Borough of Chambersburg

A full service municipality in Franklin County
celebrating over 65 years of consumer owned natural gas service
over 120 years of community electric and a
regional wastewater, water, and municipal solid waste utility

July 26, 2023

POLLUTANT REDUCTION PLAN (PRP)/TMDL PLAN FINAL REPORT:
Report Supplement

If the pollutant load reduction requirements of the permit were not met, attach an explanation and provide a schedule for completing implementation of the PRP or TMDL Plan, including interim milestones

The Borough of Chambersburg has installed nine (9) best management practices that, cumulatively, has achieved a load reduction of 104,644 pounds/year. Our required load reduction is 416,925 pounds/year. **We have achieved 25% of our required load reduction to date.** We are preparing to release construction bid documents for the Chambersburg Rail Trail Stormwater Management project. This project proposes five (5) best management practices that will be installed adjacent to the Conococheague Creek and located between Hood Street and the Chambersburg Rail Trail. The project is expected to be awarded on August 28, 2023 and should be completed by the end of November 2023. This project will further reduce approximately 24,427 pounds/year (or 31% of our load reduction requirement).

The Borough is currently under contract with Biohabitats who will be developing a conceptual plan for a floodplain restoration project at the Falling Spring Presbyterian Church property. Part of this project will be to quantify a preliminary nutrient load reduction as a result of the project. The Borough has already been in touch with DEP regarding the project and received correspondence that the project will only require a minor revision to our existing Chesapeake Bay Pollutant Reduction Plan. We are hoping this this project results in a large nutrient reduction. A conceptual plan should be completed by March 2024.

While the COVID-19 pandemic was not the sole reason for the delay in complete implementation of our Chesapeake Bay Pollutant Reduction plan, the pandemic did delay the Storm Sewer Utility in the switch from a flat fee to a fee based on impervious coverage. According to our Storm Sewer Utility Feasibility Study that was written in 2014, we proposed to implement the ERU based fee structure in 2020. Implementation did not occur until 2022. And in order to ease the burden of increased utility fees Town Council elected to allow for a 30% credit during 2022 and 2023, which was not initially contemplated.

In summary, the Borough of Chambersburg has full intentions of continuing to work with property owners, identify potential project locations, and to strive for full permit compliance. If you have any questions please contact me at astottlemyer@chambersburgpa.gov or (717) 251-2434.

Respectfully,

Andrew M. Stottlemyer
Storm Sewer System Manager

Sources Referenced:

Borough of Chambersburg Chesapeake Bay Pollutant Reduction Plan
Borough of Chambersburg Storm Sewer Utility Feasibility Report

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

POLLUTANT REDUCTION PLAN (PRP) / TMDL PLAN FINAL REPORT

Before completing this report please review the instructions, which are located within the Annual MS4 Status Report Instructions (3800-FM-BCW0491)

PRP / TMDL PLAN SUMMARY

Permittee Name: Borough of Chambersburg Permit No.: PAG133704

☒ PRP ☐ TMDL Plan ☐ Combined PRP / TMDL Plan

Plan Approval Date: **6/1/2018** Required Completion Date: **5/31/2023**

Joint Plan? ☐ Yes ☒ No *If Yes, identify all participating permittees as an attachment to this report*

Surface Waters Addressed by Plan: Falling Spring Branch/Conococheague Creek

Permittee's Planning Area (acres): **4112** Total Planning Area (Joint Plans): **4112** acres

Pollutant Load Reduction Calculation Methodology:

☒ Simplified Method ☐ Mapshed ☐ ModelMyWatershed ☐ Other:

	TSS	TN	TP
Baseline Pollutant Load – Planning Area	**416,925** lbs/yr	lbs/yr	lbs/yr
Pollutant Load Reduction Requirement (%)	10 %	%	%
Pollutant Load Reduction Requirement (lbs/yr)	416,925 lbs/yr	lbs/yr	lbs/yr
WLA Reduction Requirement *(TMDL Plan only)*	lbs/yr	lbs/yr	lbs/yr

BMP IMPLEMENTATION

BMP Type	No. of BMPs	Pollutant Load Reductions Achieved (Credit)		
		TSS	TN	TP
Structural BMPs		lbs/yr	lbs/yr	lbs/yr
Non-Structural BMPs		lbs/yr	lbs/yr	lbs/yr
Total		lbs/yr	lbs/yr	lbs/yr

Pollutant Load Reductions are documented on the following attachments:

☐ Attachment A – Infiltration BMPs No.: _____

☐ Attachment B – BMP Retrofits No.: _____

☐ Attachment C – Stream and/or Floodplain Restoration No.: _____

☐ Attachment D – Street Sweeping or Storm Drain Solids Removal No.: _____

☐ Attachment E – Tree Planting No.: _____

☐ Attachment F – Non-structural (Annual Practice) BMPs No.: _____

☐ BMP(s) have been implemented for which there are no attachments *(attach calculations)*

COMPLIANCE DETERMINATION

Were the pollutant load reduction requirements of the permit met? ☐ Yes ☒ No

If the pollutant load reduction requirements of the permit were **not met**, report the required load reductions remaining in lbs/yr and as a percentage of the total required load reduction.

	TSS		TN	TP
Load Reduction Remaining	**312281**	lbs/yr	lbs/yr	lbs/yr
Percent of Required Load Reduction Remaining	75	%	%	%

If the pollutant load reduction requirements of the permit were not met, attach an explanation and provide a schedule for completing implementation of the PRP or TMDL Plan, including interim milestones.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Andrew Stottlemyer
Responsible Official Name

Storm Sewer System Manager
Official Title

Andrew M. Stottlemyer
Signature

July 28, 2023
Date Signed

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name: Borough of Chambersburg | Permit No.: PAG133704

BMP Name: 515 E. Liberty Street Infiltration Trench | Latitude: 39°55' 55.10"

Surface Waters: Chesapeake Bay | Longitude: -77° 39' 8.25"

Municipality: Borough of Chambersburg | County: Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **3/18/2023**

☐ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on March 20, 2023

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Infiltration

BMP Effectiveness Values: TSS: 85 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft²): 11.25 Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☐ Vegetated Loading Ratio *(see instructions)*: 1626 WQ Storage Volume (ft³):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 0.42 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	.20	1933.85	386.77
	Pervious	.22	308.31	67.82
			Total TSS Load Delivered to BMP (lbs/yr) =	454.6

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (454.6 lbs/yr) x TSS Effectiveness Value (85%) = 386 lbs/yr TSS Credit

Permittee Credit for Joint BMPs (if applicable): % or lbs/yr TSS Credit

ATTACHMENT B – BMP RETROFITS

GENERAL INFORMATION

Permittee Name: _____ Permit No.: _____

BMP Name: _____ Latitude: _____

Surface Waters: _____ Longitude: _____

Municipality: _____ County: _____

☐ Construction of the BMP is Complete. Date Construction Completed: _____

☐ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: _____

Permits or Approvals Obtained: _____

Party Responsible for Long-Term O&M: ☐ Permittee ☐ Other: _____

Joint BMP? ☐ Yes ☐ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Effectiveness Values Source:

☐ DEP: BMP Type (Pre): _____ BMP Type (Post): _____

Retrofit TSS Effectiveness Value: _____ % *(Post – Pre Effectiveness Values)*

☐ CB Expert Panel Report: ☐ Runoff Reduction (RR) ☐ Sediment Treatment (ST)

RS (ac-ft): _____ IA (ac): _____ R/IA (in): _____ Retrofit TSS Effectiveness Value: _____ %

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft^2): _____ Ponding Depth (ft): _____ ☐ Underdrain

Media Description: _____ Media Depth (ft): _____

☐ Vegetated Loading Ratio *(see instructions)*: _____ WQ Storage Volume (ft^3): _____

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: _____ acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious			
	Pervious			
			Total TSS Load Delivered to BMP (lbs/yr) =	

Sediment Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (lbs/yr) x TSS Effectiveness Value = _____ lbs/yr TSS Credit

Permittee Credit for Joint BMPs (if applicable): _____ % or _____ lbs/yr TSS Credit

ATTACHMENT C – STREAM RESTORATION

GENERAL INFORMATION

Permittee Name: _____ Permit No.: _____

BMP Name: _____ Latitude: _____

Surface Waters: _____ Longitude: _____

Municipality: _____ County: _____

☐ Construction of the BMP is Complete. Date Construction Completed: _____

☐ Photographs, Drawings, and O&M Plan are attached*. Inspection/Monitoring Frequency: _____

Permits or Approvals Obtained: _____

Party Responsible for Long-Term O&M: ☐ Permittee ☐ Other: _____

Joint BMP? ☐ Yes ☐ No *If Yes, attach a list of other permittees sharing credit for the BMP*

STREAM RESTORATION TYPE

Stream Restoration – Default Rate:

☐ Simplified Method (44.88 lbs/ft/yr)

☐ Mapshed/Model My Watershed (115 lbs/ft/yr)

Expert Panel Report Protocols (Select all that apply):

☐ Protocol 1: Prevented Sediment

☐ Protocol 2: Instream and Riparian Nutrient Processing

☐ Protocol 3: Floodplain Reconnection

Does the restoration meet all the minimum qualifying conditions for stream restoration? ☐ Yes ☐ No

TSS LOAD REDUCTION – DEFAULT RATE

Total restoration length (center line of stream) (ft): _____

Restoration length stabilized using hard armoring (if applicable) (ft): _____

Restoration length armored by "Creditable w/Limits" practices (if applicable) (ft): _____

Percent of total restoration length armored by "Creditable w/Limits" practices (%): _____

Creditable restoration length (ft): _____

TSS Credit: Creditable restoration length (ft) x Default Rate (lbs/ft/yr) = _____ lbs/yr TSS

Permittee Credit for Joint BMPs (if applicable): _____ % or _____ lbs/yr TSS Credit

POLLUTANT LOAD REDUCTIONS – EXPERT PANEL PROTOCOLS

Total restoration length (ft): _____ Floodplain area created (if applicable) (ac): _____

Protocol 1 Pollutant Load Reduction: TSS: _____ lbs/yr TN: _____ lbs/yr TP: _____ lbs/yr

Protocol 2 Pollutant Load Reduction: TSS: _____ lbs/yr TN: _____ lbs/yr TP: _____ lbs/yr

Protocol 3 Pollutant Load Reduction: TSS: _____ lbs/yr TN: _____ lbs/yr TP: _____ lbs/yr

Permittee Credit for Joint BMPs (if applicable): _____ % or _____ lbs/yr TSS Credit

**** See Annual MS4 Status Report Instructions (3800-FM-BCW0491) for additional required attachments.***

ATTACHMENT D – STREET SWEEPING OR STORM SEWER SOLIDS REMOVAL

GENERAL INFORMATION

Permittee Name: _____ Permit No.: _____

BMP Name: _____ Latitude: _____

Surface Waters: _____ Longitude: _____

Municipality: _____ County: _____

☐ Required documentation is attached*. Sweeping/Removal Frequency: _____

Joint BMP? ☐ Yes ☐ No *If Yes, attach a list of other permittees sharing credit for the BMP*

