

**FINAL DRAFT
WEST MIFFLIN BOROUGH
POLLUTANT REDUCTION PLAN
FOR THE
STREETS RUN AND FALLEN TIMBER RUN WATERSHEDS**



**WEST MIFFLIN,
ALLEGHENY COUNTY, PENNSYLVANIA**

JULY 2017

**PREPARED BY
SKELLY AND LOY, INC.
PITTSBURGH, PENNSYLVANIA**

**DRAFT
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POLLUTANT REDUCTION PLAN
FOR THE
STREETS RUN AND FALLEN TIMBER RUN
WEST MIFFLIN BOROUGH,
ALLEGHENY COUNTY, PENNSYLVANIA**

PREPARED FOR

**MACKIN ENGINEERING COMPANY
AND
WEST MIFFLIN BOROUGH
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PREPARED BY



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JULY 2017

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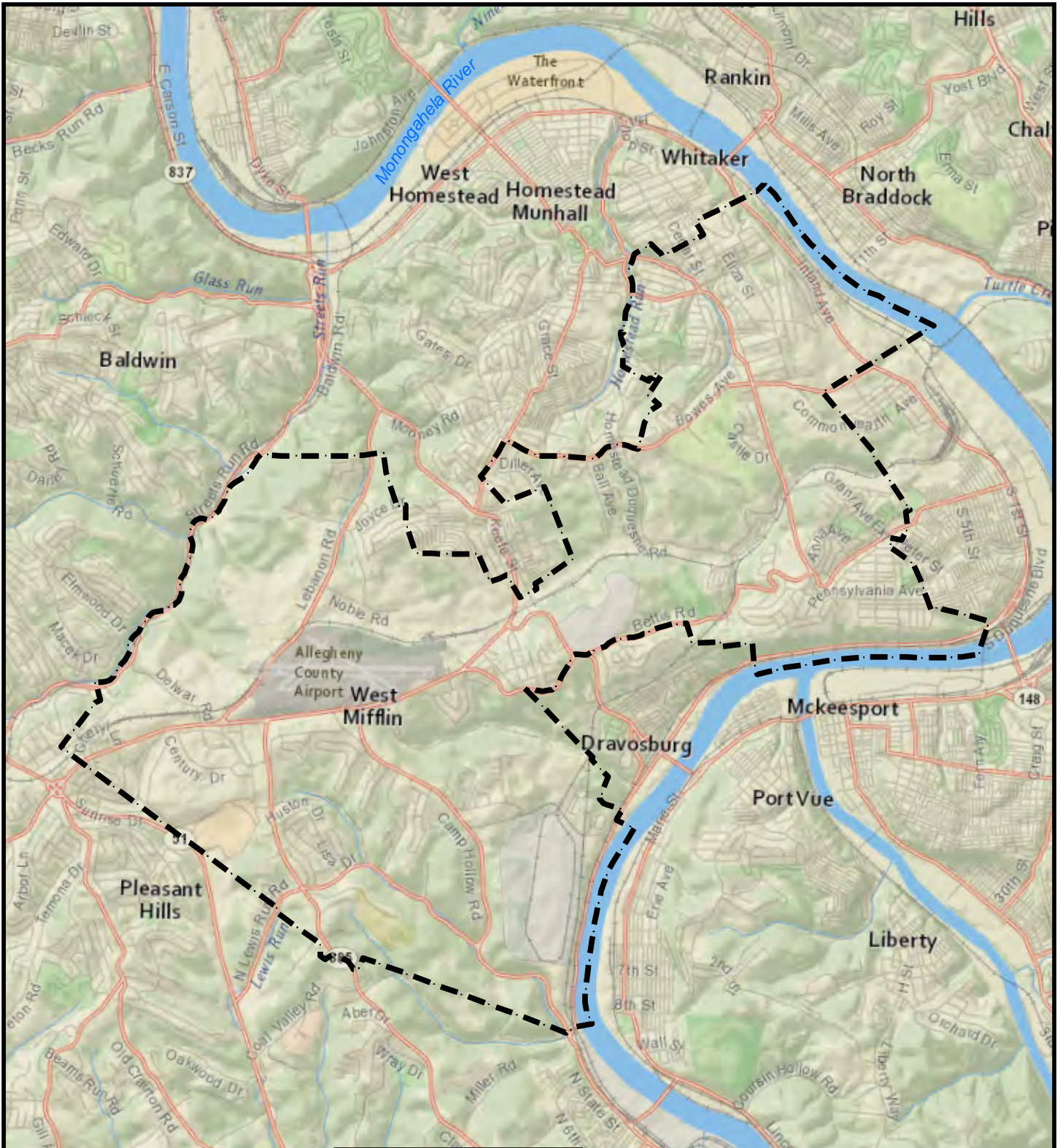
LIST OF ACRONYMS

BMP	Best Management Practices
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GWLF	Generalized Watershed Loading Function
HUC	Hydrologic Unit Codes
IDD&E	Illicit Discharge Detection and Elimination
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PA DEP	Pennsylvania Department of Environmental Protection
PA DCNR	Pennsylvania Department of Conservation and Natural Resources
PCSM	Post-Construction Stormwater Management
PennDOT	Pennsylvania Department of Transportation
PRP	Pollutant Reduction Plan
PTC	Pennsylvania Turnpike Commission
TMDL	Total Maximum Daily Load
U.S. EPA	U.S. Environmental Protection Agency
USGS	United States Geological Survey
USLE	Universal Soil Loss Equation

EXECUTIVE SUMMARY

LOCATION

According to the United States Census Bureau, the West Mifflin Borough has a total area of 14.4 square miles (37 km²), of which 14.2 square miles (37 km²) is land and 0.3 square miles (0.78 km²), or 1.80%, is water. The landscape is largely hilly and wooded, and the borough's eastern boundary is contiguous with the Monongahela River three separate times. The borough is located within Allegheny County, Pennsylvania. The borough is bordered by the City of Pittsburgh neighborhoods Lincoln Place and Hays, and the boroughs of Munhall and Whitaker to the north, the city of Duquesne to the east, the borough of Dravosburg to the southeast, the boroughs of Jefferson Hills and Pleasant Hills to the south, and the borough of Baldwin to the west. (Approximate municipality center is Latitude N40°22'5", Longitude W79°53'51". (See **Figure 1**, Location Map.)

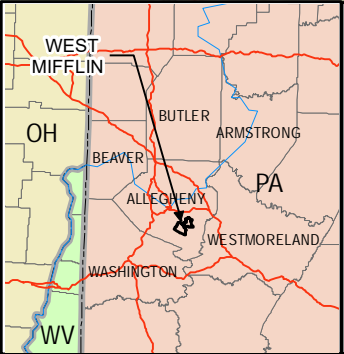


Legend

WEST MIFFLIN BOROUGH

Source: National Geographic et al. 2017 (Base Imagery)

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0 5,000' 10,000'



WEST MIFFLIN MS4 PROJECT
WEST MIFFLIN BOROUGH
ALLEGHENY COUNTY, PENNSYLVANIA

R17-0385.001

BOROUGH LOCATION

FIGURE - 1
AUGUST 2017

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ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

PURPOSE

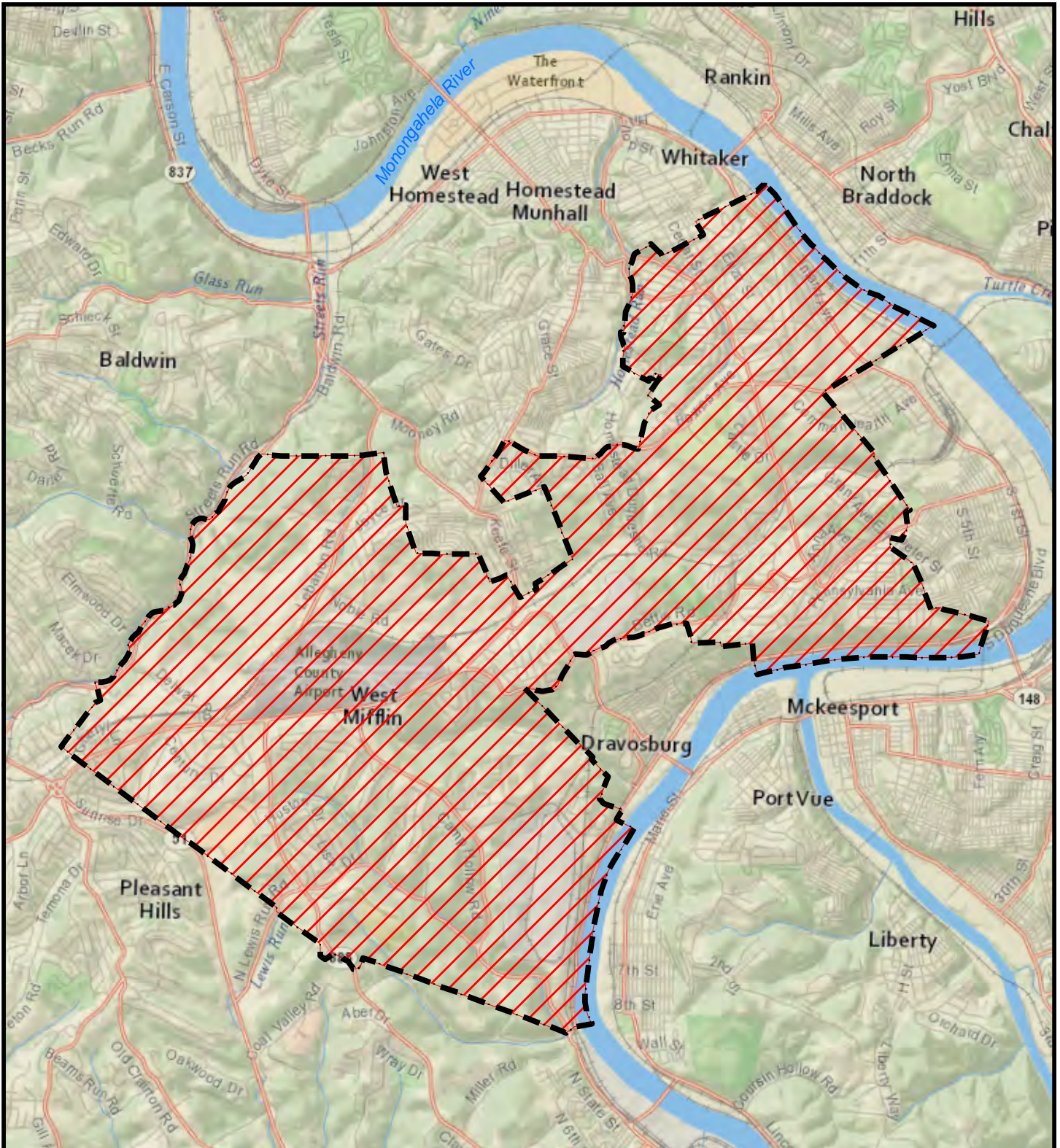
The ultimate purpose of the Pollutant Reduction Plan (PRP) is to activate implementation of specific projects to capture and reduce pollutants conveyed by stormwater runoff before they reach streams, rivers, lakes, etc. (a.k.a., surface waters). The PRP provides the background, assumptions, analysis, and methodology to establish a justifiable baseline of current pollutant load generation and then identifies Best Management Practices (BMP) with site locations, planning-level concept designs, costs, and implementation schedules. It also provides a framework for funding installation, operation, and maintenance activities that provides regulators with assurance that the identified projects will materialize within the scheduled timeframe. This West Mifflin Borough Pollutant Reduction Plan focuses on the Streets Run and Fallen Timber Run HUC12 nutrient and sediment impaired watersheds.





MS4 REGULATED AREA

The Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit applies only to urban runoff that flows through municipally owned and operated stormwater infrastructure with an identifiable concentrated discharge (outfall) to a surface water. The urbanized area is the portion of the municipality that is located within the Urbanized Area boundaries defined by the U.S. Census Bureau in the most recent decennial (2010) census. The entire borough is classified an urbanized area and represents the regulated area. The storm sewer system consists of the municipally owned and operated stormwater conveyance network including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains.

Regulated West Mifflin MS4 area includes the entire 14.4 square miles of the municipality as shown by **Figure 2**, West Mifflin Borough Urbanized and MS4 Regulated Areas.



Legend

-  WEST MIFFLIN BOROUGH
-  URBANIZED AND MS4 PLANNING AREA

Source: National Geographic et al. 2017 (Base Imagery)

0 1,800m
0 5,000' 10,000'



WEST MIFFLIN MS4 PROJECT
 WEST MIFFLIN BOROUGH
 ALLEGHENY COUNTY, PENNSYLVANIA

R17-0385.001

**URBANIZED AND MS4
 PLANNING AREA**

FIGURE - 2
 AUGUST 2017

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APPLICABLE SURFACE WATERS AND POLLUTANTS OF CONCERN

According to the Pennsylvania Department of Environmental Protection (PA DEP) Requirements Table dated June 21, 2017, West Mifflin is obligated by the regulation to provide PRPs to address “Appendix E” (Impaired Waters Sediment/Nutrient) because the municipality has stormwater which discharges to local surface watersheds listed as having impairment caused by siltation (surrogate name for sediment) or nutrients (which in this case is phosphorus). The municipality’s Urbanized Area includes three HUC12 watersheds, they are:

- Piney Fork-Peters Creek, HUC12 Code 050200050806;
- Fallen Timber Run-Monongahela River, HUC12 Code 050200050807; and
- Streets Run-Monongahela River, HUC12 Code 050200050808.

Two of these HUC 12 watersheds have streams which are identified as being impaired by parameters requiring the development of a PRP; one is not. Within the Fallen Timber Run-Monongahela River HUC 12 watershed there are two unnamed tributaries which are impaired, one of which is locally known as New England Run and the other a contributory to New England Run. One tributary having impairment caused by siltation and nutrients, the other having impairment caused by nutrients only. Within the Streets Run-Monongahela River HUC 12 watershed there are two named streams which are impaired. They are Homestead Run and Streets Run. Both of these streams are impairment caused by siltation.

The pollutants of concern are sediment and phosphorus. PA DEP has established a uniform pollutant reduction target for MS4s not identified in an existing approved Total Maximum Daily Load (TMDL) plan. Such is the case with West Mifflin Borough. The reduction targets are listed in **Table 1**.

TABLE 1
POLLUTANT REDUCTION TARGETS FOR
SURFACE WATERS IMPAIRED BY SEDIMENT AND/OR NUTRIENTS

POLLUTANT	REDUCTION TARGET
Sediment (TSS)	10%
Phosphorus (TP)	5%

In addition to the impaired surface waters described above, within the Streets Run-Monongahela River HUC 12 watershed West Mifflin’s MS4 discharges through the Thompson Run streamshed and directly to the Monongahela River watershed. Within the Fallen Timber-Monongahela River HUC 12 watershed West Mifflin’s MS4 also discharges through the unnamed tributary locally known as Curry Hollow.

Pollutant load modeling was completed on the HUC 12 Watershed scale. The HUC 12 watersheds and their respective subject surface waters are listed in **Table 2** and shown in **Figure 3**, HUC 12 Watersheds and Surface Waters.


TABLE 2
HUC 12 WATERSHEDS AND SURFACE WATERS

HUC 12 CODE	HUC 12 WATERSHED NAME	SUBJECT SURFACE WATERS WITHIN HUC 12 WATERSHED
050200050806	Piney Fork-Peters Creek	Lewis Run
		1 Unnamed Tributary to Lewis Run
050200050807	Fallen Timber Run-Monongahela River	1 Unnamed Tributary to Monongahela River (Coal Valley Road)
		1 Unnamed Tributary to Monongahela River (New England Road)
		1 Unnamed Tributary to Monongahela River (Curry Hollow)
050200050808	Streets Run-Monongahela River	Thompson Run
		Homestead Run
		Streets Run





Legend


 WEST MIFFLIN BOROUGH

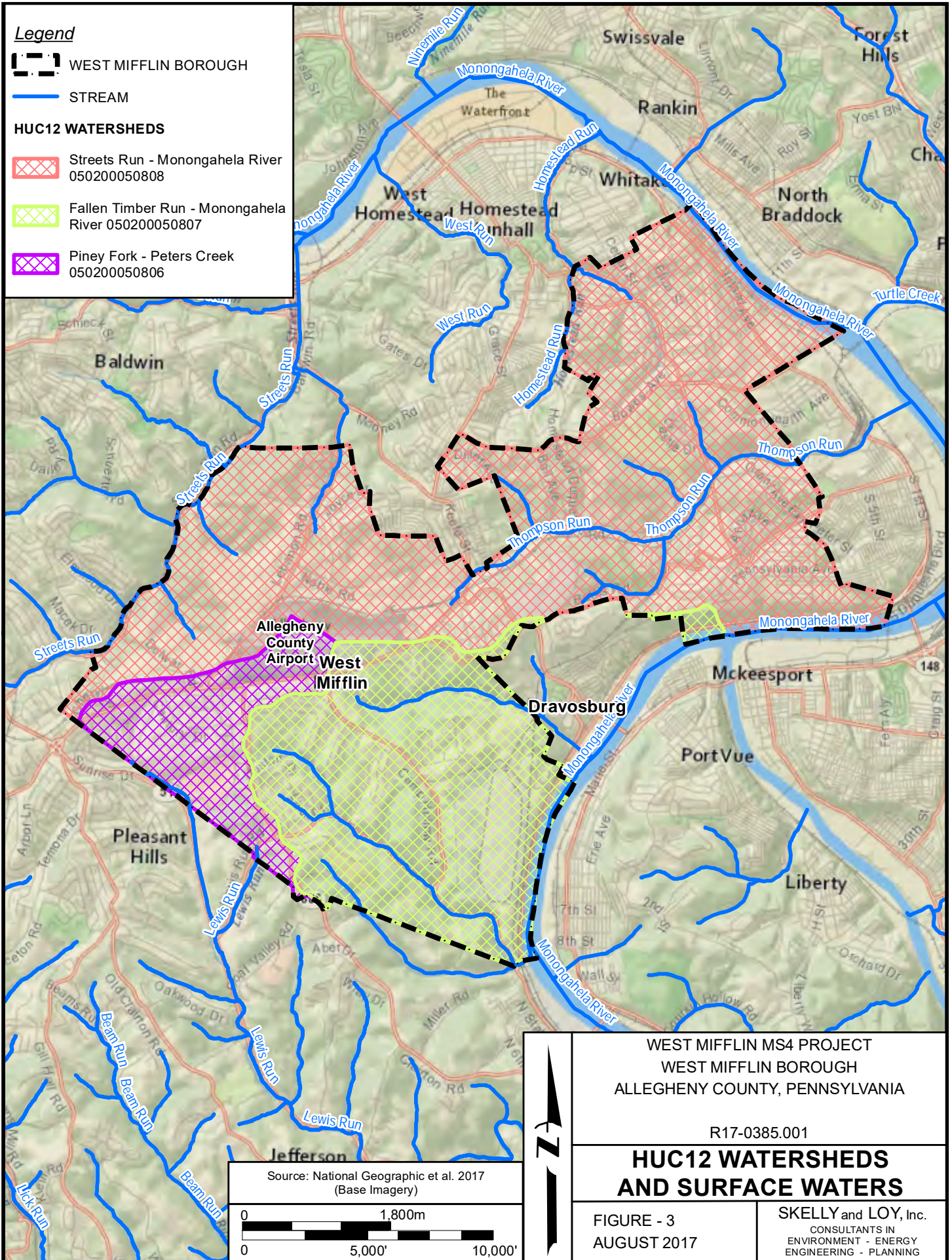
 STREAM

HUC12 WATERSHEDS

 Streets Run - Monongahela River
050200050808

 Fallen Timber Run - Monongahela
River 050200050807

 Piney Fork - Peters Creek
050200050806



Source: National Geographic et al. 2017
(Base Imagery)

0 1,800m
0 5,000' 10,000'

WEST MIFFLIN MS4 PROJECT
WEST MIFFLIN BOROUGH
ALLEGHENY COUNTY, PENNSYLVANIA

R17-0385.001

**HUC12 WATERSHEDS
AND SURFACE WATERS**

FIGURE - 3
AUGUST 2017

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PRP LAYOUT

The Executive Summary is followed by two sections. Section I, Background, describes West Mifflin Borough's characteristics influencing PRP decisions.

