

**ANNUAL MUNICIPAL SEPARATE
STORM SEWER SYSTEM (MS4)**

2020 STATUS REPORT (YEAR 1)

**JULY 2020
REVISED SEPTEMBER 2020**

PREPARED FOR:

**LANGHORNE MANOR BOROUGH
618 HULMEVILLE AVENUE
LANGHORNE, PA 19047**

PREPARED BY:

**CARROLL ENGINEERING CORPORATION
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WARRINGTON, PA 18976**

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**I. ANNUAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) STATUS
REPORT**

ANNUAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) STATUS REPORT

FOR THE PERIOD July 1, 2019 TO JUNE 30, 2020

GENERAL INFORMATION					
Permittee Name:	Langhorne Manor Borough	NPDES Permit No.:	PAI130076		
Mailing Address:	618 Hulmeville Avenue	Effective Date:	December 1, 2019		
City, State, Zip:	Langhorne, PA 19047	Expiration Date:	November 30, 2024		
MS4 Contact Person:	Barbara Ferraro	Renewal Due Date:	n/a		
Title:	Borough Secretary	Municipality:	Langhorne Manor Borough		
Phone:	(215) 752-5835	County:	Bucks		
Email:	borooffice@comcast.net				
Co-Permittees (if applicable): n/a					
Appendix(ces) that permittee is subject to (select all that apply): <input type="checkbox"/> Appendix A <input checked="" type="checkbox"/> Appendix B <input type="checkbox"/> Appendix C <input type="checkbox"/> Appendix D <input checked="" type="checkbox"/> Appendix E <input checked="" type="checkbox"/> Appendix F					
WATER QUALITY INFORMATION					
Are there any discharges to waters within the Chesapeake Bay Watershed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Identify all surface waters that receive stormwater discharges from the permittee's MS4 and provide the requested information (see instructions).					
Receiving Water Name	Ch. 93 Class.	Impaired?	Cause(s)	TMDL?	WLA?
UNT to Neshaminy Creek	WWF, MF	Yes	Siltation	Yes	Yes
UNT to Mill Creek	WWF, MF	Yes	Siltation	No	No

GENERAL MINIMUM CONTROL MEASURE (MCM) INFORMATION

Have you completed all MCM activities required by the permit for this reporting period? ☒ Yes ☐ No

List the current entity responsible for implementing each MCM of your SWMP, along with contact name and phone number.

MCM	Entity Responsible	Contact Name	Phone
#1 Public Education and Outreach on Storm Water Impacts	Langhorne Manor Borough	Barbara Ferraro	(215) 752-5835
#2 Public Involvement/Participation	Langhorne Manor Borough	Barbara Ferraro	(215) 752-5835
#3 Illicit Discharge Detection and Elimination (IDD&E)	Langhorne Manor Borough	Barbara Ferraro	(215) 752-5835
#4 Construction Site Storm Water Runoff Control	Langhorne Manor Borough	Barbara Ferraro	(215) 752-5835
#5 Post-Construction Storm Water Management in New Development and Redevelopment	Langhorne Manor Borough	Barbara Ferraro	(215) 752-5835
#6 Pollution Prevention / Good Housekeeping	Langhorne Manor Borough	Barbara Ferraro	(215) 752-5835

MCM #1 – PUBLIC EDUCATION AND OUTREACH ON STORM WATER IMPACTS

BMP #1: Develop, implement and maintain a written Public Education and Outreach Program.

1. For new permittees only, has the written PEOP been developed and implemented within the first year of permit coverage?

☐ Yes ☐ No

2. Date of latest annual review of PEOP: June 2020 Were updates made? ☒ Yes ☐ No

3. What were the plans and goals for public education and outreach for the reporting period?

The Borough's plans and goals included a substantial update to its website and to continue to distribute stormwater information to Borough's target audiences. A periodic newsletter (winter and summer) for the latest reporting period was distributed to Borough residents and businesses which contained MS4/Stormwater related articles. The Borough also conducted a public meeting on June 15, 2020 in order to educate the public on the new permit requirements and future PCSM BMP's which will need to be installed to meet pollutant reduction requirements. Construction details of the various BMP's being considered have been added to the Borough website.

4. Did the MS4 achieve its goal(s) for the PEOP during the reporting period? ☒ Yes ☐ No

5. Identify specific plans and goals for public education and outreach for the upcoming year:

The Borough will continue to reach out to its target audiences using the methods outlined in the PEOP. Educational materials shall be updated on the Borough website as necessary, and the periodic newsletter will continue to be distributed with at least one (1) MS4/Stormwater related article. Additionally, the Borough will send individual mailers to Cairn University and the Langhorne Gardens Health & Rehabilitation Center (the two (2) businesses in the Borough) with informative stormwater information. The Borough will also seek to further educate the public through the formation of the Stormwater Commission in next years permitting period.

BMP #2: Develop and maintain lists of target audience groups present within the areas served by your MS4.

1. For new permittees only, have the target audience lists been developed and implemented within the first year of permit coverage?

☐ Yes ☐ No

2. Date of latest annual review of target audience lists: June 2020

Were updates made? ☒ Yes ☐ No

BMP #3: Annually publish at least one educational item on your Stormwater Management Program.

1. For new permittees only, were stormwater educational and informational items produced and published in print and/or on the Internet within the first year of permit coverage?

☐ Yes ☐ No

2. Date of latest annual review of educational materials: June 2020

Were updates made? ☒ Yes ☐ No

3. Do you have a municipal website? ☒ Yes ☐ No (URL:
<http://langhornemanor.org>)

If Yes, what MS4-related material does it contain?

The Borough website has a dedicated Stormwater Program section. This section includes a general overview of the MS4 program, the six Minimum Control Measures, a list of things residents can do to prevent & minimize stormwater pollution, a separate tab with telephone numbers to report illicit discharges to different agencies, educational materials and links to other county, state, and federal agencies. Additionally, it contains information on the new individual permit and construction details for the PCSM BMP's which will be installed in the future in the Borough to meet the required pollutant reductions.

4. Describe any other method(s) used during the reporting period to provide information on stormwater to the public:
The Borough supplies pamphlets, brochures and handouts for their residents and other target audience members at Borough Office. Fact sheets are distributed to developers and contractors with all building permit applications.
The Borough's website contains a dedicated stormwater section.
5. Identify specific plans for the publication of stormwater materials for the upcoming year:
The Borough will review, update and provide new information to be included on the website and at Borough Hall.

BMP #4: Distribute stormwater educational materials to the target audiences.

Identify the two additional methods of distributing stormwater educational materials during the previous reporting period (e.g., displays, posters, signs, pamphlets, booklets, brochures, radio, local cable TV, newspaper articles, other advertisements, bill stuffers, posters, presentations, conferences, meetings, fact sheets, giveaways, or storm drain stenciling).

The Borough newsletter contained a stormwater related article and the Borough supplies pamphlets, brochures and handouts for their residents and other target audience members at the Borough Hall and Administration Building. Contractor's also receive educational material with their permit package.

MCM #1 Comments:

n/a

MCM #2 – PUBLIC INVOLVEMENT/PARTICIPATION

BMP #1: Develop, implement and maintain a written Public Involvement and Participation Program (PIPP)

1. For new permittees only, was the PIPP developed and implemented within one year of permit coverage?
☐ Yes ☐ No
2. Date of latest annual review of PIPP: June 2020 Were updates made? ☒ Yes ☐ No

BMP #2: Advertise to the public and solicit public input on ordinances, SOPs, Pollutant Reduction Plans (PRPs) (if applicable) and TMDL Plans (if applicable), including modifications thereto, prior to adoption or submission to DEP:

1. Was an MS4-related ordinance, SOP, PRP or TMDL Plan developed during the reporting period? ☐ Yes ☒ No
2. If Yes, describe how you advertised the draft document(s) and how you provided opportunities for public review, input and feedback:

The Borough PRP/TMDL plan was developed in the prior reporting period and subsequently approved and made effective by DEP on December 1, 2019.

3. If an ordinance, SOP or plan was developed or amended during the reporting period, provide the following information:

Ordinance / SOP / Plan Name	Date of Public Notice	Date of Public Hearing	Date Enacted or Submitted to DEP

BMP #3: Regularly solicit public involvement and participation from the target audience groups using available distribution and outreach methods.

1. At least one public meeting or other MS4 event must be held during the 5-year permit coverage period to solicit participation and feedback from target audience groups. Was this meeting or event held during the reporting period?

☒ Yes ☐ No If Yes, Date of Meeting or Event: June 16, 2020

2. Report instances of cooperation and participation in MS4 activities; presentations the permittee made to local watershed and conservation organizations; and similar instances of participation or coordination with organizations in the community.

A public meeting was conducted on June 16, 2020 where residents were encouraged to attend to discuss and provide input on the Borough's MS4 program and PRP/TMDL plan. Carroll Engineering presented an overview of the new permit requirements, six (6) minimum control measures, recent outfall monitoring, and the options for future BMP's to be installed in the Borough to meet the required pollutant reduction requirements of the PRP/TMDL plan. Presentation materials were posted on the Borough website following the meeting and the presentation is reiterated in the meeting minutes which are also available on the Borough website. Additionally, the Borough has solicited participation from residents by establishing a goal of forming a Stormwater Commission in next years permitting period. The commission shall meet to discuss Borough related stormwater issues and provide recommendations to the council on future MS4 initiatives.

3. Report activities in which members of the public assisted or participated in the meetings and in the implementation of the SWMP, including education activities or efforts such as cleanups, monitoring, storm drain stenciling, or others.

Public questions and comments were received during the June 15, 2020 meeting and are included in the meeting minutes attached hereto.

MCM #2 Comments:

n/a

MCM #3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDD&E)

BMP #1: Develop and implement a written program for the detection, elimination, and prevention of illicit discharges into the regulated small MS4.

1. For new permittees only, was the written IDD&E program developed within one year of permit coverage?

☐ Yes ☐ No

2. Date of latest annual review of IDD&E program: June 2020 Were updates made? ☒ Yes ☐ No

BMP #2: Develop and maintain map(s) that show permittee and urbanized area boundaries, the location of all outfalls and, if applicable, observation points, and the locations and names of all surface waters that receive discharges from those outfalls. Outfalls and observation points shall be numbered on the map(s).

1. Have you completed a map(s) that includes all components of BMP #2? ☒ Yes ☐ No

If Yes and you are a new permittee and have not submitted the map(s) previously, attach the map(s) to this report.

If No, date by which permittee expects map(s) to be completed:

2. Date of last update or revision to map(s): December 2018

3. Total No. of Outfalls in MS4: 12 Total No. of Outfalls Mapped: 12

4. Total No. of Observation Points: 15 Total No. of Observation Points Mapped: 15
5. During the reporting period, have you identified any existing outfalls that have not been previously reported to DEP in an NOI, application or annual report, or are any new MS4 outfalls proposed for the next reporting period?
- ☐ Yes ☒ No If Yes, select: ☐ Existing Outfall(s) Identified ☐ New Outfall(s) Proposed

BMP #3: In conjunction with the map(s) created under BMP #2 (either on the same map or on a different map), the permittee shall develop and maintain map(s) that show the entire storm sewer collection system within the permittee's jurisdiction that are owned or operated by the permittee (including roads, inlets, piping, swales, catch basins, channels, and any other components of the storm sewer collection system), including privately-owned components of the collection system where conveyances or BMPs on private property receive stormwater flows from upstream publicly-owned components.

1. Have you completed a map(s) that includes all components of BMP #3? ☒ Yes ☐ No

If Yes and you are a new permittee and have not submitted the map(s) previously, attach the map(s) to this report.

If No, date by which permittee expects map(s) to be completed:

2. If Yes to #1, is the map(s) on the same map(s) as for outfalls and receiving waters? ☒ Yes ☐ No

3. Date of last update or revision to map(s): December 2018

BMP #4: Conduct dry weather screenings of MS4 outfalls to evaluate the presence of illicit discharges. If any illicit discharges are present, the permittee shall identify the source(s) and take appropriate actions to remove or correct any illicit discharges. The permittee shall also respond to reports received from the public or other agencies of suspected or confirmed illicit discharges associated with the storm sewer system, as well as take enforcement action as necessary. The permittee shall immediately report to DEP illicit discharges that would endanger users downstream from the discharge, or would otherwise result in pollution or create a danger of pollution or would damage property.

For new permittees, all identified outfalls (and if applicable observation points) must be screened during dry weather at least twice within the 5-year period following permit coverage. For existing permittees, all identified outfalls (and if applicable observation points) must be screen during dry weather at least once within the 5-year period following permit coverage and, for areas where past problems have been reported or known sources of dry weather flows occur on a continual basis, outfalls must be screened annually during each year of permit coverage.

1. How many unique outfalls (and if applicable observation points) were screened during the reporting period? 27
2. Indicate the percentage of all outfalls screened in the past five years. 100%
3. Indicate the percent of outfalls screened during the reporting period that revealed dry weather flows: 8%
4. Did any dry weather flows reveal color, turbidity, sheen, odor, floating or submerged solids? ☐ Yes ☒ No
5. If Yes for #4, attach all sample results to this report with a map identifying the sample location. Explain the corrective action(s) taken in the attachment.
6. Do you use the MS4 Outfall Field Screening Report form (3800-FM-BCW0521) provided in the permit?
☒ Yes ☐ No
If No, attach a copy of your screening report form.

BMP #5: Enact a Stormwater Management Ordinance or SOP to implement and enforce a stormwater management program that includes prohibition of non-stormwater discharges to the regulated small MS4.

1. Do you have an ordinance (municipal) or SOP or other mechanism (non-municipal) that prohibits non-stormwater discharges? ☒ Yes ☐ No
If Yes, indicate the date of the ordinance or SOP: September 1, 2015
2. If Yes to #1, is the ordinance or SOP consistent with DEP's 2022 Model Stormwater Management Ordinance (3800-PM-BCW0100j) with respect to authorized non-stormwater discharges? ☐ Yes ☒ No
If Yes to #2 and the ordinance or SOP has not been submitted to DEP previously, attach the ordinance or SOP.

3. Were there any violations of the ordinance or SOP during the reporting period? ☐ Yes ☒ No

If Yes to #3, complete the table below (attach additional sheets as necessary).

Violation Date	Nature of Violation	Responsible Party	Enforcement Taken

4. Did you approve any waiver or variance during the reporting period that allowed an exception to non-stormwater discharge provisions of an ordinance or SOP? ☐ Yes ☒ No

If Yes to #4, identify the entity that received the waiver or variance and the type of non-stormwater discharge approved.

BMP #6: Provide educational outreach to public employees, business owners and employees, property owners, the general public and elected officials (i.e., target audiences) about the program to detect and eliminate illicit discharges.

1. Was IDD&E-related information distributed to public employees, businesses, and the general public during the reporting period? ☒ Yes ☐ No

If Yes, what was distributed? The Borough website, under the Stormwater Program Section, has a section explaining illicit discharges and a tab with water quality hotline telephone numbers to call and report illicit discharges to different agencies. Additionally, a training manual was provided to the Borough Secretary and Borough Zoning Officer which provides education on how to spot illicit discharges and report them. A copy of the appropriate reporting form was also attached to the training manual. A goal of next years permitting period is to update the Borough website/IDD&E plan to list the Borough as the primary contact for illicit discharges.

2. Is there a well-publicized method for employees, businesses and the public to report stormwater pollution incidents?

☒ Yes ☐ No

3. Do you maintain documentation of all responses, action taken, and the time required to take action? ☒ Yes ☐ No

MCM #3 Comments:

No illicit discharges were reported during the permitting period.

MCM #4 – CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Are you relying on PA's statewide program for stormwater associated with construction activities to satisfy this MCM?

☒ Yes ☐ No

(If Yes, respond to questions for BMP Nos. 1, 2 and 3 only in this section. If No, respond to questions for all BMPs in this section)

BMP #1: The permittee may not issue a building or other permit or final approval to those proposing or conducting earth disturbance activities requiring an NPDES permit unless the party proposing the earth disturbance has valid NPDES Permit coverage (i.e., not expired) under 25 Pa. Code Chapter 102.

During the reporting period, did you comply with 25 Pa. Code § 102.43 (relating to withholding building or other permits or approvals until DEP or a county conservation district (CCD) has approved NPDES permit coverage)?

☒ Yes ☐ No ☐ Not Applicable (no building permit applications received)

BMP #2: A municipality or county which issues building or other permits shall notify DEP or the applicable CCD within 5 days of the receipt of an application for a permit involving an earth disturbance activity consisting of one acre or more, in accordance with 25 Pa. Code § 102.42.

During the reporting period, did you comply with 25 Pa. Code § 102.42 (relating to notifying DEP/CCD within 5 days of receiving an application involving an earth disturbance activity of one acre or more)?

☒ Yes ☐ No ☐ Not Applicable (no building permit applications received)

BMP #3: Enact, implement and enforce an ordinance or SOP to require the implementation and maintenance of E&S control BMPs, including sanctions for non-compliance, as applicable.

1. Do you have an ordinance (municipal) or SOP or other mechanism (non-municipal) that requires implementation and maintenance of E&S control BMPs? ☒ Yes ☐ No

If Yes, indicate the date of the ordinance or SOP: September 1, 2015

2. If Yes to #1, is the ordinance or SOP consistent with DEP's 2022 Model Stormwater Management Ordinance (3800-PM-BCW0100j)? ☒ Yes ☐ No

3. If Yes to #2 and the ordinance or SOP has not been submitted previously, attach a copy of the ordinance or SOP.

BMP #4: Review Erosion and Sediment (E&S) control plans to ensure that such plans adequately consider water quality impacts and meet regulatory requirements.

Specify the number of E&S Plans you reviewed during the reporting period:

BMP #5: Conduct inspections regarding installation and maintenance of E&S control measures during earth disturbance activities. Maintain records of site inspections, including dates and inspection results, in accordance with the record retention requirements in this permit.

Specify the number of E&S inspections you completed during the reporting period:

BMP #6: Conduct enforcement when installation and maintenance of E&S control measures during earth disturbance activities does not comply with permit and/or regulatory requirements.

Specify the number of enforcement actions you took during the reporting period for improper E&S:

BMP #7: Develop and implement requirements for construction site operators to control waste at construction sites that may cause adverse impacts to water quality. The permittee shall provide education on these requirements to construction site operators.

Specify the method(s) by which you are educating construction site operators on controlling waste at construction sites:

BMP #8: Develop and implement procedures for the receipt and consideration of public inquiries, concerns, and information submitted by the public to the permittee regarding local construction activities.

1. A tracking system has been established for receipt of public inquiries and complaints. ☐ Yes ☐ No

2. Specify the number of inquiries and complaints received during the reporting period:

MCM #4 Comments:

n/a

MCM #5 – POST-CONSTRUCTION STORM WATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

BMP #1: Enact, implement and enforce an ordinance or SOP to require post-construction stormwater management from new development and redevelopment projects, including sanctions for non-compliance.

1. Do you have an ordinance (municipal) or SOP or other mechanism (non-municipal) that requires implementation and maintenance of post-construction stormwater management (PCSM) BMPs? ☒ Yes ☐ No
If Yes, indicate the date of the ordinance or SOP: September 1, 2015
2. If Yes to #1, is the ordinance or SOP consistent with DEP's 2022 Model Stormwater Management Ordinance (3800-PM-BCW0100j)? ☒ Yes ☐ No
3. If Yes to #2 and the ordinance or SOP has not been submitted previously, attach a copy of the ordinance or SOP.

BMP #2: Develop and implement measures to encourage and expand the use of Low Impact Development (LID) in new development and redevelopment. Measures should also be included to encourage retrofitting LID into existing development. Enact ordinances consistent with LID practices and repeal sections of ordinances that conflict with LID practices.

1. Do you have an ordinance (municipal) or SOP or other mechanism (non-municipal) that encourages and expands the use of LID in new development and redevelopment? ☒ Yes ☐ No
If Yes, indicate the date of the ordinance or SOP: September 1, 2015
2. If Yes to #1, is the ordinance or SOP consistent with DEP's 2022 Model Stormwater Management Ordinance (3800-PM-BCW0100j)? ☒ Yes ☐ No
3. If Yes to #2 and the ordinance or SOP has not been submitted previously, attach a copy of the ordinance or SOP.

BMP #3: Ensure adequate O&M of all post-construction stormwater management BMPs that have been installed at development or redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale.

1. Do you have an inventory of all PCSM BMPs that were installed to meet requirements in NPDES Permits for Stormwater Discharges Associated with Construction Activities approved since March 10, 2003? ☒ Yes ☐ No
If Yes to #1, complete Table 1 on the next page.
2. Has proper O&M occurred during the reporting period for all PCSM BMPs? ☒ Yes ☐ No
3. If No to #2, explain what action(s) the permittee has taken or plans to take to ensure proper O&M.

If you are relying on PA's statewide program for stormwater associated with construction activities, you may skip to MCM #6, otherwise complete all questions for BMPs #4 - #6 in this section.

BMP #4: Require the implementation of a combination of structural and/or non-structural BMPs that are appropriate to the local community, that minimize water quality impacts, and that are designed to maintain pre-development runoff conditions.

1. Specify the number of PCSM Plans reviewed during the reporting period for projects disturbing greater than or equal to one acre (including projects less than one acre that are part of a larger common plan of development or sale):
2. Has a tracking system been established and maintained to record qualifying projects and their associated BMPs?
☐ Yes ☐ No

PCSM BMP INVENTORY

Table 1. To complete the information needed for MCM #5, BMP #3, list all existing structural BMPs that discharge stormwater to the permittee's MS4 that were installed to satisfy PCSM requirements for earth disturbance activities under Chapter 102, and provide the requested information (see instructions).

BMP No.	BMP Name	DA (ac)	Entity Responsible for O&M	Latitude	Longitude	Date Installed	O&M Requirements	NPDES Permit No.
1	None in Borough			0 1 "	0 1 "			
2				0 1 "	0 1 "			
3				0 1 "	0 1 "			
4				0 1 "	0 1 "			
5				0 1 "	0 1 "			
6				0 1 "	0 1 "			
7				0 1 "	0 1 "			
8				0 1 "	0 1 "			
9				0 1 "	0 1 "			
10				0 1 "	0 1 "			
11				0 1 "	0 1 "			
12				0 1 "	0 1 "			
13				0 1 "	0 1 "			
14				0 1 "	0 1 "			
15				0 1 "	0 1 "			
16				0 1 "	0 1 "			

BMP #5: Ensure that controls are installed that shall prevent or minimize water quality impacts. The permittee shall inspect all qualifying development or redevelopment projects during the construction phase to ensure proper installation of the approved structural PCSM BMPs. A tracking system (e.g., database, spreadsheet, or written list) shall be implemented to track the inspections conducted and to track the results of the inspections (e.g., BMPs were, or were not, installed properly).

1. During the reporting period have you inspected all qualifying development and redevelopment projects during the construction phase to ensure proper installation of approved structural BMPs?
☐ Yes ☐ No ☐ Not Applicable (no qualifying projects during reporting period)
2. Has a tracking system been established and maintained to record results of inspections?
☐ Yes ☐ No

BMP #6: Develop a written procedure that describes how the permittee shall address all required components of this MCM.

Have you developed a written plan that addresses: 1) minimum requirements for use of structural and/or non-structural BMPs in plans for development and redevelopment; 2) criteria for selecting and standards for sizing stormwater BMPs; and 3) implementation of an inspection program to ensure that BMPs are properly installed? ☐ Yes ☐ No

MCM #5 Comments:

MCM #6 – POLLUTION PREVENTION / GOOD HOUSEKEEPING

BMP #1: Identify and document all operations that are owned or operated by the permittee and have the potential for generating pollution in stormwater runoff to the MS4. This includes activities conducted by contractors for the permittee.

1. Have you identified all facilities and activities owned and operated by the permittee that have the potential to generate stormwater runoff into the MS4? ☒ Yes ☐ No
2. When was the inventory last reviewed? June 2020
3. When was it last updated? May 2014

BMP #2: Develop, implement and maintain a written O&M program for all operations that could contribute to the discharge of pollutants from the MS4, as identified under BMP #1. This program shall address stormwater collection or conveyance systems within the regulated MS4.

1. Have you developed a written O&M program for the operations identified in BMP #1? ☒ Yes ☐ No
2. Date of last review or update to written O&M program: June 2020

BMP #3: Develop and implement an employee training program that addresses appropriate topics to further the goal of preventing or reducing the discharge of pollutants from operations to the regulated small MS4. All relevant employees and contractors shall receive training.

1. Have you developed an employee training program? ☒ Yes ☐ No
2. Date of last review or update to training program: June 2020 Date of latest training: June 23, 2020

3. Training topics covered:

Training topics covered were BMP Monitoring, Stormwater Facility Inspection and Record Keeping, Spill Prevention and Cleanup Procedures, and Illicit Discharge Detection and Elimination.

4. Name(s) of training presenter(s):

Training Manual was developed by Christopher Peterson, P.E., Borough Engineer

5. Names of training attendees:

Attendees were Barbara Ferraro (Borough Secretary) and Charles Pluguez (Borough Contracted Zoning Officer).

MCM #6 Comments:

n/a

POLLUTANT CONTROL MEASURES (PCMs)

Indicate the status of implementing PCMs in Appendices A, B and/or C by completing the table below. Skip this section if PCMs are not applicable.

Task	Date Completed	Attached	Anticipated Completion Date
Storm Sewershed Map(s)		<input checked="" type="checkbox"/>	
Source Inventory		<input type="checkbox"/>	6/30/2022
Investigation of Suspected Sources		<input type="checkbox"/>	6/30/2023
Ordinance/SOP for Controlling Animal Wastes		<input type="checkbox"/>	6/30/2023

PCM Comments:

POLLUTANT REDUCTION PLANS (PRPs) AND TMDL PLANS

1. Complete this section if the development and submission of a PRP and/or TMDL Plan was required as an attachment to the latest NOI or application or was required by the permit, regardless of whether DEP has approved the plan(s).

Type of Plan	Submission Date	DEP Approval Date	Surface Waters Addressed by Plan
<input type="checkbox"/> Chesapeake Bay PRP (Appendix D)			Chesapeake Bay
<input checked="" type="checkbox"/> Impaired Waters PRP (Appendix E)	3/5/2019		Mill Creek, Magolia Lake, Silver Lake
<input checked="" type="checkbox"/> TMDL Plan (Appendix F)	3/5/2019		Neshaminy Creek
<input type="checkbox"/> Combined Chesapeake Bay / Impaired Waters PRP			Chesapeake Bay,
<input type="checkbox"/> Combined PRP / TMDL Plan			

☐ Joint Plan (if checked, list the name of the MS4 group or names of all entities participating in the joint plan below)

Joint Plan Participants:

2. Identify the pollutants of concern and pollutant load reduction requirements under the permit (see instructions).

Type of Plan	TSS Load Reduction (lbs/yr)	TP Load Reduction (lbs/yr)	TN Load Reduction (lbs/yr)
<input type="checkbox"/> Chesapeake Bay PRP (Appendix D)			
<input checked="" type="checkbox"/> Impaired Waters PRP (Appendix E)	7,326	7	69
<input checked="" type="checkbox"/> TMDL Plan (Appendix F)	10,378	10	120
<input type="checkbox"/> Combined Chesapeake Bay / Impaired Waters PRP			
<input type="checkbox"/> Combined PRP / TMDL Plan			

3. Date Final Report Demonstrating Achievement of Pollutant Load Reductions Due: September 30, 2025

4. Have any modifications to the plan(s) occurred since DEP approval? ☐ Yes ☒ No

If Yes to #4, was the updated plan(s) submitted to DEP? ☐ Yes ☐ No

If Yes to #4, did you comply with the public participation requirements of the applicable appendix? ☐ Yes ☐ No

If Yes to #4, describe the plan modifications.

5. Summary of progress achieved during reporting period.

Solicitation for public participation in choosing the PCSM BMP to address pollutant reduction requirements.

6. Anticipated activities for next reporting period.

Develop proposal for the design of the proposed BMP's

PRP/TMDL Plan Comments:

Borough's PRP/TMDL Plan was approved on December 1, 2019.

NEW BMPs FOR PRP/TMDL PLAN IMPLEMENTATION

Table 2. List all new structural BMPs installed and ongoing non-structural BMPs implemented during the reporting period that are being used toward achieving load reductions in the permittee's PRP and/or TMDL Plan (see instructions).

BMP No.	BMP Name	DA (ac)	% Imp.	BMP Extent	Units	Latitude	Longitude	Date Installed or Implemented	Planning Area?	Ch. 102?	Annual Sediment Load Reduction (lbs/yr)
1	Vegated Swale along Hill Avenue	1.10	20	-	1	40°09'50"	74°55'05"	June 12, 2020	<input type="checkbox"/>	<input type="checkbox"/>	319
						O 1 11	O 1 11		<input type="checkbox"/>	<input type="checkbox"/>	
						O 1 11	O 1 11		<input type="checkbox"/>	<input type="checkbox"/>	
						O 1 11	O 1 11		<input type="checkbox"/>	<input type="checkbox"/>	
						O 1 11	O 1 11		<input type="checkbox"/>	<input type="checkbox"/>	

BMP INVENTORY FOR PRP/TMDL PLAN IMPLEMENTATION

Table 3. List all existing structural BMPs that have been installed in prior reporting periods and are eligible to use toward achieving load reductions in the permittee's PRP and/or TMDL Plan (see instructions).

BMP No.	BMP Name	DA (ac)	% Imp.	BMP Extent	Units	Latitude	Longitude	Date Installed	Annual Sediment Load Reduction (lbs/yr)	Date of Latest Inspection	Satisfactory?
						O 1 11	O 1 11				<input type="checkbox"/>
						O 1 11	O 1 11				<input type="checkbox"/>
						O 1 11	O 1 11				<input type="checkbox"/>
						O 1 11	O 1 11				<input type="checkbox"/>
						O 1 11	O 1 11				<input type="checkbox"/>

						O ' "	O ' "				<input type="checkbox"/>
--	--	--	--	--	--	-----------	-----------	--	--	--	--------------------------

CERTIFICATION

For PAG-13 Permittees: I have read the latest PAG-13 General Permit issued by DEP and agree and certify that (1) the permittee continues to be eligible for coverage under the PAG-13 General Permit and (2) the permittee will continue to comply with the conditions of that permit, including any modifications thereto. I understand that if I do not agree to the terms and conditions of the PAG-13 General Permit, I will apply for an individual permit within 90 days of publication of the General Permit. I also acknowledge that any facility construction needed to comply with the General Permit requirements shall be designed, built, operated, and maintained in accordance with operative laws and regulations.

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

Dawn Seader, Borough Council President

Name of Responsible Official

(215) 752-5835

Telephone No.

Signature

Date

II. MCM #1 – PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS

1. Public Education and Outreach Program (PEOP)
2. Website Updates / Educational Materials Posted
3. Quarterly Newsletter Articles Distributed to Target Audience

PHASE II STORM WATER MANAGEMENT PROGRAM PUBLIC EDUCATION AND PARTICIPATION PLAN: LANGHORNE MANOR BOROUGH PLAN

PUBLIC EDUCATION COMPONENT

Who Are We Trying to Educate?	How Large is the Audience?	How Do They Receive Information?	What Organizations Focus on Them?	Strategies for Distributing Educational Materials to this Audience
Municipal Employees	The Borough only has office personnel and police officers.	The community website is located at : http://www.langhornemanor.com/ Central information sources are located in the Borough building.	Not applicable	Not applicable
Residents	According to the 2010 Census the total population of Langhorne Manor Borough was 1442 and the total number of households was 326.	Bucks County Courier Times is the most popular newspaper in the community. Langhorne Manor Township periodically publishes a newsletter that is sent to Borough residents. Residents visit the public library in Langhorne. There are a number of churches in the surrounding community. There are no programs in place to reach new residents that move to the community.	There are a number of existing groups that target homeowners; recreational groups and environmental groups such as the Silver Lake Nature Center, Churchville Nature Center, Delaware Riverkeeper and Neshaminy Creek Watershed Association.	The Langhorne Manor Borough newsletter and the Langhorne Manor Borough website can be used to provide materials to this audience. Materials can be distributed to residents requiring building permits. Materials can also be made available at the Borough building for residents who visit or attend meetings.
Schools	Cairn University (previously Philadelphia Biblical University) is located in Langhorne Manor Borough. The Neshaminy School District serves Langhorne Manor Borough, but there are no schools within the Borough.	The Neshaminy School District student bodies gather regularly for assemblies and guest speakers are invited regularly to visit the schools.	Students typically belong to boy/girl scouts, 4-H Club, student councils; etc.	The school district already includes study of the environment in its curriculum. There are no elementary or secondary schools located in the Borough. The Borough can provide materials to the Philadelphia Biblical University for its students.
Businesses	There are only 2 businesses located within the community; Cairn University and Langhorne Gardens Rehabilitation and Nursing Center.	Trade journals and magazines typically target these 2 businesses.	There are only 2 businesses located within the Borough.	The Langhorne Manor Borough newsletter and the Borough website can be used to provide materials to this audience. The Borough can provide materials to Cairn University for its students.
Developers	The number of developers and contractors working within the Borough is generally very small. Few grading permits are issued each year and the Borough is primarily developed.	Developers go to the Borough Code Officer or the Borough Engineer to get information on development requirements. Trade journals and magazines typically target developers in the area. Developers typically subscribe to the Bucks County Courier Times and the Philadelphia Inquirer.	Developers typically belong to builders associations.	The Borough can provide materials to developers at the time of grading permit application submission and at mandatory pre-construction meetings.

Christopher Peterson

From: Christopher Peterson
Sent: Wednesday, April 29, 2020 9:13 AM
To: Judgie1004@gmail.com; ldabbott@verizon.net
Cc: Bill McTigue (William.mctiguejr@verizon.net); ALICIA GASPAROVIC; Dawn Seader
Subject: RE: LMB - MS4 Newsletter Article
Attachments: Recommended Website Updates.docx

Good morning.

I have attached the following document which provides recommendations for revisions to the Langhorne Manor Borough's website regarding stormwater management. These suggested revisions are designed to enhance the Borough's public education program to distribute educational materials to the target audience and encourage community participation (Minimum Control Measures #1 & #2).

Please let me know if you have any questions or comments, and have a nice week.

Regards,
Christopher A. Peterson, P.E.
Carroll Engineering Corporation
Telephone: 215-343-5700 x265
cpeterson@carrollengineering.com

From: Dawn Seader <dlseader@verizon.net>
Sent: Thursday, April 23, 2020 2:03 PM
To: Christopher Peterson <cpeterson@carrollengineering.com>
Cc: Judgie1004@gmail.com; ldabbott@verizon.net
Subject: Re: LMB - MS4 Newsletter Article

Chris - I appreciate your input on the links and providing recommendations. I'm copying Grace Judge who is our council person who oversees the website and Lois Abbott who is our webmaster. Please work with them to correct and update our information.
Thanks for all your help!
Dawn

-----Original Message-----
From: Christopher Peterson <cpeterson@carrollengineering.com>
To: Dawn Seader <dlseader@verizon.net>
Sent: Thu, Apr 23, 2020 12:32 pm
Subject: LMB - MS4 Newsletter Article

Good afternoon Dawn,

I have attached a brief stormwater article that can be inserted into the next issue of the quarterly newsletter to Borough residents. As you know, the PADEP requires municipalities to periodically educate the public on stormwater runoff. This article seeks inform residents of home repairs and improvements that can be done to improve stormwater quality and eliminate possible pollution events. It also encourages public involvement in an effort to satisfy the requirements of Minimum Control Measures (MCM's) #1 & #2 of the Borough's MS4 permit.

If you have any questions or need additional information please don't hesitate to call or email me.

I am also in the process of reviewing the various stormwater links on the website and providing some recommendations to improve the Borough's public outreach. There are a few outdated or broken links which will need to be updated. Can I email you these recommendations, or would you prefer I coordinate with your website administrator?

Thanks, and have a good weekend!

Regards,
Christopher A. Peterson, P.E.
Carroll Engineering Corporation
Telephone: 215-343-5700 x265
cpeterson@carrollengineering.com

1. The excerpt from the Overview tab of the Stormwater Page should be revised as follows:

“Federal regulations enacted in December 1999 require Langhorne Manor Borough to improve on their existing stormwater management program over the next five years, beginning on December 1, 2019.”

2. The link for the “DEP Southeast Regional Office” which can be found on the links tab of the Langhorne Manor Borough’s Storm Water Management page should have its URL revised to the following as it presently links to the same URL as the “Pennsylvania Department of Environmental Protection” link above it.

- <https://www.dep.pa.gov/About/Regional/SoutheastRegion/Pages/default.aspx>

3. The following link is recommended to be added to municipal websites by the PA DEP on their MS4 MCM#1 guidance page. This is presently included as the first URL under the Langhorne Manor Borough’s heading “GIS-based Stormwater Mapping Software”. It is recommended that the following be provided as the first link under the “Information for Residents and Homeowners” heading with the text noted below. The “GIS-Based Stormwater Mapping Software” text can be deleted.

- [Let’s Be Stormwater Smart, PA](#) - This short, simple video from DEP illustrates the problems caused by stormwater pollution and what can be done to reduce it.

URL for link above is

<http://files.dep.state.pa.us/Water/BNPNSM/StormwaterManagement/StormwaterSmartPA DEP.mp4>

4. The following links are also recommended to be added to municipal websites by the PA DEP on their MS4 MCM#1 guidance page. It is recommended that the following be provided under the “Information for Residents and Homeowners”.

- [Guidelines for Maintaining Streams in Your Community](#)

URL for link above is

<http://files.dep.state.pa.us/Newsroom/NewsroomPortalFiles/StreamMaintenanceBooklet.pdf>

- [Kids Activities Book: Spring Creek Stormwater Activity Book](#)

URL for link above is

http://files.dep.state.pa.us/Water/BNPNSM/StormwaterManagement/MunicipalStormwater/MCM1_Public_Education/MS4_Partners_Stormwater_Activity_Book_2015-rv2.pdf

- [Why use a Rain Barrel?](#)

URL for link above is

<https://extension.psu.edu/why-use-a-rain-barrel>

5. The following links are those provided under the Educational Brochures tab of the Langhorne Manor Borough's Storm Water Management page. I have included comments under each individual heading(s) and link(s) for your consideration.

Information for Homeowners and Residents

Comment Revise title to "Information for Residents and Businesses"

Stormwater Basic Information

Comment: Outdated link, see new URL below.
<https://extension.psu.edu/stormwater-basics>

EPA Municipal MS4 Information

Comment Outdated link, see new URL below.
<https://www.epa.gov/npdes/stormwater-discharges-municipal-sources>

EPA MS4 Fact Sheets

Comment Outdated link, see new URL below
<https://www.epa.gov/npdes/stormwater-phase-ii-final-rule-fact-sheet-series>

EPA Stormwater Outreach Materials

Comment Outdated link, see new URL below
<https://cfpub.epa.gov/npstbx/>

EPA Stormwater Menu of Best Management Practices

Comment Outdated link, see new URL below
<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu>

Make Your Home the Solution to Stormwater Pollution

Comment Link is accurate (no changes necessary)

When It Rains It Drains

Comment Broken/Non-Functioning Link (links to file in bbartnikow C drive). If original document cannot be located, CEC will provide a replacement.

After The Storm

Comment Link is accurate (no changes necessary)

Water Efficient Landscaping

Comment Link is accurate (no changes necessary)

What Happens After the Flush?

Comment Broken/Non-Functioning Link (links to file in bbartnikow C drive). If original document cannot be located, CEC will provide a replacement.

Where Does All the Dirty Water Go?

Comment Broken/Non-Functioning Link (links to file in bbartnikow C drive). If original document cannot be located, CEC will provide a replacement.

Stormwater Basics

Comment Delete. Replaced by Stormwater Basic information link above

<https://extension.psu.edu/water/stormwater-management/see-all-stormwater-management>

Comment Delete. See comment above

Homeowner's Guide to Stormwater

Comment This text can be made to into a hyperlink to the URL below

<http://www.stormwaterguide.org/>

Comment Link is accurate. Use this URL for hyperlink text above.

Homeowner's Guide to Stormwater BMP's

Comment This text can be made to into a hyperlink to the URL below

http://files.dep.state.pa.us/Water/BNPNSM/StormwaterManagement/ConstructionStormwater/SW_Booklet_2017.pdf

Comment Link is accurate. Use this URL for hyperlink text above.

Information for Businesses

Comment This category has been incorporated into the category above “Information for Residents and Businesses”. This category heading can be deleted.

[Stormwater Basic Information](#)

Comment Repeated Link (Delete)

[EPA Stormwater Outreach Materials](#)

Comment Repeated Link (Delete)

[When It Rains It Drains](#)

Comment Repeated Link (Delete)

[After The Storm](#)

Comment Repeated Link (Delete)

[Stormwater Crossword Puzzle Placemat](#)

Comment Broken/Non-Functioning Link (links to file in bbartnikow C drive), if link can be restored it can go under the “Information for Residents and Businesses” heading.

Information for Builders and Developers

Comment This heading can be revised to “Additional Information for Developers and Contractors”

[EPA Municipal MS4 Information](#)

Comment Repeated Link (Delete)

[EPA MS4 Fact Sheets](#)

Comment Repeated Link (Delete)

[EPA Stormwater Outreach Materials](#)

Comment Repeated Link (Delete)

[EPA Stormwater Menu of Best Management Practices](#)

Comment Repeated Link (Delete)

GIS-based Stormwater Mapping Software

<https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Pages/Be-Stormwater-Smart-.aspx>

Comment Delete. See recommendation No. 3 above.

[Don't Let Storm Water Run Off With Your Time and Money](#)

Comment Broken/Non-Functioning Link (links to file in Lois C drive)

[When It Rains It Drains](#)

Comment Repeated Link (Delete)

[After The Storm](#)

Comment Repeated Link (Delete)

[Stormwater and the Construction Industry](#)

Comment Broken/Non-Functioning Link (links to file in bbartnikow C drive)

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[Final Revised PRP and TMDL Plan](#)

[Required Pollutant Reduction Table](#)

[Borough's MS4 Map](#)

[BMP Options Table](#)

[Vegetated Swale Detail\(s\)](#)

[Infiltration Trench Detail\(s\)](#)

Click on each tab below for more information.

Overview	Water Quality Hotlines	Educational Brochures	Links
----------	------------------------------	--------------------------	-------

Stormwater management concerns the control of water (from rain, melting ice or snow) that runs off the surface of the land. The amount and rate of runoff is increased considerably as land is developed; construction of impervious surface (e.g. parking lots) hinders the infiltration of rainfall into the soil. Therefore stormwater management is imperative to offset the possible impacts of development – flooding and erosion problems, concentration of flow on neighboring properties, damages to infrastructure,

and non-point source pollution (i.e. pollution that comes from the general drainage of the land such as runoff from parking lots and farmland).

Federal regulations enacted in December 1999 require Langhorne Manor Borough to improve on their existing stormwater management program over the next five years, beginning December 1, 2019.

The National Pollutant Discharge Elimination System (NPDES) Phase II stormwater program requires that Municipal Separate Storm Sewer Systems (MS4s) address the six required elements contained in the federal regulations to reduce water pollution:

- Public education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site runoff control
- Post-construction storm water management in new development and redevelopment
- Pollution prevention and good housekeeping for municipal operations and maintenance

Stormwater runoff occurs when water from rain or snow and ice melting flows over the ground. Stormwater becomes a problem when it picks up debris, chemicals, dirt and other pollutants as it flows or when it causes flooding and erosion of streambanks. Stormwater travels through a system of pipes and roadside ditches that make up storm sewer systems. It eventually flows directly to a lake, river, stream, wetland or coastal water. All of the pollutants stormwater carries along the way empty into our waters, too, because stormwater does not get treated!

Here are some of the most important ways for Borough residents to prevent stormwater pollution:

- Properly dispose of hazardous substances, such as used motor oil, cleaning supplies and paint – never pour them down any part of the storm sewer system, and report anyone who does.
- Use pesticides, fertilizers and herbicides properly and efficiently to prevent excess runoff of these items.
- Look for signs of soil and other pollutants, such as debris and chemicals, leaving construction sites in stormwater runoff or tracked into roads by construction vehicles. Report poorly managed construction sites that could

impact stormwater runoff to the Borough.

- Install innovative stormwater practices on residential properties, such as rain barrels or rain gardens, that capture stormwater and keep it on-site instead of letting it drain away into the storm sewer system.
- Report any discharge from stormwater outfalls during times of dry weather – a sign there could be a problem with the storm sewer system.
- Pick up after pets and dispose of their waste properly. No matter where pets make a mess – in a backyard or on open space – stormwater runoff can carry pet waste from the land to the storm sewer system to a stream.
- Store materials that could pollute water indoors and use containers for outdoor storage that do not rust or leak to eliminate exposure of materials to stormwater.

Information on this program is available from the [Pennsylvania DEP](#).

Langhorne Manor Borough

618 Hulmeville Avenue
Langhorne, PA 19047
[\(215\) 752-5835](tel:(215)752-5835)

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Click on each tab below for more information.

Overview	Water Quality Hotlines	Educational Brochures	Links
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Residents can help report violations or problems they notice in their neighborhood and local streams before they cause more damage and pollution. Residents sometimes may be the first to recognize "illicit" discharges dumping into storm sewers or coming out of from storm sewer outfalls. You can help by promptly reporting the following events to the authorities listed below.

