

**NPDES Stormwater Discharges from MS4
Pollutant Reduction Plan
for
Borough of Ambler
Montgomery County, Pennsylvania**

September 2017

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for
Borough of Ambler
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Borough of Ambler, Montgomery County (Municipality) is submitting this Pollution Reduction Plan (PRP) in accordance with the requirements of *General Permit PAG-13 for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4)*; specifically, in accordance with the *MS4 Requirements Table (Municipal) Anticipated Obligations for Subsequent NPDES Permit Term*. The Municipality must create a PRP due to discharges from their MS4 to the Wissahickon Creek watershed, which has been listed as impaired for sediment, nutrients, and pathogens. The United States Environmental Protection Agency (EPA) approved Total Maximum Daily Load (TMDL) plans for sediment in 2003 for the Wissahickon Creek (see Appendix A). A TMDL strategy was submitted to the Pennsylvania Department of Environmental Protection for review and approval in December 2015. Comments have yet to be received.

The intent of this MS4 PRP is to establish the existing loading of pollutants discharged from the MS4 to the Wissahickon Creek watershed, and to present a plan to reduce these pollutants. This MS4 PRP is organized to follow the "Required PRP Elements" presented in the PRP Instructions included as part of the *PAG-13 MS4 General Permit* instruction package. This PRP will be evaluated and updated by the Municipality on an as-needed basis, based on its effectiveness in reducing pollutant loads in discharges from the regulated small MS4. If this occurs, the Municipality will work with the Pennsylvania Department of Environmental Protection (PADEP) for review and approval of any revisions or updates.

Each MS4 PRP must include the following Required PRP Elements:

- Section A: Public Participation
- Section B: Map
- Section C: Pollutants of Concern
- Section D: Determine Existing Loading for Pollutants of Concern
- Section E: Select BMPs to Achieve the Minimum Required Reductions in Pollutant Loading
- Section F: Identify Funding Mechanisms
- Section G: Identify Responsible Parties for Operation and Maintenance (O&M) of BMPs

A. Public Participation

As part of the preparation of this MS4 PRP, public participation is required. The MS4 shall complete the public participation measures listed below, and report in the PRP that each was completed:

- A complete copy of the PRP shall be available for public review.
- The applicant shall publish, in a newspaper of general circulation in the area, a public notice containing a statement describing the plan, where it may be reviewed by the public, and the length of time the permittee will provide for the receipt of comments. The public notice must be published at least 45 days prior to the deadline for submission of the PRP to DEP. **(Public Notice Attached)**
- The applicant shall accept written comments for a minimum of 30 days from the date of public notice. **(Public comments will be attached to the PRP submitted to PADEP)**
- The applicant shall accept comments from any interested member of the public at a public meeting or hearing, which may include a regularly scheduled meeting of the governing body of the municipality or municipal authority that is the permittee.
- The applicant shall consider and make a record of the consideration of each timely comment received from the public during the public comment period concerning the plan, identifying any changes made to the plan in response to the comment. **(Comment response document will be attached to the PRP submitted to PADEP)**

All required documentation of public participation, as outlined above, is included as Appendix B.

- Date PRP public notice was published in newspaper: July 24, 2017
- Date PRP was made available for public review/comment: July 24, 2017
- End date for receipt of written comments (30 days from the date of public notice): August 23, 2017
- Date PRP listed on the public meeting agenda: July 18, 2017
- Date PRP comments were accepted at a public meeting: August 15, 2017

B. Map

Mapping is an integral part of developing the PRP and requires a level of detail suitable to determine the existing land uses, impervious/pervious surface coverages, topography and loading for the sediment. The MS4 PRP map shall show land uses and / or impervious / pervious surfaces and the storm sewershed boundary. The MS4 PRP map(s) shall also show the proposed locations of structural BMPs that will be implemented to achieve the required pollutant load reductions. The storm sewershed boundary shown on the Municipality MS4 PRP Maps constitute the storm sewershed to each of the MS4 outfalls within the MS4's jurisdiction that discharge to the Wissahickon Creek watershed.

The Municipality MS4 PRP Maps are the same maps that were included in the TMDL Strategy submitted to PADEP in December 2015 and identify the storm sewershed boundary, the existing roadways and major structural features. The Municipality MS4 PRP Maps are included in Appendix C.

The Municipality MS4 PRP Maps also shows parsed areas, which are areas within the storm sewershed that are not included in the calculation of land area and existing pollutant loading. All BMPs located within these parsed areas have not been counted toward achieving pollutant reduction objectives. 26.8% of the Municipality has been parsed (137 of the 512 acres).

Examples of land area that have been parsed include:

- The land area associated with non-municipal stormwater NPDES permit coverage that exists within the urbanized area of a municipality;
- Land area associated with PennDOT roadways and the Pennsylvania Turnpike (roads and right of ways);
- Land areas in which stormwater runoff does not enter the MS4. If an accurate storm sewershed map is developed, these lands may be parsed or excluded as part of that process. Potential examples include homeowner's associations and schools which do not contain municipal roads or other municipal infrastructure.

C. Pollutants of Concern

The Municipality's December 2015 TMDL Strategy calculated the existing loading of sediment in lbs/year, the minimum reduction in loading in lbs/year, selected BMP(s) to reduce loading, and demonstrated that the selected Best Management Practices (BMPs) would achieve the minimum reductions.

For PRPs developed for impaired water ["Appendix E" noted in the Requirements Table column in the *MS4 Requirements Table (Municipal) Anticipated Obligations for Subsequent NPDES Permit Term*], the pollutants are based on the impairment listing as provided in the *MS4 Requirements Table (Municipal) Anticipated Obligations for Subsequent NPDES Permit Term*. If the impairment is based on siltation (sediment) only, a minimum of 10% sediment reduction is required. If the impairment is based on nutrients only or other surrogates for nutrients (e.g., "Excessive Algal Growth" and "Organic Enrichment/Low D.O."), a minimum 5% reduction is required. If the impairment is due to both siltation and nutrients, both sediment (10% reduction) and nutrients (5% reduction) must be addressed. PADEP has determined that 10% sediment reduction will also result in at least 5% nutrient reduction. Since there is no wasteload allocation (WLA) for nutrients or other surrogates for nutrients within the TMDL, it was assumed that sediment is the limiting factor for the Wissahickon Creek watershed. Since a 10% sediment reduction of the total TMDL load reduction requirement is proposed the Municipality can assume that all other nutrient and surrogates for nutrients will be met as part of this PRP. As such, nutrient loadings were not calculated as part of this PRP.

D. Determine Existing Loading for Pollutants of Concern

TABLE D-1 below summarizes the division of the total area of the Municipality.

TABLE D-1: SUMMARY OF AREAS

Area Description	Acres
Parsed	137
Borough ROW	80
Other Non-Parsed	295
Total Area	512

The loading and reduction for sediment was calculated as follows:

The Municipality's permit obligation applies to the land area that drains to the municipal separate storm sewer (See TABLE D-1) from within the jurisdiction of the MS4 permittee (the "storm sewershed"). The storm sewershed land area that drains to the municipal separate storm sewer from within the jurisdiction of the MS4 to Wissahickon Creek was delineated using PAMAP data known as Light Detection and Ranging (LiDAR) contours as part of the Municipality's December 2015 TMDL Strategy. Lands owned by the State or County as well as land areas that drained directly to non-Borough roads, streams, or permitted BMPs were parsed. GIS software was then used to define land use in the Municipality and utilize the total area tool to calculate the total sediment loading to the Wissahickon Creek watershed created by the Municipality for the non-parsed areas. Based upon an analysis of the non-parsed areas within the Municipality that included event mean concentrations (EMCs) (per Chapter 8 of the BMP Manual) and weighted rainfall volumes for the non-parsed areas the existing sediment loads for each watershed were calculated.

In accordance with the Municipality's December 2015 TMDL Strategy after parsing it had a total non-parsed sediment loading in 2003 of 68,103 lbs/year in its Wissahickon Creek storm sewershed. The associated TMDL MS4 required pollutant reduction for this storm sewershed is 37,202 lbs/year. Since 2003, the Municipality has installed several BMPs. These BMPs have resulted in a loading decrease of 5,792 lbs/year. Therefore, as of 2015 the remaining sediment

load that needs to be reduced is 31,410 lbs/year. Per the Municipality’s December 2015 TMDL Strategy these impairments and their associated loads are to be rectified over a fifty (50) year period in which at least 10% of the remaining TMDL load (3,141 lbs/year) will be reduced each permit cycle over that time period. This minimum sediment reduction will result in the Municipality’s MS4 having a new sediment load of 59,170 lbs/year and a remaining reduction load of 28,269 lbs/year after the next 5-year permit cycle.

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

The Municipality’s December 2015 TMDL Strategy outlines several BMP options. The Municipality has a requirement to reduce sediment by 54.6% in the Wissahickon Creek storm sewershed. As previously stated PADEP has determined that 10% sediment reduction will also result in at least 5% nutrient reduction. Implementation of BMPs or land use changes must be proposed that will result in meeting the minimum required reduction in pollutant loading with the storm sewershed(s) identified by the MS4. These BMP(s) must be implemented within five (5) years of DEP’s approval of coverage under the PAS-13 General Permit, and must be located within the storm sewersheds of the applicable impaired waters, on either public or private property.

