

LOWER PROVIDENCE TOWNSHIP

MUNICIPAL SEPARATE STORM SEWER SYSTEM – POLLUTANT REDUCTION REPORT

PREPARED FOR:

Lower Providence Township

*100 Parklane Drive
Eagleville, PA 19403
Phone: (610) 539-8020*

PREPARED BY:

Woodrow & Associates, Inc.

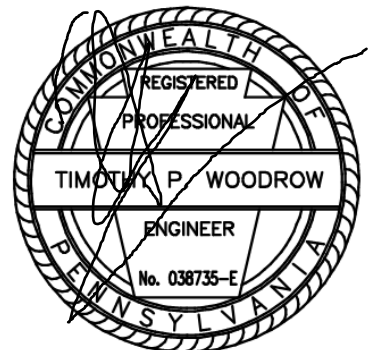
*1108 North Bethlehem Pike, Suite 5
Lower Gwynedd, PA 19002
Phone: (215) 542-5648*



PROJECT No. 14-0313LP

DATE: AUGUST 2017

REVISED: AUGUST 2023



Lower Providence Township

***Municipal Separate Storm Sewer System – Pollutant Reduction Report
Table of Contents***

- Section A:*** ***Narrative***
- a.*** ***Aerial Photograph of Lower Providence Township***
 - b.*** ***Zoning District Map of Lower Providence Township***
 - c.*** ***DEP BMP Effectiveness Values***
- Section B:*** ***Summary of Township Pollutant Requirements and Compliance***
- a.*** ***Township Pollutant Loading Calculations***
- Section C:*** ***Mine Run Watershed***
- a.*** ***Proposed BMP Pollutant Reduction Calculations***
- Section D:*** ***Indian Creek Watershed***
- a.*** ***Proposed BMP Pollutant Reduction Calculations***
- Section E:*** ***Stony Creek Watershed***
- a.*** ***Proposed BMP Pollutant Reduction Calculations***
- Section F:*** ***Operation and Maintenance of BMPs***

Section A:
Narrative

**LOWER PROVIDENCE TOWNSHIP
MUNICIPAL SEPARATE STORM SEWER SYSTEM – POLLUTANT REDUCTION REPORT**

Project Description

The applicant, Lower Providence Township, is required by The Department of Environmental Protection (DEP), through their National Pollutant Discharge Elimination System (NPDES) for Municipal Separate Storm Sewer Systems (MS4) to establish a Pollutant Reduction Plan (PRP) to reduce the quantity of pollutants entering the watersheds due to stormwater discharges from municipal outflows.

Lower Providence Township is divided into six separate watersheds listed on the DEP worksheet titled ‘MS4 Requirements Table (Municipal)’, last revised 1/10/2018, and are listed as such:

MS4 Urban Area Report		
LOWER PROVIDENCE TWP, Montgomery County		
INDIVIDUAL PERMIT REQUIRED: Yes	REASON: TMDL Plan	NPDES ID: PAG130018
IMPAIRED DOWNSTREAM WATERS	REQUIREMENTS	OTHER CAUSES OF IMPAIRMENT
Skippack Creek	Appendix E-Nutrients (5)	
Perkiomen Creek	Appendix B-Pathogens (5)	
Unnamed Tributaries to Schuylkill River	Appendix E-Siltation (5)	Water/Flow Variability (4c)
Stony Creek	Appendix E-Siltation (5)	Turbidity (5) Water/Flow Variability (4c)
Indian Creek	Appendix E-Siltation (5)	Cause Unknown (5) Water/Flow Variability (4c)
Unnamed Tributaries to Stony Creek		Cause Unknown (5)
Mine Run	Appendix B-Pathogens (5) Appendix E-Siltation (5)	Water/Flow Variability (4c)
Skippack Creek Watershed TMDL	TMDL Plan-Siltation (4a)	
Schuylkill River PCB TMDL	Appendix C-PCB (4a)	

Per DEP’s PRP Instructions, Appendix E (Non-Chesapeake Bay PRPs), the pollutant(s) are based on the impairment listing, as provided in the MS4 Requirements Table. If the impairment is based on nutrients only or other surrogates for nutrients (e.g., “Excessive Algal Growth” and “Organic Enrichments/Low D.O.”), a minimum 5% TP reduction is required. If the impairment is due to both siltation and nutrients, both sediment (10% reduction) and TP (5% reduction) must be addressed. 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.

Due to this requirement, Lower Providence Township is required to provide stormwater improvements to filter runoff prior to entering the Skippack Creek, Stony Creek, Indian Creek, and Mine Run. All other watersheds throughout the Township do not require pollutant reduction improvements.

Design Methodology

To establish a Pollutant Loading volume per individual watershed the Township Zoning Map was utilized to model the different districts assuming a maximum impervious coverage as established by the zoning code. This established a ‘worse-case’ scenario for potential Sediment Loading generated by the municipality.

Per MS4 requirements, any waterway impaired for Siltation must reduce that impairment by a minimum of 10% while waterways impaired for Phosphorous and/or Nutrients must reduce that impairment by 5%.

The required reductions to each watershed are as follows:

The Skippack Creek watershed is being managed by the ‘Skippack Creek Watershed Alliance (SCWA)’ of which Lower Providence Township is a member.

The Perkiomen Creek is impaired solely for Pathogens and does not have a reduction requirement.

The Schuylkill River is impaired solely for PCBs and does not have a reduction requirement.

10% sediment reduction requirement to Mine Run = 179,698.62 lbs/acre/yr

10% sediment reduction requirement to Indian Creek = 23,509.27 lbs/acre/yr

10% sediment reduction requirement to Stony Creek = 42,898.33 lbs/acre/yr

The provided reductions to each watershed are as follows:

As mentioned above, Lower Providence Township is part of the ‘Skippack Creek Watershed Alliance (SCWA)’ and all pollutant reductions associated to the Skippack Creek watershed can be found within that submitted report and plan, as prepared and managed by AEGIS Engineering & Planning.

The Perkiomen Creek requires no pollutant reductions.

The Schuylkill River requires no pollutant reductions.

The proposed BMP improvements within the Mine Run watershed are as follows:

- Creation of Extended Dry Detention Basins within the existing Dry Detention Basins along Redwing Lane (*BMP #MR-1 and #MR-2*) will remove **115,114.96 lbs/acre/yr** of sediment.
- Creation of an Extended Dry Detention Basin within the existing Dry Detention Basin along Peacock Drive (*BMP #MR-3*) will remove **11,119.51 lbs/acre/yr** of sediment.
- Creation of an Extended Dry Detention Basin within the existing Dry Detention Basin at Redtail Park (*BMP #MR-4*) will remove **8,612.21 lbs/acre/yr** of sediment.
- Creation of an Extended Dry Detention Basin within the existing Dry Detention Basin along Casselberry Lane (*BMP #MR-5*) will remove **19,302.60 lbs/acre/yr** of sediment.