Here are some of the conditions that you should report and who to contact:

Sediment leaving a construction site in stormwater

Off site discharge of sediment, erosion, and other improper controls during construction

Bucks County Conservation District

215-345-7577

Email photo and send full address and directions

Observed pollution event or pollutants in stream

Pennsylvania Department of Environmental Protection

Water Quality Hotlines

484-250-5900

1-800-541-2050 (toll free)

Anytime, including evenings and weekends

Clogged or leaking sewer lines; Broken water mains

Bucks County Water and Sewer Authority

215-343-2538

After hours, call 911

Spills

Pennsylvania Department of Environmental Protection

Water Quality Hotlines

484-250-5900

1-800-541-2050 (toll free)

Anytime, including evenings and weekends

Illegal dumping activity into water courses

Langhorne Manor Borough

215-752-5835

Weekdays during working hours

Pennsylvania Department of Environmental Protection

Water Quality Hotlines

484-250-5900

1-800-541-2050 (toll free)

Anytime, including evenings and weekends

Dry weather flows from outfall pipes into streams (72 hours after a rain storm)

Langhorne Manor Borough

215-752-5835

Weekdays during working hours

Fish Kills

PA Fish Commission

717-626-0228

Pennsylvania Department of Environmental Protection

Water Quality Hotlines

484-250-5900

1-800-541-2050 (toll free)

Anytime, including evenings and weekends

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- [DEP Southeast Regional Office](#)
- [Bucks County Conservation District](#)
- [Environmental Protection Agency](#)

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Christopher Peterson

From: Christopher Peterson
Sent: Thursday, April 23, 2020 12:32 PM
To: Dawn Seader
Subject: LMB - MS4 Newsletter Article
Attachments: (2020-4-23) LMB MS4 Stormwater Article.docx

Good afternoon Dawn,

I have attached a brief stormwater article that can be inserted into the next issue of the quarterly newsletter to Borough residents. As you know, the PADEP requires municipalities to periodically educate the public on stormwater runoff. This article seeks inform residents of home repairs and improvements that can be done to improve stormwater quality and eliminate possible pollution events. It also encourages public involvement in an effort to satisfy the requirements of Minimum Control Measures (MCM's) #1 & #2 of the Borough's MS4 permit.

If you have any questions or need additional information please don't hesitate to call or email me.

I am also in the process of reviewing the various stormwater links on the website and providing some recommendations to improve the Borough's public outreach. There are a few outdated or broken links which will need to be updated. Can I email you these recommendations, or would you prefer I coordinate with your website administrator?

Thanks, and have a good weekend!

Regards,
Christopher A. Peterson, P.E.
Carroll Engineering Corporation
Telephone: 215-343-5700 x265
cpeterson@carrollengineering.com

Stormwater Management

With recent guidance on social distancing and workplace restrictions you are likely to find you have more time to spend at home. This may be an excellent opportunity to make some improvements to your property which can also benefit our local streams and improve the environment. Below are some tips for home repair and improvements from EPA:

- “Before beginning an outdoor project, locate the nearest storm drains and protect them from debris and other materials.
- Sweep up and properly dispose of construction debris such as concrete and mortar.
- Use hazardous substances like paints, solvents, and cleaners in the smallest amounts possible, and follow the directions on the label. Clean up spills immediately and dispose of the waste safely. Store substances properly to avoid leaks and spills.
- Purchase and use nontoxic, biodegradable, recycled, and recyclable products whenever possible.
- Clean paint brushes in a sink, not outdoors. Filter and reuse paint thinner when using oil-based paints. Properly dispose of excess paints through a household hazardous waste collection program, or donate unused paint to local organizations.
- Reduce the amount of paved area and increase the amount of vegetated area in your yard. Use native plants in your landscaping to reduce the need for watering during dry periods. Consider directing downspouts away from paved surfaces onto lawns and other measures to increase infiltration and reduce polluted runoff.”¹

Langhorne Manor Borough encourages its residents to get involved and would like your input on ideas for improving stormwater in our community.

¹ *“The Solution to Stormwater Pollution!”* EPA.gov, January 2003,
https://www3.epa.gov/npdes/pubs/solution_to_pollution.pdf.



Langhorne Manor Borough Newsletter

Letter from the President

Hello LMB! The last 3 months have been really difficult. Many of us have been dealing with financial stress, becoming a teacher along with trying to continue working and missing loved ones. We may even know someone who has gotten sick. But the resiliency I've witnessed in our little borough has been amazing. I love seeing neighbors walking our beautiful streets, contributing to the local food bank, working in their gardens and enjoying their families.

As a community, we've had a lot of changes. In April we held our first virtual Council meeting. We had a few hiccups but 40 people "attended" the meeting and it was very successful. We held our second one in May and we anticipate the next couple of months will also need to be held virtually. June 2nd was Primary Election Day. Poll workers had their hands full navigating the new machines. But ingenuity won out and a minor change in the ballot size smoothed out the process. We are grateful to the workers! Behind masks, gloves and Plexiglas, they helped us feel comfortable voting.



I want to give a big thank you to our police department! Officers had increased their hours to support the community during the pandemic. Their presence has been noticed as I've received many compliments on their behalf.

We have also been inconvenienced with cancellation of our bulk pickup date in May. Many of us have increased our yard waste because we're working in our gardens. Republic Services was dealing with its own issues around the pandemic necessitating the rescheduling of bulk pickup to June 20th.

We'll get through this together. I hope to see you on my walks through The Manor!

Dawn

2020 Census

Did you know that U.S. Census data helps direct federal funding to local schools, roads, fire departments, and other resources? That's one reason it is so important that everyone in our community be counted. It's also required by law. Respond today at www.census.gov, even if you lost the information you received in the mail. It's not too late.



Photo by Dawn Seader

Langhorne Manor Borough is such a beautiful and tranquil place to live. Take a walk and enjoy some of its beauty!

Inside this issue

Road Paving Update.....	2
Ordinance Highlights.....	2 & 4
Storm Water Management.....	3
Citizen's Commission	3
Office Information.....	4
Important Dates.....	4

Special points of interest

- Complete the Census
- Check out the Road Paving Map on the Borough Website
- Beautiful pictures from our residents
- Q & A about Borough Ordinances



Photo by Cheryl Oessenich

Road Paving Update

General Asphalt Paving returned several weeks ago to our borough to add seed and soil as needed next to the streets where paving has been completed. We anticipate they will return to finish the paving project on the South side of Route 1 within the next couple of weeks, weather permitting.

A map of the borough roads has been uploaded onto the borough website showing which streets have been paved, which have only had base repairs and those that have not yet been addressed. It is anticipated that

the paving project should be completed by the end of June.

In these next few weeks, if you are anticipating any work being done at your property that involves excavating the road, please let us know as soon as possible. Permit fees for excavations done on unpaved roads can be obtained at minimal cost. Permit fees for excavations done after the road has been paved are more costly. If you have specific questions about this project, please contact Council Member Nick Pizzola at 215-375-2037.

Check out the map on the Borough Website to see which streets are completed and which still need to be paved!

Sign Up For LMB Text Messaging Service!!!

LMB is starting a new messaging service. It will be used to push information out to residents. If you are interested in receiving text messages about upcoming events in The Manor, simply text LMB to 215-258-8961.

The service is for informational purposes ONLY. If you have any questions call Borough Office at 215-752-5835.

Ordinance Highlights!

Q: I have a pet. What do I need to know?

A: Make sure all dogs are properly licensed, and be sure to keep all pets from running at large. Also remember to pick up after pets. Not only will your neighbors appreciate it, but keeping animal waste out of our storm drains preserves our environment as well. See the [Animals Ordinance](#), and [Animal Defecation Ordinance](#). Refer also to the Emergency Info > Police tab on the website for more resources on dog licensing.



Photo by Steve Runk

Q: I want to put a shed on my property. What do I need to know?

A: See §34-24 of the [Building Construction Code](#), and the [Langhorne Manor Borough Fee Schedule](#). Also contact Borough Office for a permit application at 215-752-5835.

Continued on page 4 (Ordinances)



Photo by Alicia Gasparovic

Stormwater Management

With the nice weather approaching, you may be spending more time working outside. Here are some tips from the EPA on how to complete that to-do list while caring for our streams and environment¹:

Keep our streams clean:

- * Locate the nearest storm drains and protect them from debris and other materials.
- * Sweep up, rather than hose down, yard waste and construction debris.
- * Cover piles of mulch and dirt to prevent runoff from washing into storm drains.
- * Direct downspouts away from paved surfaces onto lawns and gardens to increase infiltration and reduce polluted runoff.

Want to make your property more eco-friendly?

- * Reduce the amount of paved area and increase the amount of vegetated area in your yard.
- * Use native plants in your landscaping to reduce the need for watering during dry periods.

¹ "The Solution to Stormwater Pollution!" EPA.gov, January 2003. For more eco-friendly ideas, view this document here: https://www3.epa.gov/npdes/pubs/solution_to_pollution.pdf.



Photo by Alicia Gasparovic

Citizens' Commission for Stormwater Management

We're looking for volunteers. We would like your input on ideas for improving stormwater quality in our community, and we are forming a group of interested residents to help guide the implementation of the Langhorne Manor Pollutant Reduction Plan required by the PA DEP. This Pollution Reduction Plan involves upcoming changes to the rock-lined swales currently found along some streets in the Manor.

Visit our website for more information. Go to Emergency Info > Stormwater Management to read the Final Revised PRP and TMDL Plan Sections F, G, H, I. Please contact Bill McTigue or Alicia Gasparovic to find out more or to volunteer. Find their contact info on our website under Government > Officials.



Photo by Denise Reid

618 Hulmeville Avenue
Langhorne, PA 19047-3946

Phone: 215-752-5835
Fax: 215-752-4675
E-mail: borooffice@comcast.net

Office Hours By
Appointment Only

Important Dates

- 6/13 Community Yard Sale
- 6/16 Council Meeting via Zoom
- 6/20 Bulk Trash Collection
- 7/4 Independence Day
- 7/7 Council Meeting
- 7/21 Second Council Meeting
(if necessary)



Borough Council Meetings are held the 1st Tuesday of the month. If a second meeting is needed, it's typically held the 3rd Tuesday of the month. Zoom links are located on the agenda posted prior to meeting dates.

Please be safe
as you
celebrate the
Fourth of July
and other
events through-
out the
Summer! As
we move from
phases **Yellow**
to **Green**,
please abide by
each phase's
recommenda-
tions. Let's
keep our
families and
friends healthy!

Ordinances (cont.)

Q: A tree on my property fell during a storm and is blocking the street. What should I do?

A: Alert a member of Council or Mayor Byrne as soon as possible to arrange for traffic barriers if needed, and to confirm whether you have contacted a service for removal. In emergencies like these, the Borough may need to quickly remove the tree without notice and the property owner will be responsible for the cost, so be sure to call promptly if you have made other arrangements. See [Shade Tree Commission Ordinance](#) (Article 6 – Diseased Trees).

Q: I have one or more apartments for renters. Do I need to register with the Borough?

A: Yes. See the [Rental Unit Licensing and Inspection Ordinance](#) and the [Tenant Registration Form](#).



Christopher Peterson

From: Christopher Peterson
Sent: Monday, November 11, 2019 7:57 AM
To: Dawn Seader (dlseader@verizon.net)
Cc: Bill McTigue (William.mctiguejr@verizon.net)
Subject: LMB MS4 - Fall & Winter Newsletter Article
Attachments: Fall Newsletter - Watershed Protection Tip.docx; Winter Newsletter - Watershed Protection Tip.docx

Good morning Dawn,

I have attached two (2) articles which relate to leaf collection and good salting etiquette for your use in preparing the upcoming Borough Newsletter(s).

As you know, the PADEP requires municipalities to periodically educate the public on stormwater runoff. If you have any questions or need additional information please don't hesitate to call or email me. Have a good week.

Regards,
Christopher A. Peterson, P.E.
Carroll Engineering Corporation
Telephone: 215-343-5700 x265
cpeterson@carrollengineering.com

WATERSHED PROTECTION TIP

Leaf & Yard Waste Management

Fallen leaves and grass clippings can plug storm sewers which can lead to flooding. When grass clippings and high amounts of decomposing leaves make it to our streams, unnatural elevated levels of nutrients can harm aquatic wildlife.

What You Can Do?

- Keep all fallen leaves and grass clippings on your property; and out of the streets and storm sewers.
- Compost leaves on site away from storm sewers. Contain your compost to keep nutrient-rich water from leaching into the storm system.
- If you see a storm drain that is clogged and can clear it without placing yourself in danger, please remove the leaves. Use a rake to help you reach the leaves without entering the street.

Watershed Protection Tip

Salting Information

Do you use salt to help melt away the winter snow? Below find some useful salting tips that will help to protect the quality of our community's waterways:

- Shovel early. Less salt is needed when snow and ice are removed during the storm.
- More salt does not mean more melting. Apply in appropriate quantities, and remember that salt takes time to work.
- Most salts stop working when the temperature drops below 15 degrees Fahrenheit. Don't reapply salt during these times.
- Sweep up excess salt on dry pavement, before it is washed away.

Try alternative materials for traction. Sand is effective, but can clog storm sewers and degrade stream habitats, if these are nearby. Cracked corn can be used as an alternative, which is more environmentally friendly.

Read the label. All de-icers will melt ice, but some de-icers have a lesser impact on the environment. Instead of products that contain sodium chloride or calcium chloride, use products that contain acetate, potassium chloride, or magnesium chloride.

This Watershed Protection Tip is part of Langhorne Manor Borough's ongoing efforts to provide public education on stormwater management and to protect our environment.



Winter 2020

Langhorne Manor Borough Newsletter



Letter from the President

I'd like to introduce myself – my name is Dawn Seader and I've been a resident of LMB for almost 22 years. I was elected Council President of Langhorne Manor Borough at the January 6, 2020 borough council meeting. I'm excited about this opportunity to serve our community and believe we can continue making LMB the beautiful and charming place we love.

This is the official newsletter for the Borough and it is designed to provide you with information about what has happened in The Manor as well as things that may be coming up that would interest you. We anticipate some exciting changes this year including the completion of our road paving project, providing more information on the newly designed website and supporting community land development such as Cairn University's sports fields.

There are new faces on Council and our Committees, we have a new Borough Secretary and we're working to make information more accessible. Should you have questions about what is happening in The Manor, go on to our website to find the best person to contact – langhornemanor.org. You can also stay up-to-date with council meetings by accessing meeting agendas and minutes.

I look forward to the year ahead!

Dawn Seader

Inside this issue

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[Road Paving Project Update2](#)

[Storm Water Management2](#)

[2019 Events.....3](#)

[Important Dates.....3](#)

[Borough Office Hours Update.....4](#)

Road Paving Project Update

The winter season is upon us and the paving season has ended for now. The project is about half completed. PennDOT does not allow paving after mid-December as weather conditions are too unpredictable to properly pave with asphalt.

The roads on the North side of Route 1 have been paved and driveways tied-in. The roads and driveways on the South side are approximately 25% complete. Some residents have had their driveways milled but not tied-in to the street because the street has not had the wearing course installed. For those residents whose driveways have been milled, but not tied-in, any damage occurring to the edge of the driveway through the winter season will be repaired by contractor at no cost to the resident or borough when paving begins again.

The contractor, General Asphalt Paving, will return in the spring to complete the project. Notification will go out about a week in advance when the road work is anticipated to resume. Residents on streets that will be closed to traffic for any extended period of time while the finish course is installed, will be notified a day in advance so they can make alternate parking arrangements. If you have any questions regarding the paving projects or the borough streets, please contact **Council Vice President Nick Pizzola at 215-375-2037** and he will be happy to speak with you.

Grants from the RDA

LMB's Council is pleased to report that the Bucks County Redevelopment Authority has approved two grants, which we applied for in September.

The first grant for Road Improvements was approved for \$200,000. We anticipate the repaving project to begin again in Spring 2020.

The second grant was for a utility vehicle for the Borough in the amount of \$40,000.

Many thanks to the RDA. Grants such as these keep our taxes from increasing every year.

Storm Water Management Tips

Do you use salt to help melt away the winter snow? Below find some useful salting tips that will help to protect the quality of our community's waterways:

- ◆ Shovel early. Less salt is needed when snow and ice are removed during the storm.
- ◆ More salt does not mean more melting. Apply in appropriate quantities, and remember that salt takes time to work.
- ◆ Most salts stop working when the temperature drops below 15 degrees Fahrenheit. Don't reapply salt during these times.
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- ◆ Try alternative materials for traction. Sand is effective, but can clog storm sewers and degrade stream habitats, if these are nearby. Cracked corn can be used as an alternative, which is more environmentally friendly.
- ◆ Read the label. All de-icers will melt ice, but some de-icers have a lesser impact on the environment. Instead of products that contain sodium chloride or calcium chloride, use products that contain acetate, potassium chloride, or magnesium chloride.

This Watershed Protection Tip is part of Langhorne Manor Borough's ongoing efforts to provide public education on storm water management and to protect our environment.



Courtesy of Stephen Perloff

Annual summer picnic at Mark and Kathy's!

2019 The Year In Pictures



*Santa arrives!!!
In style...*



Ice cream social Uncle Dave's



*Lots of food
and
merriment!!!*

Important Dates

- 3/03 Council Meeting
- 3/17 Second Council Meeting (if necessary)
- 4/07 Council Meeting
- 4/21 Second Council Meeting (if necessary)
- 4/28 Primary Election
- 5/05 Council Meeting
- 5/9 Community Yard Sale
- 5/16 Bulk Pick-up
- 5/19 Second Council Meeting (if necessary)

Borough Council Meetings are held on the 1st Tuesday of the month.
If a second meeting is needed, it's typically held on the 3rd Tuesday

**Langhorne Manor Borough
618 Hulmeville Avenue
Langhorne, PA 19047**

Langhorne Manor Borough Newsletter

618 Hulmeville Avenue
Langhorne, PA 19047

Phone: 215-752-5835

Fax: 215-752-4675

E-mail: borooffice@comcast.net

Website: langhornemanor.org

Office Hours are by appointment only.

Please call or email the borough office to
schedule an appointment.



III. MCM #2 – PUBLIC INVOLVEMENT / PARTICIPATION

1. Public Involvement & Participation Program (PIPP)
2. Borough Council Meeting Minutes

PHASE II STORM WATER MANAGEMENT PROGRAM PUBLIC EDUCATION AND PARTICIPATION PLAN: LANGHORNE MANOR BOROUGH PLAN

PUBLIC PARTICIPATION COMPONENT

Who Are We Trying to Involve?	What Organizations Do They Belong To?	What Volunteer Programs Do These Organizations Run?	What is the Scope of these Programs and How Often Do They Take Place?	Strategies for Partnering with Community Organizations to Involve the Public in Storm Water Management
Municipal Employees	The Borough only has office personnel and police officers. Not applicable.	Not applicable.	Not applicable.	Not applicable.
Residents	Residents typically belong to recreational groups and environmental groups such as the Silver Lake Nature Center, Churchville Nature Center, Delaware Riverkeeper, Neshaminy Creek Watershed Association.	These organizations run cleanup days, environmental work programs, stream restoration programs, water quality monitoring programs.	Cleanup and workdays are typically done twice per year. Environmental related projects, stream restoration and water monitoring programs are run periodically as the organization's funding permits.	The Borough website can provide links to some of these organizations. The Borough can assist these organizations by providing letters of support for grant and funding requests. The Borough can make residents more aware of storm water management related programs to give them the opportunity to contribute to the community.
Schools	Students belong to boy/girl scouts, 4-H Club, student councils, etc.	The scouts are a volunteer program	The scouts have a number of environmental related programs that can be done, including storm drain stenciling and water quality monitoring.	The Borough can provide information and support to these organizations to promote better stormwater management.
Businesses	There are only 2 businesses located within the community; Cairn University (previously Philadelphia Biblical University) and Langhorne Gardens Rehabilitation and Nursing Center.	The University is a potential source of volunteers for stormwater related projects.	There currently are none in place.	The Borough can reach out to the businesses to make them more aware of these programs to give them the opportunity to volunteer.
Developers	Developers typically belong to builders' associations, etc.	Developers sometimes assist and provide some funding and support for environmental programs.	Program support is sporadic as the funding of environmental organizations permits.	The Borough can reach out to developers to make them more aware of these programs to give them the opportunity to provide support to environmental organizations and programs.

**MINUTES
LANGHORNE MANOR BOROUGH COUNCIL
MEETING OF JUNE 16, 2020**

1. **CALL TO ORDER** - The Zoom virtual meeting of Langhorne Manor Borough Council was called to order in the Langhorne Manor Borough Hall, 618 Hulmeville Avenue, Langhorne, Pennsylvania, on June 16, 2020 at 8:02 PM Eastern Daylight Time, after Zoom participants were admitted to the meeting at 7:58 PM Eastern Daylight Time by Dawn Seader, President. Ms. Seader welcomed everyone and gave instructions for the Zoom virtual meeting.

PERSONS PRESENT – Dawn Seader-President, Nicholas Pizzola-Vice President, Robert Byrne-Mayor, James Niwinski, Alicia Gasparovic, William McTigue, Jr., Grace Judge, Maryann Barnes, Thomas J. Profy, IV-Solicitor, and Barbara Ferraro-Secretary/Treasurer.

2. The Pledge of Allegiance was led by Mayor Byrne.

3. **CARROL ENGINEERING PRESENTATION** – Ms. Gasparovic introduced Christopher Peterson from Carroll Engineering, the Borough Engineer, to speak about the project in order to meet Pennsylvania Department of Environmental Protection (DEP) Permit requirements. Mr. Peterson stated that the Borough is currently at the end of year one of a five-year permit cycle. Mr. Peterson stated that the PA DEP stormwater permit regulates the stormwater discharges from the Borough's Municipal Separate Storm Sewer System (MS4), including the roadside swales, inlets, and storm sewers which drain to natural watercourses. The DEP developed a permit program with the goal of reducing the pollutants associated with stormwater. Mr. Peterson stated that the permit requires the implementation of a Stormwater Management Program (SWMP) which consists of six Minimum Control Measures (MCMs) and the Best Management Practices (BPMs) within each MCM to reduce and prevent stormwater impacts on water quality. The six MCMs and a summary of how the Borough has complied with the requirements are as follows:

- **MCM#1 Public Education and Outreach on Stormwater Impacts**

The Borough published and provided educational material in the form of flyers, pamphlets, brochures, handouts and fact sheets to the public through a dedicated Stormwater Management page on the Borough's website, Borough Hall and Administration building, periodic direct mailings to Cairn University and Langhorne Gardens Nursing Home, in the quarterly Borough Newsletter, material included with all Building permit applications and public meetings. Target audiences are Borough residents, Borough employees, businesses, developers and schools.

- **MCM#2 Public Involvement & Participation**

The Borough has developed a written public involvement & participation program providing for opportunities for the public to participate in the decision-making processes associated with the development, implementation and update of programs and activities related to the Borough's individual program. The program outlines methods of communications to groups that operate within proximity to the Borough or its receiving waters. The Borough conducts at least one public meeting per year to solicit public involvement and participation from target audience groups and presents a summary of the implementation of the program. Things the public can do to help the Borough meet their goals are: volunteer for specific stormwater projects, do not

dump into the storm sewer system, keep storm drain inlets near homes clear, pick up after pets, do not rake leaves or grass clippings into streets, use pesticides and lawn care products sparingly, wash cars on non-paved areas or car washes, repair auto leaks, use non-toxic de-icing material, attend public meetings and provide input, visit the Borough's website and review the material and links.

- **MCM#3 Illicit Discharge Detection and Elimination Program (IDD&E)**

This has been accomplished by developing a written Illicit Discharge Detection and Elimination Program. Illicit discharge examples are as follows: motor vehicle fluids, grass clippings, leaf litter, animal waste, sewage, restaurant waste and household hazardous waste, all either accidental or intentional. Residents should call the Borough or any of the agencies listed on the Borough's website if they observe these. No illicit discharges were observed by Carroll Engineering's Spring screening. A Borough map with all outfalls and the storm sewer system has been developed. The Borough's Act 167 Stormwater Ordinance prohibits non-stormwater discharges. The Borough's website includes telephone numbers for reporting of dry weather flows which is defined as water or fluid in the storm sewer system when it has not rained in at least 3 days.

- **MCM#4 Construction Site Stormwater Runoff Control**

The Borough is relying on the DEP's statewide program for issuing construction NPDES Permits for stormwater discharges associated with construction activities to satisfy all requirements.

- **MCM#5 Post-construction stormwater management in new development and redevelopment**

The Borough is relying on the DEP's statewide program for issuing NPDES Permits for stormwater discharges. MCMs 4-6 are the responsibility of the Borough. The Borough's Act 167 Stormwater Ordinance addresses stormwater discharges and establishes BMPs in plans for development, establishes criteria for sizing stormwater BMPs and implements an inspection program.

- **MCM#6 Pollution prevention and good housekeeping for municipal operations and maintenance**

The Borough has identified all facilities and activities that are owned by them and have the potential to generate stormwater runoff such as streets, parking lots, and Borough owned buildings. The Borough has developed a written operation and maintenance program for these municipal operations and facilities. A written employee training program has been developed for Borough administrative staff, outside contractors, Council members, volunteers and law enforcement personnel. This presentation is a training session for Borough Council. The 2019 Borough MS4 Training Manual shall be provided to the administrative staff and is done on a yearly basis.

RETTEW Associates has prepared a Pollutant Reduction Plan (PRP) for the Borough to meet the requirements set forth by the DEP. The PRP can be found on the Borough's website.

The Borough's existing sediment load of 103,782 lbs/year must be reduced by 29.9% or 31,031 lbs/year and they plan to improve water quality in the short-term by reducing the existing sediment load by 10% within this five-year period.

Mr. Peterson shared the Reductions Table which is on the Borough website.

Mr. Peterson stated that the recent construction of a vegetated swale along Hill Avenue adjusts the Borough's total reduction for the permit period to 10,059 lbs/year.

Mr. Peterson stated that the proposed Cairn University project which proposed a variety of BMPs and has been put on hold due to the COVID-19 pandemic, would result in the reduction of 7,772 lbs/year of sediment which would exceed the Borough's required reduction for Mill Creek. CEC recommends the Borough monitor the situation and proceed with the BMP construction within the Neshaminy Creek Watershed in year 3 of the permit period.

The Borough has identified a variety of potential stormwater BMPs that could be implemented to achieve the required pollutant reductions over the next 5-year permit term. The options include converting existing roadside swales to a Vegetated Swale, a Bioswale or an Infiltration Trench.

Mr. Peterson shared the MS4 map which showed where the swale conversions are proposed. This map can be found on the Borough's website.

Mr. Peterson shared the BMP Table which can be found on the Borough's website.

Mr. Peterson shared the Vegetated Swale Information which can be found on the Borough's website.

Mr. Peterson shared the Infiltration Trench information which can be found on the Borough's website.

Mr. Peterson stated that the Borough should carefully consider these options for satisfying their PRP and TMDL obligations.

Ms. Seader asked if there were any questions from Council.

Mr. McTigue asked about decorative river rock on top of the Infiltration System as the current is aesthetically pleasing and wondering if it could be repurposed? Mr. Peterson stated they could look at some of the material being reused as a topper for the infiltration trench to slow down stormwater and maintain visual appeal although it may be cost prohibitive. Ms. Gasparovic stated they could use the side stones over again to make them look rock lined. Mr. Peterson stated they need to look at erosion issues when considering this.

Ms. Gasparovic said it seemed as if the Borough would get the most DEP credits if they used the Infiltration System that also filtered out more sediment than the grass systems. She stated that Mr. Peterson is steering the Borough this way but it would be looked into further with the Citizen's Committee.

Mr. Pizzola asked about a cost estimate? Mr. Peterson answered that a cost estimate was provided when RETTEW prepared the PRP plan dated 10/13/17. He stated that this is an older plan and worth being revisited. Mrs. Gasparovic stated that the two proposals that were in the RETTEW plan were about \$50,000 each and would not get the Borough to the 30% reduction

required in the 15 years. She stated that it also did not include engineering fees. Ms. Seader asked how close did this get to the 30% reduction? Ms. Gasparovic stated about two-thirds. Mr. Peterson reminded the Council that they are only responsible for 10% in this permit period and only need to pick one option, but to maximize the reduction to reach their goal.

Mr. Niwinski asked if Cairn does their construction, is this taking into consideration the two-thirds? Mr. Peterson stated that if Cairn proceeds, all the BMPs that they were proposing should meet the Borough's requirement for the Mill Creek Watershed and the Borough should address the Neshaminy Creek Watershed first.

Ms. Seader asked if we did the two options and Cairn did their renovations, would we get to the 30%? Mr. Peterson answered no.

Ms. Gasparovic clarified that when the Cairn project meets the Borough's Mill Creek requirement that it would be for the 10%. Mr. Peterson stated that was correct and that there was no TMDL and no 30% for the Mill Creek Watershed. The 30% is for the Neshaminy Creek Watershed as it is in worse shape.

Mr. Niwinski asked what the requirements are for the surrounding municipalities are? Mr. Peterson stated that it is weighted on how much area each municipality contributes to the watersheds. LMB contributes roughly 8% to the watersheds.

Ms. Gasparovic asked about the Hill Avenue Vegetated Swale that was just installed is outside of the map Carroll prepared-does that give the Borough any credits? Mr. Peterson stated that it was part of the subdivision approval in an effort to try and partner with a private developer and also to benefit the Borough. The Borough would get some reductions from the swale. Carroll has put together calculations that will be in their annual report and show that the Borough is working toward their goal. This does help the Borough towards the 30%.

Ms. Seader asked if there were any questions from residents.

James Keba-604 Hill Avenue stated that it looks like the most impactful are Prospect to Elm on both Hill and Station and asked that if the Borough goes with option 2 with a dam, how many dams are there and how much pooling happens into properties? Mr. Peterson responded that the check dams are crushed stone and are not really dams in the true sense. They are there to slow down the stormwater. They are porous and will drain in minutes to an hour. The spacing is calculated at the time of the design and is based on the slope-the steeper the slope, the more check dams would be needed to slow down stormwater and prevent erosion. Mr. Keba stated that it was likely that some properties would be more impacted than others. Mr. Peterson responded that it could be. If the Vegetated Swale option is selected they would have to look at the check dams and the properties on steeper slopes would be more impacted. Mr. Keba asked if on the western side of Route 1, is any of that impactful and where does that drain to? Mr. Peterson responded a lot of it flows to the west towards Chubb Run and there is not a lot of opportunity or Borough real estate in the rights-of-way to adequately treat the stormwater. The options are fairly limited for the Borough and the improvement options presented have the most amount of drainage area and can help the Borough meet their goals. Mr. Keba asked that although we have

an 8% requirement overall, what percent is on the other side of Route 1 which is not really impactful to the Neshaminy Creek? Mr. Peterson responded that the area is tributary to the Neshaminy but there are no controls and it is not impactful to what the Borough does on the other side.

Jay Ferraro-402 Hill Avenue asked if the infiltration bed process is contingent upon a percolation rate that would be tested prior to the operation being put into place? Mr. Peterson responded that he believes that the DEP allows the Borough to make their own determination as to whether or not to test for percolation and it would certainly be in the best interests of the Borough to determine how the system would function or they could just rely on installing the system and whatever percolation the existing soils may have without testing. Mr. Ferraro stated that an investment in a percolation test would tell the Borough what size system would have to be installed into what areas in order to get the maximum result for the dollars spent. Mr. Peterson responded that was correct. Mr. Ferraro stated that some of the properties would be impacted more than others as was brought up earlier and that the impact might not be equal on the entire run of the infiltration bed based on the percolation rate in certain areas. Mr. Peterson stated that is true and there is limited roadside area so there is not a whole lot of difference between areas that have good percolation to areas that do not because there is not enough space to put a larger facility in there. Mr. Ferraro stated that something to think about was in order to put in a larger pipe system in order to get the performance, property owners may not like the rock swales because it starts to widen that swale and it starts to increase the size of the rock in order to keep erosion from taking place and they may feel like they are losing some of the frontage on their property. Mr. Peterson stated theoretically if the Borough was to put in a wider envelope of stone for the infiltration trench, it does not necessarily mean that the conveyance above it be any wider. It only has to be as wide as the inlets provided. Mr. Ferraro stated that currently the homeowners are responsible for the maintenance of that property and he would assume that the Borough would have to have some sort of instruction on how to maintain it to make sure that the yard drains do not get clogged or filled because the Borough has a pretty big issue with residents discharging lawn clippings, leaves and other types of lawn waste against the curb line and they rely heavily on street sweeping to keep these inlets clean. It is going to have to be made clear that the yard drains are going to need a constant eye and constant maintenance to keep them from getting clogged. Mr. Peterson stated that when the plan is produced it will come with certain maintenance requirements and the Borough could proceed with a mailing program whereby each of the residents would be reminded on what their maintenance responsibilities are and when they should be completed. When Carrol does their illicit discharge inspections they could take a look at the inlets and provide a status update to the Borough and then discuss how to mitigate some of these issues. He stated that there are permanent inlet filters that can be provided to make maintenance a little easier, but there are costs associated with these types of devices.

Peter Revenidis-107 West Fairview asked if there was anything the Borough could implement like the University is doing without destroying the rock swales that we already have? Mr. Peterson responded that the Borough is in a difficult position and it comes to how much real estate the Borough has to do these BMPs and is not enough real estate for a stormwater basin. They only own the Hall, the Administration building and the rights-of-way.

Naomi Mindlin-301 Hill Avenue asked if the Borough has a plan to get to the 30% and do they need to do it in the 10% increments and wouldn't it be advantageous to do the whole thing all at once? Mr. Peterson responded that there are cost benefits to doing it all at once. Right now the PRP does not have enough alternatives to meet the 29.9% although there are enough alternatives to get us through 10 years of permitting. He stated that it's important to remember that this is an evolving permit process through the DEP, there have been a lot of changes, there may be different requirements in the future and it may be found that the Borough's burden may be less so it may be advantageous to wait on certain BMP installations.

Ms. Seader asked if Ms. Gasparovic and Mr. McTigue had any comments on next steps? Mr. McTigue stated that the residents' committee will be the way to go and there are a number of technical issues that need to be considered. Ms. Gasparovic stated that she has heard of one resident who would like to be involved, reminded everyone to contact her or Mr. McTigue if they would like to be involved and are looking for 3-5 people. She asked if the Council would appoint at the next meeting, and about the launch of the committee and the advertisement of how they would meet. Residents who are interested can come to the next meeting and introduce themselves and state why they are interested. They may also give Ms. Gasparovic or Mr. McTigue a note and they will present it. Information will also be on the website.

Christopher Croteau-608 Station Avenue asked if Mr. Peterson could provide a link on everything he said? Ms. Gasparovic stated that it would be added to the Borough's website in the dedicated Stormwater section. Mr. Peterson stated that it would be advantageous to put the PRP and TMDL on the website. Ms. Seader responded it would be.

Kevin Oessenich-301 W. Fairview asked if the calculations were based on estimates, not actual, so it really is not known what the actual sediment amounts that are going into the Neshaminy Creek are? Mr. Peterson responded that is a factor of not being able to test for that and that is how the DEP does the whole process. They have a system by which they look at the land coverages within the Borough; they look at impervious and pervious land within the Borough. Those numbers have associated loading rates in pounds per year and that is how the total loading rate is calculated for the Borough and has been approved by the DEP as the accepted method. In terms of actual loading, he does not know if anyone could determine this. Mr. Oessenich stated that he understands that the percentage determination is actually based on averages across Bucks County. Mr. Peterson said that is correct and this may be advantageous for the Borough. Mr. Oessenich asked if they know if the existing swales are actually contributing to the sediment that is taking place? Mr. Peterson responded that the swales really just convey the pollutants that have already been accumulated in the stormwater from residential properties. They are not seeing a lot of erosion there because there is substantial armoring with the existing stones so this is not a contributing factor. It is mostly pollutants from residences. Mr. Oessenich asked if the proposed system is better than the existing swale system at picking up the water because those who have properties with the swales have no water problems on their properties? He asked if they will have problems as people who do not have a system currently do? Mr. Peterson responded that they would take a look at the existing geometry and come up with an equivalent or something that would have a greater capacity than what is there now. The last thing they would want to do is contribute to flooding and lower property values. The system will have to convey to 10-year storm requirement for the DEP and would like it to convey the 100-year

storm. Mr. Oessenich stated to Council that we have historical significance and beauty in the swales. The question is there an alternative so we will not lose this in Langhorne Manor?

James Keba asked how is the Route 1 water conveyed, where does it go and how impactful is it to what is being spoken about? Mr. Peterson responded that he believes it has been pulled out.

Ms. Seader thanked Mr. Peterson for his time.

4. APPROVAL OF MINUTES – Ms. Gasparovic issued thanks for the detail in the police report. A motion was made by Ms. Gasparovic and seconded by Mr. McTigue to approve the minutes of the May 19, 2020 meeting. No objections were presented. The motion carried.

5. INSPECTOR'S REPORT

Ms. Ferraro report for May 2020:

- Building Permits - 4
- Construction Inspections - 4
- Zoning reviews - 3

Ms. Seader stated that we will be updating the permit process and fillable applications will be on the website at some point.

6. FENCE ORDINANCE ADOPTION – The proposed change from 4 feet to 6 feet height allowance was advertised. Ms. Seader asked for comments from Council. Mr. McTigue commented on the appearance of the Borough, what attracts people to it and that they are attracted because fences are limited, personal property notwithstanding, the appearance of the Borough should be considered. Ms. Gasparovic stated that the Borough will still require open fences and only back-yard fences. Ms. Barnes commented that she has spoken to residents who state it is not a problem to tweak an ordinance, but their concern is that people move into the neighborhood and then the Borough immediately changes an ordinance and it raises suspicions. She agrees with Mr. McTigue. Mr. Niwinski expressed concern about 6-foot high cyclone/chain-link fences. Ms. Seader read the portion of the new Ordinance Article 8, section 801(a). The only thing that changed was the allowance for 6-foot fences. Ms. Gasparovic spoke about tweaking several ordinances to clean up inconsistencies and to make a note of this for the future. Ms. Barnes asked Mr. Profy if the Borough is obligated to have a public hearing when changing an Ordinance. Mr. Profy responded no.

Ms. Seader asked if there were any questions from residents.

Richard Wagner-602 Hill Avenue asked what are the surrounding area's Ordinances? Ms. Seader responded that she does not necessarily want to do what other municipalities do. Mr. Wagner stated that Newtown and Langhorne Boroughs have charm and character and 6-foot high cyclone fences do not contribute to charm and character of the Borough.

Melissa Mather-602 Hill Avenue stated that a 5-foot rear fence with the right material could help people with their dog issue. She stated that Newtown and Langhorne have actual physical

examples to see what happens when you change from 4-feet. If you change from 4-feet in the front to 5-feet in the back, it would allow for the safety and security someone is looking for. She stated that the Borough might want to alter the cyclone fence language.

Chris Croteau-608 Station Avenue thanked Council for a great job. His neighbor wants to put a clear 4-foot fence and Mr. Crouteau doesn't want a chain-link fence across his property. He stated that the neighbor has been forced to do things now which Mr. Crouteau feels is inappropriate. He understands that Borough does not want chain-link or privacy fences, but says not to ask residents to go through hoops.

Ms. Seader clarified that residents and Council want to take the allowance for 6-foot cyclone fences out of the proposed Ordinance. Mr. Pizzola stated he was not sure Council could make this amendment to the proposed Ordinance at this meeting and it was up to the Solicitor to advise them. Ms. Seader stated that Mr. Profy nodded. Ms. Seader asked for a motion to adopt the Fence Ordinance as written, with the exception of 6-foot cyclone fences. Mr. McTigue wanted clarification as to where the cyclone fence provision is being removed. Mr. Profy stated that the 6-foot cyclone fences be removed and only allowed at 4-feet high. Ms. Seader asked for a motion to allow for 6-foot fences with the exception of cyclone fences and to limit cyclone fences to 4 feet. Mr. Pizzola made the motion. Ms. Gasparovic seconded. Mr. McTigue and Ms. Barnes opposed. The motion carried by a vote of 5-2.

7. POLICE REPORT

Mayor Byrne's report for May 2020:

- Total hours-295
- Total fuel-108.1gallons
- Total mileage-803
- Total citations-1
- Total complaints-17

Mayor Byrne introduced Sergeant Kenney to discuss the Police Department. Mayor Byrne asked if anyone had any questions for the Sergeant.

Ms. Seader stated that two officers are trained in 40-hour Crisis Intervention Training (CIT) for mental health and supporting people of different cultures. She stated that it has been 18 years since they discharged a gun. They support our community as well as neighboring communities.

Mr. Pizzola stated to Sgt. Kenney and the rest of the force that he and neighbors are pleased and proud of our force. With these unsettled times police are being looked at differently and Mr. Pizzola stated he does not feel that way. He supports them and the Borough's neighboring forces.

Mr. McTigue echoed Mr. Pizzola and is proud of the CIT. Mr. McTigue asked if Council was going to appeal for additional officers to be trained. Mrs. Seader responded no, the county wants 20% of the force trained and the Borough more than meets that.

Ms. Gasparovic asked if Mayor Byrne or Sgt. Kenney would like to address the civil unrest that is going on now or speak to the CIT? Sgt. Kenney responded that CIT does not deal as much with the civil issues and speaks more to the mental health side. It opens up avenues and resources to use that were not available years ago. Mental health is a big issue and affects many people. The Borough police department does not have that many issues.

Ms. Barnes stated that Council appreciates what they do. Sgt. Kenney responded that he would take that back to the force.

8. COMMITTEE REPORTS -

- **Mr. Niwinski:** - No report
- **Ms. Gasparovic:** - Ms. Gasparovic thanked Steve Schoell for doing work for free and for removing a tree and cement that had fallen. Ms. Gasparovic stated that she received thanks and complaints on different items from residents: she thanked Mr. Pizzola for contacting BCWSA to fix a leak at Prospect and Hulmeville Avenues. She thanked Ms. Ferraro for fixing problems with trash collection recently. She received complaints that there is still an ongoing issue with trucks speeding up Hill Avenue to reach Maple Avenue.

Ms. Gasparovic followed up on Mr. Ferraro's suggestion from last month's meeting about educating residents about waivers, variances and special exceptions. She would like to prepare a document as a guide to put on the website. She stated that she might reach out to Mr. Ferraro for assistance.

Ms. Gasparovic mentioned that there is a Shade Tree Commission vacancy which needs to be filled. It will be advertised on the website and is looking to fill the vacancy next month. Ms. Seader would like to see that when there is a vacancy that it is advertised and have people who are interested attend meetings.

Ms. Gasparovic stated that the Borough just received its insurance renewal proposal for the package policy and Workers' Compensation Policy (WC). Both rates have gone up due to increase in police hours. The total increase is about \$1,600. Ms. Gasparovic addressed Council as to if they were intending to keep the increased police hours. She prepared documents with police payroll estimated projections. She stated that she estimated an increase in payroll from \$64,000 to \$78,000. The estimate can be changed but a good faith estimate must be submitted to the insurance company. Ms. Seader stated she would like to keep the increased police hours. Mr. McTigue asked how the number squared up with the budget, is it on track. Ms. Gasparovic responded that the Borough has been over budget fairly consistently. Mr. Pizzola stated that based on the \$78,000 it is higher than the budget. Mr. Niwinski stated if the rating is based off of police hours and the hours are raised, it will never go back to the lower hours rate as the insurance company will want to keep the higher premium. Mr. Niwinski asked if the hours are auditable. Ms. Gasparovic stated only the WC where the hours can be adjusted for an additional or return premium. Mr. Pizzola recommends \$70,000-\$72,000. Mr. Pizzola recommends and questions if there is a need to keep increased police hours. Ms. Seader stated that it is only an increase of 2 hours/day. There was discussion about police hours and rates. Ms. Barnes stated

that the Police Committee should meet and discuss the hours. The premium is due July 15th, so it can be discussed and finalized next month. Ms. Gasparovic stated she would need estimates for quotes to be obtained after the Police Committee meeting. Mayor Byrne stated that complaints about the Police Department have stopped due to the increased hours. Ms. Gasparovic stated that she would get estimates based on the Police Committee's recommendation.

- **Mr. McTigue:** - Mr. McTigue stated that bulk trash is this Saturday, June 20th. There will be 4 trucks and residents should have their trash out by 6:00 am. The service issues were attributed to the loss of a permanent driver and a new permanent driver should be assigned in the next week or so.

Ms. Seader asked if the COVID-19 disaster declaration Resolution needed to be updated. Mr. McTigue responded that Emergency Management told him as long as the Governor's declaration is in place it is not necessary. However, Mr. McTigue recommended that it be renewed. Ms. Barnes made a motion to adopt Resolution 2020-10 Ratifying the COVID-19 Disaster Emergency Declaration Pursuant to Section 7501(b) of The Pennsylvania Emergency Services Code, 35 Pa.C.S.A. 7101 *et seq.*, Mr. Niwinski seconded. There were no objections. The motion carried.

- **Ms. Seader:** - Ms. Seader thanked the poll workers on election day who faced a lot of challenges.

The Borough's Secretary/Treasurer's bond came through.

The Newsletter went out and is on the website.

Ms. Seader stated that there is a Langhorne Manor Facebook page and that it is not an official LMB page. It is not monitored by the Borough and is run by residents.

Ms. Seader stated that the State is still in the yellow phase but does not anticipate being there much longer. This does not change things significantly. As Borough Hall is not large enough for appropriate social distancing for Council or residents, Council will continue to have meetings through Zoom through the green phase.

Ms. Seader had asked Mr. Ferraro who is the Comcast/Verizon liaison, to look into all of the different accounts the Borough has with them. Ms. Seader provided a list of the accounts from Mr. Ferraro to Council and stated that the accounts cannot be combined. Council should keep the Police accounts separate in case of grants. Mr. Ferraro stated that if Council was to make changes it would probably force them into a new contract which would lock Council into rates that would not be able to be changed. Ms. Gasparovic asked what the television is for? Ms. Seader stated that the current civil unrest is a perfect example of why it is needed and she believed they used it for surveillance. Ms. Gasparovic asked Mr. Ferraro if Council renegotiates how much money the Borough gets from Comcast and Verizon, when it comes up, is the Borough already maxed out or is there anything else the Borough can get in that respect? Ms. Seader responded that she and Mr. Profy have been working with a consultant who has been negotiating the contract. When the County negotiates their contract, the Borough gets the

benefits of it and it is still in the process. The renewal has been delayed due to what is happening right now.

Ms. Seader stated that Stephen Perloff recommended last month that Council adopt a Postal Service Resolution. Ms. Seader read part of the Resolution. Ms. Seader stated that she spoke with Mr. Profy who recommended taking out the paragraph that urges the President to remove the burden on the Postal Service to prefund its pension costs. Mr. Profy spoke to the argumentative nature and interjected the Borough into a legislative issue. Mr. Perloff stated that analysts say that if you take away the requirement that alone would make the Post Office solvent, that is why he put it in the and recommends that it is kept in the resolution. Mr. Perloff also spoke to the costs of the Borough to mail items through the post office compared to FEDEX. Mr. Perloff mentioned also that mail-in ballots will be used in the future. Ms. Gasparovic stated that it is important that Council is able to urge Congress and officials above them on important issues. Ms. Seader asked Council for a motion to adopt the Resolution 2020-11 In Support of The United States Postal Service as written leaving this paragraph out. Ms. Judge made the motion and Ms. Gasparovic seconded. There were no objections. The motion carried.

