

Pennypack Creek Watershed Act 167 Study



Status Report – June 15, 2010

Dr. Jeffrey Featherstone



Center for Sustainable Communities
TEMPLE UNIVERSITY®

Pennypack Creek Watershed Act 167 Study

Key Features:

- ❑ Lead: Center for Sustainable Communities**
Assisted by Paul DeBarry, NTM Engineering
- ❑ Timetable: October 2008 – December 2010**
- ❑ 20 Work Tasks**

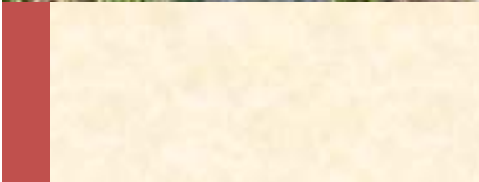
Task Completion Schedule

	TASK	2008			2009									2010															
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	Adjust DEM	■	■	■																									
2	Map Streams				■	■																							
3	Map Obstructions	■	■																										
4	Conduct Fieldwork: Obstructions		■	■			■	■	■	■	■	■																	
5	Conduct Fieldwork: Stormwater Facilities		■	■			■	■	■	■	■	■																	
6	Delineate Sub-basins				■	■																							
7	Update Modeling Data		■	■	■	■																							
8	Update Street File				■	■																							
9	Evaluate Runoff Characteristics					■	■	■	■	■	■	■																	
10	Assess Development Patterns					■	■	■	■	■	■	■																	
11	Model Hydrology					■	■	■	■	■	■	■																	
12	Model Hydraulics												■	■	■	■													
13	Depict Flooding Hazard Areas																■	■	■	■	■								
14	Model Stormwater Improvements and Estimate																■	■	■	■	■	■	■						
15	Prepare Facilities Plan																				■	■	■						
16	Develop Control Standards																				■	■	■						
17	Prepare Draft ACT 167 Plan																				■	■	■						
18	Submit Draft Plan																					■	■						
19	Project Oversight	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
20	Submit Final Plan																											■	

