13.75	0.7	238.26
York	impervious developed	10,330.7	29.69	1.18	1,614.15
	pervious developed	40,374.8	18.73	0.29	220.4
All Other Counties	impervious developed	-	23.06	2.28	1,839
	pervious developed	-	20.72	0.84	264.96

Notes:

- 1 These land loading rate values may be used to derive existing pollutant loading estimates under DEP's simplified method for PRP development. MS4s may choose to develop estimates using other scientifically sound methods.
- 2 Acres and land loading rate values for named counties in the Chesapeake Bay watershed are derived from CAST. (The column for Acres represents acres within the Chesapeake Bay watershed). For MS4s located outside of the Chesapeake Bay watershed, the land loading rates for "All Other Counties" may be used to develop PRPs under Appendix E; these values are average values across the Chesapeake Bay watershed.
- 3 For land area outside of the urbanized area, undeveloped land loading rates may be used where appropriate. When using the simplified method, DEP recommends the following loading rates (for any county) for undeveloped land:
 - TN – 10 lbs/acre/yr
 - TP – 0.33 lbs/acre/yr
 - TSS (Sediment) – 234.6 lbs/acre/yr

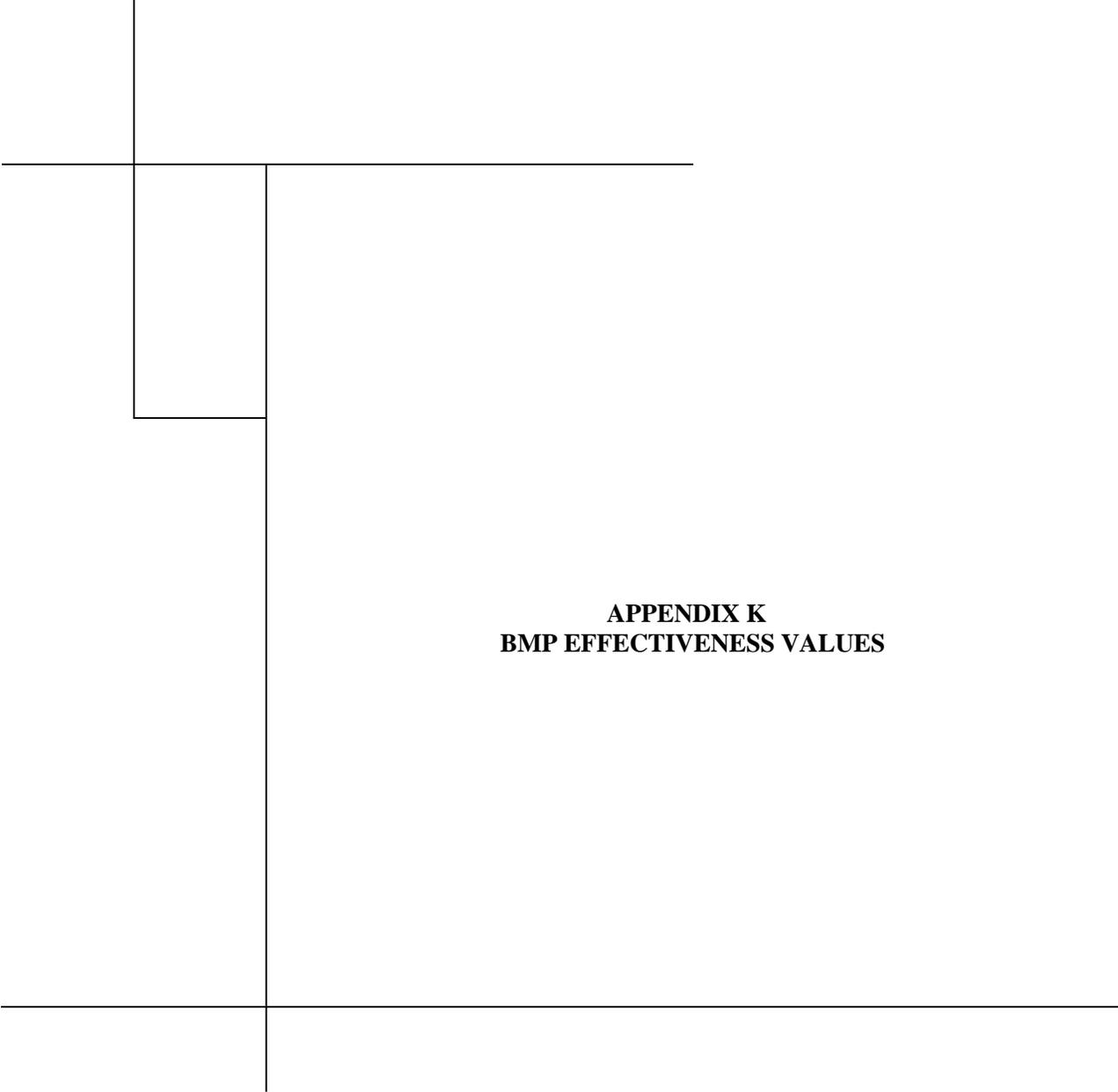
These values were derived by using the existing loads for each pollutant, according to the 2014 Chesapeake Bay Progress Run, and dividing by the number of acres for the unregulated stormwater subsector.