- **Mr. Pizzola:** - Mr. Pizzola stated that streets are being prepared for paving, it should start tomorrow and weather dependent, conclude Friday or Monday. Then the seeding and soil will be completed and the last thing will be the ADA ramps.

Mr. Pizzola reported that Morrissey did crack sealing on the access lanes and gave us a warranty discount for a cost.

Mr. Pizzola stated that he has been working with Jason Snyder who is the engineer who designed the roadway repairs on what Mr. Pizzola calls the No Trucks project. The Borough must have an ordinance and comply with PennDOT regulations to enforce no trucks except for local deliveries on all Borough roads.

PennDOT has asked all municipalities to look at hot pour mastic for upgraded repair for cracks and potholes. Mr. Pizzola would like PennDOT to use the Borough as an exhibition site in order to have work done on the access lanes. Mr. Pizzola spoke about the issues on the access lanes and this should greatly reduce the need for personnel to fill potholes.

Mr. Snyder stated that he is out at the paving sites every day if anyone needs to talk to him. He has an ongoing punch list.

Mr. Snyder prepared draft road study documents for Mr. Profy to review and draft an Ordinance as to the No Truck project if Council would like. He proposed "No Trucks Except Local Deliveries" signs on all core streets based on structural integrity. The Borough has no authority over the state streets. Trucks must have an actual delivery on a Borough street. Posting for weight would require the police department purchase scales and is not recommended.

Mr. Snyder stated that he contacted the Commonwealth to see if there is support for the Borough to be an exhibition site for the hot pour mastic. It would not be free, but if Council is interested and would like to continue, he thinks he could have answers in the next week or two.

Ms. Gasparovic asked if our Ordinance is based on weights so would it be smarter to just have a No Trucks Ordinance. Mr. Snyder stated he had not seen our Ordinance. Mr. Pizzola stated that the Ordinance is out of date as it has a weight limit of only 4,000 lbs. Mr. Profy stated that he would like the material and data from Mr. Snyder so he could create a more comprehensive Ordinance.

Ms. Gasparovic asked about getting more seed for those who did not have grass grow and could they put down more if there is extra? Mr. Pizzola said there is no guarantee that it will grow and there is not much they can do. Mr. Snyder will ask the superintendent if they can add more, but the contracts hold residents responsible. He will add it to the punch list and see what the response is.

Ms. Seader apologized, but had one more item after the discussion of the Fence Ordinance. Chuck Goodnow came to Council for a waiver for a 4-foot gate on his property in the middle of the hedges. The fence was approved but the gate was not. Ms. Seader asked for a motion that Council grant the waiver for Mr. Goodnow. Mr. Pizzola made the motion, Mr. Niwinski seconded. There were no objections. The motion carried.

Mr. Pizzola stated that when the road project contract was negotiated it took out the Borough parking lot and a small section on Gillam Avenue that is in Middletown due to cost. This reduced the contract by about \$28,000. The Borough now has a \$200,000 grant from the RDA plus savings on flipping the Gillam Avenue paving to the other side of Hulmeville Avenue to the overpass. Mr. Pizzola is asking for Council to approve paving the Borough Hall parking lot while General Asphalt is still in the Borough and the contract has not been closed out. The Borough has the funds and explained that he looked at how the General Fund revenues are coming in now as compared to last year. Tax revenues are basically the same, liquid fuels will probably be reduced due to COVID and the remaining balance on the contract that has to be paid is \$662,000. If the parking lot is added, the total comes to approximately \$680,000. As of May 31st, there is \$380,000 of capital reserve, \$305,000 in the Road Improvement fund, the \$200,000 RDA grant which hasn't been collected yet, the liquid fuels fund is \$85,000 plus a \$30,000 journal entry in the General fund that is owed to the Highway Aid Fund. This all totals \$1,000,000 which can only be used for roads. If the Borough pays out \$680,000 it leaves them with approximately \$320,000 in the paving fund without anything from Liquid Fuels. The payment is \$6,600 and with the funds the Borough has today they can pay for 45 more months which is why Mr. Pizzola is asking for this to be done. Mr. Pizzola corrected a statement he made about the Borough signing an escalator clause that if the price of oil goes down by 10% the Borough shares in the savings, if the price of oil goes up the Borough has to pay. Mr. Pizzola stated that the Borough did not however, sign the escalator clause due to the concern that oil prices would rise in the future.

Ms. Seader asked if Mr. Pizzola asked if the Borough can use Liquid Fuels for radar signs. Mr. Pizzola has not got an answer. She asked for clarification that the parking lot was in the original bid, but removed due to cost.

Mr. Snyder said he will issue change order. Mr. Ferraro stated that the issue with the savings and the additional fuel costs came up twice. The second time it came up was when the time-table was being extended in December and Mr. Pizzola said it was not a good idea for Council to enter into that kind of an agreement with them. Mr. Ferraro stated he thought the contract would have been reviewed at that point. This is the third time talking about a change order and a third opportunity while extending their time-table and give them additional work, to negotiate the \$7,000 back into the contract. Mr. Snyder stated they could do that.

Ms. Gasparovic asked about the condition of parking lot. Mr. Pizzola stated it is over 30 years old and needs to be done. Mr. Snyder stated he would like to fabric and re-pave the parking lot to extend its life. Ms. Barnes stated she was concerned about issues with dumping over the years and the Borough needs to be careful about any dumping. Mr. Pizzola stated there have been no issues since the signs were put up several years ago. **Correction 7/7/20-Ms. Gasparovic stated she would like the suggestion that was made and rescinded by Mr. Snyder to extend the paving to the Borough Hall Parking lot as he had extra paving materials. This suggestion was rescinded due to Mr. McTigue's following statement.** Mr. McTigue stated there is a part of the area behind the parking lot that is Native grounds and they should be aware of them. Mr. Pizzola made a motion to repave the Borough parking lot. Ms. Judge seconded. There were no objections. The motion carried.

- **Ms. Judge:** - Ms. Judge stated that \$500,000 from the sewer account was wired to investment account.

Ms. Judge stated that the hardware was installed in the Borough office and data transferred.

Ms. Judge stated that the texting service was launched this week. Several texts when out and 85 people have signed up.

Ms. Gasparovic thanked Ms. Seader and Ms. Judge. This will save money. The postcard that went out stated that people would have the option to get hard copies of the newsletter and a small number of people have made that request.

Ms. Seader stated that the Borough is getting more electronic which is a good thing.

- **Ms. Barnes:** - Ms. Barnes stated she is happy to hear that the truck ordinance is being looked into.

Ms. Barnes stated that the Friday after council meeting, she took lunch, dinner and dessert over to the workers at Langhorne Gardens as was approved at last month's meeting.

Ms. Barnes stated that the Planning Commission will be meeting shortly for the Grupp subdivision in July and they are hoping to meet in person.

Ms. Seader reminded Council to get Ms. Ferraro their reports.

9. MAYOR'S REPORT – Mayor Byrne stated that the electronic speeding signs record speed, number of cars, average speed and is accessible to be downloaded to the police car. They are battery and solar powered. The cost for two units is \$5,824 and four units cost \$11,378. Hulmeville Borough is seeing a drop in speeding with the use of their devices. Ms. Seader reminded Council that the Borough did not receive an RDA grant for them but should review it. Mr. McTigue asked if it was in the budget and stated that the RDA grant process is coming up and is due September 30th. Mr. McTigue questioned if it is in budget and stated that the grant process is coming up. Mayor Byrne suggested looking into the \$15,000 plowing budget as there was no snow this year and asked about the Liquid Fuels. It has not been confirmed that the Borough could use Liquid Fuels. Ms. Gasparovic asked if there was a sense that there would be RDA funds available. Ms. Seader stated that they never know. Mr. McTigue stated that due to people looking for RDA relief in this time, the bottom line may be decreased for municipalities and the Borough should be careful of that. Mr. Pizzola stated that he would bring numbers to Council at the next meeting.

10. SOLICITOR'S REPORT – no formal report. Mr. Profy responded to Ms. Gasparovic's question at last month's meeting on the responsibility to properly post weight limits on the roads and bridges in order to assess fines. There is an advance informational sign that needs to be posted in the event that the bridge does not have an intersection immediately preceding it in order to avoid the fine. This will be addressed when the Ordinance is prepared as far as putting weight limits on the roads that are subject to the jurisdiction of Langhorne Manor Borough. Ms. Gasparovic asked if this was a moot point due to the Council stating no trucks in general. Mr. Profy said that it would be addressed when he obtains the information from Mr. Snyder.

11. CORRESPONDENCE – None

12. APPROVAL OF BILLS FOR PAYMENT – Ms. Seader stated that all Council members received a copy of the bills list for payment for May and asked for questions and concerns. Mrs. Gasparovic questioned some items which were addressed. Ms. Gasparovic asked if the Borough charges for removal of trees from the street, is the homeowner charged? Mr. Pizzola stated that the Borough has never charged the homeowner for the removal of an emergency tree. Ms. Gasparovic stated that it is in the Ordinance and Council has been giving homeowners the wrong information and a change in the Ordinance should be looked into. Ms. Gasparovic wanted someone made aware of what looks like a minimum sewer charge for Langhorne Gardens. Ms. Seader asked for a motion to accept the bills list as presented. Ms. Gasparovic made the motion. Ms. Barnes seconded. There were no objections. The motion carried.

13. APPROVAL OF TREASURER'S REPORT –

Highway Aid Fund for March: Ms. Seader asked for a motion to accept the Highway Aid Fund from March as presented. Ms. Judge made the motion. Ms. Barnes seconded. There were no objections. The motion carried.

General Fund for May: Ms. Gasparovic asked about items which were addressed. Ms. Seader asked for a motion to accept the General Fund for May as presented. The motion was made by Mr. Niwinski and was seconded by Mr. Pizzola. There were no objections. The motion carried.

Sewer Fund for May: Ms. Seader asked for a motion to accept the Sewer Fund for May as presented. The motion was made by Mr. Niwinski and was seconded by Ms. Judge. There were no objections. The motion carried.

Highway Aid Fund for May: Ms. Seader asked for a motion to accept the Highway Aid Fund for May as presented. The motion was made by Mr. Niwinski and seconded by Mr. Pizzola. There were no objections. The motion carried.

14. COMMENTS FROM RESIDENTS AND VISITORS:

Ms. Gasparovic asked if there was any information on a candlelight vigil. Ms. Seader stated that it was being put off due to inability of being able to contact people. They will be asking for Council support in order to hold it on Borough grounds.

15. ADJOURNMENT – Ms. Seader entertained a motion to adjourn the meeting. Motion was made by Mr. McTigue and seconded by Ms. Barnes to adjourn the meeting. No objections were presented. The motion carried. The meeting adjourned at 11:12 P.M.

The next meeting will be July 7, at 8:00 P.M.

Respectfully submitted,

Barbara T. Ferraro
Secretary/Treasurer
Langhorne Manor Borough

IV. MCM #3 – Illicit Discharge Detection and Elimination (IDD&E)

1. Illicit Discharge Detection and Elimination Program (IDD&E)
2. Storm Sewer & Outfall Map with Storm Sewer Sheds and Land Uses
3. Pollution Reduction & TMDL Parsed Area Map
4. Outfall Field Screening Report dated May 7, 2020
5. Langhorne Manor Borough Stormwater Management Ordinance
(included under Section V & VI)

LANGHORNE MANOR BOROUGH

ILLICIT DISCHARGE DETECTION AND ELIMINATION PLAN

Introduction

The Illicit Discharge Detection and Elimination Plan (IDDEP) is a program designed to prohibit and eliminate to the maximum extent practicable illicit discharges and connections to Langhorne Manor Borough's municipal separate storm sewer system (MS4).

An illicit discharge is defined as any discharge (or seepage) to a municipal separate storm sewer that is not composed entirely of stormwater. This does not refer to discharges authorized under an National Pollutant Discharge Elimination System (NPDES) permit (other than the NPDES permit for discharges from the regulated small MS4); certain allowable non-stormwater discharges described in the EPA regulations, NPDES MS4 permit or the MS4 permittee's ordinances; and discharges resulting from fire fighting activities. Examples of illicit discharges include dumping of motor vehicle fluids, household hazardous wastes, grass clippings, leaf litter, animal waste, or unauthorized discharges of sewage, industrial waste, restaurant waste, or any other non-stormwater waste into a separate stormwater drainage system. Illicit discharges can be accidental or intentional.

Visual Screening of Stormwater Outfalls

A multi-faceted illicit discharge detection program has been established. Under this program, illicit discharges are identified through two primary methods:

- Dry weather outfall screening, and
- Receipt of complaint calls from the general public.

Dry weather outfall screening involves locating outfalls from the MS4 and collecting evidence of dry weather discharges from these outfalls. The objective of dry weather field screening is to develop an overall assessment of dry weather discharges from MS4s, based on volume and quality of observed discharges, in order to target future illicit discharge investigations towards sources with the highest probability of causing water quality impairment. The storm water outfall locations within the Borough are shown on the Borough of Langhorne Manor Storm Sewer System Plan. In accordance with the Borough's NPDES MS4 permit all outfalls will be screened at least once during each permit coverage term, and for areas where past problems have been reported or known sources of dry weather flows occur on a continual basis, outfalls will be screened annually. Screening should be performed during varying seasonal and meteorological conditions.

Due to the limited number of outfalls within the MS4 area of the Borough no separate high priority areas have been established. All outfalls have been assumed to have the same priority.

For each outfall, if the screening reveals dry weather flow, the discharge from the outfall and the area around the outfall shall be inspected visually for color, turbidity, sheen, floating or submerged

solids; for adverse affects on plants or animals in proximity to the outfall; and for odor. If the outfall produces any odor, or if the visual inspection shows any indication that the discharge may contain pollutants, then samples of the discharge shall be collected for field and / or lab testing of selected chemical and biological parameters as part of a process to determine if the dry weather flow is illicit. Common parameters include pH, conductivity, E. Coli bacteria, fecal coliform bacteria, metals, suspended solids, dissolved solids, oils, ammonia, surfactants, chlorine, and fluoride.

Observations of each outfall shall be recorded each time an outfall is screened, regardless of the presence of dry weather flow. Proper quality assurance and quality control procedures shall be followed when collecting, transporting or analyzing water samples. All outfall inspection information shall be recorded on the Outfall Reconnaissance Inventory/Sample Collection field sheet (see Appendix A) excerpted from the *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments* (CWP, October 2004). Adequate written documentation shall be maintained to justify a determination that an outfall flow is not illicit. If an outfall flow is illicit, the actions taken to identify and eliminate the illicit flow also shall be documented.

Illicit Discharge Source Identification

When a problem area or discharge is found, additional efforts are necessary to determine the source of the discharge. Various options exist for source investigation of identified illicit discharges. Commonly used methods include inlet observations (tracing the discharge upstream in the storm sewer system), video inspection, dye testing and smoke testing. In the event that the Borough receives notification of a potential illicit discharge, in most if not all cases the Borough will serve as the initial responder for such reports. The Borough's Neshaminy Creek Watershed Act 167 Stormwater Management Ordinance, adopted in April of 2011, and Delaware River South Watershed Act 167 Stormwater Management Ordinance, adopted March 2005, provide right-of-entry authorization for source identification and procedures for enforcement. If the location of the observed discharge falls outside the Borough's jurisdiction or the investigation of the discharge requires resources and/or expertise beyond the Borough's capabilities, the Borough will refer the investigation to the proper authorities (County or State). Regardless of who performs the investigation, the investigator should first develop a plan based on the outfall screening data and other sewer system and land use data available to the jurisdiction. This plan should provide a rational basis for selecting an appropriate investigation method or combination of methods based upon the field observations and/or the understood nature of the identified discharge.

Illicit Discharge Elimination

The Borough's Neshaminy Creek Watershed Act 167 Stormwater Management Ordinance, adopted in May of 2011, and Delaware River South Watershed Act 167 Stormwater Management Ordinance, adopted March 2005, establish the necessary legal authority to detect, investigate and eliminate illicit discharges. If the nature and source of an identified illicit discharge is clearly understood, then the Borough will either take enforcement action or directly refer enforcement to the appropriate agency/department. If the nature and/or source of the observed or reported discharge is/are not thoroughly understood, additional investigation must be performed to

determine the nature of the discharge and/or identify the source. Once the nature and source of the identified discharge is understood, the appropriate agency/department will be contacted to coordinate the elimination of the illicit discharge.

When illicit discharges are documented the Borough and appropriate agency/department will work with the discharger to find a solution to the problem and to remove/correct the illicit connection. In all cases the discharger will be notified of an illicit discharge violation and referred to local, state and federal agencies with jurisdiction.

All actions relating to illicit discharge elimination will be recorded in a database administered by the Borough. The database will be organized by MS4 outfall and will contain information such as: the number of illicit connections eliminated, any complaints received and corrected, and the number of discharges and quantities of flow eliminated.

APPENDIX A

Outfall Reconnaissance Inventory/Sample Collection Field Sheet

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed:		Outfall ID:	
Today's date:		Time (Military):	
Investigators:		Form completed by:	
Air Temperature (°F):		Rainfall (in.): Last 24 hours: Last 48 hours:	
Latitude:	Longitude:	GPS Unit:	GPS LMK #:
Camera:		Photo #s:	
Land Use in Drainage Area (Check all that apply): <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Industrial <input type="checkbox"/> Ultra-Urban Residential <input type="checkbox"/> Suburban Residential </div> <div> <input type="checkbox"/> Commercial <input type="checkbox"/> Open Space <input type="checkbox"/> Institutional Other: _____ Known Industries: _____ </div> </div>			
Notes (e.g., origin of outfall, if known):			

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE	DIMENSIONS (IN.)	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other: _____	<input type="checkbox"/> Circular <input type="checkbox"/> Elliptical <input type="checkbox"/> Box <input type="checkbox"/> Other: _____	<input type="checkbox"/> Single <input type="checkbox"/> Double <input type="checkbox"/> Triple <input type="checkbox"/> Other: _____	Diameter, circular: _____ Dimensions, Box: h - _____ w - _____ Elliptical: h - _____ w - _____
	In Water: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully With Sediment: <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Fully			
<input type="checkbox"/> Open drainage	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> rip-rap <input type="checkbox"/> Other: _____	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other: _____	Depth: _____ Top Width: _____ Bottom Width: _____	
<input type="checkbox"/> In-Stream	Complete Stream Discharge form			
Flow Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>If No, Skip to Section 5</i>	Flow Description (If present) <input type="checkbox"/> Trickle <input type="checkbox"/> Moderate <input type="checkbox"/> Substantial		

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER	RESULT	UNIT	EQUIPMENT	
<input type="checkbox"/> Flow #1	Volume		Liter	Bottle
	Time to fill		Sec	Stopwatch
<input type="checkbox"/> Flow #2	Flow depth	1. 2. 3. 4.	In	Tape measure
	Flow width	_____, _____"	Ft, In	Tape measure
	Measured length	_____, _____"	Ft, In	Tape measure
	Time of travel	1. 2. 3. 4.	S	Stop watch
Water Temperature			°F	Thermometer
Ammonia			mg/L	Ammonia photometer
Salinity		Dilution? %	ppm	Refractometer
Conductivity		Dilution? %	µs	Conductivity meter
pH			pH	pH meter
Potassium			ppm	Potassium ion meter
Fluoride			mg/L	Fluoride photometer
Detergents			ppm	Colorimeter

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☐ No (If No, Skip to Section 5)

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	<input type="checkbox"/>	<input type="checkbox"/> Sewage <input type="checkbox"/> Rancid/sour <input type="checkbox"/> Petroleum/gas <input type="checkbox"/> Sulfide <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint	<input type="checkbox"/> 2 – Easily detected	<input type="checkbox"/> 3 – Noticeable from a distance
Color	<input type="checkbox"/>	<input type="checkbox"/> Clear <input type="checkbox"/> Brown <input type="checkbox"/> Gray <input type="checkbox"/> Yellow <input type="checkbox"/> Green <input type="checkbox"/> Orange <input type="checkbox"/> Red <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Faint colors in sample bottle	<input type="checkbox"/> 2 – Clearly visible in sample bottle	<input type="checkbox"/> 3 – Clearly visible in outfall flow
Turbidity	<input type="checkbox"/>	See severity	<input type="checkbox"/> 1 – Slight cloudiness	<input type="checkbox"/> 2 – Cloudy	<input type="checkbox"/> 3 – Opaque
Floatables -Does Not Include Trash!!	<input type="checkbox"/>	<input type="checkbox"/> Sewage (Toilet Paper, etc.) <input type="checkbox"/> Suds <input type="checkbox"/> Petroleum (oil sheen) <input type="checkbox"/> Other:	<input type="checkbox"/> 1 – Few/slight; origin not obvious	<input type="checkbox"/> 2 – Some; indications of origin (e.g., possible suds or oil sheen)	<input type="checkbox"/> 3 – Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☐ No (If No, Skip to Section 6)

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	<input type="checkbox"/>	<input type="checkbox"/> Spalling, Cracking or Chipping <input type="checkbox"/> Peeling Paint <input type="checkbox"/> Corrosion	
Deposits/Stains	<input type="checkbox"/>	<input type="checkbox"/> Oily <input type="checkbox"/> Flow Line <input type="checkbox"/> Paint <input type="checkbox"/> Other:	
Abnormal Vegetation	<input type="checkbox"/>	<input type="checkbox"/> Excessive <input type="checkbox"/> Inhibited	
Poor pool quality	<input type="checkbox"/>	<input type="checkbox"/> Odors <input type="checkbox"/> Colors <input type="checkbox"/> Floatables <input type="checkbox"/> Oil Sheen <input type="checkbox"/> Suds <input type="checkbox"/> Excessive Algae <input type="checkbox"/> Other:	
Pipe benthic growth	<input type="checkbox"/>	<input type="checkbox"/> Brown <input type="checkbox"/> Orange <input type="checkbox"/> Green <input type="checkbox"/> Other:	

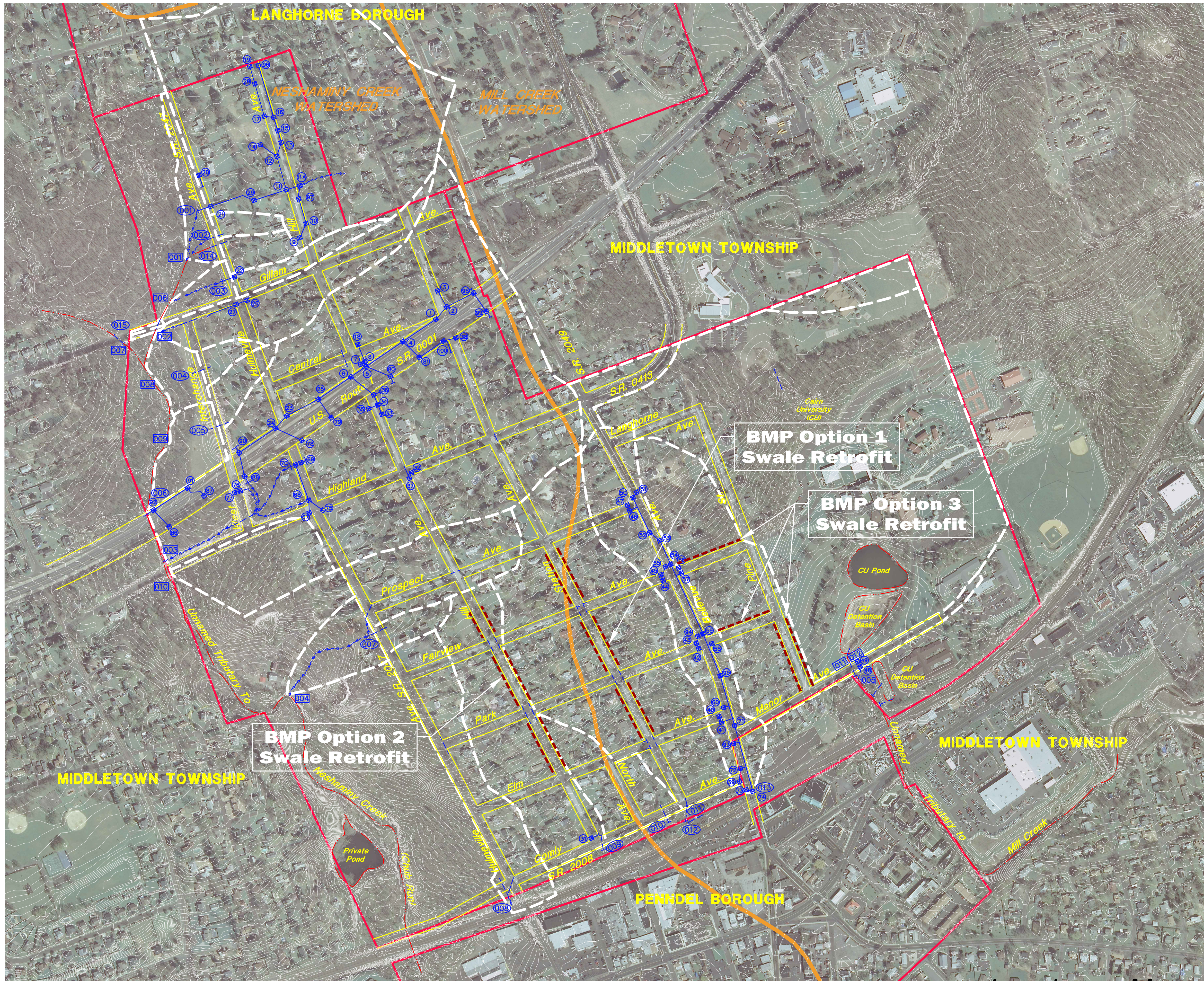
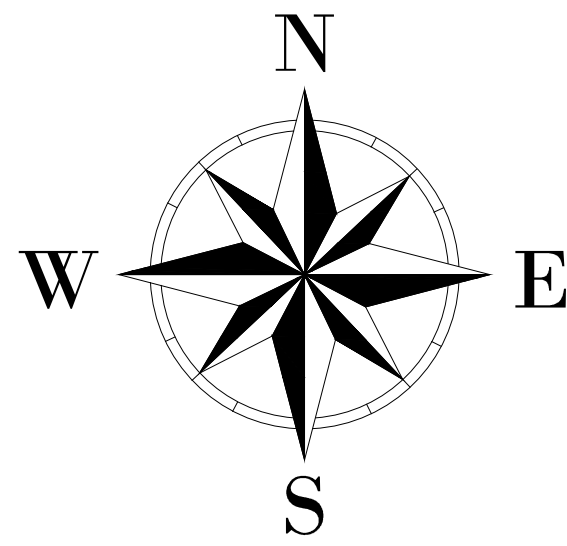
Section 6: Overall Outfall Characterization

<input type="checkbox"/> Unlikely <input type="checkbox"/> Potential (presence of two or more indicators) <input type="checkbox"/> Suspect (one or more indicators with a severity of 3) <input type="checkbox"/> Obvious

Section 7: Data Collection

1. Sample for the lab?	<input type="checkbox"/> Yes <input type="checkbox"/> No	2. Sterile sample for bacteria analysis?	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. If yes, collected from:	<input type="checkbox"/> Flow <input type="checkbox"/> Pool	4. Sample for optical brightener?	<input type="checkbox"/> Yes <input type="checkbox"/> No
5. Intermittent flow trap set?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, type: <input type="checkbox"/> OBM <input type="checkbox"/> Caulk dam	

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

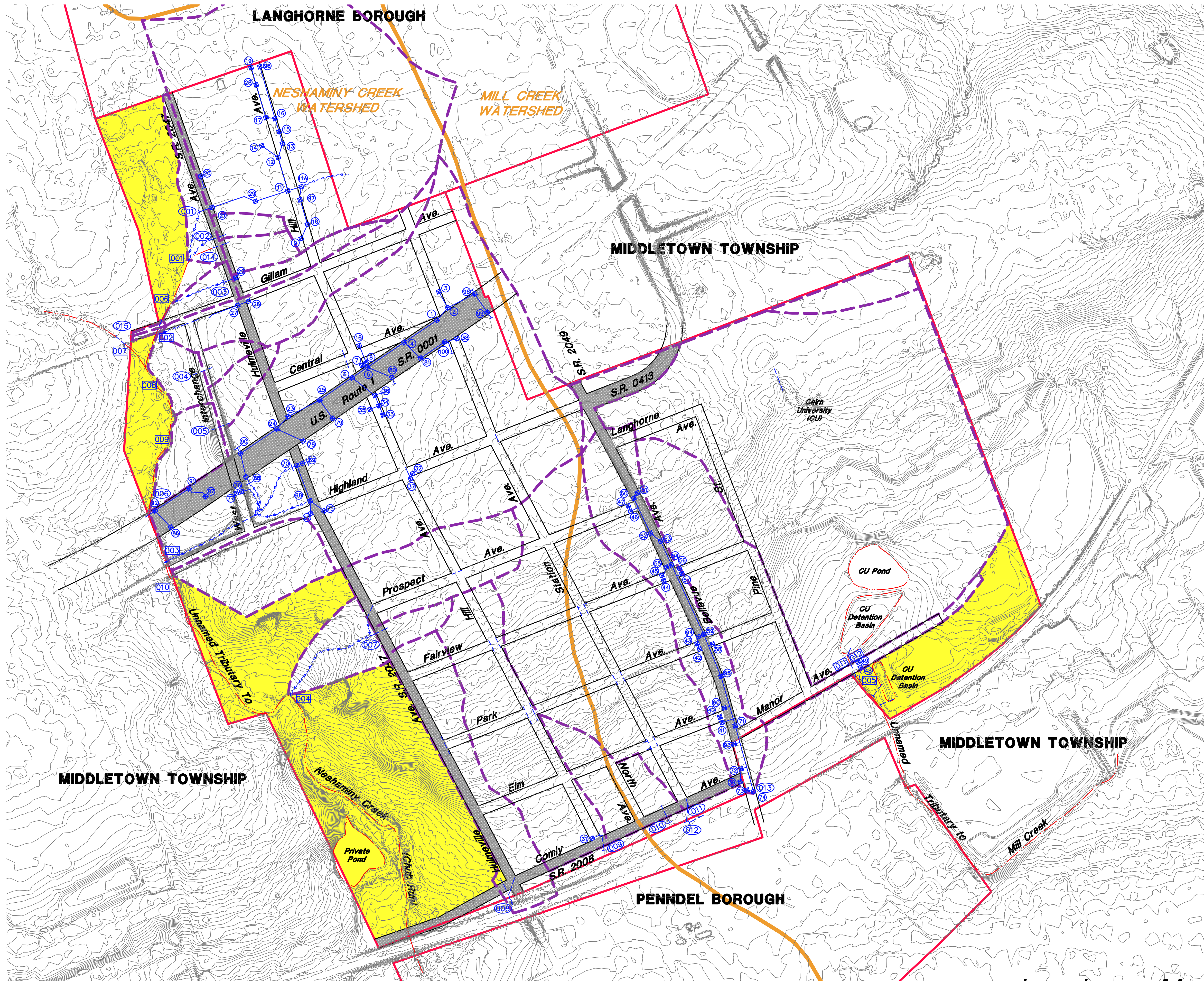
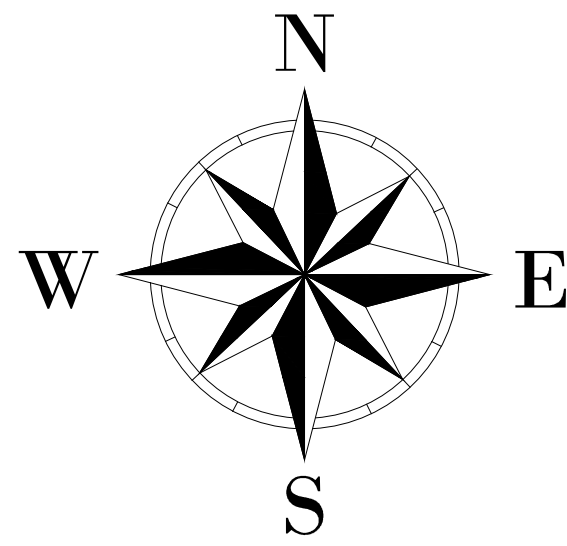


NOTES:
1. THIS FIGURE IS DESIGNED TO BE USED IN CONJUNCTION WITH THE NPDES MS4 PLAN FOR LANGHORNE MANOR BOROUGH.
2. ACCURACY OF THE COVERAGES IS LIMITED TO THE ACCURACY OF THE ORIGINAL DATA.
SOURCE:
1. STREAM SHAPEFILES WERE OBTAINED FROM PASDA.
2. STREET SHAPEFILES WERE MIGRATED FROM EXISTING CAD DRAWINGS BY PCS.
3. DRAINAGE DITCH, PIPING AND STORM SEWER FILES WERE DIGITIZED FROM PAPER MAPS AND FIELD VERIFIED BY PCS.

LEGEND

STREAM/WATERCOURSE	
STORM SEWER INLET	
STORM SEWER INLET NUMBER	
LMB MS4 OUTFALL NUMBER	
OBSERVATION POINT LMB MS4 NUMBER	
STORM SEWER CULVERT	
STORM SEWER PIPE	
SWALE/OPEN CHANNEL	
Borough Boundary / Urbanized Area	
Borough Street	
PennDOT Road	
Watershed Drainage Boundary	
Storm Sewershed Boundary	

Q:\Langhorne Manor Borough\GIS\2016 Update\Drawing Set\Outfall Map_2017.dwg
Q:\Langhorne Manor Borough\GIS\2016 Update\Drawing Set\Outfall Map_2017.dwg
Q:\Langhorne Manor Borough\GIS\2016 Update\Drawing Set\Outfall Map_2017.dwg



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- LEGEND**
- STREAM/WATERCOURSE
 - STORM SEWER INLET
 - STORM SEWER INLET NUMBER
 - LMB MS4 OUTFALL NUMBER
 - OBSERVATION POINT LMB MS4 NUMBER
 - STORM SEWER CULVERT
 - STORM SEWER PIPE
 - SWALE/OPEN CHANNEL
 - Borough Boundary / Urbanized Area
 - Borough Street
 - PennDOT Road
 - Watershed Drainage Boundary
 - Storm Sewershed Boundary

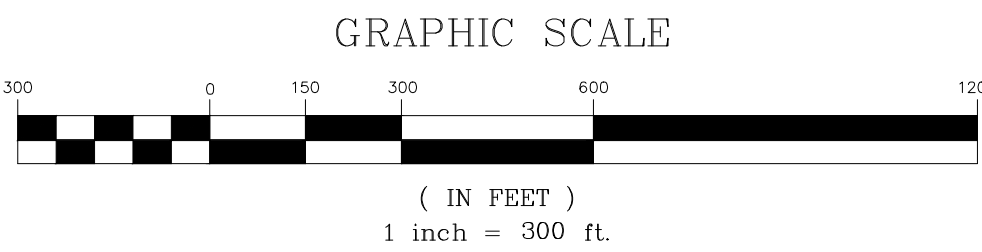
- PARSED AREA LEGEND**
- PENNDOT ROAD
 - AREAS DIRECT TO STREAM

TOTAL BOROUGH AREA (PER DEP)	384.9 ACRES
NESHAMINY CREEK WATERSHED AREA	262.3 ACRES
PENNDOT ROADS	18.3 ACRES
AREA DIRECT TO STREAMS	55.0 ACRES
PROPOSED NESHAMINY CREEK PLANNING AREA	189.0 ACRES
MILL CREEK WATERSHED AREA	122.6 ACRES
PENNDOT ROADS	4.7 ACRES
AREA DIRECT TO STREAMS	10.5 ACRES
PROPOSED MILL CREEK PLANNING AREA	107.4 ACRES

Prepared By:

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Langhorne Manor Borough Pollution Reduction & TMDL Plans Parsed Area Map

Langhorne Manor Borough, Bucks County, Pennsylvania
November 2018

Revision Description



Carroll Engineering Corporation

May 7, 2020

Via E-Mail

Ms. Dawn Seader, Council President
Langhorne Manor Borough
618 Hulmeville Avenue
Langhorne Manor, PA 19047

Subject: NPDES Stormwater Permit No. PAI130076 - Year 1 Outfall Monitoring

Dear Ms. Seader:

In accordance with the Illicit Discharge Detection and Elimination requirements of the above referenced permit, our office recently monitored 12 of the Borough's 12 outfalls. The inspection was conducted on March 10, 2020, but was abandoned due to an unforeseen rain event which occurred during the time of inspection. The remaining outfall inspections were then resumed on May 6, 2020.

As you may be aware, five (5) of the Borough's outfalls are located on private property and cannot be directly inspected. Instead, these outfalls are monitored through the inspection of one or more observation points which are tributary to these outfalls. There are also additional observation points which are not associated with any specific outfall, but discharge at the municipal boundary. Our office monitored 15 of the 15 designated observation points.

The outfall and observation point numbering convention has been taken from the approved map titled the "Langhorne Manor Borough Pollution Reduction & TMDL Plans Parsed Area Map", prepared by Pickering Corts & Summerson Consulting Engineers & Land Surveyors, dated November 2018.

Enclosed you will find our Outfall Field Screening Report which contains copies of the MS4 Outfall Field Screening Reports and pictures for each outfall and/or observation point.

Today's Commitment To Tomorrow's Challenges

Corporate Office:
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(215) 343-5700

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Third Floor
King of Prussia, PA 19406
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Malvern, PA 19355
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105 Raider Boulevard
Suite 206
Hillsborough, NJ 08844
908-874-7500

www.carrollengineering.com

Ms. Dawn Seader, Council President
Langhorne Manor Borough
Page 2
May 7, 2020

Our office found no illicit discharges during our field visits; however, I would like to take this opportunity to explain certain observations made during the monitoring.

Outfall 5 & Observation Point 1, 5, & 14

There is standing water at the discharge end of these outfalls/observation points. There are several reasons for this condition. Scour holes have developed at the outfalls, and downstream swales are relatively flat and traverse wooded areas where vegetation and debris appear to be clogging the conveyance.

Observation Point 14

A fallen tree is located just downstream of this observation point which may impede downstream flow.

Observation Point 7

Flow was observed at this observation point which was attributed to a known water main break/leak at Hulmeville Road and Prospect Avenue which was awaiting the issuance of a Highway Occupancy Permit before the emergency repair could be completed. As such, this outfall shall be inspected again in year-2 of this permit period to adequately monitor the dry weather conditions.

Observation Point 10

The concrete endwall has broken and fallen into the downstream swale which may impede flow. Photographs from previous outfall monitoring indicated the presence of a crack developing and was shown to be broken at the time of the March 2017 outfall inspection. It appears that this endwall may have been cast-in-place without steel reinforcement.

A copy of this report will be submitted to the Department of Environmental Protection, as part of the Borough's Year 1 annual report. If you should have any questions or comments regarding this matter, please do not hesitate to contact me.

Very truly yours,

CARROLL ENGINEERING CORPORATION

Christopher A. Peterson

Christopher A. Peterson, P.E.

CAP:cam

Enclosures

cc: Langhorne Manor Borough Council

Barbara Ferraro, Borough Secretary, Langhorne Manor Borough

Charles Pluguez, Borough Zoning Officer, Langhorne Manor Borough

Thomas J. Profy, IV, Esquire, Borough Solicitor

OUTFALL FIELD SCREENING REPORT

MCM#3: ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

MAY 7, 2020

PREPARED FOR:

**LANGHORNE MANOR BOROUGH
618 HULMEVILLE AVENUE
LANGHORNE, PA 19047**

PREPARED BY:

**CARROLL ENGINEERING CORPORATION
949 EASTON ROAD
WARRINGTON, PA 18976**

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I. OUTFALL & OBSERVATION POINT DESCRIPTIONS

OUTFALL & OBSERVATION POINT DESCRIPTIONS

Presented below is a discussion of each of the Borough's Outfalls and Observation Points which utilize the numbering convention shown on a map titled the "Langhorne Manor Borough Pollution Reduction & TMDL Plans Parsed Area Map", prepared by Pickering Corts & Summerson Consulting Engineers & Land Surveyors, dated November 2018.

I. OUTFALLS

Outfall 1:

This outfall is located west of Hulmeville Avenue (SR 2047) on private property and is monitored through the inspection of the following Observation Points

- **Observation Point 1 (Formerly Outfall 5)**

This observation point is a 44x27-inch diameter corrugated metal storm pipe crossing Hulmeville Avenue which discharges to a swale that is ultimately tributary to Outfall 1. The storm pipe was partially submerged at the outlet due to some scouring.

- **Observation Point 2 (Formerly Outfall 4)**

This observation point is an 18-inch diameter corrugated metal storm pipe crossing Hulmeville Avenue which discharges to a swale that is ultimately tributary to Outfall 1.

- **Observation Point 14 (Formerly Outfall 3)**

This observation point is a 36x24-inch diameter corrugated metal storm pipe crossing Hulmeville Avenue which discharges to a swale that is ultimately tributary to Outfall 1. The storm pipe was partially submerged at the outlet due to some scouring and the receiving swale being clogged with vegetation and debris.

Outfall 2 (Formerly Outfall 7):

This outfall is an earthen swale on the southern side of Gillam Avenue directly to the east of an existing 30-inch diameter reinforced concrete storm pipe which conveys the Unnamed Tributary to Neshaminy Creek across Gilliam Avenue. The parabolic swale is approximately 7-feet wide and 24-inches deep.

Outfall 3 (Formerly Outfall 9):

This outfall is located on the northern side of Highland Avenue and west of West Interchange at the bottom of a steep embankment where an earthen swale meets the Unnamed Tributary to Neshaminy Creek at the approximate location of an existing 8x5-feet concrete culvert which conveys the aforementioned creek across Highland Avenue. The trapezoidal swale was observed to have minimal flow during dry weather which is expected due to the relative size of the swale (8-feet wide and 16-inches deep) and is located in an area known to have springs as is evidenced by the adjacent Langhorne Spring Water Company property.

Outfall 4:

This outfall is located west of the intersection of Hulmeville Avenue (SR2047) and Fairview Avenue on private property and is monitored through the inspection of the following Observation Point.

- **Observation Point 7 (Formerly Outfall 10 & 11)**

This observation point is an earthen swale which is ultimately tributary to Outfall 4 and is located downstream of two (2) 18-inch diameter steel storm pipes crossing Hulmeville Avenue. Flow was observed during dry weather at this location which was attributed to a known water main break in Hulmeville Avenue which was awaiting a Highway Occupancy Permit to complete the emergency repair. As such, this outfall shall be monitored in year-2 of the permit period to adequately observe dry weather conditions.

Outfall 5 (Formerly Outfall 21):

This outfall is located on the southern side of Manor Avenue at the southern entrance drive of Cairn University. It is a 15-inch diameter stormwater pipe which discharges flow from a series of stormwater inlets (48 & 49) on Manor Avenue to the Unnamed Tributary to Mill Creek. This outfall was partially submerged due the depth of flow in the creek. The upstream inlet 49 was observed to have no flow.

Outfall 6 (Formerly Outfall 2):

The outfall is located on the northern side of Gilliam Avenue west of Hulmeville Avenue (SR 2047) on private property and is monitored through the inspection of the following Observation Point.

- **Observation Point 3 (Formerly Outfall 2)**

This observation point is an 18-inch diameter reinforced concrete storm pipe crossing Hulmeville Avenue which discharges to a swale that is ultimately tributary to Outfall 6.

Outfall 7:

This outfall is an earthen swale/wide depression located on the southern side of Gillam Avenue east of an existing 36-inch diameter reinforced concrete pipe which conveys the Unnamed Tributary to the Neshaminy Creek across Gilliam Avenue. The parabolic swale/depression is approximately 6-feet wide and relatively shallow at about 3-inches deep.

Outfall 8:

This outfall is located on the western side of the West Interchange on private property and is monitored through the inspection of the following Observation Point.

- **Observation Point 4**

This observation point of an 18-inch diameter reinforced concrete storm pipe crossing Hulmeville Avenue which discharges to a swale that is ultimately tributary to Outfall 8. A fallen tree was observed just downstream of this outfall which may impede flow.

Outfall 9:

This outfall is located on the western side of the West Interchange on private property and is monitored through the inspection of the following Observation Point.

- **Observation Point 5**

This observation point is an 18-inch diameter reinforced concrete pipe which discharges to a swale that is ultimately tributary to Outfall 9. The storm pipe was partially submerged at the outlet due to some scouring.

Outfall 10:

This outfall is an earthen swale located on the southern side of Highland Avenue at the approximate location of an 8x5-foot concrete culvert which conveys the Unnamed Tributary of the Neshaminy Creek across Highland Avenue. The parabolic swale is approximately 4.5-feet wide and 4-inches deep.

Outfall 11:

This outfall is a roadside earthen swale located on the northern side of Manor avenue at the Cairn University's southern entrance drive which meets the Unnamed Tributary to Mill Creek. This parabolic swale is approximately 30-inches wide and 12-inches deep.

Outfall 12:

This outfall is a roadside earthen swale/depression located on the northern side of Manor avenue at the Cairn University's southern entrance drive which meets the Unnamed Tributary to Mill Creek. This parabolic swale/depression is approximately 12-feet wide and 6-inches deep.

II. ADDITIONAL OBSERVATION POINTS

Additional Observation Points are included in the Borough's outfall monitoring program. Although they are not associated with an outfall located within Langhorne Manor Borough, they represent a point at which concentrated stormwater flow leaves the Borough where illicit discharges should be monitored. The following is a discussion of these observation points.

Observation Point 6:

This observation point is located on the northern side of U.S. Route 1 west of the West Interchange. The area here sheet flows into the Unnamed Tributary to the Neshaminy Creek which is not associated with a designated outfall in the Borough. No channelization was observed at this location.

Observation Point No. 8 (Formerly Outfall 12):

This observation point is located at the southwestern corner of the intersection of Hulmeville Avenue and Comly Avenue. There are two (2) existing 24-inch diameter corrugated metal storm pipes crossing Comly Avenue which direct flow to a common rock lined swale draining to Penndel Borough. These storm pipes are proposed to be replaced as part of the PADOT's project to replace Hulmeville Avenue bridge over the CSX/SEPTA railway (DOT#589 956 P, PUC Docket No. A-2016-2544173, MPMS No. 13606). The rock lined swale is approximately 5-feet wide and 8-inches deep.

Observation Point No. 9 (Formerly Outfall 13):

This observation point is an 18-inch diameter HDPE storm pipe crossing Comly Avenue located directly south of the Hill Avenue and Comly Avenue tee-intersection and directs flow through a swale to downstream areas in Penndel Borough.

