

**NOTICE OF INTENT
INDIVIDUAL PERMIT
PAI -13 - 05044**

For

**West Brandywine Township
Chester County, PA**

Prepared By:
Herbert E. MacCombie, Jr., P.E.
Consulting Engineers & Surveyors, Inc.
1000 Palmers Mill Road
Media, PA 19063

December 31, 2015



APPLICATION FOR NPDES MS4 INDIVIDUAL PERMIT (IP)

FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)

- (1) Please read the attached instructions carefully before completing this application.
- (2) If any of your regulated small MS4s discharge into "special protection waters" you must use this Individual NPDES MS4 Permit application.
- (3) Check the appropriate box if you are submitting this application for a RENEWAL of your current permit, or if this application is for a NEW permit:

Renewal Permit (for renewal, please provide Permit Number) PAI-130544
 OR
New Permit

A. Multi-Municipal Joint Application									
1.	Is this application being made jointly with other municipalities? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "Yes", please complete the information below								
2.	Attach a completed and signed "Applicant Information for a Joint NPDES MS4 Authorization" for each joint permittee. Enter the total number of joint permittees: _____ A completed "Applicant Information for a Joint NPDES MS4 Authorization" is attached for each joint permittee. <input type="checkbox"/> Yes <input type="checkbox"/> No								
3.	Attach to this application a map (or maps) to show the locations of the regulated small MS4s, the urbanized area boundaries, and the municipal boundaries of each of the joint permittees. Are the required maps attached to this application? <input type="checkbox"/> Yes <input type="checkbox"/> No								
B. MS4 Operator Information									
1.	Name of MS4 Operator: West Brandywine Township								
2.	Contact Person: Dale Barnett								
3.	Title/Role: Manager								
4.	Division: _____ Department: _____								
5.	Phone Number: 610-380-8200 Fax: 610-384-4934								
6.	E-mail: engineercodes@wbrandywine.org								
7.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 2px;">Mailing Address:</td> <td style="padding: 2px;">Address Line 1: 198 Lafayette Road</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">Address Line 2:</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">City: Coatesville, PA</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">Zip Code: 19320</td> </tr> </table>	Mailing Address:	Address Line 1: 198 Lafayette Road		Address Line 2:		City: Coatesville, PA		Zip Code: 19320
Mailing Address:	Address Line 1: 198 Lafayette Road								
	Address Line 2:								
	City: Coatesville, PA								
	Zip Code: 19320								
8.	<input checked="" type="checkbox"/> Place a check mark in the box to indicate that all of the following map requirements are met: USGS Topographical, or equivalent, maps that show municipal boundaries for all permittees listed in Sections A or B above are enclosed; and the maps marked to show the location of regulated MS4 outfalls; and the maps are marked to show and identify all named Waters of the Commonwealth that receive discharges from each regulated MS4 outfalls.								

C. Urbanized Area (UA) Information	
Urbanized Area Name(s): Philadelphia, NW	UA #(s): 13

D. Description of Receiving Waters (refer to the instructions for more information).

List water bodies into which the regulated small MS4(s) discharge, their classification(s), uses, impairments, TMDL status, and location of the most downstream outfall.

1. Name of Waterbody	2.i. Designated Uses	2.ii. Existing Uses	3. 303(d) or 305(b) Listed? (Y/N)	4. TMDL ? (Y/N)	5. TMDL Parameter(s) List the Wasteload Allocation (WLA) and Load Allocation (LA) if applicable.	6. ID of most Downstream Outfall - 3-digit number.	7. Latitude (° ' ")	8. Longitude (° ' ")
a. West Branch Brandywine Creek B02	HQ-TSF-MF	Same	No	Yes	N-28.08 kg/dy P-0.536 kg/dy			
b. Unnamed Branches to WBBC B03	HQ-TSF-MF	Same	No	Yes	N-39.84 kg/dy P-7.246 kg/dy			
c. Indian Run B10	HQ-CWF	Same	Yes	Yes	N-38.86 kg/dy P-0.562kg/dy			
d. Culbertson Run B10	HQ-TSF-MF	Same	Yes	Yes	NOT IMPAIRED			
e. Beaver Creek B30	CWF-MF	Same	Yes	No	NO WLA's			
f.					No WLA's for Sediment were assigned to WBT			
g.								
h.								
i.								
j.								
k.								
l.								

9. Do any of the waterbodies that receive discharges from your regulated small MS4 qualify as either "High Quality" or "Exceptional Value" under 25 Pa. Code Chapter 93 of DEP's regulations? Yes No

E. Stormwater Management Program (SWMP)

MS4 operators must implement a written SWMP with BMPs to meet six (6) Minimum Control Measures (MCMs), including measurable goals and a schedule, as part of the application. The SWMP in Appendix A of the Authorization to Discharge meets this requirement.

Check the boxes next to each Minimum Control Measure in the following table to confirm that the Stormwater Management Program contained in Appendix A will be followed. **For any MCM in which the Program in DEP's version of Appendix A will not be followed, you must revise Appendix A to provide an alternative program that achieves equal or better protection of water quality.** In the right-hand column, provide the names of the person(s) responsible for implementing the program for each Minimum Control Measure.

Minimum Control Measures	Check to indicate that the MS4 Permittee will implement the MCM as provided in DEP's SWMP (i.e. DEP's Version of Appendix A)	Name and telephone number of the principal person responsible for implementation.
The permittee will implement the SWMP in Appendix A of the Authorization to Discharge. You must check the box in the center column, and provide the information in the right-hand column.	<input checked="" type="checkbox"/>	DALE BARNETT 610-380-8200
(1) Public Education and Outreach	<input checked="" type="checkbox"/>	SAME
(2) Public Participation and Involvement	<input checked="" type="checkbox"/>	SAME
(3) Illicit Discharge Detection and Elimination	<input checked="" type="checkbox"/>	SAME
<p>(4) Construction Site Stormwater Runoff Control, and (5) BMPs #1, #2, and #3 of the MCM for Post-Construction Stormwater Management in New Development and Redevelopment</p> <p>You must check one (1) of the two (2) boxes in the column to the right and fill-in the blanks as indicated.</p> <p>Check the following box if you will implement these MCMs as provided in DEP's SWMP (i.e. DEP's Version of Appendix A) <input checked="" type="checkbox"/></p>	<p><input checked="" type="checkbox"/> MCM #4.A: The permittee will rely on DEP's statewide program for issuing National Pollutant Discharge Elimination System (NPDES) Permits for Stormwater Discharges Associated with Construction Activities to satisfy all requirements under this MCM #4 and all requirements described under BMPs #1 through #3 of MCM #5 in DEP's version of Appendix A. In this case, the permittee is not required as a condition of this permit to implement any of the BMPs listed under MCM #4 nor any of the requirements described in first three (3) BMPs listed under MCM #5 in DEP's version of Appendix A of the Authorization to Discharge.</p> <p>Note: The permittee may not issue any final approvals for development or redevelopment projects that require NPDES permits for discharges of stormwater from construction sites until after DEP or a delegated County Conservation District issues the NPDES Permit for Stormwater Discharges Associated with Construction Activities.</p>	

	<input type="checkbox"/> MCM #4.B: The permittee is not relying on DEP's program for issuing NPDES Permits for Stormwater Discharges Associated with Construction Activities; therefore, the permittee must satisfy all of the requirements described in all of the BMPs listed under MCM #4 and all of the requirements in the BMPs #1, #2, and #3 under MCM #5 in DEP's version of Appendix A of the Authorization to Discharge.	Name of person responsible: _____ Telephone number: _____
(5)BMPs #4, #5, and #6 of the MDM for Post Construction Stormwater Management in New Development and Redevelopment	<input checked="" type="checkbox"/>	DALE BARNETT 610-380-8200
(6) Pollution Prevention and Good Housekeeping for Municipal Operations and Maintenance	<input checked="" type="checkbox"/>	TOM EELLS 610-380-8200

F. MS4 TMDL Plan for Discharges to Impaired Waters with a TMDL

Additional Requirement to have a written MS4 TMDL Plan for Impaired Waters with a TMDL: If any outfalls of your regulated small MS4 discharges stormwater into any portion of a receiving water with applicable wasteload allocations in an approved TMDL, you must develop, submit to DEP for approval, and ensure implementation of a written MS4 TMDL Plan that achieves pollutant reductions consistent with the assumptions and requirements of the wasteload allocations in applicable TMDLs. Refer to Section 2, Part C, of the Authorization to Discharge for the list of ten (10) components that shall be addressed in the MS4 TMDL Strategy component of the MS4 TMDL Plan, **which shall be submitted as a written attachment to this application.**

Is any of your regulated small MS4 discharging stormwater to any portion of receiving waters with applicable WLAs in an approved TMDL? Yes No

If you answered yes above, then you must complete the remainder of this section.

Name and telephone number of the principal person responsible for preparation and implementation of the MS4 TMDL Plan.

Name: _____ Phone: _____
 Preparation: James W. MacCombie, P.E., P.L.S. 610-356-9550
 Implementation: Dale Barnett and Tom Eels 610-380-8200

Check one (1) of the following boxes to indicate how your MS4 TMDL Plan was developed:

- Your MS4 TMDL Plan implements and enforces the TMDL control measures from a watershed or regional TMDL Plan; or
- You will develop, submit to DEP for approval, and ensure implementation of your own TMDL control measures for your MS4 TMDL Plan according to the guidance in Section II.F of the Instructions.

Signature and Seal by Professional Engineer (PE) for MS4 TMDL Plans

If an MS4 TMDL Plan is required, do the components submitted with this application include the signature and seal of a professional engineer with a valid license in good standing from the Pennsylvania Department of State as required? Yes No

G. Discharges to the Chesapeake Bay

Are any of your regulated small MS4s located in or discharging to any receiving watersheds that drain to the Chesapeake Bay? Yes No

If you answered yes above, then within twelve (12) months of the effective date of your Approval of Individual Permit Coverage, you must develop and submit to DEP for approval a Chesapeake Bay Pollutant Reduction Plan;

Your Chesapeake Bay Pollutant Reduction Plan may incorporate portions of MS4 TMDL Plans that address applicable waste load allocations (WLAs) for sediment, nitrogen, or phosphorus associated with existing stormwater discharges to watersheds that drain to the Chesapeake Bay as described in Part C(1) of the Authorization to Discharge. Will your Chesapeake Bay Pollutant Reduction Plan incorporate portions of any MS4 TMDL Plans? Yes No

Signature and Seal by Professional Engineer (PE) for Chesapeake Bay Pollutant Reduction Plan

Indicate by checking the following box that your Chesapeake Bay Pollutant Reduction Plan will include the signature and seal of a professional engineer with a valid license in good standing from the Pennsylvania Department of State as required? Yes

H. Discharges to Impaired Waters without a TMDL

For each regulated small MS4 that discharges stormwater into any portion of a receiving water that is impaired, but does not have an approved TMDL, permittees shall ensure that new discharges from the permittee's regulated small MS4s do not cause or contribute to exceedances of water quality standards. Permittees must:

- a. identify outfalls that discharge to impaired waters;
- b. identify additional or modified BMPs in the SWMP to ensure that discharges do not cause or contribute to the impairment; and
- c. implement such BMPs and report on the status of each.

For each outfall that discharges to impaired waters, list the outfall, the impairment, and the BMPs that will be added or modified to the SWMP to ensure that new discharges from your regulated small MS4 will not cause or contribute to the identified impairments. For outfalls that discharge stormwater that reasonably cannot be a cause or contributor to the impairment of the receiving water, provide an explanation.

I. Stormwater Management Ordinance

Indicate by checking one (1) of the boxes below whether you have an existing ordinance from an Act 167 Plan approved by DEP in 2005 or later; or you plan to adopt an MS4 Stormwater Management Ordinance that corresponds to the checked box in E(4)-(5); or you have completed and attached an MS4 Stormwater Management Ordinance Checklist that corresponds to the checked box in E(4)-(5).