CREDITING METHOD

BMP Type: ☐ Street Sweeping ☐ Storm Sewer Solids Removal

Expert Panel Report Advanced Sweeping Technology: ☐ SCP-1 (AST- 2 PW) ☐ SCP-2 (AST- 1 PW)
☐ SCP-3 (AST- 1 P2W) ☐ SCP-4 (AST- 1 P4W) ☐ SCP-5 (AST- 1 P8W) ☐ SCP-6 (AST- 1 P12W)
☐ SCP-7 (AST- S1 or S2) ☐ SCP-8 (AST- S3 or S4)

Expert Panel Report Mechanical Broom Technology: ☐ SCP-9 (MBT- 2PW) ☐ SCP-10 (MBT- 1 PW)
☐ SCP-11 (MBT- 1 P4W)

DEP Effectiveness Value Table: ☐ DEP Default

Expert Panel Report: ☐ Mass Loading – Street Sweeping ☐ Mass Loading – Solids Removal

Impervious area swept within planning area: _____ acres

BMP Effectiveness Values (if applicable): TSS: ____ % TN: ____ % TP: ____ %

TSS LOAD REDUCTION – EFFICIENCY APPROACH

Sediment Load Generated by Impervious – Simplified Method

Pollutant	Land Cover	Area Swept (ac)	Loading Rate (lbs/ac/yr)	Generated Load (lbs/yr)
TSS	Impervious			

Sediment Load Generated by Impervious – Land Cover-Based Calculation Method

Pollutant	Land Cover	Area Swept (ac)	Loading Rate (lbs/ac/yr)	Generated Load (lbs/yr)
TSS				
TSS				

Total:

TSS Load Generated by Impervious (lbs/yr) x TSS Effectiveness Value (%) = _____ lbs/yr TSS

TSS LOAD REDUCTION – MASS LOADING APPROACH

Sediment Load Reduction (lbs of TSS collected)	Permit Year 1 (Y1)	Permit Year 2 (Y2)	Permit Year 3 (Y3)	Permit Year 4 (Y4)	Permit Year 5 (Y5)
	lbs	lbs	lbs	lbs	lbs

Average annual TSS reduction (Y1 + Y2 + Y3 + Y4 + Y5) / 5 = _____ lbs/yr TSS

Permittee Credit for Joint BMPs (if applicable): _____ % or _____ lbs/yr TSS

**** See Annual MS4 Status Report Instructions (3800-FM-BCW0491) for required attachments.***

ATTACHMENT E – TREE PLANTING

GENERAL INFORMATION

Permittee Name: _____ Permit No.: _____

BMP Name: _____ Latitude: _____

Surface Waters: _____ Longitude: _____

Municipality: _____ County: _____

☐ Required documentation is attached*.

Joint BMP? ☐ Yes ☐ No *If Yes, attach a list of other permittees sharing credit for the BMP*

BMP TREATMENT AREA

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).

Trees Planted within Planning Area: _____ x 0.01 = BMP Treatment Area (ac): _____

TSS LOAD REDUCTION CREDIT

TSS loading rate for land prior to planting trees: _____ lbs/ac/yr TSS

Method used to determine existing loading rate prior to planting trees:

☐ Simplified Method – use pervious loading rate for county

☐ Land Cover-based calculation method – use loading rate for land cover type on which trees are planted

BMP effectiveness values for tree planting: TSS 20%; TN 10%; TP 15%

BMP Treatment Area (ac) x TSS loading rate ( ) lbs/ac/yr x 20% = _____ lbs/yr TSS

Permittee Credit for Joint BMPs (if applicable): _____ % or _____ lbs/yr TSS

**** See Annual MS4 Status Report Instructions (3800-FM-BCW0491) for required attachments.***

ATTACHMENT F – NON-STRUCTURAL (ANNUAL PRACTICE) BMPs

GENERAL INFORMATION

Permittee Name: _____ Permit No.: _____

BMP Name: _____ Latitude: _____

Surface Waters: _____ Longitude: _____

Municipality: _____ County: _____

☐ Required documentation is attached*.

Joint BMP? ☐ Yes ☐ No *If Yes, attach a list of other permittees sharing credit for the BMP*

ELIGIBILITY AND BMP TYPE

Is the BMP located in the Planning Area? ☐ Yes ☐ No

Is the BMP required to meet regulatory requirements? ☐ Yes ☐ No

Permittees may only credit those reductions that will occur as a result of exceeding regulatory requirements.

BMP Type:

☐ Till – Low Residue ☐ Till – High Residue ☐ Conservation Till ☐ Cover Crops

☐ Other: _____

BMP Effectiveness Values: TSS: ____ % TN: ____ % TP: ____ %

Effectiveness Value Source:

☐ Chesapeake Bay Expert Panel Report ☐ Other: _____

BMP IMPLEMENTATION AREA

BMP Implementation Area: _____ acres

TSS Load Delivered to BMP – Simplified Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious			
	Pervious			
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (lbs/yr) x TSS Effectiveness Value = _____ lbs/yr TSS Credit

Permittee Credit for Joint BMPs (if applicable): ____ % or _____ lbs/yr TSS Credit

**** See Annual MS4 Status Report Instructions (3800-FM-BCW0491) for required attachments.***

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name: Borough of Chambersburg | Permit No.: PAG133704

BMP Name: 515 E. Liberty Street Infiltration Trench | Latitude: 39°55' 55.10"

Surface Waters: Chesapeake Bay | Longitude: -77° 39' 8.25"

Municipality: Borough of Chambersburg | County: Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **3/18/2023**

☐ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on March 20, 2023

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Infiltration

BMP Effectiveness Values: TSS: 85 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft²): 11.25 Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☐ Vegetated Loading Ratio *(see instructions)*: 1626 WQ Storage Volume (ft³):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 0.42 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	.20	1933.85	386.77
	Pervious	.22	308.31	67.82
			Total TSS Load Delivered to BMP (lbs/yr) =	454.6

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (454.6 lbs/yr) x TSS Effectiveness Value (85%) = 386 lbs/yr TSS Credit

Permittee Credit for Joint BMPs (if applicable): % or lbs/yr TSS Credit

Herbert, Rowland & Grubic, Inc.
5 North Main Street, Suite 3
Chambersburg, PA 17201
717.263.2070
www.hrg-inc.com

March 29, 2023

Andy Stottlemyer, Storm Sewer System Manager
Chambersburg Borough Storm Sewer Utility
SENT VIA E-MAIL

Re: 515 E. Liberty Avenue Infiltration Trench Pollutant Reduction Calculation

Dear Mr. Stottlemyer:

As requested, HRG has completed the pollutant load reduction calculations associated with the proposed installation of thirty linear feet (30 lf) of NDS Pro Series five-inch (5") wide trench drain that will discharge into a Flo-Well Manufactured Dry-well 50-gallon capacity discharge tank that will be installed at 515 E. Liberty Street. It has been determined that the proposed improvements will provide the Borough of Chambersburg a sediment load reduction of approximately three hundred and eighty-six (386 lbs) of sediment per year as noted in Table 1 below.

TABLE 1 – POLLUTANT LOAD REDUCTION SUMMARY

Site	BMP ID	Lat.	Long.	Drainage Area (acres)	Drainage Area Characteristics			
					% Imperv.	Imperv. (acres)	% Pervious	Pervious (acres)
515 E. Liberty Street	BMP-16	39°55'54"	77°39'08"	0.42 ac.	47%	0.20 Ac.	53%	0.22 Ac.

Loading Rate		Total Sediment (lbs/yr)	BMP Type	BMP Effectiveness	Sediment Load Reduction (lbs/yr)
Impervious	Pervious				
1,933.85	308.31	454.6 lbs/yr	Infiltration Trench	85%	**386 lbs/yr**

The calculated annual sediment load reduction is based on the following:

- The BMP consists of a Flo-Well Manufactured Dry-well and 30 LF of 5" NDS trench drain.
- The BMP will receive sheet flow from 515 E. Liberty Street through the proposed trench drain.
- The BMP captures runoff generated from a drainage area of approximately 0.42 acres.
- The drainage area consists largely of impervious cover, however the standard PADEP-approved Statewide MS4 Land Cover Estimates of forty-seven percent (47%) impervious coverage and fifty-three percent (53%) pervious coverage was used in the load reduction calculations to provide a level of conservatism.

- A sediment removal efficiency of eighty-five percent (85%) was used to determine the annual sediment load reduction. This value is consistent with the removal efficiencies in PADEP's BMP Effectiveness Table.
- Continued functionality of the BMP relies on the Borough following regular Operation and Maintenance guidelines provided in PADEP's BMP Design Manual.

Enclosed are project related documentation for inclusion in one of the Borough's upcoming MS4 Annual Reports.

Please feel free to contact me should you have any questions or concerns.

Sincerely,

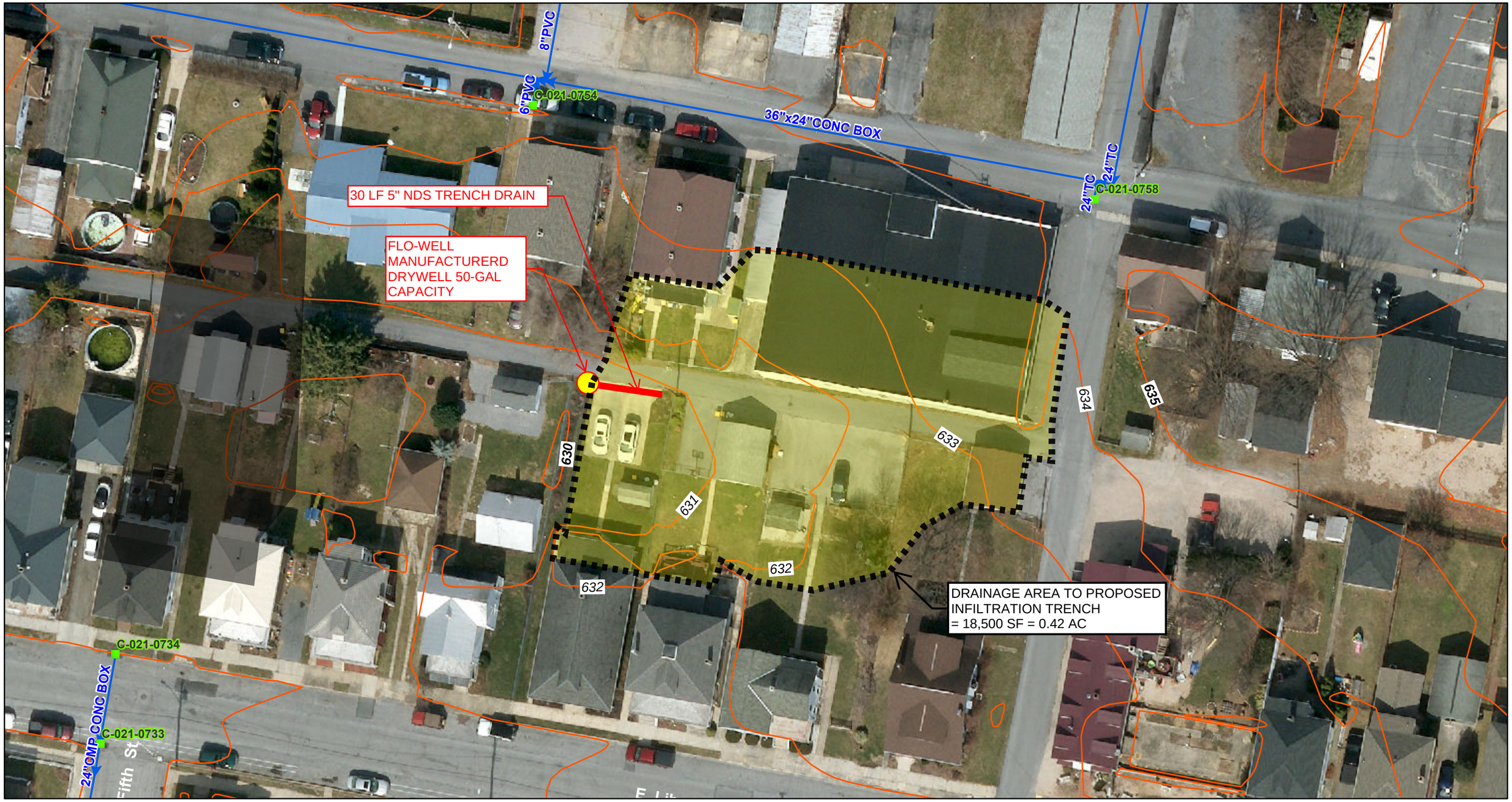
Herbert, Rowland & Grubic, Inc.