Observation Point No. 10 (Formerly Outfall 14):

This observation point is an 18-inch diameter HDPE storm pipe crossing Comly Avenue located on the southern side of Comly Avenue, west of its intersection with North Avenue, and directs flow through a swale to downstream areas in Penndel Borough. The concrete endwall has broken and fallen into the downstream swale which may impede flow. Photographs from previous outfall monitoring indicated the presence of a crack developing and was shown to be broken at the time of the March 2017 outfall monitoring program. It appears that this endwall may have been cast-in-place without steel reinforcement.

Observation Point No. 11 & 12 (Formerly Outfall 15 & 16):

These observation points are located directly south of the Station Avenue and Comly Avenue tee-intersection. Observation Point 11 is an 18-inch diameter steel storm pipe from Comly Avenue and Observation Point 12 is a 12-inch diameter steel storm pipe from the east. These storm pipes share a common endwall and direct flow via a common swale to downstream areas in Penndel Borough.

Observation Point 13 (Inlet 74):

This observation point is located southeast of the intersection of Comly Avenue and Bellevue Avenue. It is a stormwater inlet (74) that discharges to a downstream stormwater network in Penndel Borough via a 12-inch reinforced concrete storm pipe.

Observation Point 15:

This observation point is an earthen roadside swale located on the northern side of Gilliam Avenue and east of an existing 36-inch diameter reinforced concrete pipe which conveys the Unnamed Tributary to the Neshaminy Creek across Gilliam Avenue.

II. MS4 OUTFALL SCREENING REPORTS & PICTURES



MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-6-20	Outfall ID No.: 002
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: <u>40° 10' 08.5"</u>
	Longitude: <u>-74° 55' 30.4"</u>
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input checked="" type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: 24 in Top Width: 84 in Bottom Width: 60	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p> <hr/> <p>Responsible Official Name</p> <p>215-343-5700 x265</p> <hr/> <p>Telephone No.</p>	<p style="text-align: center;"><i>Christopher A. Peterson</i></p> <hr/> <p style="text-align: center;">Signature</p> <p style="text-align: center;">5-7-20</p> <hr/> <p style="text-align: center;">Date</p>

Outfall 2





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-6-20	Outfall ID No.: 003
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: <u>40° 09' 54.7"</u>
	Longitude: <u>-74° 55' 30.2"</u>
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: 16 in Top Width: 96 in Bottom Width: 96	

Dry Weather Flow Present at Outfall During Inspection? ☒ Yes ☐ No (If No, skip to Certification Section)

Description of Flow Rate: ☒ Trickle ☐ Moderate ☐ Significant ☐ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☒ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☒ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☒ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☒ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson	<i>Christopher A. Peterson</i>
Responsible Official Name	Signature
215-343-5700 x265	5-7-20
Telephone No.	Date

Outfall 3





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-6-20	Outfall ID No.: 005
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 09' 46.9"
	Longitude: -74° 54' 36.5"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input checked="" type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 15 in	<input checked="" type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

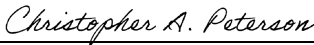
Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson <hr/> Responsible Official Name 215-343-5700 x265 <hr/> Telephone No.	<div style="text-align: center;">  <hr/> Signature 5-7-2020 <hr/> Date </div>

Outfall 5





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-1-20	Outfall ID No.: 007
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 10' 7.4"
	Longitude: -74° 55' 32.9"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input checked="" type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: 3 in Top Width: 72 in Bottom Width: 60	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p>	<p><i>Christopher A. Peterson</i></p>
<p>Responsible Official Name</p>	<p>Signature</p>
<p>215-343-5700 x265</p>	<p>5-7-2020</p>
<p>Telephone No.</p>	<p>Date</p>

Outfall 7





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-6-20	Outfall ID No.: 010
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 9' 53.8"
	Longitude: -74° 55' 30.2"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input checked="" type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: 4 in Top Width: 54 in Bottom Width: 48	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson	<i>Christopher A. Peterson</i>
Responsible Official Name	Signature
215-343-5700 x 265	5-7-2020
Telephone No.	Date

Outfall 10





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: 011
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input checked="" type="checkbox"/> Other: Cairn University	Latitude: 40° 9' 48.132"
	Longitude: -74° 54' 32.922"
	Dry Weather Inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input checked="" type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: 6 in Top Width: 30 in Bottom Width: 12	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p>	<p><i>Christopher A. Peterson</i></p>
<p>Responsible Official Name</p>	<p>Signature</p>
<p>215-343-5700 x265</p>	<p>5-7-2020</p>
<p>Telephone No.</p>	<p>Date</p>

Outfall 11





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-6-20	Outfall ID No.: 012
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input checked="" type="checkbox"/> Other: Cairn University	Latitude: <u>40° 9' 48.132"</u>
	Longitude: <u>-74° 54' 32.922"</u>
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input checked="" type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: <u>6</u> in Top Width: <u>144</u> in Bottom Width: <u>120 in</u>	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p>	<p><i>Christopher A. Peterson</i></p>
<p>Responsible Official Name</p>	<p>Signature</p>
<p>215-343-5700 x265</p>	<p>5-7-2020</p>
<p>Telephone No.</p>	<p>Date</p>

Outfall 12





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 001
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 10' 13.9"
	Longitude: -74° 55' 25.2"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input checked="" type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input checked="" type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 44x27 in	<input checked="" type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p>	<p><i>Christopher A. Peterson</i></p>
<p>Responsible Official Name</p>	<p>Signature</p>
<p>215-343-5700 x265</p>	<p>5-7-2020</p>
<p>Telephone No.</p>	<p>Date</p>

Observation Point 1





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 002
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 10' 13.9" Longitude: -74° 55' 25.2" Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Date of Previous Precipitation: 3-7-20 Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input checked="" type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 18 in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

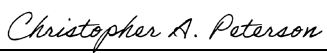
Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson <hr/> Responsible Official Name 215-343-5700 x265 <hr/> Telephone No.	<div style="text-align: center;">  <hr/> Signature 5-7-2020 <hr/> Date </div>

Observation Point 2





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 003
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 10' 10.75"
	Longitude: -74° 55' 24.4"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input checked="" type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 18 in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p>	<p><i>Christopher A. Peterson</i></p>
<p>Responsible Official Name</p>	<p>Signature</p>
<p>215-343-5700 x265</p>	<p>5-7-2020</p>
<p>Telephone No.</p>	<p>Date</p>

Observation Point 3





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 004
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 10' 06.5"
	Longitude: -74° 55' 26.9"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input checked="" type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 18 in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p>	<p><i>Christopher A. Peterson</i></p>
<p>Responsible Official Name</p>	<p>Signature</p>
<p>215-343-5700 x265</p>	<p>5-7-2020</p>
<p>Telephone No.</p>	<p>Date</p>

Observation Point 4





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 005
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 10' 02.7"
	Longitude: -74° 55' 26.6"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s):	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input checked="" type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 18 in	<input checked="" type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p>	<p><i>Christopher A. Peterson</i></p>
<p>Responsible Official Name</p>	<p>Signature</p>
<p>215-343-5700 x265</p>	<p>5-7-2020</p>
<p>Telephone No.</p>	<p>Date</p>

Observation Point 5





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-6-20	Outfall ID No.: Observation Point 006
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 09' 59.3"
	Longitude: -74° 55' 30.6"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input checked="" type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: <u>n/a (sheet flow area, no channels observed)</u>	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLCIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p> <hr/> <p>Responsible Official Name</p> <p>215-343-5700 x265</p> <hr/> <p>Telephone No.</p>	<p style="text-align: center;"><i>Christopher A. Peterson</i></p> <hr/> <p>Signature</p> <p style="text-align: center;">5-7-2020</p> <hr/> <p>Date</p>

Observation Point 6 (Sheet flow area, no channelization observed)





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 007
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: <u>40° 09' 51.2"</u>
	Longitude: <u>-74° 55' 14.4"</u>
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☒ Yes ☐ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☒ Moderate ☐ Significant ☐ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☒ No If Yes, provide a description below.

The dry weather flow is attributed to a known water main break in Hulmeville Avenue which was awaiting an HOP permit for an emergency repair. As such, the flow aboserved was potable and did not have a color or odor.

Does the dry weather flow contain an odor? ☐ Yes ☒ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☒ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☒ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL 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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).	
Christopher Peterson	<i>Christopher A. Peterson</i>
Responsible Official Name	Signature
215-343-5700 x265	5-7-2020
Telephone No.	Date

Reserved for follow up Monitoring Report for Observation Point 7 in Year-2

(Dry weather flow was observed during the time of inspection due to an adjacent water main break in Hulmeville Avenue which was not stormwater related (potable water). As such, future monitoring of this observation point shall be conducted in Year-2 of the permit period to adequately observe dry-weather conditions.)

Observation Point 7 (Flow attributed to adjacent water main break on Hulmeville Avenue which was awaiting an HOP permit for the emergency repair. Potable water)





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 008
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: <u>40° 09' 34.8"</u>
	Longitude: <u>-74° 55' 03.6"</u>
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input checked="" type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: <u>8</u> in Top Width: <u>60</u> in Bottom Width: <u>48</u>	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
<p>Christopher Peterson</p> <hr/> <p>Responsible Official Name</p> <hr/> <p>215-343-5700 x265</p> <hr/> <p>Telephone No.</p>	<p><i>Christopher A. Peterson</i></p> <hr/> <p>Signature</p> <hr/> <p>5-7-2020</p> <hr/> <p>Date</p>

Observation Point 8 (facing North)



Observation Point 8 (Facing South)





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 009
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 9' 36.9"
	Longitude: -74° 54' 56.9"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input checked="" type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 18 in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson	<i>Christopher A. Peterson</i>
Responsible Official Name	Signature
215-343-5700 x265	5-7-2020
Telephone No.	Date

Observation Point 9





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 010
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 09' 38.6"
	Longitude: -74° 54' 51.8"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input checked="" type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 18 in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson	<i>Christopher A. Peterson</i>
Responsible Official Name	Signature
215-343-5700 x265	5-7-2020
Telephone No.	Date

Observation Point 10





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 011
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 09' 39.4"
	Longitude: -74° 54' 49.9"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 18 in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

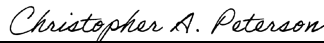
Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson <hr/> Responsible Official Name 215-343-5700 x265 <hr/> Telephone No.	<div style="text-align: center;">  <hr/> Signature 5-7-2020 <hr/> Date </div>

Observation Point 11 & 12 (left and right respectively)





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 012
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input checked="" type="checkbox"/> Other: RR Station Lot	Latitude: 40° 09' 37.9"
	Longitude: -74° 54' 49.6"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 12 in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

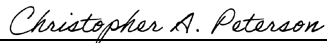
Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson <hr/> Responsible Official Name 215-343-5700 x265 <hr/> Telephone No.	<div style="text-align: center;">  <hr/> Signature 5-7-2020 <hr/> Date </div>

Observation Point 11 & 12 (left and right respectively)





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-6-20	Outfall ID No.: Observation Point 013
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input checked="" type="checkbox"/> Other: Roadway	Latitude: 40° 09' 39.8"
	Longitude: -74° 54' 44.7"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input checked="" type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 12 in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

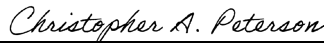
Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson <hr/> Responsible Official Name 215-343-5700 x265 <hr/> Telephone No.	<div style="text-align: center;">  <hr/> Signature 5-7-2020 <hr/> Date </div>

Observation Point 13 (Picture taken through inlet grate, standing water in inlet bottom
no flow observed at discharge)





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 3-10-20	Outfall ID No.: Observation Point 014
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 10' 15.8"
	Longitude: -74° 55' 26.2"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 3-7-20
	Amount of Previous Precipitation: 0.17 in
Inspector Name(s): Jessica Serpe	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input checked="" type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input checked="" type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input checked="" type="checkbox"/> Single <input checked="" type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: 44x27 in	<input checked="" type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: _____ in Top Width: _____ in Bottom Width: _____	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

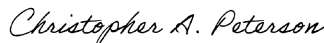
Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson <hr/> Responsible Official Name 215-343-5700 x265 <hr/> Telephone No.	<div style="text-align: center;">  <hr/> Signature 5-7-2020 <hr/> Date </div>

Observation Point 14 (Outlet partially submerged with standing water/not flowing)





MS4 OUTFALL FIELD SCREENING REPORT

BACKGROUND INFORMATION

Permittee Name: Langhorne Manor Borough	NPDES Permit No.: PAI130076
Date of Inspection: 5-6-20	Outfall ID No.: Observation Point 015
Land Uses in Outfall Drainage Area (Select All): <input type="checkbox"/> Industrial <input type="checkbox"/> Urban Residential <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Suburban Residential <input type="checkbox"/> Open Space <input type="checkbox"/> Other:	Latitude: 40° 10' 7.4"
	Longitude: -74° 55' 32.9"
	Dry Weather Inspection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Date of Previous Precipitation: 5-1-20
	Amount of Previous Precipitation: 1.05 in
Inspector Name(s): Christopher Peterson	Were Photographs Taken? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Are Photographs Attached? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

OUTFALL DESCRIPTION

TYPE	MATERIAL	SHAPE	DIMENSIONS	SUBMERGED
<input type="checkbox"/> Closed Pipe	<input type="checkbox"/> RCP <input type="checkbox"/> CMP <input type="checkbox"/> PVC <input type="checkbox"/> HDPE <input type="checkbox"/> Steel <input type="checkbox"/> Other	<input type="checkbox"/> Circular <input type="checkbox"/> Single <input type="checkbox"/> Elliptical <input type="checkbox"/> Double <input type="checkbox"/> Box <input type="checkbox"/> Triple <input type="checkbox"/> Other <input type="checkbox"/> Other	Diameter: _____ in	<input type="checkbox"/> In Water <input type="checkbox"/> With Sediment
<input checked="" type="checkbox"/> Open Channel	<input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Earthen <input type="checkbox"/> Rip-Rap <input type="checkbox"/> Other	<input type="checkbox"/> Trapezoid <input checked="" type="checkbox"/> Parabolic <input type="checkbox"/> Other	Depth: 6 in Top Width: 24 in Bottom Width: 36 in	

Dry Weather Flow Present at Outfall During Inspection? ☐ Yes ☒ No (If No, skip to Certification Section)

Description of Flow Rate: ☐ Trickle ☐ Moderate ☐ Significant ☒ N/A

DRY WEATHER FLOW EVALUATION

Does the dry weather flow contain color? ☐ Yes ☐ No If Yes, provide a description below.

Does the dry weather flow contain an odor? ☐ Yes ☐ No If Yes, provide a description below.

Is there an observed change in the receiving waters as a result of the discharge? ☐ Yes ☐ No
If Yes, provide a description below.

Does the dry weather flow contain floating solids, scum, sheen or substances that result in deposits? ☐ Yes ☐ No
If Yes, provide a description below.

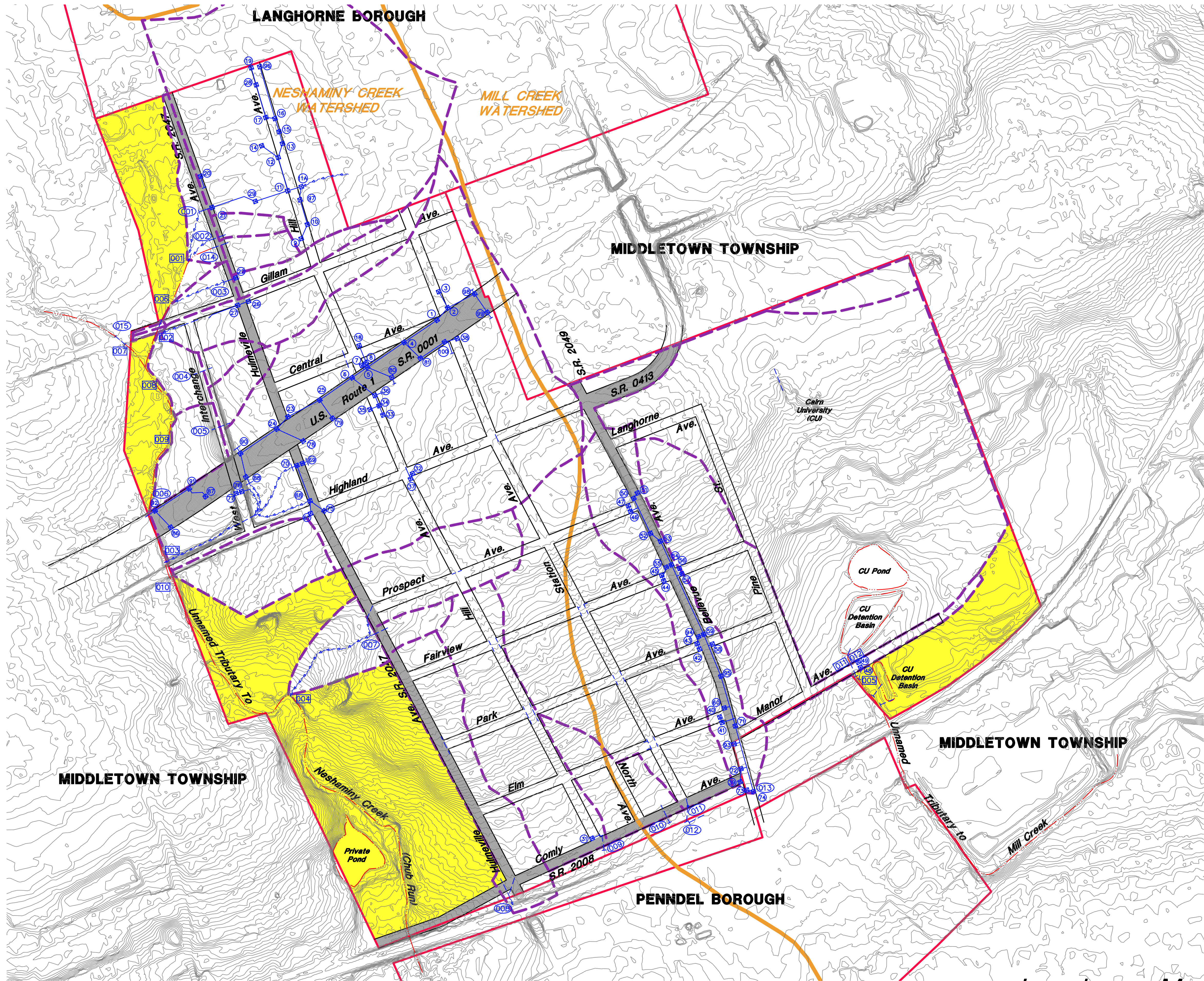
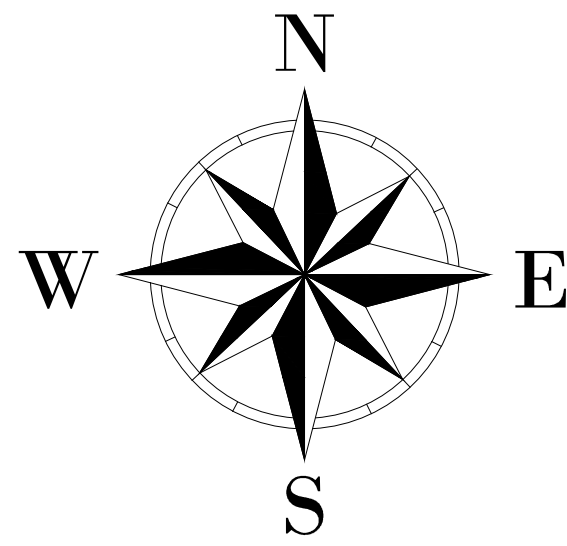
Were sample(s) collected of the dry weather flow? <input type="checkbox"/> Yes <input type="checkbox"/> No (If Yes, No. Samples: _____)					
FIELD / LABORATORY ANALYSIS					
PARAMETER	RESULTS	UNITS	PARAMETER	RESULTS	UNITS
Flow Rate		GPM	Fecal Coliform		No./100 mL
pH		S.U.	COD		mg/L
Total Residual Chlorine (TRC)		mg/L	BOD5		mg/L
Conductivity		µmhos/cm	TSS		mg/L
Ammonia-Nitrogen		mg/L	TDS		mg/L
Other: _____			Oil and Grease		mg/L
Other: _____			Other: _____		
Indicate the parameters above that were analyzed by a DEP-certified laboratory:					
ILLICIT DISCHARGES					
Is the dry weather flow an illicit discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If Yes, describe efforts made to determine the source(s) of the illicit discharge.					
Describe corrective actions taken by the permittee in response to the finding of an illicit discharge.					
Inspector Comments:					

RESPONSIBLE OFFICIAL CERTIFICATION	
<p>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. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).</p>	
Christopher Peterson <hr/> Responsible Official Name 215-343-5700 x265 <hr/> Telephone No.	<div style="text-align: center;"> <i>Christopher A. Peterson</i> <hr/> Signature 5-7-2020 <hr/> Date </div>

Observation Point 15



III. LANGHORNE MANOR BOROUGH POLLUTION REDUCTION & TMDL PLANS PARSED AREA MAP



NOTES:
1. THIS FIGURE IS DESIGNED TO BE USED IN CONJUNCTION WITH THE NPDES MS4 PLAN FOR LANGHORNE MANOR BOROUGH.
2. ACCURACY OF THE COVERAGES IS LIMITED TO THE ACCURACY OF THE ORIGINAL DATA.
SOURCE:
1. STREAM SHAPEFILES WERE OBTAINED FROM PASDA.
2. STREET SHAPEFILES WERE MIGRATED FROM EXISTING CAD DRAWINGS BY PCS.
3. DRAINAGE DITCH, PIPING AND STORM SEWER FILES WERE DIGITIZED FROM PAPER MAPS AND FIELD VERIFIED BY PCS.

- LEGEND**
- STREAM/WATERCOURSE
 - STORM SEWER INLET
 - STORM SEWER INLET NUMBER
 - LMB MS4 OUTFALL NUMBER
 - OBSERVATION POINT LMB MS4 NUMBER
 - STORM SEWER CULVERT
 - STORM SEWER PIPE
 - SWALE/OPEN CHANNEL
 - Borough Boundary / Urbanized Area
 - Borough Street
 - PennDOT Road
 - Watershed Drainage Boundary
 - Storm Sewershed Boundary

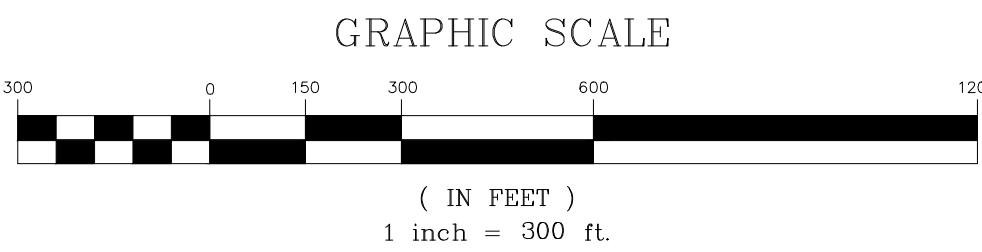
- PARSED AREA LEGEND**
- PENNDOT ROAD
 - AREAS DIRECT TO STREAM

TOTAL BOROUGH AREA (PER DEP)	384.9 ACRES
NESHAMINY CREEK WATERSHED AREA	262.3 ACRES
PENNDOT ROADS	18.3 ACRES
AREA DIRECT TO STREAMS	55.0 ACRES
PROPOSED NESHAMINY CREEK PLANNING AREA	189.0 ACRES
MILL CREEK WATERSHED AREA	122.6 ACRES
PENNDOT ROADS	4.7 ACRES
AREA DIRECT TO STREAMS	10.5 ACRES
PROPOSED MILL CREEK PLANNING AREA	107.4 ACRES

Prepared By:

PCS **Pickering**
Corts & Summerson
Consulting Engineers & Land Surveyors

Newtown, PA Phillipsburg, NJ
642 Newtown-Yardley Road
Suite 300
Newtown, Pennsylvania 18940
tel: (215) 968-8300 fax: (215) 968-3849
www.pcs-csl.com



Langhorne Manor Borough Pollution Reduction & TMDL Plans Parsed Area Map

Langhorne Manor Borough, Bucks County, Pennsylvania
November 2018

Revision	Description

C:\Langhorne Manor Borough\GIS\2016 Update\Drawing Set\Outfall Map_2017.dwg 11/20/2018 10:15:05 AM neshwartz, T, Survey Div.

**V. MCM #4 - CONSTRUCTION STORMWATER RUNOFF CONTROL
MCM #5 POST-CONSTRUCTION STORMWATER
MANAGEMENT IN NEW DEVELOPMENT
AND REDEVELOPMENT**

1. Langhorne Manor Borough Stormwater Management Ordinance

**LANGHORNE MANOR BOROUGH
ACT 167
STORMWATER MANAGEMENT
ORDINANCE**

**Implementing the requirements of the
*Neshaminy Creek and Delaware River South Watersheds
Act 167 Stormwater Management Plan***

ORDINANCE NO. 2015-002

**LANGHORNE MANOR BOROUGH, BUCKS COUNTY,
PENNSYLVANIA**

**Adopted at a Public Meeting Held on
September 1, 2015**

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ARTICLE I. GENERAL PROVISIONS

Section 101. Short Title

This Ordinance shall be known and may be cited as the “Langhorne Manor Borough Act 167 Stormwater Management Ordinance”.

Section 102. Statement of Findings

The Governing Body of the Municipality finds that:

- A. Inadequate management of accelerated stormwater runoff resulting from development and redevelopment throughout a watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtakes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities to convey and manage stormwater, undermines floodplain management and flood reduction efforts in upstream and downstream communities, reduces groundwater recharge, and threatens public health and safety.
- B. Inadequate planning and management of stormwater runoff resulting from land development and redevelopment throughout a watershed can also harm surface water resources by changing the natural hydrologic patterns, accelerating stream flows (which increase scour and erosion of streambeds and streambanks, thereby elevating sedimentation), destroying aquatic habitat, and elevating aquatic pollutant concentrations and loadings such as sediments, nutrients, heavy metals, and pathogens.
- C. A comprehensive program of stormwater management (SWM), including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the public health, safety, welfare, and the protection of the people of the municipality and all the people of the Commonwealth, their resources, and the environment.
- D. Stormwater is an important water resource by providing groundwater recharge for water supplies and base flow of streams, which also protects and maintains surface water quality.
- E. Public education on the control of pollution from stormwater is an essential component in successfully addressing stormwater.
- F. Federal and state regulations require certain municipalities to implement a program of stormwater controls. These municipalities are required to obtain a permit for stormwater discharges from their separate storm sewer systems under the National Pollutant Discharge Elimination System (NPDES).

Section 103. Purpose

The purpose of this Ordinance is to promote the public health, safety, and welfare within Langhorne Manor Borough by maintaining the natural hydrologic regime and by minimizing the harms and maximizing the benefits described in Section 102 of this Ordinance, through provisions designed to:

- A. Meet legal water quality requirements under state law, including regulations at 25 Pa. Code 93 to protect, maintain, reclaim, and restore the existing and designated uses of the waters of this Commonwealth.
- B. Minimize increases in stormwater volume and control peak flows.
- C. Minimize impervious surfaces.
- D. Provide review procedures and performance standards for stormwater planning and management.
- E. Preserve the natural drainage systems as much as possible.
- F. Manage stormwater impacts close to the runoff source, requiring a minimum of structures and relying on natural processes.
- G. Focus on infiltration of stormwater to maintain groundwater recharge, to prevent degradation of surface and groundwater quality, and to otherwise protect water resources.
- H. Preserve and restore the flood-carrying capacity of streams.
- I. Prevent scour and erosion of streambanks and stream beds.
- J. Provide standards to meet National Pollution Discharge Elimination System (NPDES) permit requirements.
- K. Address certain requirements of the Municipal Separate Stormwater Sewer System (MS4) NPDES Phase II Stormwater Regulations.
- L. Provide for proper operation and maintenance of all stormwater management facilities and Best Management Practices (BMPs) that are implemented in the Municipality.

Section 104. Statutory Authority

The Municipality is empowered to regulate land use activities that affect runoff, surface, and groundwater quality and quantity by the authority of:

- A. Pennsylvania Municipalities Planning Code, Act 247, as amended.

- B. Borough Code, Act of February 1, 1966 (1965 P.L. 1656, Mo. 581), as amended - 53 P.S. § 45101, as amended.

Section 105. Applicability/Regulated Activities

All Regulated Activities and all activities that may affect stormwater runoff, including Land Development and Earth Disturbance Activity, are subject to regulation by this Ordinance.

Regulated activities include, but are not limited to;

1. Land development,
2. Subdivisions,
3. Prohibited or polluted discharges,
4. Alteration of the natural hydrologic regime,
5. Construction or reconstruction of, or addition of new impervious or semi-pervious surfaces (i.e., driveways, parking lots, roads, etc.), except for reconstruction of roads where there is no increase in impervious surface,
6. Construction of new buildings or additions to existing buildings,
7. Redevelopment,
8. Diversion piping or encroachments in any natural or man-made channel, and
9. Nonstructural and structural stormwater management Best Management Practices (BMPs) or appurtenances thereto.

Section 106. Exemptions – Neshaminy Creek Watershed

- A. Regulated Activities that create impervious surfaces smaller than or equal to 1,000 square feet are exempt from the peak rate control requirements and the SWM Site Plan preparation located in Section IV of this Ordinance unless the activity is found to be a significant contributor of pollution to the waters of this Commonwealth.
- B. Regulated Activities that create impervious surfaces between 1,001 square feet up to and including 5,000 square feet are exempt only from the peak rate control requirements of this Ordinance.
- C. Regulated Activities as part of a residential project that create impervious surfaces between 1,001 square feet up to and including 5,000 square feet, and less than 1 acre of earth disturbance, are exempt from the peak rate control requirements and the SWM Site Plan preparation located in Section IV of this Ordinance provided a Small Project Stormwater Management Site Plan, prepared in accordance with Appendix I, is submitted to and approved by the Municipality.

Table 106.1 Impervious Surface Exemption Thresholds for the Neshaminy Creek Watershed

Ordinance Article or Section	Type of Project	Proposed Impervious Surface		
		0 – 1,000 sq. ft.	1,001 – 5000 sq. ft.	5,000 + sq. ft.
Article IV SWM Site Plan Requirements	Development	Exempt	Not Exempt, except for small residential projects satisfying Appendix I	Not Exempt
Section 303 Volume Control Requirements	Development	Not Exempt	Not Exempt	Not Exempt
Section 304 Peak Rate Control Requirements	Development	Exempt	Exempt	Not Exempt
Erosion and Sediment Pollution Control Requirements	Must comply with Title 25, Chapter 102 of the PA Code and any other applicable state, county, and municipal codes. PADEP requires an engineered post-construction SWM Plan with projects proposing earth disturbance greater than 1 acre.			

- D. Agricultural activity is exempt from the peak rate control requirements and SWM Site Plan preparation requirements of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code 102.
- E. Forest management and timber operations are exempt from the peak rate control requirements and SWM Site Plan preparation requirements of this Ordinance provided the activities are performed according to the requirements of 25 Pa. Code 102.
- F. Any aspect of BMP maintenance to an existing SWM system made in accordance with plans and specifications approved by Langhorne Manor Borough is exempt.
- G. The use of land for gardening for home consumption is exempt from the requirements of this ordinance.
- H. Exemptions from any provisions of this Ordinance shall not relieve the applicant from the requirements in Section 301.D through L.
- I. Additional Exemption Criteria:
 - 1. Exemption Responsibilities – An exemption shall not relieve the Applicant from implementing such measures as are necessary to protect public health, safety, and property.
 - 2. Drainage Problems – Where drainage problems are documented or known to exist downstream of or is expected from the proposed activity, the Municipality may deny exemptions.
 - 3. Exemptions are limited to specific portions of this Ordinance.

4. HQ and EV Streams – The municipality may deny exemptions in high quality (HQ) or exceptional value (EV) waters and Source Water Protection Areas (SWPA).

Section 107. Exemptions – Delaware River South Watershed

Any regulated activity that meets the exception criteria in the following table is exempt from the provisions of this section of the ordinance. This criterion shall apply to the total development even if development is to take place in phases. The date of the municipal ordinance adoption (March 1, 2005) shall be the starting point from which to consider tracts as “parent tracts” in which future subdivisions and respective impervious area computations shall be cumulatively considered. An exemption shall not relieve the applicant from implementing such measures as are necessary to protect health, safety, and property. This exemption shall not relieve the applicant from meeting the special requirements for watersheds drainage to high quality (HQ) or exceptional value (EV) waters and requirements for groundwater recharge (Section 308), water quality (Section 307) and streambank erosion (Section 309).

Stormwater Management Exemption Criteria

Total Parcel Size	Impervious Area Exemption (sq. ft.)
≤ 1/4 acre	1,200 sq. ft.
>1/4 to 1 acre	2,500 sq. ft.
>1 acre	5,000 sq. ft.

Exemptions shall be at the discretion of the municipality upon review of site conditions, topography, soils, and other factors as deemed appropriate.

Section 108. Repealer

Any other Ordinance or Ordinance provision of the Municipality inconsistent with any of the provisions of this Ordinance is hereby repealed to the extent of the inconsistency only.

Section 109. Severability

Should any section or provision of this Ordinance be declared invalid by a court of competent jurisdiction, such decision shall not affect the validity of any of the remaining provisions of this Ordinance.

Section 110. Compatibility with Other Ordinance or Legal Requirements

Approvals issued pursuant to this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance.

ARTICLE II. DEFINITIONS

Section 201. Interpretation

For the purposes of this Ordinance, certain terms and words used herein shall be interpreted as follows:

- A. Words used in the present tense include the future tense; the singular number includes the plural, and the plural number includes the singular; words of masculine gender include feminine gender; and words of feminine gender include masculine gender.
- B. The word “includes” or “including” shall not limit the term to the specific example, but is intended to extend its meaning to all other instances of like kind and character.
- C. The word “person” includes an individual, firm, association, organization, partnership, trust, company, corporation, unit of government, or any other similar entity.
- D. The words “shall” and “must” are mandatory; the words “may” and “should” are permissive.
- E. The words “used” or “occupied” include the words “intended, designed, maintained, or arranged to be used, occupied or maintained.”

Section 202. Definitions

Accelerated Erosion – The removal of the surface of the land through the combined action of man’s activity and the natural processes of a rate greater than would occur because of the natural process alone.

Agricultural Activity – Activities associated with agriculture such as agricultural cultivation, agricultural operation, and animal heavy use areas. This includes the work of producing crops including tillage, land clearing, plowing, disking, harrowing, planting, harvesting crops or pasturing and raising of livestock and installation of conservation measures. Construction of new buildings or impervious area is not considered an agricultural activity.

Alteration – As applied to land, a change in topography as a result of the moving of soil and rock from one location or position to another; also the changing of surface conditions by causing the surface to be more or less impervious as the result of changing the land cover including the water, vegetation and bare soil.

Applicant – A person who has filed an application for approval to engage in any Regulated Activity defined in Section 105 of this Ordinance.

As-built Drawings – Engineering or site drawings maintained by the Contractor as he constructs the project and upon which he documents the actual locations of the building components and changes to the original contract documents. These documents, or a copy of same, are turned over to the Qualified Professional at the completion of the project.

Bankfull – The channel at the top-of-bank, or point from where water begins to overflow onto a floodplain.

Base Flow – Portion of stream discharge derived from groundwater; the sustained discharge that does not result from direct runoff or from water diversions, reservoir releases, piped discharges, or other human activities.

Best Management Practices (BMP) – Activities, facilities, designs, measures, or procedures used to manage stormwater impacts from regulated activities, to meet state water quality requirements, to promote groundwater recharge, and to otherwise meet the purposes of this Ordinance. Stormwater BMPs are commonly grouped into one of two broad categories or measures: “structural” or “nonstructural.” In this Ordinance, nonstructural BMPs or measures refer to operational and/or behavior-related practices that attempt to minimize the contact of pollutants with stormwater runoff whereas structural BMPs or measures are those that consist of a physical device or practice that is installed to capture and treat stormwater runoff. Structural BMPs include, but are not limited to, a wide variety of practices and devices, from large-scale retention ponds and constructed wetlands, to small-scale underground treatment systems, infiltration facilities, filter strips, low impact design, bioretention, wet ponds, permeable paving, grassed swales, riparian or forested buffers, sand filters, detention basins, and manufactured devices. Structural stormwater BMPs are permanent appurtenances to the project site.

Bioretention – A stormwater retention area that utilizes woody and herbaceous plants and soils to remove pollutants before infiltration occurs.

Buffer – The area of land immediately adjacent to any stream, measured perpendicular to and horizontally from the top-of-bank on both sides of a stream (see Top-of-bank).

Channel – An open drainage feature through which stormwater flows. Channels include, but shall not be limited to, natural and man-made watercourses, swales, streams, ditches, canals, and pipes that convey continuously or periodically flowing water.

Cistern – An underground reservoir or tank for storing rainwater.

Conservation District – The Bucks County Conservation District.

Culvert – A structure with its appurtenant works, which carries water under or through an embankment or fill.

Curve Number – Value used in the Soil Cover Complex Method. It is a measure of the percentage of precipitation which is expected to run off from the watershed and is a function of the soil, vegetative cover, and tillage method.

Dam – A man-made barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semifluid. A dam may include a refuse bank, fill

or structure for highway, railroad or other purposes which impounds or may impound water or another fluid or semifluid.

Department – The Pennsylvania Department of Environmental Protection (PADEP).

Designee – The agent of Bucks County, Bucks County Conservation District, and/or agent of the Governing Body involved with the administration, review, or enforcement of any provisions of this Ordinance by contract or memorandum of understanding.

Design Professional (Qualified) – A Pennsylvania Registered Professional Engineer, Registered Landscape Architect or Registered Professional Land Surveyor trained to develop stormwater management plans.

Design Storm – The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 5-year storm) and duration (e.g., 24-hours), used in the design and evaluation of stormwater management systems.

Detention Basin – An impoundment designed to collect and retard stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate. Detention basins are designed to drain completely soon after a rainfall event and become dry until the next rainfall event.

Detention Volume - The volume of runoff that is captured and released into the Waters of the Commonwealth at a controlled rate.

Developer – A person that seeks to undertake a land development or subdivision.

Development – Any human-induced change to improved or unimproved real estate, whether public or private, including but not limited to land development, construction, installation, or expansion of a building or other structure, land division, street construction, drilling, and site alteration such as embankments, dredging, grubbing, grading, paving, parking or storage facilities, excavation, filling, stockpiling, or clearing. As used in this ordinance, development encompasses both new development and redevelopment.

Development Site – The specific tract or parcel of land where any regulated activity set forth in Section 105 is planned, conducted or maintained.

Diffused Drainage Discharge – Drainage discharge that is not confined to a single point location or channel, including sheet flow or shallow concentrated flow.

Discharge – 1. (verb) To release water from a project, site, aquifer, drainage basin or other point of interest (verb); 2. (noun) The rate and volume of flow of water such as in a stream, generally expressed in cubic feet per second. See also Peak Discharge.

Discharge Point – The point of discharge for a stormwater facility.

Disconnected Impervious Area (DIA) – An impervious or impermeable surface that is disconnected from any stormwater drainage or conveyance system and is redirected or directed to a pervious area, which allows for infiltration, filtration, and increased time of concentration as specified in Appendix F, Disconnected Impervious Area.

Disturbed Areas – Unstabilized land area where an earth disturbance activity is occurring or has occurred.

Ditch – A man-made waterway constructed for irrigation or stormwater conveyance purposes.

Drainage Conveyance Facility – A stormwater management facility designed to transport stormwater runoff that includes channels, swales, pipes, conduits, culverts, and storm sewers.

Drainage Easement – A right granted by a landowner to a grantee, allowing the use of private land for stormwater management purposes.

Drainage Permit – A permit issued by the municipality after the SWM Site Plan has been approved.

Earth Disturbance Activity – A construction or other human activity that disturbs the surface of land, including, but not limited to, clearing and grubbing, grading, excavations, embankments, land development, agricultural plowing or tilling, timber harvesting activities, road maintenance activities, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock or earth materials.

Emergency Spillway – A conveyance area that is used to pass peak discharge greater than the maximum design storm controlled by the stormwater facility.

Encroachment – A structure or activity that changes, expands or diminishes the course, current or cross section of a watercourse, floodway or body of water.

Existing Resources and Site Analysis Map – A base map which identifies fundamental environmental site information including floodplains, wetlands, topography, vegetative site features, natural areas, prime agricultural land and areas supportive of endangered species.

Erosion – The process by which the surface of the land, including water/stream channels, is worn away by water, wind, or chemical action.

Erosion and Sediment Control Plan – A site-specific plan identifying BMPs to minimize accelerated erosion and sedimentation. For agricultural plowing or tilling activities, the Erosion and Sediment Control Plan is that portion of a conservation plan identifying BMPs to minimize accelerated erosion and sedimentation.

Exceptional Value Waters – Surface waters of high quality which satisfy Pennsylvania Code Title 25 Environmental Protection, Chapter 93, Water Quality Standards, §93.4b(b) (relating to antidegradation).

Existing Conditions – The initial condition of a project site prior to the proposed alteration.

Existing Recharge Area – Undisturbed surface area or depression where stormwater collects and a portion of which infiltrates and replenishes the groundwater.

Flood – A temporary condition of partial or complete inundation of land areas from the overflow of streams, rivers, and other waters of the Commonwealth.

Floodplain – Any land area susceptible to inundation by water from any natural source or as delineated by applicable Department of Housing and Urban Development, Federal Insurance Administration Flood Hazard Boundary Map as being a special flood hazard area.

Floodway – The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Forest Management/Timber Operations – Planning and associated activities necessary for the management of forestland. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, and reforestation.

Freeboard – A vertical distance between the elevation of the design high-water and the top of a dam, levee, tank, basin, swale, or diversion berm. The space is required as a safety margin in a pond or basin.

Governing Body – Council of the Borough of Langhorne Manor, Bucks County, Pennsylvania

Grade – 1. (noun) A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein. 2. (verb) To finish the surface of a roadbed, the top of an embankment, or the bottom of excavation.

Groundwater – Water beneath the earth's surface that supplies wells and springs, and is often between saturated soil and rock.

Groundwater Recharge – The replenishment of existing natural underground water supplies from rain or overland flow.

HEC-HMS – The U.S. Army Corps of Engineers, Hydrologic Engineering Center (HEC) - Hydrologic Modeling System (HMS). This model was used to model the Neshaminy Creek and Delaware River South watersheds during the Act 167 Plan development and was the basis for the Standards and Criteria of this Ordinance.

High Quality Waters – Surface waters having quality which exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water by satisfying

Pennsylvania Code Title 25 Environmental Protection, Chapter 93 Water Quality Standards, § 93.4b(a).

Hot spot – An area where land use or activity generates highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater. Typical pollutant loadings in stormwater may be found in Chapter 8 Section 6 of the *Pennsylvania Stormwater Best Management Practices Manual*, Pennsylvania Department of Environmental Protection (PADEP) no. 363-0300-002 (2006). More information concerning hot spots may be found in Section 306.A of this Ordinance.

Hydrograph – A graph representing the discharge of water versus time for a selected point in the drainage system.

Hydrologic Regime – The hydrologic cycle or balance that sustains quality and quantity of stormwater, baseflow, storage, and groundwater supplies under natural conditions.

Hydrologic Soil Group – A classification of soils by the Natural Resources Conservation Service, formerly the Soil Conservation Service, into four runoff potential groups. The groups range from A soils, which are very permeable and produce little runoff, to D soils, which are not very permeable and produce much more runoff.

Impervious Surface – A surface that prevents the infiltration of water into the ground. Impervious surfaces include, but are not limited to, streets, sidewalks, pavement roofs, or driveway areas. Any surface areas designed to be gravel or crushed stone shall be regarded as impervious surfaces.

Impoundment – A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

Infill development – Development that occurs on smaller parcels that remain undeveloped but are within or very close proximity to urban or densely developed areas. Infill development usually relies on existing infrastructure and does not require an extension of water, sewer or other public utilities.

Infiltration – Movement of surface water into the soil, where it is absorbed by plant roots, evaporated into the atmosphere, or percolated downward to recharge groundwater.

Infiltration Structures – A structure designed to direct runoff into the underground water (e.g., French drains, seepage pits, or seepage trenches).

Initial Abstraction (I_a): The value used to calculate the volume or peak rate of runoff in the soil cover complex method. It represents the depth of rain retained on vegetation plus the depth of rain stored on the soil surface plus the depth of rain infiltrated prior to the start of runoff.

Inlet – The upstream end of any structure through which water may flow.

Intermittent Stream – A stream that flows only part of the time. Flow generally occurs for several weeks or months in response to seasonal precipitation or groundwater discharge.

Karst – A type of topography or landscape characterized by surface depressions, sinkholes, rock pinnacles/uneven bedrock surface, underground drainage, and caves. Karst is formed on carbonate rocks, such as limestone or dolomite.

Land Development – Any of the following activities:

- (i) The improvement of one lot or two or more contiguous lots, tracts, or parcels of land for any purpose involving:
 - a. A group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure, or
 - b. The division or allocation of land or space, whether initially or cumulatively, between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features;
- (ii) A subdivision of land;
- (iii) Development in accordance with Section 503(1.1) of the PA Municipalities Planning Code.

Lot – A designated parcel, tract or area of land established by a plat or otherwise as permitted by law and to be used, developed or built upon as a unit.

Low Impact Development (LID) Practices – Practices that will minimize proposed conditions runoff rates and volumes, which will minimize needs for artificial conveyance and storage facilities.

Main Stem (Main Channel) – Any stream segment or other runoff conveyance used as a reach in the Neshaminy Creek and Delaware River South hydrologic models.

Manning Equation (Manning Formula) – A method for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. “Open channels” may include closed conduits so long as the flow is not under pressure.

Municipal Engineer – A professional engineer licensed as such in the Commonwealth of Pennsylvania, duly appointed as the engineer for a municipality, planning agency or joint planning commission.

Municipality – Langhorne Manor Borough, Bucks County, Pennsylvania.

Natural Hydrologic Regime (see Hydrologic Regime)

Nonpoint Source Pollution – Pollution that enters a water body from diffuse origins in the watershed and does not result from discernible, confined, or discrete conveyances.

Nonstormwater Discharges – Water flowing in stormwater collection facilities, such as pipes or swales, which is not the result of a rainfall event or snowmelt.

