
Borough of Myerstown

MS₄ Program

Pollutant Reduction Plan (PRP)

For

Tulpehocken Creek (Appendix E)

2018 – 2023 MS₄ Permit

May 2017

ARRO Project No. 10813.04



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1. INTRODUCTION

Myerstown Borough, Lebanon County was classified as an urbanized area per the 2010 U.S. Census. The Pennsylvania Department of Environmental Protection (PA DEP) has notified the Borough that they are required to renew the National Pollutant Discharge Elimination System (NPDES) Small Municipal Separate Storm Sewer Systems (MS4) permit. The requirements for Myerstown Borough are defined by the PA DEP Ms4 requirements as:

MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Cumberland County						
MYERSTOWN BORO	PAG133703	No		Tulpehocken Creek	Appendix E - Nutrients, Siltation (5)	
				Unnamed Tributaries to Tulpehocken Creek		Cause Unknown (5)

The Pollutant Reduction Plan (PRP) has been developed to satisfy the requirements of: 1) PRP for the Tulpehocken Creek. All of the storm sewer sheds identified in this plan are tributary to the Tulpehocken Creek.

2. POLLUTANT REDUCTION PLAN (PRP)

A. Public Participation

Myerstown Borough encouraged a plan that included public participation and buy in. The Borough publicly advertised notice of public review, 30 day comment period and public meeting in the Lebanon Daily Newspaper on June 2, 2017; a copy of the advertisement is located in Appendix A.

The Borough posted a copy of the complete draft Pollutant Reduction Plan on the Borough Website prior to the public notice. A hard copy was also made available at the Borough office during normal business hours.

The Borough received written comment from June 5, 2017 to July 7, 2017; a copy of all written comments is provided in Appendix B. A public meeting was held on July 11, 2017 at 6:30 PM; a summary of comments received is provided in Appendix C.

The Borough would like to acknowledge the valuable input received from the public and Borough staff in the development of the PRP. The Borough's record of consideration for all timely comments received is provided in Appendix D. This PRP reflects careful planning of Myerstown with respect to the impaired waters of the commonwealth, local flooding, erosion problems, and the financial impact to the residents.

B. Map

In accordance with PA DEP guidelines for development of the PRP, Myerstown has completed mapping of the regulated MS4 Storm Sewer Sheds; the required mapping is provided in Appendix E. Mapping of the Borough was broken out into a series of mapping, consistent with the design process for the development of the PRP. This methodology also provides for clarity of the data being presented. The mapping includes the following:

- Myerstown Borough MS4 Conveyance System – includes collection and conveyance to the regulated outfalls, identifies outfall, outfall location with latitude and longitude, and waters of the commonwealth and Chapter 93 designation.
- Myerstown Borough Attaining/Non-Attaining Streams – defines streams attainment status and associated impairment.
- Myerstown Borough MS4 Drainage Area Land Use – defines land use based upon zoning to assist in determination of land use contribution to local impairments.
- Myerstown Borough MS4 Drainage Area Analysis – provides topographic map utilized in determining storm sewer shed to outfalls.
- Myerstown Borough MS4 Drainage Area Impervious/Pervious Analysis – provides aerial mapping utilizing Geographic Information System (GIS) data to identify the drainage area and amount of impervious area within each storm sewer shed.
- Myerstown Borough MS4 Drainage Area Runoff Rate and Volume Analysis – provides rate and volume of runoff per storm sewer shed to identify potential local flooding issues.
- Myerstown Borough Municipal Storm Sewer Shed – provides a comparison of the 2010 Census Urbanized Area boundary to define regulated MS4 outfalls and the portion of the storm sewer sheds that the Borough is responsible for.
- Myerstown Borough Existing BMP Structures – identifies existing Best Management Practices accounted for in the reduction of the base pollutant loading.
- Myerstown Borough Geology – in combination with NRCS soils data, geology is evaluated for the suitability for potential BMP implementation.
- Myerstown Borough Potential BMP Structures – provides identification of potential BMPs identified by the Borough that were evaluated.
- Myerstown Borough Proposed BMP Structures – provides identification of the selected BMPs identified by the Borough for implementation.

C. Pollutants of Concern

Myerstown Borough, in accordance with the PA DEP Municipal requirements table and the impaired waters mapping provided herein, is subject to Appendix E of the MS4 permit.

Appendix E – Tulpehocken Creek

Appendix E is the requirement for development of a Pollutant Reduction Plan (PRP) for the identified impaired waterway. Myerstown Borough is responsible for developing a PRP for the Tulpehocken Creek to address siltation and nutrients. In accordance with the PRP guidelines, the goal of the PRP is for the following reductions:

- 3% reduction of Total Nitrogen (TN)
- 5% reduction of Total Phosphorous (TP)
- 10% reduction of Sediment (TSS)

Furthermore, the PA DEP PRP instructions state: “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.” The PRP has been prepared to meet the required 10% reduction of sediment and 5% reduction of Total Phosphorous.