Study Work Tasks

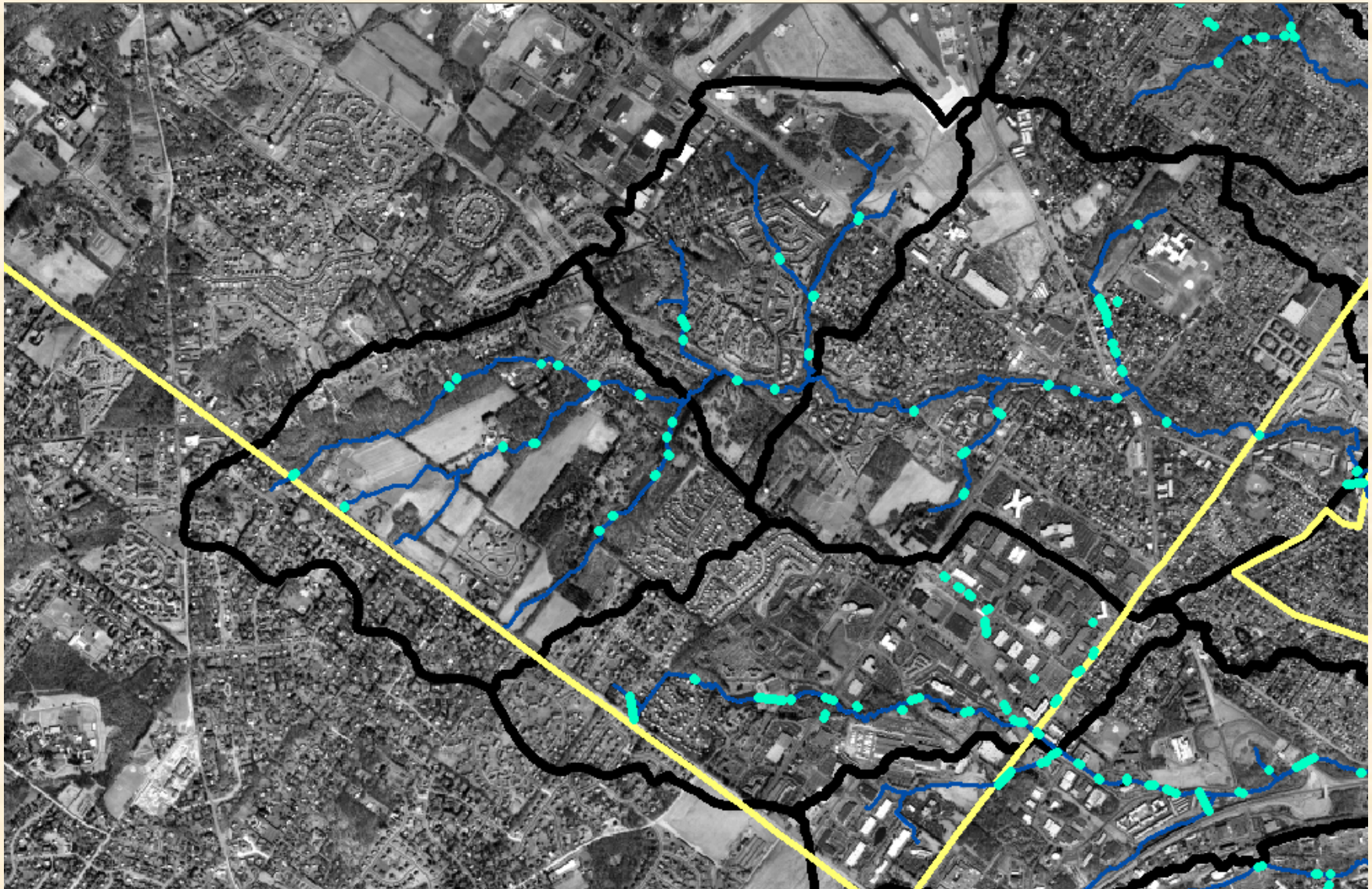
Tasks 1-5

1. **Adjust DEM - Completed**
2. **Map Streams -Completed**
3. **Map Obstructions - Completed**
4. **Field Work: Obstructions – 90% Complete**
5. **Field Work: Stormwater Facilities – 80% Complete**



Obstructions

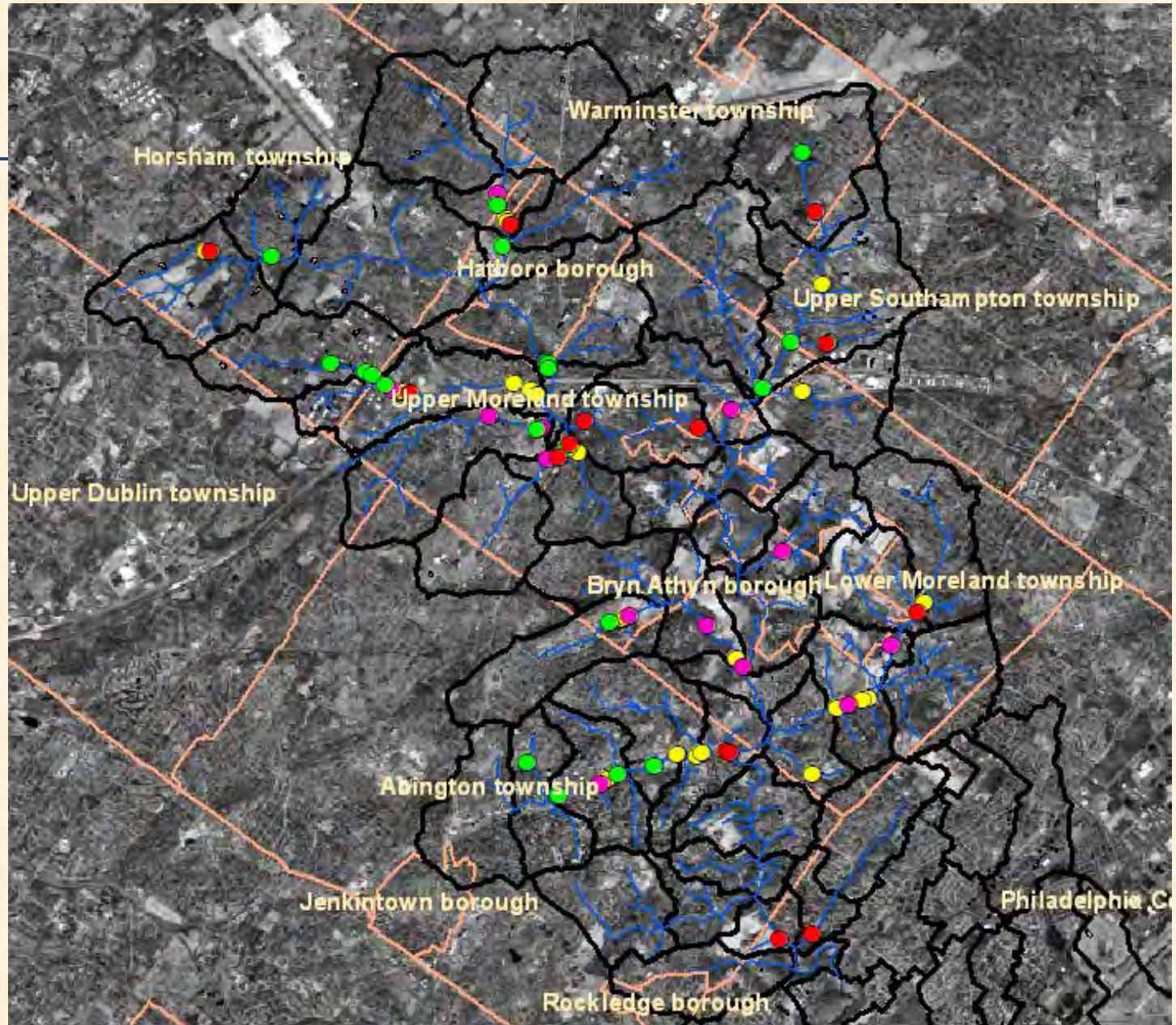
The PWD is completing a survey to update bridge and culvert data and is calculating the capacity of each structure. The CSC is using the GIS to calculate the drainage area for each structure and will provide design storm flows based on drainage area pro-rating for structures with catchments > 0.5 sqmi.