NPDES – National Pollutant Discharge Elimination System, the federal government’s system for issuance of permits under the Clean Water Act, which is delegated to PADEP in Pennsylvania.

NRCS – Natural Resource Conservation Service (previously Soil Conservation Service).

Outfall – “Point source” as described in 40 CFR § 122.2 at the point where the municipality’s storm sewer system discharges to surface Waters of the Commonwealth.

Outlet – Points of water disposal to a stream, river, lake, tidewater or artificial drain.

Parent Tract – The parcel of land from which a land development or subdivision originates, determined from the date of municipal adoption of this ordinance.

Peak Discharge – The maximum rate of stormwater runoff from a specific storm event.

Penn State Runoff Model (PSRM) – The computer-based hydrologic model developed at the Pennsylvania State University.

Perennial Stream – A stream which contains water at all times except during extreme drought.

Pipe – A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

Planning Commission – The planning commission of Langhorne Manor Borough.

Point Source – Any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, or conduit from which stormwater is or may be discharged, as defined in State regulations at 25 Pa. Code § 92.1.

Post Construction – Period after construction during which disturbed areas are stabilized, stormwater controls are in place and functioning and all proposed improvements in the approved land development plan are completed.

Predevelopment – (see Existing Condition)

Pretreatment – Techniques employed in stormwater BMPs to provide storage or filtering to trap coarse materials and other pollutants before they enter the system, but not necessarily designed to meet the volume requirements of Section 303.

Pervious Surface – A surface that allows the infiltration of water into the ground.

Project Site – The specific area of land where any Regulated Activities in the municipality are planned, conducted or maintained.

Qualified Professional - Any person licensed by the Pennsylvania Department of State or otherwise qualified by law to perform the work required by the Ordinance.

Rational Method – A rainfall-runoff relation used to estimate peak flow.

Recharge – The replenishment of groundwater through the infiltration of rainfall, other surface waters, or land application of water or treated wastewater.

Record Drawings – Original documents revised to suit the as-built conditions and subsequently provided by the Engineer to the Client. The Engineer reviews the Contractor's as-built drawings against his/her own records for completeness, then either turns these over to the Client or transfers the information to a set of reproducible, in both cases for the Client's permanent records. Record drawings are not the same as record plans submitted for recording with the County in accordance with the PA Municipalities Planning Code (Act 247).

Redevelopment – Any development that requires demolition or removal of existing structures or impervious surfaces at a site and replacement with new impervious surfaces. Maintenance activities such as top-layer grinding and re-paving are not considered to be redevelopment. Interior remodeling projects and tenant improvements are also not considered to be redevelopment. Utility trenches in streets are not considered redevelopment unless more than 50 percent of the street width including shoulders is removed and re-paved.

Regulated Activities - Any earth disturbance activities or any activities that involve the alteration or development of land in a manner that may affect stormwater runoff.

Regulated Earth Disturbance Activity - Activity involving earth disturbance subject to regulation under 25 Pa. Code 92, 25 Pa. Code 102, or the Clean Streams Law.

Release Rate – The percentage of existing conditions peak rate of runoff from a site or subarea to which the proposed conditions peak rate of runoff must be reduced to protect downstream areas.

Repaving – Replacement of the impervious surface that does not involve reconstruction of an existing paved (impervious) surface.

Replacement Paving – Reconstruction of and full replacement of an existing paved (impervious) surface.

Retention Basin – A structure in which stormwater is stored and not released during the storm event. Retention basins are designed for infiltration purposes, and do not have an outlet. The retention basin must infiltrate stored water in 4 days or less.

Retention Volume/Removed Runoff – The volume of runoff that is captured and not released directly into the surface Waters of the Commonwealth during or after a storm event.

Return Period – The probability an event will occur in any given year. Typically displayed as a whole number, e.g. 25-year event, and represents the inverse of the frequency of that event. For example, the 25-year return period rainfall gives the probability, 1/25 or 4 %, which that size storm will occur in any given year.

Road Maintenance – Earth disturbance activities within the existing road cross-section, such as grading and repairing existing unpaved road surfaces, cutting road banks, cleaning or clearing drainage ditches and other similar activities.

Roof Drains – A drainage conduit or pipe that collects water runoff from a roof and leads it away from the structure.

Runoff – Any part of precipitation that flows over the land surface.

SALDO – Subdivision and land development ordinance.

Sediment - Soils or other materials transported by surface water as a product of erosion.

Sediment Pollution – The placement, discharge or any other introduction of sediment into the Waters of the Commonwealth.

Sedimentation – The process by which mineral or organic matter is accumulated or deposited by the movement of water or air.

Seepage Pit/Seepage Trench – An area of excavated earth filled with loose stone or similar coarse material, into which surface water is directed for infiltration into the underground water. More information on Seepage Pits may be found in the PA BMP Manual, December 2006, Chapter 6, Section 4.

Separate Storm Sewer System – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) primarily used for collecting and conveying stormwater runoff.

Shallow Concentrated Flow – Stormwater runoff flowing in shallow, defined ruts prior to entering a defined channel or waterway.

Sheet Flow – A flow process associated with broad, shallow water movement on sloping ground surfaces that is not channelized or concentrated.

Soil Cover Complex Method – A method of runoff computation developed by the NRCS that is based on relating soil type and land use/cover to a runoff parameter called Curve Number (CN).

Source Water Protection Areas (SWPA) – The zone through which contaminants, if present, are likely to migrate and reach a drinking water well or surface water intake.

Special Protection Subwatersheds – Watersheds that have been designated in Pennsylvania Code Title 25 Environmental Protection, Chapter 93 Water Quality Standards as exceptional value (EV) or high quality (HQ) waters.

Spillway – A conveyance that is used to pass the peak discharge of the maximum design storm that is controlled by the stormwater facility.

State Water Quality Requirements – The regulatory requirements to protect, maintain, reclaim, and restore water quality under Title 25 of the Pennsylvania Code and the Clean Streams Law.

Storm Frequency – The number of times that a given storm “event” occurs or is exceeded on the average in a stated period of years. See “Return Period”.

Storm Sewer – A system of pipes and/or open channels that convey intercepted runoff and stormwater from other sources, but excludes domestic sewage and industrial wastes.

Stormwater – The surface runoff generated by precipitation reaching the ground surface.

Stormwater Management Best Management Practices – Is abbreviated as **BMPs** or **SWM BMPs** throughout this Ordinance.

Stormwater Management Facility – Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff quality, rate or quantity. Typical stormwater management facilities include, but are not limited to, detention and retention basins, open channels, storm sewers, pipes, and infiltration structures.

Stormwater Management Plan – The watershed plan, known as the “Neshaminy Creek Watershed Act 167 Stormwater Management Plan,” for managing those land use activities that will influence stormwater runoff quality and quantity and that would impact the Neshaminy Creek watershed adopted by Bucks and Montgomery Counties as required by the Act of October 4, 1978, P.L. 864 (Act 167) or the plan for managing stormwater runoff in the Delaware River South watershed adopted by Bucks County as required by the Act of October 4, 1978, P.L. 864 (Act 167), and known as the “Delaware River South Watershed Act 167 Stormwater Management Plan”.

Stormwater SWM Site Plan – The plan prepared by the Applicant or his representative indicating how stormwater runoff will be managed at the particular site of interest according to this ordinance.

Stream – A flow of water in a natural channel or bed, as a brook, rivulet, or a small river

Stream Buffer – The land area adjacent to each side of a stream, essential to maintaining water quality. (See Buffer)

Stream Enclosure – A bridge, culvert, or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated water of the Commonwealth.

Streambank Erosion – The widening, deepening, or headward cutting of channels and waterways, caused by stormwater runoff or bankfull flows.

Subarea (Subwatershed) – The smallest drainage unit of a watershed for which stormwater management criteria have been established in the Stormwater Management Plan.

Subdivision – The division or redivision of a lot, tract, or parcel of land by any means into two or more lots, tracts, parcels, or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership, or building or lot development, provided the subdivision by lease of land for agricultural purposes into parcels of more than ten acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

Surface Waters of the Commonwealth – Any and all rivers, streams, creeks, rivulets, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and all other bodies or channels of conveyance of surface waters, or parts thereof, whether natural or artificial, within or on the boundaries of the Commonwealth.

Swale – A low lying stretch of land that gathers or carries surface water runoff.

SWM Site Plan – The documentation of the stormwater management system to be used for a given development site, the contents of which are established in Section 402.

Timber Operations – See Forest Management.

Time-of-Concentration (Tc) – The time required for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if any.

Top-of-Bank – Highest point of elevation in a stream channel cross-section at which a rising water level just begins to flow out of the channel and over the floodplain.

Vegetated swale – A natural or man-made waterway, usually broad and shallow, covered with erosion-resistant grasses, used to convey surface water.

Vernal Pool – Seasonal depressional wetlands that are covered by shallow water for variable periods from winter to spring, but may be completely dry for most of the summer and fall.

Watercourse – A channel or conveyance of surface water having a defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

Waters of the Commonwealth – Any and all rivers, streams, creeks, rivulets, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and all other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of the Commonwealth.

Watershed – Region or area drained by a river, watercourse, or other body of water, whether natural or artificial.

Wet Basin – Pond for urban runoff management that is designed to detain urban runoff and always contains water.

Wetland – Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, fens, and similar areas.

ARTICLE III. STORMWATER MANAGEMENT

Section 301. General Requirements

- A. Applicants proposing Regulated Activities in Langhorne Manor Borough that do not fall under the exemption criteria shown in Sections 106 and 107 shall submit a Stormwater Management (SWM) Site Plan consistent with this Ordinance to the Municipality for review. The SWM criteria of this Ordinance shall apply to the total proposed development even if development is to take place in stages. Preparation and implementation of an approved SWM Site Plan is required. No Regulated Activities shall commence until the Municipality issues written approval of a SWM Site Plan, which demonstrates compliance with the requirements of this Ordinance.
- B. SWM Site Plans approved by the Municipality, in accordance with Article IV, shall be on-site throughout the duration of the Regulated Activity.
- C. The Municipality may, after consultation with the Department of Environmental Protection (PADEP), approve measures for meeting the state water quality requirements other than those in this Ordinance, provided that they meet the minimum requirements of, and do not conflict with, state law including but not limited to the Clean Streams Law.
- D. For all regulated earth disturbance activities, Erosion and Sediment (E&S) Control Best Management Practices (BMPs) shall be designed, implemented, operated, and maintained during the Regulated Earth Disturbance Activities (e.g., during construction) to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code and the Clean Streams Law. Various BMPs and their design standards are listed in the *Erosion and Sediment Pollution Control Program Manual*, No. 363-2134-008 (April 15, 2000), as amended and updated.
- E. For all Regulated Activities in the Neshaminy Creek Watershed, implementation of the volume controls in Section 303 of this Ordinance is required.
- F. For all Regulated Activities in the Delaware River South Watershed, all stormwater runoff shall be pretreated for water quality prior to discharge to surface or groundwater and post-construction water quality protection shall be addressed as required by Section 307 of this Ordinance.
- G. Impervious areas:
 - 1. The measurement of impervious areas shall include all of the impervious areas in the total proposed development even if development is to take place in stages.
 - 2. For development taking place in stages, the entire development plan must be used in determining conformance with this Ordinance.

3. For projects that add impervious area to a parcel, the total impervious area on the parcel is subject to the requirements of this Ordinance.
- H. Stormwater flows onto adjacent property shall not be created, increased, decreased, relocated, or otherwise altered without written notification of the adjacent property owner(s) by the Developer. Such stormwater flows shall be subject to the requirements of this Ordinance.
- I. All Regulated Activities shall include such measures as necessary to:
1. Protect health, safety, and property;
 2. Meet the water quality goals of this Ordinance by implementing measures to:
 - a. Minimize disturbance to floodplains, wetlands, and wooded areas.
 - b. Create, maintain, repair or extend riparian buffers.
 - c. Avoid erosive flow conditions in natural flow pathways.
 - d. Minimize thermal impacts to waters of this Commonwealth.
 - e. Disconnect impervious surfaces (i.e. Disconnected Impervious Areas, DIAs) by directing runoff to pervious areas, wherever possible. See Appendix F for detail on DIAs.
 3. To the maximum extent practicable, incorporate the techniques for Low Impact Development Practices (e.g. protecting existing trees, reducing area of impervious surface, cluster development, and protecting open space) described in the *Pennsylvania Stormwater Best Management Practices Manual*, Pennsylvania Department of Environmental Protection (PADEP) no. 363-0300-002 (2006). See Ordinance Appendix E for a summary description.
- J. Infiltration BMPs should be spread out, made as shallow as practicable, and located to maximize the use of natural on-site infiltration features while still meeting the other requirements of this Ordinance.
- K. The design of all facilities over karst shall include an evaluation of measures to minimize the risk of adverse effects.
- L. Storage facilities should completely drain both the volume control and rate control capacities over a period of time not less than 24 and not more than 72 hours from the end of the design storm.

- M. The design storm volumes to be used in the analysis of peak rates of discharge should be obtained from the Precipitation-Frequency Atlas of the United States, Atlas 14, Volume 2, Version 3.0, U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, Hydrometeorological Design Studies Center, Silver Spring, Maryland. NOAA's Atlas 14 can be accessed at <http://hdsc.nws.noaa.gov/hdsc/pfds/>
- N. For all regulated activities, SWM BMPs shall be designed, implemented, operated, and maintained to meet the purposes and requirements of this Ordinance and to meet all requirements under Title 25 of the Pennsylvania Code, the Clean Streams Law, and the Storm Water Management Act.
- O. Various BMPs and their design standards are listed in the *Pennsylvania Stormwater Best Management Practices Manual* (PA BMP Manual).

Section 302. Permit Requirements by Other Governmental Entities

Approvals issued and actions taken under this Ordinance do not relieve the Applicant of the responsibility to secure required permits or approvals for activities regulated by any other code, law, regulation or ordinance.

Section 303. Volume Control – Neshaminy Creek Watershed

(For Delaware River South requirements see Sections 307, 308 and 309)

Volume controls will mitigate increased runoff impacts, protect stream channel morphology, maintain groundwater recharge, and contribute to water quality improvements. Stormwater runoff volume control methods are based on the net change in runoff volume for the two-year storm event.

Volume controls shall be implemented using the Design Storm Method in subsection A or the Simplified Method in subsection B below. For Regulated Activities equal to or less than one (1) acre, this Ordinance establishes no preference for either methodology; therefore, the applicant may select either methodology on the basis of economic considerations, the intrinsic limitations of the procedures associated with each methodology, and other factors. All regulated activities greater than one (1) acre must use the Design Storm Method.

- A. **Design-Storm Method (Any Regulated Activity):** This method requires detailed modeling based on site conditions. For modeling assumptions refer to Section 305.A.
 - 1. Post-development total runoff should not be increased from pre-development total runoff for all storms equal to or less than the 2-year 24-hour duration precipitation.

2. The following applies in order to estimate the increased volume of runoff for the 2-year 24-hour duration precipitation event:

To calculate the runoff volume (cubic feet) for existing site conditions (pre-development) and for the proposed developed site conditions (post-development), it is recommended to use the soil cover complex method as shown on the following page. Table B-3 in Ordinance Appendix B is available to guide a qualified professional and/or an applicant to calculate the stormwater runoff volume. The calculated volume shall be either reused, evapotranspired, or infiltrated through structural or nonstructural means.

Soil Cover Complex Method:

Step 1: Runoff (in) = $Q = (P - 0.2S)^2 / (P + 0.8S)$ where

P = 2-year Rainfall (in)

$S = (1000 / CN) - 10$, the potential maximum retention
(including initial abstraction, Ia)

Step 2: Runoff Volume (Cubic Feet) = $Q \times \text{Area} \times 1/12$

Q = Runoff (in)

Area = SWM Area (sq ft)

B. Simplified Method (Regulated activities less than or equal to 1 acre):

1. Stormwater facilities shall capture the runoff volume from at least the first two inches (2") of runoff from all new impervious surfaces.

Volume (cubic feet) = (2" runoff / 12 inches) * impervious surface (sq ft)

2. At least the first inch (1") of runoff volume from the new impervious surfaces shall be permanently removed from the runoff flow—i.e., it shall not be released into the surface waters of the Commonwealth. The calculated volume shall be either reused, evapotranspired or infiltrated through structural or nonstructural means.

Volume (cubic feet) = (1" runoff / 12 inches) * impervious surface (sq ft)

3. Infiltration facilities should be designed to accommodate the first half inch (0.5") of the permanently removed runoff.
4. No more than one inch (1") of runoff volume from impervious surfaces shall be released from the site. The release time must be over 24 to 72 hours.

C. Stormwater Control Measures:

The applicant must demonstrate how the required volume is controlled through Stormwater Best Management Practices (BMPs) which shall provide the means necessary to capture, reuse, evaporate, transpire or infiltrate the total runoff volume.

1. If natural resources exist on the site, the applicant is required to submit a SWM Site Plan shall determine the total acreage of protected area where no disturbance is proposed. The acreage of the protected area should be subtracted from the total site area and not included in the stormwater management site area acreage used in determining the volume controls.

$$\text{Stormwater Management Site Area} = \{\text{Total Site Area (for both pre and post development conditions)} - \text{Protected Area}\}$$

Natural Resource Areas should be calculated based upon the municipality's own natural resource protection ordinance. If no ordinance exists, See Table B-2 in Ordinance Appendix B for guidance to assess the total protected area. For additional reference see Chapter 5 Section 5.4.1 of the PA BMP manual.

2. Calculate the volume controls provided through nonstructural BMPs. Table B-5 in Ordinance Appendix B is recommended as guidance.
3. Volume controls provided through nonstructural BMPs should be subtracted from the required volume to determine the necessary structural BMPs.

$$\text{Required Volume Control (ft}^3\text{)} - \text{Nonstructural Volume Control (ft}^3\text{)} = \text{Structural Volume Requirement (ft}^3\text{)}$$

4. Calculate the volume controls provided through structural BMPs. Table B-6 in Ordinance Appendix B is recommended as guidance. See PA BMP manual Chapter 6 for description of the BMPs.
5. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on the suitability of soils and site conditions (see Table B-6 in Ordinance Appendix B for a list of Infiltration BMPs). Infiltration BMPs shall be constructed on soils that have the following characteristics:
 - a. A minimum soil depth of twenty-four (24") inches between the bottom of the infiltration BMPs and the top of bedrock or seasonally high water table.
 - b. An infiltration rate sufficient to accept the additional stormwater load and dewater completely as determined by field tests. A minimum of 0.2 inches/hour (in/hr) should be utilized and for acceptable rates a safety factor of 50% should be applied for design purposes (e.g., for soil which measured

0.4 in/hr, the BMP design should use 0.2 in/hr to insure safe infiltration rates after construction).

- c. All open-air infiltration facilities shall be designed to completely infiltrate runoff volume within three (3) days (72 hours) from the start of the design storm.
- 6. Soils – A soils evaluation of the project site shall be required to determine the suitability of infiltration facilities. All regulated activities are required to perform a detailed soils evaluation by a qualified design professional which at minimum address' soil permeability, depth to bedrock, and subgrade stability. The general process for designing the infiltration BMP shall be:
 - a. Analyze hydrologic soil groups as well as natural and man-made features within the site to determine general areas of suitability for infiltration practices. In areas where development on fill material is under consideration, conduct geotechnical investigations of sub-grade stability; infiltration may not be ruled out without conducting these tests.
 - b. Provide field tests such as double ring infiltrometer or hydraulic conductivity tests (at the level of the proposed infiltration surface) to determine the appropriate hydraulic conductivity rate. Percolation tests are not recommended for design purposes.
 - c. Design the infiltration structure based on field determined capacity at the level of the proposed infiltration surface and based on the safety factor of 2.
 - d. If on-lot infiltration structures are proposed, it must be demonstrated to the municipality that the soils are conducive to infiltrate on the lots identified.
 - e. An impermeable liner will be required in detention basins where the possibility of groundwater contamination exists. A detailed hydrogeologic investigation may be required by the municipality.

Section 304. Stormwater Peak Rate Control and Management Districts

Peak rate controls for large storms, up to the 100-year event, is essential in order to protect against immediate downstream erosion and flooding. The following peak rate controls have been determined through hydrologic modeling of the Neshaminy Creek and Delaware River South watersheds.

- A. Standards for managing runoff from each subarea in the Neshaminy Creek and Delaware River South Watersheds for the 2-, 5-, 10-, 25-, 50-, and 100-year design storms are shown in Tables 304.1 and 304.2. Development sites located in each of the management districts must control proposed development conditions runoff rates to existing conditions runoff rates for the design storms in accordance with Tables 304.1 and 304.2 on the following page.

Table 304.1
Peak Rate Runoff Control Standards by Stormwater Management Districts
In The Neshaminy Creek Watershed

District	Design Storm Postdevelopment (Proposed Conditions)	Design Storm Predevelopment (Existing Conditions)
A	2-year	1-year
	5-year	5-year
	10-year	10-year
	25-year	25-year
	50-year	50-year
	100-year	100-year
B	2-year	1-year
	5-year	2-year
	10-year	5-year
	25- year	10-year
	50-year	25-year
	100-year	50-year
C	2-year	2-year
	5-year	5-year
	10-year	10-year
	25- year	25- year
	50-year	50-year
	100-year	100-year

Table 304.2
Peak Rate Runoff Control Standards by Stormwater Management Districts
In The Delaware River South Watershed

District	Design Storm Postdevelopment (Proposed Conditions)	Design Storm Predevelopment (Existing Conditions)
A	2-year	1-year
	5-year	5-year
	10-year	10-year
	25-year	25-year
	50-year	50-year
	100-year	100-year
B	2-year	1-year
	5-year	2-year
	10-year	5-year
	25- year	10-year
	50-year	50-year
	100-year	100-year

- B. General – Proposed conditions rates of runoff from any Regulated Activity shall not exceed the peak release rates of runoff from existing conditions for the design storms

specified on the Stormwater Management District Watershed Map (Ordinance Appendix D) and in this section of the Ordinance.

- C. District Boundaries – The boundaries of the Stormwater Management Districts are shown on official maps and are available for inspection at the municipal office and county planning offices. A copy of the map at a reduced scale, and four other maps with zoomed-in extents are included in Ordinance Appendix D. The exact location of the Stormwater Management District boundaries as they apply to a given development site shall be determined by mapping the boundaries using the two-foot topographic contours (or most accurate data required) provided as part of the SWM Site Plan.
- D. Sites Located in More Than One District – For a proposed development site located within two or more stormwater management district category subareas, the peak discharge rate from any subarea shall meet the Management District Criteria for the district in which the discharge is located.
- E. Off-Site Areas – When calculating the allowable peak runoff rates, developers do not have to account for runoff draining into the subject development site from an off-site area. On-site drainage facilities shall be designed to safely convey off-site flows through the development site.
- F. Site Areas – The stormwater management site area is the only area subject to the management district criteria. Non-impacted areas or non-regulated activities bypassing the stormwater management facilities would not be subject to the management district criteria.
- G. Alternate Criteria for Redevelopment Sites – For redevelopment sites, one of the following minimum design parameters shall be accomplished, whichever is most appropriate for the given site conditions as determined by Langhorne Manor Borough:
 - 1. Meet the full requirements specified by Tables 304.1 and 304.2, and Sections 304.A through 304.F
 - or
 - 2. Reduce the total impervious surface on the site by at least twenty (20) percent based upon a comparison of existing impervious surface to proposed impervious surface.

Section 305. Calculation Methodology

- A. The following criteria shall be used for runoff calculations:
 - 1. For development sites not considered redevelopment, the ground cover used to determine the existing conditions runoff volume and flow rate shall be as follows:
 - a. Wooded sites shall use a ground cover of “woods in good condition.” A site is classified as wooded if a continuous canopy of trees exists over a ¼ acre.

- b. The undeveloped portion of the site including agriculture, bare earth, and fallow ground shall be considered as “meadow in good condition,” unless the natural ground cover generates a lower curve number (CN) or Rational “c” value (i.e., woods) as listed in Tables B-4 or B-7 in Appendix B of this Ordinance.
 2. For sites considered redevelopment, the ground cover used to determine the existing conditions runoff volume and flow rate for the developed portion of the site shall be based upon actual land cover conditions. If the developed site contains impervious surfaces, 20 percent of the impervious surface area shall be considered meadow in the model for existing conditions.
- B. Stormwater runoff peak discharges from all development sites with a drainage area equal to or greater than 200 acres shall be calculated using a generally accepted calculation technique that is based on the NRCS Soil Cover Complex Method. Table 305.1 summarizes acceptable computation methods. The method selected by the design professional shall be based on the individual limitations and suitability of each method for a particular site. The Municipality may allow the use of the Rational Method ($Q=CIA$) to estimate peak discharges from drainage areas that contain less than 200 acres.

 Q = Peak flow rate, cubic feet per second (CFS)
 C = Runoff coefficient, dependent on land use/cover
 I = Design rainfall intensity, inches per hour
 A = Drainage Area, acres.
- C. All calculations consistent with this ordinance using the Soil Cover Complex Method shall use the appropriate design rainfall depths for the various return period storms according to the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 rain data corresponding to the Doylestown rain gage, seen in Table B-1 in Ordinance Appendix B. The SCS Type II rainfall curve from NOAA is found on Figure B-1 in Ordinance Appendix B. This data may also be directly retrieved from the NOAA Atlas 14 website: hdsc.nws.noaa.gov/hdsc/pfds/orb/pa_pfds.html. If a hydrologic computer model such as PSRM or HEC-1 / HEC-HMS is used for stormwater runoff calculations, then the duration of rainfall shall be 24 hours.

TABLE 305.1
Acceptable Computation Methodologies For
Stormwater Management Plans

METHOD	METHOD DEVELOPED BY	APPLICABILITY
TR-20 (or commercial computer package based on TR-20)	USDA NRCS	Applicable where use of full hydrology computer model is desirable or necessary.
TR-55 (or commercial computer package based on TR-55)	USDA NRCS	Applicable for land development plans within limitations described in TR-55.
HEC-1 / HEC-HMS	U.S. Army Corps of Engineers	Applicable where use of full hydrologic computer model is desirable or necessary.

PSRM	Penn State University	Applicable where use of a hydrologic computer model is desirable or necessary; simpler than TR-20 or HEC-1.
Rational Method (or commercial computer package based on Rational Method)	Emil Kuichling (1889)	For sites less than 200 acres, or as approved by the Municipality and/or Municipal Engineer.
Other Methods	Varies	Other computation methodologies approved by the Municipality and/or Municipal Engineer.

- D. All calculations using the Rational Method shall use rainfall intensities consistent with appropriate times-of-concentration for overland flow and return periods from NOAA Atlas 14, Volume 2 Version 2.1. Times-of-concentration for overland flow shall be calculated using the methodology presented in Chapter 3 of *Urban Hydrology for Small Watersheds*, NRCS, TR-55 (as amended or replaced from time to time by NRCS). Times-of-concentration for channel and pipe flow shall be computed using Manning's equation.
- E. Runoff Curve Numbers (CN) for both existing and proposed conditions to be used in the soil cover complex method shall be based on Table B-4 in Ordinance Appendix B.
- F. Runoff coefficients (C) for both existing and proposed conditions for use in the Rational Method shall be consistent with Table B-7 in Ordinance Appendix B.
- G. Runoff from proposed sites graded to the subsoil will not have the same runoff conditions as the site under existing conditions because of soil compaction, even after top-soiling or seeding. The proposed condition "CN" or "C" shall increase by 5% to better reflect proposed soil conditions.
- H. The Manning equation is preferred for one-dimensional, gradually-varied, open channel flow. In other cases, appropriate, applicable methods should be applied, however, early coordination with the municipality is necessary.
- I. Outlet structures for stormwater management facilities shall be designed to meet the performance standards of this Ordinance using the generally accepted hydraulic analysis technique or method of the municipality.
- J. The design of any stormwater detention facilities intended to meet the performance standards of this Ordinance shall be verified by routing the design storm hydrograph through these facilities using the Storage-Indication Method. For drainage areas greater than 200 acres in size, the design storm hydrograph shall be computed using a calculation method that produces a full hydrograph. The municipality may approve the use of any generally accepted full hydrograph approximation technique that shall use a total runoff volume that is consistent with the volume from a method that produces a full hydrograph.

Section 306. Other Requirements

A. Hot Spots

1. The use of infiltration BMPs is prohibited on hot spot land use areas. Examples of hot spots are listed in Ordinance Appendix G.
2. Stormwater runoff from hot spot land uses shall be pretreated. In no case may the same BMP be employed consecutively to meet this requirement. Guidance regarding acceptable methods of pre-treatment is located in Appendix G.

B. West Nile Guidance Requirements

All wet basin designs shall incorporate biologic controls consistent with the West Nile Guidance found in Appendix H.

Section 307. Water Quality – Delaware River South Watershed

In addition to the performance standards and design criteria requirements of this Article, the applicant SHALL comply with the following water quality requirements of this Article.

- A. Adequate storage and treatment facilities will be provided to capture and treat stormwater runoff from developed or disturbed areas. The Recharge Volume computed under Section 308 may be a component of the Water Quality Volume if the applicant chooses to manage both components in a single facility. If the Recharge Volume is less than the Water Quality Volume, the remaining Water Quality Volume may be captured and treated by methods other than recharge/infiltration BMPs. The required Water Quality Volume (WQv) is the storage capacity needed to capture and to treat a portion of stormwater runoff from the developed areas of the site produced from 90 percent of the average annual rainfall (P).

To achieve this goal, the following criterion is established:

The following calculation formula is to be used to determine the water quality storage volume, (WQv), in acre-feet of storage for the Delaware River South watershed:

$$\text{WQv} = [(P)(Rv)(A)]/12 \quad \text{Equation: 307.1}$$

WQv = Water Quality Volume (acre-feet)

P = Rainfall Amount equal to 90% of events producing this rainfall (in)

A = Area of the project contributing to the water quality BMP (acres)

Rv = $0.05 + 0.009(I)$ where I is the percent of the area that is impervious surface (impervious area/A*100)

The P value for the five PennDOT rainfall regions is shown in Figure B-2 in Appendix B of the Model Ordinance within the Plan. Since the Delaware River South is in PennDOT Region 5, the P value to be utilized to meet this requirement is 2.04 inches.

- B. Design of BMPs used for water quality control shall be in accordance with design specifications outlined in the *Stormwater Best Management Practices Manual* or other applicable manuals. The following factors SHALL be considered when evaluating the suitability of BMPs used to control water quality at a given development site:
1. Total contributing drainage area.
 2. Permeability and infiltration rate of the site soils.
 3. Slope and depth to bedrock.
 4. Seasonal high water table.
 5. Proximity to building foundations and well heads.
 6. Erodibility of soils.
 7. Land availability and configuration of the topography.
 8. Peak discharge and required volume control.
 9. Stream bank erosion.
 10. Efficiency of the BMPs to mitigate potential water quality problems.
 11. The volume of runoff that will be effectively treated.
 12. The nature of the pollutant being removed.
 13. Maintenance requirements.
 14. Creation/protection of aquatic and wildlife habitat.
 15. Recreational value.
 16. Enhancement of aesthetic and property value.
- C. To accomplish the above, the applicant shall submit original and innovative designs to the municipality for review and approval. Such designs may achieve the water quality objectives through a combination of BMPs (best management practices).
- D. No regulated earth disturbance activities within the Municipality shall commence until approval by the Municipality of a plan which demonstrates compliance with State Water Quality Requirements post-construction is complete.
- E. The BMPs shall be designed, implemented and maintained to meet State Water Quality Requirements, and any other more stringent requirements as determined by the Municipality.
- F. To control post-construction stormwater impacts from regulated earth disturbance activities, State Water Quality Requirements can be met by BMPs, including site design, which provide for replication of pre-construction stormwater infiltration and runoff conditions, so that post-construction stormwater discharges do not degrade the physical, chemical or biological characteristics of the receiving waters. As described in the DEP Comprehensive Stormwater Management Policy (#392-0300-002, September 28, 2002), this may be achieved by the following:
1. Infiltration: replication of pre-construction stormwater infiltration conditions,
 2. Treatment: use of water quality treatment BMPs to ensure filtering out of the chemical and physical pollutants from the stormwater runoff, and

3. Streambank and Streambed Protection: management of volume and rate of postconstruction stormwater discharges to prevent physical degradation of receiving waters (e.g., from scouring).
- G. Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate DEP regional office must be provided to the Municipality. The issuance of an NPDES Construction Permit (or permit coverage under the statewide General Permit (PAG-2) satisfies the requirements of subsection 307.D.

Section 308. Groundwater Recharge (Infiltration) – Delaware River South Watershed

- A. Infiltration BMPs shall meet the following minimum requirements:

Regulated activities will be required to recharge (infiltrate) a portion of the runoff created by the development as part of an overall stormwater management plan designed for the site. The volume of runoff to be recharged shall be determined from sections 308.A.2.a. or 308.A.2.b. depending upon demonstrated site conditions.

1. Infiltration BMPs intended to receive runoff from developed areas shall be selected based on suitability of soils and site conditions (see Table B-6 in Ordinance Appendix B for a list of Infiltration BMPs) and shall be constructed on soils that have the following characteristics:
 - a. A minimum depth of 24 inches between the bottom of the BMP and the limiting zone.
 - b. An infiltration rate sufficient to accept the additional stormwater load and drain completely as determined by field tests conducted by the applicant's design professional. A minimum of 0.2 inches/hour (in/hr) should be utilized and for acceptable rates a safety factor of 50% should be applied for design purposes (e.g., for soil which measured 0.4 in/hr, the BMP design should use 0.2 in/hr to insure safe infiltration rates after construction).
 - c. The recharge facility shall be capable of completely infiltrating the recharge volume within four days (96 hours).
 - d. Pretreatment shall be provided prior to infiltration.
 - e. The requirements for recharge are applied to all *disturbed areas*, even if they are ultimately to be an undeveloped land use such as grass, since studies have found that compaction of the soils during disturbance reduces their infiltrative capacity.
2. The recharge volume (Re) shall be computed by first obtaining the infiltration requirement using methods in either section 308.A.2.a. or 308.A.2.b. then multiplying by the total proposed impervious area. The overall required recharge volume for a site

is computed by multiplying total impervious area by the infiltration requirement.

a. NRCS Curve Number Equation

The following criteria shall apply.

The NRCS runoff shall be utilized to calculate infiltration requirements (P) in inches.

For zero runoff: $P = I \text{ (Infiltration)} = (200 / CN) - 2$ **Equation: 308.1**
where: $P = I = \text{infiltration requirement (inches)}$
 $CN = \text{SCS (NRCS) curve number of the existing conditions contributing to the recharge facility}$

This equation can be displayed graphically in, and the infiltration requirement can also be determined from Figure 308-1.

The recharge volume (Re_v) required would therefore be computed as:

$Re_v = I * \text{impervious area (SF)} / 12 = \text{Cubic Feet (CF)}$ **Equation: 308.2**

b. Annual Recharge Water Budget Approach

It has been determined that infiltrating 0.5 inches of runoff from the impervious areas will aid in maintaining the hydrologic regime of the watershed. If the goals of Section 308.A.2.a cannot be achieved, then 0.5 inches of rainfall shall be infiltrated from all impervious areas, up to an existing site conditions curve number of 81. Above a curve number of 81, Equation 308.1 or the curve in Figure 308.1 should be used to determine the infiltration requirement.

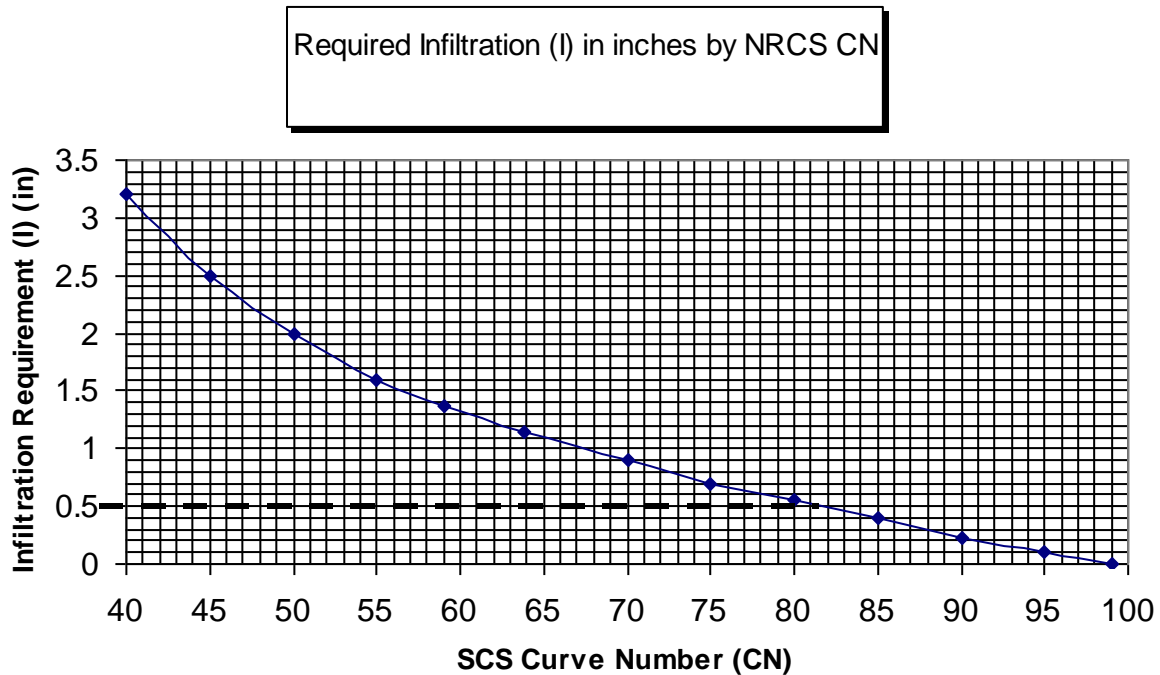
where: $I = 0.5 \text{ inches}$

The recharge volume (Re_v) required would therefore be computed as:

$Re_v = I * \text{percent impervious area (SF)} / 12 = \text{Cubic Feet (CF)}$

The recharge values derived from these methods are the minimum volumes the applicant must control through an infiltration/recharge BMP facility. However, if a site has areas of soils where additional volume of infiltration can be achieved, the applicant is encouraged to recharge as much of the stormwater runoff from the site as possible.

Figure 308-1. Infiltration Requirement Based Upon NRCS Curve Number.



B. The general process for designing the infiltration BMP shall be:

A detailed soils evaluation of the project site shall be required to determine the suitability of recharge facilities. The evaluation shall be performed by a qualified professional and, at a minimum, address soil permeability, depth to bedrock, and subgrade stability.

1. Analyze hydrologic soil groups as well as natural and man-made features within the watershed to determine general areas of suitability for infiltration practices.
2. Provide field tests, such as double ring infiltration tests at the level of the proposed infiltration surface to determine the appropriate hydraulic conductivity rate.
3. Design the infiltration structure for the required storm volume based on field determined capacity at the level of the proposed infiltration surface.
4. Where the recharge volume requirement cannot be physically accomplished due to the results of the field soils testing, supporting documentation and justification shall be supplied to the municipality with the drainage plan.
5. If on-lot infiltration structures are proposed by the applicant's design professional, it must be demonstrated to the municipality that the soils are conducive to infiltration on the lots identified.

- C. Extreme caution shall be exercised where infiltration is proposed in geologically susceptible areas such as strip mine or limestone areas. Extreme caution shall also be exercised where salt or chloride would be a pollutant since soils do little to filter this pollutant and it may contaminate the groundwater. Extreme caution shall be exercised where infiltration is proposed in source water protection areas. The qualified design professional shall evaluate the possibility of groundwater contamination from the proposed infiltration/recharge facility and perform a hydrogeologic justification study if necessary. The infiltration requirement in High Quality/Exceptional Value waters shall be subject to the DEP's Title 25: Chapter 93 Antidegradation Regulations. The municipality may require the installation of an impermeable liner in BMP and/or detention basins where the possibility of groundwater contamination exists. A detailed hydrogeologic investigation may be required by the municipality.
- D. The municipality shall require the applicant to provide safeguards against groundwater contamination for uses which may cause groundwater contamination, should there be a mishap or spill.
- E. Recharge/infiltration facilities shall be used in conjunction with other innovative or traditional BMPs, stormwater control facilities, and nonstructural stormwater management alternatives.

Section 309. Stream Bank Erosion Requirements – Delaware River South Watershed

- A. In addition to the water quality volume, to minimize the impact of stormwater runoff on downstream streambank erosion, the requirement is to design the BMP to detain the post-development 2-year, 24-hour design storm to the predevelopment 1-year flow using the SCS Type II distribution. Additionally, provisions shall be made (such as adding a small orifice at the bottom of the outlet structure) so that the postdevelopment 1-year storm takes a minimum of 24 hours to drain from the facility from a point where the maximum volume of water from the 1-year storm is captured. (i.e., the maximum water surface elevation is achieved in the facility.)
- B. Release of water can begin at the start of the storm (i.e., the invert of the water quality orifice is at the invert of the facility). The design of the facility shall consider and minimize the chances of clogging and sedimentation. Orifices smaller than 3 inches diameter are not recommended. However, if the design engineer can provide proof that the smaller orifices are protected from clogging by use of trash racks, etc., smaller orifices may be permitted.

ARTICLE IV. STORMWATER MANAGEMENT (SWM) SITE PLAN REQUIREMENTS

Section 401. General Requirements

For any of the activities regulated by this Ordinance, the preliminary or final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, the commencement of any earth disturbance, or activity may not proceed until the Property Owner or Applicant or his/her agent has received written approval of a SWM Site Plan from the municipality and an approval of an adequate Erosion and Sediment (E&S) Control Plan review from the municipality or County Conservation District.

Section 402. SWM Site Plan Requirements

The SWM Site Plan shall consist of a general description of the project, including calculations, maps, and plans. A note on the maps shall refer to the associated computations and E&S Control Plan by title and date. The cover sheet of the computations and E&S Control Plan shall refer to the associated maps by title and date. All SWM Site Plan materials shall be submitted to the municipality in a format that is clear, concise, legible, neat, and well organized; otherwise, the SWM Site Plan shall not be accepted for review and shall be returned to the Applicant.

The following items shall be included in the SWM Site Plan:

A. General

1. General description of the project including plan contents described in Section 402.B.
2. General description of proposed SWM techniques to be used for SWM facilities.
3. Complete hydrologic and hydraulic computations for all SWM facilities.
4. All reviews and letters of adequacy from the Conservation District for the Erosion & Sedimentation Plan as required by Langhorne Manor Borough, county or state regulations.
5. A general description of proposed nonpoint source pollution controls.
6. The SWM Site Plan Application and completed fee schedule form and associated fee for all regulated activities not already paying fees under the SALDO or other municipal regulations. (Ordinance Appendix C-1).
7. The SWM Site Plan Checklist (Ordinance Appendix C-2).

8. Appropriate sections from the municipalities' Subdivision and Land Development Ordinance, and other applicable local ordinances, shall be followed in preparing the SWM Site Plan.
- B. Plans: SWM Site Plan shall provide the following information;
1. The overall stormwater management concept for the project.
 2. A determination of natural site conditions and stormwater management needs. This shall include, but not be limited to:
 - a. Site Features:
 - 1) The location of the project relative to highways, municipal boundaries or other identifiable landmarks.
 - 2) The locations of all existing and proposed utilities, sanitary sewers, and water lines on site and to within fifty (50) feet of property lines.
 - 3) Proposed structures, roads, paved areas, and buildings.
 - 4) The total tract boundary and size with distances marked to the nearest foot and bearings to the nearest degree.
 - 5) Plan and profile drawings of all SWM BMP's, including drainage structures, pipes, open channels, and swales. At a minimum this should include pre- and post-drainage area maps, an overall post construction stormwater management plan, stormwater details sheets, and landscape plans (if proposing bio-retention facilities, low impact development, bioretention, or vegetative basins).
 - 6) The locations and minimum setback distances of existing and proposed on-lot wastewater facilities and water supply wells.
 - 7) The location of all erosion and sediment control facilities.
 - 8) The location of proposed septic tank infiltration areas and wells in cases where groundwater recharge measures such as seepage pits, beds or trenches are proposed.
 - b. Natural Site Conditions:
 - 1) An Existing Resource and Site Analysis Map (ERSAM) showing environmentally sensitive areas including, but not limited to;
 - steep slopes,
 - ponds,
 - lakes,
 - streams,
 - wetlands,
 - hydric soils,
 - hydrologic soil groups A and B,
 - vernal pools,
 - stream buffers,

- open channels,
- existing recharge areas, and
- floodplains.

The area of each of these sensitive areas shall be calculated and should be consistent with the runoff volume calculation Section 303.C.1.

- 2) A detailed site evaluation for projects proposed in areas of frequent flooding, karst topography, and other environmentally sensitive areas, such as brownfields and source water protection areas.
 - 3) Existing and proposed contour lines (2 ft).
 - 4) The total extent of the drainage area upstream from the site and all down gradient receiving channels, swales and waters to which stormwater runoff or drainage will be discharged.
- c. Stormwater runoff design computations and documentation as specified in this Ordinance, or as otherwise necessary to demonstrate that the maximum practicable measures have been taken to meet the requirements of this Ordinance, including the recommendations and general requirements in Section 301.
 - d. The effect of the project (in terms of runoff volumes, water quality, and peak flows) on surrounding properties and aquatic features and on any existing stormwater conveyance system that may be affected by the project.
3. The format of the Plan shall include the following;
 - a. The expected project time schedule.
 - b. The name of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the plan.
 - c. The date of submission.
 - d. A graphic and written scale of one (1) inch equals no more than fifty (50) feet; for tracts of twenty (20) acres or more, the scale shall be one (1) inch equals no more than one hundred (100) feet.
 - e. A north arrow.
 - f. An access easement around all stormwater management facilities is required that would provide ingress to and egress from a public right-of-way. The size of the easement shall commensurate with the maintenance and access requirements determined in the design of the BMP.