The Municipality plans to achieve the sediment reduction by designing, constructing, operating and maintaining BMPs. The Municipality is required to implement this plan over the next five (5) years. Table E-1 is a summary of the proposed BMPs under consideration, including location, type, area treated, and sediment removed:

TABLE E-1: SUMMARY OF BMPS

BMP LOCATION	BMP TYPE	AREA TREATED BY BMP (Acres)	SEDIMENT REMOVED BY BMP (lbs/year)
Wissahickon Creek Watershed	Streambank Restoration	Varies	Up to 5,801

As denoted in Section D, the load after proposed BMPs are implemented for the Wissahickon Creek Storm Sewershed should be at most 59,170 lbs/year. As demonstrated above in Table E-1 the proposed total load reduction will be at least 3,141 lbs/year and as much as 5,801 lbs/year, which meets and/or exceeds the minimum reduction proposed in the Municipality's December 2015 TMDL Strategy.

The following table summarizes the sediment load and required sediment reduction for the Wissahickon Creek Storm Sewershed. Also included is a summary of the proposed BMPs contemplated to achieve the required sediment load reduction.

TABLE E-2: MS4 PRP STRATEGY SUMMARY FOR WISSAHICKON CREEK STORM SEWERSHED

Description	Value	Unit
Wissahickon Creek Small Watershed	512	acres
Parsed Area - Total	137	acres
Wissahickon Creek Storm Sewershed	375	acres
2003 MS4 Sediment Load	68,103	lbs/year
MS4 Required Pollutant Reduction per TMDL	37,202	lbs/year
Sediment Load Removed by BMPs Installed Since 2003	5,792	lbs/year
Current Sediment Load	62,311	lbs/year
Remaining Sediment Load to be Removed for Compliance with TMDL	31,410	lbs/year
TMDL Proposed Sediment Pollutant Load Reduction Percentage	10	%
Minimum Required Pollutant Load Reduction	3,141	lbs/year
Proposed Sediment Load Reduction from BMPs	Up to 5,801	lbs/year
Remaining Sediment Load to be Removed for Compliance with TMDL After Proposed BMPs Installed	25,609 to 28,269	lbs/year

F. Identify Funding Mechanism(s)

The Municipality intends to apply for all related grants, such as growing greener, to implement these BMPs. The Municipality intends to utilize general fund money to cover the construction costs for the proposed BMPs should grant money not be awarded. The BMPs are expected to be constructed over the last three years of the new permit cycle. Once the PRP has been approved by PADEP, the Municipality intends to approve design of the BMPs, upon which time a feasibility and cost analysis will be prepared and shared with PADEP.

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

Once implemented, the BMPs must be maintained in order to continue producing the expected pollutant reductions. Applicants must identify the following for each selected BMP:

- The parties responsible for ongoing O&M;
- The activities involved with O&M for each BMP; and
- The frequency at which O&M activities will occur.

Actual O&M activities will be identified by the MS4 in their Annual MS4 Status Reports, submitted under the General Permit. Once the PRP has been approved by PADEP and the Municipality begins design of the BMPs, an O&M manual will be created and submitted to PADEP for review and comment.

Table G-1 OPERATION AND MAINTENANCE OF BMPs

NAME OF BMP	LOCATION OF BMP	OWNER/ RESPONSIBLE PARTY	O&M ACTIVITY & FREQUENCY
Streambank Stabilization	Wissahickon Creek Watershed	Department of Public Works	N/A

H. GENERAL INFORMATION

Terms: The term “nutrients” refers to “Total Nitrogen” (TN) and “Total Phosphorus” (TP) unless specifically stated otherwise in PADEP’s latest Integrated Report. The terms “sediment,” “siltation,” and “suspended solids” all refer to inorganic solids and are hereinafter referred to as “sediment.”

Pollutants of Concern and Required Reductions: For all PRPs, MS4s shall calculate existing loading of the pollutant(s) of concern, in lbs/year; calculate the minimum reduction in loading, in lbs/year; select BMP(s) to reduce loading; and demonstrate that the selected BMP(s) will achieve the minimum reductions.

For PRPs developed for impaired waters (Appendix E), the pollutant(s) are based on the impairment listing, as provided in the MS4 Requirements Table. If the impairment is based on siltation only, a minimum 10% sediment reduction is required. If the impairment is based on nutrients only or other surrogates for nutrients (e.g., “Excessive Algal Growth” and “Organic Enrichment/Low D.O.”), a minimum 5% TP reduction is required. If the impaired is due to both siltation and nutrients, both sediment (10% reduction) and TP (5% reduction) must be addressed.

Existing Pollutant Loading: Existing loading must be calculated and reported as of the date of the development of the PRP. MS4s may not claim credit for street sweeping and other non-structural BMPs implemented in the past. If structural BMPs were implemented prior to development of the PRP and continue to be operated and maintained, the MS4 may claim pollutant reduction credit in the form of reduced existing loading.

NOTE – An MS4 may not reduce its obligations for achieving pollutant load reductions through previously installed BMPs. An MS4 may only use such BMPs to reduce its estimate of existing pollutant loading. For example, if a rain garden was installed ten years ago and is expected to remove 100 lbs of sediment annually, and the overall annual loading of sediment in the storm sewershed is estimated to be 1,000 lbs without specifically addressing the rain garden, an MS4 may not claim that the rain garden satisfies its obligations to reduce sediment loading by 10%. The MS4 may, however, use the rain garden to demonstrate that existing loading is 900 lbs instead of 1,000 lbs, and 90 lbs rather than 100 lbs needs to be reduced during the term of permit coverage.

BMP Effectiveness: All MS4s must use the BMP effectiveness values contained within PADEP’s BMP Effectiveness Values document (3800-PM-BCW0100m) or Chesapeake Bay Program expert panel reports for BMPs listed in those resources when determining pollutant load reductions in PRPs. For BMPs not listed in 3800-PM-BCW0100m or expert panel reports, MS4s may use effectiveness values from other technical resources; such resources must be documented in the PRP.

Combining PRPs: If the MS4 discharges into multiple local surface waters impaired for nutrients and/or sediment, one PRP may be submitted to satisfy Appendix E but calculations and BMP selections must be completed independently for the storm sewershed of each impaired water. If, for example, an MS4 permittee must complete three PRPs according to the MS4 Requirements Table for three separate surface waters, storm sewershed maps must be developed, existing loads must be calculated, and BMPs must be implemented for pollutant reductions independently within those storm sewersheds. In other words, BMPs cannot be implemented in one storm sewershed to count toward pollutant reductions in an entirely separate storm sewershed for a different impaired water.

Where local surface waters are impaired for nutrients and/or sediment, and those waters are tributary to a larger body of water that is also impaired, MS4s can propose

BMPs within the upstream impaired waters to meet the pollutant reduction requirements of both the upstream and downstream waters. For example, if Stream A flows through a municipality that is tributary to Stream B, both are impaired and the MS4 has discharges to both streams, the MS4 can implement BMPs in the storm sewershed of Stream A to satisfy pollutant reduction requirements for both Streams A and B. In general, the MS4 permittee would not be able to satisfy pollutant reduction requirements for both streams if BMPs were only implemented in the storm sewershed of Stream B; however, on a case by case basis DEP will consider such proposals where it can be demonstrated that implementing BMPs in the upstream storm sewershed is infeasible.

If, however, Stream A does not flow into Stream B, both are impaired and the MS4 has discharges to both streams, in general DEP would expect that BMPs be implemented in the storm sewershed of both streams to meet pollutant reduction requirements.

MS4s participating in collaborative efforts are encouraged to contact DEP's Bureau of Clean Water during the PRP development phase for feedback on proposed approaches.

Joint PRPs: MS4s may develop and submit a joint PRP, regardless of whether the MS4s will be submitting a "joint NOI" or are already co-permittees. In general, the MS4s participating in a joint PRP should have contiguous land areas. The "study area" to be mapped is the combined storm sewershed for all MS4 jurisdictions.

BMP Selection: MS4s may propose and take credit for only those BMPs that are not required to meet regulatory requirements or otherwise go above and beyond regulatory requirements. For example, a BMP that was installed to meet Chapter 102 NPDES permit requirements for stormwater associated with construction activities may not be used to meet minimum pollutant reductions unless the MS4 can demonstrate that the BMP exceeded regulatory requirements; if this is done, the MS4 may take credit for only those reductions that will occur as a result of exceeding regulatory requirements.

NOTE – Street sweeping may be proposed as a BMP for pollutant loading reductions if 1) street sweeping is not the only method identified for reducing pollutant loading, and 2) the BMP effectiveness values contained in 3800-PM-BCW0100m or Chesapeake Bay Program expert panel reports are utilized.