APPENDIX J
STATEWIDE MS4 LAND COVER ESTIMATES

Statewide MS4 Land Cover Estimates

County	Municipality	UA % Impervious	UA % Pervious	Outside of UA % Impervious	Outside of UA % Pervious	UA Acres
Erie	FAIRVIEW TWP	21%	79%	11%	89%	5,792.0
Luzerne	FAIRVIEW TWP	13%	87%	5%	95%	1,650.6
York	FAIRVIEW TWP	28%	72%	14%	86%	8,094.3
Washington	FALLOWFIELD TWP	17%	83%	6%	94%	1,649.4
Bucks	FALLS TWP	37%	63%	27%	73%	11,271.3
Beaver	FALLSTON BORO	34%	66%	34%	66%	345.4
Mercer	FARRELL CITY	54%	46%	55%	45%	1,455.4
Allegheny	FAWN TWP	13%	87%	4%	96%	582.8
Fayette	FAYETTE CITY BORO	30%	70%	26%	74%	155.2
Lackawanna	FELL TWP	15%	85%	5%	95%	1,378.0
York	FELTON BORO	17%	83%	17%	83%	325.6
Centre	FERGUSON TWP	27%	73%	7%	93%	5,420.0
Cambria	FERNDALE BORO	56%	44%	56%	44%	236.7
Allegheny	FINDLAY TWP	43%	57%	15%	85%	4,820.6
Washington	FINLEYVILLE BORO	64%	36%	63%	37%	74.2
Berks	FLEETWOOD BORO	52%	48%	52%	48%	660.9
Delaware	FOLCROFT BORO	32%	68%	32%	68%	895.0
Susquehanna	FOREST CITY BORO	29%	71%	28%	72%	597.0
Allegheny	FOREST HILLS BORO	46%	54%	46%	54%	996.8
Northampton	FORKS TWP	31%	69%	22%	78%	4,240.9
Luzerne	FORTY FORT BORO	45%	55%	45%	55%	972.4
Allegheny	FORWARD TWP	28%	72%	5%	95%	756.6
Butler	FORWARD TWP	8%	92%	2%	98%	344.6
Luzerne	FOSTER TWP	35%	65%	3%	97%	310.2
Lehigh	FOUNTAIN HILL BORO	55%	45%	55%	45%	485.2
Allegheny	FOX CHAPEL BORO	7%	93%	7%	93%	5,017.8
Montgomery	FRANCONIA TWP	25%	75%	24%	76%	8,060.4
Beaver	FRANKLIN TWP	7%	93%	7%	93%	11,612.8
Cambria	FRANKLIN BORO	33%	67%	32%	68%	365.1
Carbon	FRANKLIN TWP	25%	75%	8%	92%	969.4
Chester	FRANKLIN TWP	11%	89%	9%	91%	4,662.0
Fayette	FRANKLIN TWP	10%	90%	2%	98%	95.2
York	FRANKLIN TWP	16%	84%	5%	95%	1,128.3
Allegheny	FRANKLIN PARK BORO	23%	77%	17%	83%	5,922.8
York	FRANKLINTOWN BORO	46%	54%	28%	72%	78.1
Blair	FRANKSTOWN TWP	29%	71%	5%	95%	2,930.0
Allegheny	FRAZER TWP	37%	63%	7%	93%	753.7
Beaver	FREEDOM BORO	45%	55%	44%	56%	484.2
Blair	FREEDOM TWP	41%	59%	6%	94%	130.8
Luzerne	FREELAND BORO	51%	49%	50%	50%	429.6
Northampton	FREEMANSBURG BORO	36%	64%	35%	65%	458.6
Armstrong	FREEPORT BORO	17%	83%	16%	84%	682.4
Cambria	GEISTOWN BORO	54%	46%	53%	47%	679.2
Fayette	GEORGES TWP	12%	88%	4%	96%	2,529.5
Fayette	GERMAN TWP	19%	81%	3%	97%	172.8
Adams	GETTYSBURG BORO	47%	53%	47%	53%	1,063.7
Armstrong	GILPIN TWP	33%	67%	3%	97%	132.5
Erie	GIRARD BORO	31%	69%	27%	73%	1,221.8
Erie	GIRARD TWP	14%	86%	5%	95%	1,677.7
Allegheny	GLASSPORT BORO	37%	63%	37%	63%	1,140.8
Lackawanna	GLENBURN TWP	18%	82%	7%	93%	733.9
Northampton	GLENDON BORO	32%	68%	32%	68%	396.4
Allegheny	GLENFIELD BORO	14%	86%	15%	85%	401.2
Delaware	GLENOLDEN BORO	48%	52%	48%	52%	624.8



APPENDIX K
BMP EFFECTIVENESS VALUES

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS BMP EFFECTIVENESS VALUES

This table of BMP effectiveness values (i.e., pollutant removal efficiencies) is intended for use by MS4s that are developing and implementing Pollutant Reduction Plans and TMDL Plans to comply with NPDES permit requirements. The values used in this table generally consider pollutant reductions from both overland flow and reduced downstream erosion, and are based primarily on average values within the Chesapeake Assessment Scenario Tool (CAST) (www.casttool.org). Design considerations, operation and maintenance, and construction sequences should be as outlined in the Pennsylvania Stormwater BMP Manual, Chesapeake Bay Program guidance, or other technical sources. The Department of Environmental Protection (DEP) will update the information contained in this table as new information becomes available. Interested parties may submit information to DEP for consideration in updating this table to DEP's MS4 resource account, RA-EPPAMS4@pa.gov. Where an MS4 proposes a BMP not identified in this document or in Chesapeake Bay Program expert panel reports, other technical resources may be consulted for BMP effectiveness values. Note – TN = Total Nitrogen and TP = Total Phosphorus.

