BUCKS COUNTY STORMWATER MANAGEMENT PLAN WATERSHED PLAN ADVISORY COMMITTEE (WPAC) MEETING NO. 2

JULY 30, 2024

WELCOME FROM:

Bucks County

BCPC
Bucks County Planning Commission

EVAN J. STONE, EXECUTIVE DIRECTOR

BUCKS COUNTY PLANNING COMMISSION

ESTONE@BUCKSCOUNTY.ORG

NEWELL TERESKA & MACKAY TEAM

NEWELL TERESKA MACKAY ENGINEERING

SCOTT BROWN, MS, PE, D.WRE
PAUL DEBARRY, MS, PE, PH, GISP, D.WRE
BETHANY SHUMAKER, MS, PE, CSI
SETH DELLINGER, GIS SPECIALIST

CENTER FOR WATERSHED PROTECTION

BETH UHLER
PENNSYLVANIA DIRECTOR

JMT

SHINY MATHEW, PE, ENV SP
ASSOCIATE VICE PRESIDENT

AGENDA

- Welcome & Introductions
- Act 167 Overview
- Phase 1 Status
- Summary of Survey Responses
- Phase 2 Scope of Work
- Open Discussion
- Schedule/Timeline

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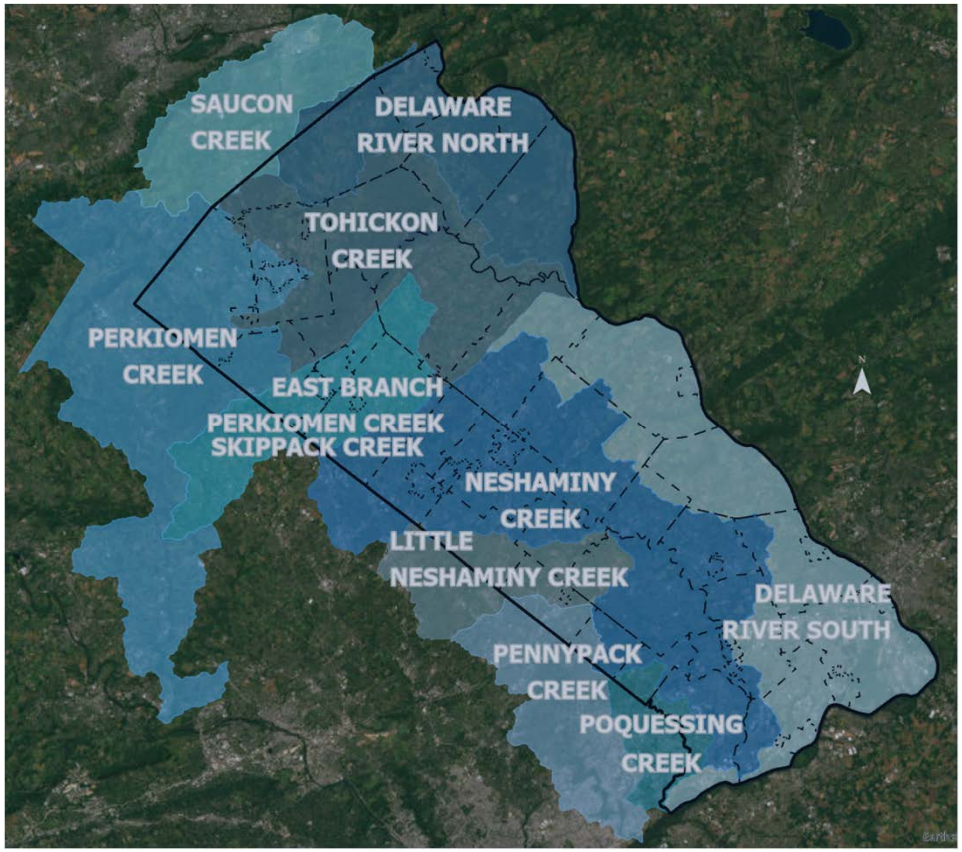

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ACT 167 OVERVIEW

PHASE 1: INITIAL WATERSHED ASSESSMENT

PHASE 2: STORMWATER MANAGEMENT STUDY AND PLAN

IMPLEMENTATION

ACT 167 – GOALS OF THE PLAN

- Maintain natural hydrologic regime
- Identify and prevent flooding/stormwater (SW) problems
- Promote groundwater recharge
- Minimize stream bank erosion
- Water quality control
- Nonstructural SW mgmt.
- Maintenance provisions
- Education
- Consistency across municipalities

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EXISTING ACT 167 STORMWATER MANAGEMENT PLANS

Existing Plans

- Delaware River and Tributaries
  - Delaware River North (2002)
  - Delaware River South (2004)
  - Neshaminy Creek (2010)
    - Includes the Little Neshaminy
  - Pennypack Creek (2011)*
  - Poquessing Creek (2012)*
  - Saucon Creek (2010)
  - Tohickon Creek (2002)*
- Schuylkill River Tributaries
  - East Brank Perkiomen Creek (2004)
  - Perkiomen Creek (2009)

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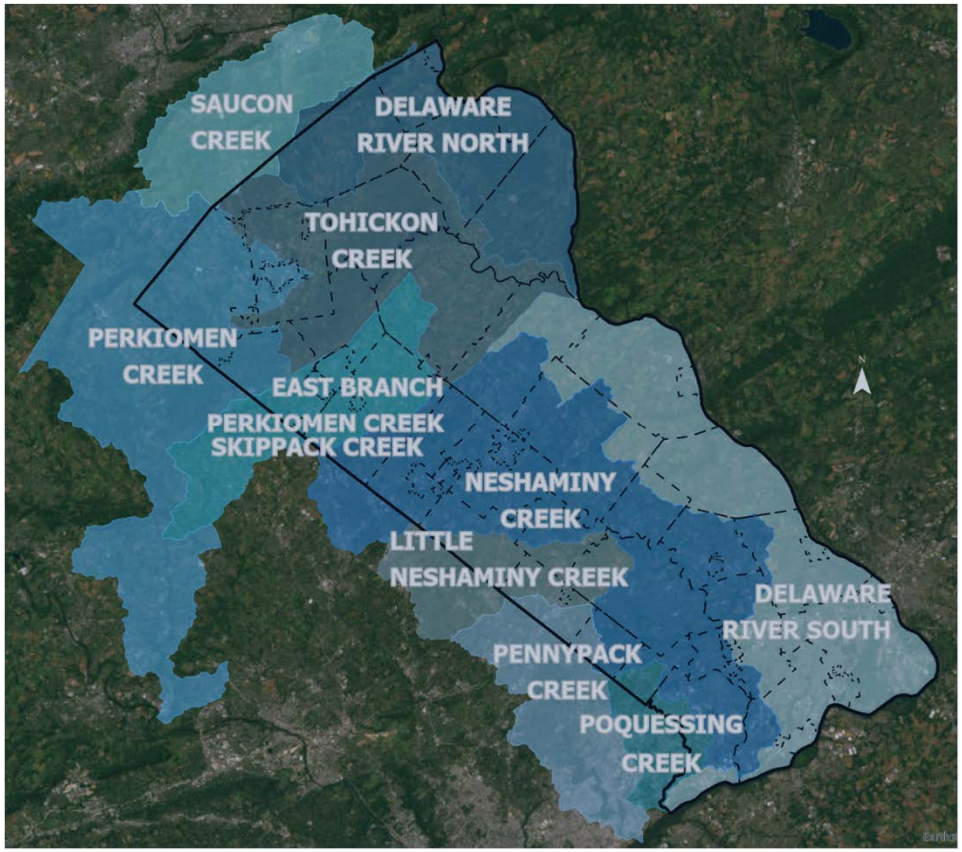

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PHASE 1 STATUS

PHASE 1 ACT 167 SCOPE OF WORK

- Obtain input from the WPAC
- Obtain & review existing related reports/plans and data
- Conduct survey on problem areas
- Collect, collate and map problem areas
- Determine typical versus critical problem areas
- Formulate Phase 2 Scope of Work
- Develop Phase 2 cost estimate
- Review SOW with WPAC
- Finalize Phase 1 Report

Related Plans and Reports Reviewed:

- Bucks County Hazard Mitigation Plan (2021)
- Bucks County Open Space and Greenways Plan
- Watershed Restoration and Protection Project
  - Gallows Run
  - Poquessing/Pennypack
  - Perkiomen Creek
  - Pidcock and Mill Creek
  - Neshaminy Creek
- Core Creek updated Watershed Implementation Plan (2017)
- Upper and Middle Neshaminy Creek River Conservation Plan (2002)
- Lower Neshaminy Creek Watershed Conservation Plan (2004)
- Little Neshaminy Creek River Conservation Plan (2007)
- Neshaminy Creek Watershed Sediment Reduction Plan (2014)
- *Upper Makefield Township Watershed Restoration Plan*

PHASE 1 STATUS

- Completed a review of the following:
  - Land Use
  - Physiography
  - Soils
  - Water Resources and Chapter 93, 303 (d) Impaired Waterways
  - Dams
  - Floodplains
  - Climate
  - Existing Act 167 Problem Areas, Obstructions, and Release Rate Districts
- Reviewed the Stormwater Management Survey responses from the WPAC