The object is to identify the most limiting obstructions

Capacity Exceeded:

- ≥ 1 -Yr Storm
- ≥ 2 -Yr Storm
- ≥ 5 -Yr Storm
- ≥ 10 -Yr Storm



Study Work Tasks

Tasks 6-10

6. Delineate Sub-basins - Completed
7. Update Modeling Data – Completed
8. Update Street File - Completed
9. Evaluate Runoff Characteristics -
Completed
10. Assess Development Patterns – 60%
Complete

Study Work Tasks

Tasks 11-15

- 11. Hydrologic Model Development – Complete**
- 12. Hydraulic Model (Suburban) – Completed in FIS**
- 13. Prepare Flood Depth Maps for Selected Locations – 40% Complete**
- 14. Model Stormwater Improvements and Estimate Costs – 50% Complete**
- 15. Prepare Stormwater Improvements Plan – 20% Complete**

Stormwater Detention Facilities Inventory:

- * Identify newly installed facilities and determine volumes.



Stormwater Detention Facilities Inventory:

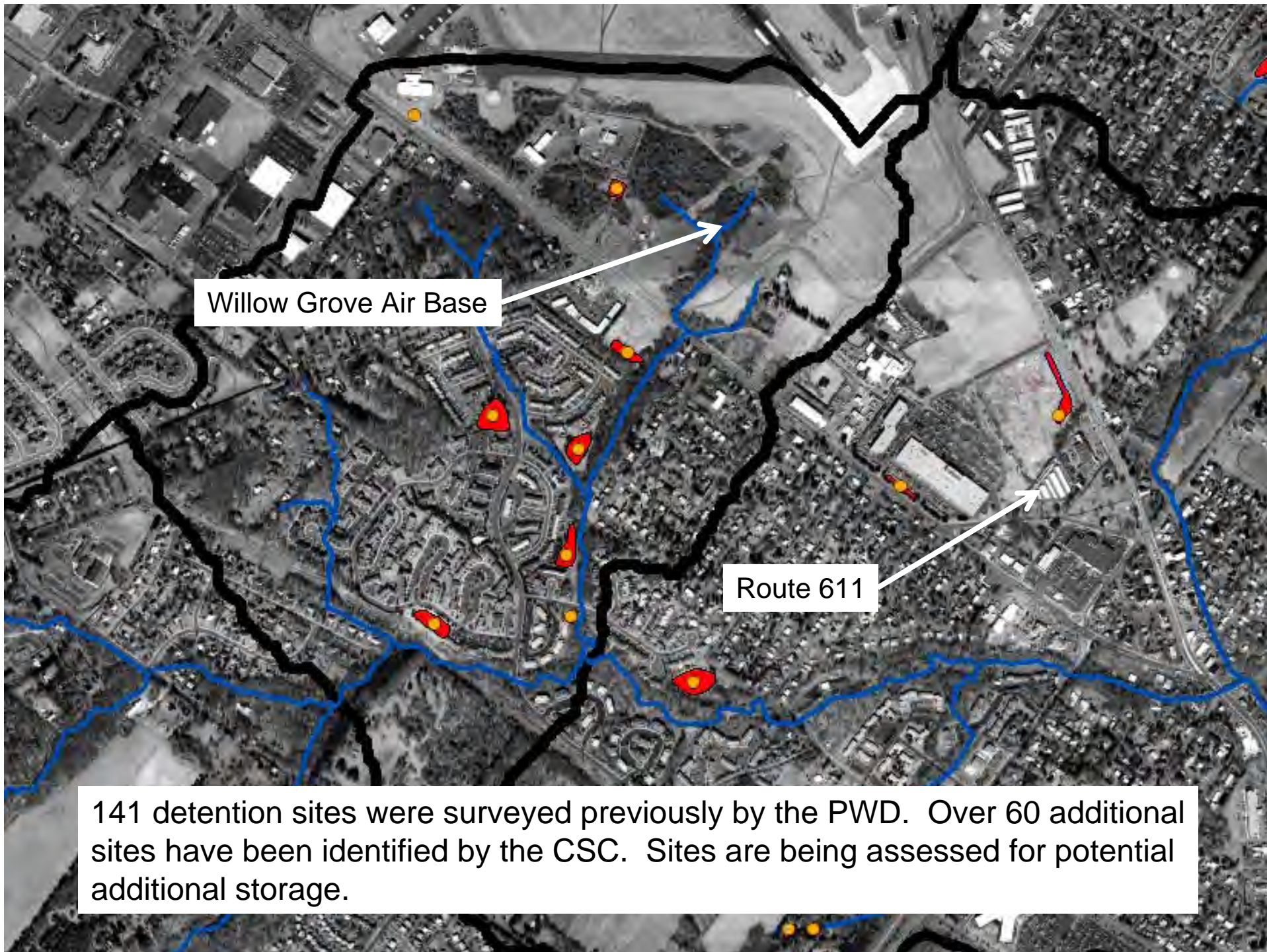
- * Determine Potential for lowering floor or elevating berm.



Stormwater Detention Facilities Inventory:

- * Determine Potential for vegetation or improved outlet.