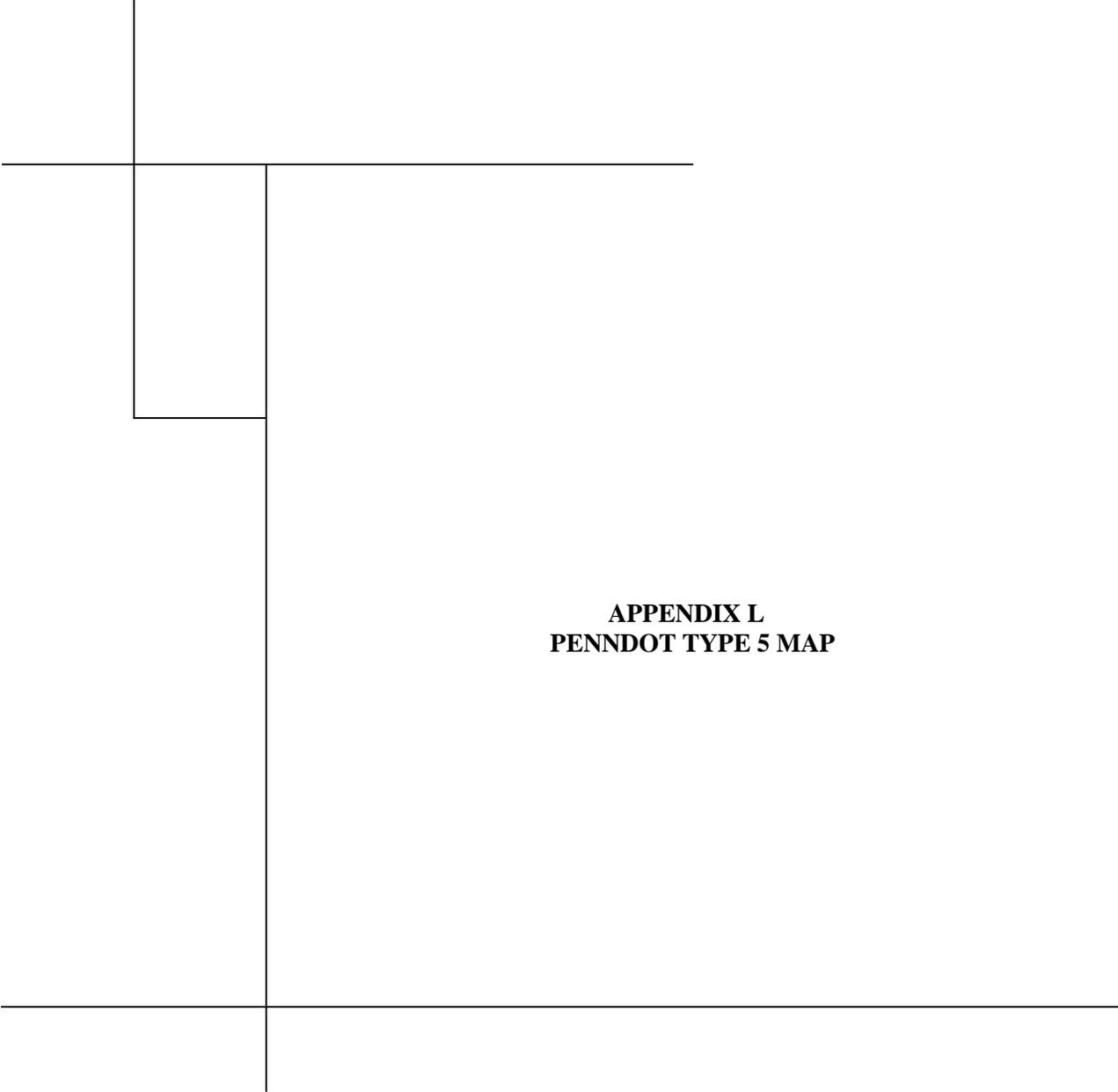
BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Wet Ponds and Wetlands	20%	45%	60%	A water impoundment structure that intercepts stormwater runoff then releases it to an open water system at a specified flow rate. These structures retain a permanent pool and usually have retention times sufficient to allow settlement of some portion of the intercepted sediments and attached nutrients/toxics. Until recently, these practices were designed specifically to meet water quantity, not water quality objectives. There is little or no vegetation living within the pooled area nor are outfalls directed through vegetated areas prior to open water release. Nitrogen reduction is minimal.
Dry Detention Basins and Hydrodynamic Structures	5%	10%	10%	Dry Detention Ponds are depressions or basins created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Hydrodynamic Structures are devices designed to improve quality of stormwater using features such as swirl concentrators, grit chambers, oil barriers, baffles, micropools, and absorbent pads that are designed to remove sediments, nutrients, metals, organic chemicals, or oil and grease from urban runoff.
Dry Extended Detention Basins	20%	20%	60%	Dry extended detention (ED) basins are depressions created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Dry ED basins are designed to dry out between storm events, in contrast with wet ponds, which contain standing water permanently. As such, they are similar in construction and function to dry detention basins, except that the duration of detention of stormwater is designed to be longer, theoretically improving treatment effectiveness.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Infiltration Practices w/ Sand, Veg.	85%	85%	95%	A depression to form an infiltration basin where sediment is trapped and water infiltrates the soil. No underdrains are associated with infiltration basins and trenches, because by definition these systems provide complete infiltration. Design specifications require infiltration basins and trenches to be built in good soil, they are not constructed on poor soils, such as C and D soil types. Engineers are required to test the soil before approval to build is issued. To receive credit over the longer term, jurisdictions must conduct yearly inspections to determine if the basin or trench is still infiltrating runoff.
Filtering Practices	40%	60%	80%	Practices that capture and temporarily store runoff and pass it through a filter bed of either sand or an organic media. There are various sand filter designs, such as above ground, below ground, perimeter, etc. An organic media filter uses another medium besides sand to enhance pollutant removal for many compounds due to the increased cation exchange capacity achieved by increasing the organic matter. These systems require yearly inspection and maintenance to receive pollutant reduction credit.
Filter Strip Runoff Reduction	20%	54%	56%	Urban filter strips are stable areas with vegetated cover on flat or gently sloping land. Runoff entering the filter strip must be in the form of sheet-flow and must enter at a non-erosive rate for the site-specific soil conditions. A 0.4 design ratio of filter strip length to impervious flow length is recommended for runoff reduction urban filter strips.
Filter Strip Stormwater Treatment	0%	0%	22%	Urban filter strips are stable areas with vegetated cover on flat or gently sloping land. Runoff entering the filter strip must be in the form of sheet-flow and must enter at a non-erosive rate for the site-specific soil conditions. A 0.2 design ratio of filter strip length to impervious flow length is recommended for stormwater treatment urban filter strips.
Bioretention – Raingarden (C/D soils w/ underdrain)	25%	45%	55%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has an underdrain and is in C or D soil.
Bioretention / Raingarden (A/B soils w/ underdrain)	70%	75%	80%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has an underdrain and is in A or B soil.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Bioretention / Raingarden (A/B soils w/o underdrain)	80%	85%	90%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has no underdrain and is in A or B soil.
Vegetated Open Channels (C/D Soils)	10%	10%	50%	Open channels are practices that convey stormwater runoff and provide treatment as the water is conveyed, includes bioswales. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils. This BMP has no underdrain and is in C or D soil.
Vegetated Open Channels (A/B Soils)	45%	45%	70%	Open channels are practices that convey stormwater runoff and provide treatment as the water is conveyed, includes bioswales. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils. This BMP has no underdrain and is in A or B soil.
Bioswale	70%	75%	80%	With a bioswale, the load is reduced because, unlike other open channel designs, there is now treatment through the soil. A bioswale is designed to function as a bioretention area.
Permeable Pavement w/o Sand or Veg. (C/D Soils w/ underdrain)	10%	20%	55%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, no sand or vegetation and is in C or D soil.
Permeable Pavement w/o Sand or Veg. (A/B Soils w/ underdrain)	45%	50%	70%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, no sand or vegetation and is in A or B soil.
