



NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS WAIVER APPLICATION

 Type of Waiver: ☒ New Waiver ☐ Renewal of Waiver Waiver No.: PA_____

 Do you have existing NPDES permit coverage? ☒ Yes Permit No.: PAG130058 ☐ No

MS4 CLIENT/OPERATOR INFORMATION

Organization Name or Registered Fictitious Name

Franklin Township

Mailing Address Line 1

P.O. Box 118

Mailing Address Line 2

20 Municipal Lane

Address Last Line – City

Kemblesville

State

PA

ZIP+4

19347

Country

USA

WAIVER ELIGIBILITY INFORMATION

- | | | | |
|----|--|---|--|
| 1. | Does the MS4 serve a population of less than 1,000 within the urbanized area? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| | Population in UA: 277 in PRP Source: 2010 Census Data and extrapolation - refer to waiver justification | | |
| 2. | Does the MS4 serve a population under 10,000 within the municipality seeking a waiver? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| | Population in Municipality: 4352 Source: 2010 Census Data | | |
| 3. | Does the MS4 have at least one outfall that discharges stormwater to surface waters with an approved TMDL? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 4. | Does the MS4 discharge to any local surface water that is impaired for BOD (organic enrichment), sediment (siltation), pathogens, oil and grease and/or nutrients? | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 5. | Is advanced written approval of a waiver attached to this application? | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |

CERTIFICATION

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

Joan N. McVaugh

Name (type or print legibly)

Township Manager

Official Title

Signature

Date Signed

NARRATIVE: Waiver Justification

The following is a list of exhibit drawings included with this Waiver Justification:

- Exhibit 1 – Stream Assessment Map
- Exhibit 2 – Municipal MS4 Requirements Table
- Exhibit 3 – PADEP’s Technical Deficiency Letter, dated July 10, 2018
- Exhibit 4 – 2010 Census PA Urbanized Area Populations
- Exhibit 5 – Storm Sewersheds and Land Use – Sheet A PRP
- Exhibit 6 – Distance to Chesapeake Bay from eMapPA
- Exhibit 7 – Wiki Watershed Big Elk Creek Watershed
- Exhibit 8 – Stormwater Conveyance and Storm Sewersheds Sheet A PRP
- Exhibit 9 – MS4 Outfall Drainage Areas
- Exhibit 10 – Statewide MS4 Land Cover Estimates
- Exhibit 11 – Existing Stormwater BMPs

Franklin Township is currently covered by Permit No. PAG130058. Franklin Township is divided into three separate watersheds. The northern portion of the Township is tributary to the White Clay Creek/Christina River/Delaware River watershed. The southeastern portion of the Township is tributary to the Christina River/ Delaware River watershed. The southern portion of the Township is tributary to the Big Elk Creek/Chesapeake Bay watershed (see Exhibit 1 – Stream Assessment Map for the locations of the three watersheds).

The northern portion of the Township tributary to the White Clay Creek/Christina River/Delaware River watershed requires a TMDL plan to be completed since multiple tributaries of the White Clay Creek are deemed to be impaired or non-attaining. The southeastern portion of the Township tributary to the Christina River/Delaware River watershed does not require either a TMDL plan or a PRP plan to be completed since there is no urbanized area in this portion of the Township. The southern portion of the Township tributary to the Big Elk Creek/Chesapeake Bay watershed currently requires a PRP plan to be completed since the Chesapeake Bay is deemed to be impaired or non-attaining (see Exhibit 2 - Municipal MS4 Requirements Table for the Chesapeake Bay impairment).

Franklin Township was first made aware that a PRP Plan would be required for the Big Elk Creek/Chesapeake Bay watershed as per PADEP’s Technical Deficiency Letter, dated July 10, 2018 (see Exhibit 3 - PADEP’s Technical Deficiency Letter, dated July 10, 2018 for the requirement to complete a PRP plan). This issue was discussed at a meeting at PADEP’s southeast regional office on August 29, 2018. At that time, PADEP told representatives of Franklin Township that a waiver would not be acceptable due to the Chesapeake Bay impairment. Franklin Township does not agree with this verbal assessment since all of the streams within the PRP area are listed as not-impaired or attaining. In the past two years, Franklin Township has made a good faith effort to prepare a PRP plan for the Big Elk Creek/Chesapeake Bay watershed, but due to the limited area for selecting proposed locations for stormwater BMPs, Franklin Township has decided that a formal Waiver request for this area would be justifiable at this time.

This Waiver request is a **partial waiver request** and it only includes the southern portion of the Township tributary to the Big Elk Creek/Chesapeake Bay watershed and the requirement to complete a PRP plan for the Big Elk Creek/Chesapeake Bay watershed. Franklin Township intends to complete the required TMDL plan for the White Clay Creek/Christina River/Delaware River watershed and intends to implement proposed stormwater BMPs in this area.

The Census Bureau enlarged the urbanized area for 2010 even though there was little development within the majority of the new urbanized area (see Exhibit 1 – Stream Assessment Map for the location of the urbanized area within the TMDL area and within the PRP area).

Franklin Township has a total area of 13.2 square miles or 8,448 acres. The total amount of urbanized area within both the TMDL area and the PRP area is 4,662 acres. The TMDL area accounts for the majority of the urbanized area within Franklin Township. The TMDL area contains 4,227.4 acres of urbanized area and the PRP area contains 434.6 acres of urbanized area. The urbanized area within the PRP area accounts for approximately 5.1% (434.6 acres/8,448 acres) of the total Township area. The urbanized area within the PRP area accounts for approximately 9.3% (434.6 acres/4,662 acres) of the total urbanized area within the Township. Franklin Township considers the amount of urbanized area within the PRP area to be de minimus when compared to the total Township area and when compared to the total amount of urbanized area within the Township.

Franklin Township has a total population of 4,352. The total population of Franklin Township is less than 10,000 people. The population within the urbanized area for both the TMDL area and the PRP area is 2,977 (see Exhibit 4 – 2010 Census PA Urbanized Area Populations for the total Township population and the population within the urbanized area). Since the urbanized area within the PRP area accounts for approximately 9.3% of the total urbanized area within the Township, the population within both the urbanized area and within the PRP area is extrapolated to be 277 (.093 x 2,977). The population within both the urbanized area and within the PRP area is less than 1,000 people.

Within both the urbanized area and within the PRP area, the number of residential dwellings was estimated by a review of aerial imagery (see Exhibit 5 – Storm Sewersheds and Land Use – Sheet A PRP for the locations of the existing residential dwellings). Within both the urbanized area and within the PRP area, the total number of residential dwellings was determined to be approximately 157. Utilizing a ratio of 2.6 people per residential dwelling, the population within both the urbanized area and within the PRP area may be estimated to be 408 (2.6 x 157). The population within both the urbanized area and within the PRP area was determined to be less than 1,000 people utilizing a second method.

For the Waiver Application form, a population of 277 was utilized within the urbanized area and the PRP area. The 2010 Census data is considered to be a more reliable method to determine the population within both the urbanized area and within the PRP area.

The PRP area is tributary to the Big Elk Creek and then the Chesapeake Bay. Per the Municipal MS4 Requirements Table and the eMapPA website, the Big Elk Creek and all of its tributaries are determined to be not impaired or attaining. Franklin Township considers this to be a very important item to consider when reviewing this waiver application. All of the streams within the PRP area are determined to be not impaired or attaining and do not have a significant impact on the Chesapeake Bay impairment. 25 Pa. Code Chapter 93 designates the Big Elk Creek as a high quality stream (HQ-TSF, MF) which justifies that all of the streams within the PRP area are not impaired and are not contributing a detrimental amount of pollution to the Chesapeake Bay.