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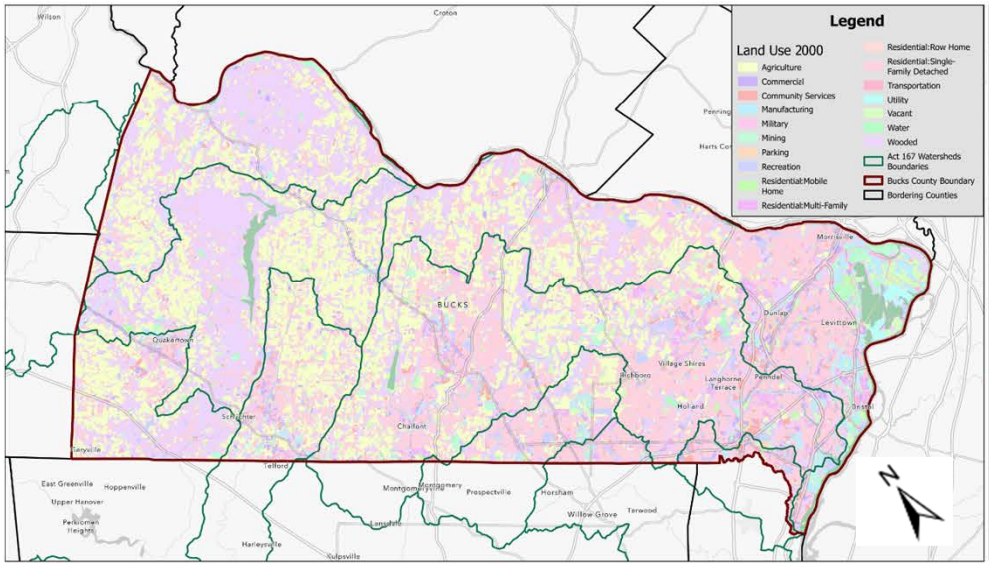
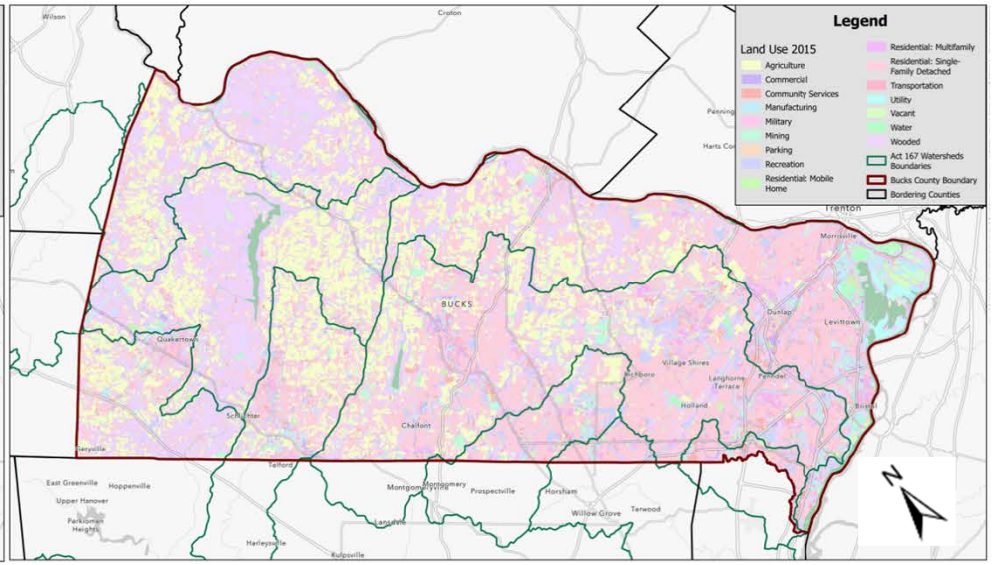
LAND USE/LAND COVER



DRVPC 2000 Land Cover



DRVPC 2015 Land Cover

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LAND USE CHANGE 2000-2015

Land Use	Area (sq mi) in 2000	Area (sq mi) in 2015	Change - Area (sq mi)
Agriculture	164.4	128.0	-36.4
Wooded	181.2	183.4	2.2
Residential (All)	163.1	174.5	11.4
Transportation	6.2	26.6	20.3
Commercial	15.3	11.3	-4.0
Community Services	7.0	8.5	1.5
Manufacturing	9.3	9.0	-0.3
Military	1.0	0.03	-0.97
Mining	3.2	2.1	-1.1
Parking	9.4	10.4	1.0
Recreation	12.8	16.2	3.4
Utility	6.1	8.8	2.8
Vacant	23.2	22.1	-1.2
Water	18.7	20.0	1.3

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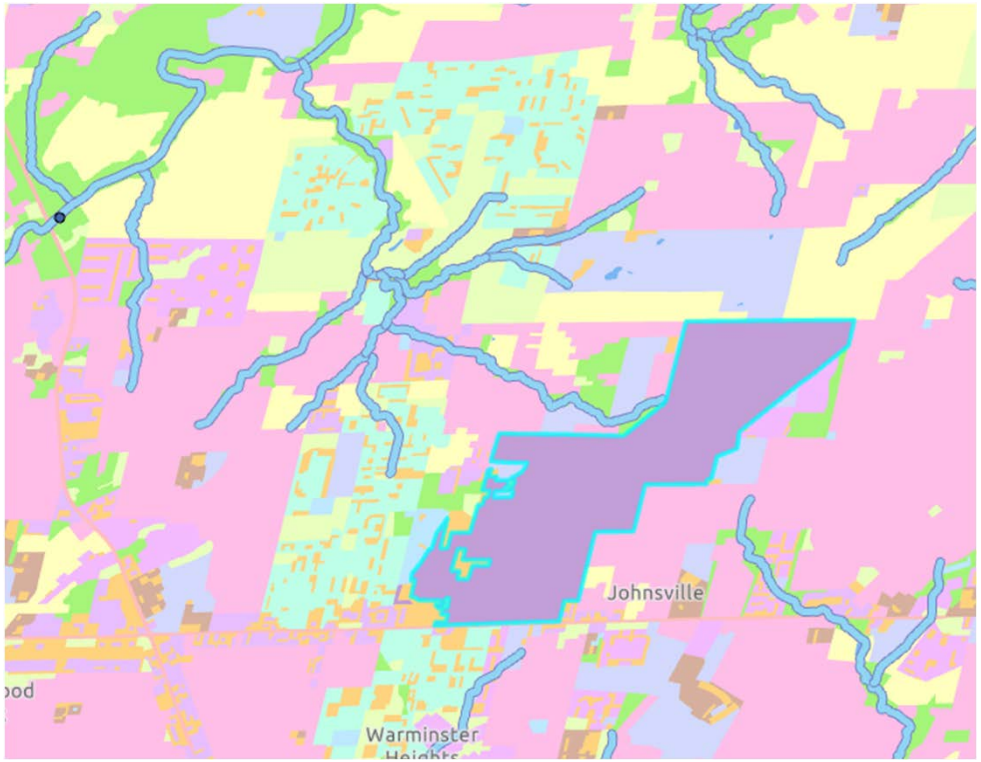
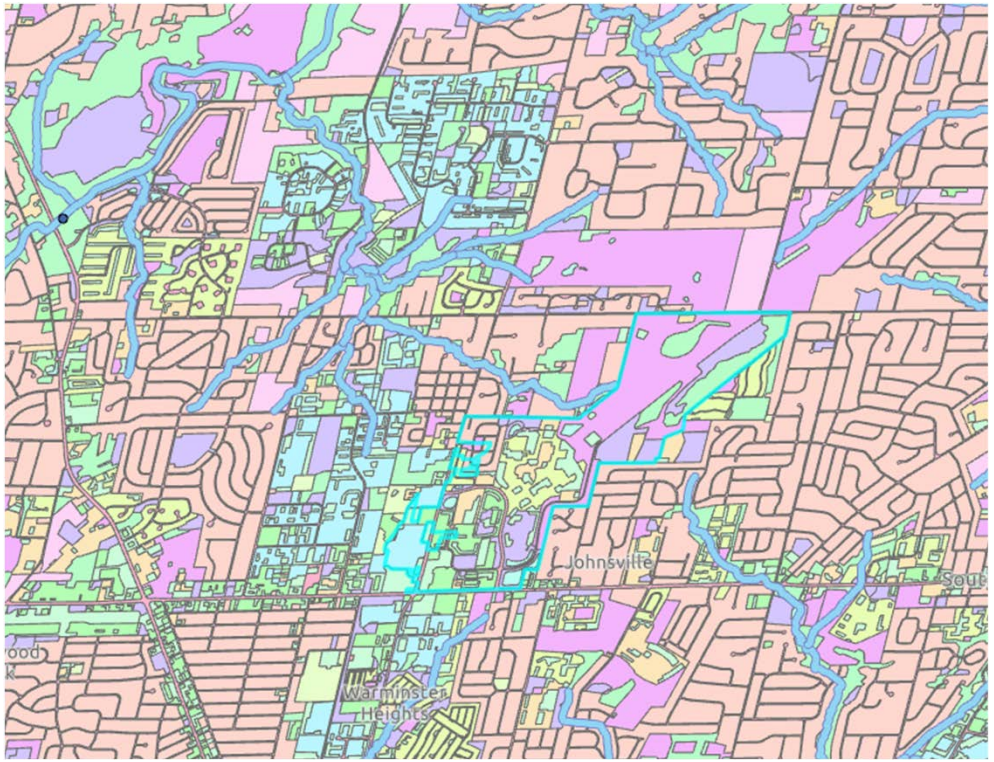
LAND USE EXAMPLE 525 ACRE FORMER MILITARY NAVAL AIR WARFARE CENTER



DRVPC 2000 Land Cover



DRVPC 2015 Land Cover

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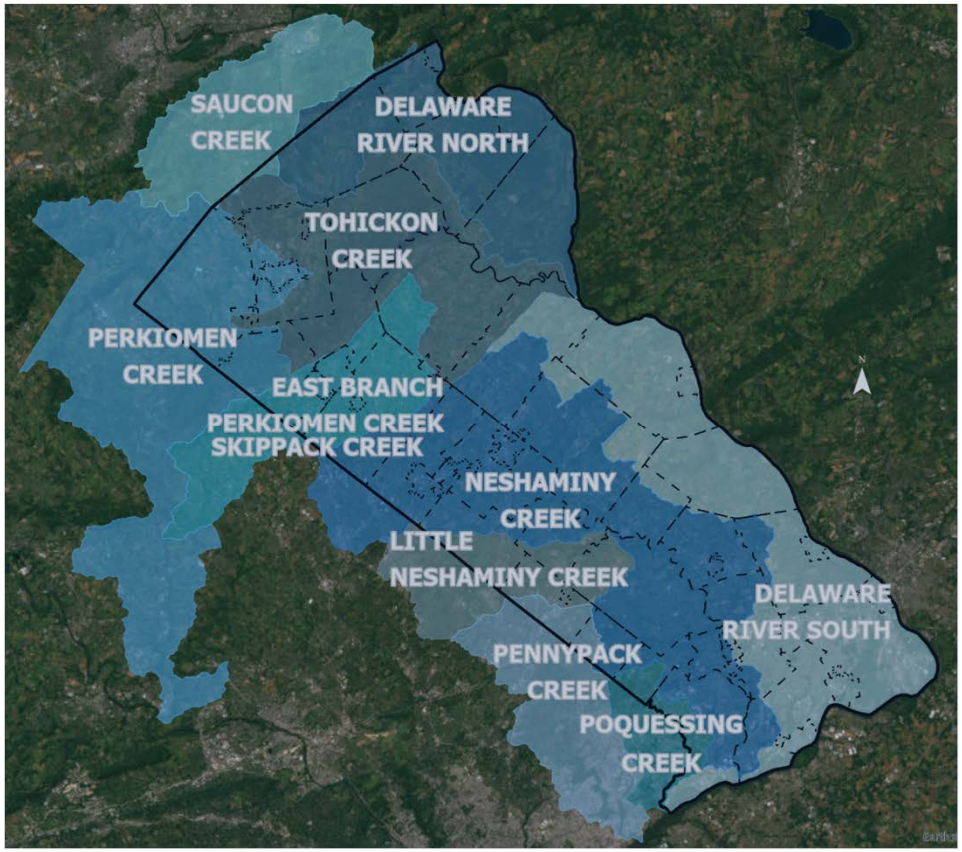