- g. A key map showing all existing man-made features beyond the property boundary that would be affected by the project.
 - h. A note on the plan indicating the location and responsibility for maintenance of stormwater management facilities. All facilities shall meet the performance standards and design criteria specified in this ordinance.
 - i. The following signature block for the Design Engineer: "I, (Design Engineer), on this date (date of signature), hereby certify that the SWM Site Plan meets all design standards and criteria of the Langhorne Manor Borough Act 167 Stormwater Management Ordinance."
 - j. A statement, signed by the Applicant, acknowledging that any revision to the approved SWM Site Plan must be approved by the municipality and that a revised E&S Plan must be submitted to the Conservation District.
- 4. A soil erosion and sediment control plan, where applicable, as prepared for and submitted to the approval authority.
 - 5. The SWM Site Plan shall include an Operations & Maintenance (O&M) Plan for all existing and proposed physical stormwater management facilities, as well as schedules and costs for O&M activities. This plan shall address long-term ownership and responsibilities for O&M.

Section 403. Plan Submission

The municipality requires submission of a complete SWM Site Plan, as specified in this Ordinance.

- A. Proof of application or documentation of required permit(s) or approvals for the programs listed below shall be part of the plan:
 - 1. NPDES Permit for Stormwater Discharges from Construction Activities.
 - 2. Any other permit under applicable state or federal regulations.
- B. Six (6) copies of the SWM Site Plan shall be submitted to the following agencies:
 - 1. Two (2) copies to the municipality accompanied by the requisite municipal review fee, as specified in this Ordinance.
 - 2. Two (2) copies to the County Conservation District.
 - 3. One (1) copy to the municipal engineer (where applicable).

4. One (1) copy to the County Planning Commission/Department if the regulated activity is also required to submit a subdivision and/or land development plan to the county planning commission in accordance with the Pennsylvania Municipal Planning Code.
- C. Any submissions to the agencies listed above that are found to be incomplete shall not be accepted for review and shall be returned to the Applicant with a notification in writing of the specific manner in which the submission is incomplete.
- D. Additional copies shall be submitted as requested by the municipality or PADEP.

Section 404. Stormwater Management (SWM) Site Plan Review

- A. The SWM Site Plan shall be reviewed by a Qualified Professional on behalf of the municipality for consistency with the provisions of this Ordinance. After review, the Qualified Professional shall provide a written recommendation for the municipality to approve or disapprove the SWM Site Plan. If it is recommended to disapprove the SWM Site Plan, the Qualified Professional shall state the reasons for the disapproval in writing. The Qualified Professional also may recommend approval of the SWM Site Plan with conditions and, if so, shall provide the acceptable conditions for approval in writing. The SWM Site Plan review and recommendations shall be completed within the time allowed by the Municipalities Planning Code for reviewing subdivision plans.
- B. The municipality will notify the applicant in writing within 45 days whether the SWM Site Plan is approved or disapproved. If the SWM Site Plan involves a Subdivision and Land Development Plan, the notification period is 90 days. If a longer notification period is provided by other statute, regulation, or ordinance, the applicant will be so notified by the municipality. If the municipality disapproves the SWM Site Plan, the municipality shall cite the reasons for disapproval in writing.

Section 405. Modification of Plans

A modification to a submitted SWM Site Plan that involves a change in SWM BMPs or techniques, or that involves the relocation or redesign of SWM BMPs, or that is necessary because soil or other conditions are not as stated on the SWM Site Plan as determined by the municipality shall require a resubmission of the modified SWM Site Plan in accordance with this Article.

Section 406. Resubmission of Disapproved SWM Site Plans

A disapproved SWM Site Plan may be resubmitted, with the revisions addressing the municipality's concerns, to the municipality in accordance with this Article. The applicable review fee must accompany a resubmission of a disapproved SWM Site Plan.

Section 407. Authorization to Construct and Term of Validity

The municipality's approval of an SWM Site Plan authorizes the regulated activities contained in the SWM Site Plan for a maximum term of validity of 5 years following the date of approval. The Municipality may specify a term of validity shorter than 5 years in the approval for any specific SWM Site Plan. Terms of validity shall commence on the date the Municipality signs the approval for an SWM Site Plan. If an approved SWM Site Plan is not completed according to Section 407 within the term of validity, the municipality may consider the SWM Site Plan disapproved and may revoke any and all permits. SWM Site Plans that are considered disapproved by the municipality shall be resubmitted in accordance with Section 406 of this Ordinance.

ARTICLE V. INSPECTIONS

Section 501. Inspections

- A. The municipality shall inspect all phases of the installation of the Best Management Practices (BMPs) and/or stormwater management (SWM) facilities as deemed appropriate by the municipality.
- B. During any stage of the work, if the municipality determines that the BMPs and/or stormwater management facilities are not being installed in accordance with the approved SWM Site Plan, the municipality shall revoke any existing permits or other approvals and issue a cease and desist order until a revised SWM Site Plan is submitted and approved, as specified in this Ordinance and until the deficiencies are corrected.
- C. A final inspection of all BMPs and/or stormwater management facilities may be conducted by the municipality to confirm compliance with the approved SWM Site Plan prior to the issuance of any Occupancy Permit.
- D. The applicant and/or developer shall be responsible for providing as-built plans of all SWM BMPs included in the approved SWM Site Plan. The as-built plans and an explanation of any discrepancies, which were reviewed and received approval by the municipality, shall be submitted to the municipality.
- E. The as-built submission shall include a certification of completion signed by a Qualified Professional verifying that all SWM BMPs have been constructed according to the approved plans and specifications. If any Qualified Professionals contributed to the construction plans, they must sign and seal the completion certificate.

ARTICLE VI. FEES AND EXPENSES

Section 601. Municipal Stormwater Management (SWM) Site Plan Review and Inspection Fee

Fees shall be established by the municipality to cover plan review and construction inspection costs incurred by the municipality. All fees shall be paid by the Applicant at the time of SWM Site Plan submission. A review and inspection fee schedule shall be established by resolution of the municipal governing body based on the size of the Regulated Activity and based on the municipality's costs for reviewing SWM Site Plans and conducting inspections pursuant to Section 501. The municipality shall periodically update the review and inspection fee schedule to ensure that review costs are adequately reimbursed.

Section 602. Expenses Covered by Fees

The fees required by this Ordinance (unless otherwise waived by the municipality) shall, at a minimum, cover:

- A. Administrative costs.
- B. The review of the Stormwater (SWM) Site Plan by the municipality.
- C. The review of As-built Drawings.
- D. The site inspections.
- E. The inspection of SWM facilities and drainage improvements during construction.
- F. The final inspection at the completion of the construction of the SWM facilities and drainage improvements presented in the SWM Site Plan.
- G. Any additional work required to enforce any permit provisions regulated by this Ordinance, correct violations, and assure proper completion of stipulated remedial actions.

ARTICLE VII. MAINTENANCE RESPONSIBILITIES

Section 701. Performance Guarantee

- A. For subdivisions and land developments, the Applicant shall provide a financial guarantee to the Municipality for the timely installation and proper construction of all stormwater management (SWM) facilities as:
 - 1. Required by the approved SWM Site Plan equal to or greater than the full construction cost of the required controls; or
 - 2. The amount and method of payment provided for in the subdivision and land development ordinance.
- B. For other regulated activities, the Municipality shall require a financial guarantee from the Applicant.

Section 702. Responsibilities for Operations and Maintenance (O&M) of Stormwater Facilities and BMPs

- A. The owner of any land upon which stormwater facilities and BMPs will be placed, constructed, or implemented, as described in the stormwater facility and BMP O&M plan, shall record the following documents in the Office of the Recorder of Deeds for Bucks County, within Thirty (30) days of approval of the stormwater facility and BMP O&M plan by the Municipality:
 - 1. The O&M plan, or a summary thereof,
 - 2. O&M agreements under Section 704, and
 - 3. Easements under Section 705.
- B. The municipality may suspend or revoke any approvals granted for the project site upon discovery of failure on the part of the owner to comply with this section.
- C. The following items shall be included in the Stormwater Facility and BMP O&M Plan:
 - 1. Map(s) of the project area, in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Bucks County, and shall be submitted on 24-inch x 36-inch sheets. The contents of the maps(s) shall include, but not be limited to:
 - a. Clear identification of the location and nature of stormwater facilities and BMPs.

- b. The location of the project site relative to highways, municipal boundaries or other identifiable landmarks.
 - c. Existing and final contours at intervals of two (2) feet, or others as appropriate.
 - d. Existing streams, lakes, ponds, or other bodies of water within the project site area.
 - e. Other physical features including flood hazard boundaries, sinkholes, streams, existing drainage courses, and areas of natural vegetation to be preserved.
 - f. The locations of all existing and proposed utilities, sanitary sewers, and water lines on site and within 50 feet of property lines of the project site.
 - g. Proposed final changes to the land surface and vegetative cover, including the type and amount of impervious area that would be added.
 - h. Proposed final structures, roads, paved areas, and buildings, and
 - i. A twenty (20)-foot-wide access easement around all stormwater facilities and BMPs that would provide ingress to and egress from a public right-of-way.
- 2. A description of how each stormwater facility and BMP will be operated and maintained, and the identity and contact information associated with the person(s) responsible for O&M.
 - 3. The name of the project site, the name and address of the owner of the property, and the name of the individual or firm preparing the plan, and
 - 4. A statement, signed by the facility owner, acknowledging that the stormwater facilities and BMPs are fixtures that can be altered or removed only after approval by the municipality.
- D. The Stormwater Facility and BMP O&M Plan for the project site shall establish responsibilities for the continuing O&M of all stormwater facilities and BMPs, as follows:
- 1. If a plan includes structures or lots which are to be separately owned and in which streets, sewers and other public improvements are to be dedicated to the municipality, stormwater facilities and BMPs may also be offered for dedication to and maintained by the municipality.
 - 2. If a plan includes O&M by single ownership, or if sewers and other public improvements are to be privately owned and maintained, the O&M of stormwater

facilities and BMPs shall be the responsibility of the owner or private management entity.

- E. The municipality shall make the final determination on the continuing O&M responsibilities. The municipality reserves the right to accept or reject the O&M responsibility for any or all of the stormwater facilities and BMPs.
- F. Facilities, areas, or structures used as BMPs shall be enumerated as permanent real estate appurtenances and recorded as deed restrictions or conservation easements that run with the land.
- G. The O&M Plan shall be recorded as a restrictive deed covenant that runs with the land.
- H. The municipality may take enforcement actions against an owner for any failure to satisfy the provisions of this Article and this Ordinance.

Section 703. Municipal Review of Stormwater Facilities and BMP Operations and Maintenance (O&M) Plan

- A. The municipality shall review the Stormwater Facilities and BMP O&M Plan for consistency with the purposes and requirements of this ordinance, and any permits issued by PADEP.
- B. The municipality shall notify the Applicant in writing whether the Stormwater Facility and BMP O&M Plan is approved.
- C. The municipality shall require a "Record Drawing" of all stormwater facilities and BMPs.

Section 704. Operations and Maintenance (O&M) Agreement for Privately Owned Stormwater Facilities and BMPs

- A. The owner shall sign an O&M agreement with the municipality covering all stormwater facilities and BMPs that are to be privately owned. The O&M agreement shall be transferred with transfer of ownership. The agreement shall be substantially the same as the agreement in Ordinance Appendix A.
- B. Other items may be included in the O&M agreement where determined necessary to guarantee the satisfactory O&M of all stormwater controls and BMPs. The O&M agreement shall be subject to the review and approval of the municipality.
- C. The owner is responsible for the O&M of the SWM BMPs. If the owner fails to adhere to the O&M Agreement, the municipality may perform the services required and charge the owner appropriate fees. Nonpayment of fees may result in a lien against the property.

Section 705. Stormwater Management Easements

1. The owner must obtain all necessary real estate rights to install, operate, and maintain all stormwater facilities in the SWM Site Plan.
2. The owner must provide the municipal easements, or other appropriate real estate rights, to perform inspections and maintenance for the preservation of stormwater runoff conveyance, infiltration, and detention areas.

ARTICLE VIII. PROHIBITIONS

Section 801. Prohibited Discharges

- A. Any drain or conveyance, whether on the surface or subsurface, that allows any non-stormwater discharge, including sewage, process wastewater, and wash water to enter the waters of the Commonwealth is prohibited.
- B. No person shall allow, or cause to allow, discharges into surface waters of this Commonwealth which are not composed entirely of stormwater, except (1) as provided in Subsection C below, and (2) discharges allowed under a state or federal permit.
- C. The following discharges are authorized unless they are determined to be significant contributors to pollution to the waters of the Commonwealth:
 - 1. Discharges or flows from firefighting activities,
 - 2. Discharges from potable water sources including dechlorinated water line and fire hydrant flushing,
 - 3. Irrigation water and landscape drainage,
 - 4. Air conditioning condensate,
 - 5. Springs,
 - 6. Water from crawl space pumps,
 - 7. Flows from riparian habitats and wetlands,
 - 8. Uncontaminated water from foundations and footing drains,
 - 9. Water from lawn watering,
 - 10. De-chlorinated swimming pool discharges (clean, no filter backwash) (per Department of Environmental Protection (PADEP) requirements),
 - 11. Uncontaminated pumped groundwater,
 - 12. Water from individual residential car washing, and/or
 - 13. Diverted stream flows
- D. In the event that the municipality or PADEP determines that any of the discharges identified in Subsection C significantly contribute to pollution of the waters of this Commonwealth, the municipality or PADEP will notify the responsible person(s) to cease the discharge.

Section 802. Roof Drains

Roof drains and sump pumps shall discharge to infiltration or vegetative BMPs and to the maximum extent practicable satisfy the criteria for disconnected impervious areas (DIAs).

Section 803. Alteration of SWM BMPs

- A. No person shall modify, remove, fill, landscape, or alter any Stormwater Management (SWM) Best Management Practices (BMPs), facilities, areas, or structures unless it is part of an approved maintenance program and written approval of the municipality has been obtained.
- B. No person shall place any structure, fill, landscaping, or vegetation into a stormwater facility or BMP or within a drainage easement which would limit or alter the functioning of the stormwater facility or BMP without the written approval of the municipality.

ARTICLE IX. ENFORCEMENT AND PENALTIES

Section 901. Right-of-Entry

- A. Upon presentation of proper credentials, duly authorized representatives of the municipality may enter at reasonable times upon any property within the municipality to inspect the implementation, condition, or operation and maintenance of the stormwater facilities or Best Management Practices (BMPs) in regard to any aspect governed by this Ordinance.
- B. Landowners with stormwater facilities and BMPs on their property shall allow persons working on behalf of the municipality ready access to all parts of the premises for the purposes of determining compliance with this Ordinance.
- C. Persons working on behalf of the municipality shall have the right to temporarily locate on any stormwater facility or BMP in the Municipality such devices as are necessary to conduct monitoring and/or sampling of the discharges from such stormwater facilities or BMP.

Section 902. Inspection

Stormwater Management (SWM) Best Management Practices (BMPs) should be inspected for proper operation by the landowner, or the owner's designee (including the Municipality for dedicated and owned facilities), according to the following list of minimum frequencies:

- 1. Annually for the first 5 years,
- 2. Once every 3 years thereafter,
- 3. During or immediately after the cessation of a 10-year or greater storm, and/or
- 4. As specified in the Operations and Maintenance (O&M) agreement.

Section 903. Enforcement

All inspections regarding compliance with the Stormwater Management (SWM) Site Plan and this Ordinance shall be the responsibility of the Municipality.

- A. Whenever the Municipality finds that a person has violated a prohibition or failed to meet a requirement of this Ordinance, the Municipality may order compliance by written notice to the responsible person. Such notice may, without limitation, require the following remedies:
 - 1. Performance of monitoring, analyses, and reporting;
 - 2. Elimination of prohibited connections or discharges;

3. Cessation of any violating discharges, practices, or operations;
 4. Abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;
 5. Payment of a fine to cover administrative and remediation costs;
 6. Implementation of stormwater facilities and Best Management Practices (BMPs); and
 7. Operation and Maintenance (O&M) of stormwater facilities and BMPs.
- B. Such notification shall set forth the nature of the violation(s) and establish a time limit for correction of these violations(s). Said notice may further advise that, if applicable, should the violator fail to take the required action within the established deadline, the work will be done by the Municipality and the expense may be charged to the violator.
- C. Failure to comply within the time specified may subject a violator to the penalty provisions of this Ordinance. All such penalties shall be deemed cumulative and shall not prevent the Municipality from pursuing any and all other remedies available in law or equity.

Section 904. Suspension and Revocation of Permits and Approvals

- A. Any building, land development, or other permit or approval issued by the municipality may be suspended or revoked, in whole or in part, by the Municipality for:
1. Noncompliance with or failure to implement any provision of the permit;
 2. A violation of any provision of this ordinance; or
 3. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard or nuisance, pollution or which endangers the life, health, or property of others.
- B. A suspended permit may be reinstated by the Municipality when:
1. The Municipality has inspected and approved the corrections to the stormwater facilities and BMPs or the elimination of the hazard or nuisance, and;
 2. The Municipality is satisfied that all applicable violations in this Ordinance have been corrected.
- C. Any permit or approval that has been revoked by the Municipality cannot be reinstated. The Applicant may apply for a new permit under the procedures outlined of this Ordinance.

Section 905. Penalties

- A. Any person violating the provisions of this Ordinance shall be subject to penalties that may range from liens against the property to fines for each violation, recoverable with costs. Each day that the violation continues shall constitute a separate offense and the applicable fines are cumulative.
- B. In addition, the Municipality may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus, or other appropriate forms of remedy or relief.

Section 906. Appeals

- A. As per the Pennsylvania Municipalities Planning Code (MPC), Section 909.1(9), any person aggrieved by any action pursuant to this Ordinance may appeal to the Langhorne Manor Borough Zoning Hearing Board within thirty (30) days of that action.
- B. Any person aggrieved by any decision of Langhorne Manor Borough Zoning Hearing Board, relevant to the provisions of this Ordinance may appeal to the County Court of Common Pleas in the County where the activity has taken place within thirty (30) days of the municipal decision.


ARTICLE X. EFFECTIVE DATE

Section 1001. Effective Date

- A. This Ordinance shall take effect immediately upon adoption.

A. **LANGHORNE MANOR BOROUGH ACT 167 STORMWATER
MANAGEMENT ORDINANCE ENACTMENT**

ENACTED and ORDAINED as Ordinance No. 2015-002 at a duly advertised,
convened and official meeting of the Council of the Borough of Langhorne Manor, Bucks
County, Pennsylvania on this 1st day of September, 2015.



William R. McTigue, Jr., Council President



MaryAnn Barnes, Council Vice-President



Sharon Gimpel, Council Member



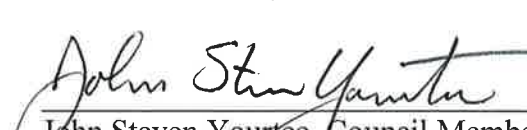
Edward Hanisco, Council Member



Nicholas Pizzola, Council Member



Patricia A. Silcox, Council Member



John Steven Yourtee, Council Member

ATTEST:



Loretta Luff, Board Secretary

Approved this 1st day of September, 2015.



Mayor

APPENDIX A: STORMWATER CONTROLS AND BEST MANAGEMENT PRACTICES OPERATIONS AND MAINTENANCE AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20____, by and between _____, (hereinafter the “Landowner”), and _____, _____ County, Pennsylvania, (hereinafter “Municipality”);

WITNESSETH

WHEREAS, the Landowner is the owner of certain real property as recorded by deed in the land records of _____ County, Pennsylvania, Deed Book _____ at Page _____, (hereinafter “Property”).

WHEREAS, the Landowner is proceeding to build and develop the Property; and

WHEREAS, the Stormwater Controls and BMP Operations and Maintenance Plan approved by the Municipality (hereinafter referred to as the “Plan”) for the property identified herein, which is attached hereto as Appendix A and made part hereof, as approved by the Municipality, provides for management of stormwater within the confines of the Property through the use of Best Management Practices (BMPs); and

WHEREAS, the Municipality, and the Landowner, his successors and assigns, agree that the health, safety, and welfare of the residents of the Municipality and the protection and maintenance of water quality require that on-site stormwater Best Management Practices be constructed and maintained on the Property; and

WHEREAS, for the purposes of this agreement, the following definitions shall apply:

BMP – “Best Management Practice;” activities, facilities, designs, measures or procedures used to manage stormwater impacts from land development, to protect and maintain water quality and groundwater recharge and to otherwise meet the purposes of the Municipal Stormwater Management Ordinance, including but not limited to infiltration trenches, seepage

pits, filter strips, bioretention, wet ponds, permeable paving, rain gardens, grassed swales, forested buffers, sand filters and detention basins.

WHEREAS, the Municipality requires, through the implementation of the Plan, that stormwater management BMPs as required by said Plan and the Municipal Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, his successors and assigns, and

NOW, THEREFORE, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The BMPs shall be constructed by the Landowner in accordance with the plans and specifications identified in the Plan.
2. The Landowner shall operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality and in accordance with the specific maintenance requirements noted on the Plan.
3. The Landowner hereby grants permission to the Municipality, its authorized agents and employees, to enter upon the property, at reasonable times and upon presentation of proper identification, to inspect the BMP(s) whenever it deems necessary. Whenever possible, the Municipality shall notify the Landowner prior to entering the property.
4. In the event the Landowner fails to operate and maintain the BMP(s) as shown on the Plan in good working order acceptable to the Municipality, the Municipality or its representatives may enter upon the Property and take whatever action is deemed necessary to maintain said BMP(s). This provision shall not be construed to allow the Municipality to erect any permanent structure on the land of the Landowner. It is expressly understood and agreed that the Municipality is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Municipality.

5. In the event the Municipality, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner shall reimburse the Municipality for all expenses (direct and indirect) incurred within 10 days of receipt of invoice from the Municipality.
6. The intent and purpose of this Agreement is to ensure the proper maintenance of the BMP(s) by the Landowner; provided, however, that this Agreement shall not be deemed to create or effect any additional liability of any party for damage alleged to result from or be caused by stormwater runoff.
7. The Landowner, its executors, administrators, assigns, and other successors in interests, shall release the Municipality's employees and designated representatives from all damages, accidents, casualties, occurrences or claims which might arise or be asserted against said employees and representatives from the construction, presence, existence, or maintenance of the BMP(s) by the Landowner or Municipality. In the event that a claim is asserted against the Municipality, its designated representatives or employees, the Municipality shall promptly notify the Landowner and the Landowner shall defend, at his own expense, any suit based on the claim. If any judgment or claims against the Municipality's employees or designated representatives shall be allowed, the Landowner shall pay all costs and expenses regarding said judgment or claim.
8. The Municipality shall inspect the BMP(s) at a minimum of once every three years to ensure their continued functioning.

This Agreement shall be recorded at the Office of the Recorder of Deeds of _____ County, Pennsylvania, and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

For the Municipality:

(SEAL)

For the Landowner:

ATTEST:

_____ (City, Borough, Township)

County of _____, Pennsylvania

I, _____, a Notary Public in and for the County and State aforesaid, whose commission expires on the _____ day of _____, 20__, do hereby certify that _____ whose name(s) is/are signed to the foregoing Agreement bearing date of the _____ day of _____, 20__, has acknowledged the same before me in my said County and State.

GIVEN UNDER MY HAND THIS _____ day of _____, 200_.

NOTARY PUBLIC

(SEAL)

APPENDIX B: STORMWATER MANAGEMENT DESIGN CRITERIA

TABLE B-1 DESIGN STORM RAINFALL AMOUNT

Source: NOAA Atlas 14 website, Doylestown Gage (36-2221)
http://hdsc.nws.noaa.gov/hdsc/pfds/orb/pa_pfds.html.

FIGURE B-1 ATLAS 14 TYPE II S-CURVES FOR ALL FREQUENCY STORMS – DOYLESTOWN GAGE (36-2221)

Source: NOAA Atlas 14 website, Doylestown Gage (36-2221)
http://hdsc.nws.noaa.gov/hdsc/pfds/orb/pa_pfds.html.

TABLE B-2 NATURAL RESOURCE PROTECTION STORMWATER MANAGEMENT CONTROLS

Source: PA BMP Manual Chapter 8, pg 33

TABLE B-3 GUIDANCE TO CALCULATE THE 2-YEAR, 24-HOUR VOLUME INCREASE FROM PRE-DEVELOPMENT TO POST-DEVELOPMENT CONDITIONS

Source: PA BMP Manual Chapter 8, pg 37

TABLE B-4 RUNOFF CURVE NUMBERS

Source: NRCS (SCS) TR-55

TABLE B-5 VOLUME CONTROL CALCULATION GUIDANCE FOR NONSTRUCTURAL BMPS

Source: PA BMP Manual Chapter 8, pg 34

TABLE B-6 VOLUME CONTROL CALCULATION GUIDANCE FOR STRUCTURAL BMPS

Source: PA BMP Manual Chapter 8, pg 38

TABLE B-7 RATIONAL RUNOFF COEFFICIENTS

Source: New Jersey Department of Transportation, Technical Manual for Stream Encroachment, August, 1984

TABLE B-8 MANNING ROUGHNESS COEFFICIENTS

TABLE B-1
DESIGN STORM RAINFALL AMOUNT (INCHES)

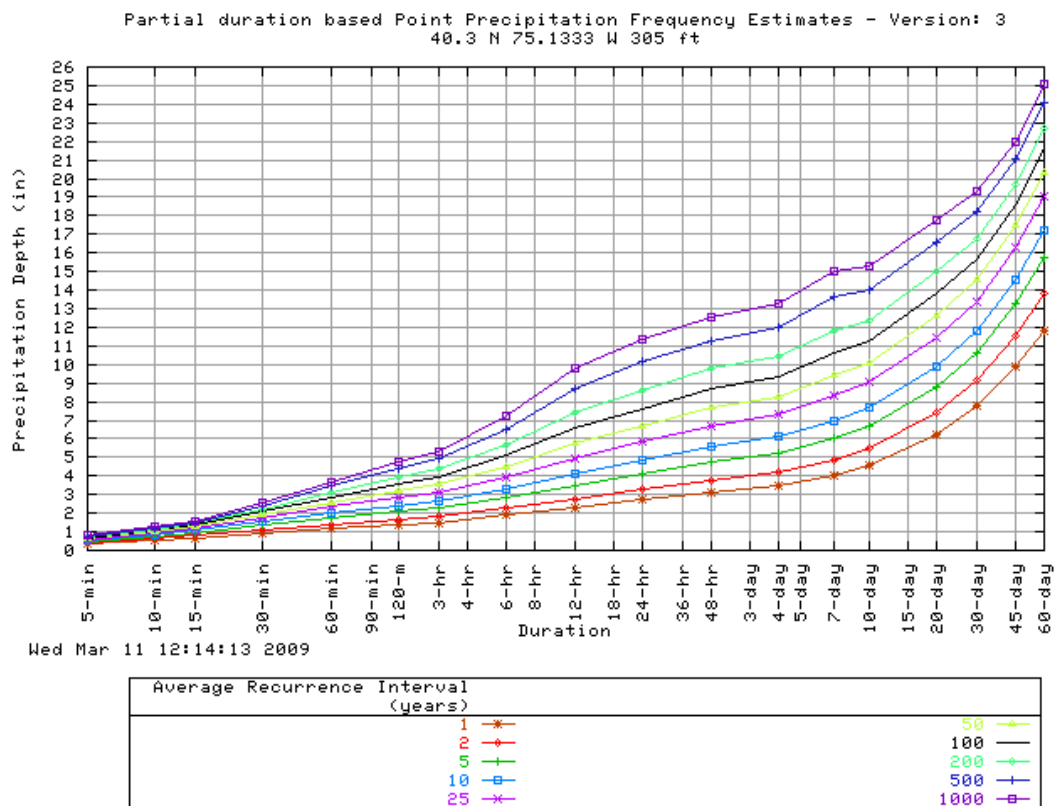
The design storm rainfall amount chosen for design should be obtained from the National
Oceanic and Atmospheric Administration Atlas 14 interactive website:
http://hdsc.nws.noaa.gov/hdsc/pfds/orb/pa_pfds.html

Source: NOAA Atlas 14 website, Doylestown Gage (36-2221)
http://hdsc.nws.noaa.gov/hdsc/pfds/orb/pa_pfds.html

Precipitation Frequency Estimates (inches)																		
ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.34	0.54	0.68	0.93	1.15	1.38	1.51	1.89	2.30	2.71	3.13	3.48	4.07	4.61	6.23	7.76	9.85	11.81
2	0.40	0.64	0.81	1.12	1.40	1.67	1.83	2.28	2.78	3.26	3.78	4.19	4.87	5.51	7.39	9.14	11.57	13.83
5	0.47	0.76	0.96	1.36	1.75	2.10	2.30	2.86	3.50	4.11	4.76	5.24	6.02	6.71	8.81	10.65	13.30	15.78
10	0.53	0.84	1.06	1.54	2.01	2.42	2.66	3.32	4.11	4.81	5.57	6.09	6.96	7.68	9.93	11.83	14.60	17.23
25	0.59	0.94	1.19	1.76	2.34	2.86	3.15	3.98	4.99	5.83	6.71	7.30	8.30	9.03	11.44	13.36	16.25	19.04
50	0.63	1.00	1.27	1.92	2.60	3.21	3.54	4.52	5.74	6.70	7.66	8.29	9.41	10.11	12.61	14.52	17.46	20.35
100	0.67	1.07	1.35	2.07	2.85	3.56	3.94	5.09	6.55	7.63	8.67	9.33	10.59	11.23	13.79	15.66	18.61	21.57
200	0.71	1.13	1.42	2.21	3.11	3.92	4.35	5.69	7.43	8.64	9.75	10.44	11.83	12.39	14.98	16.79	19.69	22.70
500	0.76	1.20	1.51	2.40	3.44	4.41	4.90	6.54	8.73	10.12	11.30	12.01	13.60	14.00	16.58	18.23	21.02	24.08
1000	0.79	1.24	1.56	2.53	3.69	4.78	5.34	7.23	9.82	11.35	12.57	13.29	15.04	15.28	17.80	19.31	21.96	25.04

* These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.

FIGURE B-1
Atlas 14 Type II S-Curves for All Frequency Storms – Doylestown Gage (36-2221)



**TABLE B-2: NATURAL RESOURCE PROTECTION
STORMWATER MANAGEMENT CONTROLS**

Existing Natural Sensitive Resource	Mapped in the ERSAM? Yes/No/n/a	Total Area (Ac.)	Area to be Protected (Ac.)
Waterbodies			
Floodplains			
Riparian Areas / Buffers			
Wetlands			
Vernal Pools			
Woodlands			
Natural Drainage Ways			
Steep Slopes, 15%-25%			
Steep Slopes, over 25%			
Other:			
Other:			
Total Existing:			

TABLE B-3: GUIDANCE TO CALCULATE THE 2-YEAR, 24-HOUR VOLUME INCREASE FROM PRE-DEVELOPMENT TO POST-DEVELOPMENT CONDITIONS

Existing Conditions: Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (ft3)
Woodland								
Meadow								
Impervious								
Total:								

Developed Conditions: Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia (0.2*S)	Q Runoff (in)	Runoff Volume (ft3)
Total:								

2-year Volume Increase (ft3):

TABLE B-4. Runoff Curve Numbers (from NRCS (SCS) TR-55)

LAND USE DESCRIPTION	Hydrologic Condition	HYDROLOGIC SOIL GROUP			
		A	B	C	D
Open Space					
Grass cover < 50%	Poor	68	79	86	89
Grass cover 50% to 75%	Fair	49	79	84	
Grass cover > 75%	Good	39	61	74	80
Meadow		30	58	71	78
Agricultural					
Pasture, grassland, or range – Continuous forage for grazing	Poor	68	79	86	89
Pasture, grassland, or range – Continuous forage for grazing.	Fair	49	69	79	84
Pasture, grassland, or range – Continuous forage for grazing	Good	39	61	74	80
Brush-weed-grass mixture with brush the major element.	Poor	48	67	77	83
Brush-weed-grass mixture with brush the major element.	Fair	35	56	70	77
Brush-weed-grass mixture with brush the major element.	Good	30	48	65	73
Fallow Bare soil	-----	77	86	91	94
Crop residue cover (CR)	Poor	76	85	90	93
	Good	74	83	88	90
Woods – grass combination (orchard or tree farm)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30	55	70	77
Commercial (85% Impervious)		92	94	95	
Industrial (72% Impervious)		88	91	93	
Institutional (50% Impervious)		82	88	90	
Residential districts by average lot size:					
	% Impervious				
1/8 acre or less * (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Farmstead		59	74	82	86
Smooth Surfaces (Concrete, Asphalt, Gravel or Bare Compacted Soil)	98	98	98	98	
Water	98	98	98	98	
Mining/Newly Graded Areas (Pervious Areas Only)	77	86	91	94	

* Includes Multi-Family Housing unless justified lower density can be provided.

Note: Existing site conditions of bare earth or fallow ground shall be considered as meadow when choosing a CN value.

**TABLE B-5: VOLUME CONTROL CALCULATION GUIDANCE FOR
NONSTRUCTURAL BMPS**

Type of Nonstructural BMP

	AREA (sq ft)	*	Runoff Volume (in)	* 1/12 =	Volume Reduction(ft³)
Use of Natural Drainage Feature					
<i>Utilize natural flow pathways</i>	_____sq ft		* 1/4"	* 1/12 =	_____cu ft
Minimum Soil Compaction					
<i>Lawn</i>	_____sq ft		* 1/4"	* 1/12 =	_____cu ft
<i>Meadow</i>	_____sq ft		* 1/3"	* 1/12 =	_____cu ft
Protecting existing trees (not located in protected area)					
For trees within 20 feet of impervious cover:					
<i>Tree Canopy</i>	_____sq ft		* 1"	* 1/12 =	_____cu ft
For trees within 20-100 feet of impervious cover:					
<i>Tree Canopy</i>	_____sq ft		* 1/2"	* 1/12 =	_____cu ft
Rooftop Disconnection					
For runoff directed to pervious and/or vegetative areas where infiltration occurs					
<i>Roof Area</i>	_____sq ft		* 1/4"	* 1/12 =	_____cu ft
Impervious Disconnection					
For runoff from impervious surfaces such as streets and concrete directed to pervious and/or vegetative areas where infiltration occurs					
<i>Impervious Area</i>	_____sq ft		* 1/4"	* 1/12 =	_____cu ft
Total Volume Reduction					_____cu ft

* represents multiply

TABLE B-6: VOLUME CONTROL CALCULATION GUIDANCE FOR STRUCTURAL BMPs

$$\begin{array}{ccc} \text{Required} & \text{Nonstructural} & \text{Structural Volume} \\ \text{Volume Control (ft}^3\text{)} & \text{Volume Control (ft}^3\text{)} & \text{Requirement (ft}^3\text{)} \\ \text{Table B-3} & \text{Table B-5} & \end{array} =$$

Type	Proposed Structural BMP	Section in BMP Manual	Area (sq ft)	Storage Volume (cu ft)
Infiltration and / or Evapotranspiration	Porous Pavement	6.4.1		
	Infiltration Basin	6.4.2		
	Infiltration Bed	6.4.3		
	Infiltration Trench	6.4.4		
	Rain Garden/Bioretention	6.4.5		
	Dry Well/Seepage Pit	6.4.6		
	Constructed Filter	6.4.7		
	Vegetative Swale	6.4.8		
	Vegetative Filter Strip	6.4.9		
	Infiltration Berm	6.4.10		
Evaporation and / or Reuse	Vegetative Roof	6.5.1		
	Capture and Re-use	6.5.2		
Runoff Quality	Constructed Wetlands	6.6.1		
	Wet Pond / Retention Basin	6.6.2		
	Dry Extended Detention Basin	6.6.3		
	Water Quality Filters	6.6.4		
Restoration	Riparian Buffer Restoration	6.7.1		
	Landscape Restoration / Reforestation	6.7.2		
	Soil Amendment	6.7.3		
Other	Level Spreader	6.8.1		
	Special Storage Areas	6.8.2		
	other			

Total Volume Control from Structural BMPs: _____

TABLE B.7. RATIONAL RUNOFF COEFFICIENTS
By Hydrologic Soils Group and Overland Slope (%)

Land Use	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
Cultivated Land	0.08 _s 0.14 _s	0.13 0.18	0.16 0.22	0.11 0.16	0.15 0.21	0.21 0.28	0.14 0.20	0.19 0.25	0.26 0.34	0.18 0.24	0.23 0.29	0.31 0.41
Pasture	0.12 0.15	0.20 0.25	0.30 0.37	0.18 0.23	0.28 0.34	0.37 0.45	0.24 0.30	0.34 0.42	0.44 0.52	0.30 0.37	0.40 0.50	0.50 0.62
Meadow	0.10 0.14	0.16 0.22	0.25 0.30	0.14 0.20	0.22 0.28	0.30 0.37	0.20 0.26	0.28 0.35	0.36 0.44	0.24 0.30	0.30 0.40	0.40 0.50
Forest	0.05 0.08	0.08 0.11	0.11 0.14	0.08 0.10	0.11 0.14	0.14 0.18	0.10 0.12	0.13 0.16	0.16 0.20	0.12 0.15	0.16 0.20	0.20 0.25
Residential												
Lot Size 1/8 Acre	0.25 0.33	0.28 0.37	0.31 0.40	0.27 0.35	0.30 0.39	0.25 0.44	0.30 0.38	0.33 0.42	0.38 0.49	0.33 0.41	0.36 0.45	0.42 0.54
Lot Size 1/4 Acre	0.22 0.30	0.26 0.34	0.29 0.37	0.24 0.33	0.29 0.37	0.33 0.42	0.27 0.36	0.31 0.40	0.36 0.47	0.30 0.38	0.34 0.42	0.40 0.52
Lot Size 1/3 Acre	0.19 0.28	0.23 0.32	0.26 0.35	0.22 0.30	0.26 0.35	0.30 0.39	0.25 0.33	0.29 0.38	0.34 0.45	0.28 0.36	0.32 0.40	0.39 0.50
Lot Size 1/2 Acre	0.16 0.25	0.20 0.29	0.24 0.32	0.19 0.28	0.23 0.32	0.28 0.36	0.22 0.31	0.27 0.35	0.32 0.42	0.26 0.34	0.30 0.38	0.37 0.48
Lot Size 1 Acre	0.14 0.22	0.19 0.26	0.22 0.29	0.17 0.24	0.21 0.28	0.26 0.34	0.20 0.28	0.25 0.32	0.31 0.40	0.24 0.31	0.29 0.35	0.35 0.46
Industrial	0.67 0.85	0.68 0.85	0.68 0.86	0.68 0.85	0.68 0.86	0.69 0.86	0.68 0.86	0.69 0.86	0.69 0.87	0.69 0.86	0.69 0.86	0.70 0.88
Commercial	0.71 0.88	0.71 0.88	0.72 0.89	0.71 0.89	0.72 0.89	0.72 0.89	0.72 0.89	0.72 0.89	0.72 0.90	0.72 0.89	0.72 0.89	0.72 0.90
Streets	0.70 0.76	0.71 0.77	0.71 0.79	0.71 0.80	0.72 0.82	0.74 0.84	0.72 0.84	0.73 0.85	0.76 0.89	0.73 0.89	0.75 0.91	0.78 0.95
Open Space	0.05 0.11	0.10 0.16	0.14 0.20	0.08 0.14	0.13 0.19	0.19 0.26	0.12 0.18	0.17 0.23	0.24 0.32	0.16 0.22	0.21 0.27	0.28 0.39
Parking	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97	0.85 0.95	0.86 0.96	0.87 0.97

_s Runoff coefficients for storm recurrence intervals less than 25 years.

_s Runoff coefficients for storm recurrence intervals of 25 years or more.

Source : Rawls, W.J., S.L. Wong and R.H. McCuen, 1981, "Comparison of Urban Flood Frequency Procedures", Preliminary Draft, U.S. Department

TABLE B-8. MANNING'S ROUGHNESS COEFFICIENTS

DESCRIPTION	Manning's n-value
Smooth-wall Plastic Pipe	0.011
Concrete Pipe	0.012
Smooth-lined Corrugated Metal Pipe	0.012
Corrugated Plastic Pipe	0.024
Annular Corrugated Steel And Aluminum Alloy Pipe (Plain or polymer coated)	
68 mm x 13 mm (2 2/3 in x 1/2 in) Corrugations	0.024
75 mm x 25 mm (3 in x 1 in) Corrugations	0.027
125 mm x 25 mm (5 in x 1 in) Corrugations	0.025
150 mm x 50 mm (6 in x 2 in) Corrugations	0.033
Helically Corrugated Steel And Aluminum Alloy Pipe (Plain or polymer coated)	
75 mm x 25 mm (3 in x 1 in), 125 mm x 25 mm (5 in x 1 in), or 150 mm x 50 mm (6 in x 2 in) Corrugations	0.024
Helically Corrugated Steel And Aluminum Alloy Pipe (Plain or polymer coated)	
68 mm x 13 mm (2 2/3 in x 1/2 in) Corrugations	
a. Lower Coefficients*	
450 mm (18 in) Diameter	0.014
600 mm (24 in) Diameter	0.016
900 mm (36 in) Diameter	0.019
1200 mm (48 in) Diameter	0.020
1500 mm (60 in) Diameter or larger	0.021
b. Higher Coefficients**	0.024
Annular or Helically Corrugated Steel or Aluminum Alloy Pipe Arches or Other Non-Circular Metal Conduit (Plain or Polymer coated)	0.024
Vitrified Clay Pipe	0.012
Ductile Iron Pipe	0.013
Asphalt Pavement	0.015
Concrete Pavement	0.014
Grass Medians	0.050
Grass – Residential	0.30
Earth	0.020
Gravel	0.030
Rock	0.035
Cultivated Areas	0.030 - 0.050
Dense Brush	0.070 - 0.140
Heavy Timber (Little undergrowth)	0.100 - 0.150
Heavy Timber (w/underbrush)	0.40
Streams:	
a. Some Grass And Weeds (Little or no brush)	0.030 - 0.035
b. Dense Growth of Weeds	0.035 - 0.050
c. Some Weeds (Heavy brush on banks)	0.050 - 0.070

Notes:

* Use the lower coefficient if any one of the following conditions apply:

- a. A storm pipe longer than 20 diameters, which directly or indirectly connects to an inlet or manhole, located in swales adjacent to shoulders in cut areas or depressed medians.
- b. A storm pipe which is specially designed to perform under pressure.

**Use the higher coefficient if any one of the following conditions apply:

- a. A storm pipe which directly or indirectly connects to an inlet or manhole located in highway pavement sections or adjacent to curb or concrete median barrier.
- b. A storm pipe which is shorter than 20 diameters long.
- c. A storm pipe which is partly lined helically corrugated metal pipe.

Application is hereby made for review of the LANGHORNE MANOR BOROUGH ACT 167 and NPDES STORMWATER MANAGEMENT ORDINANCE and related data as submitted herewith in accordance with the Langhorne Manor Borough Stormwater Management and Earth Disturbance Ordinance.

Date of Submission _____ Submission No. _____

2. Name of Applicant Telephone No.

Address _____
Zip _____

3. Name of property owner _____ Telephone No. _____

Address _____
Zip _____

4. Name of engineer or surveyor _____ Telephone No. _____

Address _____
Zip _____

5. Type of subdivision or development proposed:

<input type="checkbox"/> Single-Family Lots	<input type="checkbox"/> Townhouses	<input type="checkbox"/> Commercial (Multi-Lot)
<input type="checkbox"/> Two Family Lots	<input type="checkbox"/> Garden Apartments	<input type="checkbox"/> Commercial (One-Lot)
<input type="checkbox"/> Multi-Family Lots	<input type="checkbox"/> Mobile-Home Park	<input type="checkbox"/> Industrial (Multi-Lot)
<input type="checkbox"/> Cluster Type Lots	<input type="checkbox"/> Campground	<input type="checkbox"/> Industrial (One-Lot)
<input type="checkbox"/> Planned Residential Development	<input type="checkbox"/> Other (_____)	

6. Linear feet of new road proposed _____ L.F.

7. Area of proposed and existing impervious area on the entire tract.

- a. Existing (to remain) _____ S.F. _____ % of Property
b. Proposed _____ S.F. _____ % of Property

8. Stormwater

a. Does the peak rate of runoff from proposed conditions exceed that flow which occurred for existing conditions for the designated design storm? _____

b. Design storm utilized (on-site conveyance systems) (24 hr.) _____

No. of Subarea _____

Watershed Name _____

Explain: _____

c. Does the submission and/or district meet the criteria for the applicable Management District? _____

d. Number of subarea(s) from Ordinance Appendix D of the Langhorne Manor Borough Act 167 Stormwater Management Plan. _____

e. Type of proposed runoff control _____

f. Does the proposed stormwater control criteria meet the requirements/guidelines of the Stormwater Ordinances? _____

If not, what waivers are requested? _____

Reasons _____

g. Does the plan meet the requirements of Article III of the Stormwater Ordinances? _____

If not, what waivers are requested? _____

Reasons Why _____

h. Was TR-55, June 1986 utilized in determining the time of concentration? _____

i. What hydrologic method was used in the stormwater computations? _____

j. Is a hydraulic routing through the stormwater control structure submitted? _____

k. Is a construction schedule or staging attached? _____

l. Is a recommended maintenance program attached? _____

9. Erosion and Sediment Pollution Control (E&S):

a. Has the stormwater management and E&S plan, supporting documentation and narrative been submitted to the Bucks County Conservation District? _____

b. Total area of earth disturbance _____ S.F. or Acres

10. Wetlands

a. Have wetlands been delineated by someone trained in wetland delineation? _____

b. Have the wetland lines been verified by a state or federal permitting authority? _____

c. Have the wetland lines been surveyed? _____

d. Total acreage of wetland within the property _____

e. Total acreage of wetland disturbed _____

f. Supporting documentation _____

11. Filing

a. Has the required fee been submitted? _____

Amount _____

b. Has the proposed schedule of construction inspection to be performed by the Applicant's engineer been submitted? _____

c. Name of individual who will be making the inspections _____

d. General comments about stormwater management at the development _____

CERTIFICATE OF OWNERSHIP AND ACKNOWLEDGMENT OF APPLICATION:

COMMONWEALTH OF PENNSYLVANIA

COUNTY OF _____.