Permeable Pavement w/o Sand or Veg. (A/B Soils w/o underdrain)	75%	80%	85%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has no underdrain, no sand or vegetation and is in A or B soil.
Permeable Pavement w/ Sand or Veg. (A/B Soils w/ underdrain)	50%	50%	70%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, has sand and/or vegetation and is in A or B soil.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Permeable Pavement w/ Sand or Veg. (A/B Soils w/o underdrain)	80%	80%	85%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has no underdrain, has sand and/or vegetation and is in A or B soil.
Permeable Pavement w/ Sand or Veg. (C/D Soils w/ underdrain)	20%	20%	55%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, has sand and/or vegetation and is in C or D soil.
Stream Restoration	0.075 lbs/ft/yr	0.068 lbs/ft/yr	44.88 lbs/ft/yr	An annual mass nutrient and sediment reduction credit for qualifying stream restoration practices that prevent channel or bank erosion that otherwise would be delivered downstream from an actively enlarging or incising urban stream. Applies to 0 to 3rd order streams that are not tidally influenced. If one of the protocols is cited and pounds are reported, then the mass reduction is received for the protocol.
Forest Buffers	25%	50%	50%	An area of trees at least 35 feet wide on one side of a stream, usually accompanied by trees, shrubs and other vegetation that is adjacent to a body of water. The riparian area is managed to maintain the integrity of stream channels and shorelines, to reduce the impacts of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals. (Note – the values represent pollutant load reductions from stormwater draining through buffers).
Tree Planting	10%	15%	20%	The BMP effectiveness values for tree planting are estimated by DEP. DEP estimates that 100 fully mature trees of mixed species (both deciduous and non-deciduous) provide pollutant load reductions for the equivalent of one acre (i.e., one mature tree = 0.01 acre). The BMP effectiveness values given are based on immature trees (seedlings or saplings); the effectiveness values are expected to increase as the trees mature. To determine the amount of pollutant load reduction that can be credited for tree planting efforts: 1) multiply the number of trees planted by 0.01; 2) multiply the acreage determined in step 1 by the pollutant loading rate for the land prior to planting the trees (in lbs/acre/year); and 3) multiply the result of step 2 by the BMP effectiveness values given.
Street Sweeping	3%	3%	9%	Street sweeping must be conducted 25 times annually. Only count those streets that have been swept at least 25 times in a year. The acres associated with all streets that have been swept at least 25 times in a year would be eligible for pollutant reductions consistent with the given BMP effectiveness values.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Storm Sewer System Solids Removal	0.0027 for sediment, 0.0111 for organic matter	0.0006 for sediment, 0.0012 for organic matter	1 – TN and TP concentrations	<p>This BMP (also referred to as “Storm Drain Cleaning”) involves the collection or capture and proper disposal of solid material within the storm system to prevent discharge to surface waters. Examples include catch basins, stormwater inlet filter bags, end of pipe or outlet solids removal systems and related practices. Credit is authorized for this BMP only when proper maintenance practices are observed (i.e., inspection and removal of solids as recommended by the system manufacturer or other available guidelines). The entity using this BMP for pollutant removal credits must demonstrate that they have developed and are implementing a standard operating procedure for tracking the material removed from the sewer system. Locating such BMPs should consider the potential for backups onto roadways or other areas that can produce safety hazards.</p> <p>To determine pollutant reductions for this BMP, these steps must be taken:</p> <ol style="list-style-type: none"> 1) Measure the weight of solid/organic material collected (lbs). Sum the total weight of material collected for an annual period. Note – do not include refuse, debris and floatables in the determination of total mass collected. 2) Convert the annual wet weight captured into annual dry weight (lbs) by using site-specific measurements (i.e., dry a sample of the wet material to find its weight) or by using default factors of 0.7 (material that is predominantly wet sediment) or 0.2 (material that is predominantly wet organic matter, e.g., leaf litter). 3) Multiply the annual dry weight of material collected by default or site-specific pollutant concentration factors. The default concentrations are shown in the BMP Effectiveness Values columns. Alternatively, the material may be sampled (at least annually) to determine site-specific pollutant concentrations. <p>DEP will allow up to 50% of total pollutant reduction requirements to be met through this BMP. The drainage area treated by this BMP may be no greater than 0.5 acre unless it can be demonstrated that the specific system proposed is capable of treating stormwater from larger drainage areas. For planning purposes, the sediment removal efficiency specified by the manufacturer may be assumed, but no higher than 80%.</p>