The applicant will satisfy one (1) of the following (Check one and fill-in blanks where indicated.):

<p>F.1.</p> <p><input type="checkbox"/> By the end of the first year of coverage under this permit, you will enact and implement either: a) the MS4 Stormwater Management Ordinance corresponding to the checked box in E(4)-(5); or, b) an ordinance from an Act 167 Plan approved in 2005 or later; or, c) an ordinance that satisfies all applicable requirements on a completed and signed MS4 Stormwater Management Ordinance Checklist corresponding to the checked box in E(4)-(5).</p>	<p>OR</p>	<p>F.2.</p> <p><input checked="" type="checkbox"/> Already have enacted and implemented an Act 167 Stormwater Management Ordinance from an Act 167 Plan approved in 2005 or later. Provide the enactment date and number of your stormwater management ordinance.</p> <p>Number: <u>3013-07</u></p> <p>Date: <u>December 19, 2013</u></p> <p><u>adopted in accordance with the Chester County, County-wide Act 167 Plan.</u></p>	<p>OR</p>	<p>F.3.</p> <p><input type="checkbox"/> In relation to the box checked in E(4)-(5), the corresponding MS4 Stormwater Management Ordinance Checklist is completed, signed, and attached, and all applicable requirements are satisfied. If your ordinance already is enacted, provide the enactment date and number of your stormwater management ordinance.</p> <p>Number: _____</p> <p>Date: _____</p>
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Fill in the Name and Telephone number of the principal person responsible.

Dale Barnett, Manager
 Name

610-380-8200
 Telephone number

J. Compliance History Review

Has the applicant been in violation during the past five (5) years of any permits issued by DEP, or any orders, regulations, or schedules of compliance? Yes No

If yes, list each permit, order, regulation, or schedule that is/was in violation and provide compliance status of the permitted activity (use additional sheets to provide information on all permits).

Brief Description of Non-Compliance:

*MS-4 Program deficiencies - Yrs. 4 & 5

Steps Taken to Return to Compliance and Dates Compliance Achieved:

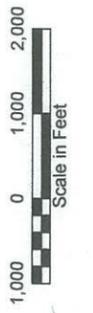
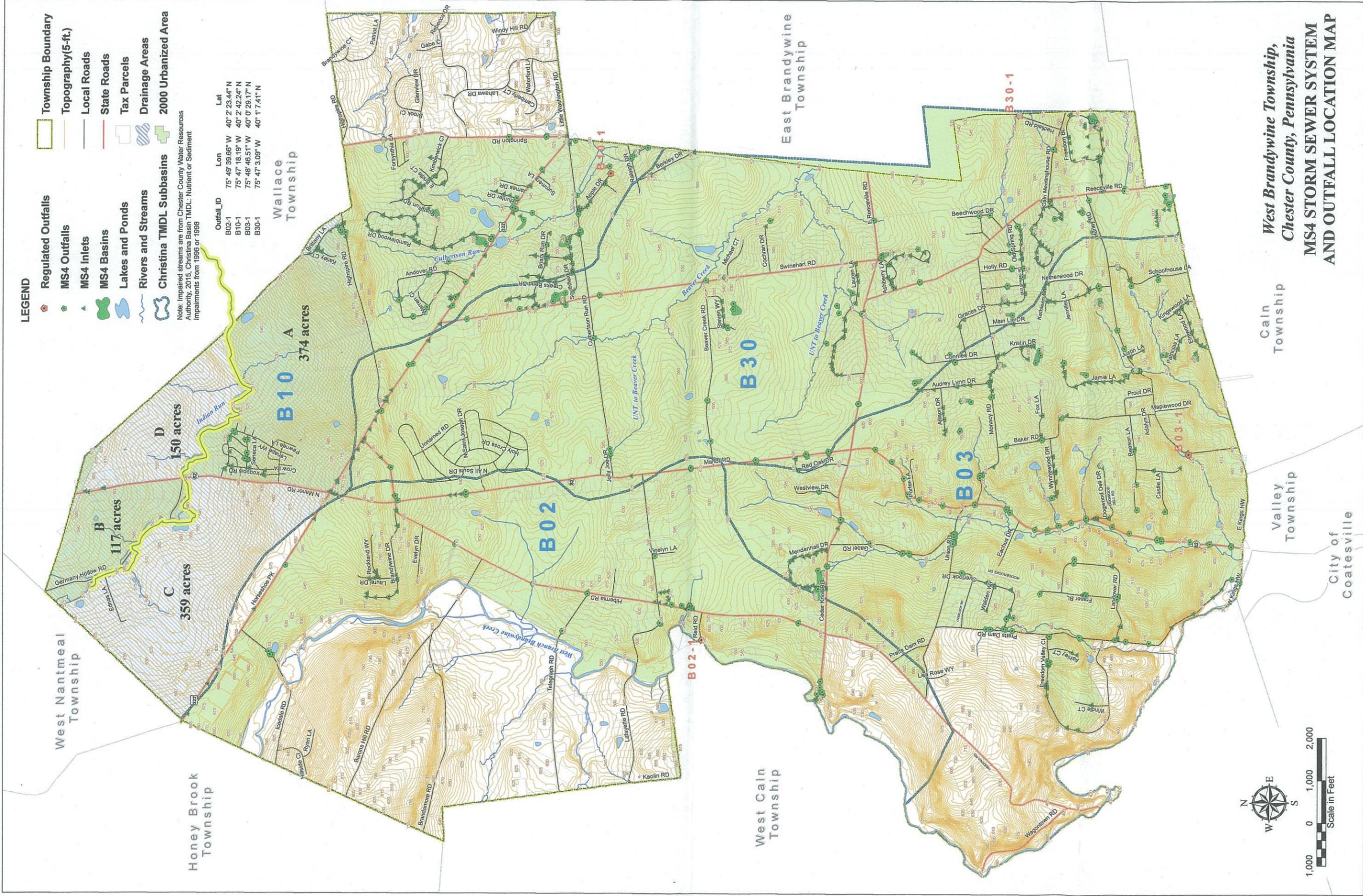
*Deficiencies corrected - Program in compliance in future years

K. Certification:

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

Name and official title: (Please Print or Type name and title. Use corporate or professional seal as appropriate)

Signature: _____ Date Signed: _____



West Brandywine Township
Christina Basin MS4 TMDL Plan
Part 1 – MS4 TMDL Strategy

Submitted By: West Brandywine Township

Date: December 31, 2015

C-TIP MS4 TMDL STRATEGY OUTLINE

Section A- Introduction

Section B - Key Definitions

- I. Definitions from PAG-13 (3/2012), “Authorization to Discharge”**
- II. Definitions Used in this MS4 TMDL Strategy**

Section C - Required Information (as required in the NOI instructions)

- I. Title of TMDL(s) that affect [Municipal name]**
- II. Watershed Name(s) and Hydrologic Unit Code (HUC)**
 - **Figure 1.** Christina Basin and its TMDL Watersheds, TMDL Subbasins and Municipalities
- III. List of Pollutants and Waste Load Allocations (WLAs) Assigned to Each MS4 Covered by the NOI**
 - a. Pollutants Assigned
 - **Table 1.** Brandywine-Christina Watershed (HUC # 02040205)EPA TMDL MS4 Baseline Pollutant Loadings, MS4 Allocations, and Reductions
 - b. Pollutants Not Applicable
- IV. List of Municipalities Subject to the Same TMDL Pollutants (within HUC Watershed 02040205)**
- V. List of Counties Subject to the TMDL (within HUC Watershed 02040205)**
- VI. Allocated Pollutant Loadings Established in Each Applicable TMDL**
- VII. Reduction in Pollutant Loads Necessary to Meet Each Applicable TMDL or WLA**
 - a. EPA Pollutant Load Reductions
 - i. Sediment Reductions:
 - ii. Nitrogen and Phosphorus Reductions:
 - b. Adjusted MS4 Allocations and Required Load Reductions
 - i. Justification for Adjusting MS4 Baseline, MS4 Allocations, and Reductions
 - ii. Adjustment Approach
 1. Adjustment Process
 2. Delineation of TMDL Storm Sewershed
 - iii. Recalculation of Required Load Reduction (Adjustment Equations)
 - iv. New Municipal Load Allocation (LA)

- **Table 2.** Adjusted MS4 Baselines, MS4 Allocations Required Load Reductions and New LA for [Municipal name]

VIII. Control Measures and BMPs Implemented to Meet the TMDL(s)

- a. MS4 TMDL Implementation Area
- b. Priorities for Implementation
- c. Inventory of Previously Installed Pollutant Reduction Control Measures (March 10, 2003– [date of submission])
 - **Table 3.** Previously Installed BMPs/Control Measures and Pollutant Reductions
 - **Figure 2.** Locations of Previously Installed and Candidate BMPs/Control Measures
- d. Municipal Stormwater Ordinance Control Measure
- e. Proposed Control Measures to be Implemented
 - **Table 4.** List of Candidate Control Measures (BMPs)

IX. Analysis of Consistency of this Implementation Plan with WLAs and TMDLs

- a. Analysis of Consistency
- b. Timeline and Milestones
 - **Table 5.** Timeline and Milestones for attaining TMDL Pollutant Load Reductions
- c. Implementation Tracking
 - **Table 6.** TMDL Implementation and Attainment Log
- d. Process for Evaluating and Updating MS4 TMDL Plan
- e. BMP/Control measures Performance Evaluation and Reporting

X. Additional Information: (See Appendices)

Section D - References

Appendix A - List of Municipalities in C-TIP Partnership

Appendix B – PADEP letter dated March 21, 2012

Appendix C - Worksheets for adjusting TMDL MS4 Allocations

Appendix D – Strategy Synopsis

SECTION A - INTRODUCTION

This MS4 TMDL Strategy is Part 1 of West Brandywine Township's MS4 TMDL Plan. This MS4 TMDL Strategy is submitted in accordance with the requirements of General Permit PAG-13 for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s). This MS4 TMDL Strategy has been prepared and will be implemented as part of the Christina Basin TMDL Implementation Plan (C-TIP), and addresses all requirements of the Christina Basin stormwater TMDLs (as listed in Subsection C.I), applicable West Brandywine Township. West Brandywine Township is a participating member of the C-TIP Partnership as indicated in Appendix A.

This MS4 TMDL Strategy (Part I) for West Brandywine Township is based on, and consistent with all applicable Christina Basin TMDLs. This MS4 TMDL Strategy is organized to follow and respond to the instructions presented in the General Permit PAG-13 instruction packages. Part II, MS4 TMDL Design Details, will be developed by West Brandywine Township and will be submitted to DEP within one year of the date of the approval of coverage under the Municipality's new MS4 permit.

This MS4 TMDL Strategy has been developed after significant coordination with both EPA and PADEP over more than a three year period. A letter from PADEP, included for reference as Appendix B, provides support for the approach taken in this MS4 TMDL Strategy, and more specifically, offers concurrence with the general concept for revising the Christina Basin TMDL MS4 Allocations. This MS4 TMDL Strategy is based on several analyses of the data and results published in the Christina Basin stormwater TMDL Reports and current conditions that have been previously reviewed by PADEP.

This MS4 TMDL Strategy includes the following:

- Section AIntroduction**
- Section BKey Definitions**
- Section C.....Required Information (as required in the NOI instructions)**
- Section DReferences**
- Appendix AList of Municipalities in C-TIP partnership**
- Appendix BPADEP letter dated March 21, 2012**
- Appendix CWorksheets for adjusting TMDL MS4 Allocations**
- Appendix DBMP/control measure documentation and calculations**

SECTION B - KEY DEFINITIONS

I. Definitions from PAG-13 (3/2012), "Authorization to Discharge" (pages 6, 7, 8):

Municipal Separate Storm Sewer: A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), which is all of the following:

- Owned or operated by a state, city, town, borough, township, county, district, association or other public body (created under state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater or other wastes,
- Designed or used for collecting or conveying stormwater,
- Not a combined sewer, and
- Not part of a Publicly Owned Treatment Works as defined at 40 CFR § 122.2.

Outfall: A "Point Source" as defined by 40 CFR § 122.2 is the point where an MS4 discharges stormwater to other surface waters of this Commonwealth. This does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream and are used to convey waters of the Commonwealth (40 CFR § 122.26(b)(9)).

Regulated Small MS4: Any small MS4 that is covered by the federal Phase II stormwater program, either through automatic nationwide designation under 40 CFR § 122.32(a)(1) (via the Urbanized Area criteria) or by designation on a case-by-case basis by DEP pursuant to 40 CFR § 122.32(a)(2). "Regulated small MS4s" are a subset of "small MS4s".

Storm Sewershed: The catchment area that drains into the storm sewer system based on the surface topography in the area served by the storm sewer.

Urbanized Area (UA): Land area comprising one or more places (central place(s)) and the adjacent densely settled surrounding area (urban fringe) that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile, as defined by the United States Bureau of the Census and as determined by the latest available decennial census. The UA outlines the extent of automatically regulated areas.

II. Definitions Used in this MS4 TMDL Strategy:

(The terms listed below are capitalized throughout the text.)