- Creation of an Extended Dry Detention Basin within the existing Dry Detention Basin along Sunnyside Avenue (*BMP #MR-6*) will remove **8,703.55 lbs/acre/yr** of sediment.
 - 280 L.F. of streambank stabilization, on both sides of Mine Run, where the watercourse passes beneath Jode Road (*BMP #MR-7*). A permanent 35' Riparian Buffer will also be established along this section of proposed bank stabilization. This proposed streambank stabilization will remove **12,566.40 lbs/acre/yr** of sediment.
 - 556 L.F. of streambank stabilization, on both sides of Mine Run, where the watercourse passes beneath Sheawater Drive (*BMP #MR-8*). A permanent 35' Riparian Buffer will also be established along this section of proposed bank stabilization. This proposed streambank stabilization will remove **24,953.28 lbs/acre/yr** of sediment.
- ❖ *The total proposed sediment reduction within the Mine Run watershed is 200,372.51 lbs/acre/yr of sediment.***

The proposed BMP improvements within the Stony Creek watershed are as follows:

- Creation of an Extended Dry Detention Basin within the existing Dry Detention Basin along Lloyd Lane (*BMP #SC-1*) will remove **30,461.29 lbs/acre/yr** of sediment.
 - Creation of an Extended Dry Detention Basin within the existing Dry Detention Basin along Henry Road (*BMP #SC-2*) will remove **15,066.38 lbs/acre/yr** of sediment.
- ❖ *The total proposed sediment reduction within the Stony Creek watershed is 45,527.67 lbs/acre/yr of sediment.***

The proposed BMP improvements within the Indian Creek watershed are as follows:

- Creation of a new Bio-filtration Rain Garden at the terminal storm inlet within the commercial properties located at South Trooper Road and Egypt Road (*BMP #IC-1*) will remove **23,686.32 lbs/acre/yr** of sediment.

Improvement Implementation Schedule

Upon approval of the proposed BMP improvements by DEP, the Township shall enter a 5-year implementation schedule to construct all of the proposed improvements.

BMP Funding and Maintenance Responsibilities

The Township shall be responsible for all costs associated with final design, construction, and perpetual operation and maintenance of all the proposed BMP improvements. Funding for BMP improvements and maintenance shall be drawn from the Township general fund and through obtaining grant funding. Lower Providence Township is currently, and will remain as, the sole owner of the Basins.

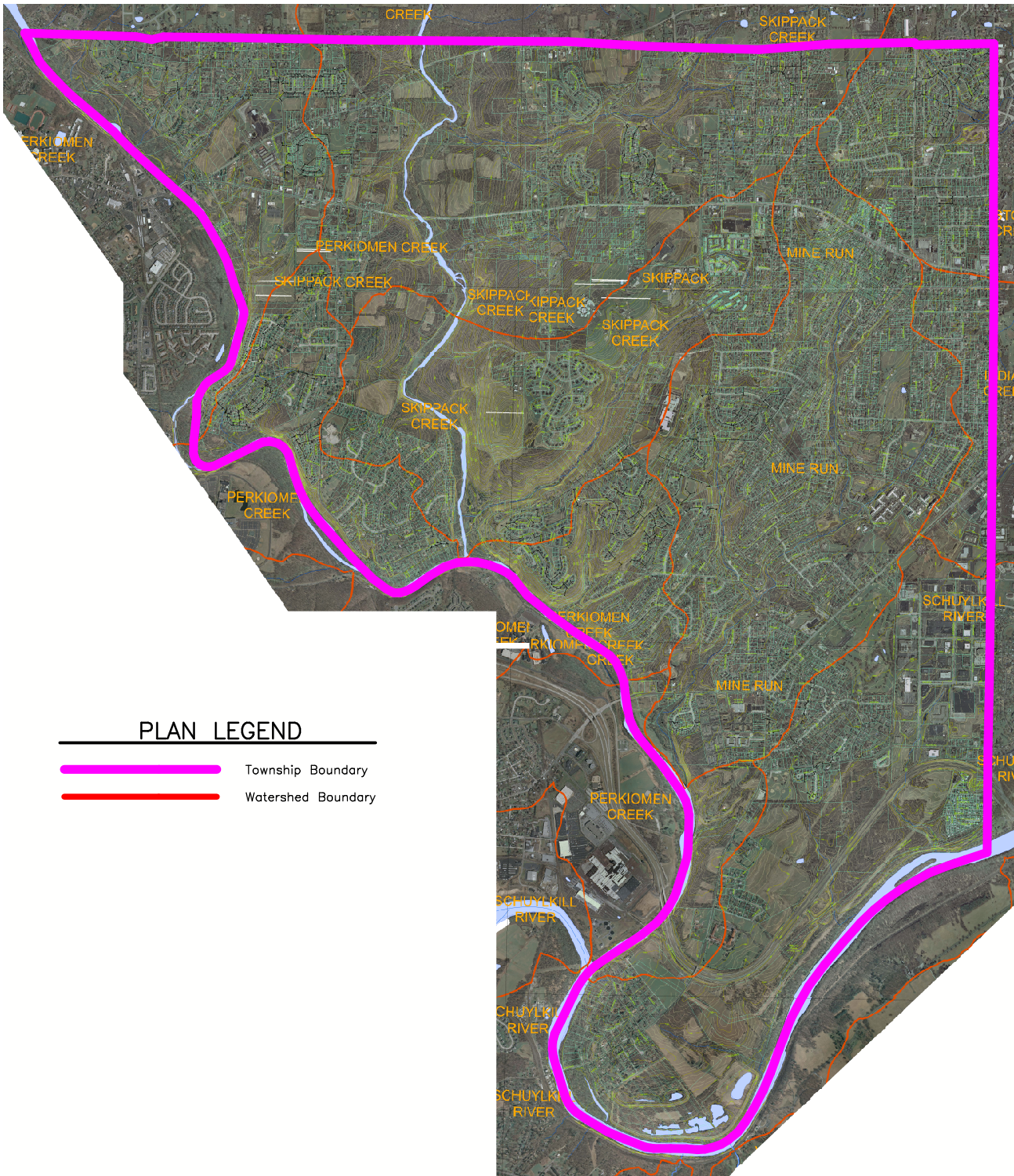
Summary and Conclusions

With the implementation of the proposed stormwater modifications and improvements outlined in this report:

- The proposed streambank stabilizations and improvements to basins draining to the Mine Run watershed have reduced Sediment by **200,372.51 lbs/acre/yr** when the required reduction amount is **179,698.62 lbs/acre/yr**.
- The improvements to basins draining to the Stony Creek watershed have reduced Sediment by **45,527.67 lbs/acre/yr** when the required reduction amount is **42,898.33 lbs/acre/yr**.

- The improvements to basins draining to the Indian Creek watershed have reduced Sediment by **23,686.32 lbs/acre/yr** when the required amount is **23,509.27 lbs/acre/yr**.

a. Aerial Photograph of Lower Providence Township:



