

**DRAFT**

**MS4 Wissahickon Creek TMDL Strategy Plan**

For

Horsham Township  
Montgomery County

January 2016

Prepared For:

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## **I. Introduction**

Horsham Township, located within Montgomery County, is comprised of 17.3 square miles of land. All areas of the Township will drain to one of three distinct watersheds; Neshaminy Creek (Little Neshaminy Sub-basin), Pennypack Creek, and Wissahickon Creek. See Appendix 'A' – Horsham Township Watershed Map. For the purpose of this “Strategy Plan” only the areas of the Township which are located within the Wissahickon Creek watershed will be considered. Additional strategy plans for areas of the Township that drain to the Neshaminy Creek and Pennypack Creek will be contained under separate covers.

The Township owns and maintains a small municipal separate storm sewer system (MS4), which requires a National Pollution Discharge Elimination System (NPDES) permit to allow the discharge of stormwater runoff to waters of the Commonwealth of Pennsylvania. The purpose of this “Strategy Plan” (Strategy) is to analyze the areas of the Township which drain to the Wissahickon Creek and identify ways to control runoff to the creek and comply with the requirements set forth in the NPDES permit. The Wissahickon Creek has a Total Maximum Daily Load Plan (TMDL), approved by EPA in 2003. The plan establishes sediment waste load allocations (WLA) for the Township limiting the amount of pollution permitted to be discharged to the waters of the Commonwealth of Pennsylvania. At the time of this strategy plan, the Wissahickon TMDL plan has a siltation (sediment) WLA attributed to Horsham Township. Nutrient WLAs have not been established for the Township’s MS4. Nutrient WLAs have been established for point sources within the watershed; however, no point sources discharge to the Township’s MS4 and are not subject to the MS4 permit requirements.

This Strategy intends to establish the WLA of the Township and to present a plan to reduce waste loads discharged from the MS4 to the Wissahickon Creek that are consistent with the WLA outlined in the approved TMDL Plan. Upon approval of this Strategy, the Township will provide MS4 TMDL Design Details to accompany this Strategy and satisfy the requirements of the Township’s MS4 NPDES Permit. Implementation of the Strategy is an adaptive, iterative, and dynamic process. The Strategy plan will be evaluated and updated by the Township on an as-needed basis based on its determined effectiveness and a cost/benefit analysis of the potential BMPs.

## II. Waste Load Allocation (WLA)

The EPA approved TMDL for the Wissahickon Creek identifies the WLA for sediment that is attributed to Horsham Township. The following table is taken from page 4-24 of the TMDL and outlines the existing pollutant load as well as the WLA for Horsham. The WLA is broken down into sediment attributed to stream bank erosion and sediment attributed to overland runoff. At the direction of DEP, this Strategy considers BMPs that will achieve an overall reduction target of 57.5% (combination of stream bank and overland WLAs).

*Table 1 – WLA for Horsham Township*

Municipality	Existing Load from Streambank Erosion (lbs/yr)	Streambank Erosion WLA (lbs/yr)	Percent Reduction for Streambank Erosion	Existing Overland Flow WLA (lbs/yr)	Overland Load WLA (lbs/yr)	Percent Reduction for Overland Flow	Total WLA (lbs/yr)	Total Percent Reduction Streambank & Overland
Horsham	2,611.24	1,267.20	51%	5,764.44	2,288.51	60%	3,555.71	57.5%

The approved TMDL is based on the entire drainage area to the creek, more specifically, the WLA outlined in Table 1 are based on flows being contributed from the entire 72.4 acres of Horsham Township that drain to the Wissahickon Creek (less than 1% of the total Township area). Since Horsham Township is only responsible for managing runoff that is collected by their storm sewer system and discharged to the creek, a parsing process was completed to remove areas which do not drain to the Township storm sewer system in order to generate a new WLA target.