Adjusted TMDL Allocations: MS4 Baseline Loads, MS4 Allocations (Waste Load Allocations), or Load Reductions that have been recalculated to more accurately represent the pollutant loads received and discharged by the regulated MS4, and covered by the MS4 permit, as recommended in the TMDL Reports. Adjustment methods are described in Subsection C.VII.b.

Load Reduction: The required pollutant load reduction; difference between the TMDL MS4 Baseline Load and the MS4 Allocation (Waste Load Allocation).

MS4 Allocation: Used herein to refer to EPA's "MS4 Allocation, EPA's "MS4 Load Allocation", as used in the TMDL Reports, and which appear to be used by EPA as synonyms for "Waste Load Allocation" (WLA).

MS4 TMDL Implementation Area: All areas that are within the Municipality's boundaries and within a TMDL Watershed that are:

- a. Located where the target pollutant load reductions are quantifiable at the impaired stream segment that receives stormwater discharges from the Municipality's regulated small MS4; and
- b. Within the Urbanized Area; or
- c. Outside the Urbanized Area and in accordance with PADEP's forthcoming credit, trading, and offset policies.

This is the maximum geographic area within which the MS4 Municipality can install new TMDL control measures or can identify previously installed control measures (2003-2012) that can be counted toward achieving the Municipality's required pollutant Load Reduction.

Regulated Storm Sewershed: All land area that drains to the Regulated Small MS4 that is both within the Urbanized Area and within the Municipal boundary.

TMDL Storm Sewershed: All Regulated Storm Sewershed areas and portions of the Regulated Small MS4 that are within a TMDL Subbasin. This represents the land area that generates the pollutant load received and discharged by the Regulated Small MS4 and which can be used to "adjust" EPA's MS4 Baseline Loads, MS4 Allocations, and required pollutant Load Reductions.

TMDL Subbasin: Any "subbasin" delineated in either EPA Christina Basin TMDL Report and for which either TMDL Report lists WLAs for TSS, TN and/or TP.

TMDL Watershed: The watershed in which the TMDL Subbasin is located; Either Brandywine Creek, Red Clay Creek, or White Clay Creek watershed.

SECTION C - REQUIRED INFORMATION

I. Title of TMDL(s) that affect West Brandywine Township:

The following TMDLs have been established for various portions of the watersheds in the Christina Basin, PA. Those that are and are not applicable to West Brandywine Township are indicated below:

- a. *Total Maximum Daily Loads for Bacteria and Sediment in the Christina River Basin, Pennsylvania, Delaware, and Maryland.* September 2006. U.S. Environmental Protection Agency, Philadelphia, PA (herein referred to as Bacteria/Sediment TMDL Report). This TMDL Report presents TMDLs for sediment and bacteria.

Applicable, West Brandywine Township is listed with a WLA in the above Report
 Not Applicable, West Brandywine Township is **NOT** listed with a WLA in the above Report.

- b. *Revisions to Total Maximum Daily Loads for Nutrient and Low Dissolved Oxygen Under High-Flow Conditions, Christina River Basin, Pennsylvania, Delaware, and Maryland.* September 2006. U.S. Environmental Protection Agency, Philadelphia, PA (herein referred to as the Nutrient/Low DO TMDL Report). This TMDL Report presents TMDLs for Total Nitrogen and Total Phosphorus. ..

Applicable, West Brandywine Township is listed with a WLA in the above Report
 Not Applicable West Brandywine Township is **NOT** listed with a WLA in the above Report.

- c. *Total Maximum Daily Loads, Polychlorinated Biphenyls (PCBs) and Chlordane, West Branch Brandywine Creek, Chester County, Pennsylvania.* March 9, 2001. Pennsylvania Department of Environmental Protection, Harrisburg, PA (herein referred to as the Brandywine Creek PCB/Chlordane TMDL Report). This TMDL Report presents a TMDL only for PCB.

Not Applicable, West Brandywine Township is **NOT** listed with a WLA in the above Report.

- d. *Total Maximum Daily Load for the Red Clay Creek Basin Chester County, Pennsylvania.* April 7, 2007. U.S. Environmental Protection Agency, Philadelphia, PA (herein referred to as the Red Clay Creek PCB TMDL Report). This TMDL Report presents TMDLs for PCB.

Not Applicable West Brandywine Township is **NOT** listed with a WLA in the above Report.

Further details about the applicability of the above TMDLs are provided in Subsection C.III.

II. Watershed Name(s) and Hydrologic Unit Code (HUC):

Following are the list of watershed names and the eight-digit HUC for the areas that are addressed in the Christina Basin TMDL Reports. Only watersheds that are checked below discharge through the West Brandywine Township Regulated Small MS4 to water bodies with TMDLs:

Brandywine-Christina Watershed, HUC #02040205, including:

- Brandywine Creek Watershed (PA)
- Red Clay Creek Watershed (PA)
- White Clay Creek Watershed (PA)

These watersheds are referred to herein as the TMDL Watersheds (see “Key Definitions”, above). Figure 1 presents the Christina Basin, the TMDL Watersheds and the subbasins used in the TMDL Reports (herein referred to as the TMDL Subbasins - see “Key Definitions”), as well as municipal boundaries, streams and Urbanized Area boundaries.

Figure 1. Christina Basin and its TMDL Watersheds, TMDL Subbasins and Municipalities

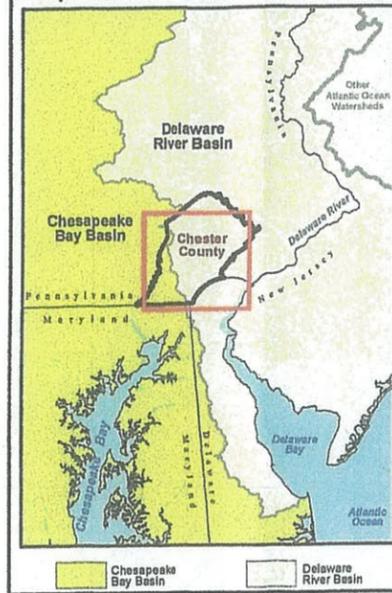
Figure 1. Christina Basin and its TMDL Watershed TMDL Subbasins and Municipalities

June 29, 2012 (Revised)

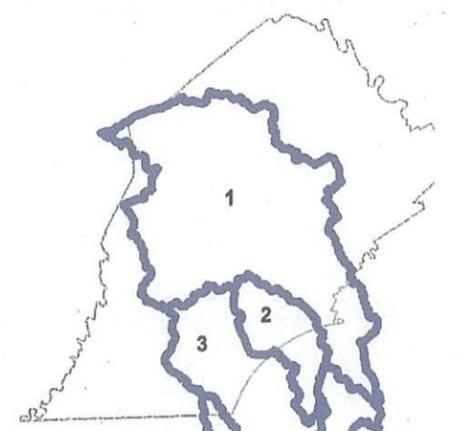
Chester County Water Resources Authority

-  Christina Basin Watersheds
-  Christina Basin HSPF Subbasins (As presented in the Christina Basin EPA TMDL Reports)
-  TMDL Subbasins (Listed with at least 1 WLA)
-  Urbanized Area (Christina Basin)- 2000 Census
-  Chester County Bound
-  Municipalities
-  Water Bodies
-  Streams

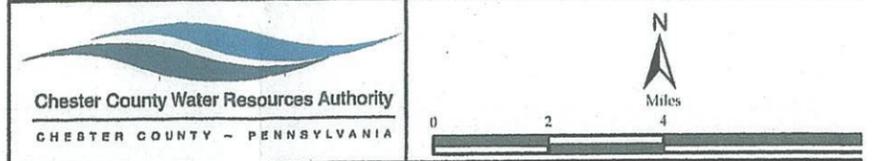
Map Location and Major Drainages



Christina Basin TMDL Watersheds



1. Brandywine Creek watershed
2. Red Clay Creek watershed
3. White Clay Creek watershed

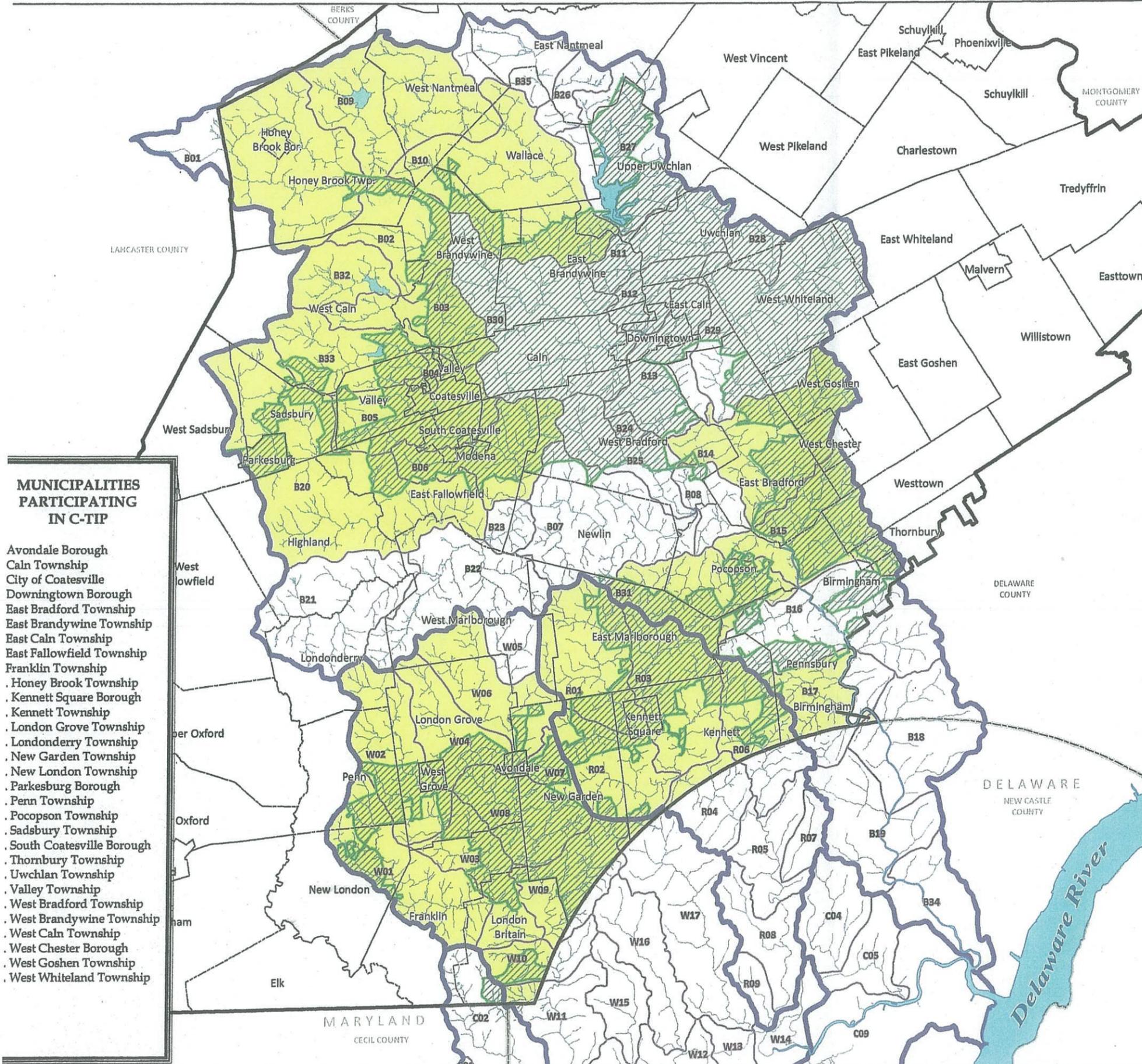


DATA SOURCES:
 Administrative Boundaries, Watersheds, Streams - Chester County
 Census 2000 Urbanized Areas (UA) subset of "Urban Areas 2000" - U.S. Department of Commerce; Bureau of the C Geography Division.
 HSPF Subbasin Delineation - GIS files provided by USGS Exton, PA Office - June, 2009.