PLAN LEGEND

- Township Boundary
- Watershed Boundary

LOWER PROVIDENCE BOUNDARY – AERIAL MAP



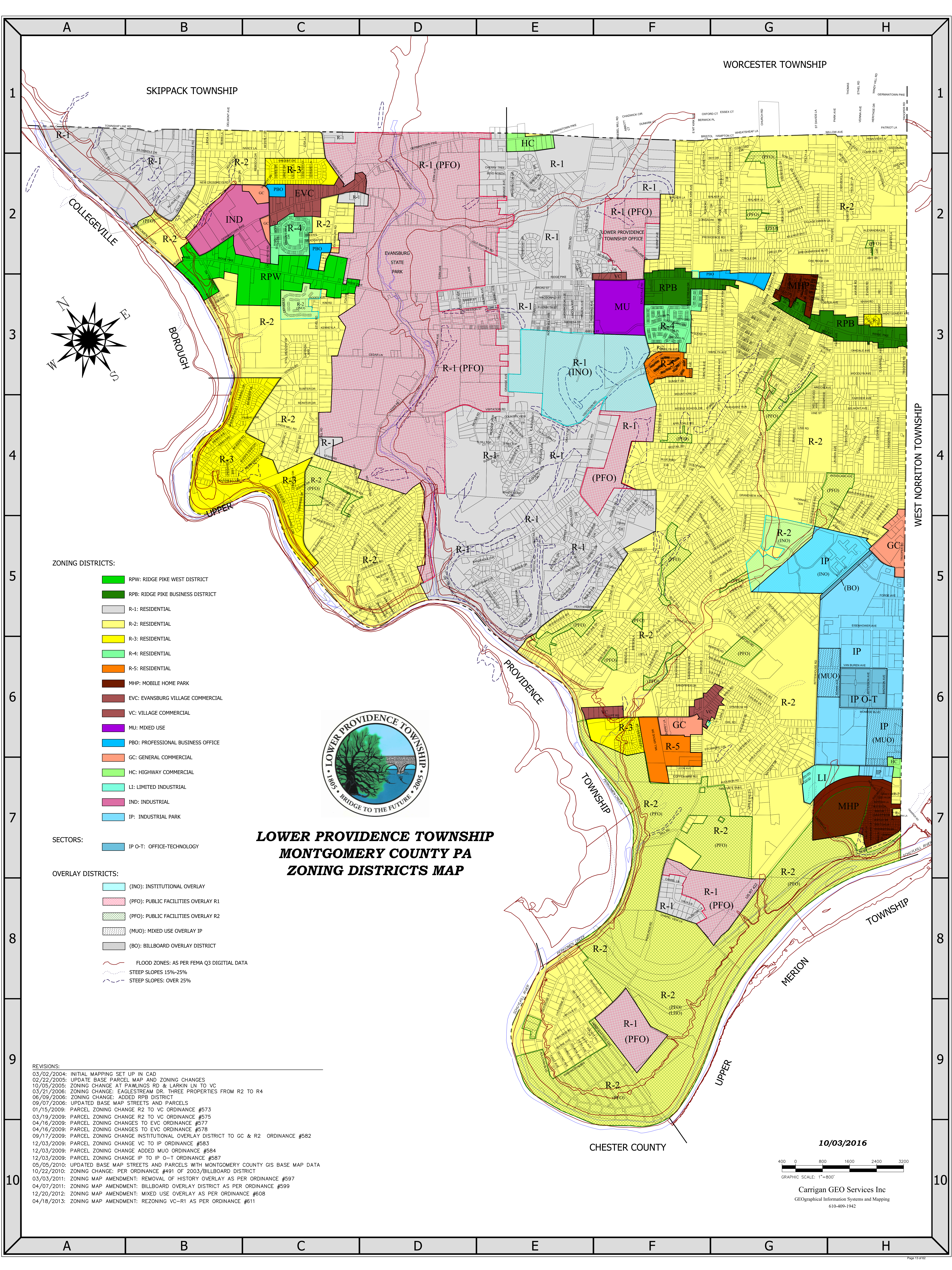
WOODROW & ASSOCIATES, INC.
 MUNICIPAL / CIVIL CONSULTING ENGINEERS
 1108 North Bethlehem Pike - suite 5
 Lower Gwynedd, PA 19002

FILE NAME:
 14-0313LP

DRAWN BY: J.A.G.	DESIGNED BY: J.A.G.	SCALE: 1"=4,000'	DRAWING DATE: 08-14-2017
---------------------	------------------------	---------------------	-----------------------------

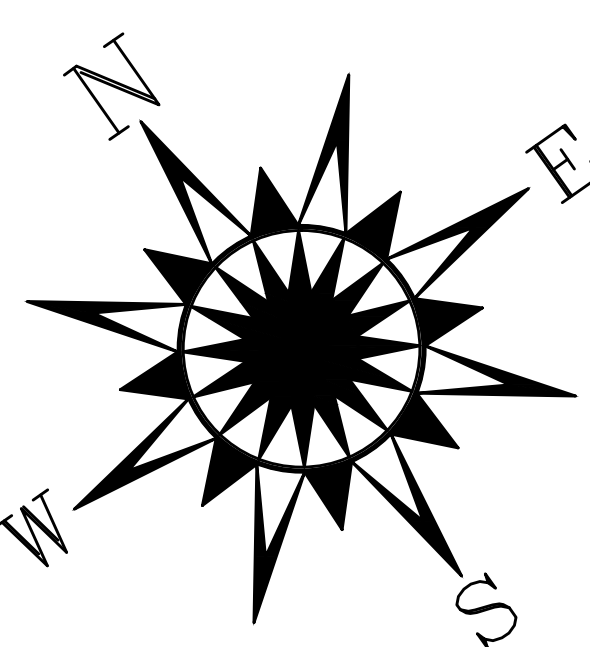
DETAIL No.:
 Page 9 of 62
1 OF 1

b. Zoning District Map of Lower Providence Township:



WORCESTER TOWNSHIP

SKIPPACK TOWNSHIP



ZONING DISTRICTS:

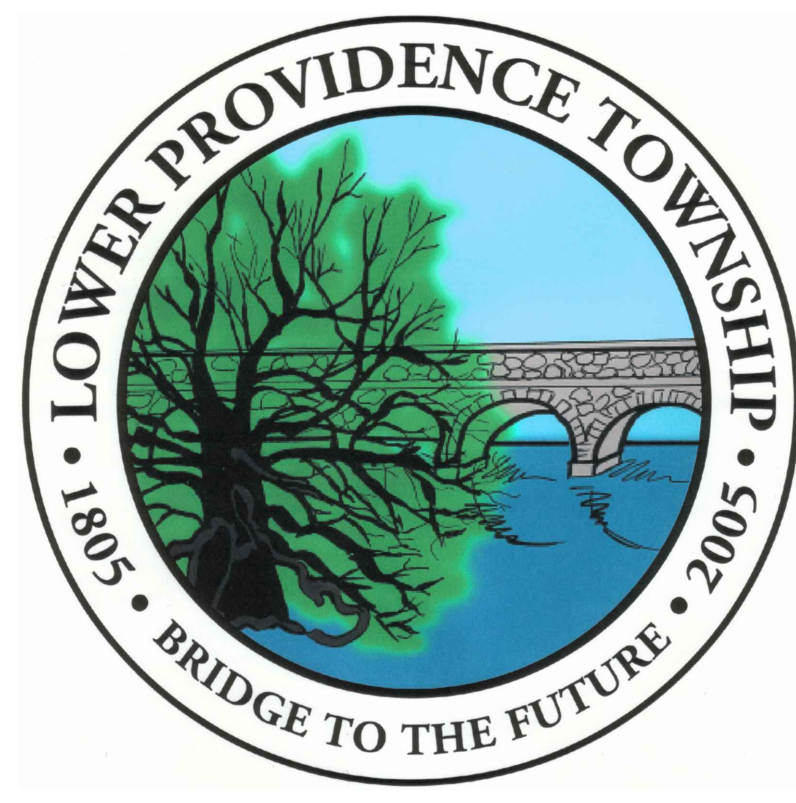
- RPW: RIDGE PIKE WEST DISTRICT
- RPB: RIDGE PIKE BUSINESS DISTRICT
- R-1: RESIDENTIAL
- R-2: RESIDENTIAL
- R-3: RESIDENTIAL
- R-4: RESIDENTIAL
- R-5: RESIDENTIAL
- MHP: MOBILE HOME PARK
- EVC: EVANSBURG VILLAGE COMMERCIAL
- VC: VILLAGE COMMERCIAL
- MU: MIXED USE
- PBO: PROFESSIONAL BUSINESS OFFICE
- GC: GENERAL COMMERCIAL
- HC: HIGHWAY COMMERCIAL
- LI: LIMITED INDUSTRIAL
- IND: INDUSTRIAL
- IP: INDUSTRIAL PARK