**APPENDIX L
PENNDOT TYPE 5 MAP**

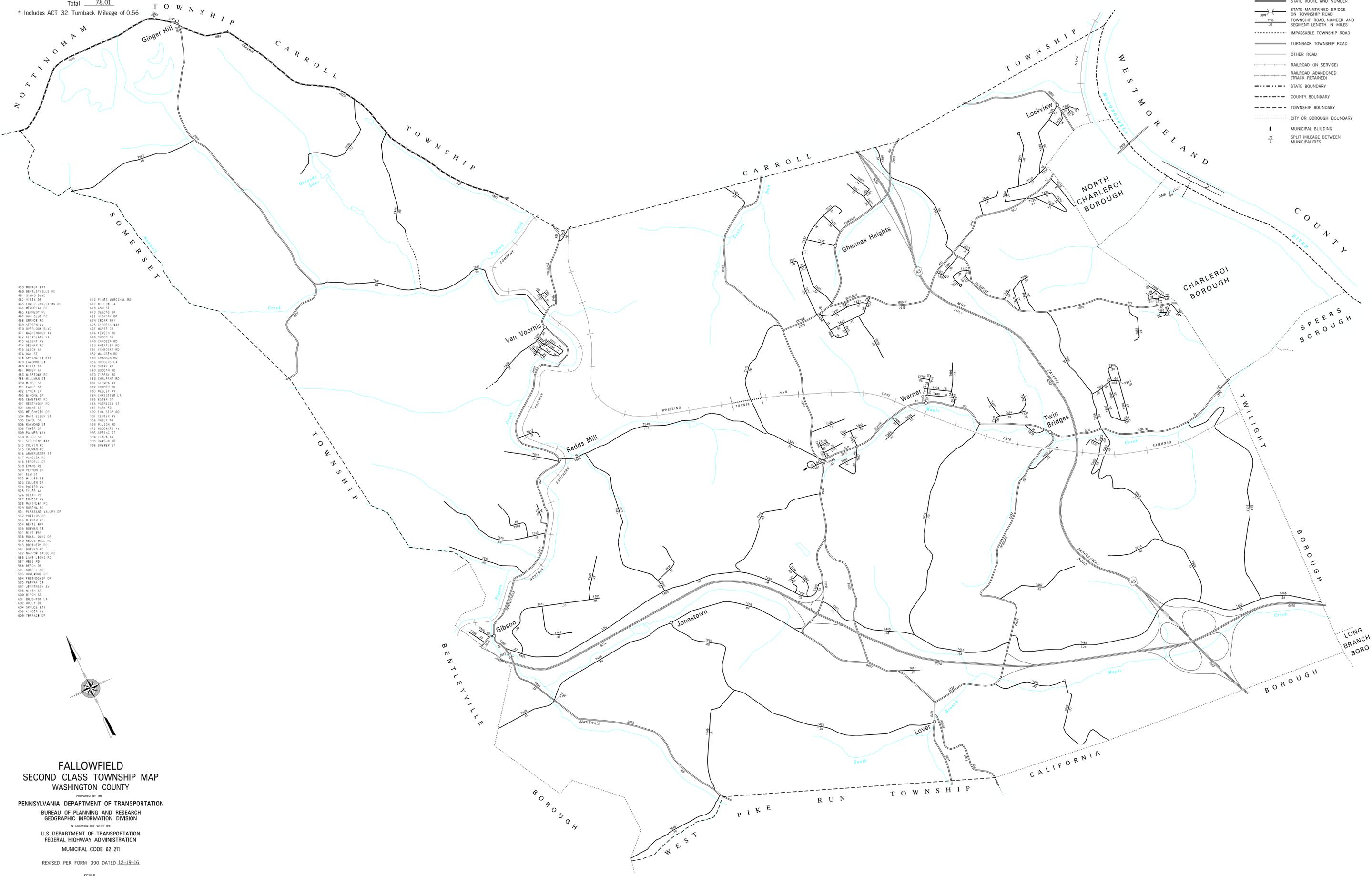
TOTAL MILES
 Township Road System 46.96*
 State Highway System 31.05
 Total 78.01

* Includes ACT 32 Turnback Mileage of 0.56

LEGEND

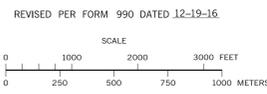
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- STATE ROUTE AND NUMBER
- STATE MAINTAINED BRIDGE ON TOWNSHIP ROAD
- TOWNSHIP ROAD, NUMBER AND SEGMENT LENGTH IN MILES
- IMPASSABLE TOWNSHIP ROAD
- TURNBACK TOWNSHIP ROAD
- OTHER ROAD
- RAILROAD (IN SERVICE)
- RAILROAD ABANDONED (TRACK RETAINED)
- STATE BOUNDARY
- COUNTY BOUNDARY
- TOWNSHIP BOUNDARY
- CITY OR BOROUGH BOUNDARY
- MUNICIPAL BUILDING
- SPLIT MILEAGE BETWEEN MUNICIPALITIES