D. Existing Loading for Pollutants of Concern

Based upon the storm sewer shed delineation, the existing loading for TSS, TP and TN was calculated for each storm sewer shed. Pollutant loadings were calculated based upon PA DEP’s “Developed Land Loading Rates for PA Counties” (Attachment B of the PRP instructions) for Lebanon County; the calculated pollutant loadings are provided in Appendix F. The calculations are summarized below:

Base Pollutant Loading (No Existing BMPs) Summary:

Appendix E - Tulpehocken Creek

Drainage Area ID	Drainage Area (Ac)			PA DEP Land Loading		
	Impervious	Pervious	Total	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Owl Creek	41.39	32.11	73.49	2,549.85	89.41	89,303.95
Tulpehocken Creek	191.07	125.47	316.53	11,154.91	403.66	406,149.20
Unnamed Tributary to Tulpehocken Creek	16.84	11.99	28.84	1,008.66	35.96	36,057.88
				14,713.42	529.02	531,511.03
Required Reduction Percent				3%	5%	10%
Required Reduction (Lbs/Year)				441.40	26.45	53,151.10

D.1. Existing BMP Load Reductions

Based upon the mapping (see Attachment E), Myerstown Borough identified existing BMPs that would reduce the existing pollutant loading. Attachment E provides a summary of the existing BMPs, along with ownership, operation and maintenance requirements. The percent of pollutant reductions for each BMP was determined based upon the recommendation reports of the Chesapeake Bay Expert Panel. The existing BMP pollutant load reduction calculations are provided in Attachment G. The existing loading for TSS, TP and TN was re-calculated for each storm sewer shed accounting for the pollutant load reduction from the existing BMPs, see Attachment H. The design base pollutant loading and required pollutant reduction goal is summarized below:

Base Pollutant Loading With Existing BMPs Summary:

Drainage Area ID	Drainage Area (Ac)			PA DEP Land Loading		
	Impervious	Pervious	Total	TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Owl Creek	41.39	32.11	73.49	2,549.85	89.41	89,303.95
Tulpehocken Creek	191.07	125.47	316.53	10,971.72	394.15	395,287.50
Unnamed Tributary to Tulpehocken Creek	16.84	11.99	28.84	923.84	31.92	31,599.69
				14,445.40	515.47	516,191.14
Required Reduction Percent:				3%	5%	10%
Adjusted Required Reduction (Lbs.):				433.36	25.77	51,619.11

E. Selected BMP's

Myerstown Borough developed a potential BMP concept plan to identify potential BMPs to be implemented, see Attachment E. The associated pollutant loading reductions for each BMP were calculated and are provided in Attachment I; a summary description of the potential BMPs evaluated is also provided in Attachment I. The percent of pollutant reductions for each BMP were determined based upon the recommendation reports of the Chesapeake Bay Expert Panel, PA DEP BMP Effectiveness Value table, and manufacture literature including independent laboratory testing (appropriate manufacture data is provided in Attachment J).

Myerstown Borough evaluated the following factors in selection of the BMPs to be implemented achieve the required pollutant load reduction. These factors included:

- Return-on-investment for dollar per pound of pollutant removed (See Appendix M)
- Overall BMP cost (see Appendix L)
- Secured grant funding
- Availability of land to implement BMPs
- Local flooding and erosion problems
- Drainage areas associated with identified waterways
- Consistency with Economic Development initiatives

Based upon the potential BMP evaluation, Myerstown Borough developed the proposed BMPs to be implemented under the MS4 permit from 2018 – 2023. The proposed BMPs are identified on Map 11: Myerstown Borough Proposed BMP Structures. The proposed BMP pollutant reduction is summarized below and in attachment K:

Option 2:

Drainage Area ID	Prop. BMP ID	BMP Description	Pollutant Reduction		
			TN (lbs/year)	TP (lbs/year)	TSS (lbs/year)
Tulpehocken Creek					
OF-007	BMP 007-BS1	Bioswale	1,468.48	62.58	68,536.66
			1,468.48	62.58	68,536.66
Required Reduction (Lbs/Year)			433.36	25.77	51,619.11
Net Reduction:			1,035.12	36.80	16,917.55

F. Funding Mechanism

Myerstown Borough, through the planning phase, evaluated the cost associated with the selected plan; the selected BMP implementation cost is summarized below:

PRP Cost Summary:

Drainage Area ID	Prop. BMP ID	BMP Description	Project Cost
OF-007	BMP 007-BS1	Bioswale	\$73,455.33

Myerstown Borough, in the 2018 budget, will establish a separate Stormwater Budget. The required funding identified above will be funded through the Borough's Stormwater Budget, as established through the General Fund. The General Fund revenues are based upon the Borough's tax base, as regulated under the Borough Code.

The Borough's staff continues to evaluate potential grant funding opportunities and apply for project specific grants.

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

Myerstown Borough will own and operate the BMPs identified in the PRP. Specific requirements for each BMP are identified below:

BMP 007-BS1: Bioswale:

Location: Proposed swale within Borough Park extending from Fish dam to the Tulpehocken Creek.

Responsible Party: Myerstown Borough

O&M Activities: Monitor storm sewer discharge areas and swale banks for scouring and erosion, immediately stabilized any areas of erosion. Maintain vegetation in natural state, where appropriate. Remove any invasive species that may develop.

Frequency of O&M Activities: Complete inspection of the restored corridor a minimum of once a year. Complete restoration and/or selective vegetation management as needed based upon inspections.

H. PRP Implementation Schedule

<u>Task</u>	<u>Implementation Date</u>
MS4 Permit Authorization	March 2018
BMP 007-BS1 Completion	November 2022
MS4 Permit Expiration	March 2023