Section II, Required PRP Components, provides technical data, analysis and substantiation, and proposed BMP specifics. It is organized and titled according to PA DEP's PRP Instructions. The subsections are:

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

West Mifflin has opted to use the presumptive approach to report pollutant reduction. Under this approach, it is assumed that if the required sediment reduction is achieved, nutrient (phosphorus and/or nitrogen) reductions are also reached. Therefore, only sediment load reduction is reported.

Essential Statistics

Concise at-a-glance summaries of the information gleaned from the research, mapping, analysis, and planning effort are provided below (**Tables 3 through 5**). Please refer to the corresponding narratives in Sections I and II of the PRP for the expanded discussions.

**TABLE 3
POLLUTANT LOADS**

DESCRIPTION	(LBS/YR)
SEDIMENT	
Sediment Adjusted Existing Load	1,240,895
Sediment Load Reduction Target (10%)	124,089
Sediment Reduction Achieved	124,149
Sediment Over Reduction	59
PHOSPHORUS	
Phosphorus Adjusted Existing Load	1,161
Phosphorus Load Reduction Target (5%)	58
Phosphorus Reduction Achieved	Presumed
NITROGEN	
Nitrogen Adjusted Existing Load (3%)	n/a
Nitrogen Load Reduction Target	n/a
Nitrogen Reduction Achieved	n/a

**TABLE 4
IMPAIRED SURFACE WATERS' POLLUTANT LOADS
BY HUC 12 WATERSHED**

DESCRIPTION	FALLEN TIMBER WATERSHED (LBS/YR)	STREETS RUN WATERSHED (LBS/YR)
SEDIMENT		
Sediment Adjusted Existing Load	68,009	1,172,886
Sediment Load Reduction Target (10%)	6,801	117,289
Sediment Reduction Achieved	6,822	117,327
Sediment Over Reduction	21	38
PHOSPHORUS		
Phosphorus Adjusted Existing Load	1,161	n/a
Phosphorus Load Reduction Target (5%)	58	n/a
Phosphorus Reduction Achieved	Presumed	n/a
NITROGEN		
Nitrogen Adjusted Existing Load (3%)	n/a	n/a
Nitrogen Load Reduction Target	n/a	n/a
Nitrogen Reduction Achieved	n/a	n/a



TABLE 5
PROPOSED BMP PROJECTS

DESCRIPTION	NUMBER
Total Number of Proposed BMPs	6
Fallen Timber HUC 12 Watershed Stream Restoration Project	1
Streets Run HUC 12 Watershed Stream Restoration Project	4
Dry Extended Detention Basin	1

Cost – Planning Level Estimate:	\$1,914,700
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I. BACKGROUND

A. HYDROLOGY

The Monongahela River is the principal receiving watercourse for West Mifflin Borough. All surface waters ultimately discharge to that waterbody.

The United States Geological Survey (USGS) developed a hierarchical system to classify hydrology by the region size draining to the watercourse. The Hydrologic Unit Codes (HUC) are comprised of 2 to 12 digits and include regions (2 digits), subregions (4 digits), basins (6 digits), subbasins (8 digits), watershed (10 digits), and subwatershed (12 digits). The PRP has been prepared based on subwatersheds (HUC 12s) generally in the 40- to 60-square-mile size (but can be larger or smaller).

West Mifflin Borough drains to three HUC 12s:

- Piney Fork-Peters Creek, HUC12 Code 050200050806;
- Fallen Timber Run-Monongahela River, HUC12 Code 050200050807; and
- Streets Run-Monongahela River, HUC12 Code 050200050808.

The watershed names aptly refer to the main watercourses. Of the numerous tributaries to each of the surface waters, 8 tributaries support West Mifflin Borough's outfalls. The HUC 12s and receiving watercourses are highlighted on Figure 3.

Three receiving waters are identified as non-attaining by the Pennsylvania Title 25 Environmental Protection, Chapter 93 Water Quality Standards (Chapter 93) list. Streets Run's main stem is impaired for siltation (a surrogate name for sediment), and Homestead Run is also impaired for siltation. Within the Fallen Timber-Monongahela HUC 12 watershed, an unnamed tributary and its unnamed tributary are listed as having impairments caused by siltation, organic enrichment/low D.O. (surrogate name for nutrients), and pathogens.

Table 6, MS4 Surface Water Summary, includes pertinent information for the MS4 surface waters.

**TABLE 6
MS4 SURFACE WATERS SUMMARY**

SURFACE WATER NAME	HUC 12 CODE	REACH CODE AT MOST DOWNSTREAM OUTFALL	CHAPTER 93 DESIGNATED USE	STATUS A (ATTAINING) I (IMPAIRED)	IMPAIRMENT CAUSE	TOTAL LENGTH (MILES)	DOWNSTREAM RECEIVING SURFACE WATER NAME
Piney Fork Run – Peters Creek	050200050806		TSF	A	Appendix B-Pathogens (5)	?	Peters Creek
Lewis Run, Unnamed Tributary		05020005001575	TSF ³	A	Appendix B-Pathogens (5)	0.76	Peters Creek
Lewis Run		05020005002008	TSF	A	Appendix B-Pathogens (5)	0.686	Peters Creek
Fallen Timber Run – Monongahela River	050200050807		WWF ²	I	Appendix A-Metals (4a) Appendix E-Organic Enrichment/Low D.O. Siltation (5)	7.48	Monongahela River
Unnamed Tributary to Monongahela		05020005001605	WWF ²	I	Appendix A-Metals (4a) Appendix E-Organic Enrichment/Low D.O. Siltation (5)	1.872	Monongahela River
Unnamed Tributary to Monongahela		05020005001606	WWF	I	Appendix A-Metals (4a) Appendix E-Organic Enrichment/Low D.O.	0.722 and 1.949	Monongahela River
Unnamed Tributary to Monongahela		05020005001607	WWF	I	Appendix A-Metals (4a) Appendix E-Organic Enrichment/Low D.O.	0.48	Monongahela River
Streets Run – Monongahela River	050200050808		WWF	I	Appendix A-Metals (4a) Appendix E-Siltation (5)		Monongahela River
Thompson Run		05020005001978	WWF	A	Appendix A-Metals (4a)	0.934	Monongahela River
		05020005001963	WWF	A	Appendix A-Metals (4a)	0.57	Monongahela River
		05020005001962	WWF	A	Appendix A-Metals (4a)	1.312	Monongahela River

SURFACE WATER NAME	HUC 12 CODE	REACH CODE AT MOST DOWNSTREAM OUTFALL	CHAPTER 93 DESIGNATED USE	STATUS A (ATTAINING) I (IMPAIRED)	IMPAIRMENT CAUSE	TOTAL LENGTH (MILES)	DOWNSTREAM RECEIVING SURFACE WATER NAME
		05020005001948	WWF	A	Appendix A-Metals (4a)	0.675	Monongahela River
		05020005001947	WWF	A	Appendix A-Metals (4a)	0.358 1.361	Monongahela River
		05020005001937	WWF	A	Appendix A-Metals (4a)	0.338	Monongahela River
Homestead Run		05020005001608	WWF	I	Appendix E-Siltation (5)	0.611	Monongahela River
		05020005001609	WWF	I	Appendix E-Siltation (5)	0.508	Monongahela River
Streets Run		0502000500475	WWF	I	Appendix A-Metals (4a) Appendix E-Siltation (5)	0.624 0.347 0.52	Monongahela River
		05020005001995	WWF	I	Appendix A-Metals (4a) Appendix E-Siltation (5)	0.494	Monongahela River
		0502000500474	WWF	I	Appendix A-Metals (4a) Appendix E-Siltation (5)	0.264 0.346	Monongahela River
		05020005001975	WWF	I	Appendix A-Metals (4a) Appendix E-Siltation (5)	0.254	Monongahela River
		0502000500473	WWF	I	Appendix A-Metals (4a) Appendix E-Siltation (5)	0.408	Monongahela River
		05020005001613	WWF	I	Appendix A-Metals (4a) Appendix E-Siltation (5)	0.616	Monongahela River

II. REQUIRED PRP COMPONENTS

A. PUBLIC PARTICIPATION

The PRP was introduced at a public meeting on Wednesday, August 30, 2017 at 2 p.m. at the Borough office. The 30-day review period for the PRP was advertised in the local newspaper, Valley Mirror, on August 3, 2017. The verbiage of the advertisement is provided below. A copy of the advertisement and proof of publishing are provided in **Appendix A**.

1. Advertisement Announcing the West Mifflin Borough PRP

West Mifflin Borough has prepared a Pollution Reduction Plan (PRP) as required by the PA DEP that outlines potential activities and projects that reduce pollution caused by sediment and/or nutrients in receiving streams. The PRP is available for public review and comment at the Borough office located at 1020 Lebanon Road, West Mifflin, PA 15122 beginning August 3, 2017 through and including September 4, 2017 weekdays, during regular business hours of 9:00 a.m. until 4:00 p.m. The Plan is also available for review beginning August 3, 2017 at the Borough's website at <https://westmifflinborough.com/>. Written comments will be accepted in person or by mail at the Borough office address above no later than close of business on September 5, 2017. Public comment concerning the PRP will also be accepted at a public meeting to be held on Wednesday, August 30, 2017 at 2 p.m. at the Borough office. The proposed adoption of the Plan by the Borough Council will be considered at a public meeting on September 13, 2017 at 6:30 p.m. during the Council's regularly scheduled Caucus meeting.

Brian Kamauf, Manager, West Mifflin Borough

Additionally, the PRP was placed on the Borough's web page for review beginning on August 3, 2017, where it remained for the entirety of the 30-day review period. Interested parties had the option to provide written comments to the Borough Manager at the Borough Office on or before September 5, 2017, or to attend the public meeting to be held on Wednesday, August 30, 2017 at 2 p.m. at the Borough Office to discuss their concerns in the public forum. Comments received and considerations are provided in **Appendix G**.

The finalized PRP is to be presented and adopted at a regularly scheduled public meeting of the West Mifflin Borough Council on September 13, 2017 at 6:30 p.m.

B. MAP

The West Mifflin MS4 Map serves the following purposes:

1. Inventory of the Existing West Mifflin Borough stormwater network
2. Delineation of the components required by regulation including:
 - a. Land uses and/or impervious and pervious surfaces
 - b. Outfalls
 - c. Storm sewershed boundaries
 - d. Planning areas
 - e. Locations of proposed BMPs
3. Framework for documenting maintenance practices and Illicit Discharge Detection and Elimination (IDD&E) activities
4. Location of proposed pollutant-reducing projects

MS4 Map Bullets

- **Map Fulfills Multiple Purposes**
 - Inventory
 - Regulated area identification
 - Inspections
 - Future project identification
- **GIS-Based**
- **Base Map**
 - Compiled from publicly available sources
- **Stormwater Sewer Collection System**
 - Digitized from aerial photographs
- **Outfalls and Sewersheds**
 - Produced by professionals
- **Planning Areas**
 - Demarcated through GIS Analysis

The map is a Geographic Information System (GIS) product created using ESRI Arc Map.

1. Base Map

The base map information was acquired from various publicly available sources including Bing Maps, Allegheny County GIS, National Geographic, U.S. Census Bureau, USGS, USDA, USFWS, PA DCNR, PA DEP, and PennDOT. The sources are detailed in Appendix B, MS4 Map Layers and Data Sources. Additional data was provided by the municipal engineers at Mackin Engineering Company. The information from the Mackin Engineering Company is shown on the map unedited. The information from other sources were only edited to remove exterior information outside of West Mifflin's borders. Therefore, there are variations in the locations of duplicated information. However, the composite of the information sufficiently provides the required data elements including impervious/pervious surfaces, locations and

names of surface waters that receive discharges from the MS4 outfalls, municipal boundaries, and the Urbanized Area Boundary according to the 2010 U.S. Census. West Mifflin Borough and its consultant, Skelly and Loy, Inc., make no claims as to the accuracy of the data.

2. Municipal Separate Storm Sewer System

The stormwater sewer collection system (including publicly owned streets, ditches, swales, inlets, pipes, manholes, intakes, and discharges and privately owned components that are connected to the system) were digitized based on desktop analysis of aerial photographs and supplemented with information provided by West Mifflin Borough staff.

The stormwater sewer collection system depicted will be field-verified as a separate work effort during the permit term.

3. Outfalls

Outfalls were located by plotting the path that storm runoff will follow by gravity between the West Mifflin Borough MS4 and the receiving surface water (a.k.a., rain traces). Surface topography with enclosed depression characteristics (such as stormwater basins, sinkholes, and ponds) were ignored, in accordance with PA DEP directions, to assume flooded conditions.

**PA DEP 3800-PM-BCW0200A
dated 1/2017 (page 6, note 2)**

“For discharges to the ground surface rather than directly to surface waters the location where stormwater would likely enter a surface water as a result of a significant storm event is to be identified as the outfall. All stormwater discharges from MS4s are point sources to surface waters unless the stormwater is intentionally directed to the subsurface under a permit.”

The outfall identification numbering follows the existing West Mifflin Borough standard.

4. Storm Sewersheds

Storm sewersheds were produced by qualified staff using professional judgement to delineate contributory drainage areas. Since West Mifflin Borough is utilizing the presumptive approach; the required sediment and the presumed nutrient reduction apply to all surface

waters within the impaired watersheds. Combined sewersheds were color-coded to correspond to the impairment/attainment status (as required with PA DEP's 2014 Integrated Water Quality Monitoring and Assessment Report) of the receiving surface water at the West Mifflin MS4 outfall location. Sewersheds discharging to surface waters not attaining their designated Chapter 93 use, relative to sediment and/or nutrients, are color-coded "brown" (**Figure 5**, PRP Nutrient and Sediment Load Areas).

5. Planning Areas

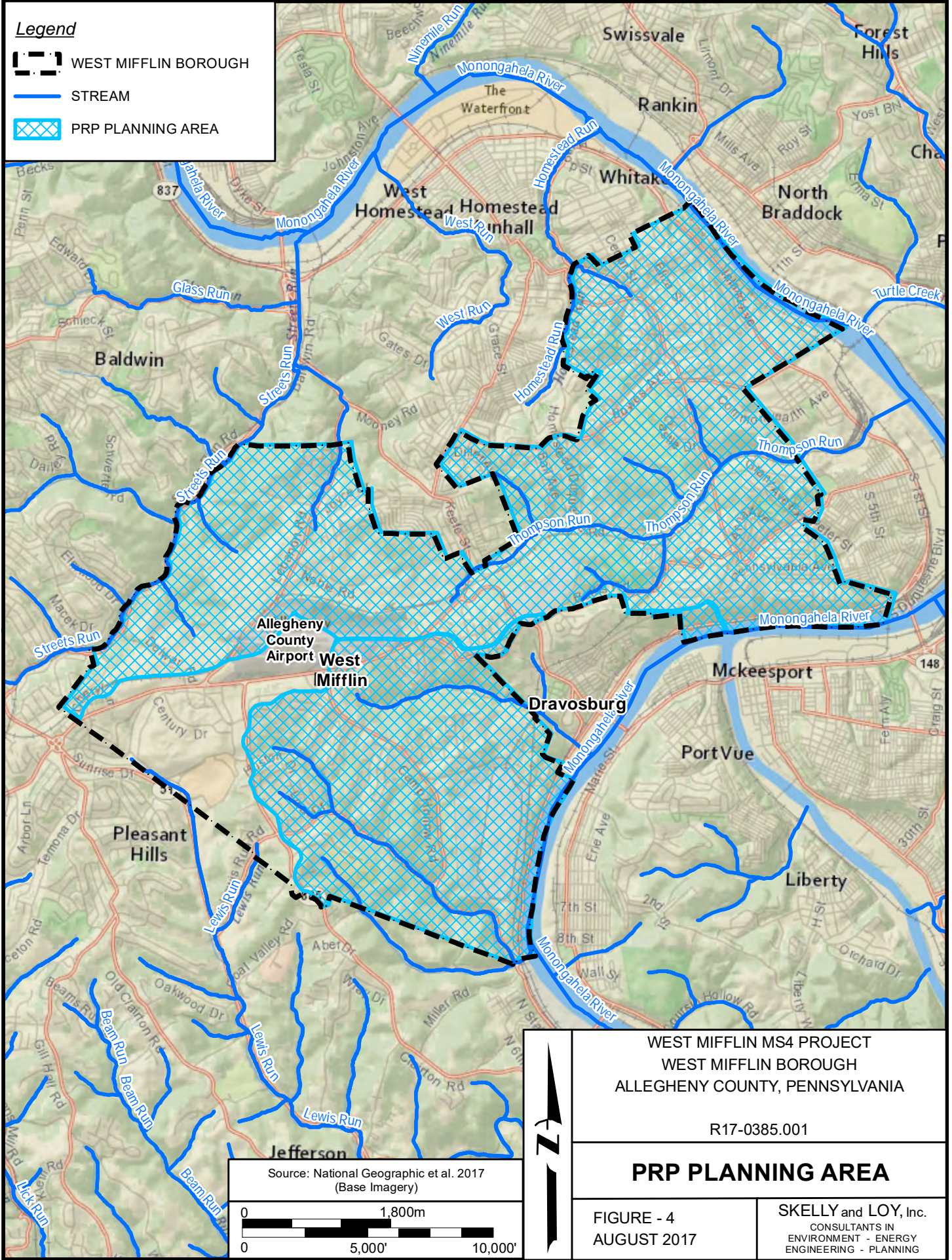
Planning Area

Figure 4, PRP Planning Area, displays the regulated PRP Planning area, which includes the Fallen Timber-Monongahela River HUC 12 and the Streets Run-Monongahela River HUC 12 watersheds, which contain nutrient and sediment impaired streams. The combined sewershed areas associated with these nutrient and sediment impaired streams after parsing are shown in **Figure 5**. Please refer to the sections below for a more detailed description of how areas were parsed from the HUC 12 watersheds.