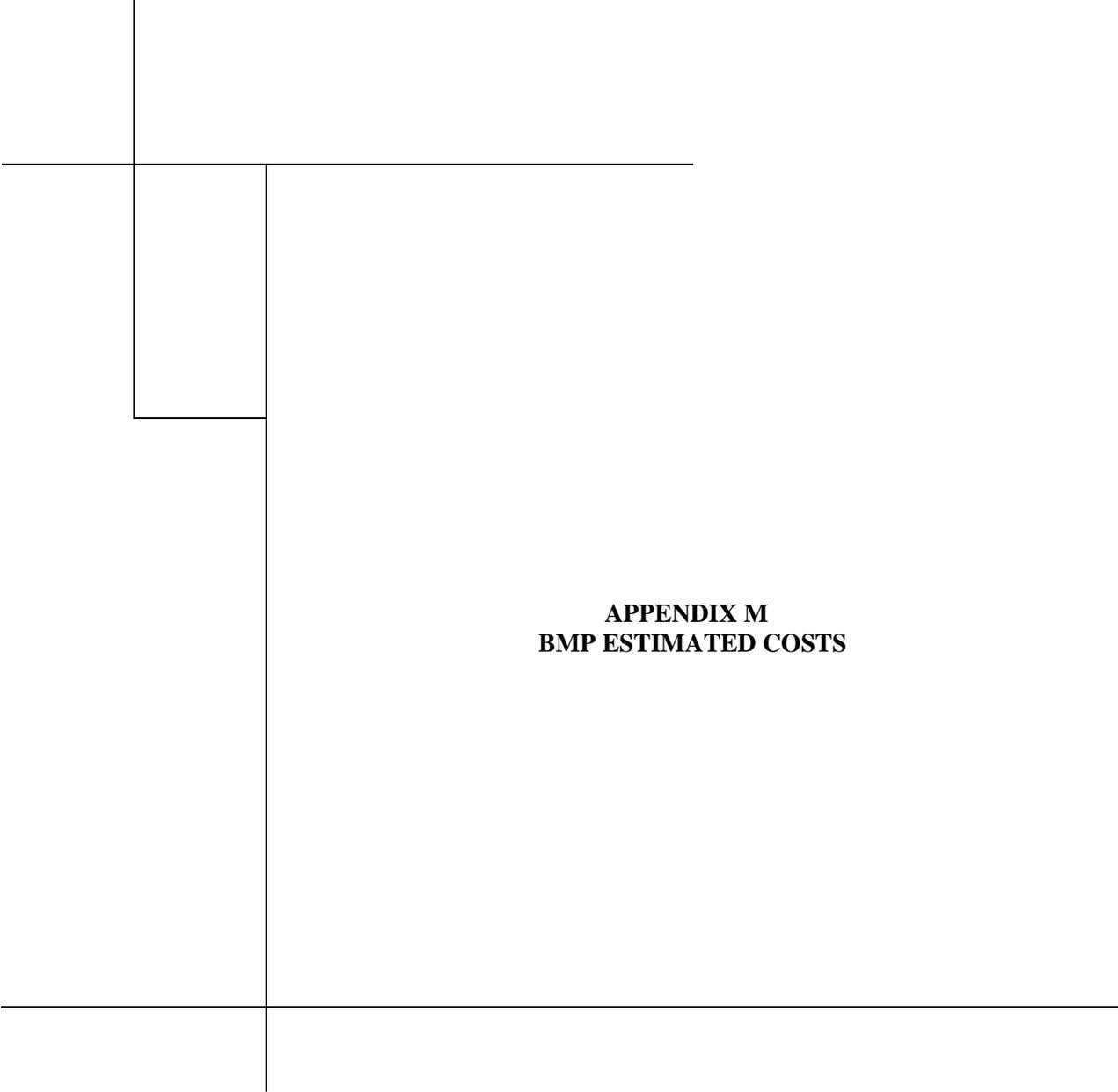
- 459 WORNACK BAY
- 460 BENTLEYVILLE RD
- 461 SIMON BLVD
- 462 VISTA DR
- 463 LOVER-JONESTOWN RD
- 464 MEMORIAL DR
- 465 KENNEDY RD
- 467 GUN CLUB RD
- 468 GRANGE RD
- 469 SERSEN AV
- 470 OVERLOOK BLVD
- 471 WASHINGTON AV
- 472 CLEARCROFT ST
- 473 ALBERT AV
- 474 DEBRAH RD
- 475 ALICE AV
- 476 OAK ST
- 478 SPRING ST EXT
- 479 LAVONNE ST
- 480 FIRST ST
- 483 WILSON RD
- 488 HILLMAN ST
- 490 WINDY ST
- 491 EAGLE ST
- 492 LINDA LA
- 493 WINDOM DR
- 495 CEMETERY RD
- 497 MEADOWVIEW RD
- 503 WELCHER DR
- 504 MARY ELLEN ST
- 505 CAROL ST
- 506 RAYMOND ST
- 508 FINE ST
- 509 PALMER BAY
- 510 RIDER ST
- 511 STEPHENS BAY
- 513 COLVIN RD
- 515 FRANK RD
- 516 ARMBRUSTER ST
- 517 VANICK RD
- 518 FERRELL DR
- 519 FINE RD
- 520 VERNON DR
- 521 FINE ST
- 522 MILLER ST
- 523 COLLEN DR
- 524 POWERS AV
- 525 TYLER AV
- 526 BLYTH RD
- 527 ERNEST AV
- 528 MCKINLEY RD
- 529 ROSENA RD
- 531 PEACOCK VALLEY DR
- 532 POTIUS DR
- 533 BETSO DR
- 534 RENZI BAY
- 535 BOWMAN ST
- 537 BLUE BAY
- 538 ROYAL OAKS DR
- 540 REDS HILL RD
- 543 BROTHERS RD
- 581 BUTSIO RD
- 582 NARROW GAUGE RD
- 585 LAKE LEONI RD
- 587 HESS RD
- 588 BECH DR
- 591 CRUTE RD
- 593 HOMEROOD DR
- 594 FRIENDSHIP DR
- 595 PEFRAK ST
- 597 JEFFERSON AV
- 598 NINTH ST
- 600 BRUSH ST
- 601 BRUSHTON LA
- 602 HILL DR
- 604 SPRUCE BAY
- 606 KINGER AV
- 609 BERRAGE DR
- 610 PINES MARGINAL RD
- 611 WILLOW LA
- 618 ANN ST
- 619 BELLECK DR
- 622 HICKORY DR
- 624 CEDAR BAY
- 625 CYPRESS WAY
- 627 WARD DR
- 646 KENESH RD
- 648 HUBER RD
- 649 CAPOZZA RD
- 650 WHEATLEY RD
- 651 TANNING RD
- 652 WALDEN RD
- 654 SHANNON RD
- 656 RODGERS LA
- 658 DASHY RD
- 660 BOGDAN RD
- 662 ZIPPAR RD
- 680 CHALFANT RD
- 681 GIBSON AV
- 682 COOPER RD
- 683 WESLEY AV
- 684 CHRISTINE LA
- 685 ESTER ST
- 686 PATRICIA ST
- 687 PARK RD
- 690 FOX STOP RD
- 901 CENTER AV
- 902 DAILY AV
- 908 WILSON RD
- 912 WOODWARD AV
- 933 SPRING ST
- 994 LEIDA AV
- 995 SWANSON RD
- 996 BREWER ST