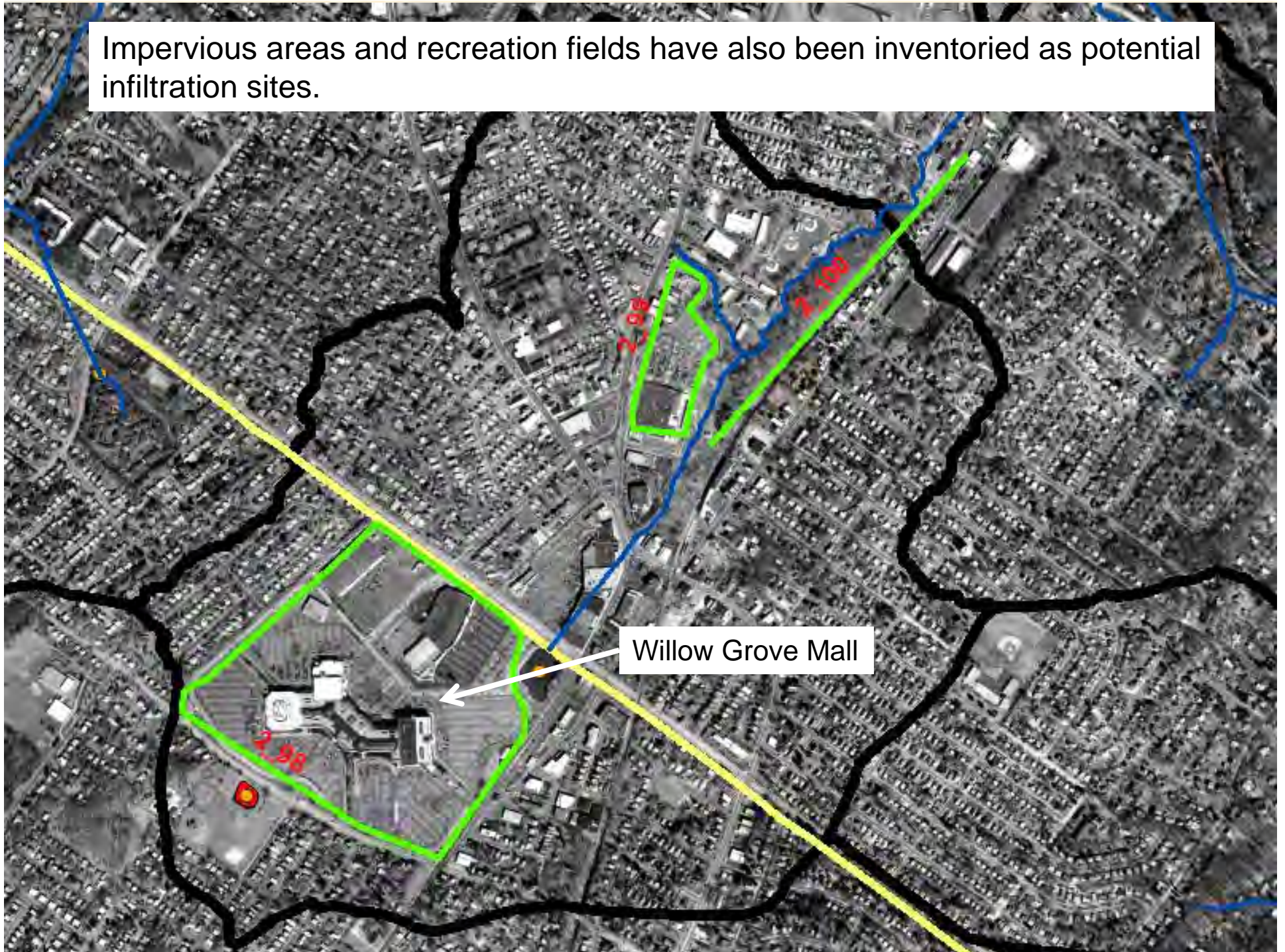


Willow Grove Air Base

Route 611

141 detention sites were surveyed previously by the PWD. Over 60 additional sites have been identified by the CSC. Sites are being assessed for potential additional storage.

Impervious areas and recreation fields have also been inventoried as potential infiltration sites.





Revitalizing Fort Washington Office Park

Table 3: Pine Run, Potential Stormwater Improvements

I.D.	Picture	Description	Recommendation	Estimated Volume (Acre-Ft)	Cost
P-1	0469	Field in SE quadrant of Welsh Rd (rte 63) & Jarrettown Rd. Dimensions of field: 1000 ft. x 1100 ft = 25 acres. Presently cultivated, but slated for development. In headwaters of two branches of Pine Run.	Must have complete retention of design storms. New stormwater facilities strongly recommended.	For complete retention of 10 year storm, (5.2 inches of rainfall), retained volume would be 10.8 Acre-Ft. Estimate 10 A-F of <i>New Detention</i> over and above existing infiltration at field (~0.5")	Stormwater Basin \$553,100
P-2	0470	Twin 24"-diam. Pipes Outfall of road drainage and runoff from subdivision surrounding Holly Hill (U. Dublin Open Space.)			
P-3A	0471 0472	Entry to Dublin Open Space Large detention basin. Dimensions: Approx 180 ft. x 210 ft. = 0.87 acres Easy access via gravel road from Jarrettown Rd.	Very good candidate for retrofit to infiltration/extended detention.	Existing depth is 8 ft. to spillway. Existing capacity ~7 A-F. ~0.9 A-F of <i>New Detention</i> for each Additional foot of depth/infiltration added. * More detailed analysis is needed to assess potential additional detention. For 4 ft. of additional berm height: ~4 A-F of <i>New Detention</i> would result.	Stormwater Basin \$22,200