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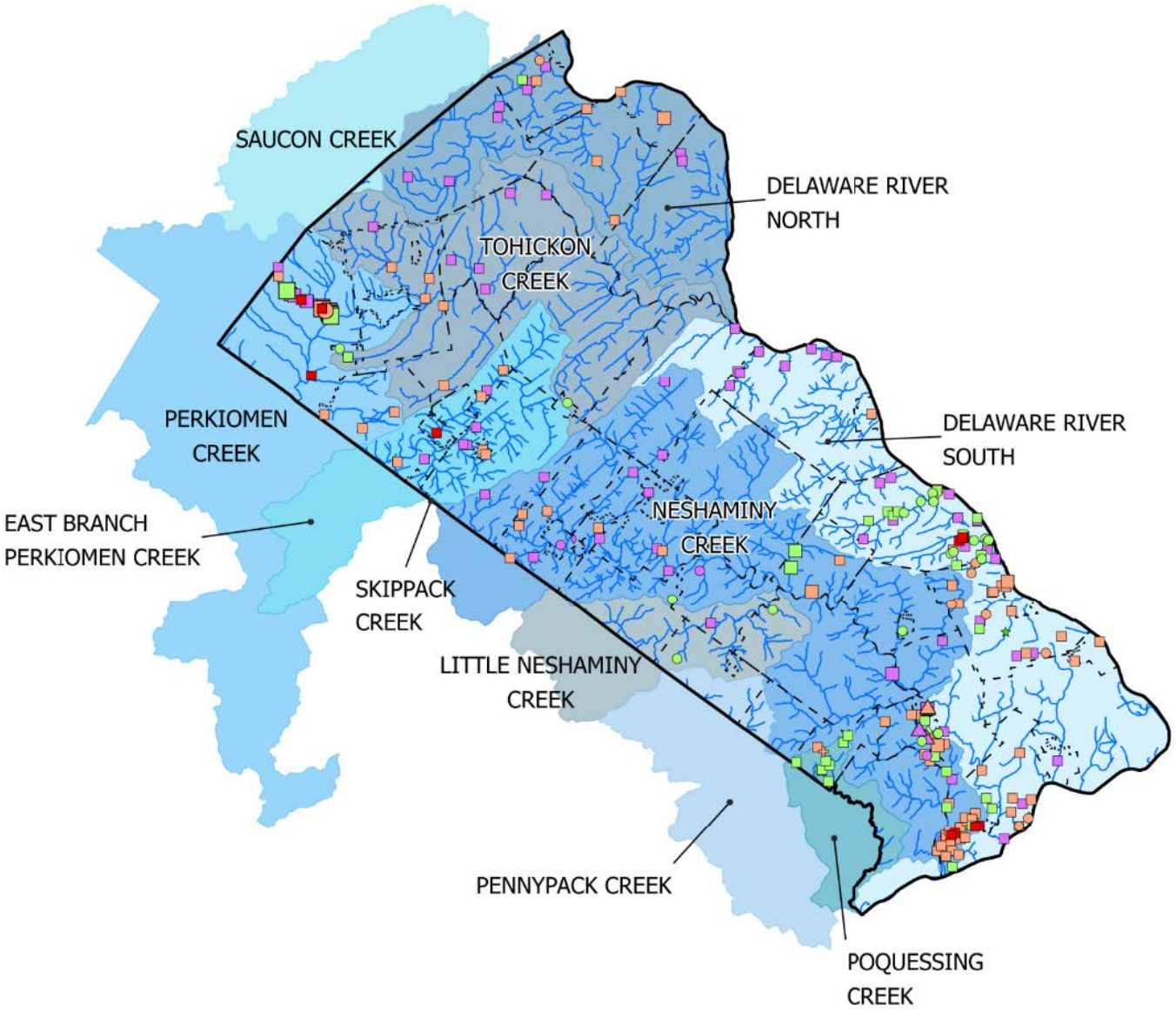
PROBLEM AREA SURVEY RESPONSE SUMMARY

SURVEY FINDINGS

Bucks County Stormwater Problem Areas

- Flooding - Loss of Life - 1 Day or Less
- Other - More than One Owner - 1 Day or Less
- Groundwater - Public - 1 Day or Less
- Water Pollution- Private - 1 Day or Less
- Accelerated Erosion - Private - 1 Day or Less
- Accelerated Erosion - Public - 1 Day or Less
- Accelerated Erosion - More Than One Owner - 1 Day or Less
- Accelerated Erosion - More Than One Owner - 1 Year
- Sedimentation - Private - 1 Day or Less
- Sedimentation - More than one Owner - 2 to 14 days
- Sedimentation - More than One Owner - 1 Year or More
- Sedimentation - Public - 1 Year or More
- Flooding - More than One Owner - 1 Day or Less
- Flooding - More Than One Owner - 2 to 14 Days
- Flooding - More than One Owner - 14 to 30 Days
- Flooding - More Than One Owner - 1 Year or More
- Flooding - Public - 1 Day or Less
- Flooding - Public - 2 to 14 Days
- Flooding - Private - 1 Day or Less
- Flooding - Private - 2 to 14 Days
- Flooding - Private - 1 Year or More



SURVEY SUMMARY

Number of each Problem Type	
31	Sedimentation
66	Accelerated Erosion
205	Flooding
5	Water Recharge
1	Water Quality

Watershed	Total	Problems not included in a Previous Act 167
Delaware River South	100	62
Neshaminy Creek	81	65
Perkiomen Creek	21	21
Delaware River North	17	*
Tohickon Creek	13	6
East Branch Perkiomen Creek	11	4
Poquessing Creek	8	6
Pennypack Creek	0	0
Saucon Creek	0	0
Skippack Creek	0	0

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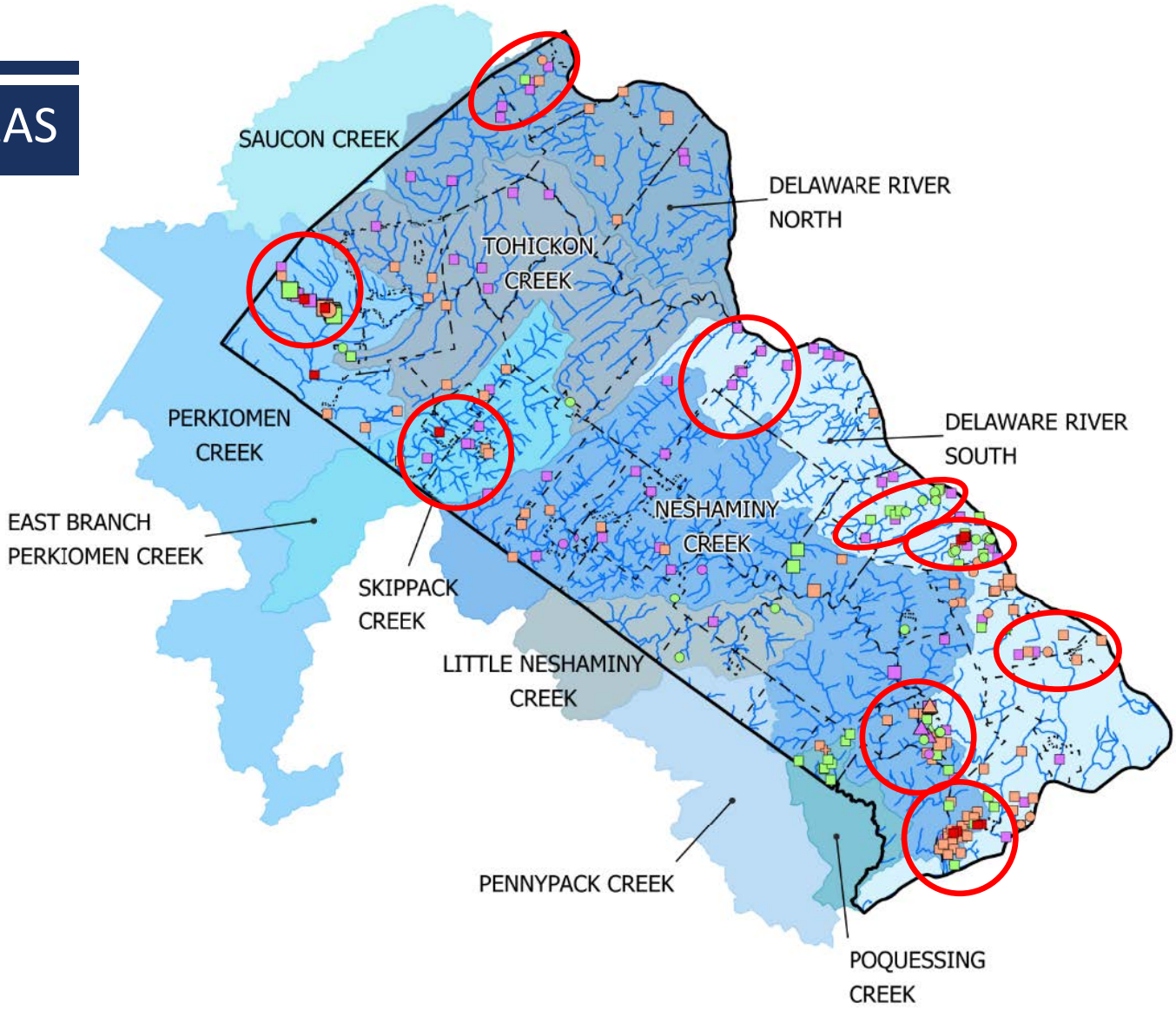
PRIORITY PROBLEM AREAS

- Priority Problem areas present an increased risk to life, property, and/or the environment