Hillary E. Dunning, P.E.
Staff Professional II

HED
004061.0430, Ph. 002, Task B
P:\0040\004061_0430\Admin\xxx - 2023 SWM Engineer\Task X - 515 E Liberty St Pollutant Reduction Memo\2023.03.29 515 E Liberty St Pollutant Reduction Calculation.docx

Enclosures

515 E. Liberty Street



March 29, 2023

NDS, Inc.
851 North Harvard Avenue
Lindsay, California 93247
Toll Free 800-726-1994
Phone 559-562-9888
Toll Free Fax 800-726-1998
Fax 559-562-4488
Website www.ndspro.com
Email nds@ndspro.com

April 2015

Product Guide Specification

Specifier Notes: This product guide specification is written in Construction Specifications Institute (CSI) 3-Part Format in accordance with *The CSI Construction Specifications Practice Guide,* including *MasterFormat, SectionFormat,* and *PageFormat.*

This section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with Division 1, other specification sections, and the Drawings. Delete all Specifier Notes after editing this section.

Section numbers and titles are based on *MasterFormat 2014 Update.*

SECTION 33 49 23

STORM DRAINAGE WATER RETENSION STRUCTURES

Specifier Notes: This section covers NDS, Inc. “Flo-Well” manufactured dry wells. Consult NDS, Inc. for assistance in editing this section for the specific application.

Use of “Flo-Well” manufactured dry wells may contribute to LEED credits. Consult NDS, Inc. for more information.

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manufactured dry wells.

1.2 RELATED REQUIREMENTS

Specifier Notes: Edit the following list of related sections as necessary. Limit the list to sections with specific information that the reader might expect to find in this section, but is specified elsewhere.

A. Section 31 23 00 – Excavation and Fill.

B. Section 33 41 00 – Storm Utility Drainage Piping.

1.3 PREINSTALLATION MEETINGS

Specifier Notes: Edit preinstallation meetings as necessary. Delete if not required.

A. Convene preinstallation meeting [1 week] [2 weeks] before start of Work of this Section.

B. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, installer, and manufacturer's representative.

C. Review the Following:
   1. Materials.
   2. Installation.
   3. Adjusting.
   4. Protection.
   5. Coordination with other Work.

1.4 SUBMITTALS

Specifier Notes: Edit submittal requirements as necessary. Delete submittals not required.

A. Comply with Division 1.

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating layout, dimensions, materials, components, and accessories.

D. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

E. Sustainable Design Submittals: Submit manufacturer's sustainable design submittals for manufactured dry wells.
   1. Recycled Content: Certify percentages of post-consumer and pre-consumer recycled content.
   2. Regional Materials: Certify distance between manufacturer and Project, in miles.

F. Manufacturer's Project References: Submit manufacturer's list of successfully completed manufactured dry well projects, including project name and location, name of architect, and type and quantity of manufactured dry wells furnished.

G. Installer's Project References: Submit installer's list of successfully completed manufactured dry well projects, including project name and location, name of architect, and type and quantity of manufactured dry wells installed.

H. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of manufactured dry wells of similar type to that specified.

B. Installer's Qualifications:
   1. Installer regularly engaged, for a minimum of 5 years, in installation of manufactured dry wells of similar type to that specified.
   2. Employ persons trained for installation of manufactured dry wells.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
   1. Store and handle materials in accordance with manufacturer's instructions.
   2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
   3. Store materials in clean areas, protected from exposure to harmful weather conditions.
   4. Store materials out of direct sunlight.
   5. Protect materials during storage, handling, and installation to prevent damage.

1.7 AMBIENT CONDITIONS

A. During Cold Weather:
   1. Do not use frozen materials.
   2. Do not use materials mixed or coated with ice or frost.
   3. Do not build on frozen Work.

B. During Wet Weather: Do not build on wet, saturated, or muddy subgrade.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: NDS, Inc., 851 North Harvard Avenue, Lindsay, California 93247. Toll Free 800-726-1994. Phone 559-562-9888. Toll Free Fax 800-726-1998. Fax 559-562-4488. Website www.ndspro.com. Email nds@ndspro.com.

Specifier Notes: Specify if substitutions will be permitted.

B. Substitutions: [Not permitted] [Comply with Division 1].

C. Single Source: Provide materials from single manufacturer.

2.2 MATERIALS

A. Manufactured Dry Wells: “Flo-Well” manufactured dry wells.
   1. Description: Round dry well system, includes 3 side panels and 1 top component.
   2. Part Number: FWAS24WH.
   3. Material: Structural-foam polyolefin with UV inhibitors.
   4. Diameter: 24 inches.
   5. Height: 28.75 inches.
   6. Capacity: 50 gallons.
   7. Fits: 4-inch Schedule 40 pipe, 4-inch DWV pipe, and 4-inch sewer and drain pipe.
   8. Knockout Leaching Ports per Panel: Ten 1.5-inch diameter.
   9. Knockout Inlet/Outlet Ports per Panel: Four 4.5-inch diameter.
   10. Color: Black.

B. Round Dry Well Covers:
   1. Part Number: FWAS24C.
   2. Material: Structural-foam polyolefin with UV inhibitors.
   3. Diameter: 24-1/4 inches.
   4. Height: 4-5/8 inches.
   5. Outer Lip: 3/4 inch.
   6. Center Knockout: 4.5-inch diameter.
   7. Color: Black.

C. Dry Well Side Panels/Extensions:
   1. Includes: 3 side panels; makes 1 round dry well.
   2. Part Number: FWSPS3.
   3. Material: Structural-foam polyolefin with UV inhibitors.
   4. Height: 24 inches with recessed 0.75-inch lip for stacking.
   5. Knockout Leaching Ports per Panel: Ten 1.5-inch diameter.
   6. Knockout Inlet/Outlet Ports per Panel: Four 4.5-inch diameter.
   7. Color: Black.

D. Round Dry Well Bottoms:
   1. Part Number: FWBP24.
   2. Material: Structural-foam polyolefin with UV inhibitors.
   3. Diameter: 24 inches.
   4. Leaching Ports: Six 1.5-inch diameter.
   5. Center Knockout for Strut Coupling: 4.5-inch diameter.
   6. Color: Black.

E. Dry Well Surface Drain Inlets with Grate:
   1. Part Number: FWSD69.
   2. Material: Structural-foam polyolefin with UV inhibitors.

3. Grate Diameter: 6 inches.
4. Diameter at Inlet: 6 inches.
5. Height: 9 inches.
6. Outside Diameter at Bottom: 4.5 inches, fits Schedule 40 PVC fittings.
7. ADA compliant.
8. Color: Black.

F. Filter Fabric Wrap to Surround Dry Wells:
1. Part Number: FWFF67.
2. Material: Porous, non-woven filter fabric.
3. Length: 7 feet.
4. Width: 2 feet.
5. Weight: 1 ounce.
6. Mullen Burst: 175 psi.
7. Flow Through: 200 gpm.
8. Color: Black.

2.3 ACCESSORIES

Specifier Notes: Specify required accessories. Delete accessories not required.

A. 9-Inch-Square Dome Atrium Grates:

Specifier Notes: Specify part number and color required for Project.

1. Part Number and Color: [981, Black] [991, Green].
2. Material: Structural-foam polyolefin with UV inhibitors.
3. Grate Openings: 3/8 inch.
4. Open Surface Area: 31.50 square inches.
5. Inlet Capacity: 136.28 gpm.

B. 9-Inch-Square Grates:

Specifier Notes: Specify part number and color required for Project.

1. Part Number and Color: [980, Black] [990, Green] [999, Gray] [999S, Sand].
2. Material: Structural-foam polyolefin with UV inhibitors.
3. Grate Openings: 7/16 inch.
4. Open Surface Area: 37.49 square inches.
5. Inlet Capacity: 114.69 gpm.
6. Load: 61 to 175 psi.

C. 12-Inch-Square Dome Atrium Grates:

Specifier Notes: Specify part number and color required for Project.

1. Part Number and Color: [1280, Green] [1290, Black].

2. Material: Structural-foam polyolefin with UV inhibitors.
3. Grate Openings: 3/8 inch.
4. Open Surface Area: 50.60 square inches.
5. Inlet Capacity: 154.79 gpm.

D. 12-Inch-Square Grates:

Specifier Notes: Specify part number and color required for Project.

1. Part Number and Color: [1210, Gray] [1211, Black] [1212, Green] [1212S, Sand].
2. Material: Structural-foam polyolefin with UV inhibitors.
3. Grate Openings: 3/8 inch.
4. Open Surface Area: 50.76 square inches.
5. Inlet Capacity: 155.28 gpm.
6. Load: 61 to 175 psi.

E. 9-Inch-Square Low-Profile Adapters:
1. Part Number: 930.
2. Bayonet bottom outlet.
3. Color: Black.

F. 12-Inch-Square Low-Profile Adapters:
1. Part Number: 1230.
2. Bayonet bottom outlet.
3. Color: Black.

G. 3-Inch and 4-Inch Universal Locking Outlets:
1. Part Number: 1243.
2. Color: Black.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive manufactured dry wells.