Submission of PRP: Attach one copy of the PRP with the NOI or individual permit application that is submitted to the regional office of DEP responsible for reviewing the NOI or application. In addition, one copy of the PRP (not the NOI or application) must be submitted to DEP's Bureau of Clean Water (BCW). BCW prefers electronic copies of PRPs, if possible. Email the electronic version of the PRP, including map(s) (if feasible), to RA-EPPAMS4@pa.gov. If the MS4 determines that submission of an electronic copy is not possible, submit a hard copy to: PA Department of Environmental Protection, Bureau of Clean Water, 400 Market Street, PO Box 8774, Harrisburg, PA 17105-8774.

PRP Implementation and Final Report: Under the PAG-13 General Permit, the permittee must achieve the required pollutant load reductions within 5 years following DEP's approval of coverage under the General Permit, and must submit a report demonstrating compliance with the minimum pollutant load reductions as an attachment to the first Annual MS4 Status Report that is due following completion of the 5th year of General Permit coverage. For example, if DEP issues written approval of coverage to a permittee on June 1, 2018, the required pollutant load reductions must be implemented by June 1, 2023 and the final report documenting the BMPs that were implemented (with appropriate calculations) must be attached to the annual report that is due September 30, 2023. In general, the same methodology used to calculate the existing pollutant loads should be used in the final report to demonstrate the reductions. If BMP effectiveness values are updated in DEP's BMP Effectiveness Values document or Chesapeake Bay Program expert panel reports between the time the PRP is approved and the time the final report is developed, those updated effectiveness values may be used.

Appendix A

MS4 Requirements Table

Appendix A-1: Applicable portion of the MS4 Requirements Table (Municipal)
Anticipated Obligations for Subsequent NPDES Permit Term

MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment	
Montgomery County	ABINGTON TWP	PAG130012	Yes	TMDL Plan	Terwood Run	Appendix E-Siltation (5)	Cause Unknown (5)
					Wissahickon Creek	Appendix E-Nutrients (4a), Appendix B-Pathogens (5)	Water/Flow Variability (4c)
					Unnamed Tributaries to Wissahickon Creek		Other Habitat Alterations (4c)
					Tacony Creek	Appendix E-Organic Enrichment/Low D.O. (5)	Flow Alterations, Other Habitat Alterations, Water/Flow Variability (4c)
					Sandy Run	Appendix B-Pathogens (4a), Appendix E-DO/BOD, Nutrients (4a)	Other Habitat Alterations, Water/Flow Variability (4c)
					Rockledge Branch	Appendix E-Siltation (5)	Cause Unknown (5)
					Robinhood Brook	Appendix E-Siltation (5)	Cause Unknown (5)
					Pennypack Creek	Appendix B-Pathogens (4a), Appendix C-Priority Organics (4a), Appendix E-Organic Enrichment/Low D.O. (4a), Appendix E-Siltation (5)	Cause Unknown (5)
					Meadow Brook	Appendix E-Siltation (5)	Cause Unknown (5)
					Jenkintown Creek		Flow Alterations, Other Habitat Alterations, Water/Flow Variability (4c)
AMBLER BORO	PAG130036	Yes	TMDL Plan	East Branch Jenkintown Creek		Flow Alterations, Other Habitat Alterations, Water/Flow Variability (4c)	
				Wissahickon TMDL	TMDL Plan-Siltation, Suspended Solids (4a)	Cause Unknown (4a)	
				Frankford Creek	Appendix C-PCB (4a), Appendix E-Organic Enrichment/Low D.O. (5)	Flow Alterations, Other Habitat Alterations, Water/Flow Variability (4c)	
				Wissahickon TMDL	TMDL Plan-Siltation, Suspended Solids (4a)	Cause Unknown (4a)	
				Unnamed Tributaries to Wissahickon Creek		Other Habitat Alterations (4c)	
				Wissahickon Creek	Appendix E-Nutrients (4a), Appendix B-Pathogens (5)	Water/Flow Variability (4c)	
				Schuylkill River PCB TMDL	Appendix C-PCB (4a)		
				Schuylkill River	Appendix C-PCB (4a)		
				Southampton Creek TMDL	TMDL Plan-Nutrients, Organic Enrichment/Low D.O., Siltation (4a)	Flow Alterations, Other Habitat Alterations, Water/Flow Variability (4c)	
				Southampton Creek		Cause Unknown (5)	
BRIDGEPORT BORO	PAG130166	Yes	TMDL Plan	Huntingdon Valley Creek	Appendix E-Siltation (5)	Cause Unknown (5)	
				Pennypack Creek	Appendix E-Siltation (5)	Cause Unknown (5)	

Appendix B

Public Participation

Appendix B-1: Public Notice & Proof of Advertisement

Appendix B-2: Public Comments Received

Appendix B-3: Public Meeting Agenda and Meeting Minutes

Appendix B-4: Record of Consideration

LEGAL NOTICE

NOTICE OF PUBLIC COMMENT PERIOD AND PUBLIC MEETING for the **NPDES Stormwater Discharges from MS4 Pollutant Reduction Plan for Borough of Ambler (PRP)**. The PRP outlines the measures the Borough intends to implement to reduce certain pollutants discharged from the Borough's municipal separate storm sewer system (MS4). The PRP is based upon and is intended to supplement the Borough MS4 TMDL Strategy submitted to PADEP in 2015. The PRP includes a summary of the existing loading of the pollutants of concern, a calculation of the minimum reduction required, and a selection of potential Best Management Practices (BMPs) intended to achieve the minimum required reduction. The Borough is soliciting written comments on the PRP. Interested persons may submit written comments during the thirty (30) day period of July 24, 2017 through August 23, 2017. The document may be reviewed during the comment period at Ambler Borough Hall, 131 Rosemary Avenue, Ambler, PA 19002 weekdays between 9AM and 4PM during the comment period. The document is also available for review on the Borough website (<http://boroughofambler.com/>). Written and verbal comments will be accepted at the public meeting scheduled at 7PM on August 15, 2017 at Ambler Borough Hall. Comments must be submitted in writing to the address above (Attn: Borough Manager) or by email to manager@borough.ambler.pa.us and must include originator's name and address. Comments submitted by facsimile will not be accepted.

Appendix C

Maps

Appendix C-1: Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania
Appendix C-2: Parsed Area Map