Parsed areas removed from the PRP Planning Area was derived through GIS analysis that merged and clipped the sewershed, the 2010 Urbanized Area, and the upstream contributory area. Parcels where development was authorized by an NPDES permit for stormwater discharges from construction activity and determined to have limited capacity for additional pollutant removal from the MS4-regulated area were excluded (parsed) from the planning areas. The resulting region is the regulated portion of West Mifflin Borough that is subject to pollutant reduction removal.

C. POLLUTANTS OF CONCERN

Pollutants of concern within the overall PRP Planning Area are sediment and total phosphorus. The PA DEP-established pollutant removal targets are listed in **Table 7**.



Legend

-  WEST MIFFLIN BOROUGH
-  STREAM
-  PRP PLANNING AREA

WEST MIFFLIN MS4 PROJECT
 WEST MIFFLIN BOROUGH
 ALLEGHENY COUNTY, PENNSYLVANIA

R17-0385.001

PRP PLANNING AREA


FIGURE - 4
 AUGUST 2017

SKELLY and LOY, Inc.
 CONSULTANTS IN
 ENVIRONMENT - ENERGY
 ENGINEERING - PLANNING

Source: National Geographic et al. 2017
 (Base Imagery)

0 1,800m 5,000' 10,000'


Legend


 WEST MIFFLIN BOROUGH

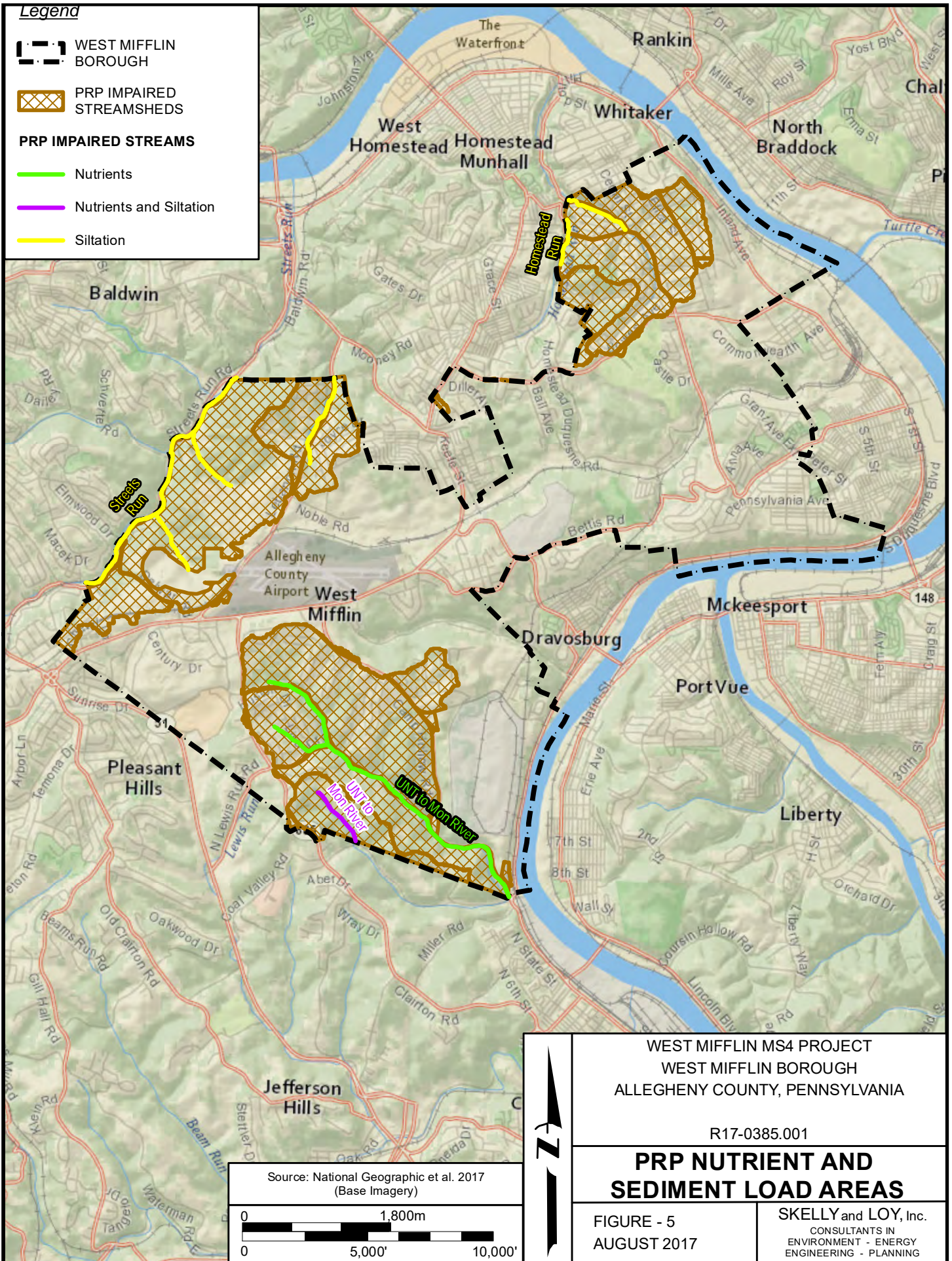
 PRP IMPAIRED STREAMSHEDS

PRP IMPAIRED STREAMS

 Nutrients

 Nutrients and Siltation

 Siltation



WEST MIFFLIN MS4 PROJECT
 WEST MIFFLIN BOROUGH
 ALLEGHENY COUNTY, PENNSYLVANIA

R17-0385.001

**PRP NUTRIENT AND
 SEDIMENT LOAD AREAS**

FIGURE - 5
 AUGUST 2017

SKELLY and LOY, Inc.
 CONSULTANTS IN
 ENVIRONMENT - ENERGY
 ENGINEERING - PLANNING

Source: National Geographic et al. 2017
 (Base Imagery)

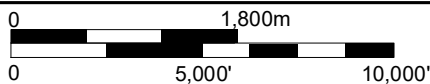


TABLE 7
 POLLUTANT REDUCTION TARGETS FOR
 SURFACE WATERS IMPAIRED BY SEDIMENT AND/OR NUTRIENTS

POLLUTANT	REDUCTION TARGET
Sediment (TSS)	10%
Phosphorus (TP)	5%

1. MS4 Reduction Goals

West Mifflin Borough has opted to use the presumptive approach. BMP projects to reduce pollutants will report only sediment reduction required to achieve 10% sediment reduction.

a. Presumptive Approach to Pollutant Reduction

In accordance with PA DEP’s PRP Instructions (3800-PM-BCW0100k, Re. 3/2017) Section I.B., a presumption of nutrient removal compliance may be assumed if 10% sediment removal is achieved.

**PA DEP’s PRP Instructions
 (3800-PM-BCW0100k, dated 3/2017) Section I.B.
 CBPRP**

“Permittees are encouraged to select appropriate BMPs to achieve the 10% sediment loading reduction objective, as it is expected that, overall within the Bay watershed, the TP (5%) and TN (3%) goals will be achieved when a 10% reduction in sediment is achieved.”

**PA DEP’s PRP Instructions
 (3800-PM-BCW0100k, dated 3/2017) Section I.B.
 PRPs**

“PRPs may use a presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% TP reduction. However, MS4s may not presume that a reduction in nutrients will accomplish a commensurate reduction in sediment.”



D. EXISTING LOADING FOR POLLUTANTS OF CONCERN

1. Summary

Existing loading totals for sediment and phosphorus were calculated by HUC 12 watershed using the DEP's simplified method (simplified method). West Mifflin Borough is contributory to three HUC 12 watersheds. The MS4 nutrient and sediment regulated area is located in two of them: Fallen Timber Run-Monongahela River and Streets Run-Monongahela. The HUC 12 Streets Run-Monongahela Watershed is only impaired by sediment. **Table 8** lists the existing total loads for each of the HUC 12 watersheds in which the West Mifflin Borough MS4 is located. (Also see Simplified Method Results, **Appendix D1**-HUC Watershed Total.)

TABLE 8
EXISTING POLLUTANT LOAD BY HUC 12 WATERSHED

HUC 12 WATERSHED NAME	HUC 12 CODE	SEDIMENT TSS (LBS/YR)	PHOSPHORUS TP (LBS/YR)
Piney Fork-Peters Creek	050200050806	0	0
Fallen Timber Run-Monongahela River	050200050807	2,022,342	3,441
Streets Run-Monongahela River	050200050808	4,801,083	0
Total HUC 12 Watershed Contributions		6,823,425	3,441

2. Calculating MS4 Existing Pollutant Load

The calculations to determine the existing pollutant load for West Mifflin Borough include (1) reducing the Planning Area through parsing and (2) reducing the modelled Planning Area load by deducting pollutant volume captured by existing BMPs from the modelled load results. Section (a.) discusses parsing and the modeled pollutant load. Section (b.) identifies further existing load reduction achieved by existing BMPs.



a. Planning Area Deductions (Parsing)

As stated in Section II.B, Map, the planning areas were created using GIS analysis to identify the portion of the Borough within each of the three HUC 12 watersheds. The area from the first analysis was decreased by exclusion/parsing of properties, as detailed in the following description. The Piney Fork-Peters Creek HUC 12 watershed was not impaired with sediment or nutrients, and this area was parsed. Following, each of the streams within the remaining two HUC 12 watersheds were delineated into 'streamsheds' that represent the combined MS4 drainage of each outfall to the stream. Streamshed areas that were not impaired by nutrients and sediment were parsed. Next, properties that have their own NPDES permit with Post-Construction Stormwater Management (PCSM) obligations and were determined to have limited potential for additional pollutant removal from the MS4-regulated area were parsed. In addition, a large U.S. Steel facility captured its own stormwater and treated this at an industrial wastewater facility and discharged this to a stream through an industrial wastewater discharge NPDES permit. As confirmed by Harris Mahmud from the DEP on July 27th, 2017 by email, this property could be parsed. **Table 9** presents a list of NPDES-permitted parcels within West Mifflin Borough, properties that have been parsed NPDES-permitted parcels are highlighted in gray in Table 9.

Appendix C, Properties with Individual Chapter 102 NPDES Permits, provides a complete list of NPDES-permitted properties within the Borough with additional information such as Permit No. and Authorization I.D.

Other properties within the Borough were excluded because they are entirely under private ownership that did not contribute runoff to or through the municipal stormwater sewer collection/conveyance system. This group included developments with private streets, regions whose runoff passed only through a stormwater sewer collection/conveyance system owned and operated by the Pennsylvania Department of Transportation (PennDOT) and/or the Allegheny County, and properties with drainage that discharged directly to a surface water. Since the Pennsylvania Department of Transportation (PennDOT) has their own MS4, state roads were parsed. As confirmed by Harris Mahmud from the DEP on July 27th, 2017 by email, Allegheny County has its own MS4 and thus county roads were parsed.

**TABLE 9
NPDES PERMITTED PARCELS AND PARSED PROPERTIES EXCLUDED FROM
WEST MIFFLIN BOROUGH MS4 PLANNING AREA**

IDENTIFICATION	ADDRESS/LOCATION	LATITUDE	LONGITUDE	ACRES WITHIN PLANNING AREA
NPDES PERMITTED SITES				
PennDOT & County Maintained/Owned Roads	All State and County Roads in Borough	N/A	N/A	193.54
Lafarge Prop Soccer Fields	1300 Apdale St, West Mifflin, PA 15122	N40.360229	W79.930185	9.85
Festival Fun Parks LLC DBA Kennywood	4800 Kennywood Blvd, West Mifflin, PA 15122	N40.387753	W79.864157	121.73
PGH Metal Stamping Plant	1451 Lebanon School Rd, West Mifflin, PA 15122	N40.344441	W79.901561	72.30
Liberty Pultrusions	1575 Lebanon School Rd, West Mifflin, PA 15122	N40.33956	W79.898482	4.76
Allegheny County Airport	Lebanon Church Rd, West Mifflin PA 15122	N40.35636	W79.916842	2.32
Tanstar Inc.	1301 Camp Hollow Rd, West Mifflin, PA 15211	N40.332861	W79.902163	489.54
Keywell Metals	890 Noble Dr, West Mifflin, PA 15122	N40.360229	W79.930185	10.60
Pull-A-Part of West Mifflin, LLC	1451 Lebanon School Rd, West Mifflin, PA 15122	N40.344441	W79.901561	72.30
Allegheny County Airport	Lebanon Church Rd, West Mifflin PA 15122	N40.354391	W79.928667	409.95
S. Taylor Environmental Park	555 Delwar Rd, Pittsburgh, PA 15236	N40.353387	W79.9488	324.21
Total				1,417

Note: Parsed parcels are indicated in gray highlight.

The above parsed areas were removed from the MS4 regulated area using GIS. The adjusted planning area remaining is the regulated West Mifflin MS4 and is the region used to quantify sediment and nutrient loads using the simplified method.

Next, GIS was used to identify total pervious/impervious area for each streamshed in the MS4 regulated area. The simplified method was used to quantify the total sediment and nutrient load for each streamshed based upon the impairment to each stream, as detailed in the PA DEP's MS4 Requirements Table (Municipal) dated June 21, 2017 and detailed in Figure 5. Total sediment and nutrient loads were totaled for each of the two HUC 12 sediment and nutrient impaired watersheds. **Table 10** reports the results from the simplified method, which is the existing pollutant after parsing. The results tables generated by the model are provided in **Appendix D**.



TABLE 10
EXISTING POLLUTANT LOAD
BY HUC 12 WATERSHED WITH PARSING ADJUSTMENT

HUC 12 WATERSHED NAME	HUC 12 CODE	SEDIMENT TSS (LBS/YR)	PHOSPHORUS TP (LBS/YR)
Piney Fork-Peters Creek	050200050806	N/A	N/A
Fallen Timber Run-Monongahela River	050200050807	89,520	1,528
Streets Run-Monongahela River	050200050808	1,415,881	0
Total HUC 12 Watershed Contributions		1,505,401	1,528






b. Existing Stormwater Facility Pollutant Load Adjustments

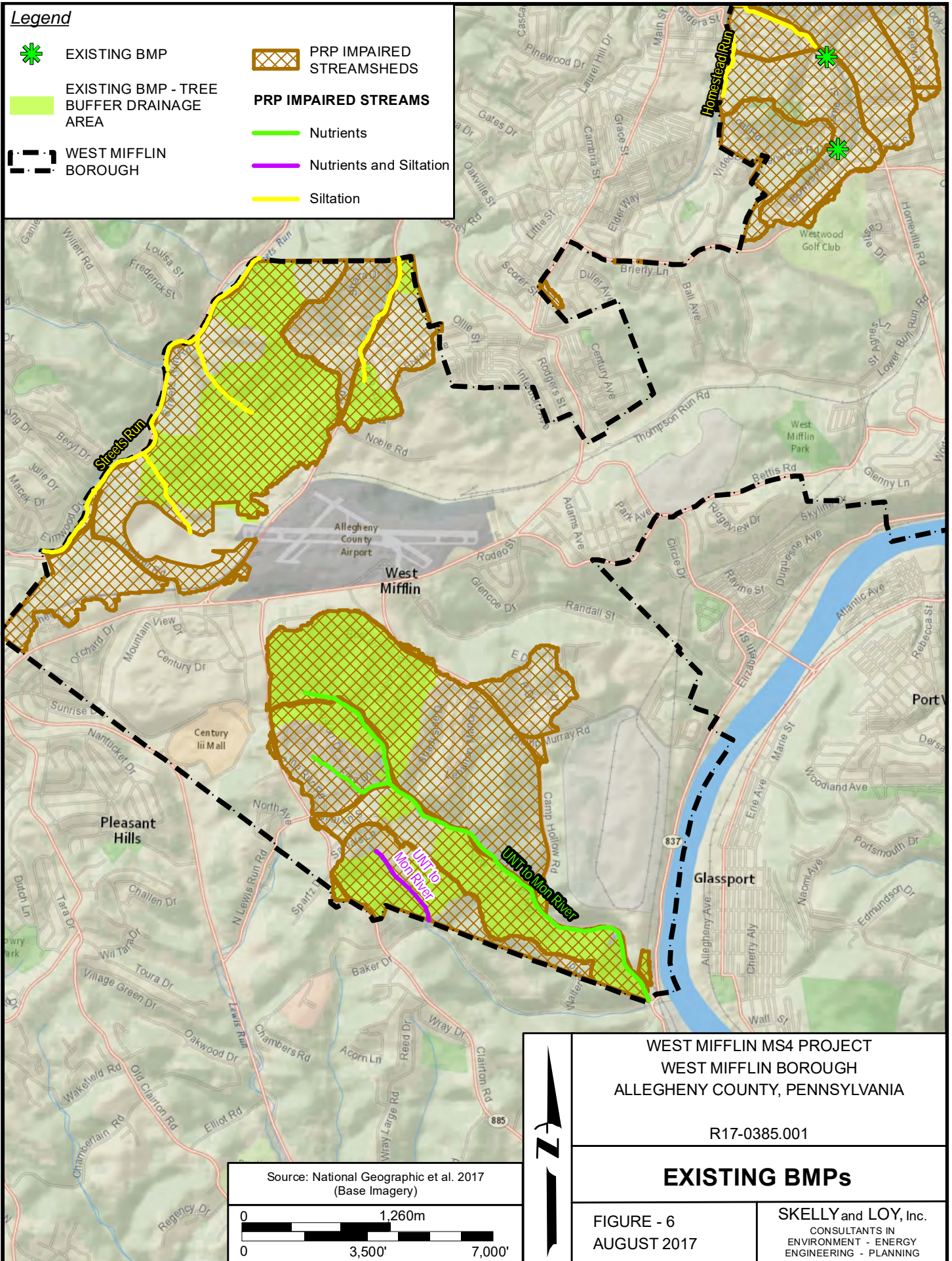
In addition to land area excluded from the MS4 regulated area, the pollutant load was further decreased to reflect the treatment provided by the municipality's 1) existing stormwater management facilities (basins and vegetated open channels) and 2) the existing 35 ft. forest buffer that surrounds nutrient and sediment impaired streams (**Figure 6**, Existing BMPs). All identified stormwater management facilities currently treating the MS4's runoff are located in the Streets Run-Monongahela River HUC 12 watershed; there are no stormwater basins that intercept and treat MS4 runoff in the Fallen Timber Run-Monongahela River HUC 12 watershed.

Using GIS, sections of streams that have an existing 35 ft. forested buffer on one side were identified. The associated drainage to these forest buffers were delineated and the treated drainage area was totaled. Current code prevents new development within 50 ft. of streams or within the 100-year floodplain. Consequently, municipally owned land that contains a forest buffer will never be developed. Privately owned land cannot be developed within 50 ft. of streams although the forest buffer could be removed. As a result, West Mifflin Borough will update the existing forest buffer BMP area each 5-year permit cycle to reflect changes in forest buffers from private owners.