B. Notify Architect of conditions that would adversely affect installation or subsequent use.

C. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

A. Install manufactured dry wells in accordance with manufacturer’s instructions at locations indicated on the Drawings.

B. Excavate hole for manufactured dry wells to dimensions and elevations indicated on the Drawings.

C. Excavate trench to slope towards manufactured dry wells as indicated on the Drawings.

D. Install manufactured dry wells level and plumb.

E. Connect pipes to manufactured dry wells in accordance with manufacturer's instructions.

F. Do not allow soil from entering manufactured dry wells or pipes.

G. Backfill evenly around manufactured dry wells with specified material.

H. Ensure no large stones or debris are in contact with manufactured dry wells.

3.3 ADJUSTING

A. Remove and replace with new material, damaged components that cannot be successfully repaired.

3.4 PROTECTION

A. Protect Work of this Section to ensure that Work will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name: Borough of Chambersburg | Permit No.: PAG133704

BMP Name: Central Parking Bio-Swale | Latitude: 39°56' 11.70"

Surface Waters: Chesapeake Bay | Longitude: -77° 39' 38.39"

Municipality: Borough of Chambersburg | County: Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **June 2018**

☒ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on May 25, 2018

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Infiltration

BMP Effectiveness Values: TSS: 80 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft²): N/A Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☐ Vegetated Loading Ratio *(see instructions)*: N/A WQ Storage Volume (ft³):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 0.17 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	.15	1944.85	290
	Pervious	.02	308.31	6
			Total TSS Load Delivered to BMP (lbs/yr) =	296

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (296 lbs/yr) x TSS Effectiveness Value (80%) = 237 lbs/yr TSS Credit

Permittee Credit for Joint BMPs (if applicable): % or lbs/yr TSS Credit

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name: Borough of Chambersburg | Permit No.: PAG133704

BMP Name: Fifth Avenue Extension Infiltration Trench | Latitude: 39°56' 48.41"

Surface Waters: Chesapeake Bay | Longitude: -77° 38' 16.66"

Municipality: Borough of Chambersburg | County: Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **Nov. 2023**

☒ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on May 25, 2018

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Infiltration

BMP Effectiveness Values: TSS: 60 TN: % TP: %

% Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft²): Approx. 9,900 Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☒ Vegetated Loading Ratio *(see instructions)*: WQ Storage Volume (ft³):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 6 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	2.82	1944.85	5,484
	Pervious	3.18	308.31	980
			Total TSS Load Delivered to BMP (lbs/yr) =	6,464

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (6,464 lbs/yr) x TSS Effectiveness Value (60%) = 3,879 lbs/yr TSS

Permittee Credit for Joint BMPs (if applicable): % or Credit lbs/yr TSS Credit

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name:	Borough of Chambersburg	Permit No.:	PAG133704
BMP Name:	Gilbert Avenue Infiltration Trench	Latitude:	39°55' 44.94"
Surface Waters:	Chesapeake Bay	Longitude:	-77° 39' 43.57"
Municipality:	Borough of Chambersburg	County:	Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **January 2020**

☒ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Infiltration

BMP Effectiveness Values: TSS: 60 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft^2): 176 Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☐ Vegetated Loading Ratio *(see instructions)*: WQ Storage Volume (ft^3):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 7.4 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	3.48	1944.85	6,768
	Pervious	3.92	308.31	1,208
			Total TSS Load Delivered to BMP (lbs/yr) =	7,976

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (7,976 lbs/yr) x TSS Effectiveness Value (60%) = 4,785 lbs/yr TSS

Permittee Credit for Joint BMPs (if applicable): % or Credit lbs/yr TSS Credit

Herbert, Rowland & Grubic, Inc.
Engineering & Related Services

MEMORANDUM

TO: **Andrew Stottlemyer, Manager**
Chambersburg Borough Storm Sewer Utility

DATE: **April 28, 2020**

RE: **Gilbert Avenue BMP**
Pollutant Load Reduction
HRG Job: 4061.0431

At your request HRG has completed the pollutant load reduction calculations associated with the subsurface infiltration Best Management Practice (BMP) near the intersection of Gilbert Avenue and Central Avenue constructed by the Borough of Chambersburg in fall of 2019. As such, it was determined that the BMP as constructed will provide the Borough of Chambersburg a sediment load reduction of approximately 4,785 pounds per year as noted in the table below.

Site	BMP ID	BMP Type	Lat.	Long.	Drainage Area (acres)	Drainage Area Characteristics				Loading Rate		Total Sediment (lbs/yr)	BMP Effectiveness (%)	Sediment Load Reduction (lbs/yr)
						% Imperv.	Imperv. (acres)	% Pervious	Pervious (acres)	Imperv.	Pervious			
Gilbert Ave Infiltration Bed	BMP-14	Subsurface Infiltration	39.929133	-77.6622	7.4	47%	3.48	53%	3.92	1944.85	308.31	7973.38	60%	4,785

The calculated annual sediment load reduction is based on the following:

- The BMP consists of 20’ of 48” perforated corrugated metal pipe installed in a 22’ x 8 ’x 7’ trench, backfilled with clean aggregate, and wrapped on all sides with geotextile fabric.
- The BMP receives sheet flow from Gilbert Avenue and Central Avenue through a standard Type-M inlet top cast directly into the crown of the 48” pipe.
- The BMP was constructed at a low point in the road prone to ponding and street flooding.
- The BMP captures runoff generated from a drainage area of approximately 7.4 acres.
- The drainage area consists largely of impervious cover, however the standard PADEP-approved Statewide MS4 Land Cover Estimates of 47% impervious and 53% impervious coverage was used in the load reduction calculations to provide a level of conservatism.
- A Sediment Removal Efficiency Value of 60% was used to determine the annual sediment load reduction. This value is consistent with the removal efficiencies of BMPs of similar design proposed in the Borough’s approved Chesapeake Bay Pollutant Reduction Plan, as well as PADEP’s BMP Effectiveness Table.
- Continued functionality of the BMP relies on the Borough following regular Operation and Maintenance guidelines provided in PADEP’s BMP Design Manual.

Attached are project related photos and documentation for inclusion in the Borough’s 2019-2020 MS4 Annual Report.

Please feel free to contact me should you have any questions or concerns.

Sincerely,

Herbert, Rowland & Grubic, Inc.

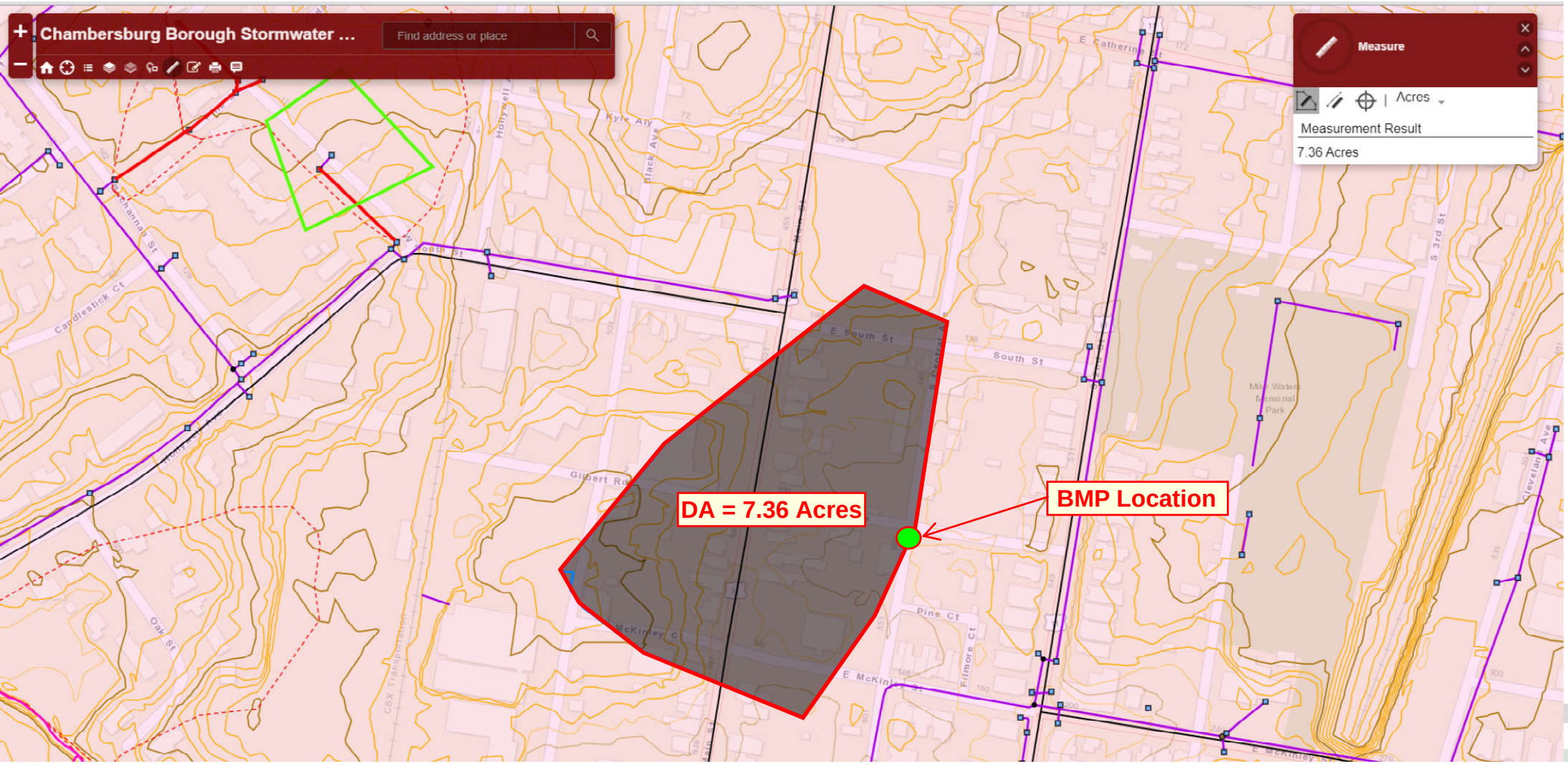
Alex Greenly
Staff Professional

AG/LB
4061.0431 Ph. 002
P:\0040\004061_0430\Admin\002 - 2018 SWM Engineer\Task B - PRP Implementation\Gilbert Ave BMP\2020.04.28 - Gilbert Ave BMP Memo.doc