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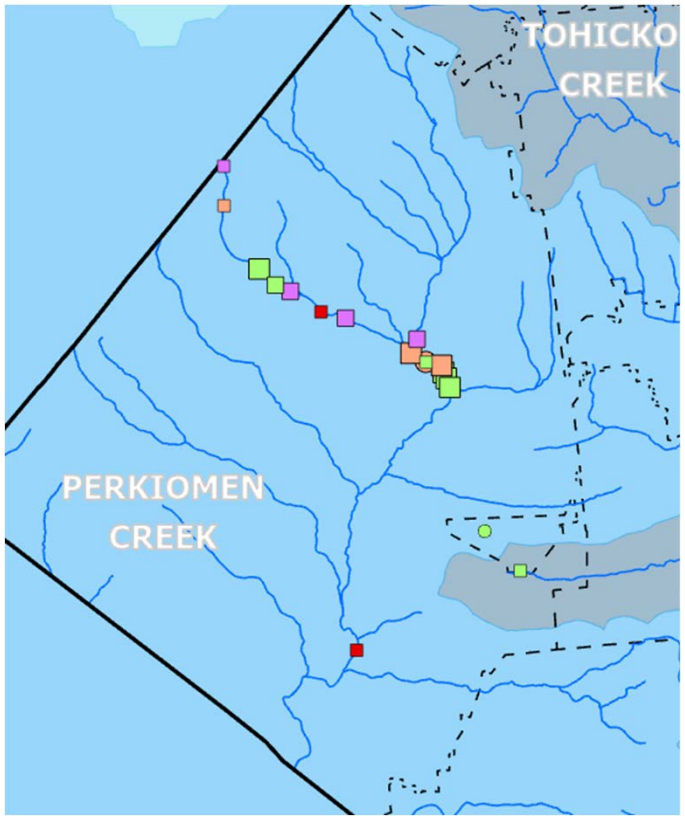
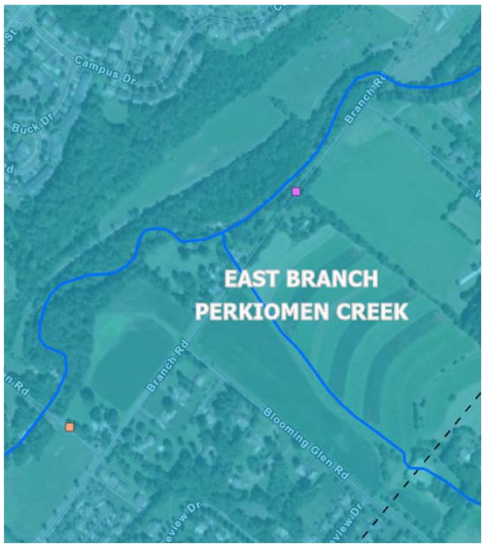
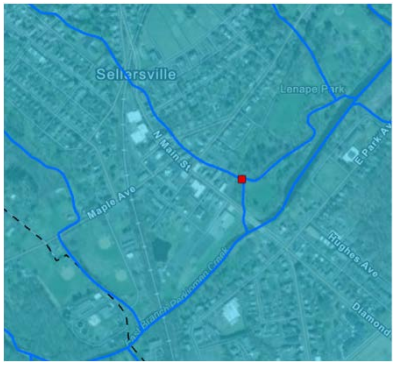
UNAMI CREEK AND LICKING CREEK

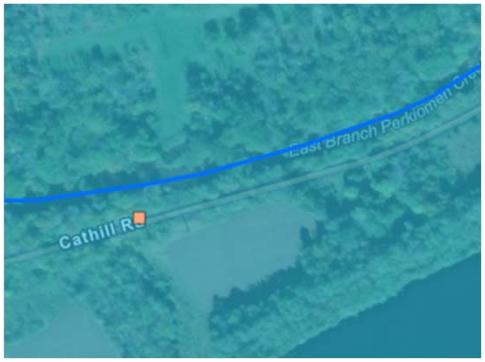
- **No Existing Perkiomen Act 167 in Bucks – only in Lehigh County**
- 15 Problem Areas
  - 1 Fatalities
  - 4 Impact Multiple Properties
- Some development in the watershed – Ag to ½ to 1 ac Res

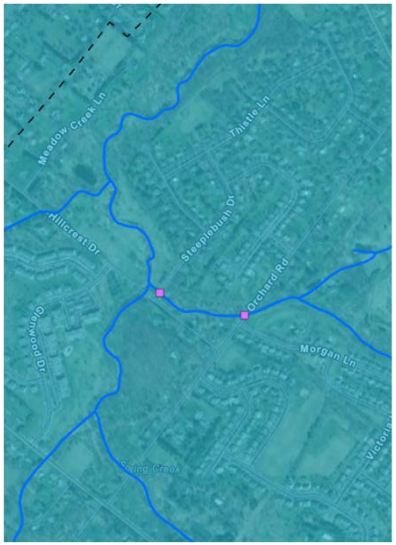


EAST BRANCH PERKIOMEN





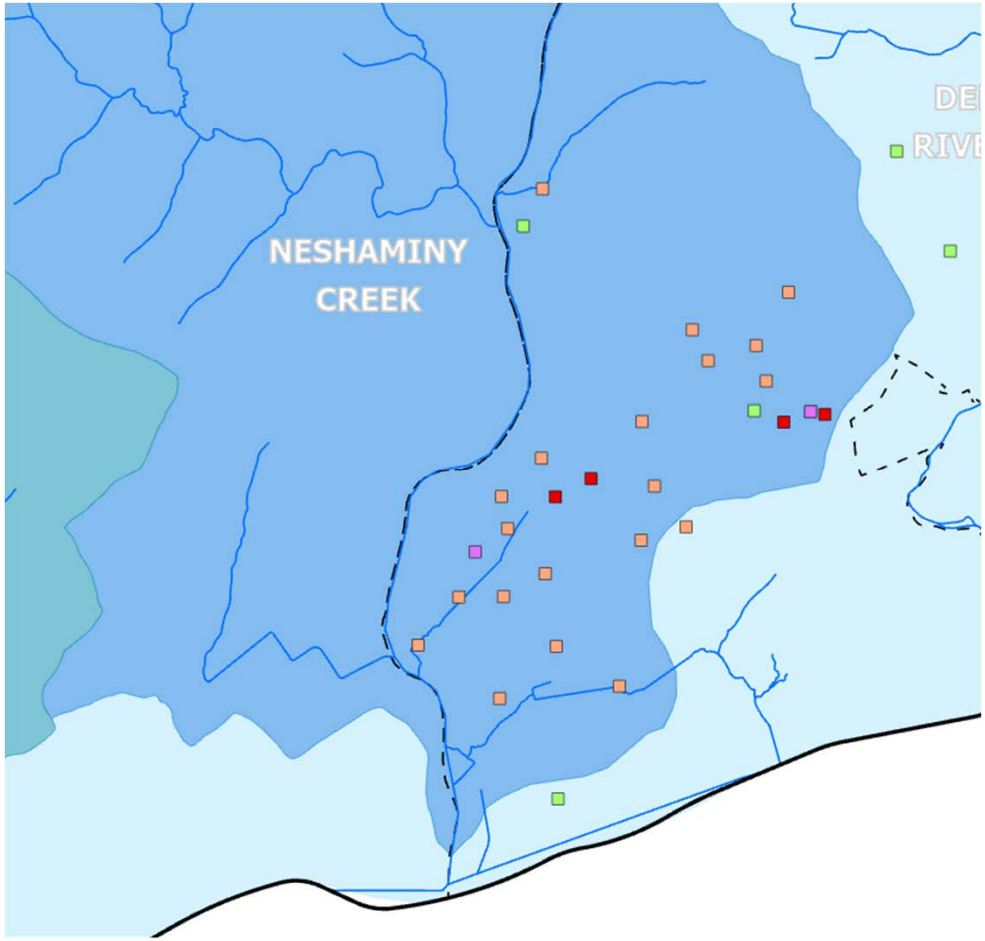




- Fatality at confluence of Mainstem EB Perkiomen Creek and unnamed tributary (UNT)
  - Existing East Branch Perkiomen Act 167 appears to have identified a problem area at the location of the fatality (Sellersville Borough)
- Multiple Culverts undersized in UNT to Pleasant Spring Creek
- Flooding overtops the banks of the EB Perkiomen Creek in East Rockhill Township. Additional Roadway flooding at Blooming Glen Rd Crossing.

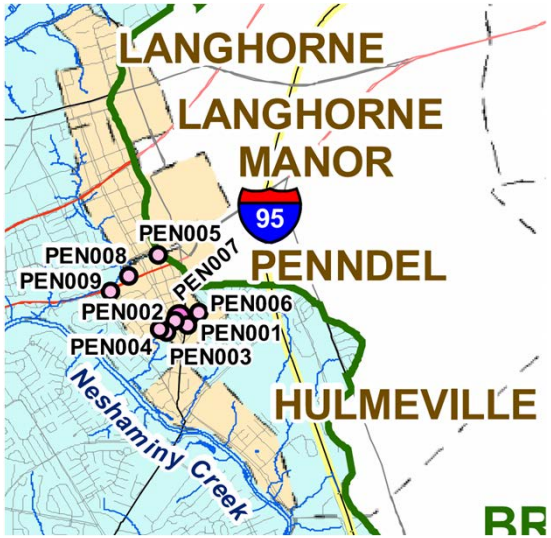
NESHAMINY CREEK AT DELAWARE RIVER

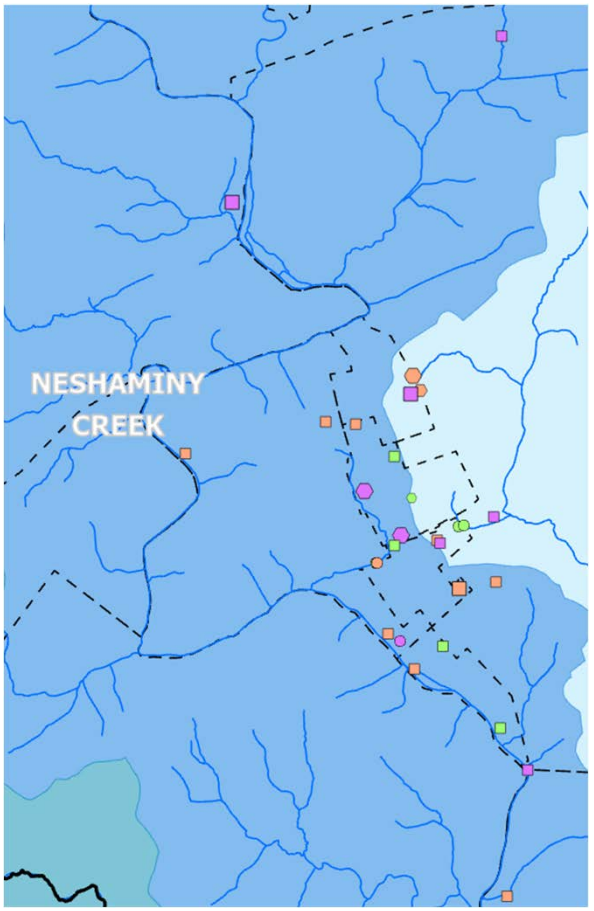
- Flooding of Delaware River and Conveyance System may need to coordinate with MS4 plan
- Problem areas
  - 4 locations with Fatalities
  - Multiple Properties impacted at nearly all points of concern
- No problem areas identified in the previous Act 167 Plan