DISCLAIMER:
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MUNICIPALITIES PARTICIPATING IN C-TIP

- . Avondale Borough
- . Caln Township
- . City of Coatesville
- . Downingtown Borough
- . East Bradford Township
- . East Brandywine Township
- . East Caln Township
- . East Fallowfield Township
- . Franklin Township
- . Honey Brook Township
- . Kennett Square Borough
- . Kennett Township
- . London Grove Township
- . Londonderry Township
- . New Garden Township
- . New London Township
- . Parkersburg Borough
- . Penn Township
- . Pocopson Township
- . Sadsbury Township
- . South Coatesville Borough
- . Thornbury Township
- . Uwchlan Township
- . Valley Township
- . West Bradford Township
- . West Brandywine Township
- . West Caln Township
- . West Chester Borough
- . West Goshen Township
- . West Whiteland Township

III. List of Pollutants and Waste Load Allocations (WLAs) Assigned to Each MS4 Covered by the NOI:

This NOI is for West Brandywine Township

a. Pollutants Assigned:

The following TMDL pollutants (as presented in the applicable TMDL Reports listed in Subsection C.I.) are applicable to West Brandywine Township because a Waste Load Allocation has been listed for West Brandywine Township and their implementation is addressed in this West Brandywine Township MS4 TMDL Strategy:

- Total Suspended Solids (Sediment)
- X Total Nitrogen
- X Total Phosphorus

Table 1 lists the pollutants (total suspended solids, total nitrogen and total phosphorous) and WLAs presented in the Bacteria/Sediment TMDL Report and the Nutrient/Low DO TMDL Report for West Brandywine Township and for all other municipalities listed in the TMDL Report(s). The TMDL Report(s) present these WLAs as “MS4 Load Allocation” (for Total Suspended Solids (TSS) referred to in the TMDL Report and herein as sediment), and “MS4 Allocation” (for total nitrogen (TN), and total phosphorus (TP), referred to herein as nitrogen and phosphorus, respectively), and these terms and numbers are presented in Table 1 exactly as presented in the TMDL Reports.

**Table 1. Brandywine-Christina Watershed (HUC # 02040205)
EPA TMDL MS4 Baseline Pollutant Loadings, MS4 Allocations, and Reductions**

TABLE 1. DAILY WATERSHED-BOUNDING WATERBODIES (TWS) MS4 ALLOCATIONS, AND REDUCTIONS
EPA TMDL MS4 Baseline Loadings, MS4 Allocations, and Reductions

MUNICIPALITIES LISTED IN TMDL REPORTS	Sediment (tons/year)			Total Nitrogen (kg/day)			Total Phosphorus (kg/day)		
	Baseline MS4 Load ^{1b}	MS4 Load Allocation ^{1b}	% Reduction ^{1b}	MS4 Baseline Load ^{2b}	MS4 Allocation ^{2b}	% Reduction ^{2b}	MS4 Baseline Load ^{2c}	MS4 Allocation ^{2c}	% Reduction ^{2c}
BRANDYVINE CREEK WATERSHED	310.81	130.35	180.46	16.08	10.86	5.22	3.015	2.031	0.984
BIRMINGHAM CITY	231.29	79.76	151.53	54.19	44.44	9.75	0.826	0.677	0.149
COATESVILLE CITY	1185.00	467.17	717.83	110.54	75.74	34.80	22.365	15.348	7.017
EAST BRADFORD TWP	803.23	428.42	376.81	9.61	5.76	3.85	0.184	0.11	0.074
EAST FALLOWFIELD TWP	366.70	139.44	227.26	2.38	2.22	0.16	7.599	4.956	2.643
EAST MARLBOROUGH TWP	384.80	238.86	145.94	4.80	3.25	1.55	0.213	0.198	0.015
HIGHLAND TWP	20.58	13.23	7.35	6.53	4.57	1.96	0.966	0.656	0.31
HONEY BROOK BORO	813.84	559.76	255.08	9.61	5.76	3.85	0.184	0.11	0.074
HONEY BROOK TWP	27.96	12.46	15.50	2.38	2.22	0.16	7.599	4.956	2.643
KENNETT TWP	144.18	59.59	84.59	4.80	3.25	1.55	0.213	0.198	0.015
MODENA BORO	52.11	32.35	19.76	6.53	4.57	1.96	0.966	0.656	0.31
PARKERSBURG BORO	113.98	43.48	70.50	47.00	43.71	3.29	4.206	3.911	0.295
PENNSBURG TWP	821.21	320.79	500.42	3.05	2.26	0.79	0.329	0.205	0.124
POCONO TWP	289.73	172.13	117.60	10.92	8.96	1.96	0.166	0.137	0.029
THORNBURY TWP	82.17	34.46	47.71	57.57	43.75	13.82	6.941	4.726	2.215
UPPER UMCHLAN TWP	485.14	164.64	320.50	43.75	103.76	22.77	1.829	1.582	0.247
VALLEY TWP	21.74	17.41	4.33	128.53	103.76	22.77	1.829	1.582	0.247
WALLACE TWP	283.22	121.6	161.62	17.25	12.08	5.17	3.532	2.473	1.059
WEST BRADFORD TWP	68.28	43.07	25.21	136.01	104.78	31.23	9.63	8.344	1.286
WEST BRADYVINE TWP	461.32	180.51	280.81	183.72	149.26	34.46	9.95	8.649	1.301
WEST CALN TWP	461.32	180.51	280.81	183.72	149.26	34.46	9.95	8.649	1.301
WEST GOSHEN TWP	461.32	180.51	280.81	183.72	149.26	34.46	9.95	8.649	1.301

Red Clay Creek Watershed	Sediment (tons/year)			Total Nitrogen (kg/day)			Total Phosphorus (kg/day)		
	Baseline MS4 Load ^{1c}	MS4 Load Allocation ^{1c}	% Reduction ^{1c}	MS4 Baseline Load ^{2c}	MS4 Allocation ^{2c}	% Reduction ^{2c}	MS4 Baseline Load ^{2d}	MS4 Allocation ^{2d}	% Reduction ^{2d}
EAST MARLBOROUGH TWP	8791.41	4193.24	4598.17	137.13	86.56	68.57	2.742	1.372	1.37
KENNETT SQUARE BORO	840.10	405.41	434.69	13.26	6.83	6.83	0.452	0.151	0.301
KENNETT TWP	6751.63	3312.06	3439.57	157.97	97.83	60.14	21.517	3.731	17.786
NEW GARDEN TWP	4709.65	2,118.72	2590.93	77.03	38.52	38.51	27.708	2.87	24.838
PENNSBURG TWP	4709.65	2,118.72	2590.93	4.32	4.32	0.00	0.082	0.082	0.00

White Clay Creek Watershed	Sediment (tons/year)			Total Nitrogen (kg/day)			Total Phosphorus (kg/day)		
	Baseline MS4 Load ^{1d}	MS4 Load Allocation ^{1d}	% Reduction ^{1d}	MS4 Baseline Load ^{2d}	MS4 Allocation ^{2d}	% Reduction ^{2d}	MS4 Baseline Load ^{2e}	MS4 Allocation ^{2e}	% Reduction ^{2e}
AVONDALE BORO	463.65	140.02	323.63	9.16	4.58	4.58	0.322	0.135	0.187
FRANKLIN TWP	4220.43	2,305.87	1914.56	122.01	81.01	61	15.219	5.557	9.662
KENNETT TWP	2894.66	1,620.44	1014.22	2.17	2.17	0.00	0.055	0.055	0
LONDON BRITAIN TWP	13616.33	4,842.81	8773.52	96.47	49.9	46.57	15.732	7.333	8.399
LONDON GROVE TWP	6746.50	2,986.66	3759.84	262.76	128.47	134.29	25.875	7.965	17.91
NEW GARDEN TWP	1913.97	1,008.60	905.37	167.06	83.83	83.23	4.916	13.374	28.542
PENN TWP	3584.76	1,410.29	2174.47	63.56	28.61	26.95	0.65	0.292	0.358
WEST GROVE BORO	582.29	192.63	389.66	71.23	33.36	37.87	0.798	0.359	0.439
				9.24	4.36	4.88	0.112	0.05	0.082

(1) U.S. EPA Region III, 8 April 2005. Total Maximum Daily Load for Bacteria and Sediment in the Christina River Basin Watershed Pennsylvania, Delaware, and Maryland. Philadelphia, PA.

(2) U.S. EPA Region III, 26 September 2006. Revisions to Total Maximum Daily Load for Nitrogen and Low Dissolved Oxygen under High-flow Conditions. Christina River Basin Watershed, Pennsylvania, Delaware, and Maryland. Philadelphia, PA.

a. Table 4.2 Final carbon TMDL allocations for MS4 municipalities. p. 4-5
 b. Table 4.8 Sediment allocations for towns in Brandyvine Creek Watershed. p. 4-16
 c. Table 4.9 Sediment allocations for towns in Red Clay Creek Watershed. p. 4-16
 d. Table 4.10 Preliminary sediment allocations for towns in White Clay Creek Watershed. p. 4-16
 e. Calculated by COMPA using Tables listed in 1a-1d. listed above. MS4 Reduction = (MS4 Baseline Load) - (MS4 Load Allocation)
 f. Municipalities that are not currently regulated under the NPDES MS4 program.
 g. and thus not required to implement TMDLs

a. Appendix C - Table C-5b. Total nitrogen MS4 allocations for Brandyvine Creek watershed (kg/day). p. C-6
 b. Appendix C - Table C-7c. Total nitrogen MS4 allocations for Red Clay Creek watershed (kg/day). p. C-8
 c. Appendix C - Table C-9b. Total nitrogen MS4 allocations for White Clay Creek watershed (kg/day). p. C-11
 d. Appendix C - Table C-8a. Total phosphorus MS4 allocations for Brandyvine Creek watershed (kg/day). p. C-8
 e. Appendix C - Table C-8b. Total phosphorus MS4 allocations for Red Clay Creek watershed (kg/day). p. C-10
 f. Appendix C - Table C-10a. Total phosphorus MS4 allocations for White Clay Creek watershed (kg/day). p. C-13
 g. Appendix C - Table C-5c. Total nitrogen MS4 baseline loads for Brandyvine Creek watershed (kg/day). p. C-5

h. Appendix C - Table C-7a. Total nitrogen MS4 baseline loads for Red Clay Creek watershed (kg/day). p. C-8
 i. Appendix C - Table C-9a. Total nitrogen MS4 baseline loads for White Clay Creek watershed (kg/day). p. C-10
 j. Appendix C - Table C-8a. Total phosphorus MS4 baseline loads for Brandyvine Creek watershed (kg/day). p. C-7
 k. Appendix C - Table C-8b. Total phosphorus MS4 baseline loads for Red Clay Creek watershed (kg/day). p. C-9
 l. Appendix C - Table C-10a. Total phosphorus MS4 baseline loads for White Clay Creek watershed (kg/day). p. C-12
 m. Calculated by COMPA using Tables listed in 2a-2l. listed above. MS4 Reduction = (MS4 Baseline Load) - (MS4 Allocation).
 n. Reduction = (MS4 Load Reduction) / (MS4 Baseline Load)

b. Pollutants Not Applicable:

The following TMDL pollutants (as listed in the TMDL Reports listed in Subsection C.I.) are NOT applicable to West Brandywine Township as indicated and explained below

Sediment (Total Suspended Solids) – There is NO WLA listed for West Brandywine Township. Therefore, implementation of the Sediment TMDL is not addressed in this West Brandywine Township MS4 TMDL Strategy.

Total Nitrogen - There is NO WLA listed for West Brandywine Township Therefore, implementation of the Total Nitrogen TMDL is not addressed in this West Brandywine Township MS4 TMDL Strategy.

Total Phosphorus - There is NO WLA listed for West Brandywine Township. Therefore, implementation of the Total Phosphorus TMDL is not addressed in this West Brandywine Township MS4 TMDL Strategy.

Bacteria – West Brandywine Township is:

a) not listed with a WLA for bacteria. Therefore, implementation of the Bacteria TMDL is not addressed in MS4 TMDL Strategy.

b) is listed with a WLA for bacteria, however, based on the PADEP letter dated March 21, 2012 (Appendix B) and best information available¹ at the time of preparation of this MS4 TMDL Strategy there are no streams designated as impaired by bacteria attributed to stormwater runoff located within or downstream of West Brandywine Township or within the Christina Basin, PA. Therefore, implementation of the Bacteria TMDL is not addressed in this MS4 TMDL Strategy.

PCB/Chlordane (Brandywine Creek) –

a) There are no Municipal WLAs listed in the Brandywine Creek PCB/Chlordane TMDL Report. This TMDL applies only to 5.6 miles of the West Branch Brandywine Creek in East Fallowfield, West Bradford, and Newlin Townships, the City of Coatesville, and Modena Borough. As quoted in the TMDL Report: “*Pennsylvania found no permitted point sources contributing to the load of either chlordane or PCBs to the West Branch Brandywine Creek*” and “*...the WLA was assigned a value of 0*”. Therefore, implementation of the Brandywine Creek PCB/Chlordane TMDL is not addressed in this MS4 TMDL Strategy.

b) West Brandywine Township has no land area in the Brandywine Creek Watershed. Therefore, implementation of the Brandywine Creek PCB/Chlordane TMDL is not addressed in this MS4 TMDL Strategy.

