MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Washington County						
CENTERVILLE BORO		No		Monongahela River	Appendix C-PCB (4a)	
				Twomile Run	Appendix E-Siltation (5)	Water/Flow Variability (4c)
CHARLEROI BORO	PAG136102	No		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 E-Siltation (5)	
				Monongahela River	Appendix C-PCB (4a)	
CHARTIERS TWP	PAG136212	No		Unnamed Tributaries to Chartiers Creek		Other Habitat Alterations (4c)
				Plum Run	Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation (4a)	Other Habitat Alterations (4c), Turbidity (4a)
				Georges Run	Appendix A-Metals (4a), Appendix E-Suspended Solids (4a), Appendix B-Pathogens (5), Appendix E-Siltation (5)	
				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)
COAL CENTER BORO		No		Monongahela River	Appendix C-PCB (4a)	
DONORA BORO	PAG136256	No		Unnamed Tributaries to Monongahela River	Appendix E-Organic Enrichment/Low D.O., Siltation (5)	
				Monongahela River	Appendix C-PCB (4a)	
DUNLEVY BORO	PAG136132*	No		Monongahela River	Appendix C-PCB (4a)	
EAST WASHINGTON BORO	PAG136364	No		Catfish Creek	Appendix A-Metals (4a), Appendix E-Suspended Solids (4a), Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation (5)	
				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)	Turbidity (5)
ELCO BORO	PAG136319*	No		Unnamed Tributaries to Monongahela River	Appendix E-Organic Enrichment/Low D.O., Siltation (5)	
				Monongahela River	Appendix C-PCB (4a)	
ELLSWORTH BORO	PAG136350	No		Pigeon Creek	Appendix E-Organic Enrichment/Low D.O., Siltation (5)	

APPENDIX B

BOROUGH OF DONORA

MS4 REQUIREMENT LETTER

pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

May 3, 2017

DONORA BORO STORM SEW SYS
603 MELDON AVE
DONORA PA 15033-1006

Re: NPDES Permit No. PAG136256

Dear Permittee:

The Pennsylvania Department of Environmental Protection (DEP) wishes to avoid any confusion about upcoming 2018 permit requirements in the Municipal Separate Storm Sewer System (MS4) program. All MS4 permittees have a responsibility to apply for an updated permit, and most have requirements to prepare plans that need to be attached to the permit application. The timing and planning requirements vary, and we want you to be clear on what specific timing and requirements apply to you. We also want you to be clear on adjustments being made to the timing of future periodic MS4 reports you send to DEP.

A. Permit Application Requirements:

If you currently hold:

- A General Permit or an Administratively Extended MS4 Individual Permit you will be required to submit a Notice of Intent (NOI) or application for continued permit coverage by September 16, 2017.

- A current MS4 Individual permit or Waiver of MS4 Permit Requirements you will be required to submit a NOI or application 180 days before the expiration date of the permit or waiver.

To avoid possible compliance action by DEP, please submit all required paperwork by the above due dates.

Permittees which believe they qualify for a waiver from MS4 program requirements should include a Waiver Application with the NOI or individual permit application.

Some of you received an advanced waiver approval exempting you from submitting a Pollutant Reduction Plan (PRP)/Total Maximum Daily Load (TMDL) Plan with your NOI/application. Please be aware that if your waiver request is not approved by your DEP regional office you will be required to submit a PRP/TMDL Plan on a schedule to be negotiated.

Please see the "2018 MS4 Permit NOI/Application Due Date Report" on the DEP Municipal Stormwater website. You can locate it from the DEP Home Page by selecting **Businesses > Water > Bureau of Clean Water > Stormwater Management > Municipal Stormwater**. Permittees noted on the report with a PRP/TMDL requirement must submit a complete PRP/TMDL plan with the NOI/permit application. More detail on the planning requirement is available on the MS4 Requirements Table, on the same website page. Note that PRP/TMDL public participation requirements must be completed prior to the submittal of any required PRP/TMDL Plan. In reference to the MS4 Requirements Table, if a permittee believes an error has been made regarding specific requirements identified for the MS4, then please contact the DEP MS4 Program at RA-EPPAMS4@pa.gov with your concerns.

B. Periodic Reporting:

MS4 permittees are required under the current (2013) permit to periodically report their activities to DEP. Some permittees report annually and some on a "progress" basis (which is at the end of the first year, at the end of the third year, and when the application for the next permit was to be submitted). The reporting periods start with the issuance date of the permit. Annual reports are due 90 days after the end of the reporting period, and progress reports are due 60 days after the end of the reporting period.