Gilbert Avenue BMP - Subsurface Infiltration Bed

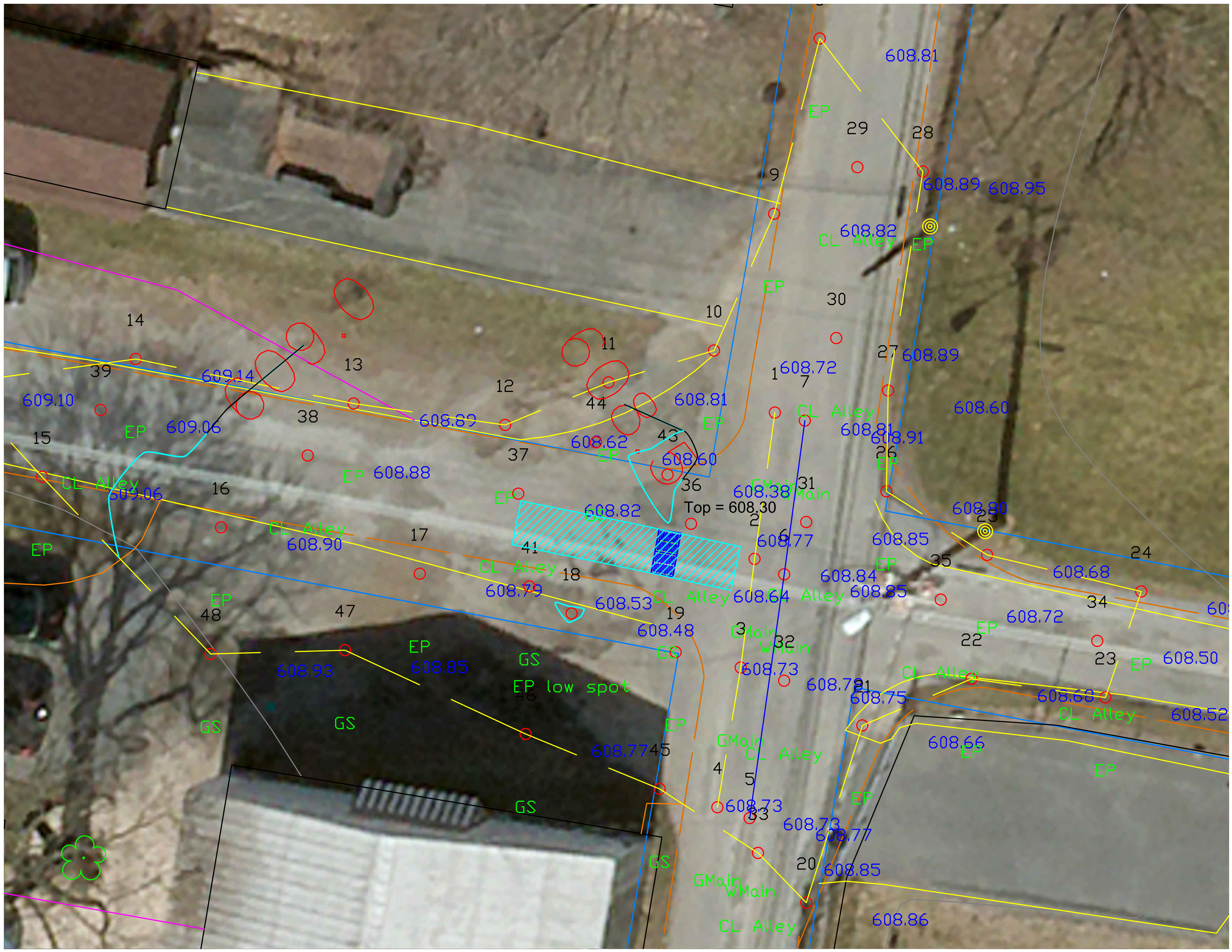
Chambersburg Borough Storm Sewer Authority

Drainage Area Map



Herbert, Rowland & Grubic, Inc.
Engineering & Related Services

04/28/2020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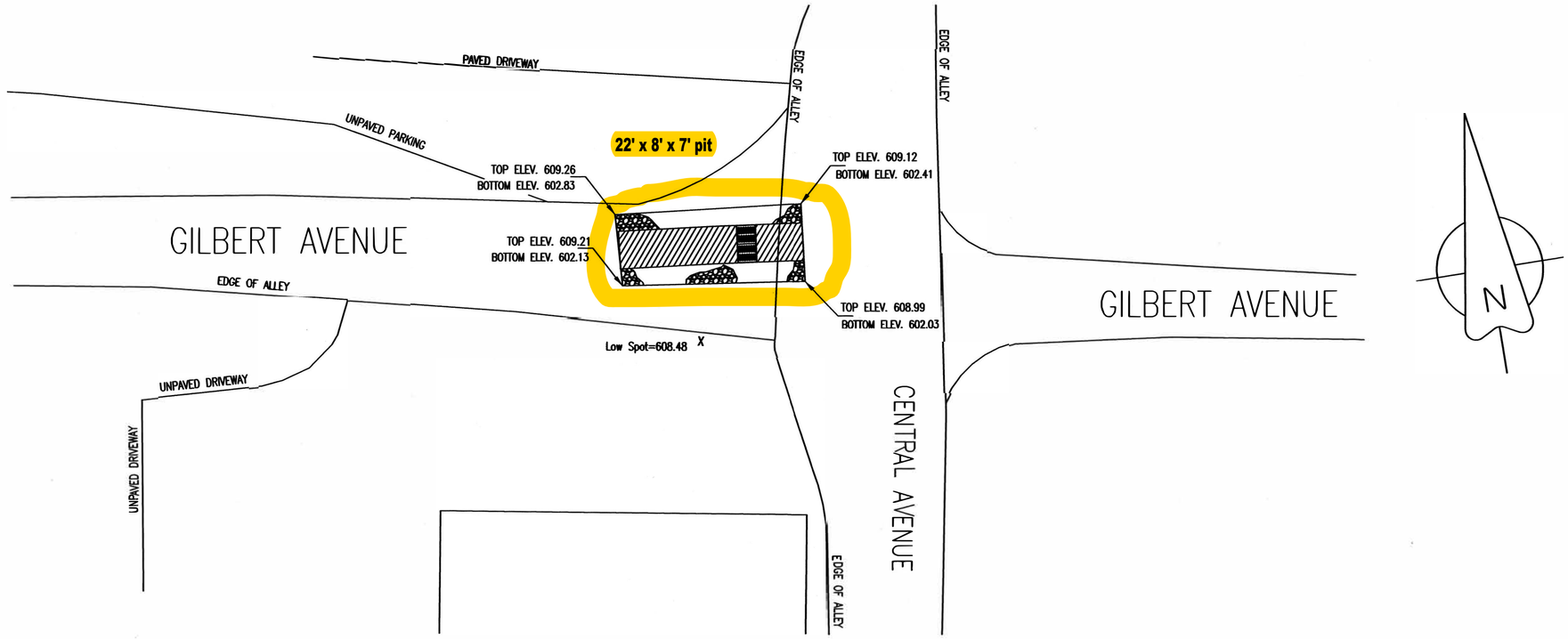
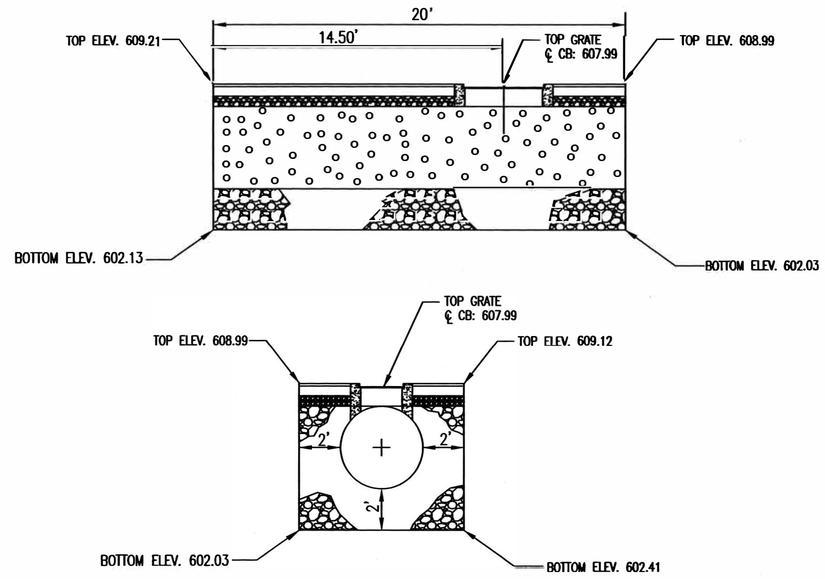
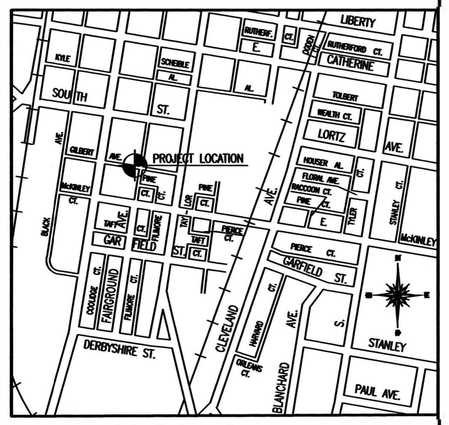




GILBERT AVENUE
NOT TO SCALE



LOCATION PLAN
NOT TO SCALE

(NO SCALE)

PENNSYLVANIA ONE CALL SYSTEM, INC.
1-800-242-1776

PENNSYLVANIA LAW REQUIRES THREE WORKING DAYS NOTICE BEFORE EXCAVATION

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE.

BOROUGH OF CHAMBERSBURG

100 S. Second Street
Chambersburg, Penna.

GILBERT AVENUE
DRAINAGE PIPE
AS-BUILT

Drawn TFZ	Scale 1"= 10'	PLAN NO.
Checked BKF	MAY 2019	**E-403**
Approved		









ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name:	Borough of Chambersburg	Permit No.:	PAG133704
BMP Name:	Harrison Drive Hydrodynamic Structure	Latitude:	39°56' 47.44"
Surface Waters:	Chesapeake Bay	Longitude:	-77° 40' 16.91"
Municipality:	Borough of Chambersburg	County:	Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **August 2021**

☒ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on December 14, 2020

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☒ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP* ***Hamilton Township***

Type of BMP (see instructions): Water quality

BMP Effectiveness Values: TSS: 10 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft^2): N/A Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☐ Vegetated Loading Ratio *(see instructions)*: WQ Storage Volume (ft^3):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 0.42 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	2.74	1944.85	5,329
	Pervious	3.09	308.31	952
			Total TSS Load Delivered to BMP (lbs/yr) =	6,281

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (6,281 lbs/yr) x TSS Effectiveness Value (10%) = 352 (56%) lbs/yr TSS

Permittee Credit for Joint BMPs (if applicable): % or Credit lbs/yr TSS Credit

HRG
Herbert, Rowland & Grubic, Inc.
Engineering & Related Services
AN EMPLOYEE-OWNED COMPANY

207 Grant Street
Chambersburg, PA 17201
717.263.2070
www.hrg-inc.com

2021 ENR MidAtlantic DESIGN FIRM OF THE YEAR

July 7, 2021

Andrew Stottlemyer, Manager
Chambersburg Borough Storm Sewer Utility
SENT VIA E-MAIL

Re: Harrison Drive Pipe Replacement Pollutant Reduction Calculation

Dear Mr. Stottlemyer:

As requested, HRG has completed the pollutant load reduction calculations associated with the proposed twelve-inch (12") pipe replacement and installation of water quality filters along Harrison Drive. The project also includes the replacement of two (2) existing inlets (C-015-0611 and C-015-0606). It has been determined that the proposed improvements will provide the Borough of Chambersburg a sediment load reduction of approximately **352 pounds of sediment per year** as noted in Table 1 below. Please note that a portion of the contributory drainage area enters from Hamilton Township, approximately forty-four percent (44%).

Table 1 – Pollutant Load Reduction Summary

Site	BMP ID	Lat.	Long.	Drainage Area (acres)	Drainage Area Characteristics			
					% Imperv.	Imperv. (acres)	% Pervious	Pervious (acres)
Harrison Drive Pipe Replacement	BMP-15	39.946538	-77.671334	5.83 ac.	47%	2.74 ac.	53%	3.09 ac.