PCB (Red Clay Creek)

¹ 2010 Pennsylvania Integrated Water Quality Monitoring and Assessment Report.”Undated, Pennsylvania Department of Environmental Protection. Office of Water Management, Bureau of Water Supply & Wastewater Management, Water Quality Assessment and Standards Division.

a) There are no Municipal WLAs listed in the Red Clay Creek PCB TMDL Report. As quoted in the TMDL Report: “According to PADEP, there are no known point sources of PCB to Red Clay and the East and West Branches of Red Clay Creek at this time” and “...the WLA was set to zero.” Therefore, implementation of the Red Clay Creek PCB TMDL is not addressed in this MS4 TMDL Strategy.

X b) West Brandywine Township has no land area in the Red Clay Creek Watershed. Therefore, implementation of the Red Clay Creek PCB TMDL is not addressed in this MS4 TMDL Strategy.

IV. List of Municipalities Subject to the Same TMDL Pollutants (within HUC Watershed 02040205):

Table 1, presented in Subsection C.III, lists all Pennsylvania municipalities in the HUC 02040205 that are subject to the sediment, nitrogen and phosphorus TMDLs.

V. List of Counties Subject to the TMDL (within HUC Watershed 02040205):

There are no counties listed or referenced in any of the above referenced TMDL Reports and therefore there are no counties subject to any of the Christina TMDLs.

VI. Allocated Pollutant Loadings Established in Each Applicable TMDL:

Table 1, as presented in Subsection C.III, lists the EPA allocated pollutant loadings for West Brandywine Township for each applicable TMDL pollutant addressed by the Christina Basin Bacteria/Sediment and Low DO/Nutrient TMDL Reports. The allocated pollutant loadings are presented within these TMDL Reports as “MS4 Load Allocation” or “MS4 Allocation”, and Table 1 presents the pollutant loadings and terminology exactly as presented in the TMDL Reports.

VII. Reduction in Pollutant Loads Necessary to Meet Each Applicable TMDL or WLA:

a. EPA Pollutant Load Reductions:

Table 1, as presented in Section C.III, lists the applicable pollutant Load Reductions required by the TMDL Reports. West Brandywine Township is located within the West Branch Brandywine Creek (B02), Un-named branches to WBBC (B03), East Branch Brandywine Creek (B10) and Beaver Creek (B30) watersheds. Table 1 indicates that pollutant Load Reductions are required by West Brandywine Township for nitrogen and phosphorus. The Township does not have a assigned Load Reduction for sediment.

The only stream segment designated as impaired within the Urbanized Area for the Township on the maps contained in the September 2006 TMDL Report of the Christina River basin , pursuant to the 1998 Section 303(d) list for nutrients is the Indian Run in B10. The is not only very little development there are virtually no municipal storm sewers. The Indian Run Mobile Home Park is a privately owned

community. It is also noted that this stream segment was removed from the impaired streams list in updated mappings. Accordingly, even if the impaired designation was still in place, there would be very little opportunity for the Township to be able to implement BMP's that would be effective in reducing the assigned pollutant loads for this permit cycle. Although the Allocation Tables were completed, the implementation of BMPs is not warranted at this time.

- i. **Sediment Reductions:** The pollutant Load Reductions for sediment (TSS) are presented within the Bacteria/Sediment TMDL Report as “Percent Reduction” and are presented in Table 1 exactly as presented in the Bacteria/Sediment TMDL Report. Table 1 also includes Municipal sediment “MS4 Load Reductions” in tons per year, which were calculated for the C-TIP based on the following equation:

$$(MS4 \text{ Load Reduction}) = (\text{Baseline MS4 Load}) - (MS4 \text{ Load Allocation})$$

where “Baseline MS4 Load” and “MS4 Load Allocation” are taken from tables presented in the Sediment TMDL Report. **NOT APPLICABLE**

- ii. **Nitrogen and Phosphorus Reductions:** The Nutrient/Low DO TMDL Report does not present pollutant Load Reductions by Municipality; they are presented only by Subbasin and only by “percent”. Table 1 presents TN (nitrogen) and TP (phosphorus) Load Reductions by Municipality and percent reductions that were calculated using the following equations:

$$(MS4 \text{ Load Reduction}) = (MS4 \text{ Baseline Load}) - (MS4 \text{ Allocation})$$
$$(\text{Percent Reduction}) = (MS4 \text{ Load Reduction}) / (MS4 \text{ Baseline Load})$$

where “MS4 Baseline Load” and “MS4 Load Allocation” are taken from tables presented in the Nutrient/Low DO TMDL Report.

b. **Adjusted MS4 Allocations and Required Load Reductions:**

West Brandywine Township

has adjusted their MS4 Allocation(s) and Load Reduction(s). See below.

has NOT adjusted their MS4 Allocation(s) and Load Reduction(s) at this time and will adhere to Table 1 Load Reductions (Skip below and go to Part VIII).

i. **Justification for Adjusting MS4 Baseline, MS4 Allocations, and Reductions:**

The TMDL Reports explain that the EPA MS4 Allocation and required Load Reductions were calculated assuming the entire land area within the TMDL Subbasin in the Municipality drains to the MS4. However because the Urbanized Area boundary bisects many municipalities in the Christina Basin, and because most Regulated MS4s cover only a portion of the Municipality, EPA acknowledges that the municipal allocations should be recalculated when MS4 mapping is available. This involves recalculating MS4 Baselines, MS4 Allocations, and pollutant Load Reductions.

The Bacteria /Sediment TMDL Report States:

“5.0 REASONABLE ASSURANCE AND IMPLEMENTATION

For purposes of this TMDL, WLAs were developed for each municipality holding MS4 permits. Distribution of loads was estimated using land use data within municipal boundaries and application of unit area loadings (lbs/acre/year) determined for subbasins defined in the HSPF model and used for TMDL development. As additional data are collected by PADEP regarding drainage areas of each storm sewer system in the basin, these WLAs can be refined to more detailed representation of WLAs for each stormwater permit and LAs for areas not bound by such permits. To do this, the drainage area of each storm sewer should be delineated so that the area and distributions of land use can be determined. The land use areas within the stormwater drainage areas can be multiplied by the unit area loadings reported herein to determine the WLA for each MS4 permit and to calculate the load reduction necessary to meet the TMDL. The remaining load in each respective township can then be assigned to LAs. Until such storm water drainage area data are available, the WLAs and required load reductions reported herein are applicable.”

*(Excerpt from **Total Maximum Daily Loads for Bacteria and Sediment in the Christina River Basin Watershed Pennsylvania, Delaware, and Maryland. Philadelphia, PA. April, 2005 (pg. 5-2).**)*

The Nutrient/Low DO TMDL Report States:

“5.0 REASONABLE ASSURANCE AND IMPLEMENTATION

For purposes of this TMDL, WLAs were developed for each municipality holding MS4 permits. Distribution of loads was estimated using land use data within municipal boundaries and application of unit area loadings (lbs/acre/year) determined for subbasins defined in the HSPF model and used for TMDL development. As additional data are collected by PADEP regarding drainage areas of each storm sewer system in the basin, these WLAs can be refined to more detailed representation of WLAs for each stormwater permit and LAs for areas not bound by such permits. To do this, the drainage area of each storm sewer should be delineated so that the area and distributions of land use can be determined. The remaining load in each respective township can then be assigned to LAs. Until such storm water drainage area data are available, the WLAs and required load reductions reported herein are applicable.”

*(Excerpt from **Revisions to Total Maximum Daily Loads for Nutrient and Low Dissolved Oxygen Under High-Flow Conditions: Christina River Basin Watershed, Pennsylvania, Delaware, and Maryland. Philadelphia, PA. September, 2006 (pg. 5-2).**)*

After extensive coordination with PADEP and analyses of available TMDL and GIS data, an approach was selected for adjusting MS4 Baselines, MS4 Allocations and required Load Reductions for the MS4 TMDL Strategy that reflects the actual extent of Regulated MS4s, and their contributing drainage areas, as described in the following section.

ii. Adjustment Approach:

1. Adjustment Process:

The MS4 Baselines, MS4 Allocations and Load Reductions were adjusted using the following approach:

- 1) The TMDL Storm Sewershed or Urbanized Area was delineated for each TMDL Subbasin based on mapping of the MS4 system and topography, excluding any portions that are discharging to streams that are not currently listed by PADEP for stormwater related impairments; and
- 2) The delineated TMDL Storm Sewershed or Urbanized Area land area was then used to pro-rate the MS4 Baselines, MS4 Allocations, and Load Reduction requirements.

Methods used for adjusting MS4 Baselines, MS4 Allocations and Load Reductions are described in the following subsection. The overall process included the following steps:

- A base map for West Brandywine Township was prepared using best available geographic data to include: political boundaries, streams and surface water bodies, TMDL Subbasin boundaries, TMDL Watershed boundaries, and the Urbanized Area.
- The West Brandywine Township Regulated Small MS4 (as defined in “Key Definitions”) was mapped.
- The TMDL Storm Sewershed area (as defined in “Key Definitions”) was delineated for each TMDL subbasin that is applicable to West Brandywine Township.
 - The portions of the TMDL Storm Sewershed that do not drain to a stream currently listed as impaired by PADEP for stormwater related causes are subtracted from the TMDL Storm Sewershed area for each TMDL subbasin.
- The total land area within the Urbanized Area within each TMDL Subbasin was calculated and used in lieu of the TMDL Storm Sewershed area as a simplified method.
 - The portions of the Urbanized Area that do not drain to a stream currently listed as impaired by PADEP for stormwater related causes are subtracted from the Urbanized Area land area for each TMDL subbasin.
- Adjusted MS4 Baselines, MS4 Allocations, and Load Reductions for each applicable TMDL pollutant were calculated by TMDL Subbasin using the methods and equations as presented below.

2. Delineation of TMDL Storm Sewershed:

The following method was used by West Brandywine Township to delineate the TMDL Storm Sewershed. This methodology is consistent with the recommended

approach described by EPA in the TMDL Reports and has been conditionally approved by PADEP in its letter dated March 21, 2012 (Appendix B):

Land Use Area Method – Within each applicable TMDL subbasin, the TMDL Storm Sewershed area is delineated based on 2008 LiDAR topography (2-foot contours), and the individual land use areas are determined using 2010 land use data. The Adjustment Equations are then applied to each land use type to recalculate the MS4 Baselines, MS4 Allocations and required Load Reductions for each category of land use within each TMDL Subbasin, for each applicable pollutant. The individual land use Baselines, MS4 Allocations and required Load Reductions are then summed by TMDL Subbasin, and then by TMDL Watershed. The TMDL Watershed totals become the adjusted MS4 Baseline, Allocation and required Load Reductions for each applicable pollutant.

Total Land Area Method – Within each applicable TMDL subbasin, the TMDL Storm Sewershed area is delineated based on 2008 LiDAR topography (2-foot contours). The Adjustment Equations are then applied to the total TMDL Storm Sewershed area for each TMDL Subbasin to recalculate the MS4 Baselines, MS4 Allocations, and Load Reductions for each applicable pollutant. The TMDL Subbasin totals are then summed by TMDL Watershed. The TMDL Watershed totals become the adjusted MS4 Baseline, Allocation and required Load Reductions for each applicable pollutant.

Urbanized Area Method – Within each applicable TMDL subbasin, the total land area within the Urbanized Area is determined using the Urbanized Areas currently depicted on the PADEP Stormwater webpage (2000 Census). The Adjustment Equations are then applied to the total land area within the Urbanized Area for each TMDL Subbasin to recalculate the MS4 Baselines, MS4 Allocations, and Load Reductions for each applicable pollutant. The TMDL Subbasin totals are then summed by TMDL Watershed. The TMDL Watershed totals become the adjusted MS4 Baseline, MS4 Allocation and required Load Reductions for each applicable pollutant.