Nutrient and Siltation TMDL Development for Wissahickon Creek, Pennsylvania

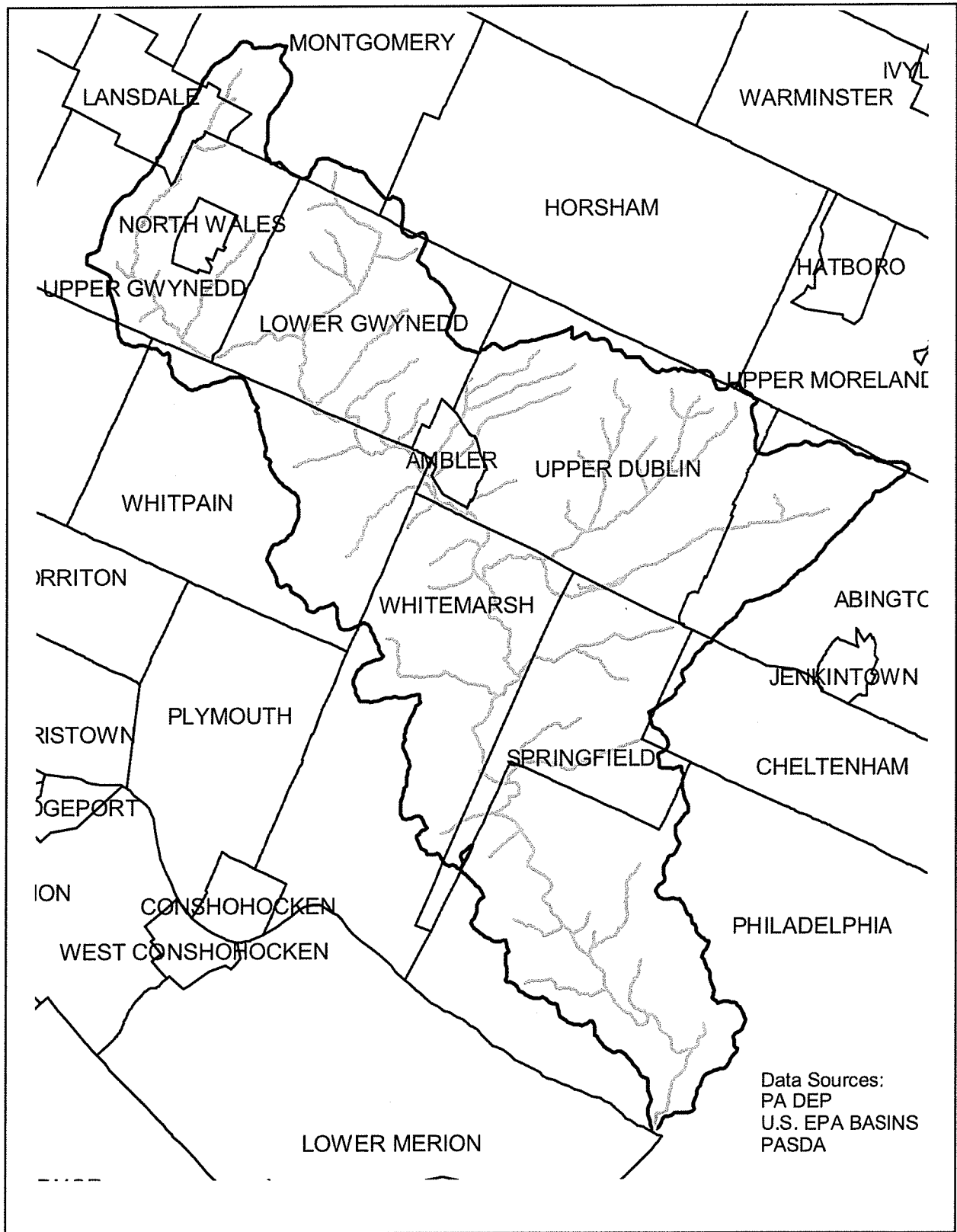


Figure 2-2. Municipal boundaries in the Wissahickon Creek watershed

Appendix D

Existing Loading for Pollutants of Concern

Appendix D-1:	EMC Table
Appendix D-2:	ROW Calculations

Appendix D-1: EMC Table

	Land Cover Classification	TSS (mg/l)	TP (mg/l)	Average Annual Runoff (in/year)
Pervious Surfaces	Forest	39	0.15	4.63
	Meadow	47	0.19	4.10
	Fertilized Planting Area	55	1.34	5.53
	Native Planting Area	55	0.4	3.62
	Lawn, Low-Input	180	0.4	6.59
	Lawn, High-Input	180	2.22	5.53
	Golf Course Fairway/Green	305	1.07	6.59
	Grassed Athletic Field	200	1.07	7.39
Impervious Surfaces	Rooftop	21	0.13	43.51
	High Traffic Street/Highway	261	0.4	39.80
	Medium Traffic Street	113	0.33	23.96
	Low Traffic/Residential Street	86	0.36	22.47
	Residential Driveway, Play Courts, etc.	60	0.46	43.51
	High Traffic Parking Lot	120	0.39	43.51
	Low Traffic Parking Lot	58	0.15	43.51

Pollutant Load (lbs/year) = 2.7 (Conversion factor) x Nutrient Concentration (EMC, mg/l) x Volume (Acre-FT)

SEDIMENT LOAD WITHIN WISSAHICKON CREEK WATERSHED

ROAD	START	END	LENGTH		AREA				TRAFFIC	IMPERVIOUS			PERVIOUS			TOTAL LOAD (lbs/yr)
			(mi)	(ft)	ROAD (sf)	CURB (sf)	WALK (sf)	GRASS (sf)		RUNOFF (ft/yr)	AREA (sf)	LOAD (mg/L)	RUNOFF (ft/yr)	AREA (sf)	LOAD (mg/L)	
Ainsworth St	Forest Ave	Race St	0.12	633.6	12672	633.6	0	0	LOW	1.88	13306	86	0.55	0	180	133
Amblor Rd	Church St	Borough Line	0.02	105.6	1584	105.6	422.4	105.6	LOW	1.88	2112	86	0.55	105.6	180	22
Anderson Ln	End	Tennis Ave	0.08	422.4	16896	422.4	3379.2	844.8	LOW	1.88	20697.6	86	0.55	844.8	180	212
Artman Rd	Overlook Rd	Cherry Ln	0.09	475.2	19008	475.2	3801.6	950.4	LOW	1.88	23284.8	86	0.55	950.4	180	239
Bannockburn Ave	S Main St	S Spring Garden St	0.03	158.4	6336	158.4	1267.2	316.8	LOW	1.88	7761.6	86	0.55	316.8	180	80
Beechmont Rd	S Spring Garden St	Church St	0.12	633.6	25344	633.6	5068.8	1267.2	LOW	1.88	31046.4	86	0.55	1267.2	180	318
Belmont Ave	Candy Ln	Overlook Rd	0.14	739.2	29568	739.2	5913.6	1478.4	LOW	1.88	36220.8	86	0.55	1478.4	180	371
Belmont Ave	N Main St	N Spring Garden St	0.06	316.8	7286.4	316.8	2534.4	633.6	LOW	1.88	10137.6	86	0.55	633.6	180	105
Belmont Ave	N Spring Garden St	N Ridge Ave	0.07	369.6	8500.8	369.6	2956.8	739.2	LOW	1.88	11827.2	86	0.55	739.2	180	123
Belmont Ave	N Ridge Ave	Hendricks St	0.28	1478.4	38438.4	1478.4	11827.2	2956.8	LOW	1.88	51744	86	0.55	2956.8	180	535
Belmont Ave	Hendricks St	Glen Mawr Dr	0.1	528	15840	528	4224	1056	LOW	1.88	20592	86	0.55	1056	180	212
E Butler Ave	S Spring Garden St	S Spring Garden St	0.05	264	10560	264	2112	528	MEDIUM	1.88	12936	113	0.55	528	180	173
E Butler Ave	S Spring Garden St	Cavaller Dr	0.05	264	10560	264	2112	528	MEDIUM	1.88	12936	113	0.55	528	180	173
E Butler Ave	Cavaller Dr	S Ridge Ave	0.04	211.2	8448	211.2	1689.6	422.4	MEDIUM	1.88	10348.8	113	0.55	422.4	180	139
E Butler Ave	S Ridge Ave	York St	0.03	158.4	6336	158.4	1267.2	316.8	MEDIUM	1.88	7761.6	113	0.55	316.8	180	104
E Butler Ave	York St	Lindenwald Ave	0.1	528	21120	528	4224	1056	MEDIUM	1.88	25872	113	0.55	1056	180	346
E Butler Ave	Lindenwald Ave	Park Ave	0.12	633.6	25344	633.6	5068.8	1267.2	MEDIUM	1.88	31046.4	113	0.55	1267.2	180	416
E Butler Ave	Park Ave	Hendricks St	0.04	211.2	8448	211.2	1689.6	422.4	MEDIUM	1.88	10348.8	113	0.55	422.4	180	139
E Butler Ave	Hendricks St	Woodland Ave	0.03	158.4	6336	158.4	1267.2	316.8	MEDIUM	1.88	7761.6	113	0.55	316.8	180	104
E Butler Ave	Woodland Ave	Rosemont Ave	0.05	264	10560	264	2112	528	MEDIUM	1.88	12936	113	0.55	528	180	173
E Butler Ave	Rosemont Ave	Bethlehem Pk	0.09	475.2	19008	475.2	3801.6	950.4	MEDIUM	1.88	23284.8	113	0.55	950.4	180	312
W Butler Ave	Borough Line	S Locust St	0.02	105.6	4224	105.6	844.8	211.2	MEDIUM	1.88	5174.4	113	0.55	211.2	180	69
W Butler Ave	S Locust St	S Chestnut St	0.06	316.8	12672	316.8	2534.4	633.6	MEDIUM	1.88	15223.2	113	0.55	633.6	180	208
W Butler Ave	S Chestnut St	S Maple St	0.06	316.8	12672	316.8	2534.4	633.6	MEDIUM	1.88	15223.2	113	0.55	633.6	180	208
W Butler Ave	S Maple St	S Main St	0.09	475.2	19008	475.2	3801.6	950.4	MEDIUM	1.88	23284.8	113	0.55	950.4	180	312
Candy Ln	E Mount Pleasant Ave	Beechmont Rd	0.05	264	10560	264	2112	528	LOW	1.88	12936	86	0.55	528	180	133
Candy Ln	Beechmont Rd	Walker Rd	0.05	264	10560	264	2112	528	LOW	1.88	12936	86	0.55	528	180	133
Center St	S Chestnut St	S Maple St	0.06	316.8	7920	316.8	2534.4	633.6	LOW	1.88	10771.2	86	0.55	633.6	180	112
Center St	S Maple St	Haywood Rd	0.05	264	10560	264	2112	528	LOW	1.88	12936	86	0.55	528	180	133
Cherry Ln	Haywood Rd	Tennis Ave	0.05	264	10560	264	2112	528	LOW	1.88	12936	86	0.55	528	180	133
S Chestnut St	W Butler Ave	Wissahickon Ave	0.07	369.6	11088	369.6	2956.8	739.2	LOW	1.88	14414.4	86	0.55	739.2	180	149
S Chestnut St	Wissahickon Ave	Center St	0.06	316.8	9504	316.8	2534.4	633.6	LOW	1.88	12355.2	86	0.55	633.6	180	127
S Chestnut St	Center St	End	0.08	422.4	12672	422.4	3379.2	844.8	LOW	1.88	16473.6	86	0.55	844.8	180	170
Church St	Borough Line	S Main St	0.12	633.6	7286.4	633.6	2534.4	633.6	LOW	1.88	10454.4	86	0.55	633.6	180	108
Church St	S Main St	Bannockburn Ave	0.15	792	7920	792	6336	1584	LOW	1.88	15048	86	0.55	1584	180	160
Church St	Bannockburn Ave	Southern Ave	0.1	528	5280	528	4224	1056	LOW	1.88	10032	86	0.55	1056	180	107
Church St	Southern Ave	Highland Ave	0.1	528	5280	528	4224	1056	LOW	1.88	10032	86	0.55	1056	180	107
Church St	Highland Ave	Trinity Ave	0.8	4224	42240	4224	33792	8448	LOW	1.88	80256	86	0.55	8448	180	884
Church St	Trinity Ave	Rosemary Ave	0.05	264	2640	264	2112	528	LOW	1.88	5016	86	0.55	528	180	53
Church St	Rosemary Ave	Bethlehem Pk	0.05	264	10560	264	2112	528	LOW	1.88	10296	86	0.55	528	180	133
Cove Rd	Tennis Ave	Edgewood Dr	0.05	264	7920	264	2112	528	LOW	1.88	10296	86	0.55	528	180	133
Edgewood Dr	End	Hendricks St	0.08	422.4	12672	422.4	3379.2	844.8	LOW	1.88	16473.6	86	0.55	844.8	180	170
Edgewood Dr	Hendricks St	Cove Rd	0.11	580.8	17424	580.8	4646.4	1161.6	LOW	1.88	22651.2	86	0.55	1161.6	180	234
Edgewood Dr	Cove Rd	Bethlehem Pk	0.21	1108.8	33264	1108.8	8870.4	2217.6	LOW	1.88	43243.2	86	0.55	2217.6	180	446
Euclid Ave	Park Ave	North St	0.09	475.2	19008	475.2	3801.6	950.4	LOW	1.88	23284.8	86	0.55	950.4	180	239
Euclid Ave	North St	Bethlehem Pk	0.12	633.6	25344	633.6	5068.8	1267.2	LOW	1.88	31046.4	86	0.55	1267.2	180	318
Fairview Ave	Hendricks St	Rosemont Ave	0.07	369.6	8500.8	369.6	2956.8	739.2	LOW	1.88	11827.2	86	0.55	739.2	180	123
Fairview Ave	Rosemont Ave	Bethlehem Pk	0.1	528	12144	528	4224	1056	LOW	1.88	16896	86	0.55	1056	180	175
Forest Ave	N Main St	N Spring Garden St	0.06	316.8	9504	316.8	2534.4	633.6	LOW	1.88	12355.2	86	0.55	633.6	180	127
Forest Ave	N Spring Garden St	N Ridge Ave	0.07	369.6	11088	369.6	2956.8	739.2	LOW	1.88	14414.4	86	0.55	739.2	180	149
Forest Ave	N Ridge Ave	School St	0.06	316.8	9504	316.8	2534.4	633.6	LOW	1.88	12355.2	86	0.55	633.6	180	127
Forest Ave	School St	Walnut Ln	0.16	844.8	25344	844.8	6758.4	1689.6	LOW	1.88	32947.2	86	0.55	1689.6	180	340
Forest Ave	Walnut Ln	Hendricks St	0.06	316.8	9504	316.8	2534.4	633.6	LOW	1.88	12355.2	86	0.55	633.6	180	127