On this the _____ day of _____, 20____, before me, the undersigned officer, personally appeared _____ who being duly sworn, according to law, deposes and says that _____ owners of the property described in this application and that the application was made with _____ knowledge

Property Owner

Notary Public _____

SIGNATURE OF APPLICANT

(Information Below This Line To Be Completed By The Municipality)

Date complete application received _____ Plan Number _____

Fees _____ date fees paid _____ received by _____

Official submission receipt date _____

Received by _____

Municipality

APPENDIX C-2: SWM SITE PLAN CHECKLIST

Project: _____
Municipality: _____
Engineer: _____
Submittal No: _____
Date: _____
Project ID: _____ (for Municipal use ONLY)

SECTION I: REGULATED ACTIVITIES

Reference: Section 105

1. Is the Proposed Project within the Neshaminy Creek or Delaware River South watersheds? ☐ Yes
☐ No
2. Does the Proposed Project meet the definition of a "Regulated Activity"? ☐ Yes ☐ No

STOP – If you have checked NO for either of the above questions, you are not required to submit a Stormwater Management Plan under the Langhorne Manor Borough Act 167 Stormwater Management Ordinance.

SECTION II: EXEMPTION

Reference: Section 106

1. Does the regulated activity create an Impervious Surface less than or equal to 1,000 square feet?
☐ Yes ☐ No
2. Does the regulated activity create an Impervious Surface greater than 1,000 square feet but less than 5,000 square feet? ☐ Yes ☐ No
3. Does the regulated activity involve an Agricultural Activity? ☐ Yes ☐ No
4. Does the regulated activity involve Forest Management or Timber Operations? ☐ Yes ☐ No

Parcel IS Exempt from the SWM Site Plan and Peak Rate Control ☐

Parcel IS Exempt from Peak Rate Control ☐

Parcel IS NOT Exempt ☐

SECTION III: VOLUME CONTROLS

Reference: Section 303 or Sections 307, 308 and 309

A. Site Disturbance Minimization

1. Has an Existing Resource and Site Analysis Map (ERSAM) been prepared?

☐ Yes ☐ No, Explain _____

2. Are any of the following environmentally sensitive areas identified on site?

Steep Slopes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Ponds / Lakes / Vernal Pools	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Streams	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Wetlands	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Hydric Soils	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Flood plains	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Stream Buffer Zones	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Hydrologic Soil Groups A or B	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Recharge Areas	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Others: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown

3. Does the site layout plan avoid environmentally sensitive areas identified on site?

☐ Yes ☐ No, Explain _____

B. Post-development Runoff Volume Control

1. What method is used to calculate the required volume control?

☐ Design-storm method ☐ Simplified method

2. What is the level of runoff volume (ft³) required to be controlled from the post-development site?
_____ (ft³)

C. Stormwater runoff control measures

1. What is the level of runoff volume (ft³) controlled through nonstructural BMPs? _____ (ft³)

2. What is the level of runoff volume (ft³) controlled through structural BMPs? _____ (ft³)

3. Have provisions been installed to promote infiltration on site?

☐ Yes ☐ No, Explain _____

4. Have provisions been installed to promote evapotranspiration, capture or reuse on site?

☐ Yes ☐ No, Explain _____

SECTION V: PEAK RATES

Reference: Section 304

1. In which of the following Storm Water Management District(s) is the site located?

<input type="checkbox"/>	A
<input type="checkbox"/>	B
<input type="checkbox"/>	C

2. Does the Proposed Conditions Runoff meet the Criteria established in Tables 304.1 or 304.2?

☐ Yes ☐ No, if you answered Yes proceed to Section VI.

SECTION VI: CALCULATION METHODOLOGY

Reference: Section 305 and Ordinance Appendix B

1. Which method(s) are utilized in the site stormwater management plan for computing stormwater runoff rates and volumes?

<input type="checkbox"/> TR-20	<input type="checkbox"/> PSRM
<input type="checkbox"/> TR-55	<input type="checkbox"/> Rational Method
<input type="checkbox"/> HEC-1 / HEC-HMS	<input type="checkbox"/> Other: _____

2. Was Table B-1 or Figure B-1 utilized in rainfall determination?

☐ Yes ☐ No, Explain _____

3. Was Table B-4 (Runoff Curve Numbers) or Table B-7 (Rational Runoff Coefficients) utilized in calculations for runoff?

☐ Yes ☐ No, Explain _____

SECTION IX: OTHER REQUIREMENTS

Reference: Section 306

1. Is the proposed activity considered a "Stormwater hot spot" as defined in Ordinance Appendix G?

☐ Yes ☐ No, If yes, what pre-treatment BMPs are planned?

2. Have proposed wet detention basins incorporated biologic control consistent with the West Nile Virus Guidelines presented in Ordinance Appendix G?

☐ Yes ☐ No ☐ Not Applicable

SECTION X: FACILITY OPERATION AND MAINTENANCE PLAN

Reference: Section 702

1. Has a Stormwater Control and BMP Operations and Maintenance Plan been approved by the Municipality?

☐ Yes ☐ No, Explain _____

2. Who shall assume responsibility for implementing the Stormwater Control and BMP Operations and Maintenance Plan?

<input type="checkbox"/> Municipality	<input type="checkbox"/> Homeowner Association
<input type="checkbox"/> Private Owner	<input type="checkbox"/> Other _____

[illegible]

APPENDIX E: LOW IMPACT DEVELOPMENT (LID) PRACTICES

ALTERNATIVE APPROACH FOR MANAGING STORMWATER RUNOFF

Natural hydrologic conditions can be altered radically by poorly planned development practices, such as introducing unnecessary impervious surfaces, destroying existing drainage swales, constructing unnecessary storm sewers, and changing local topography. A traditional drainage approach of development has been to remove runoff from a site as quickly as possible and capture it in a detention basin. This approach leads ultimately to the degradation of water quality as well as expenditure of additional resources for detaining and managing concentrated runoff at some downstream location.

The recommended alternative approach is to promote practices that will minimize post-development runoff rates and volumes and will minimize needs for artificial conveyance and storage facilities. To simulate predevelopment hydrologic conditions, infiltration is often necessary to offset the loss of infiltration by the creation of impervious surfaces. Preserving natural hydrologic conditions requires careful alternative site design considerations. Site design practices include preserving natural drainage features, minimizing impervious surface area, reducing the hydraulic connectivity of impervious surfaces, and protecting natural depression storage. A well-designed site will contain a mix of all those features.

Sometimes regulations create obstacles for an applicant interested in implementing low impact development techniques on their site. A municipality should consider examining their ordinances and amending the sections which limit LID techniques. For example, a municipality could remove parking space minimums and establish parking space maximums to reduce the area of impervious surface required. Other allowable regulations to promote LID includes permitting curb cuts or wheel stops instead of requiring curbs and allowing sumped landscaping where the runoff can drain instead of requiring raised beds. These small changes to ordinances can remove the barriers which prevent applicants from pursuing LID practices.

The following describes various LID techniques:

1. **Protect Sensitive and Special Value Resources:** See Section 5.4 of the *Pennsylvania Stormwater Best Management Practices Manual*, Pennsylvania Department of Environmental Protection (PADEP) no. 363-0300-002 (2006).
 - a. **Preserving Natural Drainage Features.** Protecting natural drainage features, particularly vegetated drainage swales and channels, is desirable because of their ability to infiltrate and attenuate flows and to filter pollutants. However, this objective is often not accomplished in land development. In fact, commonly held drainage philosophy encourages just the opposite pattern—streets and adjacent storm sewers are typically located in the natural headwater valleys and swales, thereby replacing natural drainage functions with a completely impervious system. As a result, runoff and pollutants generated from impervious surfaces flow directly into storm sewers with no opportunity for attenuation, infiltration, or

filtration. Developments designed to fit site topography also minimizes the amount of grading on site.

- b. **Protecting Natural Depression Storage Areas.** Depressional storage areas either have no surface outlet or drain very slowly following a storm event. They can be commonly seen as ponded areas in farm fields during the wet season or after large runoff events. Traditional development practices eliminate these depressions by filling or draining, thereby obliterating their ability to reduce surface runoff volumes and trap pollutants. The volume and release rate characteristics of depressions should be protected in the design of the development site. The depressions can be protected by simply avoiding the depression or by incorporating its storage as additional capacity in required detention facilities.
2. **Reduce Impervious Coverage:** See Section 5.7 of the *Pennsylvania Stormwater Best Management Practices Manual, Pennsylvania Department of Environmental Protection (PADEP) no. 363-0300-002 (2006)*.
- a. **Avoiding Introduction of Impervious Areas.** Careful site planning should consider reducing impervious coverage to the maximum extent possible. Building footprints, sidewalks, driveways, and other features producing impervious surfaces should be evaluated to minimize impacts of runoff.
 - b. **Disconnecting Impervious Surfaces (DIA's):** Impervious surfaces are significantly less of a problem if they are not directly connected to an impervious conveyance system (such as storm sewer). Two basic ways to reduce hydraulic connectivity are routing of roof runoff over lawns and reducing the use of storm sewers. Site grading should promote increasing travel time of stormwater runoff, and should help reduce concentration of runoff to a single point in the development. (See Ordinance Appendix F for additional description)
 - c. **Reducing Street Widths.** Street widths can be reduced by either eliminating on-street parking or by reducing roadway widths. Municipal planners and traffic designers should encourage narrower neighborhood streets which ultimately could lower maintenance.
 - d. **Limiting Sidewalks to One Side of the Street.** A sidewalk on one side of the street may suffice in low-traffic neighborhoods. The lost sidewalk could be replaced with bicycle/recreational trails that follow back-of-lot lines. Where appropriate, backyard trails should be constructed using pervious materials.
 - e. **Reducing Building Setbacks.** Reducing building setbacks reduces impervious cover associated with driveway and entry walks and is most readily accomplished along low-traffic streets where traffic noise is not a problem.

3. **Disconnect/Distribute/Decentralize:** See Section 5.8 of the *Pennsylvania Stormwater Best Management Practices Manual, Pennsylvania Department of Environmental Protection (PADEP) no. 363-0300-002 (2006)*.
 - a. **Routing Roof Runoff Over Lawns.** Roof runoff can be easily routed over lawns in most site designs. The practice discourages direct connections of downspouts to storm sewers or parking lots. The practice also discourages sloping driveways and parking lots to the street. By routing roof drains and crowning the driveway to run off to the lawn, the lawn is essentially used as a filter strip.
 - b. **Reducing the Use of Storm Sewers.** By reducing use of storm sewers for draining streets, parking lots, and back yards, the potential for accelerating runoff from the development can be greatly reduced. The practice requires greater use of swales and may not be practical for some development sites, especially if there are concerns for areas that do not drain in a “reasonable” time. The practice requires educating local citizens and public works officials, who expect runoff to disappear shortly after a rainfall event.
4. **Cluster and Concentrate:** See Section 5.5 of the *Pennsylvania Stormwater Best Management Practices Manual, Pennsylvania Department of Environmental Protection (PADEP) no. 363-0300-002 (2006)*. Cluster developments can also reduce the amount of impervious area for a given number of lots. The biggest savings occurs with street length, which also will reduce costs of the development. Cluster development “clusters” the construction activity onto less sensitive areas without substantially affecting the gross density of development.

In summary, a careful consideration of the existing topography and implementation of a combination of the above mentioned techniques may avoid construction of costly stormwater control measures. Benefits include reduced potential of downstream flooding, water quality improvement of receiving streams/water bodies and enhancement of aesthetics and reduction of development costs. Other benefits include more stable baseflows in receiving streams, improved groundwater recharge, reduced flood flows, reduced pollutant loads, and reduced costs for conveyance and storage.

APPENDIX F: DISCONNECTED IMPERVIOUS AREA (DIA)

ROOFTOP DISCONNECTION

When rooftop downspouts are directed to a pervious area that allows for infiltration, filtration, and increased time of concentration, the rooftop may qualify as completely or partially DIA and a portion of the impervious rooftop area may be excluded from the calculation of total impervious area.

A rooftop is considered to be completely or partially disconnected if it meets the requirements listed below:

- The contributing area of a rooftop to each disconnected discharge is 500 square feet or less, and
- The soil, in proximity of the roof water discharge area, is not designated as hydrologic soil group “D” or equivalent, and
- The overland flow path from roof water discharge area has a positive slope of 5% or less.

For designs that meet these requirements, the portion of the roof that may be considered disconnected depends on the length of the overland path as designated in Table F.1.

Table F.1: Partial Rooftop Disconnection

Length of Pervious Flow Path *	Roof Area Treated as Disconnected
(ft)	(% of contributing area)
0 – 14	0
15 – 29	20
30 – 44	40
45 – 59	60
60 – 74	80
75 or more	100

* Flow path cannot include impervious surfaces and must be at least 15 feet from any impervious surfaces.

If the discharge is concentrated at one or more discrete points, no more than 1,000 square feet may discharge to any one point. In addition, a gravel strip or other spreading device is required for concentrated discharges. For non-concentrated discharges along the edge of the pavement, this requirement is waived; however, there must be a provision for the establishment of vegetation along the pavement edge and temporary stabilization of the area until vegetation becomes stabilized.

REFERENCE

Philadelphia Water Department. 2006. *Stormwater Management Guidance Manual*. Section 4.2.2: Integrated Site Design. Philadelphia, PA.

APPENDIX G: HOT SPOTS

Hot spots are sites where the land use or activity produces a higher concentration of trace metals, hydrocarbons, or priority pollutants than normally found in urban runoff.

1. EXAMPLES OF STORMWATER HOT SPOTS

- vehicle salvage yards and recycling facilities
- vehicle fueling stations
- vehicle service and maintenance facilities
- vehicle and equipment cleaning facilities
- fleet storage areas (bus, truck, etc.)
- industrial sites (based on Standard Industrial Codes defined by the U.S. Department of Labor)
- marinas (service and maintenance)
- outdoor liquid container storage
- outdoor loading/unloading facilities
- public works storage areas
- facilities that generate or store hazardous materials
- commercial container nursery
- other land uses and activities as designated by an appropriate review authority

2. LAND USE AND ACTIVITIES NOT NORMALLY CONSIDERED HOT SPOTS

- residential streets and rural highways
- residential development
- institutional development
- office developments
- nonindustrial rooftops
- pervious areas, except golf courses and nurseries (which may need an Integrated Pest Management (IPM) Plan).

- 3. LIST OF ACCEPTABLE BMPs for Hot Spot Treatment:** The following BMP's listed under the Best Management Practice column are BMPs appropriate for application on hot spot sites. BMPs which facilitate infiltration are prohibited by this ordinance. In many design manuals the BMPs with a * designation are designed with infiltration, however it is possible to design these without infiltration.

The numbers listed under the Design Reference Number column correlate with the Reference Table which lists materials that can be used for design guidance.

Best Management Practice	Design Reference Number
Bioretention*	4, 5, 11, 16

Capture/Reuse	4, 14
Constructed Wetlands	4, 5, 8, 10, 16
Dry Extended Detention Ponds	4, 5, 8, 12, 18
Minimum Disturbance/ Minimum Maintenance Practices	1, 9
Significant Reduction of Existing Impervious Cover	N/A
Stormwater Filters* (Sand, Peat, Compost, etc.)	4, 5, 10, 16
Vegetated Buffers/Filter Strips	2, 3, 5, 11, 16, 17
Vegetated Roofs	4, 13
Vegetated Swales*	2, 3, 5, 11, 16, 17
Water Quality Inlets (Oil/Water Separators, Sediment Traps/Catch Basin Sumps, and Trash/Debris Collectors in Catch Basins)	4, 7, 15, 16, 19
Wet Detention Ponds	4, 5, 6, 8

Reference Table

Number	Design Reference Title
1	“Conservation Design For Stormwater Management – A Design Approach to Reduce Stormwater Impacts From Land Development and Achieve Multiple Objectives Related to Land Use”, Delaware Department of Natural Resources and Environmental Control, The Environmental Management Center of the Brandywine Conservancy, September 1997
2	“A Current Assessment of Urban Best Management Practices: Techniques for Reducing Nonpoint Source Pollution in the Coastal Zone”, Schueler, T. R., Kumble, P. and Heraty, M., Metropolitan Washington Council of Governments, 1992.
3	“Design of Roadside Channels with Flexible Linings”, Federal Highway Administration, Chen, Y. H. and Cotton, G. K., Hydraulic Engineering Circular 15, FHWA-IP-87-7, McLean, Virginia, 1988.
4	“Draft Stormwater Best Management Practices Manual”, Pennsylvania Department of Environmental Protection, January 2005.
5	“Evaluation and Management of Highway Runoff Water Quality”, Federal Highway Administration, FHWA-PD-96-032, Washington, D.C., 1996.
6	“Evaporation Maps of the United States”, U.S. Weather Bureau (now NOAA/National Weather Service) Technical Paper 37, Published by Department of Commerce, Washington D.C., 1959.
7	“Georgia Stormwater Manual”, AMEC Earth and Environmental, Center for Watershed Protection, Debo and Associates, Jordan Jones and Goulding, Atlanta Regional Commission, Atlanta, Georgia, 2001.

8	"Hydraulic Design of Highway Culverts", Federal Highway Administration, FHWA HDS 5, Washington, D.C., 1985 (revised May 2005).
9	"Low Impact Development Design Strategies <i>An Integrated Design Approach</i> ", Prince Georges County, Maryland Department of Environmental Resources, June 1999.
10	"Maryland Stormwater Design Manual", Maryland Department of the Environment, Baltimore, Maryland, 2000.
11	"Pennsylvania Handbook of Best Management Practices for Developing Areas", Pennsylvania Department of Environmental Protection, 1998.
12	"Recommended Procedures for Act 167 Drainage Plan Design", LVPC, Revised 1997.
13	"Roof Gardens History, Design, and Construction", Osmundson, Theodore. New York: W.W. Norton & Company, 1999.
14	"The Texas Manual on Rainwater Harvesting", Texas Water Development Board, Austin, Texas, Third Edition, 2005.
15	"VDOT Manual of Practice for Stormwater Management", Virginia Transportation Research Council, Charlottesville, Virginia, 2004.
16	"Virginia Stormwater Management Handbook", Virginia Department of Conservation and Recreation, Richmond, Virginia, 1999.
17	"Water Resources Engineering", Mays, L. W., John Wiley & Sons, Inc., 2005.
18	"Urban Hydrology for Small Watersheds", Technical Report 55, US Department of Agriculture, Natural Resources Conservation Service, 1986.
19	US EPA, Region 1 New England web site (as of August 2005) http://www.epa.gov/NE/assistance/ceitts/stormwater/techs/html .

4. RECOMMENDED PRE-TREATMENT METHODS FOR "HOT SPOT" LAND

USES: The following table recommends what is considered the best pre-treatment option for the listed land use. These methods are either a BMP or can be applied in conjunction with BMPs.

Hot Spot Land Use	Pre-treatment Method(s)
Vehicle Maintenance and Repair Facilities including Auto Parts Stores	-Water Quality Inlets -Use of Drip Pans and/or Dry Sweep Material Under Vehicles/Equipment -Use of Absorbent Devices to Reduce Liquid Releases -Spill Prevention and Response Program
Vehicle Fueling Stations	-Water Quality Inlets -Spill Prevention and Response Program
Storage Areas for Public Works	-Water Quality Inlets -Use of Drip Pans and/or Dry Sweep Material

	Under Vehicles/Equipment -Use of Absorbent Devices to Reduce Liquid Releases -Spill Prevention and Response Program -Diversion of Stormwater away from Potential Contamination Areas
Outdoor Storage of Liquids	-Spill Prevention and Response Program
Commercial Nursery Operations	-Vegetated Swales/Filter Strips -Constructed Wetlands -Stormwater Collection and Reuse
Salvage Yards and Recycling Facilities*	-BMPs that are a part of a Stormwater Pollution Prevention Plan under an NPDES Permit
Fleet Storage Yards and Vehicle Cleaning Facilities*	-BMPs that are a part of a Stormwater Pollution Prevention Plan under an NPDES Permit
Facilities that Store or Generate Regulated Substances*	-BMPs that are a part of a Stormwater Pollution Prevention Plan under an NPDES Permit
Marinas*	-BMPs that are a part of a Stormwater Pollution Prevention Plan under an NPDES Permit
Certain Industrial Uses (listed under NPDES)*	-BMPs that are a part of a Stormwater Pollution Prevention Plan under an NPDES Permit

*Regulated under the NPDES Stormwater Program

APPENDIX H: WEST NILE VIRUS GUIDANCE

(This source is from the Monroe County, PA Conservation District, who researched the potential of West Nile Virus problems from BMPs due to a number of calls they were receiving.)

Monroe County Conservation District Guidance: Stormwater Management and West Nile Virus

Source: Brodhead McMichaels Creeks Watershed Act 167 Stormwater Management Ordinance Final Draft 2/23/04

The Monroe County Conservation District recognizes the need to address the problem of nonpoint source pollution impacts caused by runoff from impervious surfaces. The new stormwater policy being integrated into Act 167 Stormwater Management regulations by the PA Department of Environmental Protection (PADEP) will make nonpoint pollution controls an important component of all future plans and updates to existing plans. In addition, to meet post-construction anti-degradation standards under the state National Pollution Discharge Elimination System (NPDES) permitting program, applicants will be required to employ Best Management Practices (BMPs) to address non-point pollution concerns.

Studies conducted throughout the United States have shown that wet basins and in particular constructed wetlands are effective in traditional stormwater management areas such as channel stability and flood control, and are one of the most effective ways to remove stormwater pollutants (United States Environmental Protection Agency 1991, Center for Watershed Protection 2000). From Maryland to Oregon, studies have shown that as urbanization and impervious surface increase in a watershed, the streams in those watersheds become degraded (CWP 2000). Although there is debate over the threshold of impervious cover when degradation becomes apparent (some studies show as little as 6% while others show closer to 20%), there is agreement that impervious surfaces cause non-point pollution in urban and urbanizing watersheds, and that degradation is ensured if stormwater BMPs are not implemented.

Although constructed wetlands and ponds are desirable from a water quality perspective there may be concerns about the possibility of these stormwater management structures becoming breeding grounds for mosquitoes. The Conservation District feels that although it may be a valid concern, **municipalities should not adopt ordinance provisions prohibiting wet basins for stormwater management.**

Mosquitoes

The questions surrounding mosquito production in wetlands and ponds have intensified in recent years by the outbreak of the mosquito-borne West Nile Virus. As is the case with all vector-borne maladies, the life cycle of West Nile Virus is complicated, traveling from mosquito to bird, back to mosquito and then to other animals including humans. *Culex pipiens* was identified as the vector species in the first documented cases from New York in 1999. This species is still considered the primary transmitter of the disease across its range. Today there are some 60

species of mosquitoes that inhabit Pennsylvania. Along with *C. pipiens*, three other species have been identified as vectors of West Nile Virus while four more have been identified as potential vectors.

The four known vectors in NE Pennsylvania are *Culex pipiens*, *C. restuans*, *C. salinarius* and *Ochlerotatus japonicus*. All four of these species prefer, and almost exclusively use, artificial containers (old tires, rain gutters, birdbaths, etc.) as larval habitats. In the case of *C. pipiens*, the most notorious of the vector mosquitoes, the dirtier the water the better they like it. The important factor is that these species do not thrive in functioning wetlands where competition for resources and predation by larger aquatic and terrestrial organisms is high.

The remaining four species, *Aedes vexans*, *Ochlerotatus Canadensis*, *O. triseriatus* and *O. trivittatus* are currently considered potential vectors due to laboratory tests (except the *O. trivittatus*, which did have one confirmed vector pool for West Nile Virus in PA during 2002). All four of these species prefer vernal habitats and ponded woodland areas following heavy summer rains. These species may be the greatest threat of disease transmission around stormwater basins that pond water for more than four days. This can be mitigated however by establishing ecologically functioning wetlands.

Stormwater Facilities

If a stormwater wetland or pond is constructed properly and a diverse ecological community develops, mosquitoes should not become a problem. Wet basins and wetlands constructed as stormwater management facilities, should be designed to attract a diverse wildlife community. If a wetland is planned, proper hydrologic soil conditions and the establishment of hydrophytic vegetation will promote the population of the wetland by amphibians and other mosquito predators. In natural wetlands, predatory insects and amphibians are effective at keeping mosquito populations in check during the larval stage of development while birds and bats prey on adult mosquitoes.

The design of a stormwater wetland must include the selection of hydrophytic plant species for their pollutant uptake capabilities and for not contributing to the potential for vector mosquito breeding. In particular, species of emergent vegetation with little submerged growth are preferable. By limiting the vegetation growing below the water surface, larvae lose protective cover and there is less chance of anaerobic conditions occurring in the water.

Stormwater ponds can be designed for multiple purposes. When incorporated into an open space design a pond can serve as a stormwater management facility and a community amenity. Aeration fountains and stocked fish should be added to keep larval mosquito populations in check.

Publications from the PA Department of Health and the Penn State Cooperative Extension concerning West Nile Virus identify aggressive public education about the risks posed by standing water in artificial containers (tires, trash cans, rain gutters, bird baths) as the most effective method to control vector mosquitoes.

Conclusion

The Conservation District understands the pressure faced by municipalities when dealing with multifaceted issues such as stormwater management and encourages the incorporation of water quality management techniques into stormwater designs. As Monroe County continues to grow, conservation design, groundwater recharge and constructed wetlands and ponds should be among the preferred design options to reduce the impacts of increases in impervious surfaces. When designed and constructed appropriately, the runoff mitigation benefits to the community from these design options will far out-weigh their potential to become breeding grounds for mosquitoes.

APPENDIX I: SMALL PROJECT STORMWATER MANAGEMENT (SWM) SITE PLAN

This small project stormwater site plan has been developed to assist those proposing residential projects to meet the requirements of the *Neshaminy Creek Watershed Stormwater Management Plan* Ordinance without having to hire professional services to draft a formal stormwater management plan. This small project site plan is only permitted for residential projects proposing less than or equal to 5,000 square feet of impervious surface and less than 1 acre of earth disturbance.

A. What is an applicant required to submit?

A brief description of the proposed stormwater facilities, including types of materials to be used, total square footage of proposed impervious areas, volume calculations, and a simple sketch plan showing the following information:

- Location of proposed structures, driveways, or other paved areas with approximate surface area in square feet.
- Location of any existing or proposed onsite septic system and/or potable water wells showing proximity to infiltration facilities.
- Bucks or Montgomery County Conservation District erosion and sediment control “Adequacy” letter as required by Municipal, County or State regulations.

B. Determination of Required Volume Control and Sizing Stormwater Facilities

By following the simple steps outlined below in the provided example, an applicant can determine the runoff volume that is required to be controlled and how to choose the appropriate stormwater facility to permanently remove the runoff volume from the site. Impervious area calculations must include all areas on the lot proposed to be covered by roof area or pavement which would prevent rain from naturally percolating into the ground, including impervious surfaces such as sidewalks, driveways, parking areas, patios or swimming pools. Sidewalks, driveways or patios that are designed and constructed to allow for infiltration are not included in this calculation.

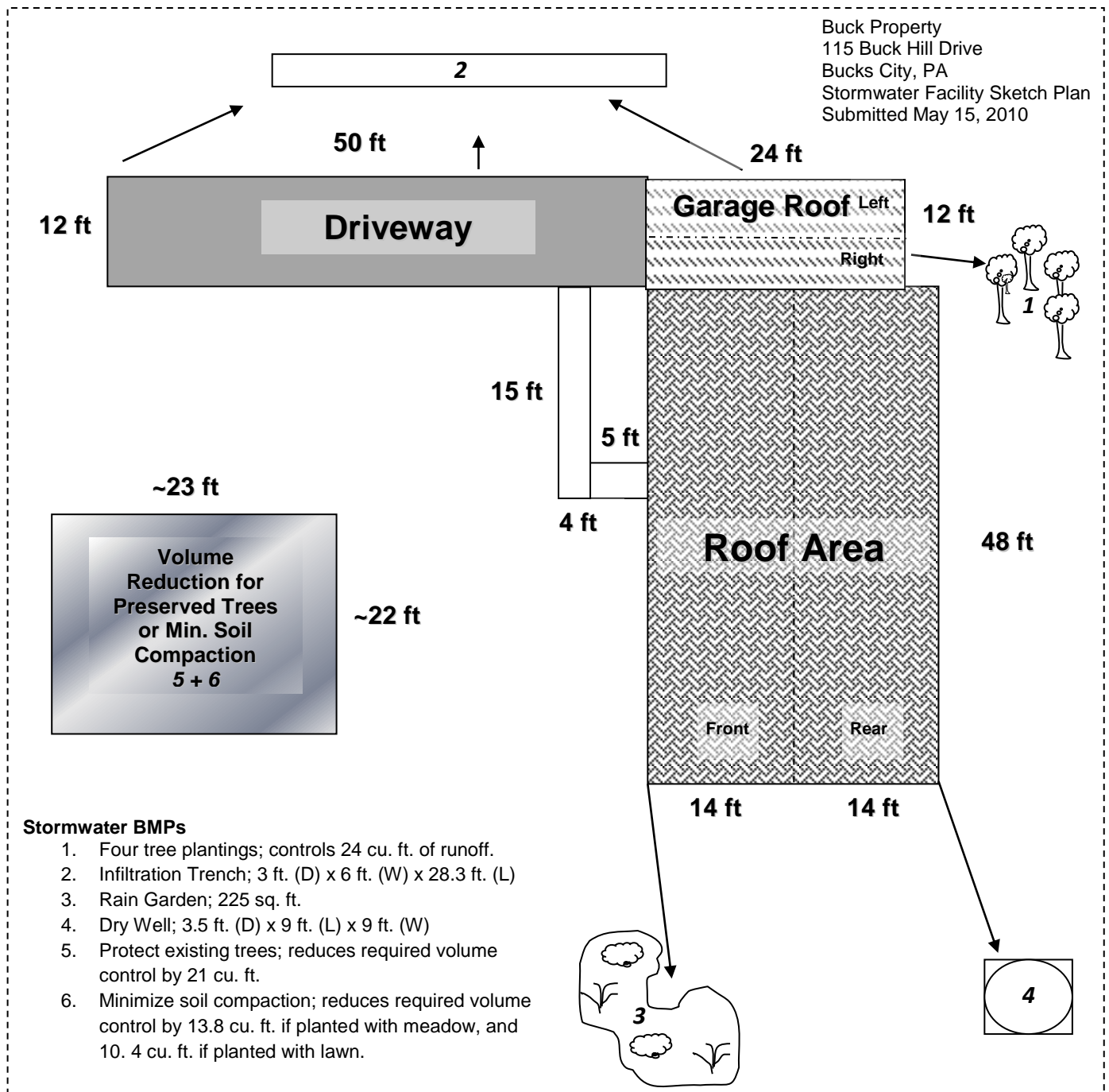
Site Plan Example: Controlling runoff volume from a proposed home site

Step 1: Determine Total Impervious Surfaces

Impervious Surface			Area (sq. ft.)
House Roof (Front)	14 ft. x 48 ft.	=	672 sq. ft.
House Roof (Rear)	14 ft. x 48 ft.	=	672 sq. ft.
Garage Roof (Left)	6 ft. x 24 ft.	=	144 sq. ft.
Garage Roof (Right)	6 ft. x 24 ft.	=	144 sq. ft.
Driveway	12 ft. x 50 ft.	=	1000 sq. ft.
Walkway	4 ft. x 20 ft.	=	80 sq. ft.

	Total Impervious		3000 sq ft

Figure 1: Sample Site Sketch Plan



Step 2: Determine Required Volume Control (cubic feet) using the following equation:

Volume (cu. ft.) = (Total impervious area in square feet x 2 inches of runoff) /12 inches

$$(3,000 \text{ sq. ft.} \times 2 \text{ inches of runoff}) /12 \text{ inches} = 500 \text{ cu. ft.}$$

Step 3: Sizing the Selected Volume Control BMP

Several Best Management Practices (BMPs), as described below, are suitable for small stormwater management projects. However, their application depends on the volume required to be controlled, how much land is available, and the site constraints. Proposed residential development activities can apply both non-structural and structural BMPs to control the volume of runoff from the site. A number of different volume control BMPs are described below. Note that Figure 1 is an example of how these BMPs can be utilized in conjunction to control the total required volume on one site.

Structural BMPs**1. Infiltration Trench**

An Infiltration Trench is a linear stormwater BMP consisting of a continuously perforated pipe at a minimum slope in a stone-filled trench. During small storm events, infiltration trenches can significantly reduce volume and serve in the removal of fine sediments and pollutants. Runoff is stored between the stones and infiltrates through the bottom of the facility and into the soil matrix. Runoff should be pretreated using vegetative buffer strips or swales to limit the amount of coarse sediment entering the trench which can clog and render the trench ineffective. In all cases, an infiltration trench should be designed with a positive overflow.

Design Considerations:

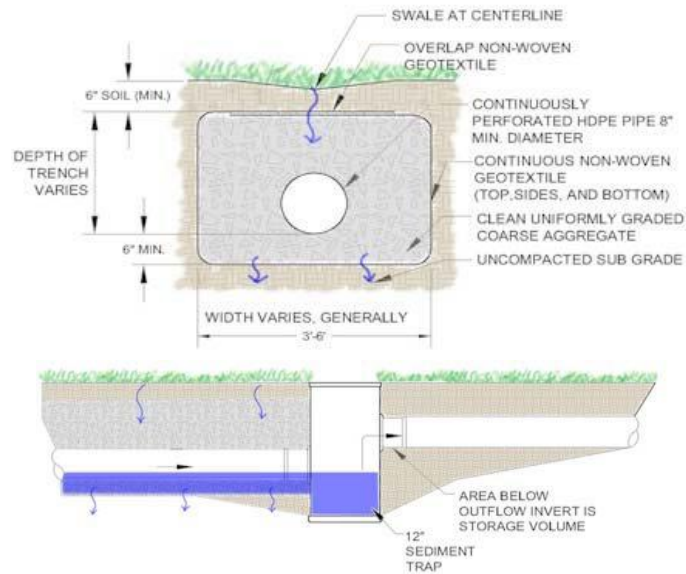
- Although the width and depth can vary, it is recommended that Infiltration Trenches be limited in depth to not more than six (6) feet of stone.
- Trench is wrapped in nonwoven geotextile (top, sides, and bottom).
- Trench needs to be placed on uncompacted soils.
- Slope of the Trench bottom should be level or with a slope no greater than 1%.
- A minimum of 6" of topsoil is placed over trench and vegetated.
- The discharge or overflow from the Infiltration Trench should be properly designed for anticipated flows.
- Cleanouts or inlets should be installed at both ends of the Infiltration Trench and at appropriate intervals to allow access to the perforated pipe.
- Volume of facility = Depth x Width x Length x Void Space of the gravel bed (assume 40%).

Maintenance:

- Catch basins and inlets should be inspected and cleaned at least two times a year.

- The vegetation along the surface of the infiltration trench should be maintained in good condition and any bare spots should be re-vegetated as soon as possible.
- Vehicles should not be parked or driven on the trench and care should be taken to avoid soil compaction by lawn mowers.

Figure 3: Infiltration Trench Diagram



Source: PA BMP Guidance Manual, Chapter 6, page 42.

Figure 4: Example of Infiltration Trench Installation



Source: PA BMP Guidance Manual, Chapter 6, Page 46.

Sizing Example for Infiltration Trench

1. Determine Total Impervious Surface to drain to Infiltration Trench:

Garage Roof (Left)	6 ft. x 24 ft.	=	144 sq ft
Driveway	12 ft. x 50 ft.	=	1000 sq ft
Walkway	4 ft. x 20 ft.	=	80 sq ft

2. Determine the required infiltration volume:

$$(1224 \text{ sq. ft.} \times 2 \text{ inches of runoff}) / 12 \text{ ft.} = 204 \text{ cu. ft.} / 0.4^* = 510 \text{ cu. ft.}$$

(*0.4 assumes 40% void ratio in gravel bed)

3. Sizing the infiltration trench facility:

$$\text{Volume of Facility} = \text{Depth} \times \text{Width} \times \text{Length}$$

Set Depth to 3 feet and determine required surface area of trench.

$$510 \text{ cu. ft.} / 3 \text{ ft.} = 170 \text{ sq ft.}$$

The width of the trench should be greater than 2 times its depth ($2 \times D$), therefore in this example the trench width of 6 feet selected.

$$\text{Determine trench length: } L = 170 \text{ sq. ft.} / 6 \text{ ft.} = 28.3 \text{ ft.}$$

Final infiltration trench dimensions: 3 ft. (D) x 6 ft. (W) x 28.3 ft. (L)

2. Rain Garden

A Rain Garden is a planted shallow depression designed to catch and filter rainfall runoff. The garden captures rain from a downspout or a paved surface. The water sinks into the ground, aided by deep rooted plants that like both wet and dry conditions. The ideal location for a rain garden is between the source of runoff (roofs and driveways) and the runoff destination (drains, stream, low spots, etc).

Design Considerations:

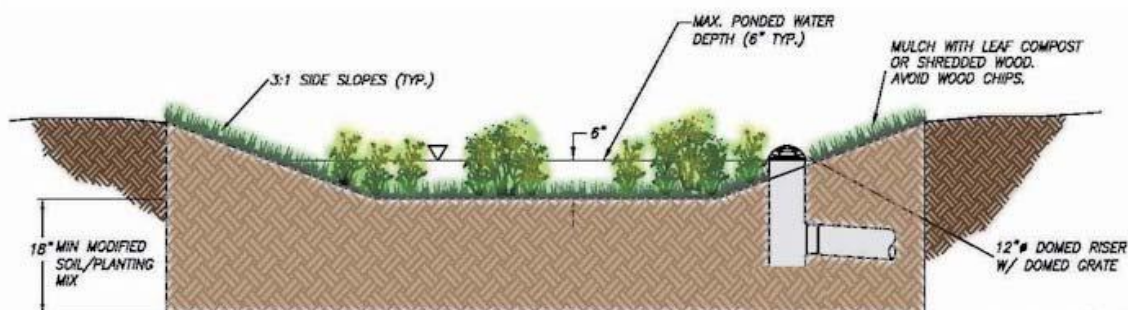
- A maximum of 3:1 side slope is recommended.
- The depth of a rain garden can range from 6 - 8 inches. Pondered water should not exceed 6 inches.
- The rain garden should drain within 72 hours.
- The garden should be at least 10-20 feet from a building's foundation and 25 feet from septic system drainfields and wellheads.
- If the site has clay soils, soil should be amended with compost or organic material.

- Choose native plants. See http://pa.audubon.org/habitat/PDFs/RGBrochure_complete.pdf for a native plant list. To find native plant sources go to www.pawildflower.org.
- At the rain garden location, the water table should be at least 2' below the soil level. If water stands in an area for more than one day after a heavy rain you can assume it has a higher water table and is not a good choice for a rain garden.

Maintenance:

- Water plants regularly until they become established.
- Inspect twice a year for sediment buildup, erosion and vegetative conditions.
- Mulch with hardwood when erosion is evident and replenish annually.
- Prune and remove dead vegetation in the spring season.
- Weed as you would any garden.
- Move plants around if some plants would grow better in the drier or wetter parts of the garden.

Figure 5: Rain Garden Diagram



Source: PA BMP Guidance Manual, Chapter 6 Page 50

Sizing Example for Rain Garden

1. Pick a site for the rain garden between the source of runoff and between a low lying area, a.k.a., a drainage area.
2. Perform an infiltration test to determine the depth of the rain garden:
 - Dig a hole 8" x 8"
 - Fill with water and put a popsicle stick at the top of the water level.
 - Measure how far it drains down after a few hours (ideally 4).
 - Calculate the depth of water that will drain out over 24 hours.
3. Determine total impervious surface area to drain to rain garden:

House Roof (Front)	14 ft. x 48 ft.	=	672 sq ft
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4. Sizing the rain garden:

For this example the infiltration test determined 6" of water drained out of a hole in 24 hours. The depth of the rain garden should be set to the results of the infiltration test so 6" is the depth of the rain garden. The sizing calculation below is based on controlling 1" of runoff. First divide the impervious surface by the depth of the rain garden.

$$(672 \text{ sq ft} * 1 \text{ inch}/6 \text{ inches}) = 112 \text{ sq. ft.}$$

In order to control 2" of runoff volume, the rain garden area needs to be multiplied by 2.

$$112 \text{ sq. ft.} * 2 = 224 \text{ sq. ft.}$$

The rain garden should be about 225 sq. ft. in size and 6" deep.

3. Dry Well (a.k.a., Seepage Pit)

A Dry Well, sometimes called a Seepage Pit, is a subsurface storage facility that temporarily stores and infiltrates stormwater runoff from the roofs of structures. By capturing runoff at the source, Dry Wells can dramatically reduce the increased volume of stormwater generated by the roofs of structures. Roof leaders connect directly into the Dry Well, which may be either an excavated pit filled with uniformly graded aggregate wrapped in geotextile, or a prefabricated storage chamber or pipe segment. Dry Wells discharge the stored runoff via infiltration into the surrounding soils. In the event that the Dry Well is overwhelmed in an intense storm event, an overflow mechanism (surcharge pipe, connection to a larger infiltration area, etc.) will ensure that additional runoff is safely conveyed downstream.

Design Considerations:

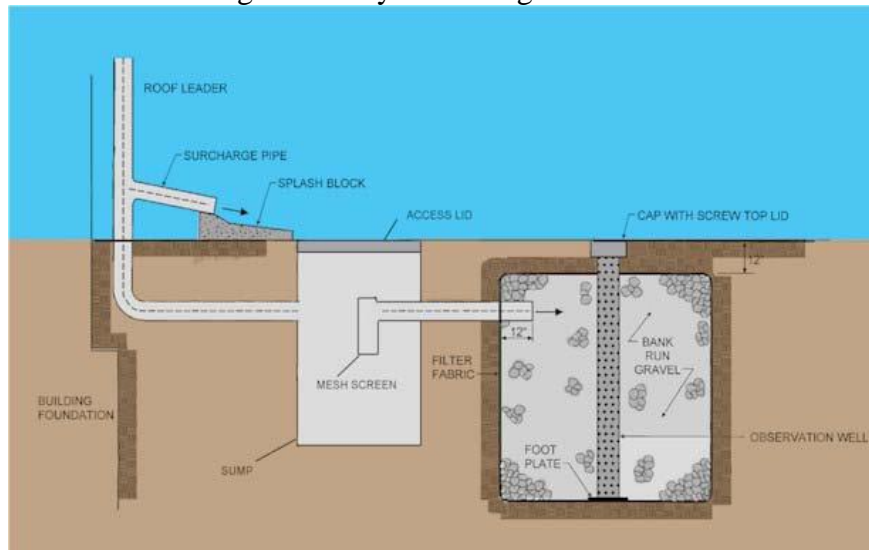
- Dry Wells typically consist of a depth of 18 to 48 inches of clean washed, uniformly graded aggregate with 40% void capacity (AASHTO No. 3, or similar). "Clean" gravel fill should average one and one-half to three (1.5 – 3.0) inches in diameter.
- Dry Wells are not recommended when their installation would create a significant risk for basement seepage or flooding. In general, 10 - 20 feet of separation is recommended between Dry Wells and building foundations.
- The facility may be either a structural prefabricated chamber or an excavated pit filled with aggregate.
- Depth of dry wells in excess of three-and-a-half (3.5) feet should be avoided unless warranted by soil conditions.
- Stormwater dry wells must never be combined with existing, rehabilitated, or new septic system seepage pits. Discharge of sewage to stormwater dry wells is strictly prohibited.

Maintenance:

- Dry wells should be inspected at least four (4) times annually as well as after large storm events.
- Remove sediment, debris/trash, and any other waste material from a dry well.
- Regularly clean out gutters and ensure proper connections to the dry well.

- Replace the filter screen that intercepts the roof runoff as necessary.

Figure 6: Dry Well Diagram



Source: PA BMP Guidance Manual, Chapter 6, Page 65.

Sizing Example for Dry Wells:

1. Determine contributing impervious surface area:

House Roof (Rear)	14 ft. x 48 ft.	=	672 sq. ft.
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2. Determine required volume control:

$$(672 \text{ sq. ft.} \times 2 \text{ inches of runoff}) / 12 \text{ inches} = 112 \text{ cu. ft.}$$

$$112 \text{ cu ft} / 0.4 = 280 \text{ cu. ft. (assuming the 40\% void ratio in the gravel bed)}$$

3. Sizing the dry well:

Set depth to 3.5 ft; Set width equal to length for a square chamber.

$$280 \text{ cu. ft.} = 3.5 \text{ ft.} \times L \times L; L = 9 \text{ ft.}$$

$$\text{Dimensions} = 3.5 \text{ ft. (D)} \times 9 \text{ ft. (L)} \times 9 \text{ ft. (W)}$$

Non-Structural BMPs

1. Tree Plantings and Preservation

Trees and forests reduce stormwater runoff by capturing and storing rainfall in the canopy and releasing water into the atmosphere through evapotranspiration. Tree roots and leaf litter also create soil conditions that promote the infiltration of rainwater into the soil. In addition, trees and forests reduce pollutants by taking up nutrients and other pollutants from soils and water through their root systems. A development site can reduce runoff volume by planting new trees or by preserving trees which existed on the site prior to development. The volume reduction calculations either determine the cubic feet to be directed to the area under the tree canopy for infiltration or determine a volume reduction credit which can be used to reduce the size of any one of the planned structural BMPs on the site.

Tree Considerations:

- Existing trees must have at least a 4" trunk caliper or larger.
- Existing tree canopy must be within 100 ft. of impervious surfaces.
- A tree canopy is classified as the continuous cover of branches and foliage formed by a single tree or collectively by the crowns of adjacent trees.
- New tree plantings must be at least 6 ft. in height and have a 2" trunk caliper.
- All existing and newly planted trees must be native to Pennsylvania. See <http://www.dcnr.state.pa.us/forestry/commontr/commontrees.pdf> for a guide book titled *Common Trees of Pennsylvania* for a native tree list.
- When using trees as volume control BMPs, runoff from impervious areas should be directed to drain under the tree canopy.