For the purpose of the parsing plan, areas that were considered to be removed include: Areas draining to private storm sewer systems not owned by the Township (Private Roads and PennDOT highways) as well as areas that drain directly to the stream. Exhibits mapping the parsed areas are included in Appendix 'B' of this report. Below is a description of each parsed area:

### Area 'A' (27.6 Acres)

Area 'A', as identified in Appendix 'B', consists of the English Village Shopping Center and Apartment Complex located along Bethlehem Pike (SR 309). The English Village consists of private roads and a storm sewer system that is not owned and/or operated by the Township. A portion of the storm sewer system within the complex discharges directly to a PennDOT system along SR 309. The other portion flows to a detention basin that discharges directly to an unnamed tributary to the Trewellyn Creek.

Area 'B' (9.05 Acres)

Area 'B' consists of residential properties along Lower State Road. The topography of the areas is such that the entirety of the lots drains away from the right-of-way. The properties front on Lower State Road and the unnamed tributary to the Trewellyn Creek flows along the rear. This area is parsed out of the WLA due to its runoff directly discharging to the stream.

Area 'C' (6.79 Acres)

Area 'C' is the Gweynedd Crossing Shopping Center located at the corner of Bethlehem Pike (SR 309) and Welsh Road (SR 63). The storm sewer system for the shopping center discharges to PennDOT systems on Welsh Road and Bethlehem Pike and is therefore parsed out of the Township's WLA.

Area 'D' (6.21 Acres)

Area 'D' is comprised of commercial properties that have frontage on Welsh Road and Bethlehem Pike. The runoff from these properties either flows directly onto one of the state highways or has a storm sewer system that collects runoff on the property that is tied into PennDOT's storm sewer system. The area is parsed on the basis of discharging directly to a PennDOT owned and maintained storm sewer system.

Area 'E' (3.58 Acres)

Area 'E' represents the right-of-way of both Bethlehem Pike (SR 309) and Welsh Road (SR 63). These areas drain directly to storm sewer systems that are owned and operated by PennDOT.

Area 'F' (1.00 Acres)

Area 'F' is a small portion of the Township that drains to the Wissahickon Creek located at the intersection of Hemingway Drive and Welsh Road (SR 63). The area drains to Welsh Road and a storm sewer system that is owned and operated by PennDOT. Both private property draining to the state highway as well as the PennDOT right-of-way area are include within 'Area F'.

Area 'G' (14.32 Acres)

Area 'G' is comprised of commercial businesses that front on Welsh Road in the southeast corner of the Township. The storm sewer collection systems for these properties connect to the PennDOT storm sewer system located along Welsh Road (SR 63). Both private

property draining to the state highways, in addition to the area within the highway right-of-way, are included within 'Area G'.

**Re-calculation of WLA**

After the above-referenced parsed areas are removed from the Township's pollutant load responsibility, the remaining areas of the Wissahickon watershed within Horsham Township are considered to contribute pollutants from the MS4. Table 2 shows the re-calculated WLA based on the described parsing plan.

*Table 2 – WLA for Horsham Township (After Parsing)*

Row	Description	Unit	Value	Source
A	Area of Township in Wissahickon	Acres	74.30	Mapping (Appendix A)
B	Township Sediment Load	lbs/yr	8,375.68	TMDL
C	Township WLA	lbs/yr	3,555.71	TMDL
D	Township TMDL Required Pollutant Reduction	lbs/yr	4,819.97	TMDL
E	Reduction Percentage	%	57.50	(D / B)
F	Parsed Area	Acres	68.50	Mapping (Appendix B)
G	Parsed Area Percentage	%	92.20	(F / A)*100
H	Parsed Area Sediment Load	lbs/yr	653.30	(1-G)*B
I	MS4 Required Pollutant Reduction	%	57.50	TMDL
J	MS4 Required Pollutant Reduction	lbs/yr	375.65	I*H

The required MS4 Pollutant Reduction (375.65 lbs/year) represents the Township's obligation based on the area within the Wissahickon watershed that drains to the Township owned MS4 system.