SEDIMENT LOAD WITHIN WISSAHICKON CREEK WATERSHED

ROAD	START	END	LENGTH		AREA					TRAFFIC	IMPERVIOUS			PERVIOUS			TOTAL LOAD (lbs/yr)
			(mi)	(ft)	ROAD (sf)	CURB (sf)	WALK (sf)	GRASS (sf)	RUNOFF (ft/yr)		AREA (sf)	LOAD (mg/L)	RUNOFF (ft/yr)	AREA (sf)	LOAD (mg/L)		
Forest Ave	Hendricks St	Glen Mawr Dr	0.1	528	15840	528	4224	1056		LOW	1.88	20592	86	0.55	1056	180	212
Forest Ave	Glen Mawr Dr	Bethlehem Pk	0.1	528	15840	528	4224	1056		LOW	1.88	20592	86	0.55	1056	180	212
Fulfilling Mill Ln	End	Tennis Ave	0.07	369.6	14784	369.6	2956.8	739.2		LOW	1.88	18110.4	86	0.55	739.2	180	186
Glen Mawr Dr	Valley Brook Rd	Belmont Ave	0.04	211.2	4857.6	211.2	1689.6	422.4		LOW	1.88	6758.4	86	0.55	422.4	180	70
Glen Mawr Dr	Belmont Ave	Forest Ave	0.16	844.8	7286.4	316.8	2534.4	633.6		LOW	1.88	10137.6	86	0.55	633.6	180	105
Greenwood Ave	Mattison Ave	Lindenwold Ave	0.16	844.8	2534.4	844.8	6758.4	1689.6		LOW	1.88	32947.2	86	0.55	1689.6	180	340
Grist Mill Ct	Hendricks St	End	0.08	422.4	12672	422.4	3379.2	844.8		LOW	1.88	16473.6	86	0.55	844.8	180	170
Haywood Rd	Tennis Ave	Walker Rd	0.11	580.8	23232	580.8	4646.4	1161.6		LOW	1.88	28459.2	86	0.55	1161.6	180	292
Haywood Rd	Walker Rd	Cherry Ln	0.13	686.4	27456	686.4	5491.2	1372.8		LOW	1.88	33633.6	86	0.55	1372.8	180	345
Heckler St	Hendricks St	Rosemont Ave	0.08	422.4	9715.2	422.4	3379.2	844.8		LOW	1.88	13516.8	86	0.55	844.8	180	178
Hendrick St	E Mount Pleasant Ave	Grist Mill Ct	0.06	316.8	14572.8	316.8	2534.4	633.6		LOW	1.88	17424	86	0.55	633.6	180	178
Hendrick St	Grist Mill Ct	Walker Rd	0.05	264	12144	264	2112	528		LOW	1.88	14520	86	0.55	528	180	148
Hendrick St	Walker Rd	Tennis Ave	0.1	528	24288	528	4224	1056		LOW	1.88	29040	86	0.55	1056	180	297
Hendrick St	Tennis Ave	Edgewood Dr	0.06	316.8	9504	316.8	2534.4	633.6		LOW	1.88	12355.2	86	0.55	633.6	180	178
Hendrick St	Edgewood Dr	Valley Brook Rd	0.07	369.6	14784	369.6	2956.8	739.2		LOW	1.88	18110.4	86	0.55	739.2	180	186
Hendrick St	Valley Brook Rd	Belmont Ave	0.06	316.8	9504	316.8	2534.4	633.6		LOW	1.88	12355.2	86	0.55	633.6	180	127
Hendrick St	Belmont Ave	Forest Ave	0.06	316.8	7286.4	316.8	2534.4	633.6		LOW	1.88	10137.6	86	0.55	633.6	180	105
Hendrick St	Forest Ave	Fairview Ave	0.06	316.8	7286.4	316.8	2534.4	633.6		LOW	1.88	10137.6	86	0.55	633.6	180	105
Hendrick St	Fairview Ave	Heckler St	0.15	792	6072	264	2112	528		LOW	1.88	8448	86	0.55	528	180	88
Hendrick St	Heckler St	E Butler Ave	0.15	792	31680	792	6336	1584		LOW	1.88	38808	86	0.55	1584	180	398
Highland Ave	S Spring Garden St	Park Ave	0.08	422.4	16896	422.4	3379.2	844.8		LOW	1.88	20697.6	86	0.55	844.8	180	212
Highland Ave	Park Ave	North St	0.03	158.4	6336	158.4	1267.2	316.8		LOW	1.88	7761.6	86	0.55	316.8	180	80
Highland Ave	North St	Church St	0.1	528	8712	528	0	0		LOW	1.88	9240	86	0.55	0	180	92
Knight Rd	Borough Line	E Mount Pleasant Ave	0.09	475.2	4752	475.2	3801.6	950.4		LOW	1.88	9028.8	86	0.55	950.4	180	96
Lemon St	Trinity Ave	Rosemary Ave	0.04	211.2	9715.2	211.2	1689.6	422.4		LOW	1.88	11616	86	0.55	422.4	180	119
Lindenwold Ave	E Race St	E Butler Ave	0.03	158.4	7286.4	158.4	1267.2	316.8		LOW	1.88	8712	86	0.55	316.8	180	89
Lindenwold Ave	E Butler Ave	Poplar St	0.05	264	12144	264	2112	528		LOW	1.88	14520	86	0.55	528	180	148
Lindenwold Ave	Poplar St	Greenwood Ave	0.04	211.2	9715.2	211.2	1689.6	422.4		LOW	1.88	11616	86	0.55	422.4	180	119
Lindenwold Ave	Greenwood Ave	Park Ave	0.09	475.2	21859.2	475.2	3801.6	950.4		LOW	1.88	26136	86	0.55	950.4	180	267
Lindenwold Ave	Park Ave	North St	0.08	422.4	19430.4	422.4	3379.2	844.8		LOW	1.88	23232	86	0.55	844.8	180	237
Lindenwold Ave	North St	Bethlehem Pk	0.07	369.6	11088	369.6	2956.8	739.2		LOW	1.88	14414.4	86	0.55	739.2	180	149
S Locust St	W Butler Ave	Wissahickon Ave	0.06	316.8	9504	316.8	2534.4	633.6		LOW	1.88	12355.2	86	0.55	633.6	180	127
S Locust St	Wissahickon Ave	Center St	0.07	369.6	11088	369.6	2956.8	739.2		LOW	1.88	14414.4	86	0.55	739.2	180	149
S Locust St	Center St	End	0.25	1320	30360	1320	10560	2640		LOW	1.88	42240	86	0.55	2640	180	438
N Main St	E Mount Pleasant Ave	Tennis Ave	0.05	264	7920	264	2112	528		LOW	1.88	10296	86	0.55	528	180	106
N Main St	E Mount Pleasant Ave	Reiffs Mill Rd	0.05	264	7920	264	2112	528		LOW	1.88	10296	86	0.55	528	180	106
N Main St	Reiffs Mill Rd	Belmont Ave	0.06	316.8	9504	316.8	2534.4	633.6		LOW	1.88	12355.2	86	0.55	633.6	180	127
N Main St	Belmont Ave	Forest Ave	0.04	211.2	6396	211.2	1689.6	422.4		LOW	1.88	8236.8	86	0.55	422.4	180	85
N Main St	Forest Ave	Walnut St	0.05	264	6396	264	2112	528		LOW	1.88	10296	86	0.55	528	180	106
N Main St	Walnut St	E Race St	0.03	158.4	4752	158.4	1267.2	316.8		LOW	1.88	6177.6	86	0.55	316.8	180	64
N Main St	E Race St	W Butler Ave	0.09	475.2	14256	475.2	3801.6	950.4		LOW	1.88	18532.8	86	0.55	950.4	180	191
N Main St	W Butler Ave	Poplar St	0.16	844.8	25344	844.8	6758.4	1689.6		LOW	1.88	32947.2	86	0.55	1689.6	180	340
N Main St	Poplar St	Orange Ave	0.15	792	23760	792	6336	1584		LOW	1.88	30888	86	0.55	1584	180	318
N Main St	Orange Ave	Banockburn Ave	0.14	739.2	22176	739.2	5913.6	1478.4		LOW	1.88	28828.8	86	0.55	1478.4	180	297
N Main St	Banockburn Ave	Church St	0.04	211.2	3168	211.2	1689.6	422.4		LOW	1.88	4224	86	0.55	422.4	180	44
N Main St	Church St	Randolph Ave	0.2	1056	36960	1056	4224	1056		LOW	1.88	42240	86	0.55	1056	180	429
N Main St	Randolph Ave	W Butler Ave	0.07	369.6	11088	369.6	2956.8	739.2		LOW	1.88	14414.4	86	0.55	739.2	180	149
N Main St	W Butler Ave	Wissahickon Ave	0.05	264	10560	264	2112	528		LOW	1.88	12936	86	0.55	528	180	133
Mattison Ave	Poplar St	Greenwood Ave	0.05	264	10560	264	2112	528		LOW	1.88	12936	86	0.55	528	180	133
Mattison Ave	Greenwood Ave	Water St	0.08	422.4	16896	422.4	3379.2	844.8		LOW	1.88	20697.6	86	0.55	844.8	180	212
Mattison Ave	Water St	Park Ave	0.09	475.2	19008	475.2	3801.6	950.4		LOW	1.88	23284.8	86	0.55	950.4	180	239
Mattison Ave	Park Ave	North St	0.11	580.8	23232	580.8	4646.4	1161.6		LOW	1.88	28459.2	86	0.55	1161.6	180	292
Mattison Ave	North St	Bethlehem Pk															