SECTORS:

- IP O-T: OFFICE-TECHNOLOGY

OVERLAY DISTRICTS:

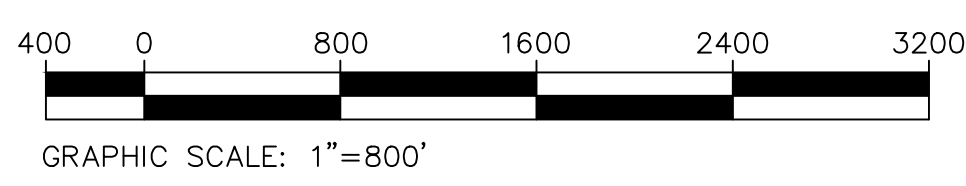
- (INO): INSTITUTIONAL OVERLAY
- (PFO): PUBLIC FACILITIES OVERLAY R1
- (PFO): PUBLIC FACILITIES OVERLAY R2
- (MUO): MIXED USE OVERLAY IP
- (BO): BILLBOARD OVERLAY DISTRICT
- FLOOD ZONES: AS PER FEMA Q3 DIGITAL DATA
- STEEP SLOPES 15%-25%
- STEEP SLOPES: OVER 25%



**LOWER PROVIDENCE TOWNSHIP
MONTGOMERY COUNTY PA
ZONING DISTRICTS MAP**

- REVISIONS:**
- 03/02/2004: INITIAL MAPPING SET UP IN CAD
 - 02/22/2005: UPDATE BASE PARCEL MAP AND ZONING CHANGES
 - 10/05/2005: ZONING CHANGE AT PAWLINGS RD & LARKIN LN TO VC
 - 03/21/2006: ZONING CHANGE: EAGLESTREAM DR. THREE PROPERTIES FROM R2 TO R4
 - 06/09/2006: ZONING CHANGE: ADDED RPB DISTRICT
 - 09/07/2006: UPDATED BASE MAP STREETS AND PARCELS
 - 01/15/2009: PARCEL ZONING CHANGE R2 TO VC ORDINANCE #573
 - 03/19/2009: PARCEL ZONING CHANGE R2 TO VC ORDINANCE #575
 - 04/16/2009: PARCEL ZONING CHANGES TO EVC ORDINANCE #577
 - 04/16/2009: PARCEL ZONING CHANGES TO EVC ORDINANCE #578
 - 09/17/2009: PARCEL ZONING CHANGE INSTITUTIONAL OVERLAY DISTRICT TO GC & R2 ORDINANCE #582
 - 12/03/2009: PARCEL ZONING CHANGE VC TO IP ORDINANCE #583
 - 12/03/2009: PARCEL ZONING CHANGE ADDED MUO ORDINANCE #584
 - 12/03/2009: PARCEL ZONING CHANGE IP TO IP O-T ORDINANCE #587
 - 05/05/2010: UPDATED BASE MAP STREETS AND PARCELS WITH MONTGOMERY COUNTY GIS BASE MAP DATA
 - 10/22/2010: ZONING CHANGE: PER ORDINANCE #491 OF 2003/BILLBOARD DISTRICT
 - 03/03/2011: ZONING MAP AMENDMENT: REMOVAL OF HISTORY OVERLAY AS PER ORDINANCE #597
 - 04/07/2011: ZONING MAP AMENDMENT: BILLBOARD OVERLAY DISTRICT AS PER ORDINANCE #599
 - 12/20/2012: ZONING MAP AMENDMENT: MIXED USE OVERLAY AS PER ORDINANCE #608
 - 04/18/2013: ZONING MAP AMENDMENT: REZONING VC-R1 AS PER ORDINANCE #611

10/03/2016



Carrigan GEO Services Inc
GEOgraphical Information Systems and Mapping
610-419-1942

c. DEP BMP Effectiveness Values:

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
 STORMWATER DISCHARGES FROM
 SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS
 BMP EFFECTIVENESS VALUES**