NESHAMINY CREEK AT LANGHORNE MANOR AND PENNDEL BOROUGH

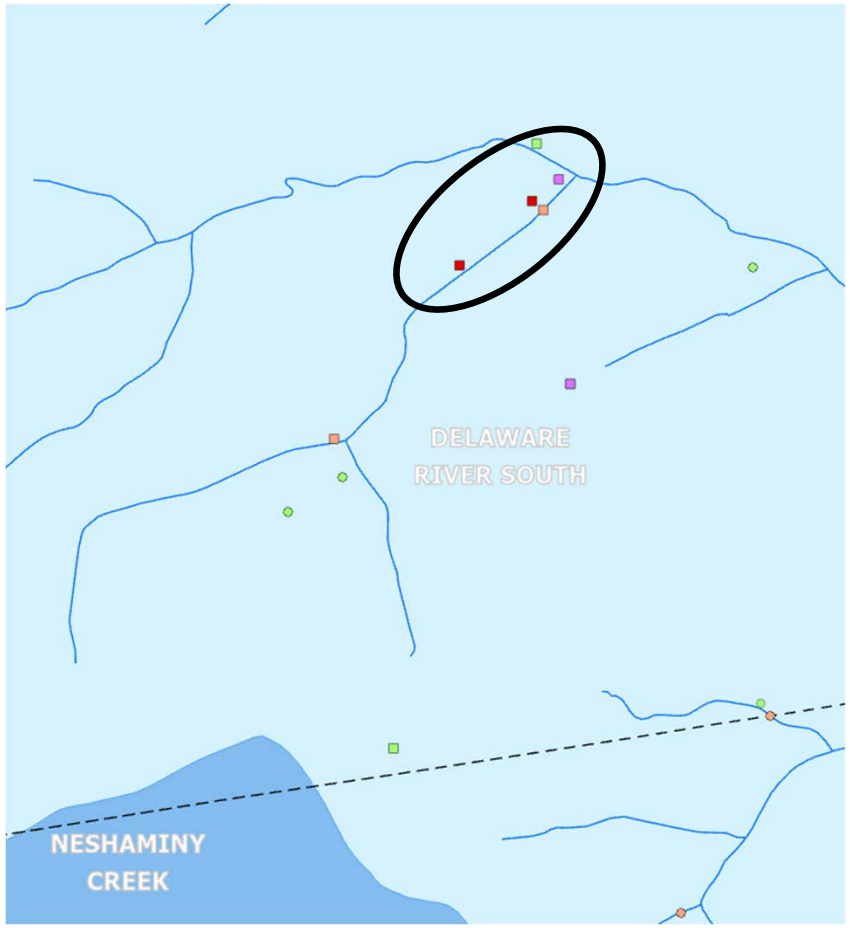
- No fatalities in this area.
- Neshaminy Creek overtops its banks in this area leading to roadway flooding
- Conveyance flooding present in this location
- Many problem areas appear to be in the same/similar locations as in the previous Act 167 plan



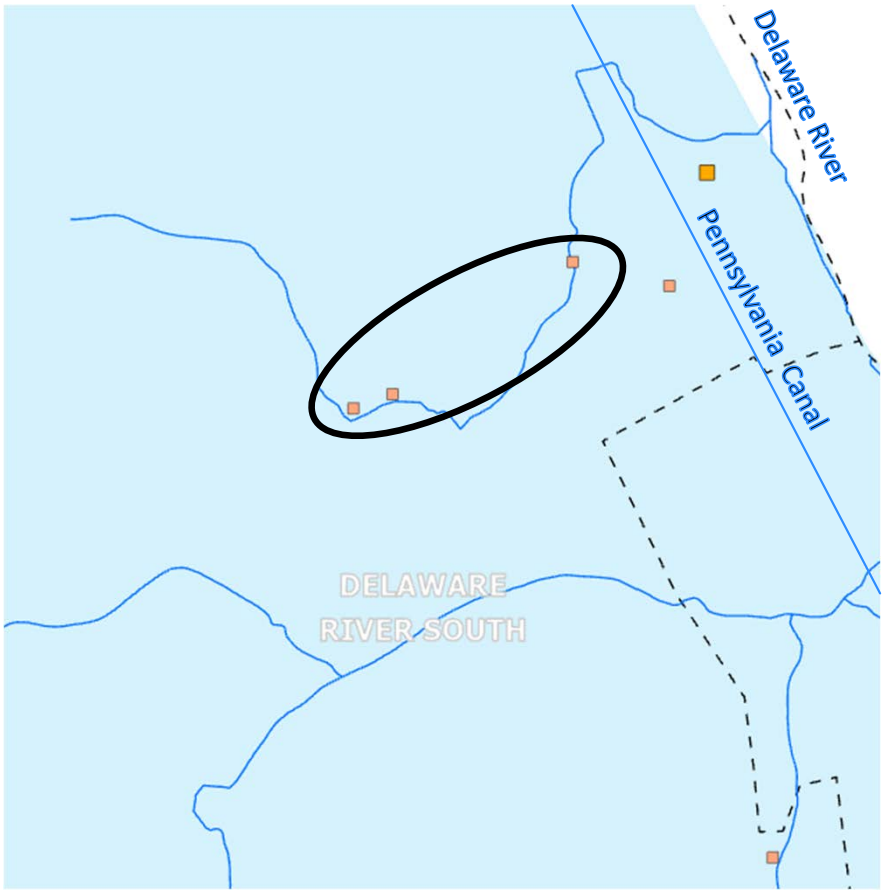


UNT TO HOUGHS CREEK (DELAWARE RIVER SOUTH)

- 2 Fatalities in related to Houghs Creek
- Roadway impacts from UNT overtopping the banks and additional flooding at confluence with Houghs
- Problems were not identified at this location in the previous Act 167



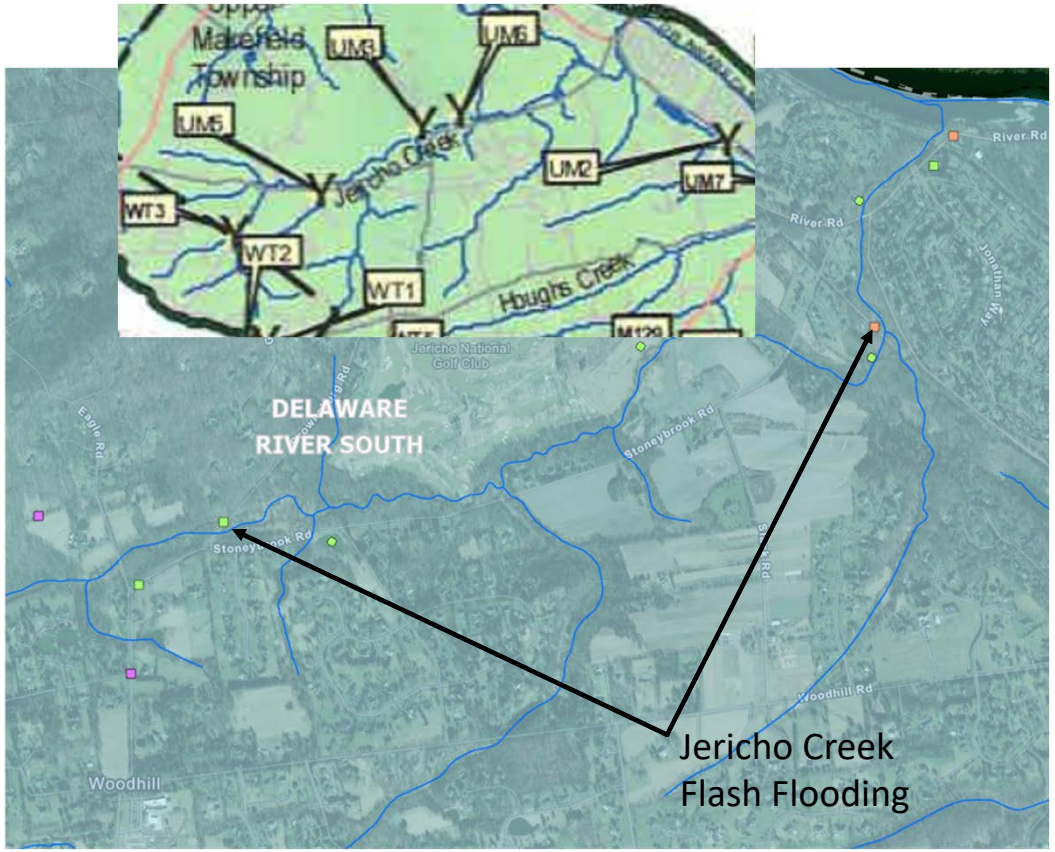
UNT TO PENNSYLVANIA CANAL IN LOWER MAKEFIELD TOWNSHIP



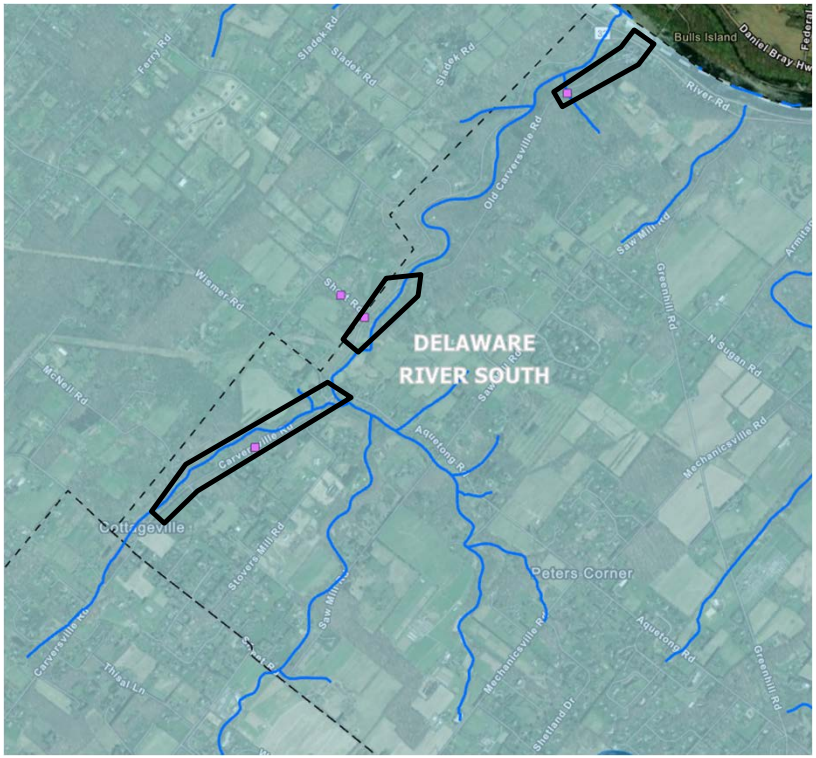
- Undersized culverts at Lower Hilltop Rd, Edgemere Dr, Highland Drive (circled)
- Problem area furthest from the stream is conveyance related, however it is caused by overtopping of stream at Highland Dr and Taylorsville Rd causing backup in the storm system
- Most downstream problem area is Delaware River flooding
- Existing Act 167 Problem area map is very hard to read

JERICHO CREEK

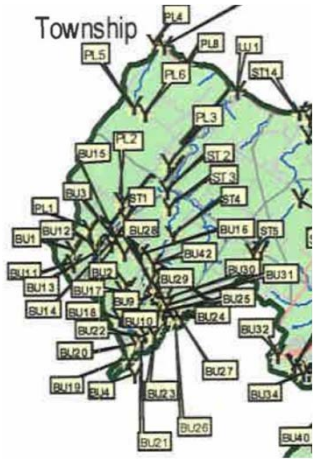
- Flood flooding along Jericho Creek with several near fatal events.
- Flooding of River Road at confluence of Jericho Creek and Delaware River. Emergency services regularly respond to flooding here.
- Existing Act 167 Plan included Problem Areas at this location and modeling was performed.