The Chesapeake Bay is deemed to be impaired or non-attaining for Appendix D – Nutrients, Siltation (4a) per the Municipal MS4 Requirements Table. The straight line distance between the urbanized area within the PRP area and the Chesapeake Bay is estimated to be 10.2 miles (see Exhibit 6 – Distance to Chesapeake Bay from eMapPA). The distance between the urbanized area within the PRP area and the impaired surface water is greater than 5 miles. Since the distance between the urbanized area within the PRP area and the impaired surface water is greater than 5 miles and the PRP area is located within a headwaters area of Big Elk Creek, the PRP area will not have a significant impact on the impairment of the Chesapeake Bay.

As per Wiki Watershed, the Big Elk Creek has a total drainage area of approximately 62.66 square miles or 40,102.4 acres (see Exhibit 7 – Wiki Watershed Big Elk Creek Watershed for the Big Elk Creek drainage area). Within both the PRP area and the urbanized area, 27 MS4 outfalls have been delineated per PADEP's requirements (see Exhibit 8 – Stormwater Conveyance and Storm Sewersheds Sheet A PRP for the location of the 27 MS4 outfalls). The 27 MS4 outfalls have a total MS4 drainage area or storm sewershed of 220.58 acres (see Exhibit 9 – MS4 outfall drainage areas). The total MS4 drainage area of 220.58 acres is approximately 0.55% (220.58 acres/40,102.4 acres) of the total Big Elk Creek Watershed. Franklin Township considers the total MS4 drainage area within the PRP to be de minimus when compared to the total Big Elk Creek Watershed. When comparing the total MS4 drainage area within the PRP to the entire Chesapeake Bay Watershed, the percentage of contributing drainage area would be significantly less than 0.55%.

The land uses within the PRP area and the urbanized area consists of a mixture of wooded areas, agricultural areas, residential lots, 1 school and a few small commercial properties. The majority of the land use areas consist of agricultural land (approx. 35%) and residential lots (approx. 50%). With significant areas of agricultural land and residential lots, the impervious surface within the urbanized area is low with the Statewide MS4 Land Cover Estimate appearing generally reasonable at 11% (see Exhibit 10 – Statewide MS4 Land Cover Estimates). Since the impervious surface area within the PRP area is low and the urbanized area is low, the impact to the Chesapeake Bay impairment is expected to be minimal.

The Simplified Method and the Statewide MS4 Land Cover Estimates were utilized to estimate the sediment load generated by the 27 MS4 outfalls within the PRP area. The 27 MS4 outfalls generate a sediment load of 72,853.74 lbs/yr. (see Exhibit 9 – MS4 Outfall Drainage Areas).

Within the PRP area and within the urbanized area, 6 existing stormwater BMPs have been identified. The 6 existing stormwater BMPs may be utilized to reduce the sediment load from the 27 MS4 outfalls. The sediment load reduction from the 6 existing stormwater BMPs is estimated to be 3,687.61 lbs/yr. (see Exhibit 11 – Existing Stormwater BMPs). The reduced sediment load with the deduction of the 6 existing stormwater BMPs is 69,166.13 lbs/yr.

All of the 6 existing stormwater BMPs are considered to be stormwater management basins. The stormwater management basins infiltrate stormwater into the groundwater and improve the water quality of the stormwater discharge from the existing stormwater BMP. All of the 6 existing stormwater BMPs are tributary to the Big Elk Creek/Chesapeake Bay watershed. The improvement to the water quality provided by the 6 existing stormwater BMPs reduces the pollutant loading and the amount of sediment discharged into the Big Elk Creek/Chesapeake Bay watershed.

For the 2018 to 2023 permit cycle, the PRP plan would require a 10% reduction in the sediment load. The PRP plan would require a sediment load reduction of 6,916.61 lbs/yr. ($0.1 \times 69,166.13$).

The requirement to prepare a PRP plan would necessitate the selection of proposed stormwater BMPs to satisfy the required sediment load reduction of 6,916.61 lbs/yr. The selection of suitable locations within the urbanized area and the within the PRP area to construct stormwater BMPs is not considered to be a simple task. The majority of the stream areas are wooded and not excessively eroded, thus are not suitable for stream restoration projects or riparian buffer projects. Franklin Township does not own any lands within the PRP area and there are no conservation easement areas. All proposed stormwater BMPs would be required to be constructed on private lands within the PRP area and would require underlying property owner approval.

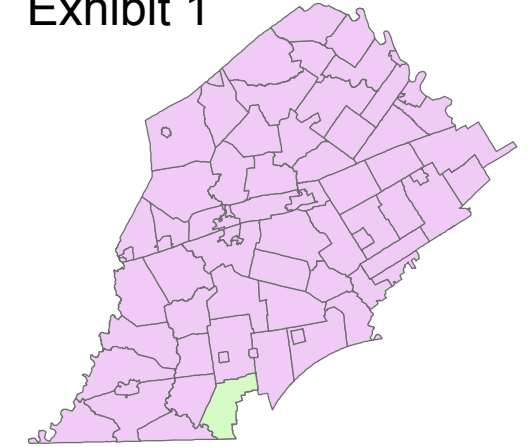
Franklin Township's stormwater management ordinance (Ordinance no. 2013-14) requires the post-development peak discharge rates to be reduced to pre-development peak discharge rates of a lower storm event (extended detention). The peak discharge rate for the post-development 2 year storm is required to be reduced to the peak discharge rate for the pre-development 1 year storm. This extended detention provides an improvement to water quality by providing longer detention times and reducing stream bank erosion by reducing discharge velocities within the urbanized areas. The requirements of Franklin Township's stormwater management ordinance mitigate the potential impacts to the Chesapeake Bay from future land development projects.

A Waiver from NPDES MS4 permitting for Franklin Township is being requested for many reasons including:

- The urbanized area within the PRP area is small (434.6 acres).
- The total Township population is small (4,352) and less than 10,000 people.
- The total population within both urbanized area and the PRP area is small (277) and is less than 1,000 people.
- None of the urbanized area within the PRP area drains to an impaired stream.
- The Big Elk Creek is considered to be a special protection watershed.
- None of the urbanized area within the PRP area drain to a stream with a TMDL or a Waste Load Allocation assigned.
- The distance from the urbanized area within the PRP area to the Chesapeake Bay is large (10.2 miles).
- The total number of MS4 outfalls generated by the urbanized area within the PRP area is low (27).
- The total MS4 drainage area of 220.58 acres is a very low percentage (0.55%) of the total Big Elk Creek watershed.
- The estimated amount of commercial, industrial and institutional areas within the urbanized area is low.
- The existing percentage impervious coverage within the urbanized area is low (11%).
- Existing stormwater BMPs (9 total) reduce the pollutant loading including nutrients and sediment via extended detention.
- The required 10% sediment load reduction for the PRP area is low (6,916.61 lbs/yr.).
- The selection of suitable locations within the urbanized area and within the PRP to construct proposed stormwater BMPs is considered to be difficult.
- Impacts of future development will continue to be mitigated due to Franklin Township's stormwater management ordinance requirements.