Legend

-  EXISTING BMP
-  EXISTING BMP - TREE BUFFER DRAINAGE AREA
-  WEST MIFFLIN BOROUGH
-  PRP IMPAIRED STREAMSHEDS
-  PRP IMPAIRED STREAMS
-  Nutrients
-  Nutrients and Siltation
-  Siltation



WEST MIFFLIN MS4 PROJECT
 WEST MIFFLIN BOROUGH
 ALLEGHENY COUNTY, PENNSYLVANIA

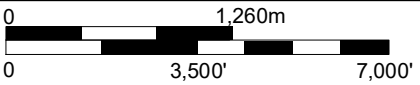
R17-0385.001

EXISTING BMPs

FIGURE - 6
 AUGUST 2017

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Source: National Geographic et al. 2017
 (Base Imagery)




Streets Run-Monongahela River HUC 12 watershed contains 1 dry extended detention drainage basins, 1 vegetative open channel, and 35 ft. forest buffers. Fallen Timber Run-Monongahela River HUC 12 watershed contains 35 ft. forest buffers. The effectiveness rates, according to PA DEP's NPDES Stormwater Discharges from Small Municipal Separate Storm Sewer Systems BMP Effectiveness Value (Form Number 3800-PM-BCW0100m dated 5/2016), were applied to the treated acreage using the average loading rate produced by the simplified method. (The BMP effectiveness values are provided in **Appendix F4.**) The existing BMP removal statistics are listed below.

Pollutant Reduction Achieved by Existing BMPs Statistics

Treated Area: 1,248 acres
 Sediment Removed: 264,506 pounds/year
 Phosphorus Removed: 711.2 pounds/year

A complete listing that includes a description, location by latitude and longitude, and the pollutant load computation is provided in **Appendix E. Table 11** summarizes the adjusted existing pollutant load reflecting parsing and the additional load reductions achieved by existing BMPs.

**TABLE 11
 FINAL ADJUSTED EXISTING POLLUTANT LOAD**

HUC 12 WATERSHED/ BASIN	ADJUSTED PLANNING AREA LOAD (POUNDS/YEAR)		EXISTING STORMWATER BMPs REDUCTIONS (POUNDS/YEAR)		FINAL ADJUSTED EXISTING LOAD (POUNDS/YEAR)	
	TSS	TP	TSS	TP	TSS	TP
Piney Fork-Peters Creek (050200050806)	N/A	N/A	N/A	N/A	N/A	N/A
Fallen Timber Run- Monongahela River (050200050807)	89,520	1,528	21,511	367	68,009	1,161
Streets Run- Monongahela River (050200050808)	1,415,881	0	242,995	341	1,172,886	N/A
Totals	1,505,501	1,528	288,510	708	1,240,895	1,161



Based on the Final Adjusted Existing Load reported above, the required sediment reduction target is as follows (**Table 12**).

TABLE 12
MS4 SEDIMENT REDUCTION TARGET

HUC 12 WATERSHED/BASIN	FINAL ADJUSTED EXISTING SEDIMENT LOAD	WEST MIFFLIN MS4 SEDIMENT REDUCTION TARGET
Piney Fork-Peters Creek (050200050806)	N/A	N/A
Fallen Timber Run-Monongahela River (050200050807)	68,009	6,801
Streets Run-Monongahela River (050200050808)	1,172,886	117,289
Totals	1,240,895	124,089

E. BMPs TO ACHIEVE THE MINIMUM REQUIRED REDUCTIONS IN POLLUTANT LOADING

West Mifflin Borough is planning six BMP projects to meet the required sediment reduction targets. Projects will be dispersed to address the corresponding sediment reduction goal in each of the three watersheds. The BMPs include 5 stream restoration projects totalling 2400 ft. and 1 dry extended detention basin.

Table 13 summarizes the proposed BMPs in West Mifflin Borough. Detailed tables titled BMP Cost and Reduction Analysis contain specific project, watershed, and basin-wide scale summaries of costs, schedules cross-referenced to maps, pollutant loads, and reductions are located in **Appendix F**, BMP Cost and Reduction Analysis Spreadsheets. Additional descriptions of the background calculations for pollutant reduction and costs are also provided in Appendix F.

It is worth noting proposed BMP sediment load reduction calculations for the contributing drainage area to the BMPs use the same methodology exercised for calculating the existing BMP sediment load reduction. PA DEP BMP effectiveness rates were applied to the treated acreage using the average loading rate produced as an output of the existing BMPs. The



average loading rate used for proposed BMPs used the simplified method produced total sediment load minus the sediment load removed by existing BMPs divided by the total area that was impaired for each HUC watershed after parsing (**Appendix D**, Simplified Method Results).

West Mifflin Borough preferred to capitalize on locating projects on undeveloped or undevelopable land (Table 13). Basin projects were selected near natural depressions for basins. Stream restoration projects addressed known trouble areas throughout the Borough, which were deeply incised with strong evidence of erosion. The proposed projects also address known maintenance trouble areas for flooding and sediment accumulation. BMPs 4, 5, 7, and 9 were evaluated and determined to be unviable. Other BMPs that were evaluated, but not proposed are excluded from Table 13, but shown in Figure 6. The next level of opportunities focused on projects that provided the largest quantity of sediment reduction for the lowest cost. Stream restoration best met the criteria.



**TABLE 13
PROPOSED BMP PROJECTS AND SEDIMENT REDUCTION**

BMP NUMBER	LONGITUDE	LATITUDE	PROPOSED BMP BY WATERSHED: STREAMSHED	RATIONALE	EXISTING SEDIMENT LOAD TO BMP (LBS/YR)	BMP SEDIMENT REDUCTION (LBS/YR)
BMP2	-79.92762386	40.37278285	Stream Restoration: Streets Run	<ul style="list-style-type: none"> Project addresses a major sediment accumulation catch basin Borough maintenance crews must clean out sediment from stream after every storm Deeply incised channel, clear indication of erosion and downstream sediment conveyance 	84,661	5,834
BMP3	-79.92710514	40.37225461	Stream Restoration: Streets Run	<ul style="list-style-type: none"> Project will also address an existing outfall repair Deeply incised channel, clear indication of erosion 	195,372	13,464
BMP6	-79.88533571	40.39193426	Stream Restoration: Homestead Run	<ul style="list-style-type: none"> Deeply incised channel, clear indication of erosion Adjacent land is largely undevelopable 	488,431	33,660
BMP10	-79.894864	40.392637	Stream Restoration: Homestead Run	<ul style="list-style-type: none"> Deeply incised channel, clear indication of erosion Adjacent land is largely undevelopable 	672,081	46,316
BMP13	-79.929568	40.36712	Dry Extended Detention Basins: Streets Run	<ul style="list-style-type: none"> No apparent utility obstructions Vacant land Will alleviate sediment deposition on road shoulder 	30,087	18,052
Streets Run-Monongahela River HUC 12 Watershed Subtotal					1,470,633	117,327
BMP8	-79.911823	40.327395	Stream Restoration: UNT to Mon near New England Rd.	<ul style="list-style-type: none"> Deeply incised channel, clear indication of erosion Adjacent land is largely undevelopable Erosion is threatening surrounding infrastructure, including streambank erosion of adjacent roadway guardrail 	7,873	6,822
Fallen Timber-Monongahela River HUC 12 Watershed Subtotal					7,873	6,822
WEST MIFFLIN MS4 PROPOSED BMP TOTALS					1,478,506	124,149

1. Summary

The selected projects will exceed the West Mifflin MS4 obligation to reduce sediment by 10% in each individual watershed. (See **Table 14.**)



TABLE 14
ACHIEVED SEDIMENT REDUCTION BY WATERSHED AND MAJOR BASIN

WATERSHED	MINIMUM REQUIRED SEDIMENT LOADING REDUCTION (LBS/YR)	ESTIMATED SEDIMENT LOADING REDUCTION (LBS/YR)
Piney Fork-Peters Creek (050200050806)	N/A	N/A
Fallen Timber Run- Monongahela River (050200050807)	6,801	6,822
Streets Run-Monongahela River (050200050808)	117,289	117,327
TOTAL	124,089	124,149

F. FUNDING MECHANISM(S)

The estimated capital costs of the proposed projects are provided in **Table 15**. Estimates were derived from the referenced Pennsylvania unit prices in the BayFAST Web-based pollutant reduction model and adjusted to 2017 values using the U.S. Inflation Calculator (www.usinflationcalculator.com). BayFAST is one of the U.S. Environmental Protection Agency's (U.S. EPA) Chesapeake Bay Program approved pollutant removal scenario tools, and the embedded costs that were established through a U.S. EPA grant are acknowledged to be reliable for planning-level use. Capital costs include budget values for design, permitting, and construction and are buffered sufficiently to allow for potential expenses associated with land access/acquisition. Expanded cost information including estimates for operation and maintenance, opportunity costs (that represent revenue lost due to the degree the exclusive stormwater use prevents revenue producing activity), and the annualized cost (annual cost of the project over useful life) are provided in **Appendix F**, BMP Cost and Reduction Analysis Spreadsheets.



TABLE 15
ESTIMATED PROJECT COSTS

PROJECT NUMBER	PROJECT DESCRIPTION	WATERSHED	CAPITAL COST
BMP2	Stream Restoration: Streets Run	Streets Run-Monongahela River	\$93,660
BMP3	Stream Restoration: Streets Run		\$216,140
BMP6	Stream Restoration: Homestead Run		\$540,349
BMP10	Stream Restoration: Homestead Run		\$743,520
BMP13	Dry Extended Detention Basins: Streets Run		\$93,660
Streets Run-Monongahela River HUC 12 Watershed Subtotal			\$1,805,065
BMP8	Stream Restoration: UNT to Mon near New England Rd	Fallen Timber Run-Monongahela River	\$109,511
Fallen Timber-Monongahela River HUC 12 Watershed Subtotal			\$109,511
WEST MIFFLIN MS4 PROPOSED BMP TOTALS			\$1,914,576

West Mifflin intends to further reduce costs by relying on its skilled Road Crew for construction. Since the estimates are based on a planning tool that assumes construction will be performed primarily by professional contractors and supplemented by community organizations, the Borough believes that use of the Borough Road Crew with professional oversight could reduce capital costs.

West Mifflin Borough is ultimately responsible to pay for implementation of the project and will add the improvements to its capital budget over the 5-year permit period to ensure required PRP sediment reduction targets are achieved. At present, West Mifflin will develop either a stormwater authority or charge residents and commercial property owners a stormwater fee to raise these funds. West Mifflin is also considering potential ordinance changes that incentivize property owners to install BMPs on their property to reduce discharged stormwater volume as well as reductions in sediment and nutrient loads. However, the Borough also will seek to leverage its investment by pursuing grants and looking for potential partners. For example, maintaining the health of existing trout streams, including the Piney Fork-Peters Creek HUC 12 watershed, is not only valuable to the environment, it supports fishing. We will approach Trout Unlimited and other non-profits for potential partnering and grant submission. Trout Unlimited will be approached for potential partnering. Another potential partner is the PTC since the future Mon-Fayette Expressway will be constructed through West Mifflin over the next 5 years and the PTC is also an MS4 permittee.



G. RESPONSIBLE PARTIES FOR OPERATION AND MAINTENANCE OF BMPs

The West Mifflin Borough Road Crew will be the party primarily responsible for the operation and maintenance of all BMPs described in the PRP. Maintenance services beyond the expertise of the Road Crew will be performed by contractors. As listed above, West Mifflin Borough will rely on two types of BMPs: Stream Restoration and Dry Extended Detention Basins. **Tables 16 through 18** summarize the maintenance activity and responsible party for each of the BMPs proposed in this plan, as well as operation and maintenance of the existing forest buffers.

TABLE 16
BMP MAINTENANCE INSTRUCTIONS
DRY EXTENDED DETENTION BASIN - PA STORMWATER BMP MANUAL #6.6.3

Inspection Schedule: Embankment: 1 x annually
 (minimum) Sediment Forebay: 1 to 4 x annually depending on rate of sediment accumulation and after rainstorm events ≥ 1 " in a 24-hour period
Inspection Responsible Party Public Works Director

Routine & Preventative Maintenance Activity	Maintenance Schedule	Notes	Responsible Party
Remove Litter	Prior to Mowing	•Dispose of litter at an approved facility	Public Works Department
Mow / trim	2x annually or as needed to ensure •proper basin operation •suppression of weeds and invasive vegetation	•Remove and dispose of excessive vegetation. (Vegetation is excessive when it is sufficient to clog the outlet.) •Mow when basin is dry to avoid rutting	Public Works Department or Contractor
Clear Inlet and Discharge Obstructions	In conjunction with mowing	•Remove obstructing debris, litter or sediment from basin inlet and discharge •Dispose of material at an approved facility or composting center, as appropriate	Public Works Department or Contractor

Corrective Maintenance Activity^{1,2}	Maintenance Schedule	Notes	Responsible Party
Remove accumulated sediment, debris and winter road treatment residuals	Anytime accumulation depth reaches the design depth as indicated by the sediment removal marker (located on the outlet structure or on a standalone stake)	•Remove sediment when basin is completely dry •Dispose of material at an approved facility •Stabilize and revegetate disturbed areas immediately	Public Works Department or Contractor
Correct erosion problems including rill and gully formation. Reseed bare areas. Install erosion control measures, as required.	As needed		Public Works Department or Contractor
Replace damaged, dead or missing plants. Use alternative species, if warranted	As needed		Public Works Department or Contractor
Maintain 95% vegetative cover	As needed	•If vegetative cover is reduced by 10%, vegetation should be reestablished	Public Works Department or Contractor
Remove exotic/invasive species	As needed		Public Works Department or Contractor
Repair trash racks, outlets, riprap or gabion structures, and inlets	As needed		Public Works Department or Contractor
Restore soil structure through aeration, rototilling, mulching or amendment	As needed		Public Works Department or Contractor

1. Follow protocols for scheduling prompt repair of minor deficiencies upon discovery
2. Establish schedule for significant repairs for publication in Annual Report



TABLE 17
BMP MAINTENANCE INSTRUCTIONS
FOREST BUFFER - PA STORMWATER BMP MANUAL #6.7.1

Inspection Schedule: 4x annually for 4 years then 1x every 5 years
Inspection Responsible Party: Public Works Director

Routine & Preventative Maintenance Activity	Maintenance Schedule	Notes	Responsible Party
Remove Litter	Prior to mowing	•Dispose of litter at an approved facility	Public Works Department
Mow	2x per growing season until tree canopy is established (generally, 3 to 5 years) As needed thereafter	•Set mower height at 8" to 12"	Public Works Department or Contractor
Remove exotic/invasive species	2x annually (minimum) years 1 through 3 As needed thereafter	•Minimize landscape disturbance •protect healthy native plant communities •Manually pull or dig invasives that can be entirely extracted safely •Use herbicides for control of plants that will spread if not entirely removed manually or on plants that pose a health hazard •Replace invasives with native , non-invasive species •Properly dispose of invasive plants	Public Works Department or Contractor
Maintain Tree Shelters	4x per year until trees reach 2-inch Diameter	•Install in conjunction with vegetation planting •Repair broken stakes •Tighten stake lines •Clean debris from tube •Remove netting as tree grows •Remove when tree is approximately 2-inches wide	Public Works Department or Contractor
Use Weed Mats	1x preventative	•Install in conjunction with vegetation planting •Remove following tree canopy development (generally 3 to 5 years)	Public Works Department or Contractor
Water	Weekly during establishment period and during periods of drought		Public Works Department or Contractor
Mulch	1x at planting		Public Works Department or Contractor
Corrective Maintenance Activity^{1,2}	Maintenance Schedule	Notes	Responsible Party
Replace trees	As needed	•Maintain 70% survival rate of planted trees. Replace dead trees if surviving tree numbers drop below threshold. • Consider alternative species, if warranted	Public Works Department or Contractor

1. Follow protocols for scheduling prompt repair of minor deficiencies upon discovery



TABLE 18
BMP MAINTENANCE INSTRUCTIONS
STREAM RESTORATION - PA STORMWATER BMP MANUAL #6.7.4

Inspection Schedule: If not specified by state and federal regulators through a permitting process, 1x annually for 2 years then 1x every 5 years and within 1 year following catastrophic storm of 25-year magnitude (5.13 inches/24- hr. period per NOAA Atlas 14)

Inspection Responsible Party Director of Public Works

Routine & Preventative Maintenance Activity	Maintenance Schedule	Notes	Responsible Party
Remove Litter	Prior to mowing	•Dispose of litter at an approved facility	Public Works Department
Mow	2x per growing season until tree canopy is established (generally, 3 to 5 years). As needed thereafter	•Set mower height at 8" to 12"	Public Works Department
Remove exotic/invasive species(aquatic and terrestrial)	2x annually (minimum) years 1 through 3 As needed thereafter	•Minimize landscape disturbance •Protect healthy native plant communities •Manually pull or dig invasives that can be entirely extracted safely •Use herbicides for control of plants that will spread if not entirely removed manually or on plants that pose a health hazard •Replace invasives with native , non-invasive species •Properly dispose of invasive plants	Public Works Department or Contractor
Use Weed Mats	1x preventative	•Install in conjunction with vegetation planting •Remove after tree canopy development (generally 3 to 5 years)	Public Works Department or Contractor
Corrective Maintenance Activity^{1,21,2}	Maintenance Schedule	Notes	Responsible Party
Repair in-channel structures (grade-controls [steps, piles, drops], sills, weirs, vanes, barbs, spurs, bank toe, etc.)	As needed	•Repair during low water consistent with permit	Public Works Department or Contractor
Repair Bank armoring structures (revetments, soil-covered riprap, cellular blocks, geogrid, gabions, bulkheads, etc.)		•Repair during low water consistent with permit	Public Works Department or Contractor
Repair habitat structures (habitat logs, fish cover structures, pool/riffle rocks and structures)		•Repair during low water consistent with permit	Public Works Dept. or Contractor
Correct irregularities in cross-section and longitudinal slope. Reestablish design grades and configuration.	As needed	•Reestablish cross section when the channel pattern and dimensions are discernably different from the design	Public Works Department or Contractor
Stabilize eroding and undercut banks	As needed		Public Works Dept. or Contractor
Maintain 85% vegetative cover	As needed	•If vegetative cover is reduced by 10%, vegetation should be reestablished	Public Works Dept. or Contractor

1. Follow protocols for scheduling prompt repair of minor deficiencies upon discovery
2. Establish schedule for significant repairs for publication in Annual Report



APPENDICES

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**APPENDIX A -
COPY OF PUBLIC NOTICE
AND PROOF OF PUBLICATION**

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APPENDIX A
COPY OF PUBLIC NOTICE AND PROOF OF PUBLICATION

1. Advertisement Announcing the West Mifflin Borough PRP

West Mifflin Borough has prepared a Pollution Reduction Plan (PRP) as required by the PA DEP that outlines potential activities and projects that reduce pollution caused by sediment and/or nutrients in receiving streams. The PRP is available for public review and comment at the Borough office located at 1020 Lebanon Road, West Mifflin, PA 15122 beginning August 3, 2017 through and including September 4, 2017 weekdays, during regular business hours of 9:00 a.m. until 4:00 p.m. The Plan is also available for review beginning August 3, 2017 at the Borough's website at <https://westmifflinborough.com/> . Written comments will be accepted in person or by mail at the Borough office address above no later than close of business on September 5, 2017. Public comment concerning the PRP will also be accepted at a public meeting to be held on Wednesday, August 30, 2017 at 2 p.m. at the Borough office. The proposed adoption of the Plan by the Borough Council will be considered at a public meeting on September 13, 2017 at 6:30 p.m. during the Council's regularly scheduled Caucus meeting.