**III. TMDL Compliance Strategy**

The Township plans to systematically achieve the required sediment reduction in the watershed through the use of structural and non-structural BMPs intended to remove sediment from runoff that is collected and conveyed by the Township owned storm sewer system. Due to a variety of factors and restrictions it may be unrealistic to achieve the required reduction percentages in the first permit term. Therefore, the Township has decided to implement the following schedule to achieve the reduction goal by year 25.

Assuming that future permit cycles will run for 5 years, as is the current standard; the Township proposes to reduce sedimentation as follows:

Years 1-5: Achieve 10% of Total Sediment Reduction

Years 6-10: Achieve 40% of Total Sediment Reduction

Years 11-15: Achieve 60% of Total Sediment Reduction

Years 16-20: Achieve 80% of Total Sediment Reduction

Years 21-25: Achieve 100% of Total Sediment Reduction

The Township feels that by setting realistic goals that can be quantified by “measurable” success, the reduction percentages outlined in the Wissahickon TMDL Plan can be met and water quality in the waterway can be positively impacted. The TMDL Strategy plan can be viewed as a “working” document that will need to be revised periodically in order to ensure that the BMPs implemented by the Township are effective in achieving the reduction goals set forth in this report. As funding or other opportunities become available the BMPs discussed below may need to be altered or new BMPs added to the strategy plan. The reason that the Township’s goal for the first 5 years is to achieve only a 10% reduction is due to budgetary restrictions. Future budgeting will allow additional funds to accrue in order to “catch up” to the long term goal.

#### Pollutant Load Concentration Calculation Method

In subsequent sections of this Strategy, pollutant load concentrations are required to quantify the amount of sediment generated from the area tributary to the proposed BMPs. To calculate the amount of pollutants contained in runoff from tributary areas, the pollutant load formula ( $\text{Pollutant Load} = \text{EMC} \times \text{Runoff Volume (Acre-feet)} \times 2.7$ ) and TSS EMC values from Worksheet 12, taken from the Pennsylvania Stormwater Best Management Practices Manual, were utilized. The following sediment concentrations were assumed for each ground cover within the Wissahickon watershed:

Forest (39 mg/l)

Meadow (47 mg/l)

Lawn, Low-Input (80 mg/l)

Medium Traffic Street (113 mg/l)

Residential Driveway (60 mg/l)

In an attempt to simplify the calculations so that a detailed runoff analysis of each drainage area was not required, the annual runoff depth for all areas was assumed to be 10 inches. The assumed annual runoff depth was suggested by the Temple Center for Sustainable Communities and is based on a water balance conducted by the USGS for the Pennypack Creek, which is assumed to have similar ground cover characteristics as the Wissahickon Creek.

#### Wissahickon Creek TMDL BMPs

The portion of the Wissahickon Creek watershed that is located within Horsham Township is unique in that it is relatively small and is comprised primarily of privately owned storm sewer systems that discharge to state owned and maintained roads and rights-of-way. Based on the parsing plan presented in this Strategy, it's been determined that the Township is ultimately responsible for the removal of 375.65 lbs of sediment per year from runoff that drains to the MS4.

As delineated on the parsing plan (Appendix B), the remaining area that the Township is responsible to manage is the Lower State Road right-of-way and the residential properties to the east of Lower State Road. This area ultimately drains into the right-of-way where runoff is collected by the MS4 via inlets located along Lower State Road. This area totals 5.8 acres and is comprised of Township owned right-of-way and private residential properties. Based on the relatively small area of the Township that drains to the Wissahickon (less than 1% of the total area of the Township) along with the fact that the parsing plan shows that Horsham is not responsible for approximately 92% of the area within the Wissahickon watershed; The Township plans to meet the sediment reduction requirements by implementing the following structural BMPs along Lower State Road:

#### BMP #1 - Water Quality Inserts (Snouts)

The Township currently owns and maintains three (3) inlets along the Lower State Road which collect runoff from approximately 2.3 acres. These inlets are currently not outfitted with sumps and/or water quality devices. By outfitting the most downstream inlet with a sump and water quality insert, pollutant reductions and sediment removal can be achieved. The following table outlines the pollutant removal ability of installing the snout:

Water Quality Snout (Lower State Road)						
Drainage Area (Acres)	Ground Cover (Acres)				Sediment Generated (lbs/year)	Sediment Removed (lbs/year)
	Lawn, Low-Input	Medium Traffic Street	Residential Driveway	Roof		
2.3	1.47	0.42	0.17	0.24	710.63	426.38

Sediment removal efficiency is based on recommended values for BMP 6.6.4: Water Quality Filters & Hydrodynamic Devices on page 183 of the PA DEP BMP Manual, 2006.

Ownership and maintenance of this BMP will be the responsibility of Horsham Township. The O&M plan for this BMP can be found in the accompanying “design details” (to be provided once the Strategy is approved).

#### BMP #2 – Residential Homeowner Outreach

The area that Horsham Township has available to implement BMPs within this extremely small area of the Township is limited. As such, the Township may explore the option of sending outreach letters to the residential homeowners that have properties within the area of the Wissahickon Creek watershed that has not been removed from the TMDL by parsing. The outreach letter will serve to open a dialog between the homeowners and Township and gauge the resident’s receptiveness to implementing BMPs, such as rain gardens, rain barrels, etc., on their properties. The letter will be in the form of a questionnaire to solicit a response and determine if installation of BMPs on any private properties adjacent to Lower State Road is feasible. Since the required reduction can be achieved through installation of a water quality insert along Lower State Road, the Residential Homeowner Outreach BMP will only be necessary if the Township determines that additional BMPs are needed within the watershed.

#### **IV. Public Participation**

As part of the preparation of this MS4 TMDL Strategy, PADEP requires solicitation of public involvement and participation. The following are required:

- A copy of the MS4 TMDL Strategy must be available for public review.
- Publish, in a newspaper of general circulation in the area, a public notice containing a statement describing the Strategy, where it may be reviewed in public, and the length of time provided for the receipt of comments.
- Accept written comments for a minimum of 30 days from the date of public notice.
- Accept any verbal or written comments from any interested member of the public at a public meeting or hearing.
- Consider and make a record of the consideration of each timely comment received from the public during the public comment period concerning the Strategy, identifying any changes made to the Strategy in response to the comment.

Submission of the MS4 TMDL Strategy to PADEP must include a copy of the newspaper notice, a copy of all written comments received from the public and a copy of the record of consideration of all timely comments received in the public comment period.

Documentation of public participation is included as Appendix C.