Loading Rate		Total Sediment (lbs/yr)	BMP Type	BMP Effectiveness	Sediment Load Reduction (lbs/yr)
Impervious	Pervious				
1,944.85	308.31	6,282 lbs/yr	Hydrodynamic Structure	10%	628 lbs/yr
Sediment Load Reduction (lbs/yr) Allocated to Hamilton Township (44%)					276 lbs/yr
Sediment Load Reduction (lbs/yr) Allocated to Borough of Chambersburg (56%)					**352 lbs/yr**

The calculated annual sediment load reduction is based on the following:

- The BMPS consist of REM Triton – TR (Drop Inlet) Series water quality filters (or approved equal) installed in both inlet C-015-0611 and inlet C-015-0606.
- The BMPs will receive sheet flow from Harrison Drive, Atherton Drive, Hamilton Avenue, and Lindia Drive through standard Type-M inlet tops.
- The BMPs capture runoff generated from a drainage area of approximately 5.83 acres.
- The drainage area consists largely of impervious cover, however the standard PADEP-approved Statewide MS4 Land Cover Estimates of forty-seven percent (47%) and fifty-three percent (53%) impervious coverage was used in the load reduction calculations to provide a level of conservatism.
- A sediment removal efficiency of ten percent (10%) was used to determine the annual sediment load reduction. This value is consistent with the removal efficiencies in PADEP's BMP Effectiveness Table.

- Continued functionality of the BMPs relies on the Borough following regular Operation and Maintenance guidelines provided in PADEP's BMP Design Manual.

Enclosed are project related documentation for inclusion in one of the Borough's upcoming MS4 Annual Reports.

Please feel free to contact me should you have any questions or concerns.

Sincerely,

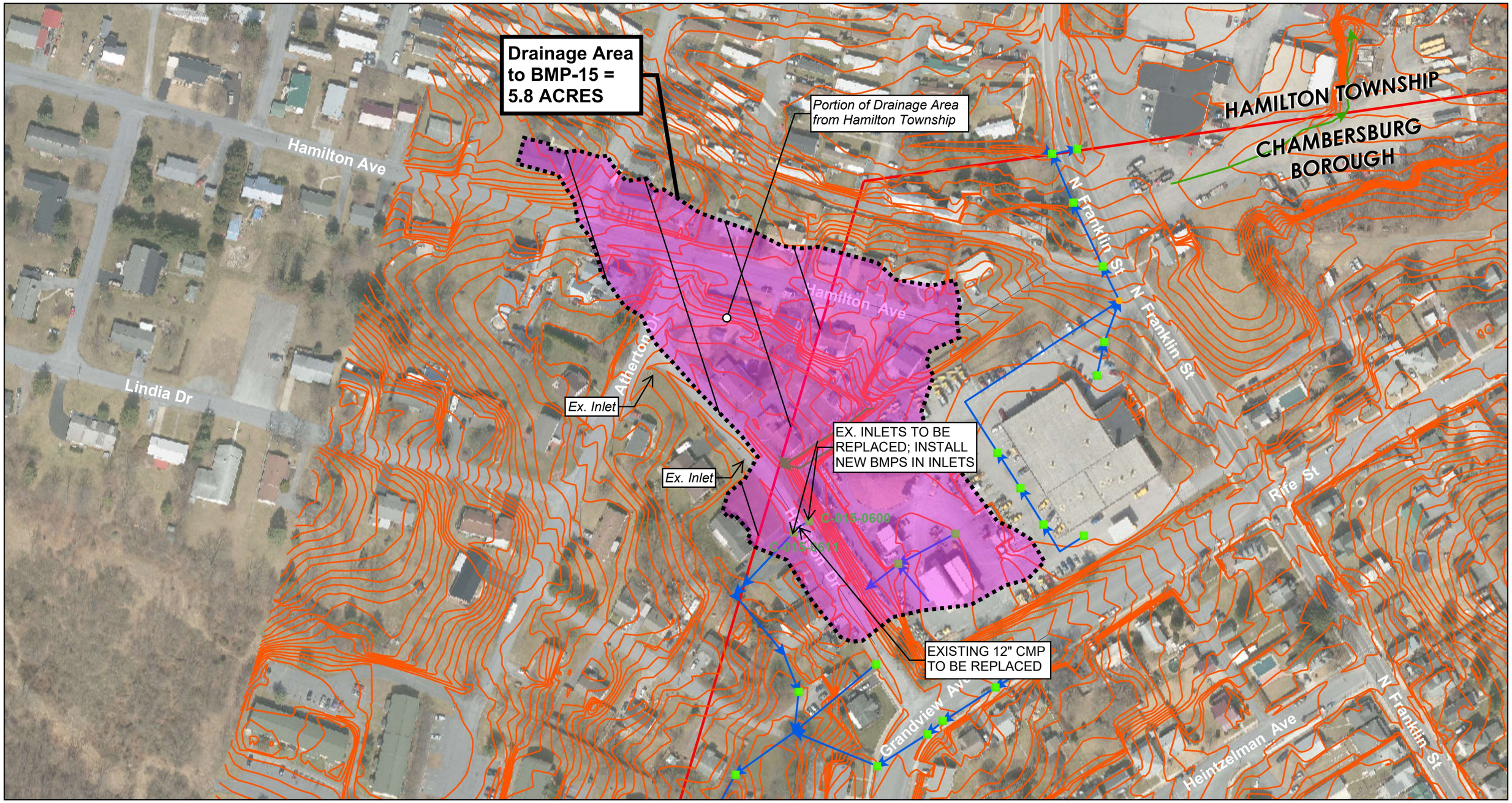
HERBERT, ROWLAND & GRUBIC, INC.

Hillary E. Dunning, P.E.
Staff Professional II

HED
HRG Job No.: 004061.0430, Ph. 004
P:\0040\004061_0430\Admin\004 - 2020 SWM Engineer\Task C - Harrison Drive Pipe Replacement\2021.07.07 Revised Drainage Area\2021.07.07 Harrison Drive Pipe Replacement Pollutant Reduction Calculation.docx

Enclosures

Storm Sewer System Map



December 22, 2020
Rev. July 6, 2021

NOTE: Drainage area was delineated using a combination of Borough topography data, discussion with Borough staff, aerial imagery, and PASDA.

DRAINAGE AREA MAP

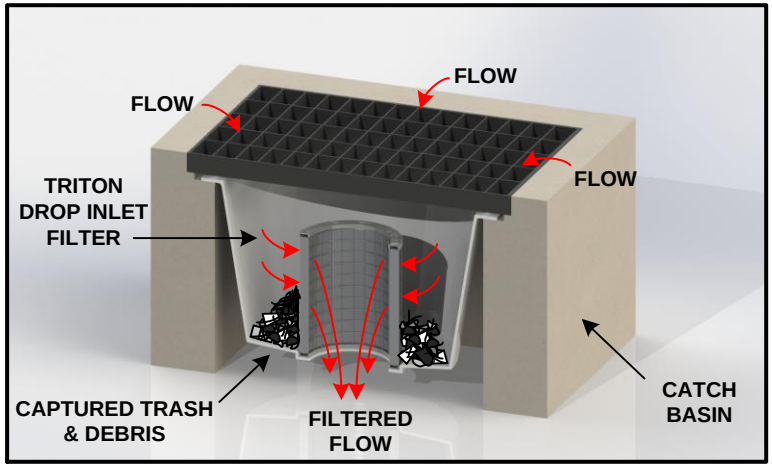
HARRISON DRIVE PIPE REPLACEMENT POLLUTANT REDUCTION CALCULATION

HRG JOB: 004061.0430, PH. 004

REM's TRITON – TR (Drop Inlet) Series

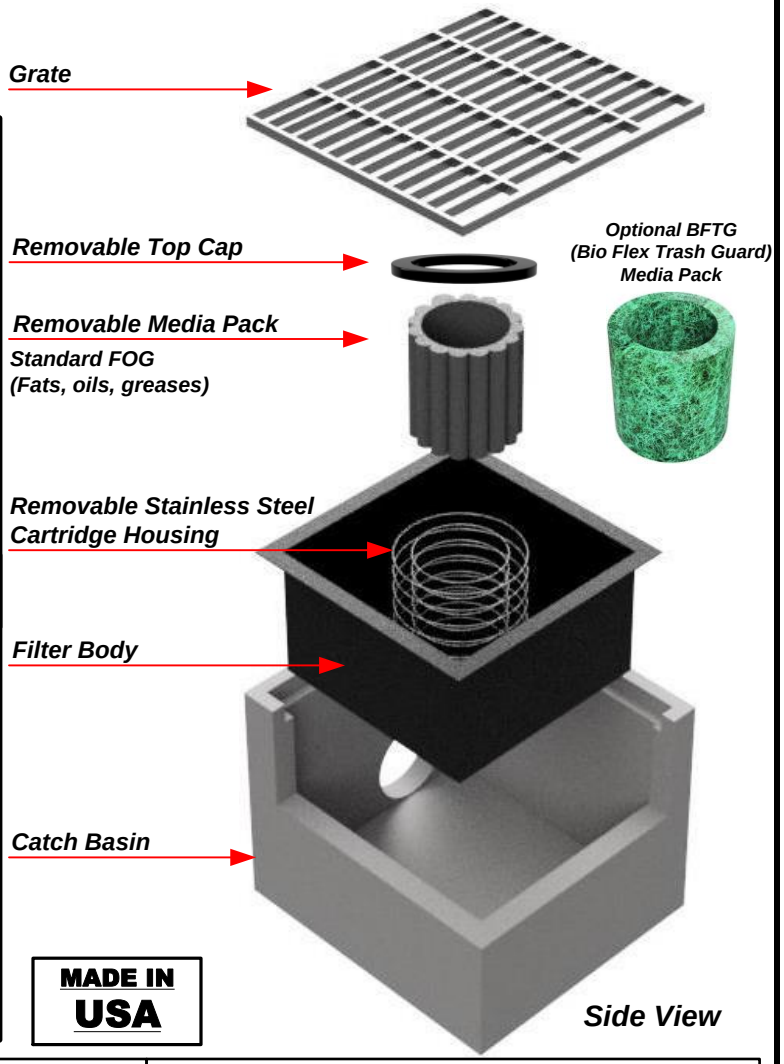
The REM TRITON -TR Filter is a multipurpose catch basin insert designed to capture sediment, trash, debris, suspended solids, oils & grease and other storm water pollutants. TRITON -TR filters may be utilized in new construction or retrofitted in existing catch basin structures. They are sized to spec or modified in the field for drains with unusual dimensions and unique frame and grates. Filter Cartridges may be easily removed when servicing. Media strategy may be optimized for specific pollutant concerns.