Franklin Township Chester County Stream Assessment

Exhibit 1



Legend

- Attaining Streams
- Non Attaining Streams
- Streams
- Chesapeake Bay Watershed
- Watershed Boundary
- State Road
- Township Road
- Private Road
- Ponds/Lakes
- Municipal Boundary
- Urban Areas 2010
- Parcels

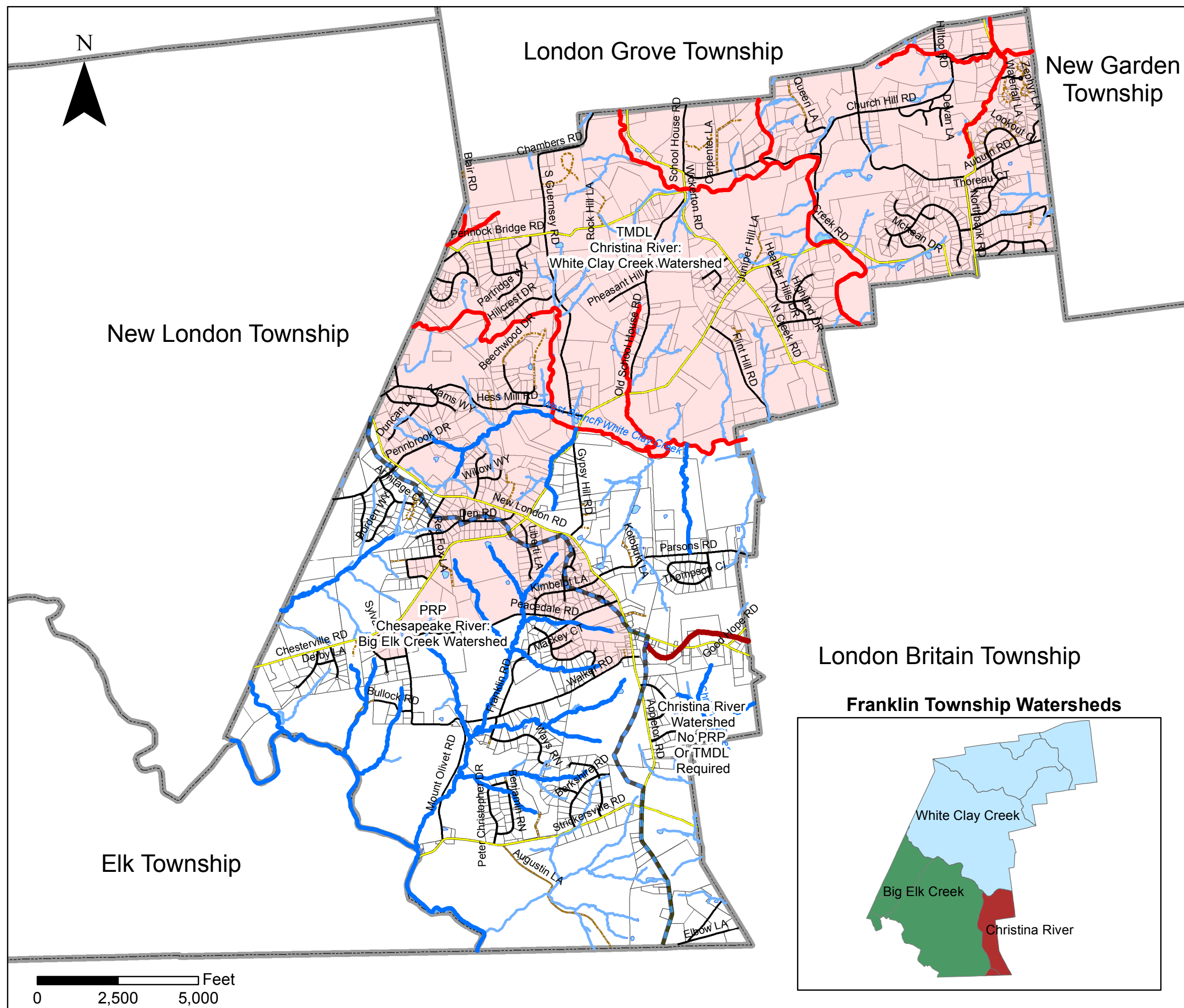
Notes:
 -Parcel boundaries, Municipal Boundaries, and Roads Data provided by Chester County GIS.
 -Streams data provided by Chester County GIS via Chester County Streams (line Features) -- via 1993 photo interpretation
 -2010 Urbanized Areas, Attaining, and Non-Attaining streams data provided by EMapGIS, 2016.

LTL CONSULTANTS, LTD.
ENGINEERS & CODE OFFICIALS

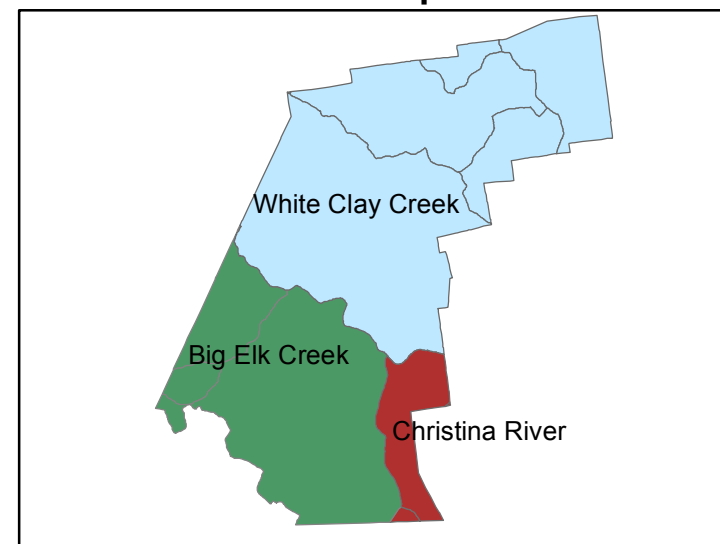
P.O. BOX 241
 ONE TOWN CENTRE DR.
 OLEY, PA 19547

(610) 987-9290
 FAX: (610) 987-9288

Document Path: E:\Franklin\0205-1508 MS4 Program\2018 MS4\Stream Assesment 013119.mxd



London Britain Township
Franklin Township Watersheds



MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Chester County						
EASTTOWN TWP	PAI130509	Yes	SP, IP	Crum Creek	Appendix E-Siltation (5)	Cause Unknown (5), Water/Flow Variability (4c)
				Darby Creek	Appendix C-PCB (5), Appendix E-Siltation (5)	Cause Unknown (5), Other Habitat Alterations, Water/Flow Variability (4c)
				Julip Run	Appendix C-PCB (5)	Cause Unknown (5), Water/Flow Variability (4c)
				Little Darby Creek	Appendix C-PCB (5)	Cause Unknown (5), Water/Flow Variability (4c)
ELK TWP		Yes	SP	Chesapeake Bay Nutrients/Sediment	Appendix D-Nutrients, Siltation (4a)	
FRANKLIN TWP	PAG130058	Yes	TMDL Plan, SP	White Clay Creek	Appendix B-Pathogens (5)	
				Chesapeake Bay Nutrients/Sediment	Appendix D-Nutrients, Siltation (4a)	
				Christina River Basin Sediment	TMDL Plan-Siltation, Suspended Solids (4a)	
				East Branch White Clay Creek	Appendix B-Pathogens (5)	
				Indian Run	Appendix B-Pathogens (5)	
				Middle Branch White Clay Creek	Appendix B-Pathogens (5)	
				Christina River Basin Nutrients	TMDL Plan-Nutrients, Organic Enrichment/Low D.O. (4a)	
				West Branch White Clay Creek	Appendix B-Pathogens (5)	
HONEY BROOK BORO		Yes	TMDL Plan, SP	Christina River Basin Sediment	TMDL Plan-Siltation, Suspended Solids (4a)	
				Christina River Basin Nutrients	TMDL Plan-Nutrients, Organic Enrichment/Low D.O. (4a)	
HONEY BROOK TWP	PAI130535	Yes	TMDL Plan, SP, IP	Chesapeake Bay Nutrients/Sediment	Appendix D-Nutrients, Siltation (4a)	
				Christina River Basin Nutrients	TMDL Plan-Nutrients, Organic Enrichment/Low D.O. (4a)	
				Christina River Basin Sediment	TMDL Plan-Siltation, Suspended Solids (4a)	
				Pequea Creek	Appendix E-Nutrients, Organic Enrichment/Low D.O., Siltation (4a)	
				West Branch Brandywine Creek	Appendix C-PCB (4a)	Water/Flow Variability (4c)
KENNETT SQUARE BORO	PAG130037	Yes	TMDL Plan	West Branch Red Clay Creek	Appendix C-PCB (4a)	
				Christina River Basin Sediment	TMDL Plan-Siltation, Suspended Solids (4a)	
				Red Clay Creek	Appendix C-PCB (4a)	
				Christina River Basin Nutrients	TMDL Plan-Nutrients, Organic Enrichment/Low D.O. (4a)	
KENNETT TWP	PAG130146	Yes	TMDL Plan	Unnamed Tributaries to East Branch Red Clay Creek		Cause Unknown (4a)
				Christina River Basin Sediment	TMDL Plan-Siltation, Suspended Solids (4a)	
				West Branch Red Clay Creek	Appendix C-PCB (4a)	
				Christina River Basin Nutrients	TMDL Plan-Nutrients, Organic Enrichment/Low D.O. (4a)	
				Burrows Run	Appendix C-PCB (4a)	
				Burroughs Brook	Appendix C-PCB (4a)	
				Bucktoe Creek	Appendix C-PCB (4a)	
				Red Clay Creek	Appendix C-PCB (4a)	