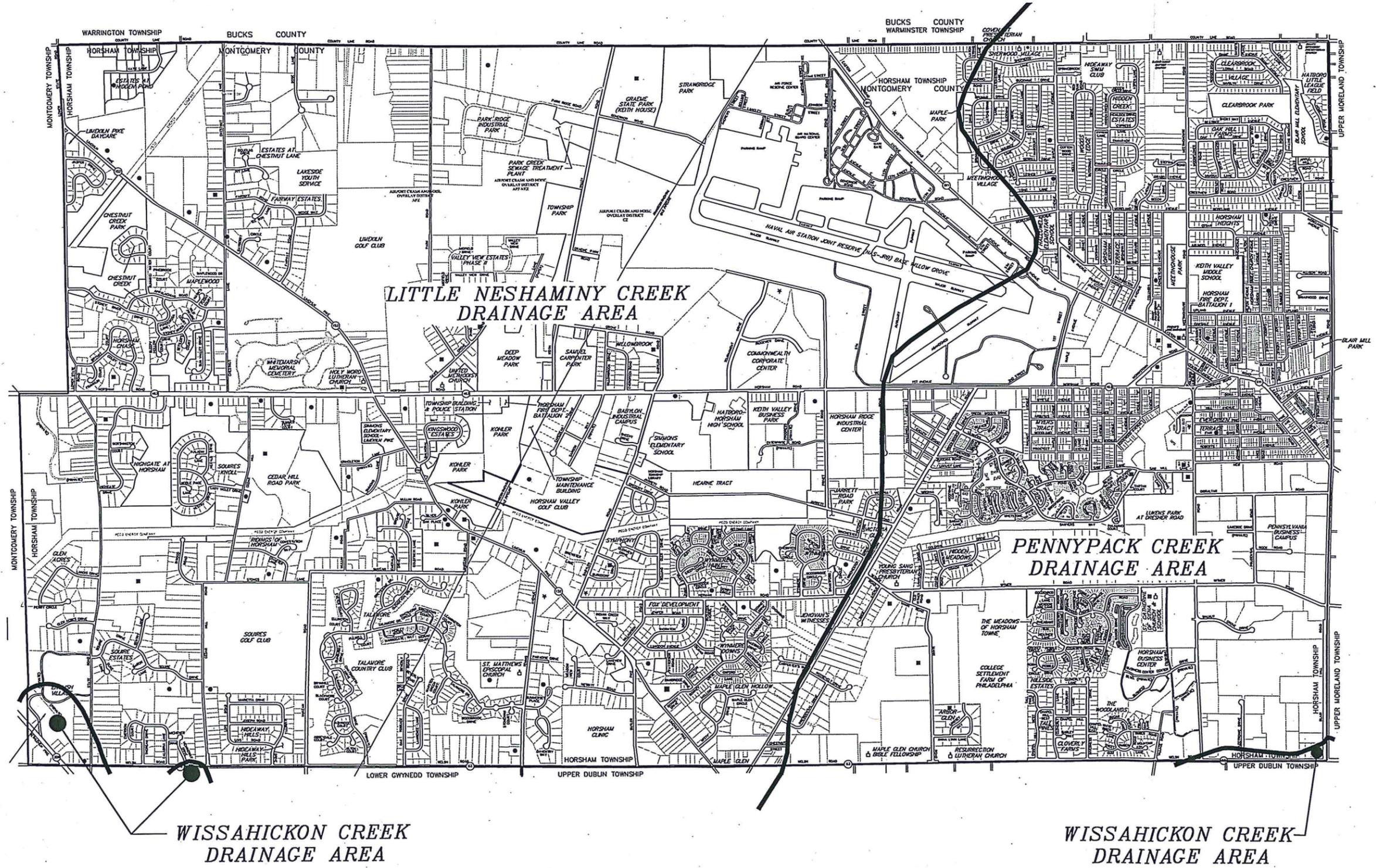
#### **V. Conclusion**

The Township is committed to implementing BMPs that will have a measurable impact to reduce the amount of sediment that reaches the Wissahickon creek from the Township's MS4. In subsequent permit cycles, this Strategy is to be evaluated for effectiveness and updated on an as-needed basis.