TRITON – TR SERIES FILTER *By REM Inc.*
Ph# (888.526.4736)
Sales@remfilters.com
Remfilters.com



Model: TR24SR-D (shown above)

Round Catch Basin Shown



Side View

MADE IN USA

Notes:

- *The TRITON - TR Series Filters may be customized in the field to fit catch basins with irregular dimensions or unusual frame and grate types. REM also designs custom filters for unique storm water infrastructures and applications.*
- *Filter bodies are constructed using **100% recycled** High Molecular Weight Polyethylene Plastic (HMWPE) with U.V. inhibitors.*
- *Filter cartridge housings are constructed utilizing Type 304 Stainless Steel, with 2" welded square openings.*
- *Removable cartridge tops are constructed utilizing over 80% recycled ABS Plastic.*
- *REM TRITON replacement Filter Media Packs are charged with REM FOG media an expanded volcanic ash medium treated to be highly hydrophobic housed in a durable geo-textile perforated polypropylene woven fabric. REM FOG media effectively encapsulates liquefied petroleum hydrocarbons (Fats, Oils & Grease including animal fats). The media's hydrophobic characteristic allows for greater polishing of flow resulting in the reduction of Total Suspended Solids (TSS). Suspended solid reduction includes but is not limited to debris, trash, silt sediment and agglomerated heavy metals. (Additional media options are available including mixed blends of granulated carbon [AC] and Zeolite [ZEO].*
- *REM TRITON filter cartridges are removable for ease of cleaning and maintenance.*
- *Filter designs include a high flow overflow bypass to eliminate pooling or flooding during heavy rain events.*
- *See our Specifier Sheet for sizes, models and flow rate information.*
- *Maintenance information and replacement REM Media Packs are available upon request by contacting REM at sales@remfilters.com or (888) 526-4736.*
- ***Made in the USA**.*

Cartridge Diameter size may vary by catch basin. Taller cartridge options provide greater volume capacity and increased treatment rates.

U.S. Patent Number: 6,217,757

PH: (888) 526-4736

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

REM Inc.

TRITON DROP INLET SERIES

(TRITON Cartridge System)

DRAWN BY:	FOR:	REV
D.F.	Drop Inlet Combinations	

SCALE	DATE	Pg.
1/4 : 1	DATE: 9/12/2018	1 OF 1

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name:	Borough of Chambersburg	Permit No.:	PAG133704
BMP Name:	North Fourth Street Stream Restoration	Latitude:	39°56' 23.97"
Surface Waters:	Chesapeake Bay	Longitude:	-77° 39' 16.43"
Municipality:	Borough of Chambersburg	County:	Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **June 2023**

☒ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on May 25, 2018

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Stream restoration

BMP Effectiveness Values: TSS: 45 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft²): N/A Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☐ Vegetated Loading Ratio *(see instructions)*: WQ Storage Volume (ft³):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: N/A acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	N/A	N/A	
	Pervious	N/A	N/A	
			Total TSS Load Delivered to BMP (lbs/yr) =	11,220

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (454.6 lbs/yr) x TSS Effectiveness Value (85%) = 11,220 lbs/yr TSS

Permittee Credit for Joint BMPs (if applicable): % or Credit lbs/yr TSS Credit

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name:	Borough of Chambersburg	Permit No.:	PAG133704
BMP Name:	Rhodes Drive Bio-retention	Latitude:	39°56' 22.73"
Surface Waters:	Chesapeake Bay	Longitude:	-77° 39' 35.12"
Municipality:	Borough of Chambersburg	County:	Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **May 2018**

☒ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on May 25, 2018

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Infiltration

BMP Effectiveness Values: TSS: 80 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft^2): Ponding Depth (ft): N/A ☒ Underdrain

Media Description: N/A Media Depth (ft): N/A

☐ Vegetated Loading Ratio *(see instructions)*: WQ Storage Volume (ft^3):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 2.39 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	1.7	1944.85	3,306
	Pervious	.49	308.31	151
			Total TSS Load Delivered to BMP (lbs/yr) =	3,457

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (3,457 lbs/yr) x TSS Effectiveness Value (80%) = 2766 lbs/yr TSS

Permittee Credit for Joint BMPs (if applicable): % or Credit lbs/yr TSS Credit

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name:	Borough of Chambersburg	Permit No.:	PAG133704
BMP Name:	Rhodes Drive Porous Pavement	Latitude:	39°56' 23.12"
Surface Waters:	Chesapeake Bay	Longitude:	-77° 39' 35.35"
Municipality:	Borough of Chambersburg	County:	Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **May 2018**

☒ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on May 25, 2018

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Porous pavement

BMP Effectiveness Values: TSS: 85 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft^2): .31 Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☐ Vegetated Loading Ratio *(see instructions)*: N/A WQ Storage Volume (ft^3):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 0.31 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	N/A	1944.85	N/A
	Pervious	.31	308.31	96
			Total TSS Load Delivered to BMP (lbs/yr) =	96

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (96 lbs/yr) x TSS Effectiveness Value (85%) = 81 lbs/yr TSS Credit

Permittee Credit for Joint BMPs (if applicable): % or lbs/yr TSS Credit

ATTACHMENT A – INFILTRATION BMPs

GENERAL INFORMATION

Permittee Name:	Borough of Chambersburg	Permit No.:	PAG133704
BMP Name:	South Main Street Drainage Conveyance	Latitude:	39°55' 9.72"
Surface Waters:	Chesapeake Bay	Longitude:	-77° 39' 54.31"
Municipality:	Borough of Chambersburg	County:	Franklin

☒ Construction of the BMP is Complete. Date Construction Completed: **June 2023**

☒ Photographs, Drawings, and O&M Plan are attached. Inspection/Monitoring Frequency: Monthly

Permits or Approvals Obtained: DEP approval acknowledged on May 25, 2018

Party Responsible for Long-Term O&M: ☒ Permittee ☐ Other:

Joint BMP? ☐ Yes ☒ No *If Yes, attach a list of other permittees sharing credit for the BMP*

Type of BMP (see instructions): Infiltration

BMP Effectiveness Values: TSS: 50 % TN: % TP: %

Effectiveness Values Source: ☒ DEP ☐ CB Expert Panel Report ☐ Other:

BMP CONSTRUCTION

BMP Infiltrating Surface Area (ft²): Ponding Depth (ft): N/A ☐ Underdrain

Media Description: N/A Media Depth (ft): N/A

☒ Vegetated Loading Ratio *(see instructions)*: WQ Storage Volume (ft³):

TSS LOAD DELIVERED TO BMP

Total Drainage Area Treated by BMP: 432 acres (Treatment Area)

TSS Load Delivered to BMP – Simplified Method ☒ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS	Impervious	See attached	See attached	See attached
	Pervious	See attached	See attached	See attached
			Total TSS Load Delivered to BMP (lbs/yr) =	161,876

TSS Load Delivered to BMP – Land Cover-Based Calculation Method ☐ Calculations attached

Pollutant	Land Cover	Area (acres)	Loading Rate (lbs/ac/yr)	Delivered Load (lbs/yr)
TSS				
			Total TSS Load Delivered to BMP (lbs/yr) =	

TSS LOAD REDUCTION CREDIT

TSS Load Delivered to BMP (161,876 lbs/yr) x TSS Effectiveness Value (50%) = Permittee Credit for Joint BMPs (if applicable): 80,938 lbs/yr TSS Credit

% or

Herbert, Rowland & Grubic, Inc.
5 North Main Street, Suite 3
Chambersburg, PA 17201
717.263.2070
www.hrg-inc.com

May 19, 2023

Andy Stottlemyer, Storm Sewer System Manager
Chambersburg Borough Storm Sewer Utility
SENT VIA E-MAIL

Re: South Main Street Vegetated Swale Nutrient Reduction Calculation

Dear Mr. Stottlemyer:

As requested, HRG has completed the pollutant load reduction calculations associated with the proposed improvements to the approximately seventeen-hundred linear foot (1,700 lf), eight-foot (8") bottom width, vegetated swale that discharges into an existing 75"x112" CMP – referred to as the South Main Street Vegetated Swale Reconstruction Project. It has been determined that the proposed improvements will provide the Borough of Chambersburg a sediment load reduction of approximately **eighty thousand nine-hundred and thirty-eight pounds (80,938 lbs) of sediment per year** as noted in Table 4, attached herein.

The calculated annual sediment load reduction is based on the following:

- The BMP consists of improvements to the approximately 1700 LF, 8' bottom width vegetated swale. Improvements include re-grading, stabilization, and landscape plantings.
- The BMP captures runoff generated from a drainage area of approximately 432 acres as shown in the attached drainage area map.
- The drainage area consists largely of impervious cover, however the standard PADEP-approved Statewide MS4 Land Cover Estimates of forty-seven percent (47%) impervious coverage and fifty-three percent (53%) pervious coverage was used in the load reduction calculations to provide a level of conservatism.
- A sediment removal efficiency of fifty percent (50%) was used to determine the annual sediment load reduction. This value is consistent with the removal efficiencies in PADEP's BMP Effectiveness Table.
- Continued functionality of the BMP relies on the Borough following regular Operation and Maintenance guidelines provided in PADEP's BMP Design Manual.

Enclosed are project related documentation for inclusion in one of the Borough's upcoming MS4 Annual Reports. Please feel free to contact me at hdunning@hrg-inc.com should you have any questions or concerns.

Sincerely,

Herbert, Rowland & Grubic, Inc.

Hillary E. Dunning, P.E.
Staff Professional II

HED
004061.0437
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Enclosures

Table 1

Existing Pollutant Loading to proposed South Fourth Street Subsurface Infiltration (BMP-10)

Sewersheds	Urban Area*						Pollutant Loading Rates (lbs./ac)**		Pollutant Loading (lbs.)		
							Sediment		Sediment		
	Total DA (acres)	Adjusted DA (acres) ***	% Imperv.	Imperv. (acres)	% Pervious	Pervious (acres)	Impervious	Pervious	Imperv.	Pervious	Total
D.A. 1	57.4	18.9	47%	8.9	53%	10.0	1,944.85	308.31	17,314.5	3,095.2	20,409.7
Total	**57.4**			**8.9**		**10.0**			**17,314.5**	**3,095.2**	**20,409.7**

*From Pre-Development Drainage Area Map for South Main Street Vegetated Swale Reconstruction Project dated February 4, 2022

**PADEP - MS4 PRP Instructions, Attachment B Developed Land Loading Rates for PA Counties

***Reduction factor of 0.33 applied due to carbonate/karst geology

Table 2

Proposed BMP Treatment of Pollutant Loads for South Fourth Street Subsurface Infiltration (BMP-10)

Sewersheds	**Pollutant Loading (lbs.)***	**Proposed BMP's Treating Sewershed Loading**		
	Sediment			
	Total	BMP	BMP Efficiency	BMP Load Reduction
D.A. 1	20,409.7	Subsurface Infiltration	60%	12,245.8
Total	**20,409.7**			**12,245.8**
Pollutant Loading Remaining (lbs.)				**8,163.9**

Table 3

Existing Pollutant Loading to proposed South Main Street Vegetated Swale (BMP-12)

Sewersheds	Urban Area*						Pollutant Loading Rates (lbs./ac)**		Pollutant Loading (lbs.)		
							Sediment		Sediment		
	Total DA (acres)	Adjusted DA (acres) ***	% Imperv.	Imperv. (acres)	% Pervious	Pervious (acres)	Impervious	Pervious	Imperv.	Pervious	Total
D.A. 1	See Table 1 and Table 2 calculations for BMP-10										8,163.9
D.A. 2	80.7	26.6	47%	12.5	53%	14.1	1,944.85	308.31	24,342.9	4,351.6	28,694.5
D.A. 3	351.6	116.0	47%	54.5	53%	61.5	1,944.85	308.31	106,058.8	18,959.5	125,018.3
Total	**432.3**			**67.0**		**75.6**			**130,401.7**	**23,311.1**	**161,876.6**