This table of BMP effectiveness values (i.e., pollutant removal efficiencies) is intended for use by MS4s that are developing and implementing Pollutant Reduction Plans and TMDL Plans to comply with NPDES permit requirements. The values used in this table generally consider pollutant reductions from both overland flow and reduced downstream erosion, and are based primarily on average values within the Chesapeake Assessment Scenario Tool (CAST) (www.casttool.org). Design considerations, operation and maintenance, and construction sequences should be as outlined in the Pennsylvania Stormwater BMP Manual, Chesapeake Bay Program guidance, or other technical sources. The Department of Environmental Protection (DEP) will update the information contained in this table as new information becomes available. Interested parties may submit information to DEP for consideration in updating this table to DEP's MS4 resource account, RA-EPPAMS4@pa.gov. Where an MS4 proposes a BMP not identified in this document or in Chesapeake Bay Program expert panel reports, other technical resources may be consulted for BMP effectiveness values. Note – TN = Total Nitrogen and TP = Total Phosphorus.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Wet Ponds and Wetlands	20%	45%	60%	A water impoundment structure that intercepts stormwater runoff then releases it to an open water system at a specified flow rate. These structures retain a permanent pool and usually have retention times sufficient to allow settlement of some portion of the intercepted sediments and attached nutrients/toxics. Until recently, these practices were designed specifically to meet water quantity, not water quality objectives. There is little or no vegetation living within the pooled area nor are outfalls directed through vegetated areas prior to open water release. Nitrogen reduction is minimal.
Dry Detention Basins and Hydrodynamic Structures	5%	10%	10%	Dry Detention Ponds are depressions or basins created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Hydrodynamic Structures are devices designed to improve quality of stormwater using features such as swirl concentrators, grit chambers, oil barriers, baffles, micropools, and absorbent pads that are designed to remove sediments, nutrients, metals, organic chemicals, or oil and grease from urban runoff.
Dry Extended Detention Basins	20%	20%	60%	Dry extended detention (ED) basins are depressions created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Dry ED basins are designed to dry out between storm events, in contrast with wet ponds, which contain standing water permanently. As such, they are similar in construction and function to dry detention basins, except that the duration of detention of stormwater is designed to be longer, theoretically improving treatment effectiveness.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Infiltration Practices w/ Sand, Veg.	85%	85%	95%	A depression to form an infiltration basin where sediment is trapped and water infiltrates the soil. No underdrains are associated with infiltration basins and trenches, because by definition these systems provide complete infiltration. Design specifications require infiltration basins and trenches to be built in good soil, they are not constructed on poor soils, such as C and D soil types. Engineers are required to test the soil before approval to build is issued. To receive credit over the longer term, jurisdictions must conduct yearly inspections to determine if the basin or trench is still infiltrating runoff.
Filtering Practices	40%	60%	80%	Practices that capture and temporarily store runoff and pass it through a filter bed of either sand or an organic media. There are various sand filter designs, such as above ground, below ground, perimeter, etc. An organic media filter uses another medium besides sand to enhance pollutant removal for many compounds due to the increased cation exchange capacity achieved by increasing the organic matter. These systems require yearly inspection and maintenance to receive pollutant reduction credit.
Filter Strip Runoff Reduction	20%	54%	56%	Urban filter strips are stable areas with vegetated cover on flat or gently sloping land. Runoff entering the filter strip must be in the form of sheet-flow and must enter at a non-erosive rate for the site-specific soil conditions. A 0.4 design ratio of filter strip length to impervious flow length is recommended for runoff reduction urban filter strips.
Filter Strip Stormwater Treatment	0%	0%	22%	Urban filter strips are stable areas with vegetated cover on flat or gently sloping land. Runoff entering the filter strip must be in the form of sheet-flow and must enter at a non-erosive rate for the site-specific soil conditions. A 0.2 design ratio of filter strip length to impervious flow length is recommended for stormwater treatment urban filter strips.
Bioretention – Raingarden (C/D soils w/ underdrain)	25%	45%	55%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has an underdrain and is in C or D soil.
Bioretention / Raingarden (A/B soils w/ underdrain)	70%	75%	80%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has an underdrain and is in A or B soil.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Bioretention / Raingarden (A/B soils w/o underdrain)	80%	85%	90%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has no underdrain and is in A or B soil.
Vegetated Open Channels (C/D Soils)	10%	10%	50%	Open channels are practices that convey stormwater runoff and provide treatment as the water is conveyed, includes bioswales. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils. This BMP has no underdrain and is in C or D soil.
Vegetated Open Channels (A/B Soils)	45%	45%	70%	Open channels are practices that convey stormwater runoff and provide treatment as the water is conveyed, includes bioswales. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils. This BMP has no underdrain and is in A or B soil.
Bioswale	70%	75%	80%	With a bioswale, the load is reduced because, unlike other open channel designs, there is now treatment through the soil. A bioswale is designed to function as a bioretention area.
Permeable Pavement w/o Sand or Veg. (C/D Soils w/ underdrain)	10%	20%	55%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, no sand or vegetation and is in C or D soil.
Permeable Pavement w/o Sand or Veg. (A/B Soils w/ underdrain)	45%	50%	70%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, no sand or vegetation and is in A or B soil.
Permeable Pavement w/o Sand or Veg. (A/B Soils w/o underdrain)	75%	80%	85%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has no underdrain, no sand or vegetation and is in A or B soil.
Permeable Pavement w/ Sand or Veg. (A/B Soils w/ underdrain)	50%	50%	70%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, has sand and/or vegetation and is in A or B soil.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Permeable Pavement w/ Sand or Veg. (A/B Soils w/o underdrain)	80%	80%	85%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has no underdrain, has sand and/or vegetation and is in A or B soil.
Permeable Pavement w/ Sand or Veg. (C/D Soils w/ underdrain)	20%	20%	55%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, has sand and/or vegetation and is in C or D soil.
Stream Restoration	0.075 lbs/ft/yr	0.068 lbs/ft/yr	44.88 lbs/ft/yr	An annual mass nutrient and sediment reduction credit for qualifying stream restoration practices that prevent channel or bank erosion that otherwise would be delivered downstream from an actively enlarging or incising urban stream. Applies to 0 to 3rd order streams that are not tidally influenced. If one of the protocols is cited and pounds are reported, then the mass reduction is received for the protocol.
Forest Buffers	25%	50%	50%	An area of trees at least 35 feet wide on one side of a stream, usually accompanied by trees, shrubs and other vegetation that is adjacent to a body of water. The riparian area is managed to maintain the integrity of stream channels and shorelines, to reduce the impacts of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals. Effectiveness credit for TN is for 4 upslope acres for each acre of buffer (4:1), and 2 upslope acres for TP and sediment (2:1). Additional credit is gained by converting land use from current use to forest. (Note – the values represent pollutant load reductions from stormwater draining through buffers).
Tree Planting	10%	15%	20%	The BMP effectiveness values for tree planting are estimated by DEP. DEP estimates that 100 fully mature trees of mixed species (both deciduous and non-deciduous) provide pollutant load reductions for the equivalent of one acre (i.e., one mature tree = 0.01 acre). The BMP effectiveness values given are based on immature trees (seedlings or saplings); the effectiveness values are expected to increase as the trees mature. To determine the amount of pollutant load reduction that can be credited for tree planting efforts: 1) multiply the number of trees planted by 0.01; 2) multiply the acreage determined in step 1 by the pollutant loading rate for the land prior to planting the trees (in lbs/acre/year); and 3) multiply the result of step 2 by the BMP effectiveness values given.
Street Sweeping	3%	3%	9%	Street sweeping must be conducted 25 times annually. Only count those streets that have been swept at least 25 times in a year. The acres associated with all streets that have been swept at least 25 times in a year would be eligible for pollutant reductions consistent with the given BMP effectiveness values.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Storm Sewer System Solids Removal	0.0027 for sediment, 0.0111 for organic matter	0.0006 for sediment, 0.0012 for organic matter	1 – TN and TP concentrations	<p>This BMP (also referred to as “Storm Drain Cleaning”) involves the collection or capture and proper disposal of solid material within the storm system to prevent discharge to surface waters. Examples include catch basins, stormwater inlet filter bags, end of pipe or outlet solids removal systems and related practices. Credit is authorized for this BMP only when proper maintenance practices are observed (i.e., inspection and removal of solids as recommended by the system manufacturer or other available guidelines). The entity using this BMP for pollutant removal credits must demonstrate that they have developed and are implementing a standard operating procedure for tracking the material removed from the sewer system. Locating such BMPs should consider the potential for backups onto roadways or other areas that can produce safety hazards.</p> <p>To determine pollutant reductions for this BMP, these steps must be taken:</p> <ol style="list-style-type: none"> 1) Measure the weight of solid/organic material collected (lbs). Sum the total weight of material collected for an annual period. Note – do not include refuse, debris and floatables in the determination of total mass collected. 2) Convert the annual wet weight captured into annual dry weight (lbs) by using site-specific measurements (i.e., dry a sample of the wet material to find its weight) or by using default factors of 0.7 (material that is predominantly wet sediment) or 0.2 (material that is predominantly wet organic matter, e.g., leaf litter). 3) Multiply the annual dry weight of material collected by default or site-specific pollutant concentration factors. The default concentrations are shown in the BMP Effectiveness Values columns. Alternatively, the material may be sampled (at least annually) to determine site-specific pollutant concentrations. <p>DEP will allow up to 50% of total pollutant reduction requirements to be met through this BMP. The drainage area treated by this BMP may be no greater than 0.5 acre unless it can be demonstrated that the specific system proposed is capable of treating stormwater from larger drainage areas. For planning purposes, the sediment removal efficiency specified by the manufacturer may be assumed, but no higher than 80%.</p>

Section B:
Summary of Township Pollutant Requirements and Compliance

a. Township Pollutant Loading Calculations:

LOWER PROVIDENCE TOWNSHIP

Mine Run Watershed:

* Per DEP MS4 Requirements Tables - Mine Run is impaired due to Pathogens and Siltation, therefore, a 10% reduction in sediment loading and 5% reduction in pathogens is required