**APPENDIX A**

Horsham Township Watershed Boundary Map

# HORSHAM TOWNSHIP WATERSHED BOUNDARY MAP



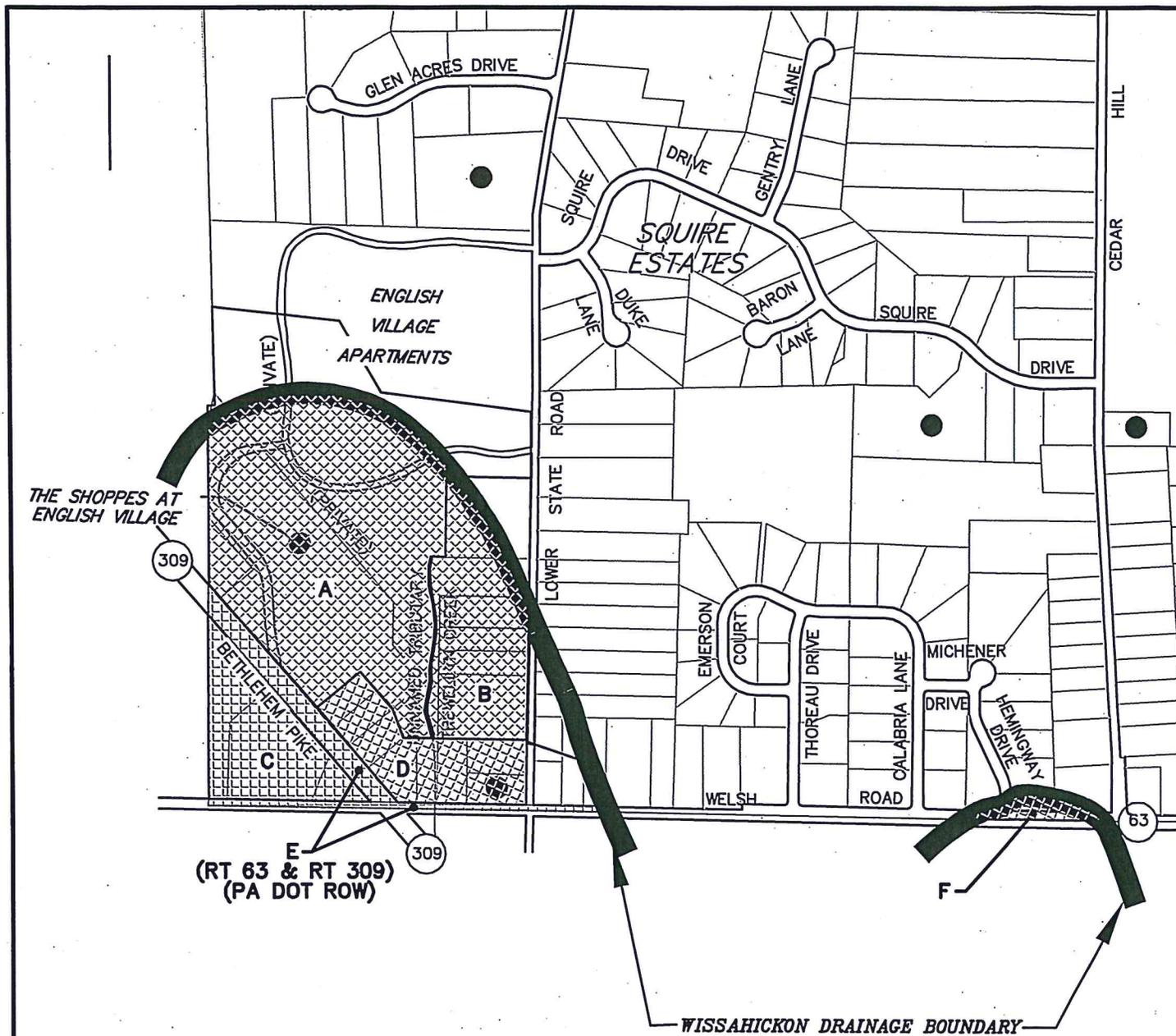
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## **APPENDIX B**