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Exhibit 3

July 10, 2018

Ms. Joan McVaugh
Franklin Township Chester County
20 Municipal Lane
P.O. Box 118
Kemblesville, PA 19347

Re: Technical Deficiencies – TMDL Plan
Franklin Township Chester County MS4 UA
NPDES Permit No. PAI130058
Authorization ID No. 1202105
Franklin Township, Chester County

Dear Ms. Mcvaugh:

The Department of Environmental Protection (DEP) has received your individual permit application for NPDES permit coverage along with your TMDL Plan. DEP has determined that there are significant technical deficiencies associated in your TMDL Plan that must be corrected. The technical deficiencies are as follows:

Public Participation:

- The plan does not provide evidence that a public meeting was held at which the plan was discussed and the public had an opportunity to provide comments. Please provide this evidence or otherwise re-publish notice of the availability of your plan, provide for a 30-day comment period, and discuss the plan during a public meeting within the comment period.

Mapping:

- Existing best management practices (BMPs) that serve to reduce existing pollutant loads are not identified on the map. Please correct and resubmit the map.
- Proposed best management practices (BMPs) that will be implemented to achieve pollutant reduction objectives are not identified on the map. Please correct and resubmit the map.
- The map shows areas that have been parsed; however, certain areas have been parsed incorrectly or are unauthorized. There are areas that are parsed out of the sewershed mapping and calculations that need to be included. Additionally, there are municipal roads that are not included as part of the sewersheds. Provide explanation for any areas that are not included as part of the sewersheds. Please correct and resubmit the map.
- Parsing has been done in the plan because the TMDL used the entire land area of the municipality instead of just the areas draining to impaired waters through the MS4. However, the calculations were done incorrectly. Areas were parsed out that should be included as part of the calculations. Please correct and resubmit the plan.

- All outfalls should be located on surface waters and the sewershed delineated from that point.
- Please identify all parsed areas on the map and provide a specific reason for the parsing. Ensure that all areas that have been parsed meet one of the 4 bullet points on the parsing guidelines document, which has been attached for your reference.

TMDL:

- Municipalities within the Christina Basin can use loading rates included in the TMDL and proceed using the Department's TMDL plan instructions **OR** the "Key outcomes of CCWRA/PADEP Communications Regarding Christina Basin TMDL & PRP calculations Process", ("Correspondence") **OR** the simplified method to calculate the existing loads and the loads to the BMP. However, these methods cannot be combined.
- If you choose to follow the Correspondence document, then you will need to follow the step-by-step instructions that have been provided and use the CMS loading rates that have been calculated for the White Clay Creek Watershed.
- Existing structural BMP's may be used to reduce the existing load, just as you would if you were completing a PRP.
- If you choose to follow the Correspondence document, then you will need to follow the step-by-step instructions and use the CMS loading rates that have been calculated for the White Clay Creek Watershed.

CBPRP:

- On the MS4 Requirements Table (Municipal) in Exhibit 2, Franklin Township is required to address Appendix D – Nutrients, Siltation (4a) for the Chesapeake Bay Nutrient/Sediment. A Chesapeake Bay Pollutant Reduction Plan was not submitted with the permit application please correct and resubmit your plan.

Selection of BMPs:

- It is unclear from the information in the plan as to which BMP(s) are being proposed for implementation. Please correct by identifying the BMP name(s) as used in the Chesapeake Bay Model and resubmit your plan.
- BMPs and Load reduction calculations have not been provided. Please correct and resubmit your plan.
- A conceptual plan as to how the wasteload allocations (WLAs) will be achieved is not contained in your plan; please correct and resubmit your plan.
- The reduction achieved by the reduction from the change of land uses is not sufficient in meeting the short-term and long-term requirements per the TMDL Plan Instructions. Moving forward the permittee needs to use the recalculated load as the load needed to be reduced (once the load is corrected per above comments)
- If you choose to recalculate the loading according to the Correspondence, then you may be able to reduce the existing load by taking reductions for structural BMP's as long as the reductions are also calculated in accordance with the Correspondence.

Funding:

- The plan does not identify probable sources of funding for each BMP. Plans need to specify probable sources of funding for each BMP, with alternatives in the event the funding sources do not materialize. Please correct and resubmit your plan.

Operation and Maintenance:

- The plan does not identify the entity that will be responsible for the operation and maintenance (O&M) of each proposed BMP. Please correct and resubmit your plan.

Please submit the information necessary to resolve the deficiencies identified in letter by no later than **September 10, 2018**. If your resubmission results in changes to the type or location of proposed BMPs, please note that you will be required to make those changes available to the public for review and comment prior to resubmission to DEP. In your resubmission, please include verification that the public participation process was completed. If you have any questions, please contact me at 484.250.5117.

Sincerely,



Juan J. Vicenty-Gonzalez
Permits Section
Clean Water Program

Enclosures

cc: LTL Consultants, Ltd.
Ms. Mahoney – Environmental Group Manager
Mr. Patel – Environmental Engineer Manager
NPDES File
Re