*From Pre-Development Drainage Area Map for South Main Street Vegetated Swale Reconstruction Project dated February 4, 2022

**PADEP - MS4 PRP Instructions, Attachment B Developed Land Loading Rates for PA Counties

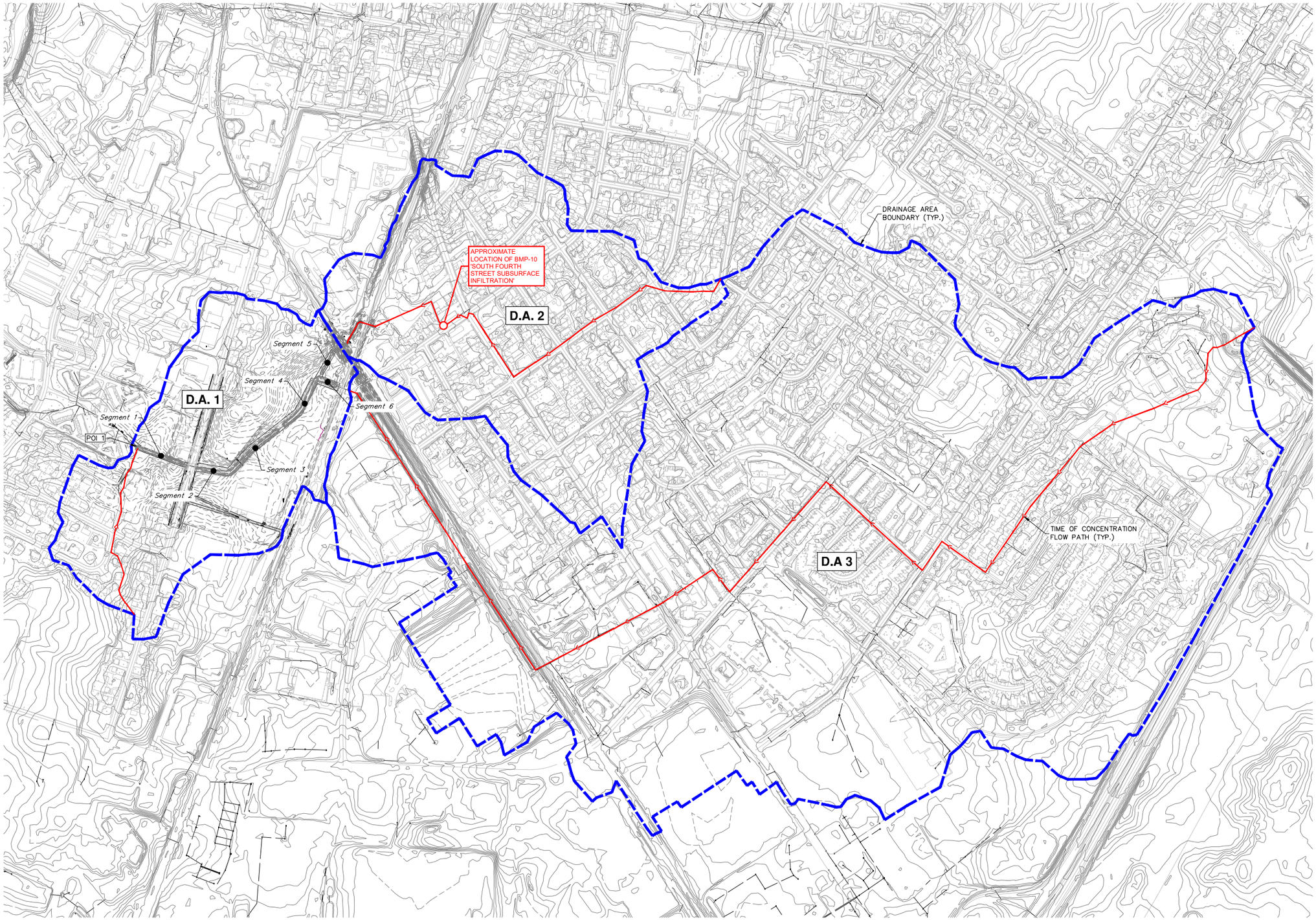
***Reduction factor of 0.33 applied due to carbonate/karst geology

****16.2 acres of Parsed Area (PAG-03) Removed from D.A. 3 Total DA (acres)

Table 4

Proposed BMP Treatment of Pollutant Loads for South Main Street Vegetated Swale (BMP-12)

Sewersheds	Pollutant Loading (lbs.)*	Proposed BMP's Treating Sewershed Loading		
	Sediment			
	Total	BMP	BMP Efficiency	BMP Load Reduction
D.A. 1	8,163.9	Vegetated Open Channel (C/D)	50%	4,081.9
D.A. 2	28,694.5	Vegetated Open Channel (C/D)	50%	14,347.2
D.A. 3	125,018.3	Vegetated Open Channel (C/D)	50%	62,509.1
Total	**161,876.6**			**80,938.3**



GRAPHIC SCALE
300' 150' 0' 300'
SCALE: 1"= 300'

EXISTING LEGEND

- Existing Storm Sewer Line
- Existing Storm Sewer Inlet
- Storm MH Existing Storm Sewer Manhole

NO.	REVISION	DATE	BY

HRG
Herbert, Rowland & Grubic Inc
Engineering & Related Services
AN EMPLOYEE-OWNED COMPANY
207 Grant Street
Chambersburg, PA 17201
(717) 263-2070
hrg@hrg-inc.com
www.hrg-inc.com

CHAMBERSBURG BOROUGH
100 SOUTH SECOND STREET
CHAMBERSBURG, PA 17201
717-264-5151

PRE-DEVELOPMENT DRAINAGE AREA MAP
FOR
SOUTH MAIN STREET VEGETATED SWALE RECONSTRUCTION
CHAMBERSBURG BOROUGH FRANKLIN COUNTY PENNSYLVANIA

PROJ. MGR. –	JMH
DESIGN–	HED
CADD–	CAC
CHECKED–	HED
SCALE–	AS SHOWN
DATE–	2022.02.04

DRAWING NO.
DRN-PRE
SHEET NO.
1 OF 1
PROJECT R004061.0437

File name: P:\0400\004061.0437\CAD\Plan Sets\ESM\004061043702PH-PRE.dwg Layout:DRN-PRE Feb 04, 2022-8:51am cornelia

Appendix E – Table 1: Proposed BMPs

Site	BMP ID	BMP Type	Lat	Long	Drainage Area (acres)	Length (ft)	Drainage Area Characteristics*				Loading Rate TSS (lbs/yr)**		Total Load TSS (lbs/yr)	BMP Effectiveness *** (%)	Estimated Pollutant Load Reduction TSS (lbs/yr)
							% Imperv.	Imperv. (acres)	% Pervious	Pervious (acres)	Imperv.	Pervious			
Rhodes Drive	BMP-1A	Bioswale	39.939655	-77.659863	2.39	n/a	n/a	1.7	n/a	0.49	1944.85	308.31	3,457	80%	2,766
	BMP-1B	Pervious Pavement	39.939764	-77.659724	0.31	n/a	n/a	0	n/a	0.31	1944.85	308.31	96	85%	81
Fifth Ave Extension	BMP-2	Subsurface Infiltration	39.945860	-77.637387	6	600	47%	2.82	53%	3.18	1944.85	308.31	6,465	60%	3,879
Elder Street/ W Commerce Street	BMP-3A	Subsurface Infiltration	39.947979	-77.666170	9.2	n/a	47%	4.32	53%	4.88	1944.85	308.31	8,412	60%	5,047
	BMP-3B	Streambank Restoration	39.948087	-77.664308	n/a	1,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	44.88	62,832
	BMP-3C	Subsurface Infiltration	39.947148	-77.663772	9.18	n/a	47%	4.31	53%	4.87	1944.85	308.31	8,394	60%	5,036
	BMP-3D	Bioretention	39.947953	-77.663204	4.35	n/a	47%	2.04	53%	2.31	1944.85	308.31	3,977	90%	3,580
Stevens Elementary	BMP-4A	Streambank Restoration	39.928384	-77.668196	n/a	500	n/a	n/a	n/a	n/a	n/a	n/a	n/a	44.88	22,440
	BMP-4B	Riparian Buffer	39.928483	-77.668567	12.38	n/a	47%	5.82	53%	6.56	1944.85	308.31	13,339	50%	6,670
Wilson College	BMP-5	Bioretention	39.951391	-77.650239	103.5	n/a	47%	48.65	53%	54.86	1944.85	308.31	111,520	90%	100,368
Mill Creek Acres Park	BMP-6	Bioretention	39.921110	-77.675127	100	n/a	47%	47.0	53%	53.0	1944.85	308.31	107,748	90%	96,974
Nitterhouse Park	BMP-7	Bioretention	39.934589	-77.672104	7.2	n/a	47%	3.38	53%	3.82	1944.85	308.31	6,583	90%	5,925
Wolf Ave Rail Trail	BMP-8A	Bioretention Pocket	39.945424	-77.661355	5.08	100	47%	2.39	53%	2.69	1944.85	308.31	5,474	90%	4,926
	BMP-8B	Bioretention Pocket	39.944690	-77.661809	4.59	100	47%	2.16	53%	2.43	1944.85	308.31	4,946	90%	4,451
	BMP-8C	Bioretention Pocket	39.944264	-77.662048	4.02	100	47%	1.89	53%	2.13	1944.85	308.31	4,331	90%	3,898
	BMP-8D	Bioretention Pocket	39.943568	-77.662442	6.22	100	47%	2.92	53%	3.30	1944.85	308.31	6,702	90%	6,032
	BMP-8E	Bioretention Pocket	39.942580	-77.662827	5.28	100	47%	2.48	53%	2.80	1944.85	308.31	5,689	90%	5,120
Fourth Street	BMP-9	Streambank Restoration	39.939835	-77.653521	n/a	250	n/a	n/a	n/a	n/a	n/a	n/a	n/a	44.88	11,220
South Fourth Street	BMP-10	Subsurface Infiltration	39.922021	-77.660717	29.3	n/a	47%	13.77	53%	15.529	1944.85	308.31	26,791	60%	16,074
Ludwig Ave Parking Lot	BMP-11	Subsurface Infiltration	39.934467	-77.658381	2.52	100	47%	1.18	53%	1.34	1944.85	308.31	2,304	60%	1,383
South Main Street	BMP-12A	Stream Restoration	39.919224	-77.665285	n/a	675	n/a	n/a	n/a	n/a	n/a	n/a	n/a	44.88	30,294
	BMP-12B	Riparian Buffer	39.919153	-77.665901	7.06	675	47%	3.32	53%	3.74	1944.85	308.31	7,607	50%	3,804
Sheffler Drive	BMP-13	Riparian Buffer	39.910609	-77.665005	31.6	n/a	47%	14.85	53%	16.75	1944.85	308.31	28,894	50%	14,447
Total															**417,247**

*PADEP - Statewide MS4 Land Cover Estimates

**PADEP PRP Instructions - Attachment B, Developed Land Loading Rates for PA Counties

***PADEP - BMP Effectiveness Values