Other Method –

iii. Recalculation of Required Load Reduction (Adjustment Equations):

Each method above results in a delineation of the land area(s) to be used to calculate the Adjusted MS4 Baselines, MS4 Allocations, and required Load Reductions (See “Key Definitions”) using the following Adjustment Equations:

$$\text{Adjustment Ratio} = \frac{\left(\text{Actual Contributing land area (acres)} \right)}{\left(\text{Land area (acres) used by EPA to calculate the EPA MS4 Allocation} \right)}$$

$$\begin{aligned}\text{Adjusted MS4 Baseline} &= \text{Adjustment Ratio} \times (\text{EPA MS4 Baseline}) \\ \text{Adjusted MS4 Allocation} &= \text{Adjustment Ratio} \times (\text{EPA MS4 Allocation}) \\ \text{Adjusted MS4 Load Reduction} &= (\text{Adjusted MS4 Baseline}) - (\text{Adjusted MS4 Allocation})\end{aligned}$$

The adjustment calculations are provided in Appendix C:

- Appendix C.1 – MS4 Worksheet for Calculating Adjusted MS4 Baseline Loads, MS4 Allocations, required Load Reductions and new Municipal LAs - Land Use Area method.
- Appendix C.2 – MS4 Worksheet for Calculating Adjusted MS4 Baseline Loads, MS4 Allocations, required Load Reductions and new Municipal LAs - Total Land Area method.

iv. New Municipal Load Allocation (LA):

The portion of the EPA MS4 Allocation that was removed by the adjustment is now assigned as the Load Allocation (LA) for West Brandywine Township. The total TMDL Allocation for West Brandywine Township remains unchanged by the adjusted MS4 Allocation, and becomes: MS4 Allocation (WLA) + Municipal LA +MOS.

Table 2 presents the Adjusted MS4 Baselines, MS4 Allocations and adjusted Load Reductions for West Brandywine Township. The new LA for West Brandywine Township is also shown for each TMDL Watershed.

**Table 2. Adjusted MS4 Baselines, MS4 Allocations Required Load Reductions
and New LA for West Brandywine Township**

6 MUNICIPAL TMDL SUMMARY (BY WATERSHED)			
Note: All values are calculated in this section from the Watershed Totals in Appendix C.2, column E		TMDL Watershed 1	TMDL Watershed 2
NITROGEN - <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable			
Total Nitrogen MS4 baseline Load (kg/day):		136.01	
Total Nitrogen MS4 Allocation (kg/day):		104.78	
Nitrogen Reduction (kg/day):		31.23	
TMDL Percent Reduction:		23%	
Adjusted Total Nitrogen MS4 baseline Load (kg/day):		10.58	
Adjusted Total Nitrogen MS4 Allocation (kg/day):		8.67	
Adjusted Nitrogen Reduction (kg/day)		1.90	
Adjusted Nitrogen Percent Reduction		18%	
New Nitrogen Municipal Load Allocation (kg/day):*		96.11	
PHOSPHORUS - <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable			
Total Phosphorus MS4 baseline Load (kg/day):		9.63	
Total Phosphorus MS4 Allocation (kg/day):		8.34	
Phosphorus Reduction (kg/day):		1.29	
TMDL Percent Reduction:		13%	
Adjusted Total Phosphorus MS4 baseline Load (kg/day):		0.16	
Adjusted Total Phosphorus MS4 Allocation (kg/day):		0.13	
Adjusted Phosphorus Reduction (kg/day):		0.03	
Adjusted Phosphorus Percent Reduction:		18%	
New Phosphorus Municipal Load Allocation (kg/day):*		8.21	
SEDIMENT - <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable			
Total Sediment baseline MS4 Load (tons/year):		0.00	
Total Sediment MS4 Allocation (tons/year):		0.00	
Sediment Reduction (tons/year):		0.00	
TMDL Percent Reduction:		#DIV/0!	
Adjusted Total Sediment MS4 baseline Load (tons/year):		0.00	
Adjusted Total Sediment MS4 Allocation (tons/year):		0.00	
Adjusted Sediment Reduction (tons/year):		0.00	
Adjusted Sediment Percent Reduction:		#DIV/0!	
New Sediment Municipal Load Allocation (tons/year)*		0.00	

* The new Municipal Load Allocations are not addressed by this MS4 TMDL Strategy

VIII. Control Measures and BMPs Implemented to Meet the TMDL(s):

a. MS4 TMDL Implementation Area:

The TMDL Implementation Area for placing TMDL BMPs/control measures consists of any location within a TMDL Subbasin that drains to a stream with a stormwater-related impairment, and within the Urbanized Area. Once PADEP credit, trading, and offset policies are in place, BMPs/control measures may be located outside the Urbanized Area, subject to those policies. The MS4 TMDL Implementation Area for West Brandywine Township is based on the information above and the definition presented in “Key Definitions”.

b. Priorities for Implementation:

Based on PADEP feedback from the letter dated March 21, 2012 (Appendix B), BMP/control measure selection has been prioritized within the Implementation Area in the following order:

- First on properties owned by the Municipality that will minimize the volume and rate of stormwater flow discharging from the Regulated Small MS4 and are within the TMDL watershed and the Urbanized Area;
- Second, on non-Municipal properties that will minimize the volume and rate of stormwater flow discharging from the Regulated Small MS4 and are within the TMDL watershed and Urbanized Area;
- Third, on non-Municipal properties within the Urbanized Area that are a source of sediment or nutrients; and
- Fourth, on any sources outside the Urbanized Area located within the TMDL watershed and targeted to maximize pollutant load reductions, and in accordance with DEP’s forthcoming applicable credit, trading, and offset policies.

West Brandywine Township will formally establish its responsibilities associated with protecting the permanence of each BMP/control measure implemented for achieving the TMDL Load Reductions presented in this MS4 TMDL Strategy, in order to sustain those water quality improvements into the long-term future. This includes establishing the necessary legal and administrative arrangements and instruments to insure that the Township can fulfill its responsibilities for access, and inspection, maintenance, and operation (O, M & I) of any constructed TMDL BMP/control measure, and protect each

measure against future disturbance except as authorized by the Township. These responsibilities will be established and implemented for each BMP/control measure installation or retrofit for which a Load Reduction is counted by West Brandywine Township toward its incremental and total TMDL targets.

c. *Inventory of Previously Installed Pollutant Reduction Control Measures (March 10, 2003– Sept 14, 2012):*

West Brandywine Township

has previously installed pollutant reduction control measures to claim (2003-2012). See below.

has NO previously installed pollutant reduction control measures to claim at this time (2003-2012). (Skip below and go to Subsection VIII.d).

The PADEP letter further states that “...any municipality that seeks to count pollutant load reductions made in the past can do so only if they satisfy all of the above factors to DEP’s satisfaction.”

Projects listed in Table 3 include BMP/control measures that fall into three categories:
(Note: Table 3 is NOT included in the report)

1. Voluntary BMPs/control measures or retrofits, either structural or non-structural, which were not completed as part of a land development project;
2. BMPs/control measures installed as part of (a) land development project(s) approved by the Municipality, which voluntarily exceeded the pollutant removal efficiency required by the NPDES construction permit (i.e., pollutant removal required by NPDES application worksheet of calculations and PA BMP Manual);
3. BMPs/control measures installed as part of (a) land development project(s) approved by the Municipality, which exceeded the pollutant removal efficiency required by the NPDES construction permit, as required by the Municipality’s Stormwater Management Ordinance.

Category 3 BMPs/control measures are considered to be the “Municipal Stormwater Ordinance Control Measure”, which is further discussed in the next subsection. For BMP/control measure categories 2 and 3, above, only the portion of pollutant load removal that is above and beyond the PADEP NPDES permit requirement is included in Table 3. For all BMPs/control measures, permanent protection, inspection, operation and maintenance provisions have been put into place. For each control measure listed in Table 3 justification for pollutant reduction credit, including calculations and information in support of items 1 through 7 above have been provided in Appendix D.

d. *Municipal Stormwater Ordinance Control Measure:*

The Stormwater Management Ordinance adopted by West Brandywine Township in December 2013 meets or exceeds the minimum standards required in the “County-wide Act 167 Plan for Chester County” and stormwater ordinance exceeds the minimum PADEP NPDES permit requirements for new construction for the following components related to water quality protection:

- X Infiltration;
- X Volume control;
- X Minimum area of proposed impervious surface or proposed or earth disturbance to which ordinance standards apply;
- X Riparian Buffers
- X Peak Rate Reductions for storm events up to the 50 year storm.
- X Prohibited Discharges

West Brandywine Township may document all future BMPs/control measures installed as part of new construction or redevelopment projects that meet the requirements of its Ordinance and achieve pollutant load reductions that exceed the minimum requirements of a PADEP NPDES permit for new construction. Only the portion of pollutant load removal that is above and beyond the PADEP NPDES permit requirement is counted towards the required TMDL pollutant Load Reductions and will be counted toward the TMDL implementation timeline and milestones for the Township(see Subsection 3.IX).

e. *Proposed Control Measures to be Implemented:*

There are no candidate BMPs/control measures proposed to be implemented by West Brandywine Township during this 5-year permit cycle as the only stream segment designated as Impaired in the 2006 TMDL Report in the Urbanized Area has subsequently been removed from the Section 303(d) list for being impaired.

West Brandywine Township is aware that according to the latest 2014 Impaired Streams Inventory, to be utilized in the next permit cycle, the streams designated as impaired has changed. In addition, the Urbanized Area has been modified according to the 2010 Census. This will have a bearing on where BMP/control measures will need to be implement as well as where they could be implemented where the water quality benefits will be maximized. The areas where development has occurred will be integrated into the 2010 Urbanized area, thereby affording the Township the opportunity to assess the benefits of the constructed BMPs toward the pollutant load reduction.

The Township has recently received a set a newly developed maps prepared by the Chester County GIS Dept. for the storm sewer system within the Township. Those maps primarily show the storm sewer systems and are undergoing further review to

determine the locations of other points of discharge from ditches or swales that may also be classified as outfalls to facilitate mapping of the contributory storm sewersheds.

The Township will continue to promote Public Education and Outreach under MCM #1 and encourage Public Participation and Involvement under MCM #2 as outlined in the Annual Report.

The Township will develop a program to contact the land owners of the large tracts of undeveloped property – farms - both within and outside the Urbanized Area, but within the watershed(s) contributing runoff to impaired streams and encourage their participation in the NPDES program to implement measures towards reducing the discharge of pollutants from their property.

Consideration will also be given to promoting and developing a Watershed Authority to provide a source of funding for the implementation, operation and maintenance of a unified and consistent management program.

IX. Analysis of Consistency of this Implementation Plan with WLAs and TMDLs:

a. Analysis of Consistency:

As shown in Tables 1, 2, and 5 (presented below), Figures 1 and 2, and as described in the “Key Definitions” and Subsections C.I through C.VIII of this MS4 TMDL Strategy, the implementation actions listed in Subsection C.VIII and this MS4 TMDL Strategy are consistent with the requirements and assumptions of the applicable TMDL Reports listed in Subsection C.I.

b. Timeline and Milestones:

As noted in Section VIIa and Section VIIIe of this Strategy, due to the determination that the only stream segment designated as impaired in the original stream mapping is no longer designated as impaired in the 2014 Impaired Streams Maps within the Urbanized Area, it does not appear that the implementation of physical BMPs warranted during the remainder of this permit cycle. Accordingly, neither Table 5 nor Table 6 is not included.

c. Process for Evaluating and Updating MS4 TMDL Plan:

West Brandywine Township will also continue participation in the C-TIP Partnership and work with the group to evaluate, and, as needed, revise the overall C-TIP approach to ensure timely progress toward the TMDL Watershed implementation targets.

d. *BMP/Control measures Performance Evaluation and Reporting:*

BMP/control measures performance evaluation will consist of inspections conducted by West Brandywine Township (or its designee) to ensure that the BMP/control measures constructed or retrofitted to meet the TMDL requirements continue to be maintained as designed. The Municipality will insure that an appropriate technical expert will inspect the facility during construction and annually, and will report observations made. Any needs will be identified and reported, and will be scheduled for implementation. Inspection information will be maintained on file and summarized in municipal periodic MS4 permit reports.

X. **Additional Information: (See Appendices)**

SECTION D – References

2010 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. Undated. Pennsylvania Department of Environmental Protection. Office of Water Management, Bureau of Water Supply & Wastewater Management, Water Quality Assessment and Standards Division, Harrisburg, PA.

Furlan, Ronald C. – PADEP. Letter dated March 21, 2012, re: Christina Basin Total Maximum Daily Load Implementation Plan (C-TIP) (2/13/2012).

Revisions to Total Maximum Daily Loads for Nutrient and Low Dissolved Oxygen Under High-Flow Conditions, Christina River Basin, Pennsylvania, Delaware, and Maryland. September 2006. U.S. Environmental Protection Agency, Philadelphia, PA.