Brian Kamauf, Manager, West Mifflin Borough

Space reserved for a copy of the proof of advertising.

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**APPENDIX B -
MS4 MAP LAYERS AND DATA SOURCES**

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WEST MIFFLIN BOROUGH
MS4 Map Layers and Data Sources

MS4 MAP LAYER	SOURCE
Basemap	Microsoft Bing Aerial photography
BMP -Existing	Skelly and Loy, Inc.
Elevation Data (contours)	PA DCNR (PAMAP Program)
HUC12 Watersheds	USGS
Land Use / Land Cover	USGS
Manholes	Mackin Engineering Company
Municipal Boundary	PA DEP
NWI (Wetlands)	US Fish and Wildlife Service
Outfalls	Mackin Engineering Company
Parcels	Allegheny County GIS
Pipes	Mackin Engineering Company
Planning Area	Skelly and Loy, Inc.
Roadways	PennDOT
Soils	USDA NRCS
Storm Sewershed - Impaired	Skelly and Loy, Inc.
Storm Sewershed - Unimpaired	Skelly and Loy, Inc.
Streams	PA DEP and USDA NRCS
Stream Impaired	PA DEP
Tree Buffer	Skelly and Loy, Inc.

1. The projection of information shown on the Maps is NAD 1983 State Plane Pennsylvania South US Feet



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**APPENDIX C -
PROPERTIES WITH INDIVIDUAL
CHAPTER 102 NPDES PERMITS**

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APPENDIX C
PROPERTIES WITH INDIVIDUAL CHAPTER 102 NPDES PERMITS

Parcel ID	Site Name	Client	Location	Area (acres)	Permit Number	Authorization ID	Parsed (Y/N)
	PennDOT & County Maintained/Owned Roads	PennDOT/Allegheny County	All State and County Roads in Borough	193.54			Y
0243-F-00100-0000-00	Lafarge Prop Soccer Fields	West Mifflin Borough	1300 Apdale St, West Mifflin, PA 15122	9.85	PAI050213002	979301	N
0238-M-00200-0000-00	Festival Fun Parks LLC DBA Kennywood	Festival Fun Parks, LLC	4800 Kennywood Blvd, West Mifflin, PA 15122	121.73	PAI050216002	1140086	N
0385-H-00400-0000-00	PGH Metal Stamping Plant	GM Corp. (Lebanon Road Mifflin LLC)	1451 Lebanon School Rd, West Mifflin, PA 15122	72.30	PAR206150	622677	N
0384-J-00300-0000-00	Liberty Pultrusions	Liberty Polyglas Inc. (Advanced Pultrusions LLC)	1575 Lebanon School Rd, West Mifflin, PA 15122	4.76	PAR236103	378486	N
0244-S-00010-0000-00	Allegheny County Airport	Allegheny County Airport Authority	Lebanon Church Rd, West Mifflin PA 15122	2.32	PAR806134	46181	N
0385-J-00100-0000-01	Tanstar Inc.	Tanstar Inc. (United States Steel Corp.)	1301 Camp Hollow Rd, West Mifflin, PA 15211	489.54	PAR806286	899731	Y
0244-E-00072-0000-00	Keywell Metals	Keywell Metals LLC (Duquense Slag Products Co.)	890 Noble Dr, West Mifflin, PA 15122	10.60	PAG036124	1047755	N
0385-H-00400-0000-00	Pull-A-Part of West Mifflin, LLC	Pull-A-Part, LLC	1451 Lebanon School Rd, West Mifflin, PA 15122	72.30	PAG036132	1060213	N
0311-K-00400-0000-00	Allegheny County Airport	Allegheny County Airport Authority	Lebanon Church Rd, West Mifflin PA 15122	409.95	PAR806134	836241	Y



Parcel ID	Site Name	Client	Location	Area (acres)	Permit Number	Authorization ID	Parsed (Y/N)
0313-C-00225-0000-00	S. Taylor Environmental Park	US Steel Corp	555 Delwar Rd, Pittsburgh, PA 15236	324.21	PA0091685	27937	Y



**APPENDIX D -
SIMPLIFIED METHOD RESULTS**

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D1 - HUC Watershed Total

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The following details the total sediment and pollutant load for each HUC 12 watershed within West Mifflin Borough, using the DEP's simplified method. Data shown below is for the entire watershed and represents the total existing initial baseload, before parsing.

Streets Run-Monongahela River HUC 12 Watershed: HUC 50200050808

Land Use	Area (acres)	Loading Rate (lb/ac/yr)		Yearly Loading (lb/yr)	
		TP	Sediment	TP	Sediment
Impervious	2107.00	0.00	1,839.00	0	3,874,782
Pervious	3496.01	0.00	264.96	0	926,302
Sub-Total:	5,603	n/a	n/a	0	4,801,083

Piney Fork-Peters Creek HUC 12 Watershed: 50200050806

Land Use	Area (acres)	Loading Rate (lb/ac/yr)		Yearly Loading (lb/yr)	
		TP	Sediment	TP	Sediment
Impervious	670.14	0.00	0.00	0	0
Pervious	274.82	0.00	0.00	0	0
Sub-Total:	945	n/a	n/a	0	0

Fallen Timber Run-Monongahela River HUC 12 Watershed: 50200050807

Land Use	Area (acres)	Loading Rate (lb/ac/yr)		Yearly Loading (lb/yr)	
		TP	Sediment	TP	Sediment
Impervious	836.66	2.28	1,839.00	1,908	1,538,626
Pervious	1825.62	0.84	264.96	1,534	483,717
Sub-Total:	2,662	n/a	n/a	3,441	2,022,342

Total HUC 12 Watershed Contributions	3,441	6,823,425
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D2 - Parsing Adjusted Load

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The following details the total sediment and nutrient load for each HUC 12 watershed within West Mifflin Borough after parsing, using the DEP's simplified method. Data shown below represents the initial existing pollutant load, before evaluation of existing BMPs. Data is first evaluated at the streamshed level and then totaled for each HUC 12 watershed.

Streets Run-Monongahela River HUC 12 Watershed: HUC 50200050808

Streets Run Streamshed					
Land Use	Area (acres)	Loading Rate (lb/ac/yr)		Yearly Loading (lb/yr)	
		TP	Sediment	TP	Sediment
Impervious	326.80	0.00	1,839.00	0.00	600,981.18
Pervious	799.63	0.00	264.96	0.00	211,870.25
Sub-Total:	1,126	n/a	n/a	0	812,851
Homestead Run Streamshed					
Land Use	Area (acres)	Loading Rate (lb/ac/yr)		Yearly Loading (lb/yr)	
		TP	Sediment	TP	Sediment
Impervious	269.53	0.00	1,839.00	0.00	495,663.77
Pervious	405.22	0.00	264.96	0.00	107,366.13
Sub-Total:	675	n/a	n/a	0	603,030
Streets Run-Monongahela River Subtotal				0	1,415,881

Fallen Timber Run-Monongahela River HUC 12 Watershed: 50200050807

Trib to Mon (1) Streamshed					
Land Use	Area (acres)	Loading Rate (lb/ac/yr)		Yearly Loading (lb/yr)	
		TP	Sediment	TP	Sediment
Impervious	270.06	2.28	0.00	615.74	0.00
Pervious	853.70	0.84	0.00	717.11	0.00
Sub-Total:	1,124	n/a	n/a	1,333	0
Trib to Mon (2) Streamshed					
Land Use	Area (acres)	Loading Rate (lb/ac/yr)		Yearly Loading (lb/yr)	
		TP	Sediment	TP	Sediment
Impervious	24.98	2.28	1,839.00	56.95	45,932.97
Pervious	164.50	0.84	264.96	138.18	43,586.74
Sub-Total:	189	n/a	n/a	195	89,520
Fallen Timber Run-Monongahela River Subtotal				1,528	89,520

Total HUC 12 Watershed Contributions	1,528	1,505,401
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**APPENDIX E -
EXISTING BMPs FOR
POLLUTANT LOAD REDUCTION CREDIT**

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BMP COST AND REDUCTION ANALYSIS SPREADSHEET DESCRIPTION

User Input

User input in the Spread Sheet includes the following data fields

- Watershed Name
- HUC 12 Code
- MS4 Area (refers to the planning area within the watershed)
- BMP ID
- BMP Latitude
- BMP Longitude
- Map Page
- Anticipated Construction Year
- BMP Options (from a pull down menu matching the list of BMPs on PA DEP 3800-PM-BCW0100m) date 5/2016)
- Quantity (Linear feet for stream Restoration Treated Acres for all others)

Pollutant Reduction Calculations

The spread sheet produces the pollutant loading rates under the heading “Load Rate (lbs/ac/yr)” using the simplified method-generated pollutant load from Appendix D2 for the regulated planning area, after parsing.

The PA DEP’s Effectiveness Values (Appendix F4) are applied to the average loading rate and the BMPs contributory drainage area to generate achieved load reductions.

Cost Estimation

Estimates were derived from the referenced Pennsylvania unit prices in the BayFAST web-based pollutant reduction model and adjusted from 2010 to 2017 values using the US Inflation Calculator (www.usinflationcalculator.com).

The following paragraph from the BayFAST Help for “Costs” provides the program’s base assumptions.

“All default costs are in 2010 dollars. Capital and opportunity costs are amortized and added to annual operations and maintenance (O&M) costs for a total annualized cost. Interest rate for capital and opportunity cost is 5%. Costs are those incurred by both public and private entities. Costs are not accumulated over time, but are a single year of cost.”

BayFAST Unit prices are offered in terms of linear feet for Stream Restoration and in treated acres for all other BMPs, so application of the pricing was straightforward multiplication for the various price categories.

Modifications to the BayFAST spread sheet include the following:

- BMP Names used in BayFAST were cross-walked to match the list of BMPs on PA DEP 3800- PM-BCW0100m) date 5/2016
- Unit price for infiltration BMPs with underdrain that BayFAST identified as the same price as the same BMPs without underdrain were increased to include the cost of underdrain installation
- A factor of 111.7% was applied per the US Inflation Calculator (www.usinflationcalculator.com) to increase the 2010 prices to 2017 values.



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**E1 Fallen Timber – Monongahela River
Watershed Spreadsheet**

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**Existing BMP Post-Parsing Baseload Reductions
Fallen Timber Run-Monongahela River**

HUC 12 Code: 50200050807
 MS4 Area (ac.): 1313

Current Condition Baseline		Min. Req'd Load Reduction (%)	Loading Rate ¹ (lbs/ac/yr)
Pollutant	Lbs/yr (From Simplified Method)		
Sediment	89,520.0	10%	68.18
Phosphorus	1,528.0	5%	1.16

BMP Latitude	BMP Longitude	Map Page	BMP Options	Quantity	Units	Existing Sediment Load to BMP	Sediment Reduction (lb/year)	Phosphorus Load Reduction (lb/year)	
Watershed aggregate		Figure 6	Forest Buffers	631	Treated Acres	43021.42	21,510.71	367.16	
TOTALS						(Linear Feet)	43021.42	21,510.71	367.16
					631	(Treated Acres)			

1. Loading Rate = Current Condition Baseline Sediment (Lbs)/PRP MS4 Area(Ac)

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**E2 Streets Run – Monongahela River
Watershed Spreadsheet**

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**Existing BMP Post-Parsing Baseload Reductions
Streets Run-Monongahela River**

HUC 12 Code: 50200050808
MS4 Area (ac.): 1801

Post-Parsing Baseline		Min. Req'd Load Reduction (%)	Loading Rate ¹ (lbs/ac/yr)
Pollutant	Lbs/yr (From Simplified Method)		
Sediment	1,415,881	10%	786.16
Phosphorus	2,288.0	5%	1.27

BMP Latitude	BMP Longitude	Map Page	BMP Options	Quantity	Units	Existing Sediment Load to BMP	Sediment Reduction (lb/year)	Phosphorus Load Reduction (lb/year)
Watershed aggregate		Figure 6	Forest Buffers	516	Treated Acres	405661	202830	327.76
-79.882808	40.384275	Figure 6	Dry Extended Detention Basins	6.9	Treated Acres	5425	3255	1.75
-79.89427137	40.38646142	Figure 6	Vegetated Open Channels (C/D Soils)	93.9	Treated Acres	73821	36910	11.93
TOTALS				616.8	(Linear Feet) (Treated Acres)	484,906	242,995	341.45

1. Loading Rate = Current Condition Baseline Sediment (Lbs)/PRP MS4 Area(Ac)

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**APPENDIX F -
BMP COST AND REDUCTION ANALYSIS
SPREADSHEETS**

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BMP COST AND REDUCTION ANALYSIS SPREADSHEET DESCRIPTION

User Input

User input in the Spread Sheet includes the following data fields

- Watershed Name
- HUC 12 Code
- MS4 Area (refers to the planning area within the watershed)
- BMP ID
- BMP Latitude
- BMP Longitude
- Map Page
- Anticipated Construction Year
- BMP Options (from a pull down menu matching the list of BMPs on PA DEP 3800-PM-BCW0100m) date 5/2016)
- Quantity (Linear feet for stream Restoration Treated Acres for all others)

Pollutant Reduction Calculations

The spread sheet produces the pollutant loading rates under the heading “Load Rate (lbs/ac/yr)”, using the existing BMPs-generated pollutant load from Appendix E1 and E2 for the regulated planning area, after parsing.

The PA DEP’s Effectiveness Values (Appendix F4) are applied to the average loading rate and the BMPs contributory drainage area to generate achieved load reductions.

Cost Estimation

Estimates were derived from the referenced Pennsylvania unit prices in the BayFAST web-based pollutant reduction model and adjusted from 2010 to 2017 values using the US Inflation Calculator (www.usinflationcalculator.com).

The following paragraph from the BayFAST Help for “Costs” provides the program’s base assumptions.

“All default costs are in 2010 dollars. Capital and opportunity costs are amortized and added to annual operations and maintenance (O&M) costs for a total annualized cost. Interest rate for capital and opportunity cost is 5%. Costs are those incurred by both public and private entities. Costs are not accumulated over time, but are a single year of cost.”

BayFAST Unit prices are offered in terms of linear feet for Stream Restoration and in treated acres for all other BMPs, so application of the pricing was straightforward multiplication for the various price categories.

Modifications to the BayFAST spread sheet include the following:

- BMP Names used in BayFAST were cross-walked to match the list of BMPs on PA DEP 3800-PM-BCW0100m) date 5/2016
- Unit price for infiltration BMPs with underdrain that BayFAST identified as the same price as the same BMPs without underdrain were increased to include the cost of underdrain installation
- A factor of 111.7% was applied per the US Inflation Calculator (www.usinflationcalculator.com) to increase the 2010 prices to 2017 values.



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F1 - Watershed Summary

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**WEST MIFFLIN BOROUGH WATERSHEDS SUMMARY
BMP COST AND REDUCTION ANALYSIS WATERSHED SUMMARY**

Watershed	PRP Area (Acres)	Current Condition Baseline		Minimum Required Loading Reduction (%)	Minimum Required Loading Reduction (lbs/yr)	Proposed BMP Reductions for Selected Projects		Total Capital Cost for Selected Projects
		Pollutant	Lbs.			BMP Load Reduction (lbs/yr)	Reduction remaining (-) Over reduction (+)	
Streets Run-Monongahela River	1,801	Sediment	1,172,886	10%	117,289	117,327	38	\$1,805,065
Fallen Timber Run-Monongahela River	1,313	Sediment	68,009	10%	6,801	6,822	21	\$109,511
		Phosphorus	1,161	5%	58			
Piney Fork-Peters Creek	0	--No PRP Required for this watershed-- No nutrient or sediment impaired streams in watershed within West Mifflin Borough.				n/a	n/a	n/a
TOTAL	3,114	Sediment	1,240,895	10%	124,089	124,149	+59	\$1,914,576
		Phosphorus	1,161	5%	58			



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**F2 - Fallen Timber-Monongahela
River Watershed Spreadsheet**

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BMP COST AND REDUCTION ANALYSIS
Fallen Timber Run-Monongahela River

HUC 12 Code: 50200050807
 MS4 Area (ac.): 1313

Current Condition Baseline		Min. Req'd Load Reduction (%)	Min. Req'd Load Reduction (lbs/yr)	Loading Rate ¹ (lbs/ac/yr)	Proposed BMP Reductions		Total Capital Cost for Selected BMPs
Pollutant	Lbs/yr				BMP Sediment Load Reduction for Selected BMPs (lbs/yr)	Reduction remaining (-) Over reduction (+)	
Sediment	68,009	10%	6,801	52	6,822	+21	\$109,510.68

BMP ID	BMP Latitude	BMP Longitude	Map Page	Anticipated Construction Year	BMP Options	Quantity	Units	Existing Sediment Load to BMP	Sediment Reduction (lb/year)	Capital Cost - Low
BMP8	-79.911823	40.327395	W13	2022	Stream Restoration	152	Linear Feet	7873.12	6,821.76	\$ 109,510.68
TOTALS						152	(Linear Feet)	7873.12	6,821.76	\$ 109,510.68
							(Treated Acres)			

1. Loading Rate = Current Condition Baseline Sediment (Lbs)/PRP MS4 Area(Ac)



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**F3 - Streets Run-Monongahela
River Watershed Spreadsheet**

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BMP COST AND REDUCTION ANALYSIS
Streets Run-Monongahela River

HUC 12 Code: 50200050808
 MS4 Area (ac.): 1801

Current Condition Baseline		Min. Req'd Load Reduction (%)	Min. Req'd Load Reduction (lbs/yr)	Loading Rate ¹ (lbs/ac/yr)	Proposed BMP Reductions		Total Low Capital Cost for Selected BMPs
Pollutant	Lbs/yr				BMP Sediment Load Reduction for Selected BMPs (lbs/yr)	Reduction remaining (-) Over reduction (+)	
Sediment	1,172,886	10%	117,289	651	117,327	+38	\$1,805,065

BMP ID	BMP Latitude	BMP Longitude	Map Page	Anticipated Construction Year	BMP Options	Quantity	Units	Existing Sediment Load to BMP	Sediment Reduction (lb/year)	Capital Cost - Low
BMP2	-79.92762386	40.37278285	W6	2019	Stream Restoration	130	Linear Feet	84,661	5,834	\$ 93,660
BMP3	-79.92710514	40.37225461	W6	2019	Stream Restoration	300	Linear Feet	195,372	13,464	\$ 216,140
BMP6	-79.88533571	40.39193426	W4	2020	Stream Restoration	750	Linear Feet	488,431	33,660	\$ 540,349
BMP10	-79.894864	40.392637	W4	2021	Stream Restoration	1032	Linear Feet	672,081	46,316	\$ 743,520
BMP13	-79.929568	40.36712	W6	2022	Dry Extended Detention Basins	46.2	Treated Acres	30,087	18,052	\$ 211,396
TOTALS						2462	(Linear Feet)	1,470,633	117,327	\$ 1,805,065
						372.7	(Treated Acres)			

1. Loading Rate = Current Condition Baseline Sediment (Lbs)/PRP MS4 Area(Ac)



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F4 - PA DEP Effectiveness Values

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PA DEP EFFECTIVENESS VALUES

per
3800-PM-BCW0100m dated 5/2016

BMP NAME	BMP EFFECTIVENESS VALUES		
	TN	TP	SEDIMENT
Wet Ponds and Wetlands	20%	45%	60%
Dry Detention Basins and Hydrodynamic Structures	5%	10%	10%
Dry Extended Detention Basins	20%	20%	60%
Infiltration Practices with Sand, Vegetation	85%	85%	95%
Filtering Practices	40%	60%	80%
Filter Strip Runoff Reduction	20%	54%	56%
Filter Strip Stormwater Treatment	0%	0%	22%
Bioretention – Raingarden (C/D soils with underdrain)	25%	45%	55%
Bioretention/Raingarden (A/B soils with underdrain)	70%	75%	80%
Bioretention/Raingarden (A/B soils without underdrain)	80%	85%	90%
Vegetated Open Channels (C/D Soils)	10%	10%	50%
Vegetated Open Channels (A/B Soils)	45%	45%	70%
Bioswale	70%	75%	80%
Permeable Pavement without Sand or Vegetation (C/D Soils with underdrain)	10%	20%	55%
Permeable Pavement without Sand or Vegetation (A/B Soils with underdrain)	45%	50%	70%
Permeable Pavement without Sand or Vegetation (A/B Soils without underdrain)	75%	80%	85%
Permeable Pavement with Sand or Vegetation (A/B Soils with underdrain)	50%	50%	70%
Permeable Pavement with Sand or Vegetation (A/B Soils without underdrain)	80%	80%	85%
Permeable Pavement with Sand or Vegetation (C/D Soils with underdrain)	20%	20%	55%
Stream Restoration (If using the PA DEP Simplified Method)	0.075 lb/ft/yr	0.068 lb/ft/yr	44.88 lb/ft/yr
Stream Restoration (If modeled at a local watershed scale) ¹			115 lb/ft/yr
Forest Buffers	25%	25%	50%
Tree Planting	10%	15%	20%
Street Sweeping	3%	3%	9%
Storm Sewer System Solids Removal	0.0027 for sediment, 0.0111 for organic matter	0.0006 for sediment, 0.0012 for organic matter	1-TN and TP concentrations

1. The proposed stream restoration was modeled at the local watershed scale



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**APPENDIX G -
PUBLIC REVIEW
COMMENTS AND RESPONSES**

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APPENDIX G
PUBLIC REVIEW COMMENTS AND RESPONSES

Space reserved for public review comments and responses.