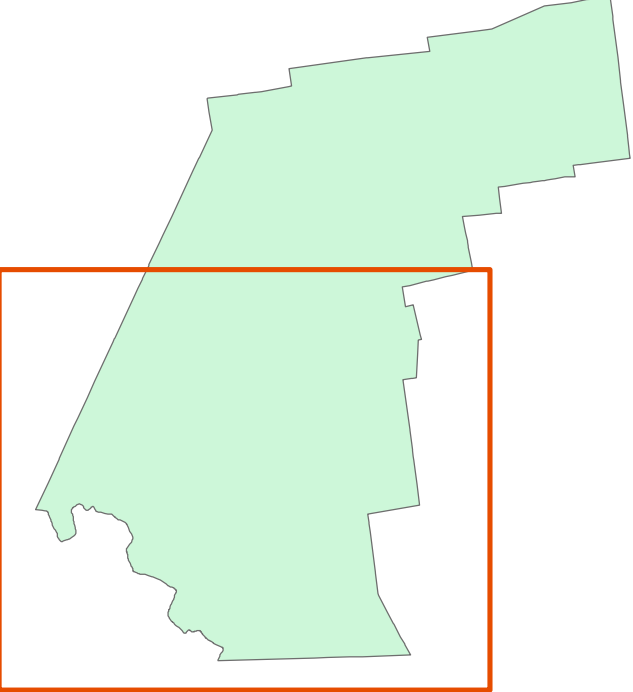
Exhibit 4

2010 Census PA Urbanized Area Populations






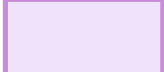



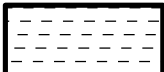




County	Township	Urbanized Area Name	Township population inside UA	Total township population	Percent of total population inside UA
Chester	Birmingham Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	3820	4208	90.78
	Charlestown Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	3359	5671	59.23
	East Bradford Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	9189	9942	92.43
	East Brandywine Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	6547	6742	97.11
	East Coventry Township	Pottstown, PA Urbanized Area	6393	6636	96.34
	East Fallowfield Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	5898	7449	79.18
	East Marlborough Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	6217	7026	88.49
	East Nottingham Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	6326	8650	73.13
	East Pikeland Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	6782	7079	95.8
	Easttown Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	10376	10477	99.04
	East Vincent Township	Pottstown, PA Urbanized Area	483	6821	7.08
	East Vincent Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	4230	6821	62.01
	Elk Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	472	1681	28.08
	Franklin Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	2977	4352	68.41
	Highland Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	8	1272	0.63
	Honey Brook Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	3408	7647	44.57
	Kennett Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	6301	7565	83.29
	London Britain Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	1552	3139	49.44
	Londonderry Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	196	2149	9.12
	London Grove Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	5822	7475	77.89
	Lower Oxford Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	2995	5200	57.6
	New Garden Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	11640	11984	97.13
	Newlin Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	157	1285	12.22
	New London Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	4906	5631	87.12
	North Coventry Township	Pottstown, PA Urbanized Area	7125	7866	90.58
	Penn Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	4585	5364	85.48
	Pennsbury Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	1950	3604	54.11
	Pocopson Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	3513	4582	76.67
	Sadsbury Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	2848	3570	79.78
	Schuylkill Township	Philadelphia, PA--NJ--DE--MD Urbanized Area	8186	8516	96.12
	South Coventry Township	Pottstown, PA Urbanized Area	1388	2604	53.3

Exhibit 5

Storm Sewersheds and Landuse Sheet A PRP

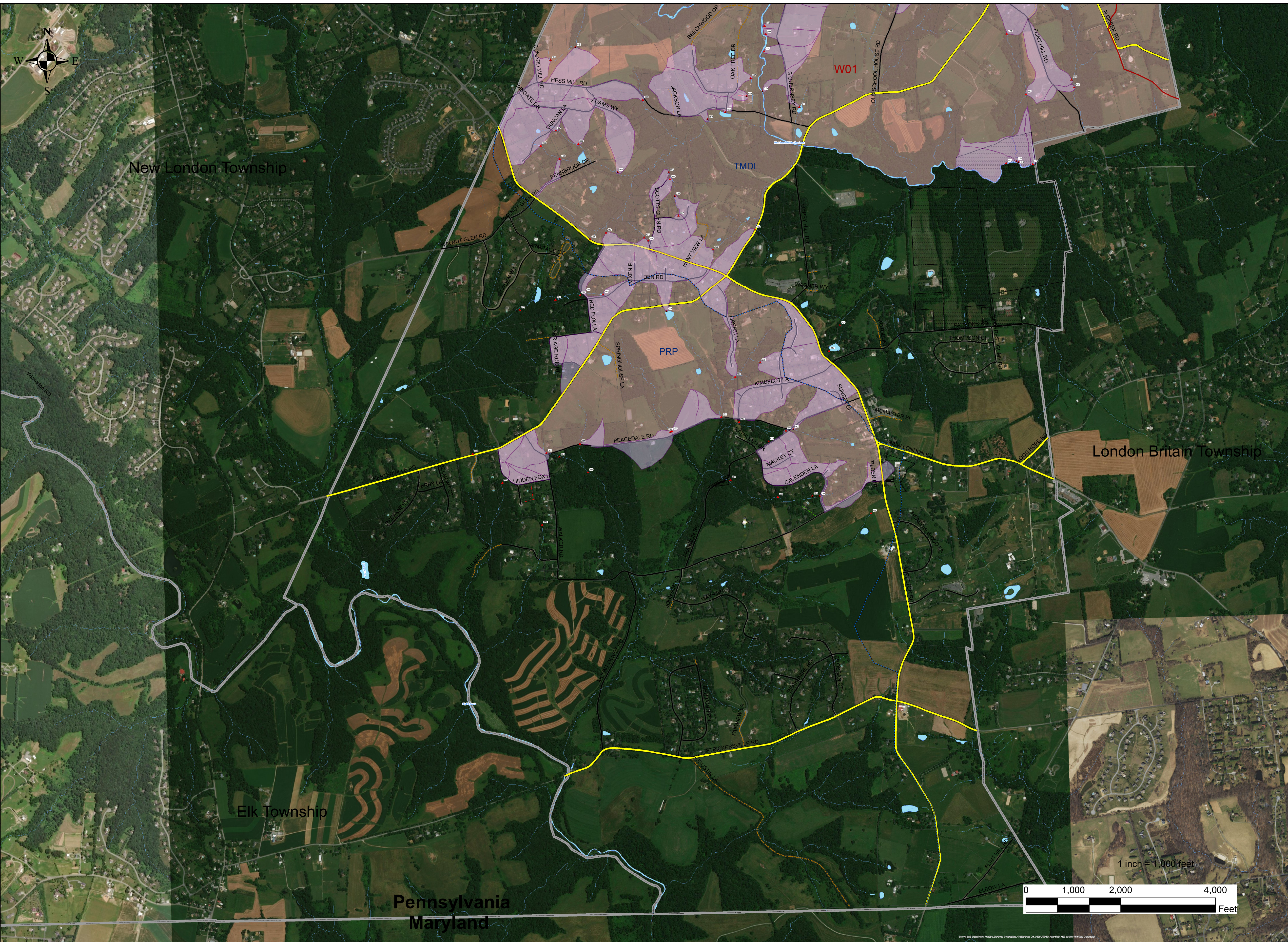
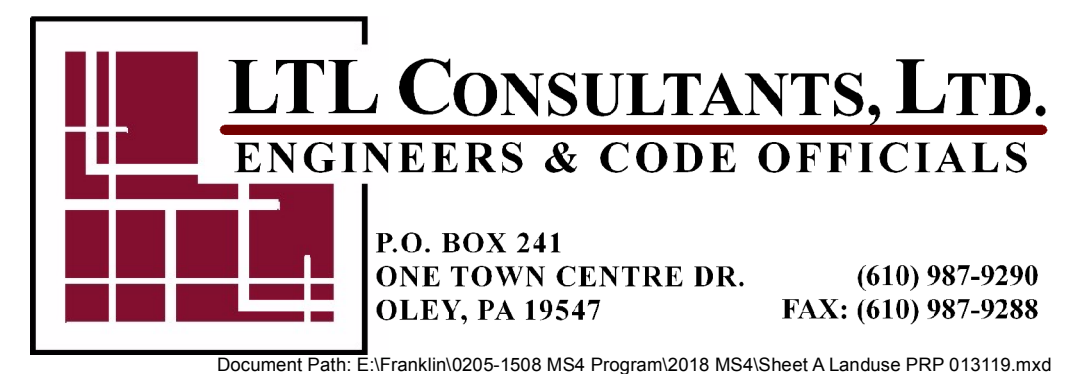


Legend

-  MS4 Outfalls
-  MS4 Observation Points
-  Chesapeake Bay Watershed
-  White Clay Creek Subwatershed Boundary
-  Streams
-  Planning Area - Storm Sewershed areas included in loading calculations
-  State Road
-  Township Road
-  Private Road
-  Township Owned Parcels
-  Parcels
-  Municipal Boundary
-  Ponds/Lakes
-  Urban Areas 2010

Notes:

- All pipe lengths are estimated, not to scale
- Parcel boundaries, Municipal Boundaries, and Roads Data provided by Chester County GIS.
- Storm Sewer System data based on approved subdivision plans and field verified provided by the Township, 2016
- Streams data provided by Chester County GIS via Chester County Streams (line Features) – via 1993 photo interpretation
- 2010 Urbanized Areas data provided by EMapGIS, 2016.