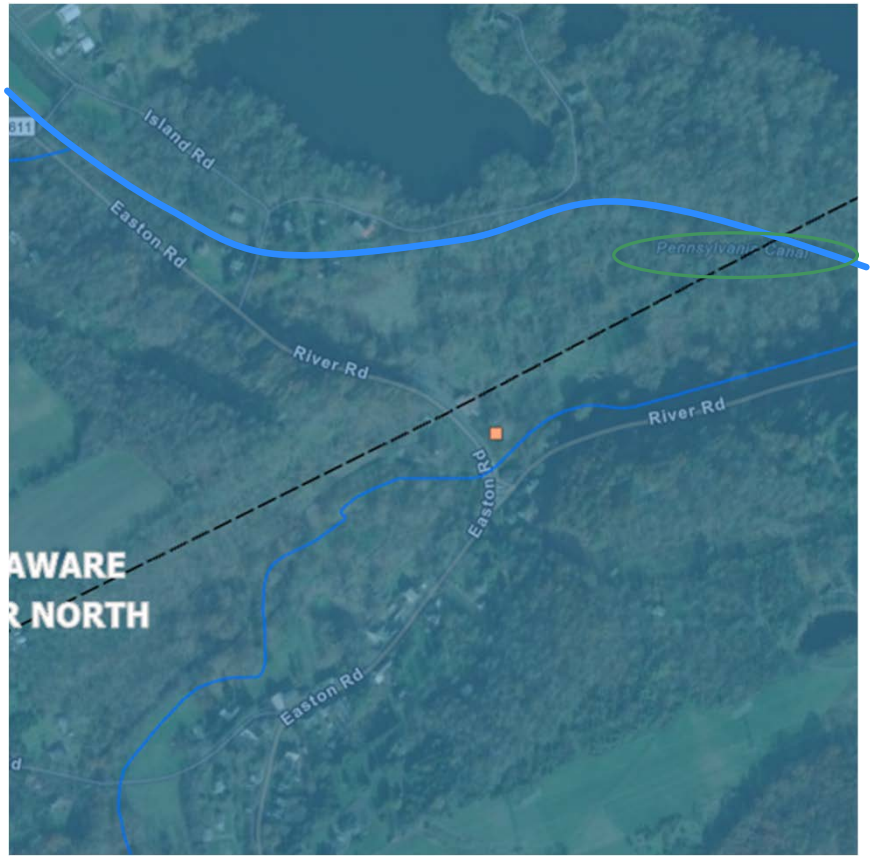
PAUNNACUSSING CREEK AND UNT



- Multiple instances of flooding along Paunnacussing Creek beginning at Joshua Lane
- Fewer problem areas identified than in previous act 167 report
- May need additional evaluations and division of Subareas modeled in previous Act 167

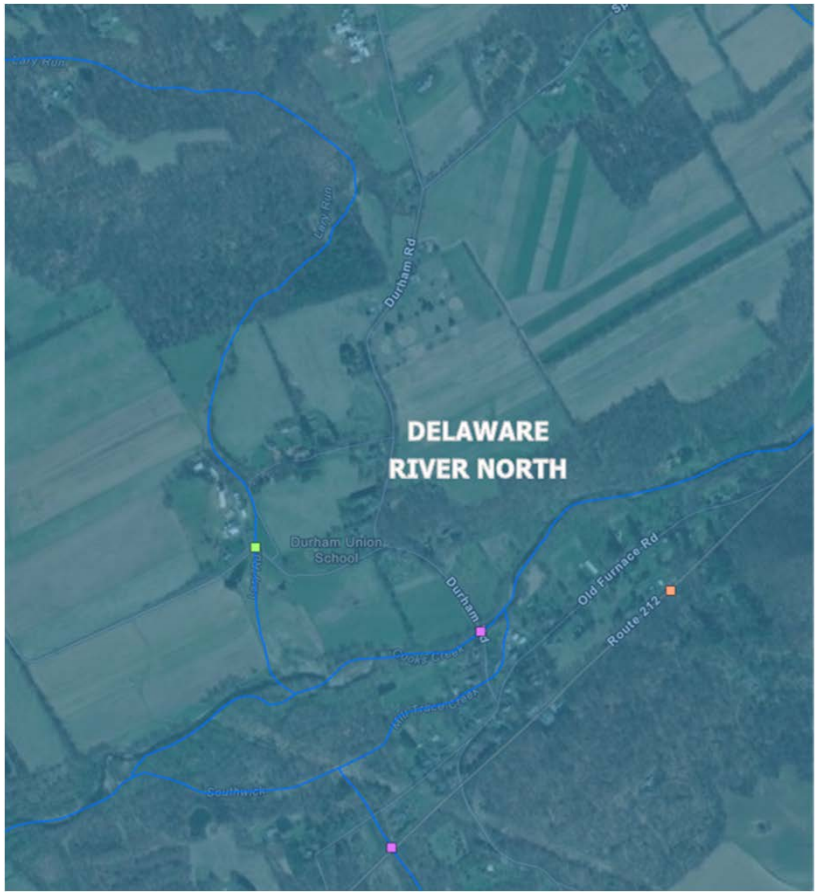


CONFLUENCE DELAWARE RIVER, PENNA. CANAL, AND GALLOWS RUN

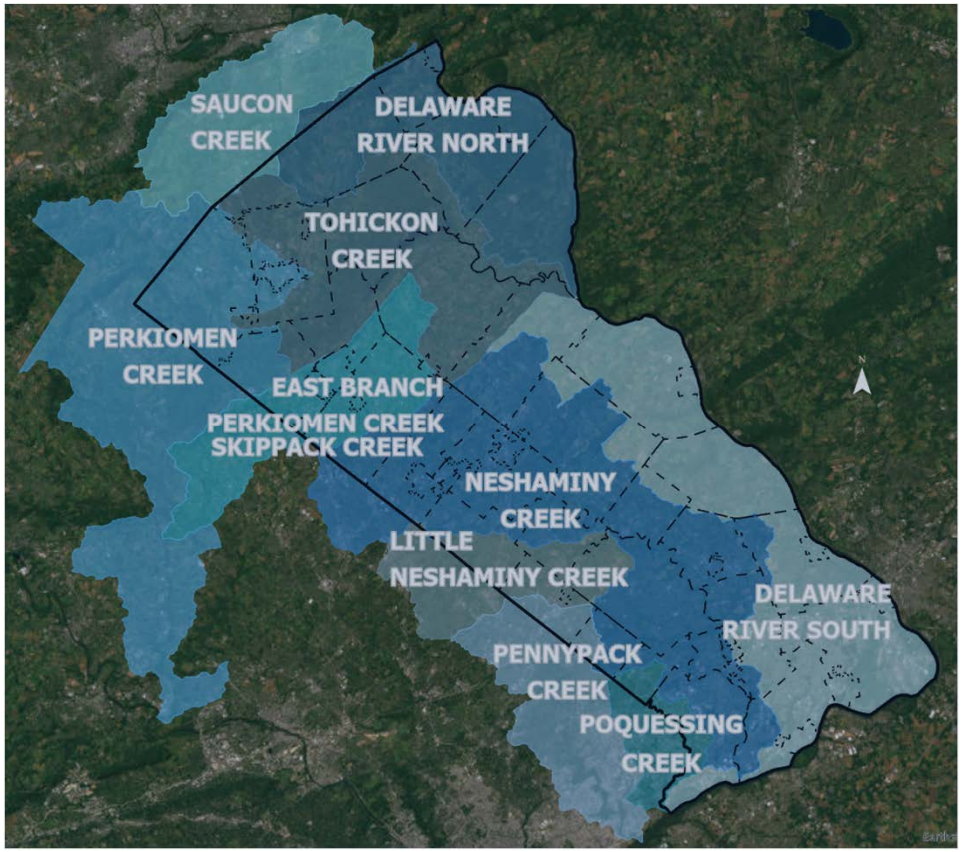


- Roadway and property flooding occurs regularly at this location.
- 5 pages missing in Delaware R North Act 167 where the modeling data should be located.
- Additional studies have been performed here in recent years.

HOLLOW RUN, COOKS CREEK AND UNT TO COOKS CREEK FLOODING



- At each location, structures appear to restrict flow and cause flooding
- Review Obstructions Data from previous Act 167 plan and further investigation will be needed
- Watershed is experiencing some development



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PHASE 2 SCOPE OF WORK

ACT 167 PHASE 2 – PLAN PREPARATION

- GIS Database Compilation (Existing Land Use, Soils, Future Land Use, Obstructions, Problem Areas)
- Evaluate Problem Areas identified in Phase 1
- Water Quantity Modeling (Flooding) (if required)
  - Those watersheds that have already been modeled may not need additional modeling
- Coordinate with MS4 Requirements
- Develop Standards & Criteria
- Develop Model Ordinance
- WPAC Participation

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PHASE 2 ACT 167 WATERSHED PLAN

- Task 1: Data Collection and Analysis
- Task 2: Technical Analysis, Problem Areas and Obstructions
- Task 3: Model Ordinance Development
- Task 4: Public/Municipal Participation through WPAC
- Task 5: Phase II Report with County-wide Model Ordinance & Implementation

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TASK 1: DATA COLLECTION AND ANALYSIS

- Priority Problem Areas
  - Areas that present increased risk to life, property, or environment
- Detailed Priority Problem Area Analysis
  - Field Investigation
  - Public/Recreational Lands with SWM Potential
  - Detailed Problem Area Forms
  - Potential Solutions and Watershed Benefits with Associated Cost Estimates

Poquessing Watershed Act 167 Problem Area Inventory			
Problem Area - Map ID:	PHA 50	Inspected By/Date:	DJS, BAB
Municipality:	Lower Southampton	Checked By/Date:	

The banks of this tributary are experiencing significant erosion. As evident from the pictures above, the channel has been eroded approximately 10-12 feet below the normal channel depth. Banks were also reported as being overgrown with invasive species.