That reporting process is unnecessarily complex; a simpler method will be phased in which establishes a uniform annual reporting period and requires all permittees to submit their reports at the same time. All current permittees with a current reporting period that goes beyond June 30, 2017 will have that reporting period extended to June 30, 2018. Reports for that period will be due 90 days later, on September 30, 2018. The reporting period in subsequent years will be July 1 to June 30, with the report due by September 30.

DEP also intends to implement an electronic reporting process, effective June 30, 2018, which all permittees will be required to use. Instructions will be provided at a later date.

If you have any questions, please contact the DEP regional office or Mr. Robert Haines at the DEP central office at robhaines@pa.gov.

Sincerely,

Lee Murphy

Lee Murphy
Environmental Group Manager
MS4 Section
NPDES Permitting Division

APPENDIX C

PUBLIC NOTICE ADVERTISEMENTS AND COMMENTS RECORDS

AFFP

Pollutant Reduction Plan

Affidavit of Publication

STATE OF PENNSYLVANIA } SS
COUNTY OF
WESTMORELAND }

Jeffrey T. Oliver, being duly sworn, says:

That he is General Manager of the Mon Valley Independent, a daily newspaper of general circulation, printed and published in Monessen, Westmoreland County, Pennsylvania; that the publication, a copy of which is attached hereto, was published in the said newspaper on the following dates:

August 02, 2017

NOTICE
The Borough of Donora is required to submit a Pollutant Reduction Plan (PRP) as part of it's National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit from its Small Municipal Separated Storm Sewer System (MS4). The Borough is required to reduce the volume of it's sediment discharges into local waters by 10% in the next 5 years beginning in 2018. It is hereby noted that a draft of the PRP will be available at the Donora Borough office at 603 Meldon Avenue. Donora, Pa 15033, and on the Borough's website for public view and written comment (addressed to the Borough Manager) from August 2nd through August 31st.
8/2

Government Notices

NOTICE

The Borough of Donora is required to submit a Pollutant Reduction Plan (PRP) as part of it's National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit from its Small Municipal Separated Storm Sewer System (MS4). The Borough is required to reduce the volume of it's sediment discharges into local waters by 10% in the next 5 years beginning in 2018. It is hereby noted that a draft of the PRP will be available at the Donora Borough office at 603 Meldon Avenue, Donora, Pa 15033, and on the Borough's website for public view and written comment (addressed to the Borough Manager) from August 2nd through August 31st.
8/2

That said newspaper was regularly issued and circulated on those dates.
SIGNED:

General Manager

Subscribed to and sworn to me this 2nd day of August 2017.

Joseph A Dalfonso, Notary Public, Westmoreland County, Pennsylvania

My commission expires: January 01, 2018

Joseph A. Dalfonso
Magisterial District Judge
Magisterial District 10-1-03
Westmoreland County, PA
My Commission Expires
1st Monday in January 2018

00000574 00011638

John Bedner
Borough of Donora
603 Meldon Avenue
Donora, PA 15033

Mon Valley Independent
Mon Valley Independent
996 Donner Avenue
Monessen PA 15062

ADVERTISING INVOICE / STATEMENT

BILLING PERIOD	TERMS OF PAYMENT
08/01/2017 - 08/31/2017	2%/10 days Current Chgs-Net

BILLED ACCOUNT

John Bedner
Borough of Donora
603 Meldon Avenue
Donora, PA 15033

ACCOUNT #

00000574

NAME OF AGENCY/CLIENT

Borough of Donora

DATE	TRANS #	DESCRIPTION	INS	SAU	UNITS	RATE	AMOUNT
		Balance Forward					130.00
08/02/2017	300016676	Pollutant Reduction Plan - 00011638 Pollutant Reduction					
		01 MV Independent - Pollutant Reduction Plan	1	1 x 2.29	22.00	3.00	66.00
		10 monvalleyindependent.com - Pollutant Reduction Plan	1	1 x 2.29	2.29	0.00	0.00
		ntry Notary Fee					7.00
							-130.00
08/14/2017	400018024	Payment Check 17184					
08/15/2017	300017181	Special Meeting 8/17 - 00012001 Special Meeting 8/17					
		01 MV Independent - Special Meeting 8/17	1	1 x 1.56	15.00	3.00	45.00
		10 monvalleyindependent.com - Special Meeting 8/17	1	1 x 1.56	1.56	0.00	0.00
		ntry Notary Fee					7.00
08/24/2017	300017497	Ordinance No. 1385 - 00012294 Ordinance No. 1385					
		01 MV Independent - Ordinance No. 1385	1	1 x 2.91	28.00	3.00	84.00
		10 monvalleyindependent.com - Ordinance No. 1385	1	1 x 2.91	2.91	0.00	0.00
		ntry Notary Fee					7.00