Layers Legend

► Buffer a Layer

► Buffer Sensitive Layer (I

► Extract Data

► Locate

▼ Measurement

 | Mile

Measurement R

10.2 Miles

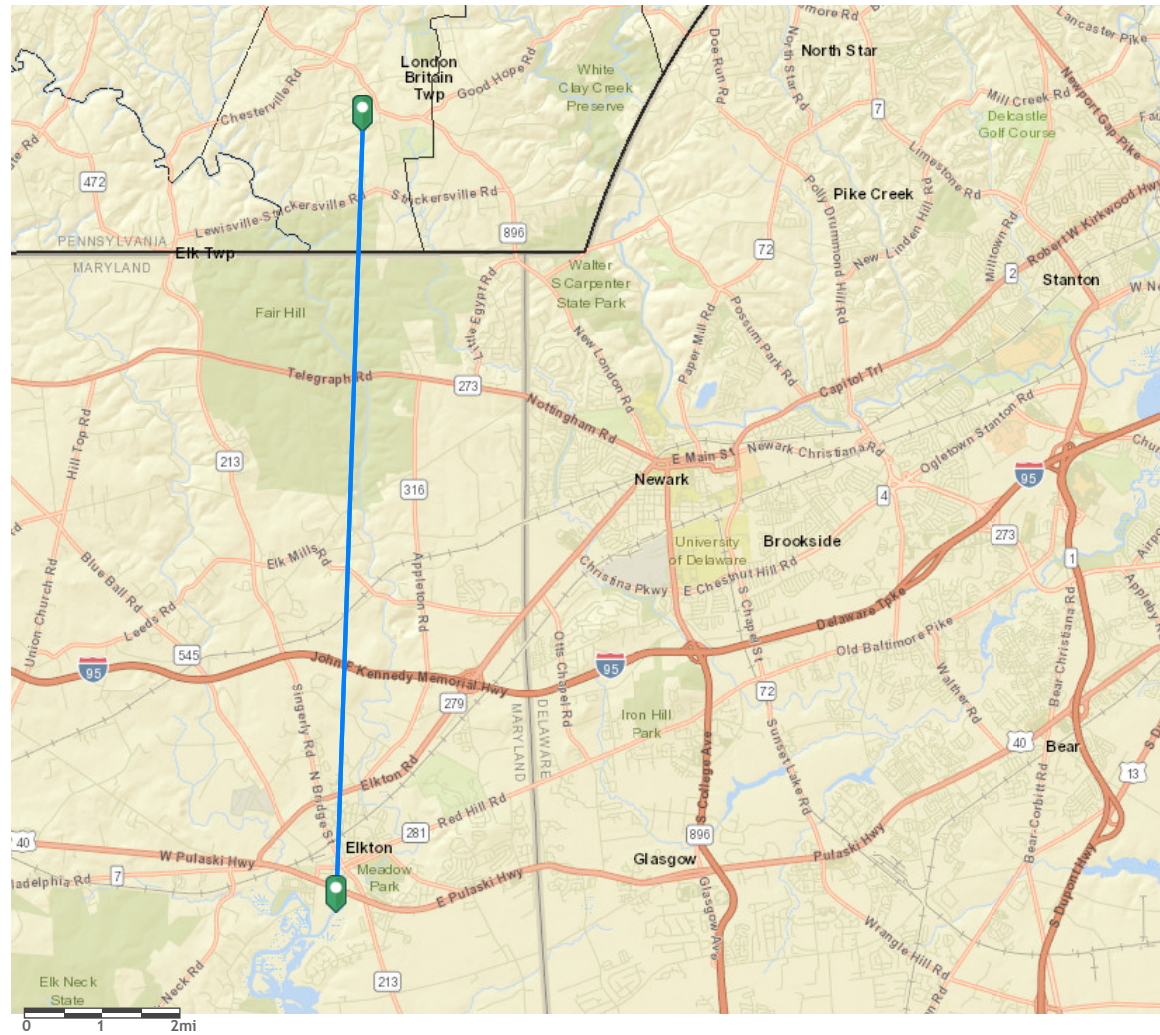
► Print

Exhibit 6

Map eFacts Query Advanced Query

ESRI Streets & Imagery Topographic National Geographic

Streets Imagery



Imagery: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; ESRI Streets: Sources: Esri, HERE, Garmin, USGS, Community

Analyze Monitor Model

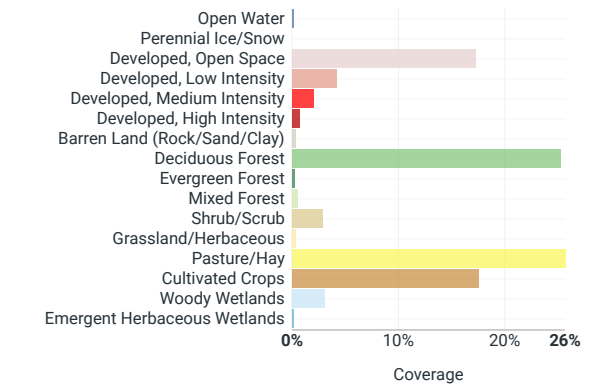
Continental US Medium Resolution 63 mi²

Streams Land Soil Terrain Climate Pt Sources Animals Water Qual

Land cover distribution

Land cover distribution

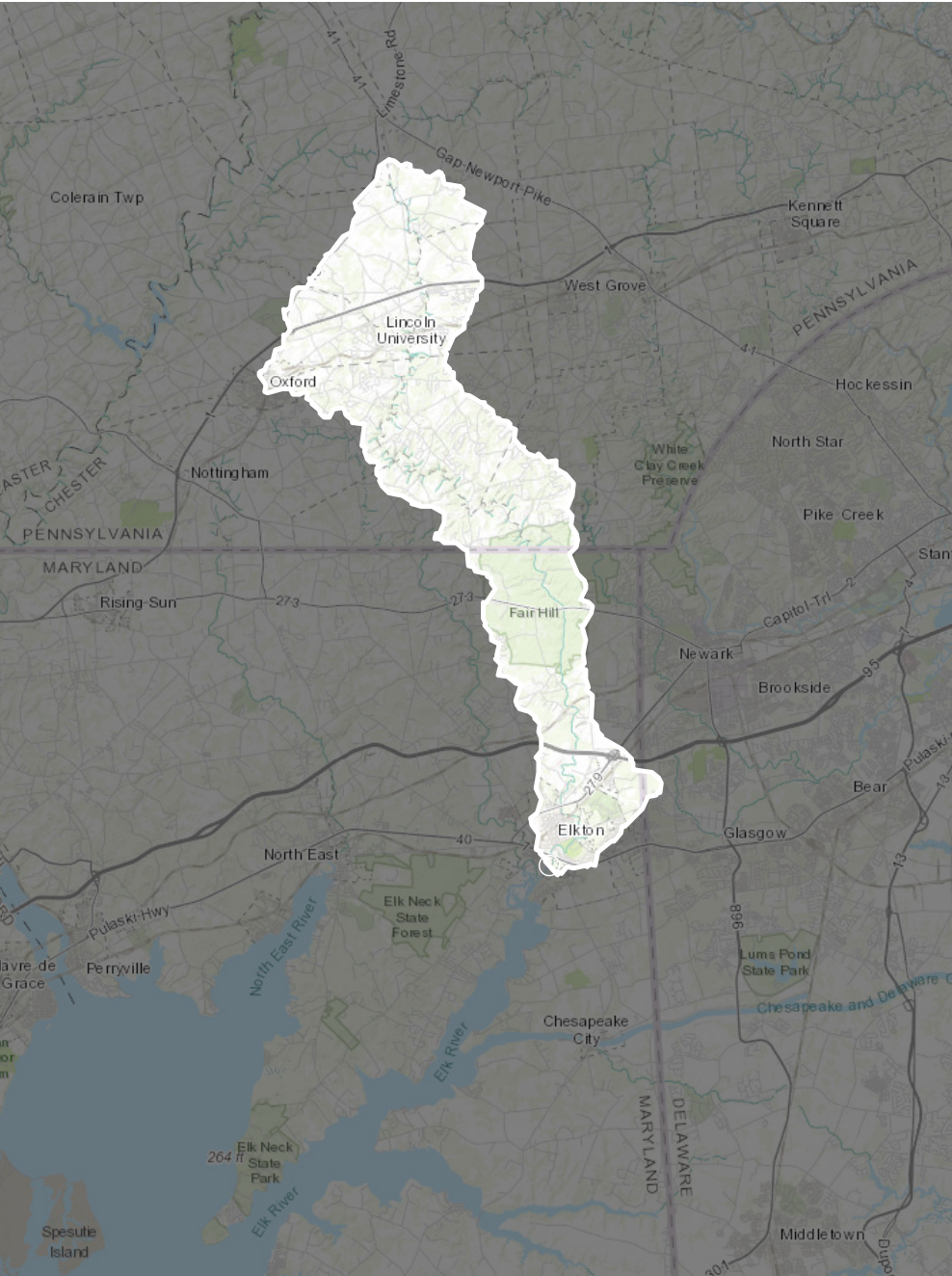
Related Layer: National Land Cover Database Turn on
Source: National Land Cover Database (NLCD 2011)