Type of Problem	Erosion		
Drainage Area			
Calculation Methodology			
Storm Frequency	Existing Peak Discharge (cfs)	Mitigated Peak Dischage (cfs)	Difference (cfs)
2			
5			
10			
50			
100			
500			

Potential Solutions

1) Stream Stabilization: Stablize existing stream bank to limit further erosion and decrease sediment trasnport downstream.

2) Regional Storage Area 01 (Bioretention, Infiltration, Dentention) within Commerical Area: ommerical area and enhance with nsporation. Increase water quality and source.

: This area appears to already be . Storage could be increased in this area, to better control relase rates from this

al small pockets of open space within the on/rain garden BMPs that will help

iate

Poquessing Watershed Act 167 Problem Area Inventory

Problem Area	Municipality	Stream Name	Preferred Solution
PHA-50	Lower Shouthampton	UNT Poquessing Creek	

Description: This problem area was reported by the Philadelphia Water Department. The subject channel is located in Lower Southampton Township at the outfall of a large commericial/industrial area. The reach stability was reported as actively degrading and the bank erosion was classified as high. The upstream drainage area is highly impervious with limited stormwater managment facilities This is resulting in high flow rates and volumes that is causing significant erosion in the downstream channel at the problem area

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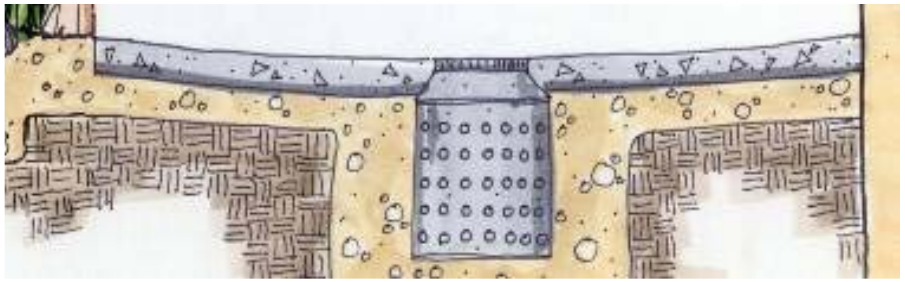
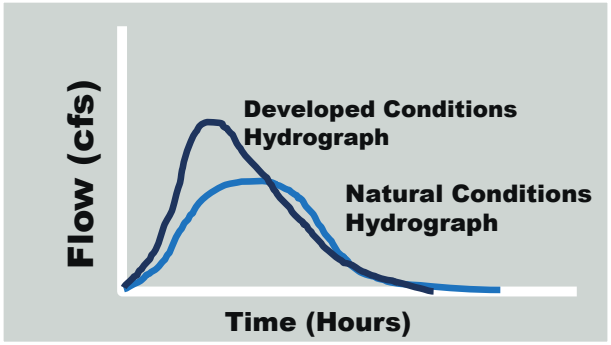
TASK 2: TECHNICAL ANALYSIS

- Evaluate Water Quality, Peak Flow, Stream Stability, and Groundwater Recharge





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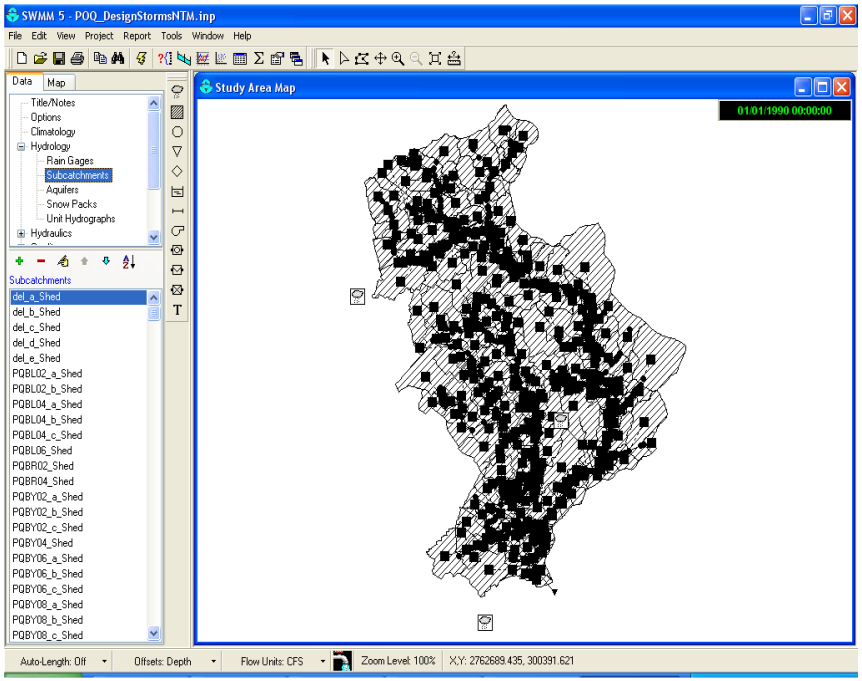
TASK 2: TECHNICAL ANALYSIS CONTINUED

- Detailed Hydrologic Modeling (if/where needed)



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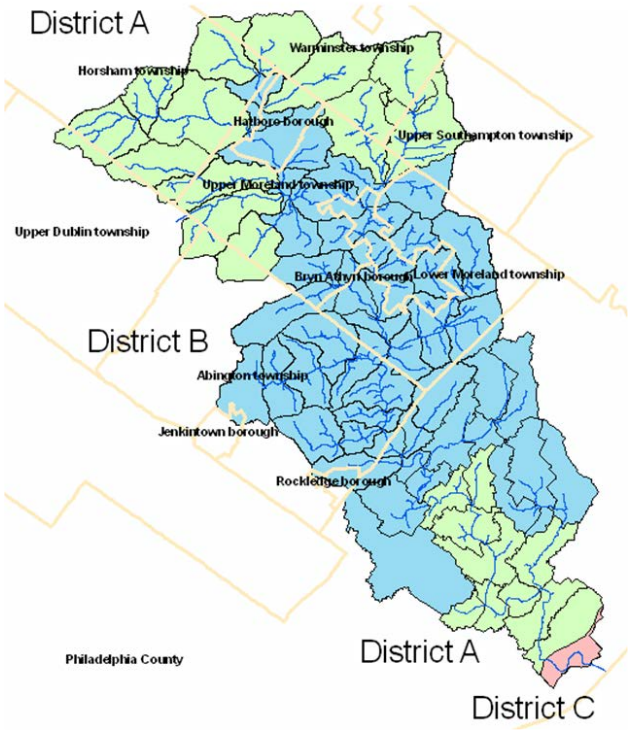
TASK 2: TECHNICAL ANALYSIS CONTINUED

- Management Strategy for Release Rate Maps
  - Detailed land use/land cover evaluation
  - Assess applicability of existing release rate maps
  - Develop additional release rate maps if necessary

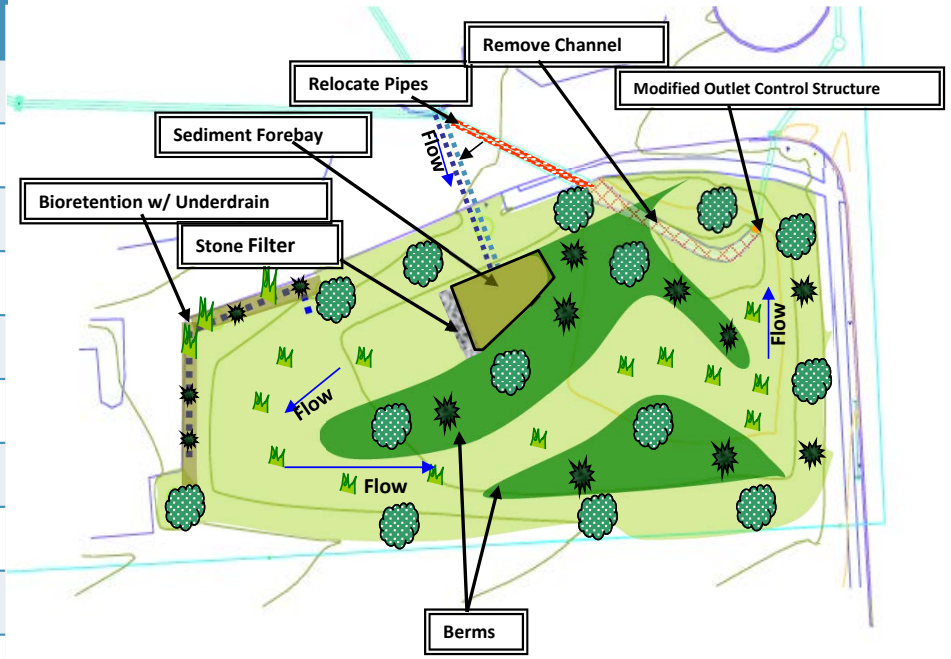
  (It is anticipated that the release rates are still valid since they are based on existing conditions at the time of Act 167 development)
- Analysis at Priority Problem Areas
  - Analysis using desktop Hydrologic and Hydraulic techniques



TASK 2: TECHNICAL ANALYSIS CONTINUED

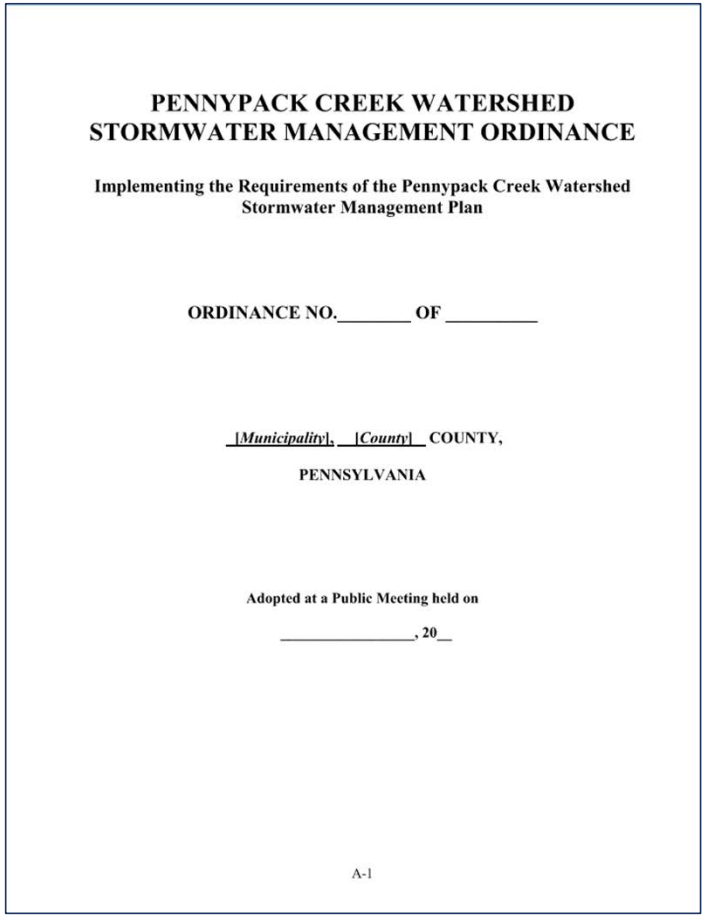
- Provide Conceptual Solutions for Existing Problem Areas