Current	AGING			
	1-30	31-60	61-90	91+
$ 216.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00

TOTAL NET AMOUNT DUE

$ 216.00

PLEASE RETURN THIS PORTION WITH YOUR REMITTANCE

If you desire to charge this amount to your credit card, please complete the following information and return to the address below: [ ] Visa [ ] Mastercard [ ] Discover [ ] American Express

Acct# _____ Exp Date: _____

Signature _____

ACCOUNT TYPE	ACCOUNT #	BILLED ACCOUNT NAME	AMOUNT REMITTED
tr	00000574	Borough of Donora	

REMIT TO

Mon Valley Independent
996 Donner Avenue
Monessen PA 15062

Phone: (724) 314-0030
Fax: (724) 314-0025

Payment in full is due upon receipt of the statement. A service charge on all balances over 30 days will be computed by a 'Periodic Rate' of 1-1/2% per month, which is an ANNUAL PERCENTAGE RATE OF 18%, this applies to the previous balance after deducting current payments and credits appearing on your statement.

ADVERTISING INCLUDES DIGITIZATION
SEARCH ENGINE OPTIMIZATION (SEO)

02111100000574000216000000000000000

APPENDIX D

PADEP 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
Washington	DONORA BORO	37%	63%	35%	65%	1,281.6
Allegheny	DORMONT BORO	66%	34%	66%	34%	485.2
Berks	DOUGLASS TWP	9%	91%	7%	93%	3,205.8
Montgomery	DOUGLASS TWP	26%	74%	14%	86%	3,818.7
York	DOVER BORO	46%	54%	46%	54%	336.6
York	DOVER TWP	27%	73%	8%	92%	4,628.3
Chester	DOWNINGTOWN BORO	45%	55%	45%	55%	1,423.4
Bucks	DOYLESTOWN BORO	51%	49%	51%	49%	1,382.6
Bucks	DOYLESTOWN TWP	25%	75%	25%	75%	9,927.0
Allegheny	DRAVOSBURG BORO	22%	78%	23%	77%	683.9
Bucks	DUBLIN BORO	40%	60%	40%	60%	372.9
Lycoming	DUBOISTOWN BORO	31%	69%	28%	72%	391.2
Fayette	DUNBAR BORO	41%	59%	34%	66%	312.2
Fayette	DUNBAR TWP	14%	86%	3%	97%	3,083.3
Blair	DUNCANSVILLE BORO	52%	48%	49%	51%	301.2
Washington	DUNLEVY BORO	17%	83%	13%	87%	220.2
Lackawanna	DUNMORE BORO	41%	59%	29%	71%	3,766.0
Luzerne	DUPONT BORO	39%	61%	39%	61%	972.1
Allegheny	DUQUESNE CITY	46%	54%	46%	54%	1,298.7
Luzerne	DURYEA BORO	35%	65%	15%	85%	1,367.8
Berks	EARL TWP	12%	88%	4%	96%	875.2
Lancaster	EARL TWP	15%	85%	9%	91%	2,801.4
Northampton	EAST ALLEN TWP	15%	85%	9%	91%	3,184.9
Northampton	EAST BANGOR BORO	16%	84%	12%	88%	303.9
Chester	EAST BRADFORD TWP	21%	79%	15%	85%	6,342.4
Chester	EAST BRANDYWINE TWP	14%	86%	13%	87%	6,429.5
Chester	EAST CALN TWP	26%	74%	26%	74%	2,338.9
Lancaster	EAST COCALICO TWP	20%	80%	13%	87%	6,539.1
Cambria	EAST CONEMAUGH BORO	50%	50%	49%	51%	176.7
Chester	EAST COVENTRY TWP	12%	88%	11%	89%	5,508.1
Allegheny	EAST DEER TWP	17%	83%	17%	83%	1,601.1
Lancaster	EAST DONEGAL TWP	24%	76%	7%	93%	2,401.4
Lancaster	EAST EARL TWP	23%	77%	7%	93%	2,093.9
Chester	EAST FALLOWFIELD TWP	12%	88%	7%	93%	4,095.2
Chester	EAST GOSHEN TWP	37%	63%	37%	63%	6,488.6
Montgomery	EAST GREENVILLE BORO	65%	35%	65%	35%	336.8
Dauphin	EAST HANOVER TWP	13%	87%	5%	95%	3,686.4
Lancaster	EAST HEMPFIELD TWP	32%	68%	27%	73%	11,069.7
Westmoreland	EAST HUNTINGDON TWP	20%	80%	7%	93%	3,770.1
Lancaster	EAST LAMPETER TWP	30%	70%	21%	79%	7,541.2
Delaware	EAST LANSDOWNE BORO	56%	44%	56%	44%	131.1
Allegheny	EAST MCKEESPORT BORO	46%	54%	45%	55%	263.1
York	EAST MANCHESTER TWP	14%	86%	10%	90%	5,086.6
Chester	EAST MARLBOROUGH TWP	19%	81%	12%	88%	5,296.8
Montgomery	EAST NORRITON TWP	43%	57%	43%	57%	3,882.9
Chester	EAST NOTTINGHAM	14%	86%	10%	90%	5,154.2