Type	Area (mi²)	Coverage (%)	Active River Area (mi²)
Open Water	0.03	0.05	0.02
Perennial Ice/Snow	0.00	0.00	0.00
Developed, Open Space	10.82	17.26	1.51
Developed, Low Intensity	2.61	4.16	0.38
Developed, Medium Intensity	1.27	2.02	0.14
Developed, High Intensity	0.42	0.66	0.04
Barren Land (Rock/Sand/Clay)	0.23	0.37	0.03
Deciduous Forest	15.79	25.21	4.58
Evergreen Forest	0.12	0.19	0.02
Mixed Forest	0.34	0.54	0.13
Shrub/Scrub	1.77	2.83	0.48
Grassland/Herbaceous	0.20	0.32	0.04
Pasture/Hay	16.09	25.68	1.84
Cultivated Crops	11.00	17.56	1.39
Woody Wetlands	1.89	3.01	1.57
Emergent Herbaceous Wetlands	0.09	0.15	0.07
Total	62.66	100.00	12.25

Download this data

Change area



Layers

Streams

Continental US Medium Resolution Stream Network

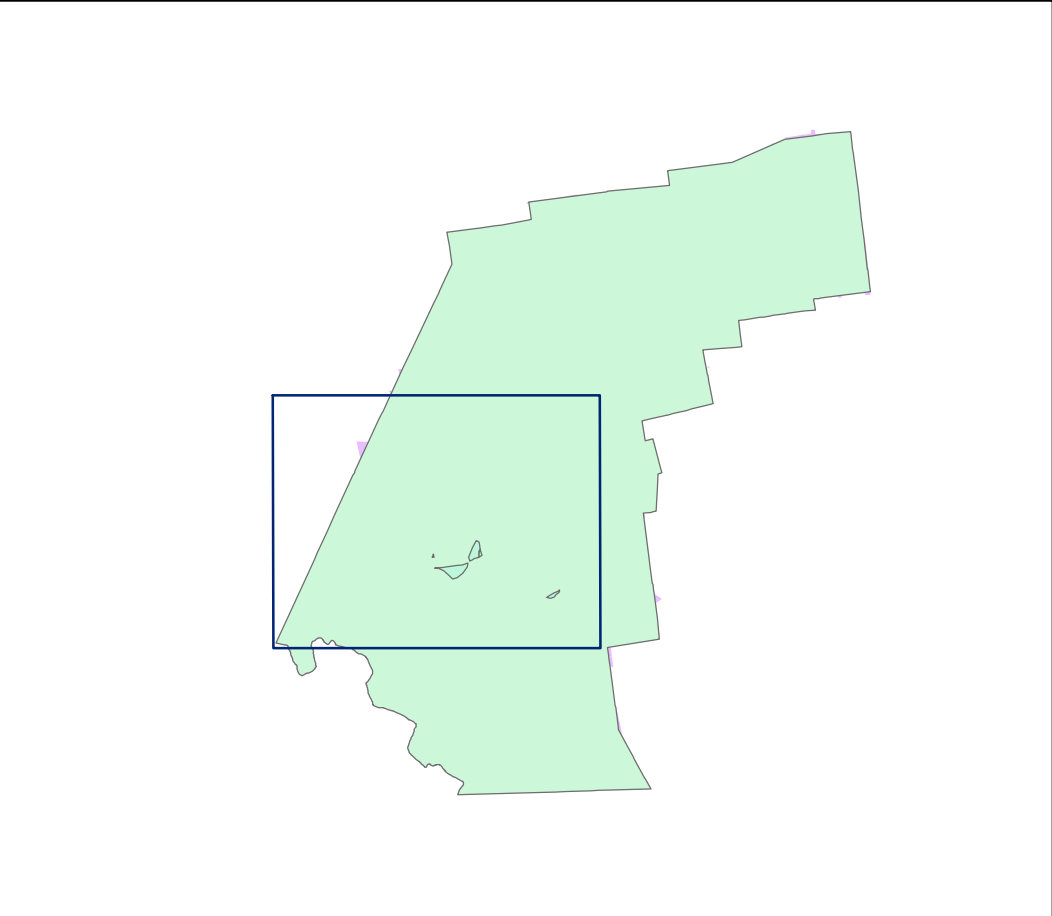
Delaware River Basin High Resolution Stream Network

Delaware River Basin TN

Map navigation controls: scale bar, north arrow, location pin, zoom in/out buttons, and a search icon.

Exhibit 8

Franklin Township
Chester County
Stormwater Conveyance
and Storm Sewersheds
Sheet A PRP



Legend

- MS4 Outfalls
- PennDOT Outfalls
- Private Outfalls
- MS4 Observation Points
- Municipal Inlet
- Double Grate Inlet
- Private Inlets
- PennDOT Inlets
- Junction Box
- Stormwater Pipe
- Crossslope/Calvert
- PennDOT Stormwater Pipe
- Private Stormwater Pipe
- Existing Stormwater BMPs with ID#
- TOWNSHIP, OPEN
- TOWNSHIP, UNDERGROUND
- Private, Proposed
- PRIVATE, OPEN
- PRIVATE, UNDERGROUND
- Swales
- PennDOT Swales
- Chesapeake Bay Watershed
- Streams
- Planning Area - Storm Sewershed areas included with loading calculations
- Non-Planning Area Storm Sewershed Area Tributary to MS4 Outfall and Downstream of Urbanized Area (Not Included in Calculations)
- Non-Planning Area with no flow from Municipal Roads or Property No Outfall to Surface Water within urbanized area
- Non-Planning Area Sheet Flow from Municipal Road or Municipal Property less than 300 ft from Surface Water
- Non-Planning Area Tributary to State or Private Road no Municipal Roads or Property
- Township Owned Parcels
- Parcels
- State Road
- Township Road
- Private Road
- Municipal Boundary
- Parcels
- Ponds/Lakes
- Urban Areas 2010
- 10' Contours

Notes:
- All pipe lengths are estimated, not to scale
- Parcel boundaries, Municipal Boundaries, and Roads Data provided by Chester County GIS
- Storm Sewer System data based on approved subdivision plans and field verified provided by the Township, 2016
- Streams data provided by Chester County GIS via Chester County Streams (line Features) -- via 1993 photo interpretation
- 2010 Urbanized Areas data provided by EMapGIS, 2016.