Zoning District:	Area within Township encompassed by assigned District:	Maximum Allowable Impervious Coverage:	Potential Maximum Impervious Coverage:	Potential Minimum Lawn Coverage:
R-1 Residential	95.34 acres	35%	33.37 acres	61.97 acres
R-2 Residential	1,744.67 acres	35%	610.63 acres	1,134.04 acres
R-2 Residential (Audubon Wildlife Sanctuary)	43.95 acres	35%	15.38 acres	28.57 acres
R-3 Residential	27.60 acres	35%	9.66 acres	17.94 acres
R-4 Residential	0.00 acres	25%	0.00 acres	0.00 acres
R-5 Residential	45.61 acres	35%	15.96 acres	29.64 acres
RPB - Ride Pike Business District	26.00 acres	70%	18.20 acres	7.80 acres
RPIW - Ridge Pike West District	0.00 acres	75%	0.00 acres	0.00 acres
MHP - Mobile Home Park	16.59 acres	30%	4.98 acres	11.61 acres
EVC - Evansburg Village Commercial	0.00 acres	50%	0.00 acres	0.00 acres
VC - Village Commercial	15.11 acres	50%	7.56 acres	7.56 acres
MU - Mixed Use	0.00 acres	75%	0.00 acres	0.00 acres
PBO - Professional Business Office	12.12 acres	65%	7.88 acres	4.24 acres
GC - General Commercial	15.89 acres	80%	12.72 acres	3.18 acres
HC - Highway Commercial	0.00 acres	80%	0.00 acres	0.00 acres
LI - Limited Industrial	0.00 acres	50%	0.00 acres	0.00 acres
IND - Industrial	0.00 acres	35%	0.00 acres	0.00 acres
IP - Industrial Park	75.06 acres	65%	48.79 acres	26.27 acres
Total from Zoning Districts:	2,117.94 acres		785.12 acres	1,332.82 acres
Total Drainage Area to Mine Run:				
Lawn Areas within Zoning Districts:	1,332.82 acres			
Max Impervious Surface within Zoning Districts:	785.12 acres			
	2,117.94 acres			

Sediment Loading Ratios for Montgomery County:

Impervious developed areas:	1,839 lbs/acre/yr
Pervious developed areas:	264.96 lbs/acre/yr

Mine Run Watershed Sediment Loading:	1,796,986.24 lbs/acre/yr
10% Required Reduction:	179,698.62 lbs/acre/yr

Basin pollutant reductions near Redwing Lane:	115,114.96 lbs/acre/yr
Basin pollutant reductions near Peacock Drive:	11,119.51 lbs/acre/yr
Basin pollutant reductions near Redtail Park:	8,612.21 lbs/acre/yr
Basin pollutant reductions near Casselberry Lane:	19,302.60 lbs/acre/yr
Basin pollutant reductions along Sunnyside Avenue:	8,703.55 lbs/acre/yr
Streambank stabilization along Jade Road:	12,566.40 lbs/acre/yr
Streambank stabilization along Sheawater Drive:	24,953.28 lbs/acre/yr
Total proposed pollutant reductions:	200,372.51 lbs/acre/yr

LOWER PROVIDENCE TOWNSHIP

Indian Creek Watershed:

* Per DEP MS4 Requirements Tables - Indian Creek is impaired due to Siltation, therefore, a 10% reduction in sediment loading is required

Zoning District:	Area within Township encompassed by assigned District:	Maximum Allowable Impervious Coverage:	Potential Maximum Impervious Coverage:	Potential Minimum Lawn Coverage:
R-1 Residential	0.00 acres	35%	0.00 acres	0.00 acres
R-2 Residential	143.92 acres	35%	50.37 acres	93.55 acres
R-3 Residential	0.00 acres	35%	0.00 acres	0.00 acres
R-4 Residential	0.00 acres	25%	0.00 acres	0.00 acres
R-5 Residential	0.00 acres	35%	0.00 acres	0.00 acres
RPB - Ride Pike Business District	5.63 acres	70%	3.94 acres	1.69 acres
RPW - Ridge Pike West District	0.00 acres	75%	0.00 acres	0.00 acres
MHP - Mobile Home Park	0.00 acres	30%	0.00 acres	0.00 acres
EVC - Evansburg Village Commercial	0.00 acres	50%	0.00 acres	0.00 acres
VC - Village Commercial	0.00 acres	50%	0.00 acres	0.00 acres
MU - Mixed Use	0.00 acres	75%	0.00 acres	0.00 acres
PBO - Professional Business Office	0.00 acres	65%	0.00 acres	0.00 acres
GC - General Commercial	27.60 acres	80%	22.08 acres	5.52 acres
HC - Highway Commercial	0.00 acres	80%	0.00 acres	0.00 acres
LI - Limited Industrial	0.00 acres	50%	0.00 acres	0.00 acres
IND - Industrial	0.00 acres	35%	0.00 acres	0.00 acres
IP - Industrial Park	52.73 acres	65%	34.27 acres	18.45 acres
Total from Zoning Districts:	229.87 acres		110.66 acres	119.21 acres
				803,848 sq.ft.
				5,192,795 sq.ft.

Total Drainage Area to Indian Creek:

Lawn Areas within Zoning Districts:	119.21 acres
Max Impervious Surface within Zoning Districts:	110.66 acres
	229.87 acres

Sediment Loading Ratios for Montgomery County:

Impervious developed areas: 1,839 lbs/acre/yr
 Pervious developed areas: 264.96 lbs/acre/yr

Indian Creek Watershed Sediment Loading:	235,092.66 lbs/acre/yr
10% Required Reduction:	23,509.27 lbs/acre/yr

Basin pollutant reductions at S. Trooper Rd & Egypt Rd: 23,686.32 lbs/acre/yr

LOWER PROVIDENCE TOWNSHIP

Stony Creek Watershed:

* Per DEP MS4 Requirements Tables - Stony Creek is impaired due to Siltation, therefore, a 10% reduction in siltation is required

Zoning District:	Area within Township encompassed by assigned District:	Maximum Allowable Impervious Coverage:	Potential Maximum Impervious Coverage:	Potential Minimum Lawn Coverage:
R-1 Residential	0.00 acres	35%	0.00 acres	0.00 acres
R-2 Residential	476.09 acres	35%	166.63 acres	309.46 acres
R-3 Residential	4.30 acres	35%	1.51 acres	2.80 acres
R-4 Residential	0.00 acres	25%	0.00 acres	0.00 acres
R-5 Residential	0.00 acres	35%	0.00 acres	0.00 acres
RPB - Ride Pike Business District	24.04 acres	70%	16.83 acres	7.21 acres
RPW - Ridge Pike West District	0.00 acres	75%	0.00 acres	0.00 acres
MHP - Mobile Home Park	5.68 acres	30%	1.70 acres	3.97 acres
EVC - Evansburg Village Commercial	0.00 acres	50%	0.00 acres	0.00 acres
VC - Village Commercial	0.00 acres	50%	0.00 acres	0.00 acres
MU - Mixed Use	0.00 acres	75%	0.00 acres	0.00 acres
PBO - Professional Business Office	0.00 acres	65%	0.00 acres	0.00 acres
GC - General Commercial	0.00 acres	80%	0.00 acres	0.00 acres
HC - Highway Commercial	0.00 acres	80%	0.00 acres	0.00 acres
LI - Limited Industrial	0.00 acres	50%	0.00 acres	0.00 acres
IND - Industrial	0.00 acres	35%	0.00 acres	0.00 acres
IP - Industrial Park	0.00 acres	65%	0.00 acres	0.00 acres
Total from Zoning Districts:	510.11 acres		186.67 acres	323.44 acres
			8,131,293 sq.ft.	14,089,168 sq.ft.