### Parsing Plan



**PARSING MAP (AREAS A-F)**  
**HORSHAM WISSAHICKON TMDL**

HORSHAM TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA



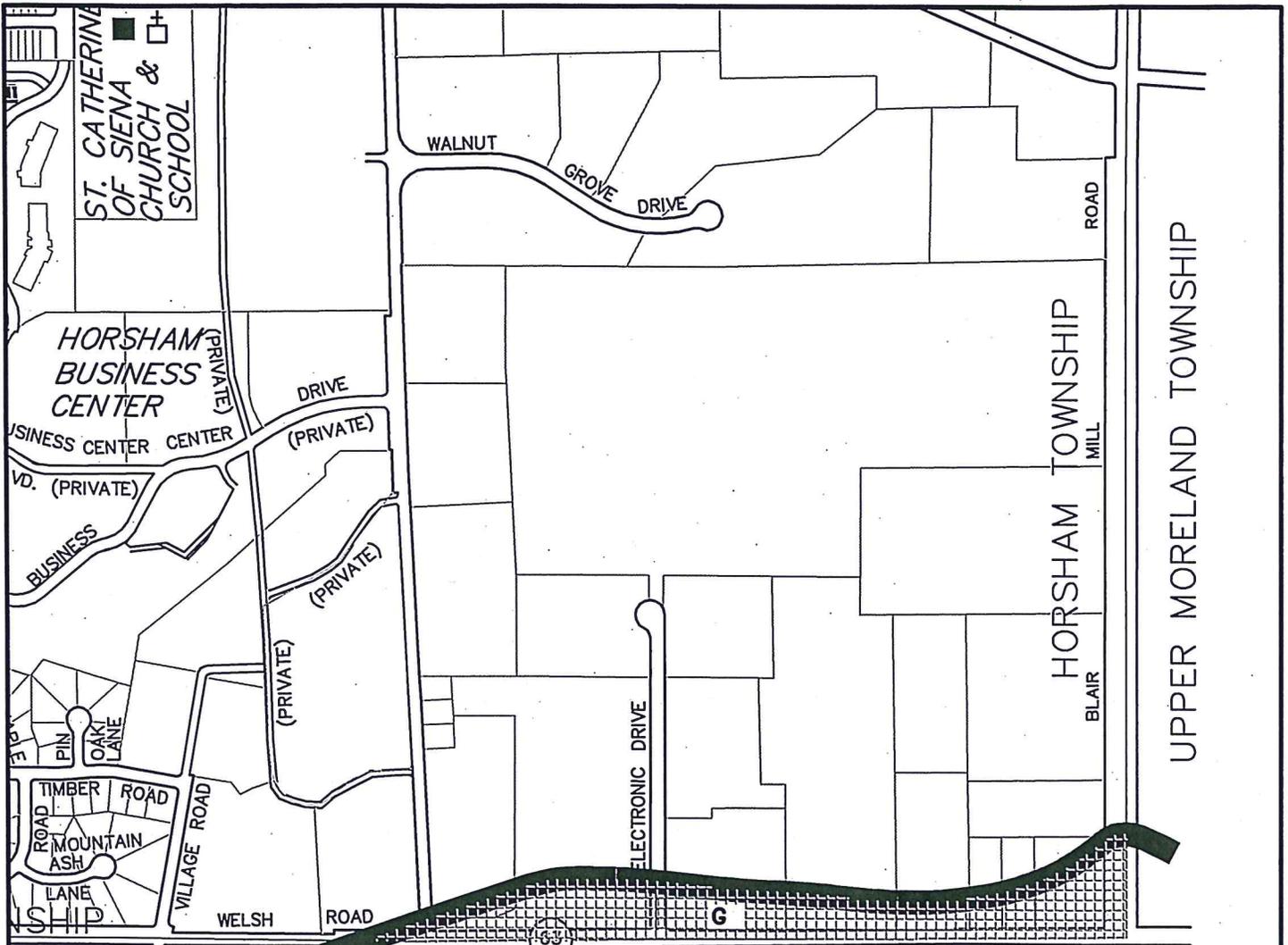
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**JOB NO.:** 12-07056

**DATE:** 1-17-15  
 REV 12-16-13

**SCALE:** 1"=750'



UPPER DUBLIN TOWNSHIP

*WISSAHICKON DRAINAGE BOUNDARY*

PARSING MAP (AREA "G")  
***HORSHAM WISSAHICKON TMDL***

HORSHAM TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA



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## **APPENDIX C**

**Public Comment Period (Documentation & Comments)**