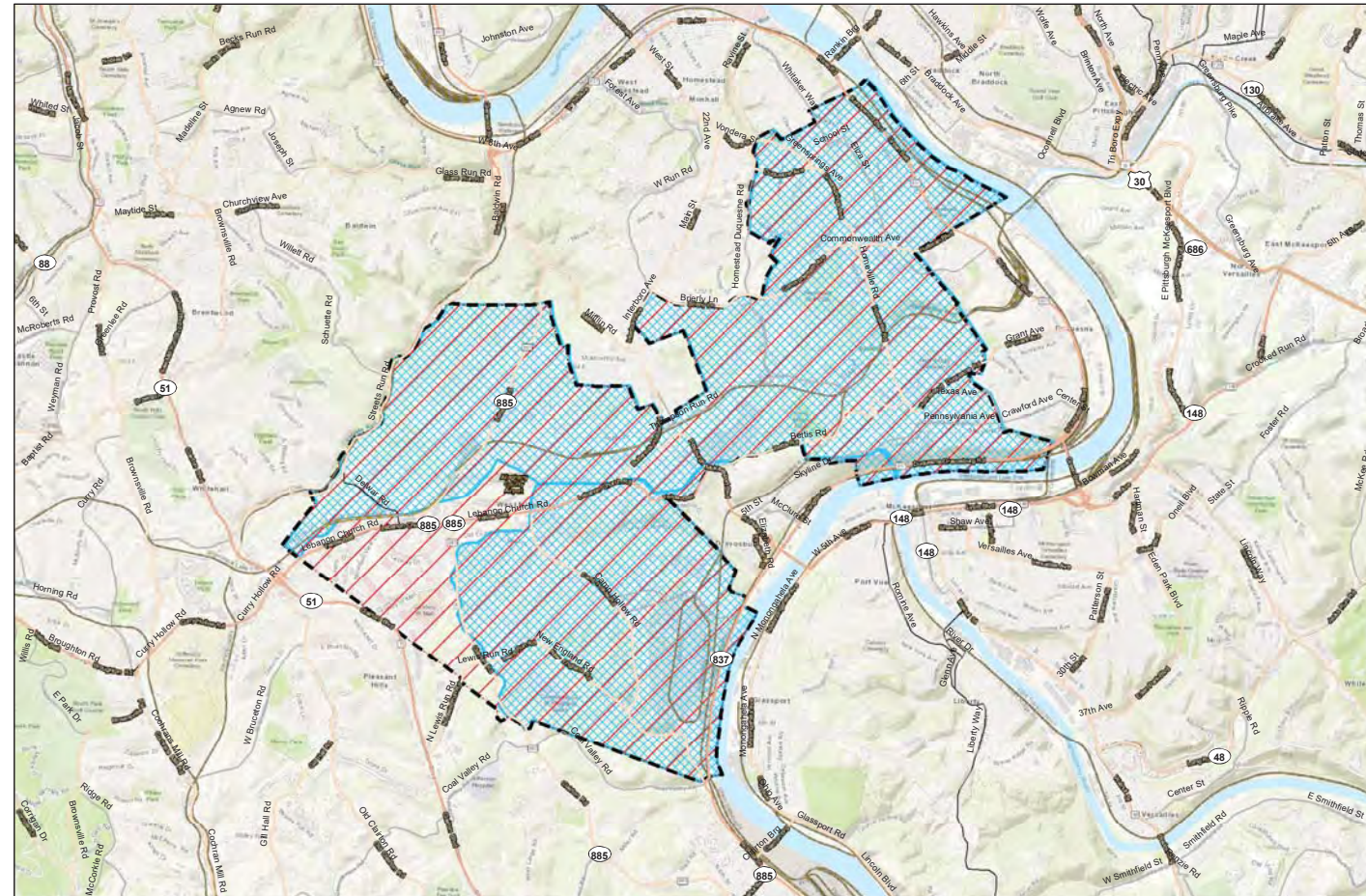
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MS4 and POLLUTANT REDUCTION PLAN WEST MIFFLIN BOROUGH

AUGUST 2017

LIST OF ACRONYMS

BMP	BEST MANAGEMENT PRACTICE
CWA	CLEAN WATER ACT
GIS	GEOGRAPHIC INFORMATION SYSTEM
HUC	HYDROLOGIC UNIT CODE
MS4	MUNICIPAL SEPARATE STORM SEWER SYSTEM
NWI	NATIONAL WETLANDS INVENTORY
PA BMP MANUAL	PENNSYLVANIA STORMWATER BEST MANAGEMENT PRACTICES MANUAL (PA DEP, 2006)
PA DCNR	PENNSYLVANIA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
PA DEP	PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
PENNDOT	PENNSYLVANIA DEPARTMENT OF TRANSPORTATION
TMDL	TOTAL MAXIMUM DAILY LOAD
UA	URBANIZED AREA
U.S. EPA	U.S. ENVIRONMENTAL PROTECTION AGENCY



LOCATION MAP

0 2,000 4,000 8,000 12,000 Feet

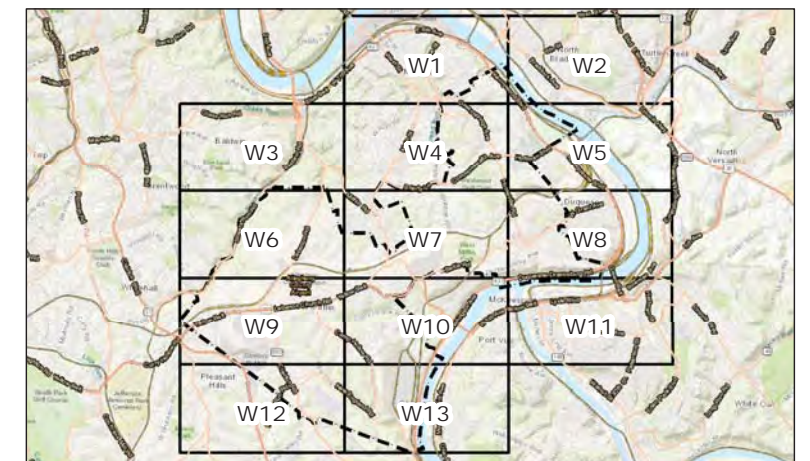


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COVER	G-1
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MS4 MAP SHEETS	W-1 THROUGH W-13

LEGEND

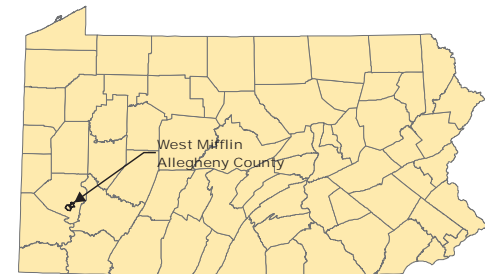
- SHEET INDEX
- PRP PLANNING AREA
- URBANIZED AND MS4 PLANNING AREA
- WEST MIFFLIN BOROUGH



SHEET INDEX

0 7,500 15,000 22,500 Feet

LOCATION WITHIN STATE



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Prepared For:
WEST MIFFLIN BOROUGH
 1020 LEBANON ROAD
 WEST MIFFLIN, PA 15122

APPENDIX H

COVER

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet	
Project No. R17-0385.001	DWG. NO. G1
PLOT DATE: 8/1/2017	SHEET NO. 1 OF 16

DEFINITIONS

10' INDEX CONTOURS: LINES DEPICTING THE CONNECTION OF POINTS OF EQUAL ELEVATION ON A 10-FOOT VERTICAL ELEVATION INTERVAL (SOURCE: PA DCNR)

10' INDEX DEPRESSION CONTOURS: LINES DEPICTING THE CONNECTION OF POINTS OF EQUAL ELEVATION ON A 10-FOOT VERTICAL ELEVATION INTERVAL THAT ENCIRCLE A LOW POINT OF THE GROUND SURFACE (SOURCE: PA DCNR)

2' INTERMEDIATE CONTOURS: LINES DEPICTING THE CONNECTION OF POINTS OF EQUAL ELEVATION ON A 2-FOOT VERTICAL ELEVATION INTERVAL (SOURCE: PA DCNR)

2' INTERMEDIATE DEPRESSION CONTOURS: LINES DEPICTING THE CONNECTION OF POINTS OF EQUAL ELEVATION ON A 2-FOOT VERTICAL ELEVATION INTERVAL THAT ENCIRCLE A LOW POINT OF THE GROUND SURFACE (SOURCE: PA DCNR)

2010 URBANIZED AREA: (UA) LAND AREA COMPRISING ONE OR MORE PLACES (CENTRAL PLACES) AND THE ADJACENT DENSELY SETTLED AREA (URBAN FRINGE) THAT TOGETHER HAVE A RESIDENTIAL POPULATION OF AT LEAST 50,000 AND AN OVERALL POPULATION DENSITY OF AT LEAST 1,000 PEOPLE PER SQUARE MILE, AS DEFINED BY THE US BUREAU OF THE CENSUS AND AS DETERMINED BY THE LAST AVAILABLE DECENNIAL (2010) CENSUS. THE UA OUTLINES THE EXTENT OF AUTOMATICALLY REGULATED AREAS (SOURCE: PA DCNR)

2010 NON URBANIZED AREAS: LAND AREA OUTSIDE THE UA (RURAL LAND AND URBAN CLUSTERS)

BMP EXISTING: EXISTING BEST MANAGEMENT PRACTICES (WITH REGARD TO MAP) ARE STRUCTURAL FACILITIES, USED TO MINIMIZE ACCELERATED EROSION AND SEDIMENTATION AND MANAGE STORMWATER TO PROTECT, MAINTAIN, RECLAIM AND RESTORE THE QUALITY OF WATERS AND THE EXISTING AND DESIGNATED USES OF WATERS WITHIN THIS COMMONWEALTH BEFORE, DURING AND AFTER EARTH DISTURBANCE ACTIVITIES. BMP'S INCLUDE WET PONDS AND EXTENDED DETENTION OUTLET STRUCTURES; FILTRATION PRACTICES SUCH AS GRASSED SWALES, SAND FILTERS AND FILTER STRIPS; INFILTRATION PRACTICES SUCH AS INFILTRATION BASINS AND INFILTRATION TRENCHES; AND OTHER BMPS AS REFERENCED IN CHAPTER 6 OF THE PENNSYLVANIA STORMWATER BMP MANUAL (363-0300-002)

CATCHBASINS: A STORMWATER STRUCTURE THAT COLLECTS SURFACE RUNOFF THROUGH AN OPENING TO THE SURFACE (OR TO THE FACE OF A CURB) AND DROPS VERTICALLY TO AN UNDERGROUND STORMWATER CONVEYANCE OR FACILITY. ON THE MAP, THE INLET SYMBOL INCLUDES INLETS (WITH NO SUMP) AND CATCH BASINS (WITH A SUMP).

DISCHARGE POINT: THE DOWNSTREAM END OF A STORMWATER PIPE OR CULVERT, WHETHER ACCOMPANIED BY A PIPE END TREATMENT SUCH AS A HEADWALL OR END SECTION OR NOT.

DISCHARGE POINT OTHER: DISCHARGE NOT UNDER THE JURISDICTION OF WEST MIFFLIN BOROUGH

INTAKE POINT: THE UPSTREAM END OF A STORMWATER PIPE OR CULVERT, WHETHER ACCOMPANIED BY A PIPE END TREATMENT SUCH AS A HEADWALL OR END SECTION OR NOT.

MANHOLES: A STRUCTURE WITH A COVERED OPENING THAT ALLOWS MAINTENANCE ACCESS TO UNDERGROUND PIPES AND FACILITIES, BUT THAT DOES NOT ACCEPT RUNOFF DIRECTLY FROM THE SURFACE. ON THE MAP THE MANHOLE SYMBOL INCLUDES MANHOLES (MAINTENANCE ACCESS) AND JUNCTION BOXES (A STRUCTURE AT THE INTERSECTION OF MULTIPLE UNDERGROUND PIPES THAT DOES NOT ACCEPT RUNOFF DIRECTLY FROM THE SURFACE AND MAY OR MAY NOT PROVIDE MAINTENANCE ACCESS).

MUNICIPAL BOUNDARY: CITIES, BOROUGHS AND TOWNSHIPS LOCATED WITHIN THE BOUNDARIES OF THE COMMONWEALTH OF PENNSYLVANIA (SOURCE: PENNDOT)

MUNICIPAL SEPARATE STORM SEWER: A CONVEYANCE OR SYSTEM OF CONVEYANCES (INCLUDING ROADS WITH DRAINAGE SYSTEMS, MUNICIPAL STREETS, CATCH BASINS, CURBS, GUTTERS, DITCHES, MAN-MADE CHANNELS, OR STORM DRAINS); (I) OWNED OR OPERATED BY A STATE, CITY, TOWN, BOROUGH, COUNTY, PARISH, DISTRICT, ASSOCIATION, OR OTHER PUBLIC BODY (CREATED BY OR PURSUANT TO STATE LAW) HAVING JURISDICTION OVER DISPOSAL OF SEWAGE, INDUSTRIAL WASTES, STORMWATER, OR OTHER WASTES, INCLUDING SPECIAL DISTRICTS UNDER STATE LAW SUCH AS A SEWER DISTRICT, FLOOD CONTROL DISTRICT OR DRAINAGE DISTRICT, OR SIMILAR ENTITY, OR AN INDIAN TRIBE OR AN AUTHORIZED INDIAN TRIBAL ORGANIZATION, OR A DESIGNATED AND APPROVED MANAGEMENT AGENCY UNDER SECTION 208 OF THE CWA THAT DISCHARGES TO SURFACE WATERS; (II) DESIGNED OR USED FOR COLLECTING OR CONVEYING STORMWATER; (III) WHICH IS NOT A COMBINED SEWER; AND (IV) WHICH IS NOT PART OF A PUBLICLY OWNED TREATMENT WORKS (POTW) AS DEFINED AT 40 CFR 122.2.(25 PA. CODE § 92A.32(A) AND 40 CFR § 122.26(B)(8))

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4): ALL SEPARATE STORM SEWERS THAT ARE DEFINED AS "LARGE" OR "MEDIUM" OR "SMALL" MUNICIPAL SEPARATE STORM SEWER SYSTEMS PURSUANT TO 40 CFR §§ 122.26(B)(4), (B)(7), AND (B)(16), RESPECTIVELY, OR DESIGNATED UNDER 40 CFR § 122.26(A)(1)(V).(25 PA. CODE § 92A.32(A) AND 40 CFR § 122.26(B)(18))

NWI (WETLANDS): AREAS THAT ARE INUNDATED OR SATURATED BY SURFACE WATER OR GROUNDWATER AT A FREQUENCY AND DURATION SUFFICIENT TO SUPPORT, AND THAT UNDER NORMAL CIRCUMSTANCES DO SUPPORT, A PREVALENCE OF VEGETATION TYPICALLY ADAPTED FOR LIFE IN SATURATED SOIL CONDITIONS, INCLUDING SWAMPS, MARSHES, BOGS AND SIMILAR AREAS AS MAPPED BY THE UNITED STATES FISH AND WILDLIFE SERVICE ON THE NATIONAL WETLANDS INVENTORY (NWI) MAP USING AERIAL IMAGING ANALYSIS TO IDENTIFY AND CLASSIFY WETLANDS AND DEEPWATER HABITATS FROM AERIAL IMAGERY.

OBSERVATION POINT: A LOCATION WHERE FIELD SCREENING WILL BE PERFORMED TO ISOLATE A SOURCE OF ILLICIT DISCHARGE, IF REQUIRED. NO OBSERVATION POINTS ARE PROPOSED AS AN ALTERNATIVE TO OUTFALLS AND THEREFORE NO OUTFALL INSPECTION RESPONSIBILITIES APPLY TO PTC OBSERVATION POINTS.