Total Drainage Area to Stony Creek:

Lawn Areas within Zoning Districts:	323.44 acres
Max Impervious Surface within Zoning Districts:	186.67 acres
	510.11 acres

Sediment Loading Ratios for Montgomery County:

Impervious developed areas:	1,839 lbs/acre/yr
Pervious developed areas:	264.96 lbs/acre/yr

Stony Creek Sediment Loading:	428,983.33 lbs/acre/yr
10% Required Reduction:	42,898.33 lbs/acre/yr

Basin pollutant reductions near Lloyd Lane:	30,461.29 lbs/acre/yr
Basin pollutant reductions near Henry Road:	15,066.38 lbs/acre/yr
Total proposed pollutant reductions:	45,527.67 lbs/acre/yr

Section C: *Mine Run Watershed*

Per PAG-13, Appendix B, the permittee shall implement the following Pollutant Control Measures (PCMs) within the drainage area of any outfall that discharges to waters impaired due to Pathogens (e.g., Fecal Coliform), regardless of whether there is an approved TMDL:

- A.** Within one (1) year of permit issuance, the permittee shall develop an inventory of all suspected and known sources of bacteria in stormwater within the drainage area of outfalls discharging to impaired waters. The inventory shall be submitted to DEP with the first Annual MS4 Status Report following General Permit coverage. The inventory must clearly identify whether the source is suspected or known, and the basis for this determination. The permittee shall also submit with the first Annual MS4 Status Report the proposed action(s) it plans to take during the permit term to control known sources.
- B.** Within three (3) years of completion of the inventory described in paragraph A, above, the permittee shall complete an investigation of each suspected source. This investigation must include stormwater sampling if the investigation is done as part of implementing the IDD&E program under MCM #3 of the General Permit, and otherwise is voluntary. The results of the investigation of suspected sources shall be submitted to DEP with an Annual MS4 Status Report no later than four (4) years following permit issuance.
- C.** All illicit and illegal discharges of sewage into the permittee's MS4 shall be eliminated. Anytime an illicit and illegal discharge of sewage into the MS4 is discovered by the permittee, the permittee shall report the finding in the subsequent Annual MS4 Status Report along with a description of remedial responses by the permittee.
- D.** The permittee shall conduct street sweeping and inlet cleaning at a minimum frequency of twice per year to collect bacteria that may be bound to solid material, with proper disposal of the collected materials.
- E.** If not already established in its Stormwater Management Ordinance (municipal permittees) or SOP (nonmunicipal permittees), the permittee shall enact an ordinance or develop and adopt an SOP that requires proper management of animal wastes on property owned by the permittee within three (3) years of coverage under this General Permit. If an existing ordinance or SOP exists that controls animal wastes, it must be attached to the first Annual MS4 Annual Report following coverage under this General Permit. If a new ordinance or SOP is enacted or developed, the new ordinance or SOP must be attached to the first Annual MS4 Status Report following enactment or development.
- F.** The permittee shall document the progress of its investigations, source control efforts and BMPs to control sources of pathogens in its Annual MS4 Status Reports

MINE RUN WATERSHED PROPOSED IMPROVEMENTS

The following basins within the Mine Run watershed are currently constructed as dry detention basins.

The basin outlet structures and interior areas of the basins are proposed to be modified to convert them to a dry extended release basin to assist in slowing and cooling runoff, while allowing the natural infiltration properties in the subsoil the greatest amount of time to absorb runoff prior to exiting the basin outlet structure in the predevelopment direction. This conversion shall extended the dewatering time of the basins.

The proposed modified basin floor areas shall be planted with bio-filtration plantings and swales constructed to extend the flowpath length and time of flow throughout the basin. Only the basin berm and partial side slopes are mowed to a maintainable grass height:

- Casselberry Drive
- Peacock Drive
- Redtail Park
- Redwing Lane
- Sunnyside Avenue

Streambank stabilization is proposed to improve areas of existing streambank that are severely eroded and impacting the watercourse. Both sides of the streambank shall be rehabilitated according to all DEP standards pertaining to a streambank stabilization project, including, but not limited to establishing a 35-foot riparian buffer on both sides of the streambank for the length of the proposed improvements. The proposed stabilization is located at:

- Mine Run crossing beneath Jode Road
- Mine Run crossing beneath Sheawater Drive

a. Proposed Pollutant Reduction Calculations:

Basin Location: Casselberry Drive

Drainage Area to Basin:

<i>Open Space Areas:</i>	<i>1.53 acres</i>
<i>Apartments/Condos:</i>	<i>9.78 acres</i>
<i>1/4 Acre Lots:</i>	<i>10.99 acres</i>
<hr/>	
<i>Total Area:</i>	<i>22.30 acres</i>

Sediment Loading Ratios for Montgomery County:

<i>Impervious developed areas:</i>	<i>1,839 lbs/acre/yr</i>
<i>Pervious developed areas:</i>	<i>264.96 lbs/acre/yr</i>

Total Sediment Loading to Basin: 38,605.20 lbs/acre/yr

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Existing Basin Configuration:

<i>Dry Detention Basin:</i>	<i>10% Sediment Reduction</i>
<i>Existing Sediment Removal:</i>	<i>3,860.52 lbs/acre/yr</i>

Proposed Basin Configuration:

<i>Extended Dry Detention Basin:</i>	<i>60% Sediment Reduction</i>
<i>Sediment Removal:</i>	<i>23,163.12 lbs/acre/yr</i>

Sediment Removal Effectiveness Increase: 19,302.60 lbs/acre/yr

Basin Location: Basin at Peacock Drive

Drainage Area to Basin:

1/2 Acre Lots: 12.09 acres

Sediment Loading Ratios for Montgomery County:

Impervious developed areas: 1,839 lbs/acre/yr

Total Sediment Loading to Basin: 22,239.03 lbs/acre/yr

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Existing Basin Configuration:

*Dry Detention Basin: 10% Sediment Reduction
Existing Sediment Removal: 2,223.90 lbs/acre/yr*

Proposed Basin Configuration:

*Extended Dry Detention Basin: 60% Sediment Reduction
Sediment Removal: 13,343.42 lbs/acre/yr*

Sediment Removal Effectiveness Increase: 11,119.51 lbs/acre/yr

Basin Location: Redtail Park

Drainage Area to Basin:

<i>Open Space Areas:</i>	<i>10.80 acres</i>
<i>1/4 Acre Lots:</i>	<i>7.81 acres</i>
Total Area:	18.61 acres

Sediment Loading Ratios for Montgomery County:

<i>Impervious developed areas:</i>	<i>1,839 lbs/acre/yr</i>
<i>Pervious developed areas:</i>	<i>264.96 lbs/acre/yr</i>

Total Sediment Loading to Basin: 17,224.42 lbs/acre/yr

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Existing Basin Configuration:

<i>Dry Detention Basin:</i>	<i>10% Sediment Reduction</i>
<i>Existing Sediment Removal:</i>	<i>1,722.44 lbs/acre/yr</i>

Proposed Basin Configuration:

<i>Extended Dry Detention Basin:</i>	<i>60% Sediment Reduction</i>
<i>Sediment Removal:</i>	<i>10,334.65 lbs/acre/yr</i>

Sediment Removal Effectiveness Increase: 8,612.21 lbs/acre/yr

Basin Location: Redwing Lane (2 Basins)

Drainage Area to Basin:

<i>Open Space Areas:</i>	<i>33.90 acres</i>
<i>School:</i>	<i>6.68 acres</i>
<i>1/4 Acre Lots:</i>	<i>113.63 acres</i>
<hr/>	
<i>Total Area:</i>	<i>154.21 acres</i>

Sediment Loading Ratios for Montgomery County:

<i>Impervious developed areas:</i>	<i>1,839 lbs/acre/yr</i>
<i>Pervious developed areas:</i>	<i>264.96 lbs/acre/yr</i>