SEDIMENT LOAD WITHIN WISSAHICKON CREEK WATERSHED

ROAD	START	END	LENGTH		AREA						TRAFFIC	IMPERVIOUS			PERVIOUS			TOTAL LOAD (lbs/yr)
			(mi)	(ft)	ROAD (sf)	CURB (sf)	WALK (sf)	GRASS (sf)	RUNOFF (ft/yr)	AREA (sf)		LOAD (mg/L)	RUNOFF (ft/yr)	AREA (sf)	LOAD (mg/L)			
E Mount Pleasant Ave	Borough Line	N Main St	0.02	105.6	2428.8	105.6	844.8	211.2	528	LOW	1.88	3379.2	86	0.55	211.2	180	35	
E Mount Pleasant Ave	N Main St	N Spring Garden St	0.05	264	6072	264	2112	528	180	LOW	1.88	8448	86	0.55	528	180	88	
E Mount Pleasant Ave	N Spring Garden St	N Ridge Ave	0.06	316.8	7286.4	316.8	2534.4	633.6	180	LOW	1.88	10137.6	86	0.55	633.6	180	105	
E Mount Pleasant Ave	N Ridge Ave	Reiffs Mill Rd	0.16	844.8	19430.4	844.8	6758.4	1689.6	180	LOW	1.88	27033.6	86	0.55	1689.6	180	281	
E Mount Pleasant Ave	Reiffs Mill Rd	Hendricks St	0.06	316.8	7286.4	316.8	2534.4	633.6	180	LOW	1.88	10137.6	86	0.55	633.6	180	105	
E Mount Pleasant Ave	Hendricks St	Candy Ln	0.06	316.8	7286.4	316.8	2534.4	633.6	180	LOW	1.88	10137.6	86	0.55	633.6	180	105	
E Mount Pleasant Ave	Candy Ln	Overlook Rd	0.18	950.4	14256	950.4	3801.6	950.4	180	LOW	1.88	19008	86	0.55	950.4	180	196	
E Mount Pleasant Ave	Overlook Rd	Bethlehem Pk	0.22	1161.6	17424	1161.6	4646.4	1161.6	180	LOW	1.88	23232	86	0.55	1161.6	180	239	
North St	Highland Ave	Trinity Ave	0.07	369.6	11088	369.6	2956.8	739.2	180	LOW	1.88	14414.4	86	0.55	739.2	180	149	
North St	Trinity Ave	Rosemary Ave	0.07	369.6	11088	369.6	2956.8	739.2	180	LOW	1.88	14414.4	86	0.55	739.2	180	149	
North St	Rosemary Ave	Mattison Ave	0.07	369.6	11088	369.6	2956.8	739.2	180	LOW	1.88	14414.4	86	0.55	739.2	180	149	
North St	Mattison Ave	Euclid Ave	0.07	369.6	11088	369.6	2956.8	739.2	180	LOW	1.88	14414.4	86	0.55	739.2	180	149	
North St	Euclid Ave	Lindenwood Ave	0.07	369.6	11088	369.6	2956.8	739.2	180	LOW	1.88	14414.4	86	0.55	739.2	180	149	
North St	Lindenwood Ave	Woodland Ave	0.13	686.4	20592	686.4	5491.2	1372.8	180	LOW	1.88	26769.6	86	0.55	1372.8	180	276	
Orange Ave	S Main St	S Spring Garden St	0.06	316.8	12672	316.8	2534.4	633.6	180	LOW	1.88	15252.2	86	0.55	633.6	180	159	
Orange Ave	S Spring Garden St	Trinity Ave	0.09	475.2	19008	475.2	3801.6	950.4	180	LOW	1.88	23284.8	86	0.55	950.4	180	239	
Orange Ave	Trinity Ave	Rosemary Ave	0.04	211.2	8448	211.2	1689.6	422.4	180	LOW	1.88	10348.8	86	0.55	422.4	180	106	
Overlook Rd	E Mount Pleasant Ave	Artman Rd	0.09	475.2	19008	475.2	3801.6	950.4	180	LOW	1.88	23284.8	86	0.55	950.4	180	239	
Overlook Rd	Artman Rd	Beechmont Rd	0.02	105.6	4224	105.6	844.8	211.2	180	LOW	1.88	5174.4	86	0.55	211.2	180	53	
Overlook Rd	Beechmont Rd	Walker Rd	0.05	264	10560	264	2112	528	180	LOW	1.88	12936	86	0.55	528	180	133	
E Park Ave	S Spring Garden St	Southern Ave	0.15	792	23760	792	6336	1584	180	LOW	1.88	30888	86	0.55	1584	180	318	
E Park Ave	Southern Ave	Highland Ave	0.06	316.8	12672	316.8	2534.4	633.6	180	LOW	1.88	15252.2	86	0.55	633.6	180	159	
E Park Ave	Highland Ave	Trinity Ave	0.06	316.8	12672	316.8	2534.4	633.6	180	LOW	1.88	15252.2	86	0.55	633.6	180	159	
E Park Ave	Trinity Ave	Rosemary Ave	0.06	316.8	12672	316.8	2534.4	633.6	180	LOW	1.88	15252.2	86	0.55	633.6	180	159	
E Park Ave	Rosemary Ave	Mattison Ave	0.06	316.8	12672	316.8	2534.4	633.6	180	LOW	1.88	15252.2	86	0.55	633.6	180	159	
E Park Ave	Mattison Ave	Euclid Ave	0.07	369.6	14784	369.6	2956.8	739.2	180	LOW	1.88	18110.4	86	0.55	739.2	180	186	
E Park Ave	Euclid Ave	Lindenwood Ave	0.07	369.6	14784	369.6	2956.8	739.2	180	LOW	1.88	18110.4	86	0.55	739.2	180	186	
E Park Ave	Lindenwood Ave	W Butler Ave	0.09	475.2	19008	475.2	3801.6	950.4	180	LOW	1.88	23284.8	86	0.55	950.4	180	239	
Poplar St	S Main St	S Spring Garden St	0.04	211.2	8448	211.2	1689.6	422.4	180	LOW	1.88	10348.8	86	0.55	422.4	180	106	
Poplar St	S Spring Garden St	Rosemary Ave	0.0001	0.28	15.84	0.28	4.224	1.056	180	LOW	1.88	20.592	86	0.55	1.056	180	0	
Poplar St	Rosemary Ave	S Ridge Ave	0.08	422.4	12672	422.4	3379.2	844.8	180	LOW	1.88	16473.6	86	0.55	844.8	180	170	
Poplar St	S Ridge Ave	York St	0.03	158.4	3168	158.4	1267.2	316.8	180	LOW	1.88	4593.6	86	0.55	316.8	180	48	
Poplar St	York St	Lindenwood Ave	0.13	686.4	13728	686.4	5491.2	1372.8	180	LOW	1.88	19905.6	86	0.55	1372.8	180	207	
E Race St	N Main St	N Spring Garden St	0.05	264	7920	264	2112	528	180	LOW	1.88	10296	86	0.55	528	180	106	
E Race St	N Spring Garden St	N Ridge Ave	0.01	52.8	1636.8	52.8	211.2	52.8	180	LOW	1.88	1900.8	86	0.55	52.8	180	19	
E Race St	N Ridge Ave	School St	0.07	369.6	11457.6	369.6	1478.4	369.6	180	LOW	1.88	13305.6	86	0.55	369.6	180	135	
E Race St	School St	Lindenwood Ave	0.07	369.6	11457.6	369.6	1478.4	369.6	180	LOW	1.88	13305.6	86	0.55	369.6	180	135	
E Race St	Lindenwood Ave	End	0.14	739.2	29568	739.2	5913.6	1478.4	180	LOW	1.88	18110.4	86	0.55	739.2	180	186	
E Race St	End	N Main St	0.03	158.4	6336	158.4	1267.2	316.8	180	LOW	1.88	7761.6	86	0.55	316.8	180	80	
Randolph Ave	N Main St	Borough Line	0.02	105.6	1584	105.6	422.4	105.6	180	LOW	1.88	2112	86	0.55	105.6	180	22	
Reiffs Mill Rd	E Mount Pleasant Ave	N Ridge Ave	0.07	369.6	11088	369.6	2956.8	739.2	180	LOW	1.88	14414.4	86	0.55	739.2	180	149	
Reiffs Mill Rd	N Ridge Ave	Tennis Ave	0.09	475.2	10929.6	475.2	3801.6	950.4	180	LOW	1.88	15206.4	86	0.55	950.4	180	158	
Reiffs Mill Rd	Tennis Ave	N Main St	0.21	1108.8	33264	1108.8	8870.4	2217.6	180	LOW	1.88	43243.2	86	0.55	2217.6	180	446	
N Ridge Ave	E Mount Pleasant Ave	Reiffs Mill Rd	0.16	844.8	25344	844.8	6758.4	1689.6	180	LOW	1.88	32947.2	86	0.55	1689.6	180	340	
N Ridge Ave	Reiffs Mill Rd	Tennis Ave	0.0001	0.28	15.84	0.28	4.224	1.056	180	LOW	1.88	20.592	86	0.55	1.056	180	0	
N Ridge Ave	Tennis Ave	Belmont Ave	0.11	580.8	17424	580.8	4646.4	1161.6	180	LOW	1.88	22651.2	86	0.55	1161.6	180	234	
N Ridge Ave	Belmont Ave	Forest Ave	0.06	316.8	9504	316.8	2534.4	633.6	180	LOW	1.88	12355.2	86	0.55	633.6	180	127	
N Ridge Ave	Forest Ave	Walnut St	0.04	211.2	6336	211.2	1689.6	422.4	180	LOW	1.88	8236.8	86	0.55	422.4	180	85	
N Ridge Ave	Walnut St	E Race St	0.07	369.6	11088	369.6	2956.8	739.2	180	LOW	1.88	14414.4	86	0.55	739.2	180	149	
N Ridge Ave	E Race St	W Butler Ave	0.04	211.2	6336	211.2	1689.6	422.4	180	LOW	1.88	8236.8	86	0.55	422.4	180	85	
S Ridge Ave	W Butler Ave	Poplar St	0.07	369.6	11088	369.6	2956.8	739.2	180	LOW	1.88	14414.4	86	0.55	739.2	180	149	
Rosemary Ave	S Spring Garden St	Poplar St	0.02	105.6	4224	105.6	844.8	211.2	180	LOW	1.88	5174.4	86	0.55	211.2	180	53	