UNIMPAIRED MS4 OUTFALL: A POINT SOURCE AS DEFINED BY 40 CFR §122.2 AT THE POINT WHERE A MUNICIPAL SEPARATE STORM SEWER DISCHARGES TO ATTAINING SURFACE WATERS, EXCLUDING OPEN CONVEYANCES CONNECTING TWO MUNICIPAL SEPARATE STORM SEWERS; AND PIPES, TUNNELS OR OTHER CONVEYANCES WHICH CONNECT SEGMENTS OF THE SAME STREAM (OR OTHER SURFACE WATERS) THAT ARE USED TO CONVEY THE SURFACE WATERS, THEMSELVES.(25 PA. CODE § 92A.32(A) AND 40 CFR §122.26(B)(9)) UNIMPAIRED STREAMS ARE STREAMS THAT HAVE BEEN EVALUATED AS ATTAINING 4 STREAM WATER USES: AQUATIC LIFE, FISH CONSUMPTION, POTABLE WATER SUPPLY, AND RECREATION

IMPAIRED MS4 OUTFALL: A POINT SOURCE AS DEFINED BY 40 CFR §122.2 AT THE POINT WHERE A MUNICIPAL SEPARATE STORM SEWER DISCHARGES TO NON-ATTAINING SURFACE WATERS, EXCLUDING OPEN CONVEYANCES CONNECTING TWO MUNICIPAL SEPARATE STORM SEWERS; AND PIPES, TUNNELS OR OTHER CONVEYANCES WHICH CONNECT SEGMENTS OF THE SAME STREAM (OR OTHER SURFACE WATERS) THAT ARE USED TO CONVEY THE SURFACE WATERS, THEMSELVES.(25 PA. CODE § 92A.32(A) AND 40 CFR §122.26(B)(9)) A STREAM SEGMENT THAT IS NOT ATTAINING ANY ONE OF ITS 4 USES (AQUATIC LIFE, FISH CONSUMPTION, POTABLE WATER SUPPLY, AND RECREATION) IS CONSIDERED IMPAIRED.

PIPES: AN UNDERGROUND CONDUIT THAT CONVEYS STORMWATER. ON THE MAP THE PIPE SYMBOL INCLUDES ROUND, ELLIPTICAL, AND BOX SHAPED CONDUITS (AKA CULVERTS) THAT ARE PART OF THE SEPARATE STORMWATER SEWER SYSTEM.

PLANNING AREA/REGULATED MS4: THE LAND WITHIN THE WEST MIFFLIN BOROUGH BOUNDARY SERVICED BY THE BOROUGH'S SEPARATE STORM SEWER SYSTEM WITHIN THE URBANIZED AREA AND UPSTREAM OF THE URBANIZED AREA.

PROPOSED BIORETENTION/RAINGARDEN: A PLANNED EXCAVATED SHALLOW SURFACE DEPRESSION PLANTED WITH SPECIALLY SELECTED NATIVE VEGETATION TO CAPTURE RUNOFF AND ENHANCE WATER QUALITY THROUGH FILTRATION OR INFILTRATION

PROPOSED DRAINAGE AREA: LAND THAT DRAINS TO A PROPOSED BMP

SURFACE WATERS: PERENNIAL AND INTERMITTENT STREAMS, RIVERS, LAKES, RESERVOIRS, PONDS, WETLANDS, SPRINGS, NATURAL SEEPS AND ESTUARIES, EXCLUDING WATER AT FACILITIES APPROVED FOR WASTEWATER TREATMENT SUCH AS WASTEWATER TREATMENT IMPOUNDMENTS, COOLING WATER PONDS AND CONSTRUCTED WETLANDS USED AS PART OF A WASTEWATER TREATMENT PROCESS.(25 PA. CODE § 92A.2)

SURFACE WATERS ATTAINING: A SURFACE WATER THAT HAS BEEN EVALUATED AS ATTAINING FOUR SURFACE WATER USES: AQUATIC LIFE, FISH CONSUMPTION, POTABLE WATER SUPPLY, AND RECREATION

SURFACE WATERS NON ATTAINING: A SURFACE WATER SEGMENT THAT IS NOT ATTAINING ANY ONE OF ITS FOUR USES (AQUATIC LIFE, FISH CONSUMPTION, POTABLE WATER SUPPLY, AND RECREATION) IS CONSIDERED IMPAIRED

SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM (SMALL MS4): AN MS4, THAT IS NOT A LARGE OR MEDIUM MS4 PURSUANT TO 40 CFR §§ 122.26(B)(4) AND 122.26(B)(7). THE TERM SMALL MS4 INCLUDES SYSTEMS SIMILAR TO SEPARATE STORM SEWER SYSTEMS IN MUNICIPALITIES, SUCH AS SYSTEMS AT MILITARY BASES, LARGE HOSPITAL OR PRISON COMPLEXES, AND HIGHWAYS AND OTHER THOROUGHFARES. THE TERM DOES NOT INCLUDE SEPARATE STORM SEWERS IN VERY DISCRETE AREAS, SUCH AS INDIVIDUAL BUILDINGS.(25 PA. CODE §92A.32(A) AND 40 CFR §122.26(B)(16))

STORMWATER: RUNOFF FROM PRECIPITATION, SNOW MELT RUNOFF AND SURFACE RUNOFF AND DRAINAGE. "STORMWATER" HAS THE SAME MEANING AS "STORM WATER "(25 PA. CODE § 92A.2)

STREAM: A CHANNEL OR CONVEYANCE OF SURFACE WATER HAVING DEFINED BED AND BANKS, WHETHER NATURAL OR ARTIFICIAL, WITH PERENNIAL OR INTERMITTENT FLOW (SOURCE: PA DEP)

STREAM IMPAIRED: STREAMS NOT ATTAINING ANY ONE OF ITS SURFACE WATER USES: AQUATIC LIFE, FISH CONSUMPTION, POTABLE WATER SUPPLY, AND RECREATION PER THE PA DEP STREAMS INTEGRATED LIST (SOURCE: PA DEP)

NOTES:

GENERAL

- 1. THE PURPOSE OF THE MS4 MAP INCLUDES:
 - A. INVENTORY OF THE WEST MIFFLIN BOROUGH STORM SEWER NETWORK
 - B. DELINEATION OF THE REQUIRED POLLUTANT REDUCTION PLANNING AREAS AND OUTFALLS
 - C. FRAMEWORK FOR DOCUMENTING MAINTENANCE PRACTICES AND ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDD&E) ACTIVITIES

- 2. THE MS4 BASE MAP IS COMPILED OF INFORMATION FROM VARIOUS SOURCES. SOURCES ARE CITED IN THE GIS DATA BASE METADATA. NO MODIFICATIONS WERE MADE TO INFORMATION OBTAINED FROM OUTSIDE SOURCES. WEST MIFFLIN BOROUGH AND SKELLY AND LOY, INC. ARE NOT RESPONSIBLE FOR THE ACCURACY OF DATA OBTAINED FROM OUTSIDE SOURCES.

APPROACH

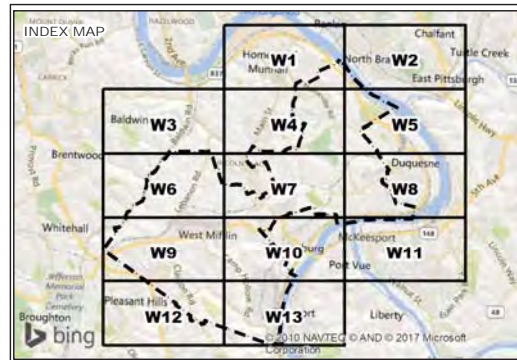
- 4. STORMWATER PIPES, INLETS, MANHOLES, INTAKES, DISCHARGES, AND SWALES WERE PROVIDED BY MACKIN ENGINEERING INC AND SUPPLEMENTED WITH INFORMATION PROVIDED BY WEST MIFFLIN BOROUGH STAFF.
- 5. THE STORMWATER SYSTEM DEPICTED WILL BE FIELD VERIFIED AS A SEPARATE WORK EFFORT (YEARS 2018 THROUGH 2023 OF PERMIT).



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**GENERAL NOTES
AND DEFINITIONS**

Project No. R17-0385.001	DWG. NO. G2
PLOT DATE: 8/3/2017	SHEET NO. 2 OF 16



Legend

Catchbasin	Stream	NWI	10' Index Contours
Collection Point	PRP Impaired Stream - Nutrients	Streamshed Boundary	10' Index Depression Contours
Headwall	PRP Impaired Stream - Nutrients and Siltation	HUC12 Boundary	2' Intermediate Contours
Manhole	PRP Impaired Stream - Siltation		2' Intermediate Depression Contours
Outfall			
Potential BMP Location			
Pipe			

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 Prepared For:
 WEST MIFFLIN BOROUGH

Urbanized Area: Pittsburgh
 County: Allegheny
 Municipality: West Mifflin Borough

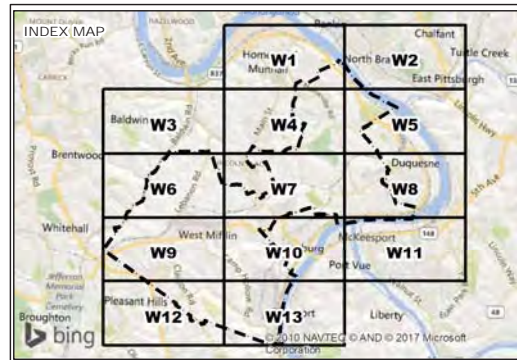
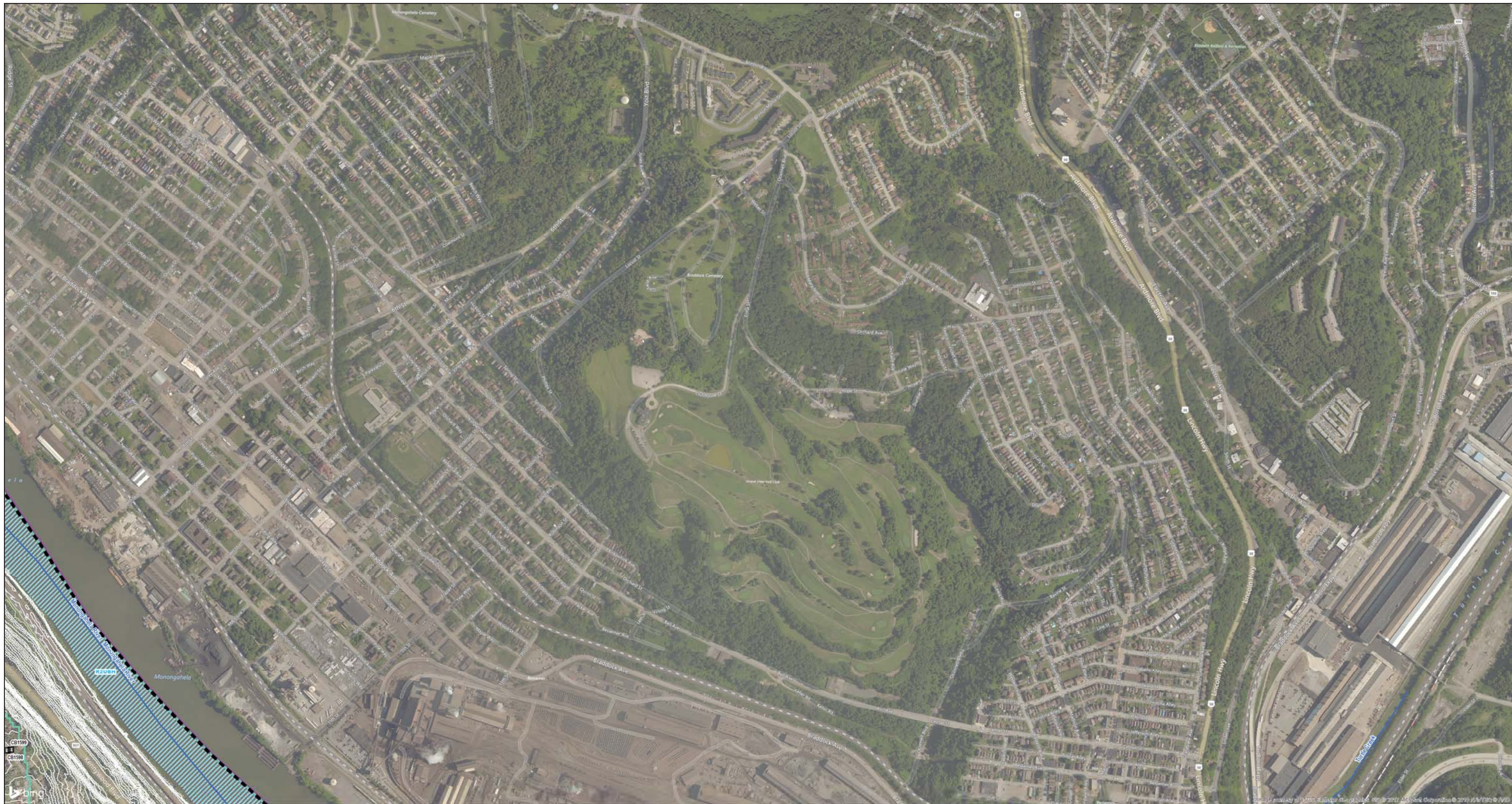
MS4 MAP SHEET W1

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Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001 DWG. NO. W1
 PLOT DATE: 8/3/2017 SHEET NO. 3 OF 16

Document Path: X:\Jobs\R17-0385.000 West Mifflin MS4\2017-07-25 PRP Figures\W1-W14 WestMifflin_MS4_Maps.mxd



Legend

Catchbasin	Stream	NWI	10' Index Contours
Collection Point	PRP Impaired Stream - Nutrients	Streamshed Boundary	10' Index Depression Contours
Headwall	PRP Impaired Stream - Nutrients and Siltation	HUC12 Boundary	2' Intermediate Contours
Manhole	PRP Impaired Stream - Siltation		2' Intermediate Depression Contours
Outfall			
Potential BMP Location			
Pipe			

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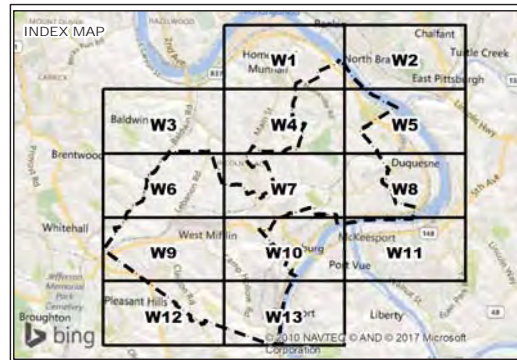
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Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001	DWG. NO. W2
PLOT DATE: 8/3/2017	SHEET NO. 4 OF 16

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Legend

Catchbasin	Stream	NWI	10' Index Contours
Collection Point	PRP Impaired Stream - Nutrients	Streamshed Boundary	10' Index Depression Contours
Headwall	PRP Impaired Stream - Nutrients and Siltation	HUC12 Boundary	2' Intermediate Contours
Manhole	PRP Impaired Stream - Siltation		2' Intermediate Depression Contours
Outfall			
Potential BMP Location			
Pipe			

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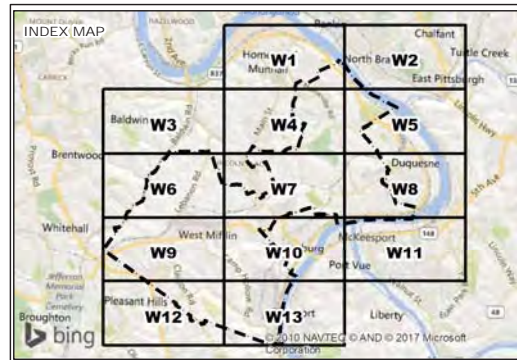
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Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001	DWG. NO. W3
PLOT DATE: 8/3/2017	SHEET NO. 5 OF 16

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Legend			
	Catchbasin		Stream
	Collection Point		PRP Impaired Stream - Nutrients
	Headwall		PRP Impaired Stream - Nutrients and Siltation
	Manhole		PRP Impaired Stream - Siltation
	Outfall		NWFI
	Potential BMP Location		Streamshed Boundary
	Pipe		HUC12 Boundary
			10' Index Contours
			10' Index Depression Contours
			2' Intermediate Contours
			2' Intermediate Depression Contours

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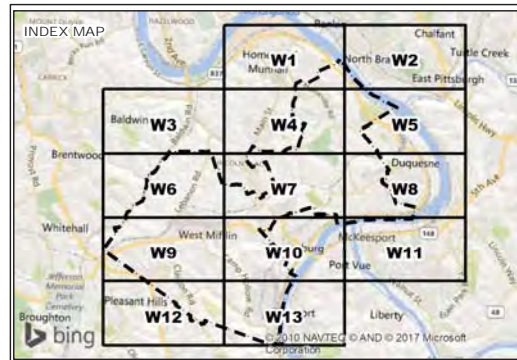
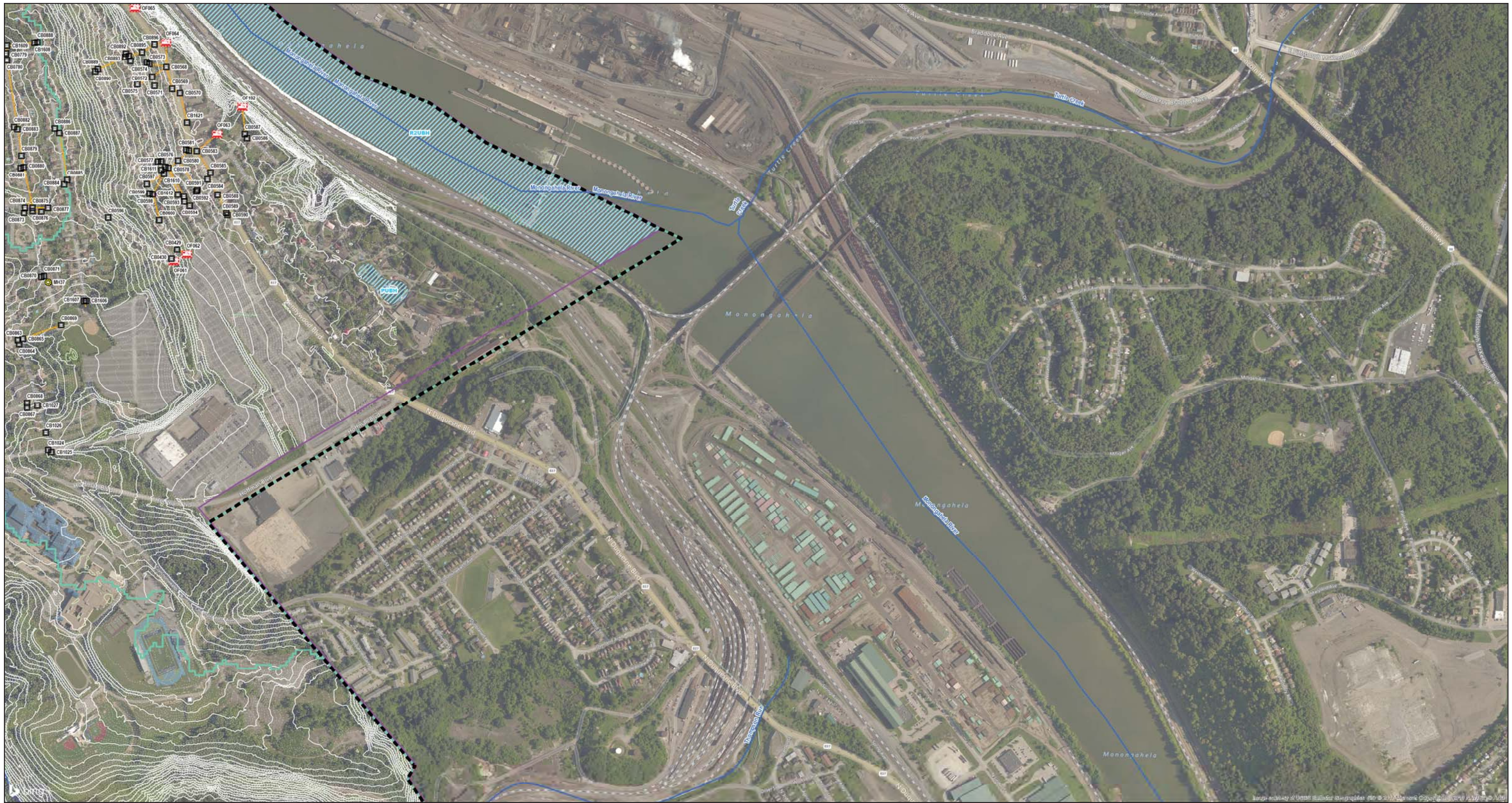
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Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001	DWG. NO. W4
PLOT DATE: 8/3/2017	SHEET NO. 6 OF 16