Total Maximum Daily Loads for Bacteria and Sediment in the Christina River Basin, Pennsylvania, Delaware, and Maryland. September 2006. U.S. Environmental Protection Agency, Philadelphia, PA.

Total Maximum Daily Load for the Red Clay Creek Basin Chester County, Pennsylvania. April 7, 2007. U.S. Environmental Protection Agency, Philadelphia, PA.

Total Maximum Daily Loads, Polychlorinated Biphenyls (PCBs) and Chlordane, West Branch Brandywine Creek, Chester County, Pennsylvania. March 9, 2001. Pennsylvania Department of Environmental Protection, Harrisburg, PA.

SIGNATURE AND SEAL BY PROFESSIONAL ENGINEER

Name

Signature

PA License Number

Date

**APPENDIX A –
MUNICIPALITIES PARTICIPATING IN C-TIP PARTNERSHIP**

APPENDIX A



**Brandywine
Valley
Association**

This is a list of the Municipalities that are members of the CTIP partnership.

1. Avondale Borough
2. Caln Township
3. Coatesville
4. Downingtown Borough
5. East Bradford Township
6. East Brandywine Township
7. East Caln Township
8. East Fallowfield Township
9. Franklin Township
10. Honey Brook Township
11. Kennett Borough
12. Kennett Township
13. London Grove Township
14. Londonderry Township
15. New Garden Township
16. New London Township
17. Parkesburg Borough
18. Penn Township
19. Pocopson Township
20. Sadsbury Township
21. South Coatesville
22. Thornbury Township
23. Uwchlan Township
24. Valley Township
25. West Bradford Township
26. West Brandywine Township
27. West Caln Township
28. West Chester Borough
29. West Goshen Township
30. West Whiteland Township

1760 Unionville-Wawaset Road, West Chester, PA 19382-6751

T: 610-793-1090 F: 610- 793-2813 E: water@bva-rcva.org

Web: www.brandywinewatershed.org

**APPENDIX B –
PADEP LETTER DATED MARCH 21, 2012**



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

March 21, 2012

Ms. Jan Bowers
Chester County Water Resources Authority
601 Westtown Rd., Suite 270
West Chester, PA 19380-0990

Re: Christina River Total Maximum Daily Load Implementation Plan (C-TIP)(02/13/2012)

Dear Ms. Bowers:

This letter constitutes the Department of Environmental Protection's (DEP) response to the Chester County Water Resource Authority's (CCWRA) submittal of the February 13, 2012, C-TIP proposal and discussions held in Harrisburg on that date. DEP would like to thank you, along with other CCWRA staff, the CCWRA, the Chester County Board of Commissioners, the Chester County Conservation District, the Brandywine Valley Association, and others who have taken the time and initiative to develop the approach and vet it with the many Christina Basin municipalities in Chester County. This coordinated effort is critical to the preparation and implementation of measures to meaningfully address the complex and geographically large Christina Basin TMDLs for Sediment and Nutrients. We are also appreciative of the efforts expended to revise earlier versions of C-TIP in response to concerns raised in several discussions with our agency.

In sum, DEP generally concurs with your approach, in concept, as a viable way for Christina municipalities to make substantial progress in addressing applicable MS4 TMDL WLAs under PAG-13 or an MS4 Individual NPDES permit to improve this Commonwealth's waters. We believe that your conceptual approach is generally sound, and parts of it, such as the approach to the parsing of WLA load in a municipality, mimic ongoing efforts we have engaged in. Also, we concur with your analysis regarding the non-applicability of bacteria TMDLs to the municipalities due to the absence of bacteria § 303(d) listings in the Christina Basin. In addition, your implementation approach appears sound, as well, though we have specific concerns below that will need to be addressed.

Although we generally concur with your proposal, our concurrence is conditioned on CCWRA and the implementing municipalities addressing our comments on how C-TIP can and should be improved, and some caveats, as set forth in the following paragraphs.

DEP's general conceptual approval of the February 13, 2012, C-TIP approach is subject to these caveats:

Rachel Carson State Office Building | P.O. Box 8774 | Harrisburg, PA 17105-8774

1. **Concurrence in Concept Only** - The conceptual approval from DEP of the February 13, 2012, C-TIP proposal is expressly limited to only the concept that has been brought before DEP, not any particulars or specifics in the proposal, except as expressly noted in this letter.
2. **Right to Change Position** - DEP reserves the right to change its position regarding the C-TIP proposal should further information or analysis reveal technical or legal flaws in the concept, as proposed or implemented, or should other circumstances or factors arise meriting a change in position.
3. **No Pre-Approval of Municipal MS4 TMDL Plans** - DEP's conceptual approval of the February 13, 2012, C-TIP proposal does not constitute pre-approval of any municipal MS4 TMDL Plan. The MS4 TMDL Strategy portion of each Plan that each municipality must develop under PAG-13 must be submitted to DEP by September 14, 2012, and will be evaluated on its own merits. Similarly, the MS4 TMDL Design Details part of the Plan that each municipality must develop must be submitted to DEP within one year of approval of coverage by DEP. DEP will not approve a MS4 TMDL Plan for a municipality unless the agency conducts an evaluation of the proposed Plan and then makes a finding that the Plan satisfies all applicable conditions of the permit and federal, state and local law, including a timeline with milestones outlining what will be accomplished, both in the first permit term and ultimately, along with the ten elements required for a Plan on pages 16-17 of Part C of the PAG-13 Authorization to Discharge.

DEP's approval is further conditioned on CCWRA and the implementing municipalities addressing the following concerns to the satisfaction of DEP.

1. **Timeline for Attaining Pollutant Reduction Goals** - The C-TIP proposes a 25 year timeline to meet pollutant reduction targets. While this timeline is markedly better than the 40 year timeline set forth in the prior C-TIP proposal that was presented to DEP, it still falls short of the 15 year timeline recommended by EPA. As a condition of concurring with the C-TIP proposal, the timelines in the C-TIP need to be modified and implemented as follows.

DEP expects timeframes for pollutant reductions to be based on the pollutant load percentage reduction required for each regulated small MS4. Regulated small MS4s with applicable WLAs requiring reductions up to 50% should have a timeline no longer than 10 years. Where reductions of 50-85% are required in the WLA, the timeline should be no longer than 15 years. Regulated small MS4s subject to WLAs requiring reductions of 85% or greater should have a timeline no greater than 20 years. Operators of regulated small MS4s can seek a longer timeframe if they are able to provide a compelling justification in their MS4 TMDL Plan submittal, to DEP's satisfaction, demonstrating why a longer timeframe is necessary. Each MS4 TMDL Plan, including a request for an alternate timeline, will be evaluated on its merits.

2. **Priorities for Municipal Pollutant Load Reductions** - On page 4 of the C-TIP narrative, the C-TIP gives first priority to implementing measures on "municipal owned/operated pollutant sources." DEP supports the focus on these areas as a way to harvest "low-hanging fruit" pollutant

load reductions in the first permit term and thereafter. Moreover, DEP expects that C-TIP municipalities will prioritize the installation and implementation of BMPs on municipal owned sources and other sources claimed by the municipality to minimize the volume and rate of stormwater flow discharging from the regulated small MS4 to surface waters. DEP also expects that BMPs will be installed and implemented at locations on municipal owned sources within the watershed that are targeted to maximize pollutant load reductions. It is important that pollutant reduction opportunities be undertaken in an efficient manner given the challenges of eliminating impairments and the costs of installing and implementing measures to address these impairments.

As a condition of DEP's concurrence with C-TIP, DEP expects that the C-TIP be amended and implemented to reflect the above-stated priorities, unless the municipality is able to provide a compelling justification, to DEP's satisfaction, demonstrating why a different approach is preferable.

3. *First Term Permit Reductions* - The C-TIP proposal specifies a 5% reduction in pollutant load in the first MS4 TMDL permit cycle (ie, the cycle running from approximately 2013-2018), along with 20-25% reductions listed in the C-TIP for subsequent permit cycles. While we acknowledge that there will be startup issues in obtaining such reductions, 5% seems like a low reduction target for the first permit term. Municipalities should, as specified in the C-TIP, be tackling their "low hanging fruit" in the first permit cycle, such as runoff from municipal owned and operated facilities. DEP questions whether it is reasonable to "backload" reductions to later permit cycles when the low hanging fruit is targeted as a priority in the first permit term. Accordingly, DEP's concurrence in the C-TIP proposal is conditioned on the C-TIP indicating that an effort will be made so that at least 10-15% of pollutant load reductions are targeted to be achieved by the end of the first MS4 TMDL permit cycle unless a municipality provides compelling justification in its MS4 TMDL Plan, to DEP's satisfaction, demonstrating the rationale for why alternate load reduction percentages may be merited in the first and other permit terms. Such demonstration needs to be consistent with any demonstration made for an alternate timeline as set forth above.

4. *Cause or Contribute Terminology* - Throughout the C-TIP proposal there are references to the term "cause or contribute," or various iterations thereof. As we understand your use of the term, it is meant to address situations where the TMDL erroneously assigns a WLA to a municipality, such as the situation where a regulated small MS4 does not discharge stormwater from its outfalls (assuming they have been correctly identified) into the subbasin subject to the WLA. It could also apply to situations where an operator of a regulated small MS4 is not required under law to submit a MS4 TMDL Plan. We think your use of the term "cause or contribute" is better expressed in the phrase "the operator of the regulated small MS4 is not required to submit an MS4 TMDL Plan because the WLA is not applicable." The term "cause or contribute" is a term of art under the federal Clean Water Act that carries with it many permitting and water-quality based effluent limitations; implications that we believe unduly complicate what you are trying to do. If you choose to continue using the term "cause or contribute" you will need to provide a definition, together with an explanation and requisite justification explaining how, as the term is used in your proposal, a municipality would demonstrate that it does not "cause or contribute" to an existing impairment, including the justifications they would need to provide. This is a critical issue since the C-TIP proposal contains numerous "outs" excusing operators of

regulated small MS4s from preparing and executing MS4 TMDL Plans if they do not "cause or contribute."

In sum, DEP's concurrence is conditioned on the C-TIP proposal being amended in either of two ways. First, the proposal can be amended to delete any references to the term "cause or contribute" and replace them with terminology such as "the permittee is not required to submit an MS4 TMDL Plan because the WLA is not applicable," or some similar language, along with conforming revisions. A second alternative is to provide an explanation with requisite definitions and justifications explaining how, as the term is used in your proposal, a permittee would demonstrate that it does not "cause or contribute" to an existing impairment, including the justifications they would need to provide.

5. Eligible Past Pollutant Reductions – A question arises whether a municipality participating in the C-TIP will be able to count pollutant reductions the permittee made at some time after the assessment that resulted in the impairment listing for which a TMDL (and WLA) was prepared. In prior C-TIP correspondence between DEP and CCWRA (July 15, 2011), DEP set out the following prerequisites for a municipality seeking to count pollutant load reductions from past actions. Any pollutant reductions claimed by a municipality for past BMP implementations will be analyzed under these factors: (1) the municipality must demonstrate that the subject BMPs satisfy all applicable legal requirements; (2) the municipal actions must have occurred after the more recent of: (a) March 10, 2003, (the date PCSM began to be implemented statewide) or (b) the completion date of the stream assessment for the applicable TMDL; (3) the municipality must demonstrate that any actions taken by the municipality to reduce pollutant loads were voluntary and not required by any permit, order, or other enforceable mechanism, or by any state, federal or local law; (4) the municipality must demonstrate that any actions taken reduced pollutant loads from the *status quo ante* prior to the action; (5) pollutant load reductions may not be claimed for open space or agricultural preservation; to count an action to reduce pollutant loads must be restorative not preservative; (6) net pollutant loading reductions must be calculated by netting the demonstrated pollutant load reductions of the applicable restoration BMPs installed after the applicable eligibility date against the increased pollutant loadings, if any, due to the addition of impervious surface and other development in and otherwise impacting the municipality during the timeframe in which credit for an applicable pollutant load reduction is sought; and (7) pollutant load reductions may be counted upon DEP's determination that all applicable legal requirements have been satisfied and there is a demonstrated quantifiable net decrease in applicable pollutant loadings in the municipality for the identified timeframe.

DEP's concurrence in the C-TIP concept is conditioned such that any municipality that seeks to count pollutant load reductions made in the past can do so only if they satisfy all of the above factors to DEP's satisfaction.