SEDIMENT LOAD WITHIN WISSAHICKON CREEK WATERSHED

ROAD	START	END	LENGTH		AREA					TRAFFIC	IMPERVIOUS			PERVIOUS			TOTAL LOAD (lbs/yr)
			(mi)	(ft)	ROAD (sf)	CURB (sf)	WALK (sf)	GRASS (sf)	RUNOFF (ft/yr)		AREA (sf)	LOAD (mg/L)	RUNOFF (ft/yr)	AREA (sf)	LOAD (mg/L)		
Rosemary Ave	Poplar St	Orange Ave	0.12	633.6	25344	633.6	5068.8	1267.2	1.88	31046.4	86	0.55	1267.2	180	318		
Rosemary Ave	Orange Ave	Water St	0.02	105.6	4224	105.6	844.8	211.2	1.88	5174.4	86	0.55	211.2	180	53		
Rosemary Ave	Water St	Lemon St	0.06	316.8	12672	316.8	2534.4	633.6	1.88	15232.2	86	0.55	633.6	180	159		
Rosemary Ave	Lemon St	Park Ave	0.02	105.6	4224	105.6	844.8	211.2	1.88	5174.4	86	0.55	211.2	180	53		
Rosemary Ave	Park Ave	North St	0.08	422.4	16896	422.4	3379.2	844.8	1.88	20697.6	86	0.55	844.8	180	212		
Rosemont Ave	North St	Church St	0.11	580.8	23232	580.8	4646.4	1161.6	1.88	28452.2	86	0.55	1161.6	180	292		
Rosemont Ave	Fairview Ave	Heckler St	0.05	264	7920	264	2112	528	1.88	10296	86	0.55	528	180	106		
Rosemont Ave	Heckler St	E Butler Ave	0.04	211.2	6336	211.2	1689.6	422.4	1.88	8236.8	86	0.55	422.4	180	85		
School St	Forest Ave	Walnut Ln	0.06	316.8	9504	316.8	2534.4	633.6	1.88	12355.2	86	0.55	633.6	180	127		
School St	Walnut Ln	E Race St	0.06	316.8	9504	316.8	2534.4	633.6	1.88	12355.2	86	0.55	633.6	180	127		
Southern Ave	S Spring Garden St	Park Ave	0.07	369.6	11088	369.6	2956.8	739.2	1.88	14414.4	86	0.55	739.2	180	149		
Southern Ave	Park Ave	Church St	0.06	316.8	12672	316.8	2534.4	633.6	1.88	15232.2	86	0.55	633.6	180	159		
N Spring Garden St	Belmont Ave	Forest Ave	0.06	316.8	9504	316.8	2534.4	633.6	1.88	12355.2	86	0.55	633.6	180	127		
N Spring Garden St	Forest Ave	Walnut St	0.04	211.2	6336	211.2	1689.6	422.4	1.88	8236.8	86	0.55	422.4	180	85		
N Spring Garden St	Walnut St	E Race St	0.06	316.8	9504	316.8	2534.4	633.6	1.88	12355.2	86	0.55	633.6	180	127		
N Spring Garden St	E Race St	W Butler Ave	0.04	211.2	6336	211.2	1689.6	422.4	1.88	8236.8	86	0.55	422.4	180	85		
S Spring Garden St	E Butler Ave	Poplar St	0.09	475.2	14256	475.2	3801.6	950.4	1.88	18532.8	86	0.55	950.4	180	191		
S Spring Garden St	Poplar St	Orange Ave	0.12	633.6	19008	633.6	5068.8	1267.2	1.88	24710.4	86	0.55	1267.2	180	255		
S Spring Garden St	Orange Ave	Highland Ave	0.04	211.2	6336	211.2	1689.6	422.4	1.88	8236.8	86	0.55	422.4	180	85		
S Spring Garden St	Highland Ave	Southern Ave	0.07	369.6	11088	369.6	2956.8	739.2	1.88	14414.4	86	0.55	739.2	180	149		
S Spring Garden St	Southern Ave	E Park Ave	0.05	264	7920	264	2112	528	1.88	10296	86	0.55	528	180	106		
S Spring Garden St	E Park Ave	Bannockburn Ave	0.05	264	7920	264	2112	528	1.88	10296	86	0.55	528	180	106		
Tennis Ave	Borough Line	N Main St	0.02	105.6	3168	105.6	844.8	211.2	1.88	4118.4	86	0.55	211.2	180	42		
Tennis Ave	N Main St	Reiffs Mill Rd	0.05	264	7920	264	2112	528	1.88	10296	86	0.55	528	180	106		
Trinity Ave	Orange Ave	Lemon St	0.05	264	10560	264	2112	528	1.88	12936	86	0.55	528	180	133		
Trinity Ave	Lemon St	Park Ave	0.09	475.2	19008	475.2	3801.6	950.4	1.88	23284.8	86	0.55	950.4	180	239		
Trinity Ave	Park Ave	North St	0.08	422.4	16896	422.4	3379.2	844.8	1.88	20697.6	86	0.55	844.8	180	212		
Trinity Ave	North St	Church St	0.07	369.6	14784	369.6	2956.8	739.2	1.88	18110.4	86	0.55	739.2	180	186		
Valley Brook Rd	Hendricks St	Glen Mawr Dr	0.11	580.8	17424	580.8	4646.4	1161.6	1.88	26512.2	86	0.55	1161.6	180	234		
Valley Brook Rd	Glen Mawr Dr	Bethlehem Pk	0.13	686.4	20592	686.4	5491.2	1372.8	1.88	26769.6	86	0.55	1372.8	180	276		
Walker Rd	Hendrick St	Candy Ln	0.06	316.8	12672	316.8	2534.4	633.6	1.88	15523.2	86	0.55	633.6	180	159		
Walker Rd	Candy Ln	Overlook Rd	0.08	422.4	16896	422.4	3379.2	844.8	1.88	20697.6	86	0.55	844.8	180	212		
Walker Rd	Overlook Rd	Haywood Rd	0.03	158.4	6336	158.4	1267.2	316.8	1.88	7761.6	86	0.55	316.8	180	80		
Walnut Ln	School St	Forest Ave	0.23	1214.4	36432	1214.4	9715.2	2428.8	1.88	47361.6	86	0.55	2428.8	180	488		
Walnut St	N Main St	N Spring Garden St	0.06	316.8	9504	316.8	2534.4	633.6	1.88	12355.2	86	0.55	633.6	180	127		
Water St	Rosemary Ave	Mattison Ave	0.06	316.8	6336	316.8	2534.4	633.6	1.88	9187.2	86	0.55	633.6	180	96		
Wissahickon Ave	S Locust St	S Chestnut St	0.06	316.8	9504	316.8	2534.4	633.6	1.88	12355.2	86	0.55	633.6	180	127		
Wissahickon Ave	S Chestnut St	S Maple St	0.06	316.8	9504	316.8	2534.4	633.6	1.88	12355.2	86	0.55	633.6	180	127		
Woodland Ave	E Butler Ave	Nicholas St	0.03	158.4	4752	158.4	1267.2	316.8	1.88	6177.6	86	0.55	316.8	180	64		
Woodland Ave	Nicholas St	North St	0.04	211.2	6336	211.2	1689.6	422.4	1.88	8236.8	86	0.55	422.4	180	85		
Woodland Ave	North St	Bethlehem Pk	0.07	369.6	11088	369.6	2956.8	739.2	1.88	14414.4	86	0.55	739.2	180	149		
York St	E Butler Ave	Poplar St	0.05	264	5280	264	2112	528	1.88	7656	86	0.55	528	180	80		
TOTAL															34,776		