DEP Draft PCSM Manual Objectives
PCSM Objective A – Low Impact Design
A.1 – Protect and Preserve Natural Landscape Processes
A.2 – Enhanced Natural Landscape SCMs
PCSM Objective B – Green Infrastructure Practices
B.1 – Infiltration-Based SCMs
B.2 – Non-Infiltration SCMs
PCSM Objective C – Volume and Water Quality Management
C.1 – Managed Release Concepts
PCSM Objective D – Rate Management
D.1 – Wet Basins, Detention Basins



TASK 3: MODEL ORDINANCE DEVELOPMENT

- Develop a Model Ordinance to be consistent with:
  - Pa Code Title 25 Chapter 102
  - MS4 Ordinance requirements for MS4 communities
    - Other options for non-MS4 communities
  - The New PADEP PSCM Manual



PENNYPACK CREEK WATERSHED
STORMWATER MANAGEMENT ORDINANCE

Implementing the Requirements of the Pennypack Creek Watershed Stormwater Management Plan

ORDINANCE NO._____ OF _____

_[*Municipality*], _[*County*]_ COUNTY,

PENNSYLVANIA

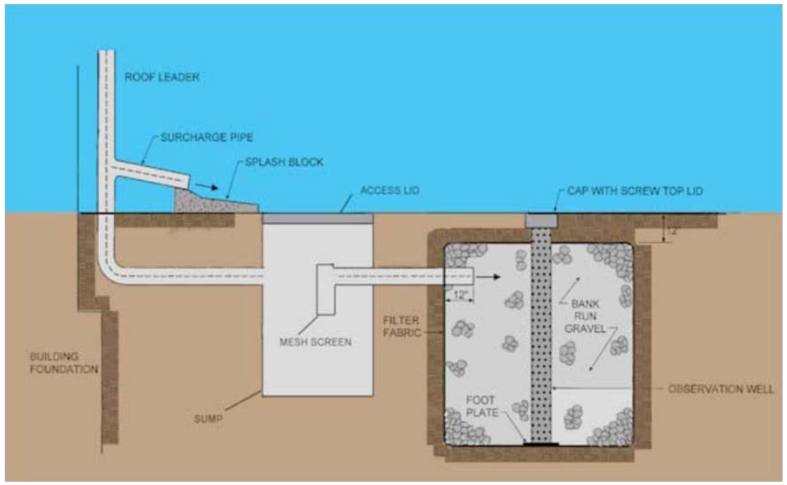
Adopted at a Public Meeting held on

_____, 20__

A-1

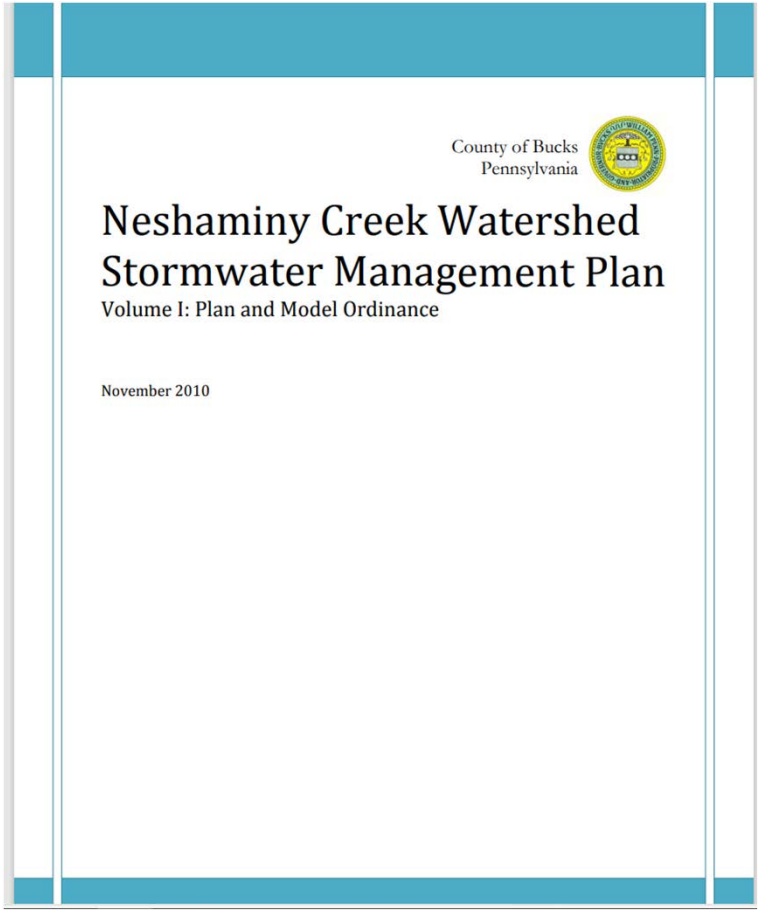
TASK 4: PUBLIC/MUNICIPAL PARTICIPATION VIA WPAC

- Public/Municipal Participation through WPAC
  - Watershed Plan Advisory Committee Meetings
  - Education and Promotion of Initiative
  - Public Hearing



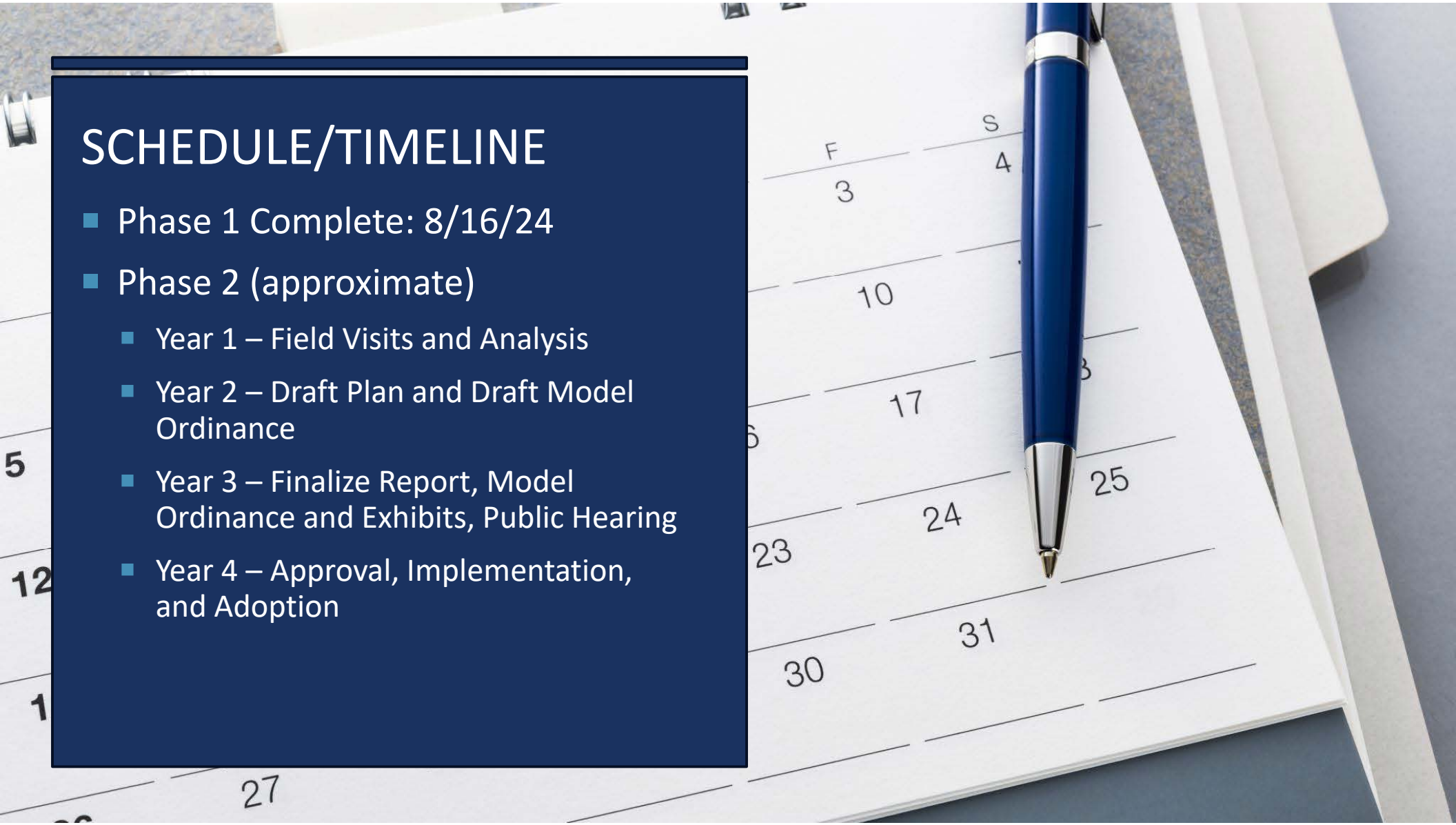
TASK 5: PHASE 2 REPORT

- Draft report including model SW ordinance
- Municipal review of draft report and ordinance
- Final report including model SW ordinance
  - Volume I – Plan & Model Ordinance
  - Volume II – Technical Appendices



ACT 167 Implementation

1. Plan Review by WPAC, County, and DEP
2. County Adoption
3. State (DEP) Approval
4. Municipal Adoption of Ordinance (within 6 months)



SCHEDULE/TIMELINE

- Phase 1 Complete: 8/16/24
- Phase 2 (approximate)
  - Year 1 – Field Visits and Analysis
  - Year 2 – Draft Plan and Draft Model Ordinance
  - Year 3 – Finalize Report, Model Ordinance and Exhibits, Public Hearing
  - Year 4 – Approval, Implementation, and Adoption

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THANK YOU!

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