FALLOWFIELD
 SECOND CLASS TOWNSHIP MAP
 WASHINGTON 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 62 211





APPENDIX M
BMP ESTIMATED COSTS

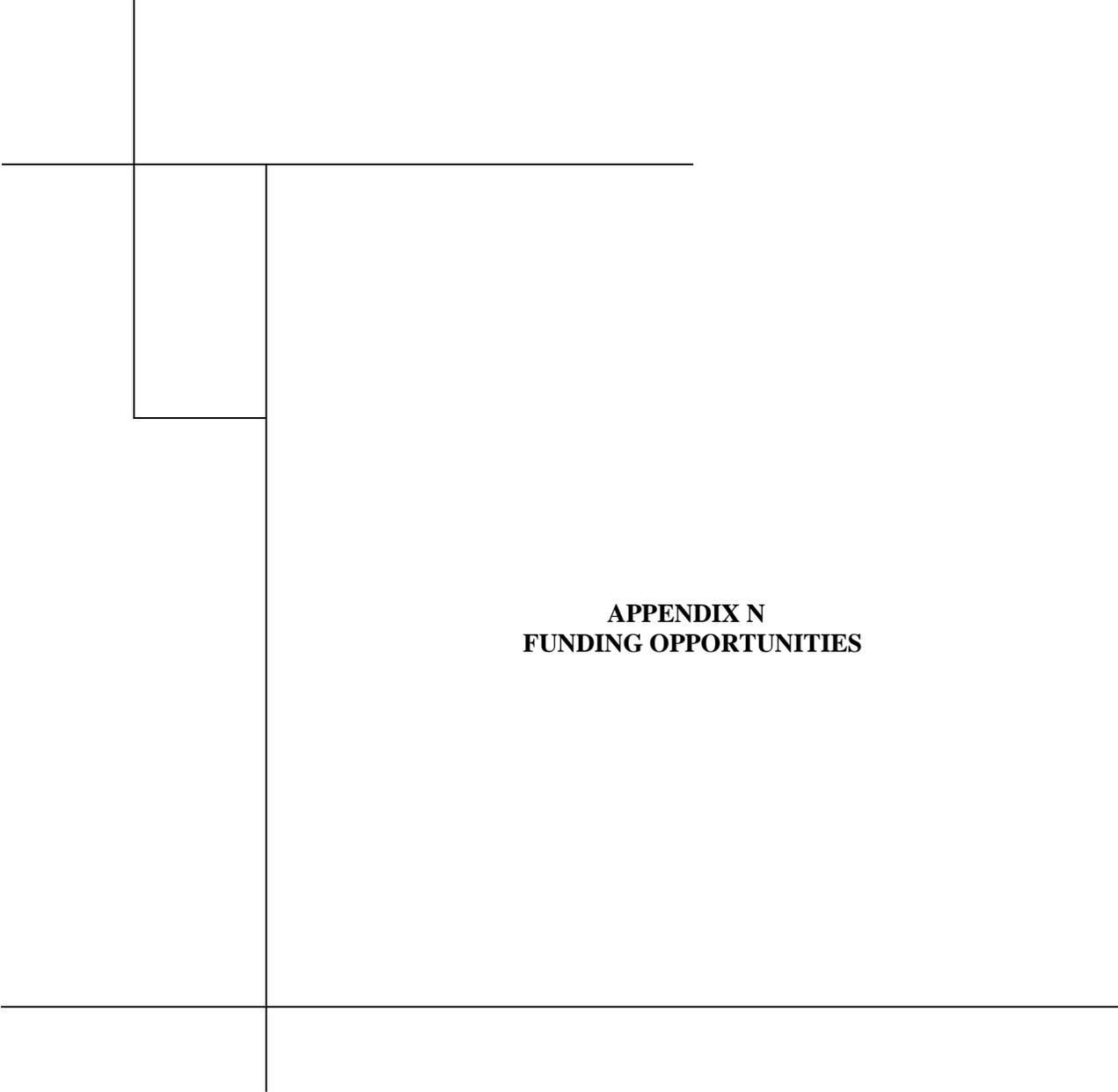
BMP Estimated Costs

Vegetated Open Channels (C/D Soils)

Estimated Initial Cost and Estimated O&M Cost was determined by measuring the linear feet of vegetated channel and by the values given in the Pennsylvania Stormwater BMP Manual Section 6.4.8 (assumed less expensive grassed swale due to proximity to roadway).

$$\text{Estimated Initial Cost} = (\$4.50/\text{ft})(8,800 \text{ ft}) = \$39,600$$

$$\text{Estimated O\&M Cost} = (\$0.75/\text{ft}/\text{year})(8,800 \text{ ft}) = \$6,600/\text{year}$$



APPENDIX N
FUNDING OPPORTUNITIES

Funding Opportunities

Stormwater Fee

The fee is charged to the property owner on a monthly basis based on the amount of impervious surface on a property (rooftops, parking lots, driveways, etc.) that does not allow rainfall to penetrate into the ground, but instead causes it to runoff into streams and rivers. Implementing this stormwater fee would help fund local stormwater management programs, which would control stormwater runoff through construction, operation, and maintenance of a stormwater system.