Assumptions:
 1. Annual runoff depth is calculated using 4 years (2012 - 2014) of daily rain gauge data from the Ambler Borough Waste Water Treatment Plant and the Runoff Curve Number method accounting for the initial abstraction and land cover classification.
 2. Sediment loading concentrations from Table 8.3, PADEP BMP Manual:
 Low Traffic Street (86 mg/l)
 Medium Traffic Street (113 mg/l)
 Lawn Low Input (180 mg/l)

Appendix E

Loading Reduction Calculations

Appendix E-1:	Existing BMPs
Appendix E-2:	Proposed BMPs

CLIENT:
AMBLER BOROUGH
PROJECT NAME:
NPDES MS4 PERMIT RENEWAL
PROJECT NUMBER:
03-0122-01

No.	LOCATION	PEAK RATE REDUCTION BMPs										60% SEDIMENT REDUCTION (Lb/year)
		TRIBUTARY AREA (ac)	IMPERVIOUS COVER (%)	IMPERVIOUS COVER (ac)	IMPERVIOUS SEDIMENT (Lb/year)	LAWN COVER (%)	LAWN COVER (ac)	RUNOFF DEPTH (in)	EMC TSS (mg/L)	LAWN SEDIMENT (Lb/year)	TOTAL SEDIMENT (Lb/year)	
1	Ambler Boiler House	1.1	70%	0.77	306	30%	0.33	6.59	180	88	394	236
2	107 Locust Street	0.1	50%	0.05	20	50%	0.05	6.59	180	13	33	20
3	200 South Main Street	4.9	70%	3.43	891	30%	1.47	6.59	180	392	1,284	770
4	237 Trinity	0.1	35%	0.04	9	65%	0.065	6.59	180	17	26	16
5	Artman Home	2.3	48%	1.10	287	52%	1.196	6.59	180	319	606	364
6	234 Spring Garden	0.1	35%	0.04	9	65%	0.065	6.59	180	17	26	16
7	300 Highland	0.1	35%	0.04	9	65%	0.065	6.59	180	17	26	16
8	Borough Hall - 131 Rosemary	1.6	50%	0.80	208	50%	0.8	6.59	180	214	421	253
9	Center Street Twins	0.4	50%	0.20	52	50%	0.2	6.59	180	53	105	63
10	203 Locust	0.1	50%	0.05	13	50%	0.05	6.59	180	13	26	16
TOTAL - PEAK RATE REDUCTION BMPs											1,770	

No.	BMP	STREAMBANK EROSION REDUCTION				
		LENGTH (ft)	EROSION RATE (Lbs/ft/yr)	SEDIMENT LOAD (Lbs/yr)	TSS REMOVAL EFFICIENCY (%)	SEDIMENT REDUCTION (Lbs/yr)
11	Stream Bank Restoration - Rose Valley, 353 Valley Brook	95	9.1	865	85%	735
12	Stream Bank Restoration - Rose Valley, East of N. Ridge	100	9.1	910	85%	774
13	Stream Bank Restoration - Tannery Run, East of N. Maple Ave.	325	9.1	2,958	85%	2,514
TOTAL - STREAMBANK EROSION REDUCTION						4,022

EROSION RATE CALCULATION	VALUE	UNIT	REFERENCE
Length of Stream in Watershed	24	miles	Wissahickon TMDL Plan
Length of Stream in Watershed	126,720	ft	miles/5280
Watershed Total Stream Bank Erosion	1,151,965	Lbs/yr	Table A-1 MS4 TMDL Strategy
Erosion Rate	9.1	Lbs/ft/yr	Total Stream Bank Erosion/Stream Length

CLIENT:

AMBLER BOROUGH

PROJECT NAME:

NPDES MS4 PERMIT RENEWAL

PROJECT NUMBER:

03-0122-01



Gilmore & Associates, Inc.

Engineering and Consulting Services

ROADWAY SEDIMENT REMOVAL				
BMP	SEDIMENT LOAD (Lbs/yr)	TSS REMOVAL EFFICIENCY (%)	SEDIMENT REDUCTION (Lbs/yr)	REMAINING SEDIMENT LOAD (Lbs/yr)
Streetsweeping	34,776	35%	12,172	22,604
Inlet Filter Inserts	22,604	60%	13,563	
TOTAL - ROADWAY			25,734	

STREAMBANK EROSION REDUCTION					
BMP	LENGTH (ft)	EROSION RATE (Lbs/ft/yr)	SEDIMENT LOAD (Lbs/yr)	TSS REMOVAL EFFICIENCY (%)	SEDIMENT REDUCTION (Lbs/yr)
Streambank Restoration	750	9.1	6,825	85%	5,801

POTENTIAL BMP SUMMARY		
BMP	SEDIMENT LOAD (lbs/yr)	SEDIMENT REDUCTION (lbs/yr)
Streetsweeping	34,776	12,172
Inlet Filter Inserts	22,604	13,562
Streambank Restoration	6,825	5,801
TOTAL	64,205	31,536

EROSION RATE CALCULATION	VALUE	UNIT	REFERENCE
Length of Stream in Watershed	24	miles	Wissahickon TMDL Plan
Length of Stream in Watershed	126,720	ft	miles/5280
Watershed Total Stream Bank Erosion	1,151,965	Lbs/yr	Table A-1 MS4 TMDL Strategy
Erosion Rate	9.1	Lbs/ft/yr	Total Stream Bank Erosion/Stream Length