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Exhibit 9

outfall #	total area (acres)	impervious area (ac.) (11%)	pervious area (ac.) (89%)	impervious load (rate 1504.78 lbs/ac/yr)	pervious load (rate 185.12 lbs/ac/yr)	total existing sediment load (lbs/yr)
070	11.68	1.28	10.40	1933.34	1924.36	3857.70
071	19.52	2.15	17.37	3231.06	3216.05	6447.12
072	11.92	1.31	10.61	1973.07	1963.90	3936.97
075	4.96	0.55	4.41	821.01	817.19	1638.20
076	18.22	2.00	16.22	3015.88	3001.87	6017.75
077	5.03	0.55	4.48	832.59	828.73	1661.32
078	7.38	0.81	6.57	1221.58	1215.91	2437.49
079	12.39	1.36	11.03	2050.86	2041.34	4092.20
080	8.15	0.90	7.25	1349.04	1342.77	2691.80
081	4.51	0.50	4.01	746.52	743.05	1489.57
082	7.83	0.86	6.97	1296.07	1290.05	2586.11
083	9.07	1.00	8.07	1501.32	1494.34	2995.66
084	20.45	2.25	18.20	3385.00	3369.28	6754.28
085	4.17	0.46	3.71	690.24	687.04	1377.28
086	14.08	1.55	12.53	2330.60	2319.78	4650.38
087	1.98	0.22	1.76	327.74	326.22	653.96
141	2.87	0.32	2.55	475.06	472.85	947.91
142	8.92	0.98	7.94	1476.49	1469.63	2946.12
143	1.76	0.19	1.57	291.33	289.97	581.30
144	6.07	0.67	5.40	1004.74	1000.07	2004.82
147	4.80	0.53	4.27	794.52	790.83	1585.36
150	4.49	0.49	4.00	743.21	739.76	1482.97
151	7.66	0.84	6.82	1267.93	1262.04	2529.96
152	4.13	0.45	3.68	683.62	680.45	1364.07
153	6.69	0.74	5.95	1107.37	1102.22	2209.59
154	5.15	0.57	4.58	852.46	848.50	1700.96
155	6.70	0.74	5.96	1109.02	1103.87	2212.89
total	220.58	24.26	196.32	36511.68	36342.05	72853.74

Statewide MS4 Land Cover Estimates

County	Municipality	UA % Impervious	UA % Pervious	Outside of UA % Impervious	Outside of UA % Pervious	UA Acres
Erie	FAIRVIEW TWP	21%	79%	11%	89%	5,792.0
Luzerne	FAIRVIEW TWP	13%	87%	5%	95%	1,650.6
York	FAIRVIEW TWP	28%	72%	14%	86%	8,094.3
Washington	FALLOWFIELD TWP	17%	83%	6%	94%	1,649.4
Bucks	FALLS TWP	37%	63%	27%	73%	11,271.3
Beaver	FALLSTON BORO	34%	66%	34%	66%	345.4
Mercer	FARRELL CITY	54%	46%	55%	45%	1,455.4
Allegheny	FAWN TWP	13%	87%	4%	96%	582.8
Fayette	FAYETTE CITY BORO	30%	70%	26%	74%	155.2
Lackawanna	FELL TWP	15%	85%	5%	95%	1,378.0
York	FELTON BORO	17%	83%	17%	83%	325.6
Centre	FERGUSON TWP	27%	73%	7%	93%	5,420.0
Cambria	FERNDALE BORO	56%	44%	56%	44%	236.7
Allegheny	FINDLAY TWP	43%	57%	15%	85%	4,820.6
Washington	FINLEYVILLE BORO	64%	36%	63%	37%	74.2
Berks	FLEETWOOD BORO	52%	48%	52%	48%	660.9
Delaware	FOLCROFT BORO	32%	68%	32%	68%	895.0
Susquehanna	FOREST CITY BORO	29%	71%	28%	72%	597.0
Allegheny	FOREST HILLS BORO	46%	54%	46%	54%	996.8
Northampton	FORKS TWP	31%	69%	22%	78%	4,240.9
Luzerne	FORTY FORT BORO	45%	55%	45%	55%	972.4
Allegheny	FORWARD TWP	28%	72%	5%	95%	756.6
Butler	FORWARD TWP	8%	92%	2%	98%	344.6
Luzerne	FOSTER TWP	35%	65%	3%	97%	310.2
Lehigh	FOUNTAIN HILL BORO	55%	45%	55%	45%	485.2
Allegheny	FOX CHAPEL BORO	7%	93%	7%	93%	5,017.8
Montgomery	FRANCONIA TWP	25%	75%	24%	76%	8,060.4
Beaver	FRANKLIN TWP	7%	93%	7%	93%	11,612.8
Cambria	FRANKLIN BORO	33%	67%	32%	68%	365.1
Carbon	FRANKLIN TWP	25%	75%	8%	92%	969.4
Chester	FRANKLIN TWP	11%	89%	9%	91%	4,662.0
Fayette	FRANKLIN TWP	10%	90%	2%	98%	95.2
York	FRANKLIN TWP	16%	84%	5%	95%	1,128.3
Allegheny	FRANKLIN PARK BORO	23%	77%	17%	83%	5,922.8
York	FRANKLINTOWN BORO	46%	54%	28%	72%	78.1
Blair	FRANKSTOWN TWP	29%	71%	5%	95%	2,930.0
Allegheny	FRAZER TWP	37%	63%	7%	93%	753.7
Beaver	FREEDOM BORO	45%	55%	44%	56%	484.2
Blair	FREEDOM TWP	41%	59%	6%	94%	130.8
Luzerne	FREELAND BORO	51%	49%	50%	50%	429.6
Northampton	FREEMANSBURG BORO	36%	64%	35%	65%	458.6
Armstrong	FREEPORT BORO	17%	83%	16%	84%	682.4
Cambria	GEISTOWN BORO	54%	46%	53%	47%	679.2
Fayette	GEORGES TWP	12%	88%	4%	96%	2,529.5
Fayette	GERMAN TWP	19%	81%	3%	97%	172.8
Adams	GETTYSBURG BORO	47%	53%	47%	53%	1,063.7
Armstrong	GILPIN TWP	33%	67%	3%	97%	132.5
Erie	GIRARD BORO	31%	69%	27%	73%	1,221.8
Erie	GIRARD TWP	14%	86%	5%	95%	1,677.7
Allegheny	GLASSPORT BORO	37%	63%	37%	63%	1,140.8
Lackawanna	GLENBURN TWP	18%	82%	7%	93%	733.9
Northampton	GLENDON BORO	32%	68%	32%	68%	396.4
Allegheny	GLENFIELD BORO	14%	86%	15%	85%	401.2
Delaware	GLENOLDEN BORO	48%	52%	48%	52%	624.8

Exhibit 11

within area to bmp #	BMP	total area captured (ac.)	impervious area captured within UA (11%) (ac.)	pervious area captured within UA (89%) (ac.)	BMP effectvns value (%)	impervious sediment load reduction (rate 1504.78 lbs/ac/yr)	pervious sediment load reduction (rate 185.12 lbs/ac/yr)	total sediment load reduction (lbs/yr)
White Briar 7/19/01 BMP 082	Detention Basin #3	3.8	0.42	3.38	10	62.90	62.61	125.51
Kimbleville West 12/4/89 BMP 092	Infiltration Trench #1	1.3	0.14	1.16	95	204.42	203.47	407.90
Kimbleville West 12/4/89 BMP 093	Infiltration Trench #2	5.7	0.63	5.07	95	896.32	892.16	1788.48
Kimbleville West 12/4/89 BMP 095	Infiltration Trench #3	3.9	0.43	3.47	95	613.27	610.42	1223.70
Kimbleville West 12/4/89 BMP 096	Detention Basin #1	1.3	0.14	1.16	10	21.52	21.42	42.94
UPI #72-5-40 8/2018 BMP 111	150 Trees Tree Planting	1.5	0.17	1.34	20	49.66	49.43	99.08
Total		17.50	1.93	15.58		1848.10	1839.51	3687.61