Total Sediment Loading to Basin: 230,229.91 lbs/acre/yr

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Existing Basin Configuration:

<i>Dry Detention Basin:</i>	<i>10% Sediment Reduction</i>
<i>Existing Sediment Removal:</i>	<i>23,022.99 lbs/acre/yr</i>

Proposed Basin Configuration:

<i>Extended Dry Detention Basin:</i>	<i>60% Sediment Reduction</i>
<i>Sediment Removal:</i>	<i>138,137.95 lbs/acre/yr</i>

Sediment Removal Effectiveness Increase: 115,114.96 lbs/acre/yr

Basin Location: Sunnyside Ave

Drainage Area to Basin:

<i>Open Space Areas:</i>	<i>11.63 acres</i>
<i>1/3 Acre Lots:</i>	<i>7.79 acres</i>
<hr/>	
<i>Total Area:</i>	<i>19.42 acres</i>

Sediment Loading Ratios for Montgomery County:

<i>Impervious developed areas:</i>	<i>1,839 lbs/acre/yr</i>
<i>Pervious developed areas:</i>	<i>264.96 lbs/acre/yr</i>

Total Sediment Loading to Basin: 17,407.10 lbs/acre/yr

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Existing Basin Configuration:

<i>Dry Detention Basin:</i>	<i>10% Sediment Reduction</i>
<i>Existing Sediment Removal:</i>	<i>1,740.71 lbs/acre/yr</i>

Proposed Basin Configuration:

<i>Extended Dry Detention Basin:</i>	<i>60% Sediment Reduction</i>
<i>Sediment Removal:</i>	<i>10,444.26 lbs/acre/yr</i>

Sediment Removal Effectiveness Increase: 8,703.55 lbs/acre/yr

Mine Run- Streambank Stabilization at Jode Road

Length of Streambank Stabilization:

Length of proposed Stabilization (on both sides of the watercourse): **280 feet**

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Stream Restoration: **44.88 lbs/ft/yr of Sediment Removal**

Sediment Removal Effectiveness: 12,566.40 lbs/yr

Mine Run- Streambank Stabilization at Sheawater Drive

Length of Streambank Stabilization:

Length of proposed Stabilization (on both sides of the watercourse): **556 feet**

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Stream Restoration: **44.88 lbs/ft/yr of Sediment Removal**

Sediment Removal Effectiveness: 24,953.28 lbs/yr

Section D:
Indian Creek Watershed

**INDIAN CREEK WATERSHED
PROPOSED IMPROVEMENTS**

A bio-filtration Rain Garden is proposed to be constructed at the terminal storm inlet within the commercial properties located at South Trooper Road and Egypt Road.

The grass area at this terminal inlet will be excavated to create a sumped Rain Garden area with amended soils and an under-drain prior to discharge into the existing storm system within South Trooper Road.

The proposed Rain Garden will capture, slow, and cool runoff while retaining it within the sump area and amended soils to allow the greatest amount of time for infiltration and treatment prior to discharge.

a. Proposed Pollutant Reduction Calculations:

Basin Location: Commercial lots at S. Trooper Rd & Egypt Rd

Drainage Area to Basin:

Commercial parking lot: 16.10 acres

Sediment Loading Ratios for Montgomery County:

Impervious developed areas: 1,839 lbs/acre/yr

Total Sediment Loading to Basin: 29,607.90 lbs/acre/yr

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Proposed Rain Gardens:

Rain Gardens in A/B soils w/ underdrain: 80% Sediment Reduction
Sediment Removal: 23,686.32 lbs/acre/yr

Sediment Removal Effectiveness Increase: 23,686.32 lbs/acre/yr

Section E:
Stony Creek Watershed

**STONY CREEK WATERSHED
BASINS CONVERTED TO A NATURALIZED STATE**

The following basins within the Stony Creek watershed are currently constructed as dry detention basins.

The basin outlet structures and interior areas of the basins are proposed to be modified to convert them to a dry extended release basin to assist in slowing and cooling runoff, while allowing the natural infiltration properties in the subsoil the greatest amount of time to absorb runoff prior to exiting the basin outlet structure in the predevelopment direction. This conversion shall extend the dewatering time of the basins.

The proposed modified basin floor areas shall be planted with bio-filtration plantings and swales constructed to extend the flowpath length and time of flow throughout the basin. Only the basin berm and partial side slopes are mowed to a maintainable grass height:

- Henry Road
- Lloyd Lane & Trooper Road

a. Proposed Pollutant Reduction Calculations:

Basin Location: Henry Road

Drainage Area to Basin:

1/4 Acre Lots: 16.39 acres

Sediment Loading Ratios for Montgomery County:

Impervious developed areas: 1,839 lbs/acre/yr

Total Sediment Loading to Basin: 30,132.75 lbs/acre/yr

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Existing Basin Configuration:

*Dry Detention Basin: 10% Sediment Reduction
Existing Sediment Removal: 3,013.28 lbs/acre/yr*

Proposed Basin Configuration:

*Extended Dry Detention Basin: 60% Sediment Reduction
Sediment Removal: 18,079.65 lbs/acre/yr*

Sediment Removal Effectiveness Increase: 15,066.38 lbs/acre/yr

Basin Location: Basin at Lloyd Lane & Trooper Road

Drainage Area to Basin:

1/2 Acre Lots: 33.13 acres

Sediment Loading Ratios for Montgomery County:

Impervious developed areas: 1,839 lbs/acre/yr

Total Sediment Loading to Basin: 60,922.58 lbs/acre/yr

Per DEP BMP Effectiveness Values - Tables 3800-PM-BCW0100m:

Existing Basin Configuration:

*Dry Detention Basin: 10% Sediment Reduction
Existing Sediment Removal: 6,092.26 lbs/acre/yr*

Proposed Basin Configuration:

*Extended Dry Detention Basin: 60% Sediment Reduction
Sediment Removal: 36,553.55 lbs/acre/yr*

Sediment Removal Effectiveness Increase: 30,461.29 lbs/acre/yr

Section F: ***Operation and Maintenance of Naturalized Basins***

BMP Operation and Maintenance Notes:

- All inspections of post construction stormwater management BMPs shall be performed by the appointed representative of the Township. The operation and maintenance requirements for the post construction stormwater management BMPs proposed for this project include the following:

Maintenance of the Bio-filtration Basins:

- The owner, its assigns shall be responsible to ensure that the Bio-Filtration Basins are in operational condition, particularly the condition of the embankment, outlet structure, trash rack, riprap aprons, inlets, and other safety related items. Inspection shall be completed quarterly and after major rainfall events. Sediment removal shall be performed when the basin is completely dry. Any removed sediment should be disposed of properly, and once removed, disturbed areas need to be immediately restabilized and revegetated. Vegetation shall be inspected annually for erosion and invasive plant species. Any discovered invasive plant species shall be removed immediately. The outside embankment shall be mowed on a semi-annual basis. Maintain all Basin berm and perimeter areas on a weekly basis. The designated Bio-filtration areas of each basin shall be mowed twice yearly. Recommended Dates for mowing are early July for the first cutting and a second cutting in March up to April 15th. DO NOT apply pesticides or fertilizers where stormwater will be conveyed.

Maintenance of the storm sewer collection system: (After each runoff event)

- The owner, its assigns shall be responsible to ensure that the storm sewer collection and lawn drain system is free and clear of any debris. The system shall be inspected after each runoff event and cleaned if required.