APPENDIX E

PRP INSTRUCTIONS ATTACHMENT B: POLLUTION LOADING RATES

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 F

BMP EFFECTIVENESS VALUES

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

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 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	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. To determine pollutant reductions for this BMP, these steps must be taken: 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. 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%.

APPENDIX G

STREET SWEEPING EFFECTIVENESS VALUES

Pollutant Reductions Associated with Different Street Cleaning Practices					
Practice #	Description [1]	Approx Passes/Yr [2]	TSS Removal (%)	TN Removal (%)	TP Removal (%)
SCP-1	AST- 2 PW	~100	21	4	10
SCP-2	AST- 1 PW	~50	16	3	8
SCP-3	AST- 1 P2W	~25	11	2	5
SCP-4	AST- 1 P4W	~10	6	1	3
SCP-5	AST- 1 P8W	~6	4	0.7	2
SCP-6	AST- 1 P12W	~4	2	0	1
SCP-7	AST- S1 or S2	~15	7	1	4
SCP-8	AST- S3 or S4	~20	10	2	5
SCP-9	MBT- 2PW	~100	0.7	0	0
SCP-10	MBT- 1 PW	~50	0.5	0	0
SCP-11	MBT- 1 P4W	~10	0.1	0	0

AST: Advanced Sweeping Technology MBT: Mechanical Broom Technology

[1] See Table 15 for the codes used to define street cleaning frequency

[2] Depending on the length of the winter shutdown, the number of passes/yr may be 10 to 15% lower than shown

Table 15. Adapting the WINSLAMM Model for the Chesapeake Bay Watershed

Bay rainfall data. The model used the calibration period from 1995 through 2005 using Washington National Airport Station event-based rainfall data. The rainfall data was processed assuming the minimum number of hours between events is 6 hours and the minimum rainfall event depth is 0.01 inch.

East Coast input data files were prepared to represent street conditions across the Chesapeake Bay watershed. The particle size distribution and peak-to-average flow ratio files were set to the program default average pavement and flow ratio files

Four different street types were simulated to represent in different land uses that had curb and gutter drainage systems:

Single-family residential: Approximately 0.25-acre lots, with cul-de-sacs connecting to two-lane residential feeder roads with parallel parking on one side; light traffic; and 25 mile-per-hour (mph) speed limit. Approximately 33 houses in a 10-acre area. The driveways are simulated as draining onto the roads.

Commercial (80 percent impervious): Big box stores and parking lots. Feeder roads (two travel lanes and center turn lane) with no on-street parking, 35 mph speed limit, and heavy traffic.

Ultra-urban downtown (95 percent impervious): Multistory buildings. Two-lane urban roads with parallel parking on both sides of the street, sidewalks, and 25 mph speed limit.

Arterial highway: A four-lane divided road with median with barrier; high-speed traffic with turn lanes; and no on-street parking. Assumed to be commercial land use

Three different sweeping start/stop dates to reflect regional differences in climate across the watershed:

Sweeping occurs over the entire year
Sweeping suspended December 1, restarts March 15
Sweeping suspended December 15, restarts February 15

Six different fixed sweeping schedules

2PW = 2 passes per week	1P4W = 1 pass every 4 weeks
1PW = 1 pass every week	1P8W = 1 pass every 8 weeks
1P2W = 1 pass every 2 weeks	1P12W = 1 pass every 12 weeks

Four seasonal sweeping schedules (more intensive in Spring or Fall)

S1: Spring – One pass every week from March to April. Monthly otherwise
S2: Spring – One pass every other week from March to April. Monthly otherwise
S3: Spring and fall – One pass every week (March to April, October to November). Monthly otherwise
S4: Spring and fall – One pass every other week during the season. Monthly otherwise

Two Levels of Sweeper Technology

MBC = Mechanical broom cleaning	VAC = Vacuum assisted cleaning

Four Options for Street Parking Density and No Parking Enforcement

For more details, consult the technical memo (Tetra Tech, Inc., 2015)