Determining the required number of planted trees to reduce the runoff volume:

1. Determine contributing impervious surface area:

Garage Roof (Right)	6 ft. x 24 ft.	=	144	ft
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2. Calculate the required control volume:

$$(144 \text{ sq. ft.} \times 2 \text{ inches of runoff}) / 12 \text{ inches} = 24 \text{ cu. ft.}$$

3. Determine the number of tree plantings:

- A newly planted deciduous tree can reduce runoff volume by 6 cu. ft.
- A newly planted evergreen tree can reduce runoff volume by 10 cu. ft.

$$24 \text{ cu. ft.} / 6 \text{ cu. ft.} = 4 \text{ Deciduous Trees}$$

Determining the volume reduction for preserving existing trees:

1. Calculate approximate area of the existing tree canopy:

$$\sim 22 \text{ sq. ft.} \times \sim 23 \text{ sq. ft.} = 500 \text{ sq. ft.}$$

2. Measure distance from impervious surface to tree canopy: 35 ft.
3. Calculate the volume reduction credit by preserving existing trees:
 - For Trees within 20 feet of impervious cover:
Volume Reduction cu. ft. = (Existing Tree Canopy sq. ft. x 1 inch) / 12
 - For Trees beyond 20 feet but not farther than 100 feet from impervious cover:
Volume Reduction cu. ft. = (Existing Tree Canopy sq. ft. x 0.5 inch) / 12

$$(500 \text{ sq. ft.} \times 0.5 \text{ inches}) / 12 = 21 \text{ cu. ft.}$$

This volume credit can be utilized in reducing the size of any one of the structural BMPs planned on the site. For example, the 21 cu. ft. could be subtracted from the required infiltration volume when sizing the infiltration trench;

$$510 \text{ cu. ft.} - 21 \text{ cu. ft.} = 489 \text{ cu. ft.}$$

$$489 \text{ cu. ft.} / 3 \text{ ft (Depth)} = 163 / 6 \text{ ft. (Width)} = 27.1 \text{ ft (Length)}$$

Using the existing trees for a volume credit would decrease the length of the infiltration trench to 27.1 ft. instead of 28.3 ft.

2. Minimize Soil Compaction and Replant with Lawn or Meadow

When soil is overly compacted during construction it can cause a drastic reduction in the permeability of the soil and rarely is the soil profile completely restored. Runoff from vegetative areas with highly compacted soils similarly resembles runoff from an impervious surface. Minimizing soil compaction and re-planting with a vegetative cover like meadow or lawn, not only increases the infiltration on the site, but also creates a friendly habitat for a variety of wildlife species.

Design Considerations:

- Area shall not be stripped of topsoil.
- Vehicle movement, storage, or equipment/material lay down shall not be permitted in areas preserved for minimum soil compaction.
- The use of soil amendments and additional topsoil is permitted.
- Meadow should be planted with native grasses. Refer to *Meadows and Prairies: Wildlife-Friendly Alternatives to Lawn* at <http://pubs.cas.psu.edu/FreePubs/pdfs/UH128.pdf> for reference on how to properly plant the meadow and for a list of native species.

Determining the volume reduction by minimizing soil compaction and planting a meadow:

1. Calculate approximate area of preserved meadow:

$$\sim 22 \text{ sq. ft.} \times \sim 23 \text{ sq. ft.} = 500 \text{ sq. ft.}$$

2. Calculate the volume reduction credit by minimizing the soil compaction and planting a lawn/meadow:

- For Meadow Areas: Volume Reduction (cu. ft.) = (Area of Min. Soil Compaction (sq. ft.) \times 1/3 inch of runoff) / 12

$$(500 \text{ sq. ft.} \times 1/3 \text{ inch of runoff}) / 12 = 13.8 \text{ cu. ft.}$$

- For Lawn Areas: Volume Reduction (cu. ft.) = (Area of Min. Soil Compaction (sq. ft.) \times 1/4 inch of runoff) / 12

$$(500 \text{ sq. ft.} \times 1/4 \text{ inch of runoff}) / 12 = 10.4 \text{ cu. ft.}$$

This volume credit can be used to reduce the size of any one of the structural BMPs on the site. See explanation under the volume credit for preserving existing trees for details.

Alternative BMP to Capture and Reuse Stormwater

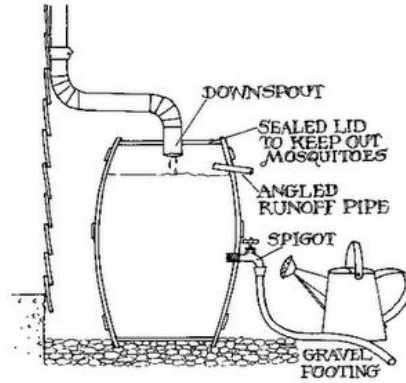
Rain Barrels

Rain barrels are large containers that collect drainage from roof leaders and temporarily store water to be released to lawns, gardens, and other landscaped areas after the rainfall has ended. Rain barrels are typically between 50 and 200 gallons in size. It is not recommended for rain barrels to be used as a volume control BMP because infiltration is not guaranteed after each storm event. For this reason, a rain barrel is not utilized in the site plan example. However, the information is included to provide an alternative for a homeowner to utilize when considering capture and reuse stormwater methods.

Design Considerations:

- Rain barrels should be directly connected to the roof gutter/spout.
- There must be a means to release the water stored between storm events to provide the necessary storage volume for the next storm.
- When calculating rain barrel size, rain barrels are typically assumed to be 25% full because they are not always emptied before the next storm.
- Use screens to filter debris and cover lids to prevent mosquitoes.
- An overflow outlet should be placed a few inches below the top with an overflow pipe to divert flow away from structures.
- It is possible to use a number of rain barrels jointly for an area.

Figure 2: Rain Barrel Diagram and Examples



Sources: (top picture) <http://www.citywindsor.ca/DisplayAttach.asp?AttachID=12348>
 (bottom picture on left) <http://repurposinglife.blogspot.com/2009/05/rainwater-harvesting.html>
 (bottom picture on right) <http://www.floridata.com/track/transplantedgardener/Rainbarrels.cfm>

Sizing Example for a Rain Barrel

1. Determine contributing impervious surface area:

Garage Roof (Right)	6 ft. x 24 ft.	=	144 sq ft
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2. Determine the amount of rainfall to be captured by the Rain Barrel. A smaller storm, no more than 2", is recommended to calculate the runoff to be captured. This example chose the 1" storm event.

3. Calculate the volume to be captured and reused:

$$(144 \text{ sq. ft.} \times 1 \text{ inch of runoff}) / 12 \text{ inches} = 12 \text{ cu. ft.}$$

4. Size the rain barrel:

$$1 \text{ cu. ft.} = 7.48 \text{ gallons}$$

$$12 \text{ cu. ft.} \times 7.48 = 90 \text{ gallons}$$

$$90 \text{ gallons} \times (0.25^*) = 22.5 \text{ gallons} \text{ (*assuming that the rain barrel is always at least 25\% full)}$$

$$90 \text{ gallons} + 22.5 \text{ gallons} = 112 \text{ gallons}$$

The rain barrel or barrels should be large enough hold at least 112 gallons of water.

REFERENCES:

- Center for Watershed Protection and US Forest Service. (2008). *Watershed Forestry Resource Guide*. Retrieved on May 26, 2010 from <http://www.forestsforwatersheds.org/reduce-stormwater/>.
- Department of Environmental Protection. (2006). *Pennsylvania Stormwater Best Management Practices Manual*.
- Wissahickon Watershed Partnership. *Pennsylvania Rain Garden Guide*. Retrieved on May 4, 2010 from http://pa.audubon.org/habitat/PDFs/RGBrochure_complete.pdf.
- Building a Backyard Rain Garden. North Carolina Cooperative Extension. Retrieved on May 4, 2010 from <http://www.bae.ncsu.edu/topic/raingarden/Building.htm>
- Delaware County Planning Commission. (2010). *Draft Crum Creek Watershed Act 167 Stormwater Management Plan. Ordinance Appendix B. Simplified Approach to Stormwater Management for Small Projects*.
- Solebury Township. (2008). *Solebury Township Stormwater Management Ordinance. "Appendix J Simplified Stormwater Management Procedures for Existing Single Family Dwelling Lots"*

APPENDIX J: REFERENCES

Articles / Books

DeBarry, P.A., Yang, E., Traver, R. G., Newman, B., *Determination of Appropriate Infiltration Requirements For Land Development Using the Water Budget Approach – the Darby – Cobbs Experience.*

Low, D.J., Hippie, D.J., Yannacci, D. (2002). *Geohydrology of Southeastern Pennsylvania.* Water-Resources Investigations Report 00-4166.

Jarrett, A.R. (1995). *Water Management.* Dubuque, Iowa. Kendall/Hunt Publishing Co.

Olmsted, F. H. & Hely, A.G. (1962). *Relation between Ground Water and Surface Water in Brandywine Creek Basin, Pennsylvania.* Geological Survey Professional Paper, 417-A, A-1-A-21

Risser, D. W., Cogner, R. W. Ulrich, J.E., and Asmussen, M.P. (2005). *Estimates of Ground-Water Recharge Based on Streamflow - Hydrograph methods, Pennsylvania.* U.S. Geological Survey Open File Report 1005-1333.

United States Environmental Protection Agency. (rev December 2005). *Stormwater Phase II Final Rule Small MS4 Stormwater Program Review.* Fact Sheet 2.0. EPA 833-F-00-002. <http://www.epa.gov/npdes/pubs/fact2-0.pdf>

ACT 167 PLANS

Bucks County Planning Commission & Bucks County Conservation District. (1992). *Neshaminy Creek Watershed Stormwater Management Plan, Volume I.*

Lehigh Valley Planning Commission. (2009). *Perkiomen Creek Headwaters Stormwater Management Plan.*

BMP Manuals

California
California Stormwater BMP Handbook: New Development and Redevelopment (January 2003)
– separate file available at <http://www.cabmphandbooks.org/Development.asp>

Georgia
Georgia Stormwater Management Manual Volume 2: Technical Handbook (August 2001)
separate file (<http://www.georgiastormwater.com/>)

Maryland
2000 Maryland Stormwater Design Manual –
http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp

Massachusetts
Stormwater Management, Volume Two: Stormwater Technical Handbook (Massachusetts, 1997) – separate file available at <http://www.mass.gov/dep/water/laws/swmpolv2.pdf>

Minnesota
Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates (July 2001) – <http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm>

New Jersey
STORMWATER Best Management Practices Manual
http://www.nj.gov/dep/stormwater/bmp_manual2.htm

New York
New York State Stormwater Management Design Manual (2001) –
<http://www.dec.ny.gov/chemical/29072.html>

Pennsylvania
Pennsylvania Stormwater Best Management Practices (2006) –
<http://164.156.71.80/WXOD.aspx?fs=2087d8407c0e00008000071900000719&ft=1>

Washington
Stormwater Management Manual for Western Washington (August 2001) –
<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

Federal

Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring (FHWA) – <http://www.fhwa.dot.gov/environment/ultraurb/3fs1.htm>

USEPA Infiltration Trench Fact Sheet (September 1999) –
<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>

Riparian Buffer References

Alliance for the Chesapeake Bay, Pennsylvania Department of Environmental Protection, September 2000. *Forest Buffer Toolkit*, Stream ReLeaf Program.

Fike, Jean, June 1999. *Terrestrial & Palustrine Plant Communities of Pennsylvania*, Pennsylvania Natural Diversity Inventory, The Nature Conservancy, Western Pennsylvania Conservancy, and Pennsylvania Department of Conservation and Natural Resources.

Palone, R. S. and A. H. Todd (eds), 1997. *Chesapeake Bay Riparian Handbook: A Guide for Establishing and Maintaining Riparian Forest Buffers*. Chesapeake Bay Program and Northeastern Area State and Private Forestry. Natural Resources Conservation Service Cooperative State Research Education and Extension Services.

Penn State College of Agricultural Sciences, 1996. *Establishing Vegetative Buffer Strips Along Streams to Improve Water Quality*. Publication # AGRS-67.

Pennsylvania Association of Conservation Districts, Inc., Keystone Chapter, Soil and Water Conservation Society, Pennsylvania Department of Environmental Protection, Natural Resources Conservation Service, 1998. *Pennsylvania Handbook of Best Management Practices for Developing Areas*. Prepared by CH2MHill.

The Federal Interagency Stream Restoration Working Group (FISRWG, 10/1998). *Stream Corridor Restoration Principles, Processes, and Practices*. GPO Item No. 0120-A; SuDocs No. A57.6/2:EN3/PT.653. ISBN-0-934213-59-3. Published October 1998. Revised August 2000.

Modeling Data

The SCS Type II rainfall curve ~ National Oceanic and Atmospheric Administration (NOAA) Atlas 14 rain data corresponding to the Doylestown rain gage. This data may be retrieved from the Atlas 14 website: http://hdsc.nws.noaa.gov/hdsc/pfds/orb/pa_pfds.html

VI. MCM #6 – POLLUTION PREVENTION / GOOD HOUSEKEEPING

1. Facility Inventory
2. Operation, Maintenance, and Inspection Program for Municipal Vehicle Operations
3. Operation, Maintenance, and Inspection Program for all Municipally Owned Stormwater Facilities
4. Employee Training Program

MCM #6, BMP #1 – Identify all facilities and activities that are owned and operated by the permittee and have the potential for generating stormwater runoff to the regulated small MS4.

- Facilities:
- Streets
 - Stormwater conveyances – open channel and close pipe
 - Borough municipal building and parking lot
 - Borough administration building
 - Two (2) vacant parcels (forest & forest/lawn)
- Activities:
- Right-of-way maintenance
 - Snow removal/de-icing
 - Inlet/outfall cleaning
 - General storm sewer system inspection, maintenance and repair
 - Lawn/ground care
 - Open space maintenance
 - Municipal building maintenance
 - Vehicle operation, fueling, maintenance and washing (all offsite by private facilities)
 - New construction and land disturbance
 - Leaf/yard debris pickup & disposal
 - Tree maintenance
 - Street sweeping

OPERATION, MAINTENANCE AND INSPECTION PROGRAM FOR MUNICIPAL VEHICLE OPERATIONS

FOR

**LANGHORNE MANOR BOROUGH
BUCKS COUNTY, PENNSYLVANIA**

JUNE 2020

The goal of this Operations, Maintenance and Inspection Program (O&M program) is to reduce or prevent pollutant runoff from municipal operations from adversely impacting the storm sewer system or the environment. The only vehicles the Borough owns are two (2) police cars.

Pollution Prevention/Good Housekeeping Procedures for Municipal Operations

Pollution prevention and good housekeeping are the simplest and least costly methods to implement to help protect stormwater quality from municipal facilities. These are integral components to an effective stormwater management policy because it is easier to prevent pollution from entering waterways than to clean it up later.

Good Housekeeping

Good housekeeping practices are designed to maintain a clean and orderly work environment. Often the most effective first step towards preventing pollution in the stormwater collection system simply involves using good common sense to improve basic housekeeping methods. A clean and orderly work area reduces the possibility of accidental spills caused by mishandling of chemicals or equipment and should reduce safety hazards to Borough personnel.

- Maintain clean, dry floors and ground surfaces by using brooms, shovels, vacuum cleaners or cleaning machines. Sweeping shall be conducted as needed to remove dirt and other debris, as well as immediately following loading/unloading activities, when practical.
- Regularly pickup garbage and waste materials and place all trash, dirt, and other debris in their proper receptacles. The Borough's recycling program shall be utilized to collect and properly dispose of paper, plastic, cans, and bottles.

Material Storage Practices

Improper storage can result in the release of materials or chemicals that can cause stormwater runoff pollution. Keep storage areas clean and well organized and provide adequate aisle space to facilitate material transfer and easy access for inspections.

- All containers, drums, and bags shall be stored away from direct traffic routes to prevent accidental spills.
- When practical, chemicals, fluids, and supplies should be kept indoors.
- If containers containing chemicals are stored outside, they must be covered when not being used and placed on spill platforms.
- All containers shall be properly labeled or marked and kept in good condition and tightly closed when not in use.
- Perform regular inspections of all indoor and outdoor storage locations.

Materials Handling Practices

Absorbent material, spill kits and drip pans must be kept near any potential spill hazard and protected from rainfall. If spills or accidents occur, contain with dikes, berms, or appropriate absorbent materials and dispose of properly after use. Spills of hazardous materials require special care and should only be attempted by trained Borough or contracted personnel. Notify appropriate emergency responders immediately if potential harmful conditions exist. Collect all waste fluids in properly labeled containers and dispose of properly.

Municipal Vehicle Operation, Inspection and Maintenance

Municipal Vehicle Operation

The Borough owns two (2) police vehicles. Only police officers are authorized to drive these municipal vehicles.

All municipal vehicles will be operated in a safe and legal manner that reduces the likelihood of accidents, and which reduces the potential for pollution to enter the municipal storm sewer system or to the environment. This includes obeying all road and traffic rules, and being alert at all times, especially during normal maintenance and refueling activities.

In the event of a vehicle pollution incident involving either vehicle fuels or cargo, all attempts will be made to prevent the spilled material(s) from entering the storm sewer system or nearby waterways. This could include diking, damming, absorbing, or removing the material from the affected area. All recovered material will be properly disposed of in accordance with all applicable state and federal waste disposal regulations.

For any spill beyond the Borough's first responders ability to address the Bucks County Emergency Management Agency will be contacted to provide assistance. Remediation companies could also be contacted, as needed, to provide assistance. An up to date list of appropriate

contractors will be maintained and readily available. A list of other entities to be contacted (PADEP, PA Fish and Boat Commission, water users/intakes, etc.) will also be maintained and available. This list is contained in the Borough's Emergency Operations Plan.

Municipal Vehicle Maintenance

All police vehicle maintenance is contracted out and performed offsite at private facilities.

Equipment is stored inside with proper preventative drainage.

Areas containing spillage or contaminants will not be washed so that the runoff could enter the storm sewer system. Dry cleanup methods will be utilized as much as possible.

Drip pans or containers will be used for all leaking vehicles. Outdoor vehicle storage areas will be periodically inspected to check for evidence of uncontrolled leakage.

Vehicle storage areas will be routinely inspected to determine the effectiveness of the pollution prevention program. Inspection records will be maintained and any deficiencies will be promptly addressed.

Municipal Vehicle Fueling

All police vehicle fueling is done offsite.

Municipal Vehicle Washing

All police vehicle washing is done offsite at private facilities (local car wash).

This O&M manual will be reviewed periodically and revised as needed.

OPERATION, MAINTENANCE AND INSPECTION PROGRAM FOR ALL MUNICIPALLY OWNED STORMWATER FACILITIES

FOR

LANGHORNE MANOR BOROUGH BUCKS COUNTY, PENNSYLVANIA

JUNE 2020

The goal of this Operations, Maintenance and Inspection Program (O&M program) is to ensure that all of Langhorne Manor Borough's storm water management facilities are functioning properly and to prevent or reduce pollutant runoff to the maximum extent practical. All components of the municipal storm sewer collection system will be included in this program. These components include municipal roads and parking lot; storm sewer inlets, piping and outfalls; and swales, ditches or other storm water conveyances. The Borough does not own or maintain any detention/retention basins or other BMP type of stormwater management structures. All work on the Borough's stormwater facilities is conducted by outside contractors, which are required to follow the procedures outlined in this manual.

Pollution Prevention/Good Housekeeping Procedures for Municipal Operations

Pollution prevention and good housekeeping are the simplest and least costly methods to implement to help protect stormwater quality from municipal facilities. These are integral components to an effective stormwater management policy because it is easier to prevent pollution from entering waterways than to clean it up later. The Borough does not have a Public Works Department or similar operation. The Borough hires individual contractors, as required, to perform municipal operations.

Good Housekeeping

Good housekeeping practices are designed to maintain a clean and orderly work environment. Often the most effective first step towards preventing pollution in the stormwater collection system simply involves using good common sense to improve basic housekeeping methods. A clean and orderly work area reduces the possibility of accidental spills caused by mishandling of chemicals or equipment and should reduce safety hazards to Borough personnel.

- Maintain clean, dry floors and ground surfaces by using brooms, shovels, vacuum cleaners or cleaning machines. Sweeping shall be conducted as needed to remove dirt and other debris, as well as immediately following loading/unloading activities, when practical.
- Regularly pickup garbage and waste materials and place all trash, dirt, and other debris in their proper receptacles. The Borough's recycling program shall be utilized to collect and properly dispose of paper, plastic, cans, and bottles.

Material Storage Practices

Improper storage can result in the release of materials or chemicals that can cause stormwater runoff pollution. Keep storage areas clean and well organized and provide adequate aisle space to facilitate material transfer and easy access for inspections.

- All containers, drums, and bags shall be stored away from direct traffic routes to prevent accidental spills.
- When practical, chemicals, fluids, and supplies should be kept indoors.
- If containers containing chemicals are stored outside, they must be covered when not being used and placed on spill platforms.
- All containers shall be properly labeled or marked and kept in good condition and tightly closed when not in use.
- Perform regular inspections of all indoor and outdoor storage locations.

Materials Handling Practices

Absorbent material, spill kits and drip pans must be kept near any potential spill hazard and protected from rainfall. If spills or accidents occur, contain with dikes, berms, or appropriate absorbent materials and dispose of properly after use. Spills of hazardous materials require special care and should only be attempted by trained Borough or contracted personnel. Notify appropriate emergency responders immediately if potential harmful conditions exist. Collect all waste fluids in properly labeled containers and dispose of properly.

Stormwater Facility Operation, Inspection and Maintenance

Stormwater Facility Operation

All municipally owned stormwater facilities will be operated according to their design specifications and in a manner that prevents or reduces adverse environmental or public health and safety impacts.

Stormwater Facility Inspection

Inspections are to be conducted by Langhorne Manor Borough inspectors or outside contractors to evaluate the performance of the stormwater facilities and to determine the potential amounts of

pollutants, trash and debris entering and discharging from the stormwater collection system. These inspections should occur on an as needed basis.

- Inspections will check for excessive silt build-up, erosion, collapsed pipes, misaligned joints and water quality concerns such as unusual algae growth, discolored water, water with a sheen, and suspect odors.
- When possible inspections will occur after severe weather conditions, such as heavy rains, to ensure they are working properly and are clear of debris. Inspection frequencies will depend on a variety of factors including weather conditions, manpower availability and type and function of the stormwater structures.
- All inspection activities, results and recommendations are to be documented in writing and kept on file with the Borough. Typical records to be retained for future reference include a log of all inspections, repairs and maintenance performed at the site, copies of inspection reports, invoices for work performed, and photographs of facilities.

Roadways and Parking Lot

Langhorne Manor Borough owns and maintains approximately 6.3 miles of Borough roadways and 1 parking lot. There are approximately 2.1 miles of state owned and maintained roads that are located within the Borough. These PennDOT roads include the following:

U.S. Route 1, Hulmeville Avenue, Bellevue Avenue and Comly Avenue.

- The overall condition and cleanliness of Borough roads and parking lot shall constantly be inspected and evaluated during routine travels by Borough inspectors, officials and personnel.
- Those areas with excessive staining, trash or sediment will be investigated and scheduled for cleaning or repairs as necessary.
- Appropriate corrective actions shall be considered for any areas exhibiting flooding or poor drainage patterns.

Storm Drain Inlets

Langhorne Manor Borough owns and maintains approximately 89 storm drain inlets located along roadways throughout the Borough. They are primarily PennDOT Type C, PennDOT Type M and City inlets. Inspections are to be conducted by Langhorne Manor Borough inspectors or outside contractors.

- Inspect all Borough storm drain inlets on an as-needed basis to determine the trash and sediment load and overall condition of the structure. If the depth of deposits is greater than or equal to one-third the depth from the basin bottom to the invert of the lowest pipe or opening into or out of the basin, cleaning will be scheduled.
- Storm drain inlets that accumulate trash and deposits quickly will be inspected more frequently and the drainage area will also be inspected to determine possible causes.
- Inlet grates will be inspected to ensure that there is no trash blocking the inlets, especially before heavy rains are forecast.

- While inspecting storm drains inlets, personnel will check for evidence of illegal dumping or illicit discharges. If evidence of illegal dumping or illicit discharges is found, efforts are to be made to identify the source of these discharges.

Storm Sewer Piping, Drainage Channels, and Outfalls

The Borough owns approximately 2 miles of underground storm sewer piping ranging in size from 12 inches to 54 inches. The age of the piping ranges from over 60 years old to new pipe that was recently installed. The piping is constructed of a variety of materials. The majority is constructed of reinforced concrete pipe, however there are storm sewers constructed of corrugated metal pipe, cast iron/ductile iron pipe, PVC pipe and polyethylene pipe. The Borough maintains several ditches and swales that function as storm drainage channels.

- Open conveyances will be periodically inspected by Borough inspectors or outside contractors to check for trash, debris, sediment build-up, obstructions and general water quality conditions.
- Piping will be periodically inspected as needed by Borough inspectors or outside contractors to check for structural integrity, blockages, or any other unusual conditions such as improper cross-connections or excessive inflow/infiltration.

Similarly, storm sewer outfall structures are to be inspected in accordance with the requirements of the Borough's NPDES MS4 permit to check for structural integrity and any erosion. There are approximately 18 outfalls in the Borough; 16 drain to the Neshaminy Creek watershed and 2 drain to the Mill Creek watershed. While inspecting storm sewer outfall structures, Borough personnel or outside contractors are to check for evidence of dry weather discharges that may indicate an illicit discharge to the storm sewer system. If evidence of an illicit discharge is found, efforts are to be made to trace the dry weather flow and identify the source of this discharge

Stormwater Facility Maintenance and Repair

Langhorne Manor Borough's storm water facility O&M program is structured to provide inspections of all facilities and to provide maintenance as needed. Although the operable life of stormwater facilities is generally expected to be several decades or more, lack of maintenance resulting in overgrown vegetation, accumulated sediment and debris, and deteriorated structures can greatly reduce their effectiveness. Without regular operation and maintenance programs, these facilities may not store or convey stormwater according to their design, and may require frequent repair or even replacement. Regular maintenance allows facilities to operate as designed for their maximum lifetime, enabling optimum flood control and water quality treatment as well as demonstrating to the public that stormwater capital investments are being protected in a systematic, responsible and cost-effective manner.

All maintenance activities are to be documented in writing and kept on file with the Borough. When possible, pictures will be taken of various storm sewer system components to document before and after maintenance conditions.

Roadways and Parking Lot

Langhorne Manor Borough is responsible for repairs and maintenance of all Borough roadways and parking lot. Roadway maintenance activities that can affect stormwater quality include roadway paving repair, traffic line painting, snow removal and de-icing, and street sweeping. If road paving, repairs or line painting is needed, the work will be performed by outside contractors. The following guidelines should be followed:

Roadway Paving Repair

- Avoid paving activities during wet weather.
- Ensure that roadside ditches are protected. During wet weather on uncurbed roadways, use temporary berms or dikes at the edge of the road to prevent sediment, debris and waste materials from washing into roadside ditches.
- Ensure that storm drain inlets and open manholes are protected during road repair work to prevent slurry mixes, dust, and debris from entering the storm sewers.
- Avoid using water to clean up. Mechanically sweep and/or vacuum dust and debris following all activities. DO NOT wash residue into the storm drain system.
- Place stockpiles away from waterways and stormwater inlets to prevent materials from being washed into streams. Cover stockpiles or contain with berms.
- Contain water and wastes generated during cleaning and flushing of spray equipment and field servicing of equipment. Use inlet protection and allow area to dry before uncovering storm drain inlets.
- Recycle used materials such as asphalt. Store these materials properly.
- Use drip pans to contain leaks from vehicles and equipment parked at the site overnight.

Traffic Line Painting

- Develop paint-handling procedures for proper use, storage and disposal of paints to keep the material contained.
- Protect storm drain inlets, open manholes and roadside ditches during grinding and pressure washing activities.
- Avoid using water to clean up. Mechanically sweep and/or vacuum grindings and dust following all activities. DO NOT wash residue into the storm drain system.
- Contain water and wastes generated during cleaning and flushing of equipment and field servicing of equipment. Use inlet protection and allow area to dry before uncovering storm drain inlets.

Snow Removal and De-Icing

The storage and application of materials used for roadway de-icing or traction control shall be conducted in a manner that reduces the impact to the storm sewer system and the environment.

Langhorne Manor Borough uses salt and cinders for de-icing. All de-icing material is applied by outside contractors and stored outside the Borough limits.

- The application of road salt and other materials to roads or parking lot will be only enough to accomplish the task and will take into consideration site specific characteristics such as road width and design, traffic concentration, and proximity to surface waters.
- All operators of snow plows/salt spreaders are to be trained in the proper application rates of road salt. The salt spreaders are to be examined before operating to ensure they are functioning properly.
- Road salt application should not occur until snow has started to fall, to help ensure that the dry salt is not swept off the roadways by vehicles.

Street Sweeping

The Borough's roads are to be swept on an as-needed basis. The Borough's street sweeping program helps to keep the streets and storm drain inlets clear of debris and occurs in coordination with the Borough's street overlay activities.

Prior to the installation of new roadway overlay, the street is swept as are the streets in the general area. The street sweeping program generally ensures that all streets in the Borough are swept on an as-needed basis. Roadway cleaning should occur after the winter de-icing season is over, in order to remove accumulated materials. Roadway cleaning may also occur under conditions when oil spill clean up materials such as sand or oil dry are applied. This will prevent these oil contaminated materials from being washed into the storm sewer system.

Storm Drain Inlets

Langhorne Manor Borough shall schedule cleaning of municipal storm drain inlets when inspections reveal an excessive accumulation of sediment or debris. Storm sewer inlet grating will also be cleaned as necessary. Structural repairs to any part of storm drain inlets will be performed as needed including replacement of damaged or deficient piping.

Storm Sewer Piping, Drainage Channels, and Outfalls

If inspections of storm sewer piping reveal structural deficiencies, cross-connections, tree roots, sediment build-up or obstructions, then the appropriate maintenance solution will be selected and implemented as soon as possible. These solutions may include excavation and repair, tree root removal, and physical cleaning. Chemical agents will not be utilized. For cleaning techniques such as jet/vactor use, rodding or bucketing, the downstream end of the pipe will be blocked off and the debris will be captured and removed from the system.

- For storm culverts, ditches and swales, maintenance of free flowing conditions will be achieved by physical removal of any debris, sediment or overgrown vegetation.
- For storm sewer easements, the Borough will remove any obstruction that is identified.
- Trash/obstructions will be removed at outfalls to maintain free flowing conditions.
- Velocity reducers will be maintained or replaced as needed.

Disposal of Debris

Any materials recovered from any part of the storm sewer collection system will be handled and disposed of in accordance with all applicable state and federal disposal regulations. All recovered materials, especially those from storm drain inlets and piping, will be evaluated to determine if it is municipal, residual or hazardous waste.

The following are guidelines for the proper disposal of materials recovered from municipal operations. Recovered materials that need to be disposed of can be classified as municipal, residual or hazardous waste. Most of the typical materials recovered by Borough contractors will be municipal wastes that can be discarded with the Borough's normal waste stream. This includes street sweeping, storm drain inlet cleaning, sewage contaminated soils, and general trash that is not obviously or knowingly contaminated. If medical wastes are recovered, they are classified as "special handling municipal waste." If Borough contractors discover waste that they believe to be hazardous or medical waste, they should immediately contact the Borough and inform them of the situation. The Borough is to contact the Fire Department and Haz-Mat team as appropriate for proper disposal of the waste.

Recovered leaves will be brought back to the municipal landfill. Recovered trash, street sweeping, and general debris will be brought back to the municipal landfill where it will be discarded along with normal Borough waste stream. Any item that can be recycled (e.g. glass, paper, plastic, metal) should be recycled.

Residual waste is nonhazardous industrial waste. Examples of residual wastes include oil contaminated materials, asbestos piping, and used tires and oils. Asphalt millings are classified as a co-product if stored and managed properly; otherwise it is residual waste.

Disposal of residual wastes will be subject to the requirements of the disposal facility. Chunks of cured asphalt are classified as clean fill and can be used as clean fill, but can not be placed in waterways (e.g. creeks, wetlands) or floodways. If used asphalt will not be used as clean fill, it must be disposed of as residual waste.

It ultimately will be up to the contractors that are collecting or handling recovered materials to determine the proper waste designation and disposal methods. Any questions can be directed to the local solid waste authority or the Department of Environmental Protection's Waste Management Program at (484) 250-5760.

For further waste disposal and recycling information, go to the website <http://www.depweb.state.pa.us/landrecwaste/cwp/view.asp?a=1239&q=462668>.

Fertilizers, Herbicides and Pesticides

Any planned herbicide or pesticide application on Borough lands or around any part of the storm sewer collection system will be reviewed by Langhorne Manor Borough personnel in order to assure compliance with all applicable regulations and to prevent adverse water quality impacts.

- Applications will only be conducted by contractors who have an appropriate applicators license from the PA Department of Agriculture.
- Fertilizers, herbicides, and pesticides shall be applied exactly according to manufacture guidelines, as more is not always better in the case of chemical application. The use of these chemicals will be limited as much as possible and non-hazardous alternatives shall be encouraged.

This O&M manual will be reviewed periodically and revised as needed.

Christopher Peterson

From: Christopher Peterson
Sent: Tuesday, June 23, 2020 8:28 AM
To: Langhorne Manor Borough; Charlie Pluguez (cpluguez@biuinc.com)
Cc: Bill McTigue (William.mctiguejr@verizon.net); 'ALICIA GASPAROVIC'
Subject: LMB MS4 - Employee Training Program
Attachments: (2019-6-23) LMB Employee MS-4 Training.pdf; Langhorne Manor Borough Outfall Map With Storm Sewerssheds & Land Uses.pdf; Sample Collection Field Sheet Form.doc

Barbara & Charlie,

As you are aware, DEP requires that Borough develop and implement a program with the goal of preventing or reducing pollutant runoff from municipal operations . This program must include municipal staff training on pollution prevention measures as required under MCM 6: Pollution Prevention / Good Housekeeping section of the Langhorne Manor Borough's MS4 permit. As such, I am providing you with the attached Langhorne Manor Borough MS4 – Employee Training Program Manual which shall serve as your training on various aspects of pollution prevention, and better inform you of general stormwater considerations. Please take the requisite time to review the attached materials, and let me know if you have any questions or revisions you would like to incorporate to the training program.

Thank you, and have a nice week.

Regards,
Christopher A. Peterson, P.E.
Carroll Engineering Corporation
Telephone: 215-343-5700 x265
cpeterson@carrollengineering.com

Langhorne Manor Borough

MS4 - EMPLOYEE TRAINING PROGRAM



PREPARED BY:

**CARROLL ENGINEERING CORPORATION
949 EASTON ROAD
WARRINGTON, PENNSYLVANIA 18976**

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STORMWATER MANAGEMENT EMPLOYEE TRAINING:

I. Purpose:

The purpose of this document is to establish an in-house stormwater management training program for Langhorne Manor Borough. This plan has been compiled with the intent to train Borough personnel about stormwater management, potential sources of contaminants, and Best Management Practices (BMPs). The success of this training program will rely heavily on commitment from Borough personnel to study the following document, provide input as necessary to revise the comprehensive training program, and continue utilize of past stormwater management training.

The items laid out in this employee training program shall be reviewed no less than once annually to ensure all Borough employees are informed of any updates to the stormwater management procedure and the stormwater management facilities for which the Borough is responsible.

II. Best Management Practice (BMP) Monitoring:

Public Works staff shall be made aware of BMPs in place that the Borough is responsible for maintaining and the procedures required to keep these BMPs functioning properly. In the event that a new BMP is added to the Borough Stormwater Management program, all responsible staff shall be educated on proper maintenance technique and frequency.

III. Stormwater Management Facility Inspection and Record Keeping:

Presently, there are no public stormwater BMPs within the Borough that require regular maintenance or inspection. However, the recently approved Pollutant Reduction Plan proposes to retro-fit approximately 1,761 LF of existing roadside swales into bioswales/vegetated swales, or infiltration trenches along Station Avenue, and/or retro-fit approximately 1,104 LF of existing roadside swales into bioswales/vegetated swales, or infiltration trenches along Hill Avenue. Each of these BMP's will be located in the Neshaminy Creek Watershed, and are projected to reduce sediment loading by approximately 17,888 lbs/year. Once these BMPs have been implemented they will require regular maintenance which shall be as follows:

Parties responsible for ongoing O&M (Operation & Maintenance): Langhorne Manor Borough will be responsible to operate and maintain all stormwater BMPs implemented on municipal property. For stormwater BMPs implemented on private property, the Borough will work with property owners to develop a mutually-agreed upon Operation & Maintenance Agreement to ensure that the implemented BMPs function as designed to minimize the sediment and nutrient loading rates to local surface streams.

BMP 1 & 2: Bioswale & Vegetated Swale

1. Activities involved with O&M and frequency at which they will occur for the BMP:

A bioswale is an excavated shallow channel, densely planted with native vegetation to treat and capture stormwater runoff. A bioswale is a type of vegetated swale, and for purposes of simplicity, the maintenance responsibilities for each of these BMP's shall be the same. These BMP's function to reduce stormwater volumes and stormwater pollutants that may otherwise discharge to local surface waters. Additional benefits of constructing a bioswale/vegetated swale include reducing the rate of stormwater conveyance, recharging groundwater supplies,

reducing stormwater temperature impacts, enhancing evapotranspiration, providing habitat, and expanding bio-diversity. To ensure that bioswales continue to function as designed, regular O&M activities must occur as follows:

- Bioswales/vegetated swales should be inspected at least two times per year and after significant storm events for sediment buildup, surface erosion, vegetative conditions, and debris/trash collection.
- To ensure native vegetation successfully establishes and to minimize competition for sunlight, water, and nutrients, all invasive and unwanted weeds should be removed. Growing trees and shrubs should be pruned as needed to remove dead branches. All vegetation should be inspected twice per year to evaluate health.
- Trash and other detritus should be removed annually or as needed.
- Perennial plantings may be cut down at the end of the growing season. All plant debris should be removed to prevent accumulation.
- The ground surface should always be covered by vegetation and/or mulch. Any bare areas should be planted and/or mulched to minimize erosion and sedimentation.
- Reseed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming.
- Rototill and replant swale if draw down time is more than 72 hours.
- Inspect and correct check dams, if applicable, when signs of altered water flow are identified.
- Water during dry periods, fertilize, and apply pesticide only when necessary.

O&M activities to be performed annually, and within 48 hours of a rain event >1 inch/24 hours:

- Inspect and correct erosion problems, damage to vegetation, and sediment and debris accumulation.
- Remove sediment when >3 inches accumulates at any spot or is covering the vegetation. Inspect vegetation on side slopes for erosion and formation of rill or gullies, correct as needed. Inspect for pools of standing water; dewater and discharge to an approved location and restore to design grade.
- Inspect for uniformity in cross-section and longitudinal slope, correct as needed.
- Inspect associated stormwater facilities such as inlets, pipes, and curb cuts, for signs of erosion or blockage; correct as needed.

BMP 2: Infiltration Trench

1. Activities involved with O&M and frequency at which they will occur for the BMP:

An Infiltration Trench is a linear stormwater BMP consisting of a continuously perforated pipe at a minimum slope in a stone-filled trench (Figure 6.4-1). Usually an Infiltration Trench is part of a conveyance system and is designed so that large storm events are conveyed through the pipe with some runoff volume reduction. During small storm events, volume reduction may be significant and there may be little or no discharge. Additional benefits of constructing a

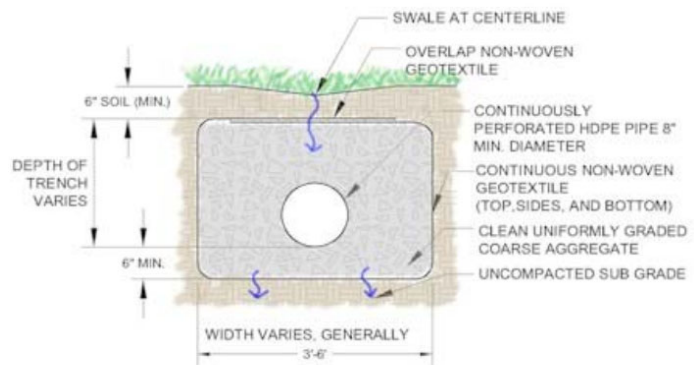


Figure 6.4-1

infiltration trench include reducing the rate of stormwater conveyance, recharging groundwater supplies, and reducing stormwater temperature impacts. To ensure that infiltration trenches continue to function as designed, regular O&M activities must occur as follows:

- Infiltration trenches should be inspected at least two times per year and after significant storm events for sediment buildup, surface erosion, vegetative conditions, and debris/trash collection.
- Vegetation and/or stone lining at the surface should be maintained in good condition.
- Trash and other detritus should be removed annually or as needed.
- The ground surface should always be covered by vegetation and/or stone lining. Any bare areas should be planted and/or re-stoned to minimize erosion and sedimentation.
- Reseed bare areas; install appropriate erosion control measures when native soil is exposed, or erosion channels are forming.
- Vehicles should not be parked or driven on a vegetated Infiltration Trench, and care should be taken to avoid excessive compaction by mowers.

O&M activities to be performed annually, and within 48 hours of a rain event >1 inch/24 hours:

- Inspect and correct erosion problems, damage to vegetation, and sediment and debris accumulation.
- Inspect for uniformity in cross-section and longitudinal slope, correct as needed.
- Inspect associated stormwater facilities such as inlets, pipes, and curb cuts, for signs of erosion or blockage; correct as needed.

IV. Spill Prevention and Cleanup Procedure:

In the event of a spill, the following protocol should be followed:

1. Identify the spilled or released material before beginning the cleanup procedure.
2. Identify stormwater facilities in the vicinity of the spill. If there is storm sewer or roadside drainage way in the area measures should be taken to prevent the spill from entering the system.
3. If the spill has already entered the storm sewer or roadside drainage way, measures should be taken to prevent further contaminants from entering the downstream area. Clean up will be required along the entire flow path to the conveyance's termination.
4. If there is a facility-specific spill response plan for the facility where the spill took place, follow the procedure laid out in the plan. If there is no established procedure develop a reasonable procedure for identifying, reporting, and cleaning up the spill. In the case of an emergency, the Northeast Regional Pennsylvania Department of Environmental Protection Emergency Response office can be reached 24/7 at 570-826-2511.
5. Facilities with potential spill risks should have response equipment available near loading and storage areas for prompt cleanup. Different chemicals can require different cleanup methods; the appropriate equipment for the chemicals transferred, stored, and used shall be located on-site.
6. Promptly clean up any spill of liquid or solid wastes. Do not hose down an area to clean or handle a spill unless the liquid will be completely contained, cleaned up, and disposed of as appropriate for the waste type. There should be no discharge to storm drains, landscape, or pavement.
7. Shop rags may be used for cleaning up drips and small spills; do not saturate rags. Paper towels should not be used under any circumstance to clean up hazardous wastes. Rags used to clean up hazardous wastes must be handled in compliance with Pennsylvania hazardous waste regulations and guidance procedures.
8. For larger spills, a dedicated shop vacuum, wet mop, or absorbent materials should be used. Similarly, all hazardous wastes including vacuum filters, mop heads and any absorbent materials used must be handled in compliance with Pennsylvania hazardous waste regulations and guidance procedures.
9. Do not use drains without knowing whether they connect to the sanitary sewer, storm system, or self-contained internal sump. Confirm before using drains to ensure proper disposal.
10. Prevention is the best spill control. Review the associated material safety data sheets for spill prevention procedures.
11. Use spill response kits for handling spills and leaks in the field. These kits are sized according to the equipment in use from large construction equipment (such as excavators) to small hand-held tools (such as chain saws).

V. Illicit Discharge Detection and Elimination:

An illicit (illegal) discharge is any discharge to a municipal storm sewer system—storm drains, pipes, and ditches—that is not composed entirely of stormwater. Pollutants end up in storm sewer systems in a number of ways, many of which are easily preventable.

Per MCM #3, BMP #4 of the MS4 permit, inspections of the Borough's outfalls / observation points should be conducted periodically, and should be prioritized according to the perceived chance of an illicit discharge within the outfall's contributing drainage area. Carroll Engineering Corporation has assumed responsibility for conducting outfall observations to satisfy the permit conditions. These observations are to be recorded each time an outfall is screened using the Outfall Reconnaissance Inventory and Sample Collection Field Sheet forms provided by PADEP (attached for use if Illicit Discharge is detected or during periodic observations).

It is also the responsibility of Borough personnel to familiarize themselves with the Borough's outfalls and observation points on the MS4 map (attached), and make a point to visually inspect them in passing on regular basis. For instance, if dry weather flow is observed at an outfall or observation point, a sample should be gathered to be analyzed. Proper quality assurance and control measures should be followed when collecting and transporting water samples, and written documentation should be maintained of how the outfall flow was determined not to be illicit. If an outfall flow is illicit, the actions taken to identify and eliminate the illicit flow shall also be documented.

WHAT ARE SOME EXAMPLES OF AN ILLICIT DISCHARGE?

- Septic Tank Seepage / Illegal Sanitary Connections
- Laundry Wastewater / Detergent
- Improper Waste Oil Disposal / Auto Fluids Flushing
- Home Improvement Waste (e.g. concrete washout, paint washout to roadway swales)
- Excess Pesticides and/or Fertilizers
- Improper Disposal of Commercial and Industrial Hazardous Waste
- Pool / Spa Discharge
- Cooking Grease / Household Waste

SO WHAT DOES AN ILLICIT DISCHARGE LOOK LIKE?

To illustrate this potential threat, example(s) are provided below for reference:

Paint / concrete washout causing discoloration



Leaking dumpster draining into storm sewer



Foam can indicate an illicit discharge (grey water) Oils / auto fluids leave "slicks" in stormwater

VI. Water Quality Hotlines:

Borough employees can also rely on the vigilance of local Residents in reporting violations or problems they notice in their neighborhood and local streams before they cause more damage and pollution. Residents sometimes may be the first to recognize "illicit" discharges dumping into storm sewers or coming out of from storm sewer outfalls. You can help by promptly reporting the following events to the authorities listed below.

Here are some of the conditions that should be reported, and who to contact:

Sediment leaving a construction site in stormwater

Offsite discharge of sediment, erosion, and other improper controls during construction

Bucks County Conservation District

215-345-7577

Email photo and send full address and directions

Observed pollution event or pollutants in stream

Pennsylvania Department of Environmental Protection

Water Quality Hotlines

484-250-5900

1-800-541-2050 (toll free)

Anytime, including evenings and weekends

Clogged or leaking sanitary sewer lines; Broken water mains

Bucks County Water and Sewer Authority

215-343-2538

After hours, call 911

Spills

Pennsylvania Department of Environmental Protection

Water Quality Hotlines

484-250-5900

1-800-541-2050 (toll free)

Anytime, including evenings and weekends

Illegal dumping activity into water courses

Pennsylvania Department of Environmental Protection

Water Quality Hotlines

484-250-5900

1-800-541-2050 (toll free)

Anytime, including evenings and weekends

Fish Kills

Pennsylvania Fish & Boat Commission

1-855-FISH-KIL (1-855-347-4545)

Pennsylvania Department of Environmental Protection

Water Quality Hotlines

484-250-5900

1-800-541-2050 (toll free)