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Legend

Catchbasin	Stream	NWI	10' Index Contours
Collection Point	PRP Impaired Stream - Nutrients	Streamshed Boundary	10' Index Depression Contours
Headwall	PRP Impaired Stream - Nutrients and Siltation	HUC12 Boundary	2' Intermediate Contours
Manhole	PRP Impaired Stream - Siltation		2' Intermediate Depression Contours
Outfall			
Potential BMP Location			
Pipe			

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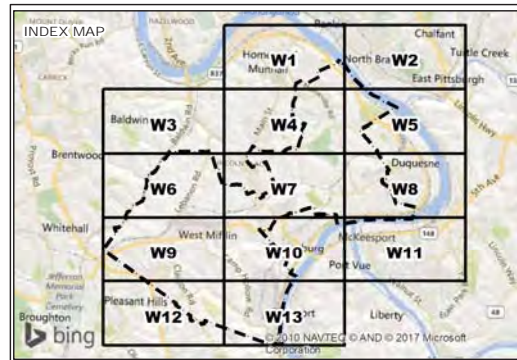
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Project No. R17-0385.001	DWG. NO. W5
PLOT DATE: 8/3/2017	SHEET NO. 7 OF 16

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Legend

Catchbasin	Stream	NWI	10' Index Contours
Collection Point	PRP Impaired Stream - Nutrients	Streamshed Boundary	10' Index Depression Contours
Headwall	PRP Impaired Stream - Nutrients and Siltation	HUC12 Boundary	2' Intermediate Contours
Manhole	PRP Impaired Stream - Siltation		2' Intermediate Depression Contours
Outfall			
Potential BMP Location			
Pipe			

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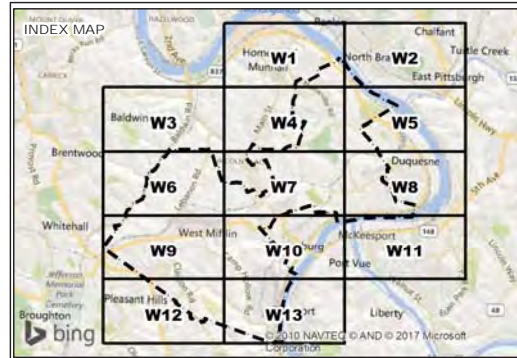
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Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001 DWG. NO. W6
 PLOT DATE: 8/3/2017 SHEET NO. 8 OF 16

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Legend			
	Catchbasin		Stream
	Collection Point		NWI
	Headwall		10' Index Contours
	Manhole		10' Index Depression Contours
	Outfall		2' Intermediate Contours
	Potential BMP Location		2' Intermediate Depression Contours
	Pipe		Streamshed Boundary
			HUC12 Boundary
			PRP Impaired Stream - Nutrients
			PRP Impaired Stream - Nutrients and Siltation
			PRP Impaired Stream - Siltation

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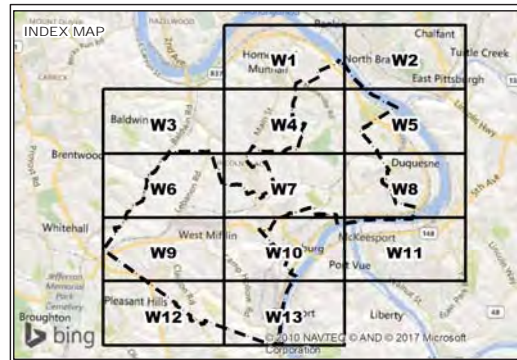
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County: Allegheny
Municipality: West Mifflin Borough

MS4 MAP SHEET W7

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001	DWG. NO. W7
PLOT DATE: 8/3/2017	SHEET NO. 9 OF 16

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Legend

Catchbasin	Stream	NWI	10' Index Contours
Collection Point	PRP Impaired Stream - Nutrients	Streamshed Boundary	10' Index Depression Contours
Headwall	PRP Impaired Stream - Nutrients and Siltation	HUC12 Boundary	2' Intermediate Contours
Manhole	PRP Impaired Stream - Siltation		2' Intermediate Depression Contours
Outfall			
Potential BMP Location			
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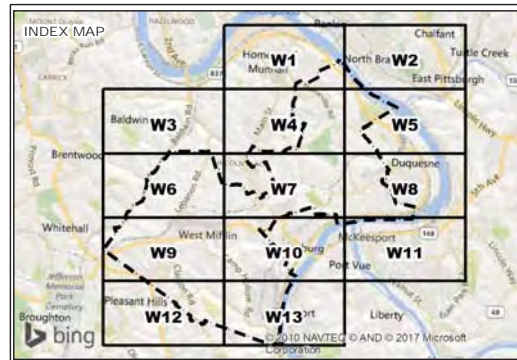
MS4 MAP SHEET W8

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Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001	DWG. NO. W8
PLOT DATE: 8/3/2017	SHEET NO. 11 OF 16

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Legend			
	Catchbasin		Stream
	Collection Point		NWI
	Headwall		Streamshed Boundary
	Manhole		10' Index Contours
	Outfall		10' Index Depression Contours
	Potential BMP Location		2' Intermediate Contours
	Pipe		2' Intermediate Depression Contours
			HUC12 Boundary
			PRP Impaired Stream - Nutrients
			PRP Impaired Stream - Nutrients and Siltation
			PRP Impaired Stream - Siltation

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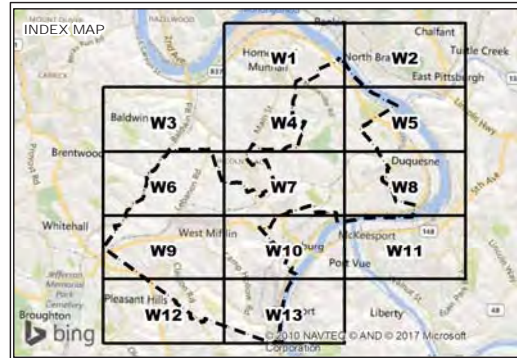
MS4 MAP SHEET W9

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Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001	DWG. NO. W9
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Legend			
	Catchbasin		Stream
	Collection Point		PRP Impaired Stream - Nutrients
	Headwall		PRP Impaired Stream - Nutrients and Siltation
	Manhole		PRP Impaired Stream - Siltation
	Outfall		NWI
	Potential BMP Location		Streamshed Boundary
	Pipe		HUC12 Boundary
			10' Index Contours
			10' Index Depression Contours
			2' Intermediate Contours
			2' Intermediate Depression Contours

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 WEST MIFFLIN BOROUGH

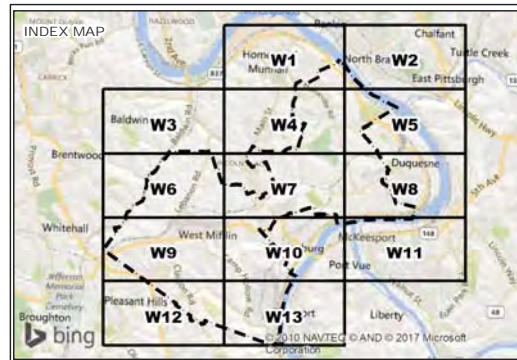
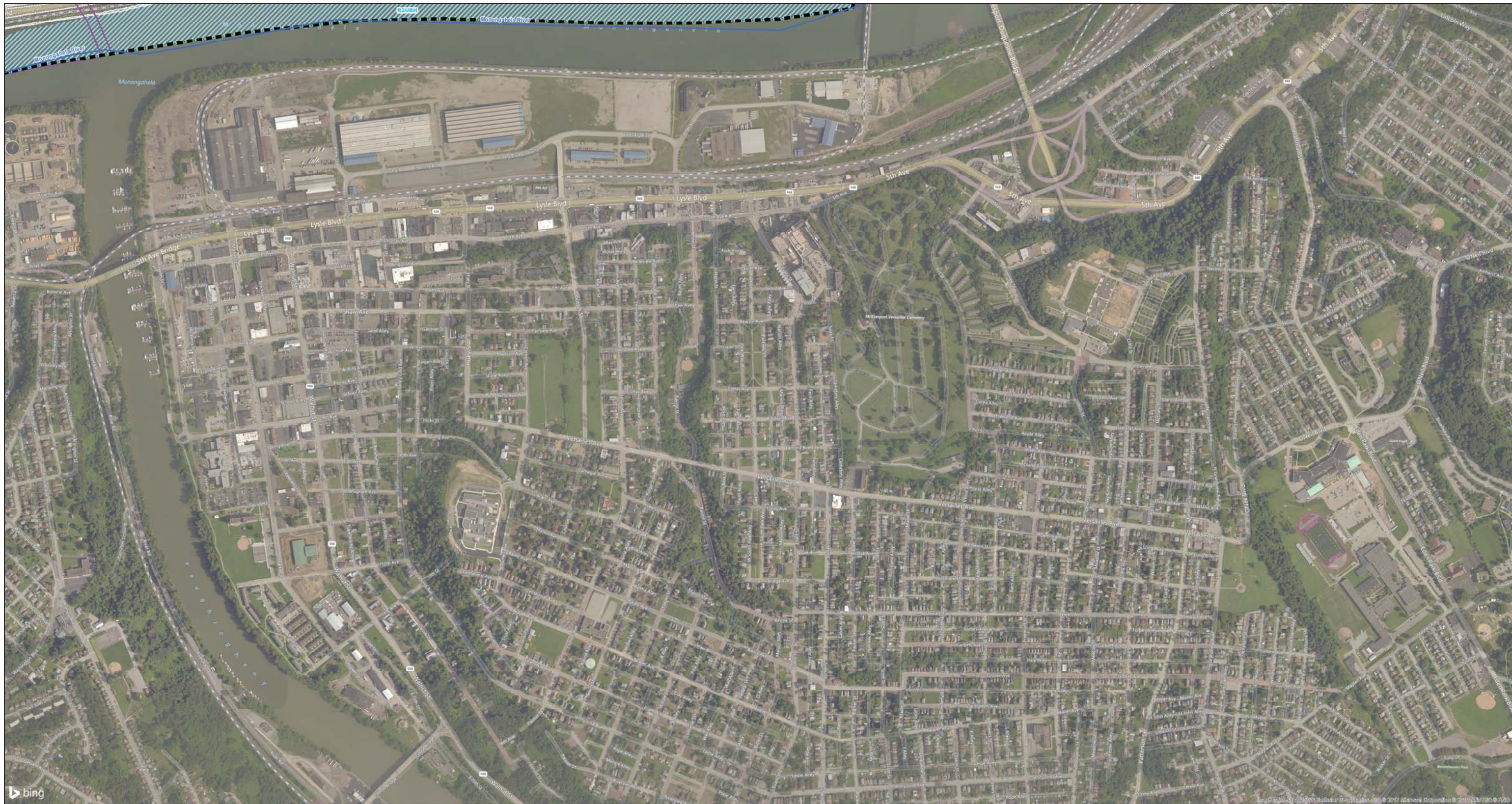
Urbanized Area: Pittsburgh
 County: Allegheny
 Municipality: West Mifflin Borough

MS4 MAP SHEET W10

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001	DWG. NO. W10
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Legend			
	Catchbasin		Stream
	Collection Point		PRP Impaired Stream - Nutrients
	Headwall		PRP Impaired Stream - Nutrients and Siltation
	Manhole		PRP Impaired Stream - Siltation
	Outfall		NWI
	Potential BMP Location		Streamshed Boundary
	Pipe		HUC12 Boundary
			10' Index Contours
			10' Index Depression Contours
			2' Intermediate Contours
			2' Intermediate Depression Contours

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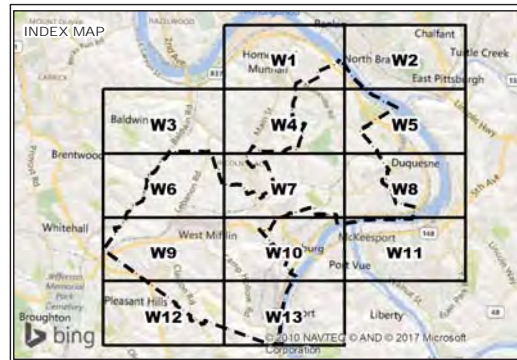
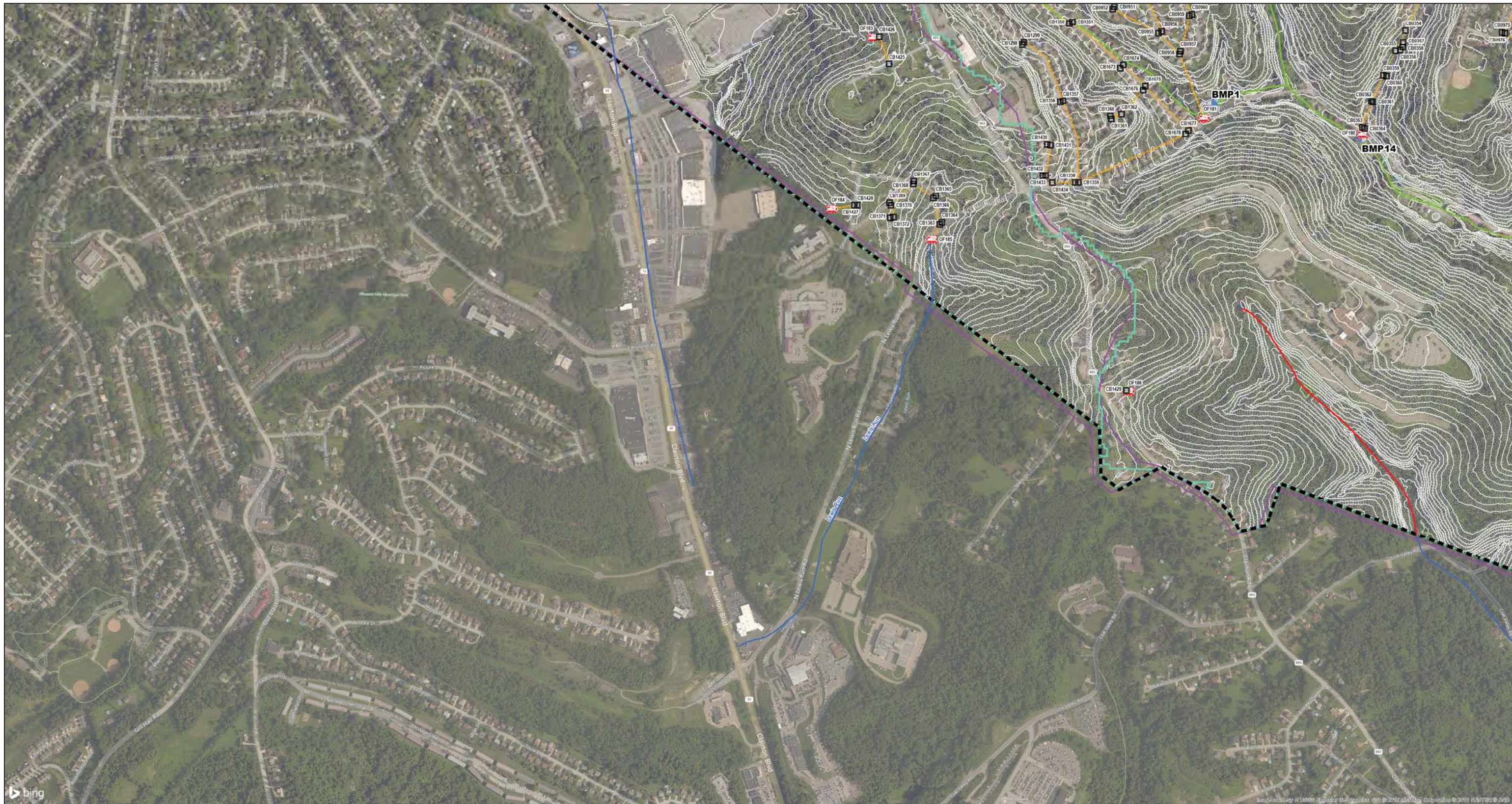
Urbanized Area: Pittsburgh
County: Allegheny
Municipality: West Mifflin Borough

MS4 MAP SHEET W11

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

Project No. R17-0385.001	DWG. NO. W11
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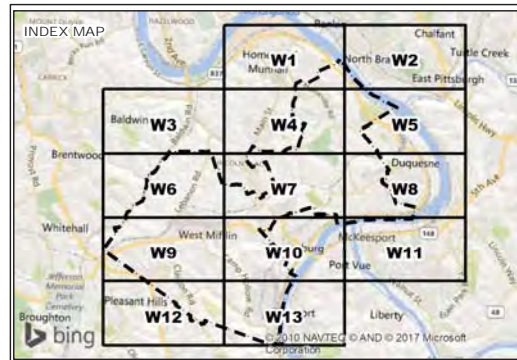
Legend			
	Catchbasin		Stream
	Collection Point		PRP Impaired Stream - Nutrients
	Headwall		PRP Impaired Stream - Nutrients and Siltation
	Manhole		PRP Impaired Stream - Siltation
	Outfall		NWI
	Potential BMP Location		Streamshed Boundary
	Pipe		HUC12 Boundary
			10' Index Contours
			10' Index Depression Contours
			2' Intermediate Contours
			2' Intermediate Depression Contours

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MS4 MAP SHEET W12

0 400 800
 Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
 Project No. R17-0385.001 DWG. NO. W12
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Legend			
	Catchbasin		Stream
	Collection Point		PRP Impaired Stream - Nutrients
	Headwall		PRP Impaired Stream - Nutrients and Siltation
	Manhole		PRP Impaired Stream - Siltation
	Outfall		NWI
	Potential BMP Location		Streamshed Boundary
	Pipe		HUC12 Boundary
			10' Index Contours
			10' Index Depression Contours
			2' Intermediate Contours
			2' Intermediate Depression Contours

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MS4 MAP SHEET W13

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