6. Eligibility of Reductions Outside the Urbanized Area (UA) – A question arises whether pollutant reductions undertaken outside the UA by any entity can be counted by a municipality toward meeting a permittee's MS4's TMDL WLA obligations. In prior C-TIP correspondence between DEP and CCWRA (July 15, 2011), DEP set out the following prerequisites that a municipality must demonstrate, to DEP's satisfaction, to count reductions undertaken outside of

the UA toward meeting a permittee's MS4's TMDL WLA obligation: (1) the municipality must demonstrate that it satisfies all applicable legal requirements; (2) any load reductions outside the UA can only be counted if they are consistent with DEP's forthcoming applicable credit, trading and offset policies; (3) the performance of any BMPs must be substantiated to the satisfaction of DEP with appropriate analyses to satisfy the claimed pollutant load reduction; (4) the permittee must establish suitable authority (e.g. ownership and control) over the BMP facilities; (5) the facilities and BMPs cannot also be counted toward meeting some other party's TMDL obligations; and (6) the target pollutant load reductions must be quantifiable at the impaired stream segment that receives stormwater discharges from the municipality's regulated small MS4.

DEP's concurrence in the C-TIP concept is conditioned such that any municipality that seeks credits for pollutant load reductions undertaken outside the UA may do so only if they satisfy all of the above factors to DEP's satisfaction.

7. Offsets, Trading and Credits in MS4 TMDL Plans – As referenced above, any offset or credit sought by a municipality must be in accordance with DEP's applicable credit, trading and offset policies. As you are aware, DEP currently has an ongoing stakeholder group (in which you are a participant) that is discussing how offsets, trading and credits would be applied in a stormwater context. As such, municipalities that seek to include offsets and/or credits for pollutant load reductions in an MS4 TMDL Plan will need to ensure that such proposals conform with DEP's applicable credit, trading and offset policies as they evolve and are finalized and implemented.

8. Adjustment of Allocations After First Permit Cycle – The C-TIP proposal provides no explanation of how load reductions will be allocated by a municipality after the first MS4 TMDL permit cycle. DEP's concurrence in the C-TIP approach is conditioned on CCWRA providing language to DEP detailing how such load reductions will be re-allocated after the first MS4 TMDL permit cycle.

In closing, DEP thanks you again for your contributions toward planning, coordinating and implementing a program that has the tremendous potential to improve and protect Pennsylvania's water resources. We look forward to a continuing dialogue as PAG-13 implementation dates approach. If you have any questions about this letter, please contact me by e-mail at rfurlan@pa.gov or by telephone at 717.787.8184.

Sincerely,



Ronald C. Furlan, PE, Division Manager
Division of Planning and Permitting

APPENDIX C –

**MS4 WORKSHEET FOR CALCULATING ADJUSTED MS4 BASELINE LOADS,
ADJUSTED MS4 ALLOCATIONS, AND ADJUSTED MS4 LOAD REDUCTIONS**

**APPENDIX C.2 - MS4 WORKSHEET FOR CALCULATING ADJUSTED MS4 BASELINE LOADS,
ADJUSTED MS4 ALLOCATIONS AND ADJUSTED MS4 LOAD REDUCTIONS -
TOTAL LAND AREA METHOD**

MUNICIPALITY NAME: , CHESTER COUNTY, PA

DATE OF TMDL PLAN SUBMISSION:

LIST APPLICABLE TMDL WATERSHED(S):		LIST ONLY THE TMDL SUBBASINS WITHIN EACH TMDL WATERSHED:
1)	<i>Brandywine Creek</i>	<i>B02, B03, B10*, B30</i>
2)		<i>*Only Indian Run is Impaired in B10</i>

FOR ALL LISTED TMDL SUBBASINS FILL IN SECTIONS 1, 2 and 4 WITH THE VALUES REFERENCED FROM THE APPLICABLE TMDL REPORT
ALL OTHER VALUES ARE CALCULATED AS DESCRIBED. CALCULATIONS MUST BE APPLIED TO ALL NEW ROWS ADDED.

1 LAND USE AREAS (ACRES):

Copied from Tables C-1. - C-4. in Appendix C of TMDL Report; Total (Watershed) is the sum of all acres for all land uses in each TMDL Watershed

TMDL subbasin	MS4 Total	Total (Watershed)
West Branch Brandywine Creek B02 (Not Impaired)	1950.51	8406.69
Unnamed tributaries to WBBC B03 (not Impaired)	2145.56	
East Branch Brandywine Creek (incl. Culbertson Run & Indian Run) B10	2087.04	
Beaver Creek B30 (Not Impaired)	2223.58	

2 TMDL STORM SEWERSHED AREA (ACRES): To be calculated by Municipality and inserted below

The following method, as described in Subsection VII.B, was used to assign these TMDL Storm Sewershed areas:

▼

TMDL subbasin	MS4 Total	Total (Watershed)
West Branch Brandywine Creek B02	0.00	491.00
Unnamed tributaries to WBBC B03	0.00	
East Branch Brandywine Creek B10 (Indian Run Basin Only in UA)	491.00	
Beaver Creek B30	0.00	

3 LAND USE ADJUSTMENT RATIOS:

Divide the TMDL Storm Sewershed area from Section 2 by the corresponding land use area from Section 1

TMDL subbasin	MS4 Total	Total (Watershed)
West Branch Brandywine Creek B02	0.000	0.058
Unnamed tributaries to WBBC B03	0.000	
East Branch Brandywine Creek B10	0.235	
Beaver Creek B30	0.000	

4 MS4 BASELINE LOADS AND MS4 ALLOCATIONS:			
Total nitrogen MS4 baseline loads (kg/day): Copied from TMDL Report Appendix C, Table(s): C-5a			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	46.80	136.01	
Unnamed tributaries to WBBC B03	44.26		
East Branch Brandywine Creek B10	44.95		
Beaver Creek B30	0.00		
Total nitrogen MS4 allocations (kg/day): Copied from TMDL Report Appendix C, Table(s): C-5b			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	28.08	104.78	
Unnamed tributaries to WBBC B03	39.84		
East Branch Brandywine Creek B10	36.86		
Beaver Creek B30	0.00		
Total phosphorus MS4 baseline loads (kg/day): Copied from TMDL Report Appendix C, Table(s): C-6a			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	0.894	9.630	
Unnamed tributaries to WBBC B03	8.051		
East Branch Brandywine Creek B10	0.685		
Beaver Creek B30	0.00		
Total phosphorus MS4 allocations (kg/day): Copied from TMDL Report Appendix C, Table(s): C-6b			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	0.536	8.344	
Unnamed tributaries to WBBC B03	7.246		
East Branch Brandywine Creek B10	0.562		
Beaver Creek B30	0.00		
Sediment baseline MS4 loads (tons/year): Copied from TMDL Report Appendix C, Table(s): C-5b			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	0.00	0.00	
Unnamed tributaries to WBBC B03	0.00		
East Branch Brandywine Creek B10	0.00		
Beaver Creek B30	0.00		
Sediment MS4 WLAs (tons/year): Copied from TMDL Report Appendix C, Table(s): C-5a			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	0.00	0.00	
Unnamed tributaries to WBBC B03	0.00		
East Branch Brandywine Creek B10	0.00		
Beaver Creek B30	0.00		

5 ADJUSTED MS4 BASELINE LOADS AND MS4 ALLOCATIONS			
Adjusted nitrogen MS4 baseline loads (kg/day):			
Multiply the MS4 Baseline Loads from section 4 by the corresponding Land Use Adjustment Ratio from section 3			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	0.000	10.58	
Unnamed tributaries to WBBC B03	0.000		
East Branch Brandywine Creek B10	10.575		
Beaver Creek B30	0.000		
Adjusted nitrogen MS4 allocations (kg/day):			
Multiply the MS4 Allocations (WLA) from section 4 by the corresponding Land Use Adjustment Ratio from section 3			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	0.00	8.67	
Unnamed tributaries to WBBC B03	0.000		
East Branch Brandywine Creek B10	8.672		
Beaver Creek B30	0.000		
Adjusted phosphorus MS4 baseline loads (kg/day):			
Multiply the MS4 Baseline Loads from section 4 by the corresponding Land Use Adjustment Ratio from section 3			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	0.00	0.16	
Unnamed tributaries to WBBC B03	0.000		
East Branch Brandywine Creek B10	0.161		
Beaver Creek B30	0.000		
Adjusted phosphorus MS4 allocations (kg/day):			
Multiply the MS4 Allocations (WLA) from section 4 by the corresponding Land Use Adjustment Ratio from section 3			
TMDL Subbasin	Subtotal	Total (Watershed)	
West Branch Brandywine Creek B02	0.000	0.13	
Unnamed tributaries to WBBC B03	0.000		
East Branch Brandywine Creek B10	0.132		
Beaver Creek B30	0.000		
Adjusted Sediment baseline MS4 loads (tons/year):			
Multiply the MS4 Baseline Loads from section 4 by the corresponding Land Use Adjustment Ratio from section 3			
TMDL Subbasin	Sub-Total	Total (Watershed)	
West Branch Brandywine Creek B02	0.00	0.00	
Unnamed tributaries to WBBC B03	0.00		
East Branch Brandywine Creek B10	0.00		
Beaver Creek B30	0.00		
Adjusted Sediment MS4 WLAs (tons/year):			
Multiply the MS4 Allocations (WLA) from section 4 by the corresponding Land Use Adjustment Ratio from section 3			
TMDL Subbasin	Sub-Total	Total (Watershed)	
West Branch Brandywine Creek B02	0.00	0.00	
Unnamed tributaries to WBBC B03	0.00		
East Branch Brandywine Creek B10	0.00		
Beaver Creek B30	0.00		

**APPENDIX D –
STRATEGY SYNOPSIS**

West Brandywine Township
Christina Basin MS4 TMDL Plan
Strategy Synopsis

VII. Reduction in Pollutant Loads Necessary to Meet Each Applicable TMDL or WLA:

a. EPA Pollutant Load Reductions:

Table 1, as presented in Section C.III, lists the applicable pollutant Load Reductions required by the TMDL Reports. Sadsbury Township is located within the Buck Run (B20), Rock Run (B33), and Sucker Run (B05) watersheds. Table 1 indicates that pollutant Load Reductions are required by Sadsbury Township for sediment, nitrogen and phosphorus.

The only stream segment designated as impaired within the Urbanized Area for the Township on the maps contained in the September 2006 TMDL Report of the Christina River basin , pursuant to the 1998 Section 303(d) list for nutrients is the Indian Run in B10. The is not only very little development in that area of the Township, there are minimal municipal storm sewers collecting runoff along the roads. The only significant development is the Indian Run Mobile Home Park, which is a privately owned community. It is also noted that this stream segment was removed from the impaired streams list in updated mappings. Accordingly, even if the impaired designation was still in place, there would be very little opportunity for the Township to be able to implement BMP's that would be effective in reducing the assigned pollutant loads for this permit cycle. Although the Allocation Tables were completed, the implementation of BMPs is not warranted at this time.

VIII. Control Measures and BMPs Implemented to Meet the TMDL(s):

e. Proposed Control Measures to be Implemented:

There are no candidate BMPs/control measures proposed to be implemented by West Brandywine Township during the remainder of this 5-year permit cycle, as the only stream segment designated as Impaired in the 2006 TMDL Report in the Urbanized Area has subsequently been removed from the Section 303(d) list for being impaired.

West Brandywine Township is aware that according to the latest 2014 Impaired Streams Inventory, to be utilized in the next permit cycle, the streams designated as impaired has changed. In addition, the Urbanized Area has been modified according to the 2010 Census. This will have a bearing on where BMP/control measures will need to be implemented, as well as where they could be implemented where the water quality benefits will be maximized. The areas where development has occurred will be integrated into the 2010 Urbanized area, thereby affording the Township the opportunity to assess the benefits of the constructed BMPs toward the pollutant load reduction.

The Township has recently received a set a newly developed maps prepared by the Chester County GIS Dept. for the storm sewer system within the Township. Those maps primarily show the storm sewer systems and are undergoing further review to determine the locations of other points of discharge from ditches or swales that may also be classified as outfalls to facilitate mapping of the contributory storm sewersheds.

The Township will continue to promote Public Education and Outreach under MCM #1 and encourage Public Participation and Involvement under MCM #2 as outlined in the Annual Report.

The Township will develop a program to contact the land owners of the large tracts of undeveloped property – farms - both within and outside the Urbanized Area, but within the watershed(s) contributing runoff to impaired streams and encourage their participation in the NPDES program to implement measures towards reducing the discharge of pollutants from their property.

Consideration will also be given to promoting and developing a Watershed Authority to provide a source of funding for the implementation, operation and maintenance of a unified and consistent management program.