BMP Construction – PENNVEST

The Pennsylvania Infrastructure Investment Authority (PENNVEST) provides construction and related funding/financing for Best Management Practices (BMPs) for the following categories:

- Urban Stormwater BMPs
- Agricultural BMPs
- Abandoned Mine Drainage BMPs
- Brownfields BMPs

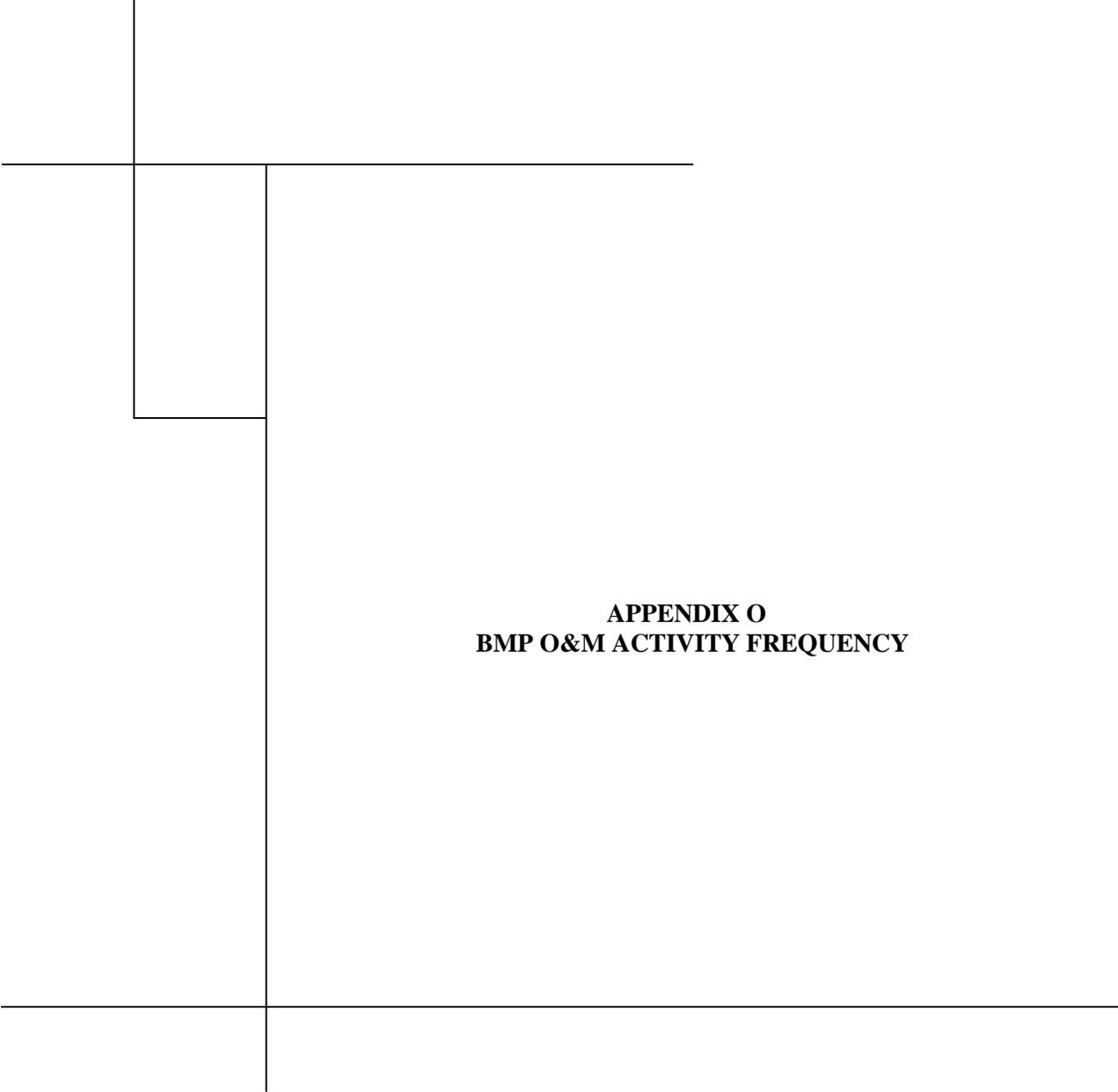
Funding/financing terms vary depending on the affordability of the project to the applicant.

Growing Greener Grants

Growing Greener is an investment of state funds to address Pennsylvania's critical environmental concerns. DEP is authorized to allocate these funds in grants for:

- Watershed restoration and protection
- Abandoned mine reclamation
- Abandoned oil and gas well plugging projects

Funding availability varies.



APPENDIX O
BMP O&M ACTIVITY FREQUENCY

BMP O&M Activity and Frequency

Vegetated Open Channels (C/D Soils)

- A. Maintenance activities to be done annually and within 48 hours after every major storm event (>1 inch rainfall depth):
 - a. Inspect and correct erosion problems, damage to vegetation, and sediment and debris accumulation (address when > 3 inches at any spot or covering vegetation)
 - b. Inspect vegetation on side slopes for erosion and formation of rills or gullies, correct as needed
 - c. Inspect for pools of standing water; dewater and discharge to an approved location and restore to design grade
 - d. Mow and trim vegetation to ensure safety, aesthetics, proper swale operation, or to suppress weeds and invasive vegetation; dispose of cuttings in a local composting facility; mow only when swale is dry to avoid rutting
 - e. Inspect for litter; remove prior to mowing
 - f. Inspect for uniformity in cross-section and longitudinal slope, correct as needed
 - g. Inspect swale inlet (curb cuts, pipes, etc.) and outlet for signs of erosion or blockage, correct as needed
- B. Maintenance activities to be done as needed:
 - a. Plant alternative grass species in the event of unsuccessful establishment
 - b. Reseed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming
 - c. Rototill and replant swale if draw down time is more than 48 hours
 - d. Inspect and correct check dams when signs of altered water flow (channelization, obstructions, erosion, etc.) are identified
 - e. Water during dry periods, fertilize, and apply pesticide only when absolutely necessary
- C. Winter conditions also necessitate additional maintenance concerns, which include the following:
 - a. Inspect swale immediately after the spring melt, remove residuals (e.g. sand) and replace damaged vegetation without disturbing remaining vegetation
 - b. If roadside or parking lot runoff is directed to the swale, mulching and/or soil aeration/manipulation may be required in the spring to restore soil structure and moisture capacity and to reduce the impacts of deicing agents.
 - c. Use nontoxic, organic deicing agents, applied either as blended, magnesium chloride-based liquid products or as pretreated salt.
 - d. Use salt-tolerant vegetation in swales.