Revitalizing Fort Washington Office Park

2-Year Floodplain and Flood Depths before Improvements

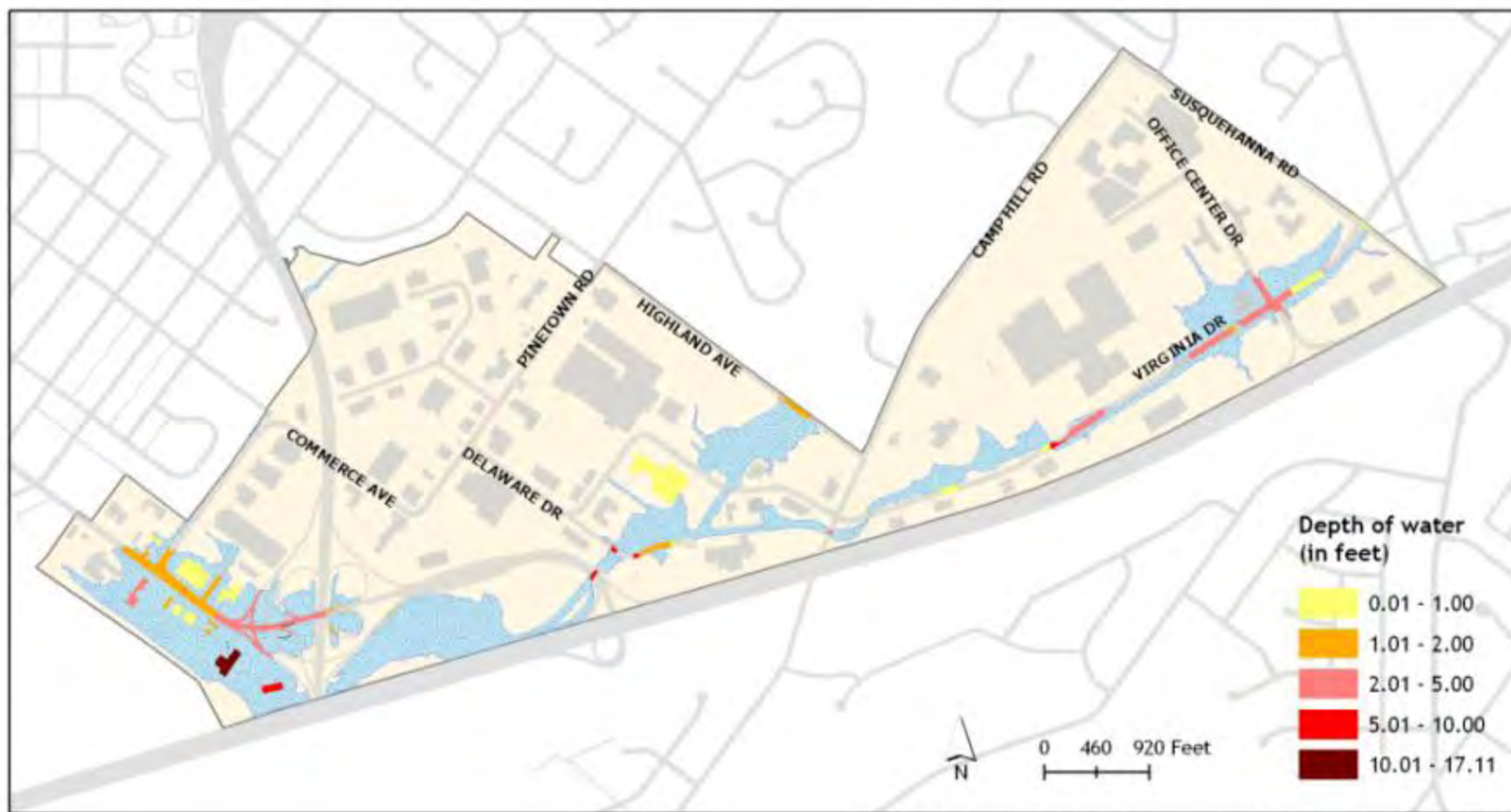


Map Prepared by Center for Sustainable Communities, Temple University Ambler, PA, July 31, 2008



Revitalizing Fort Washington Office Park

2-Year Floodplain and Flood Depths after Improvements

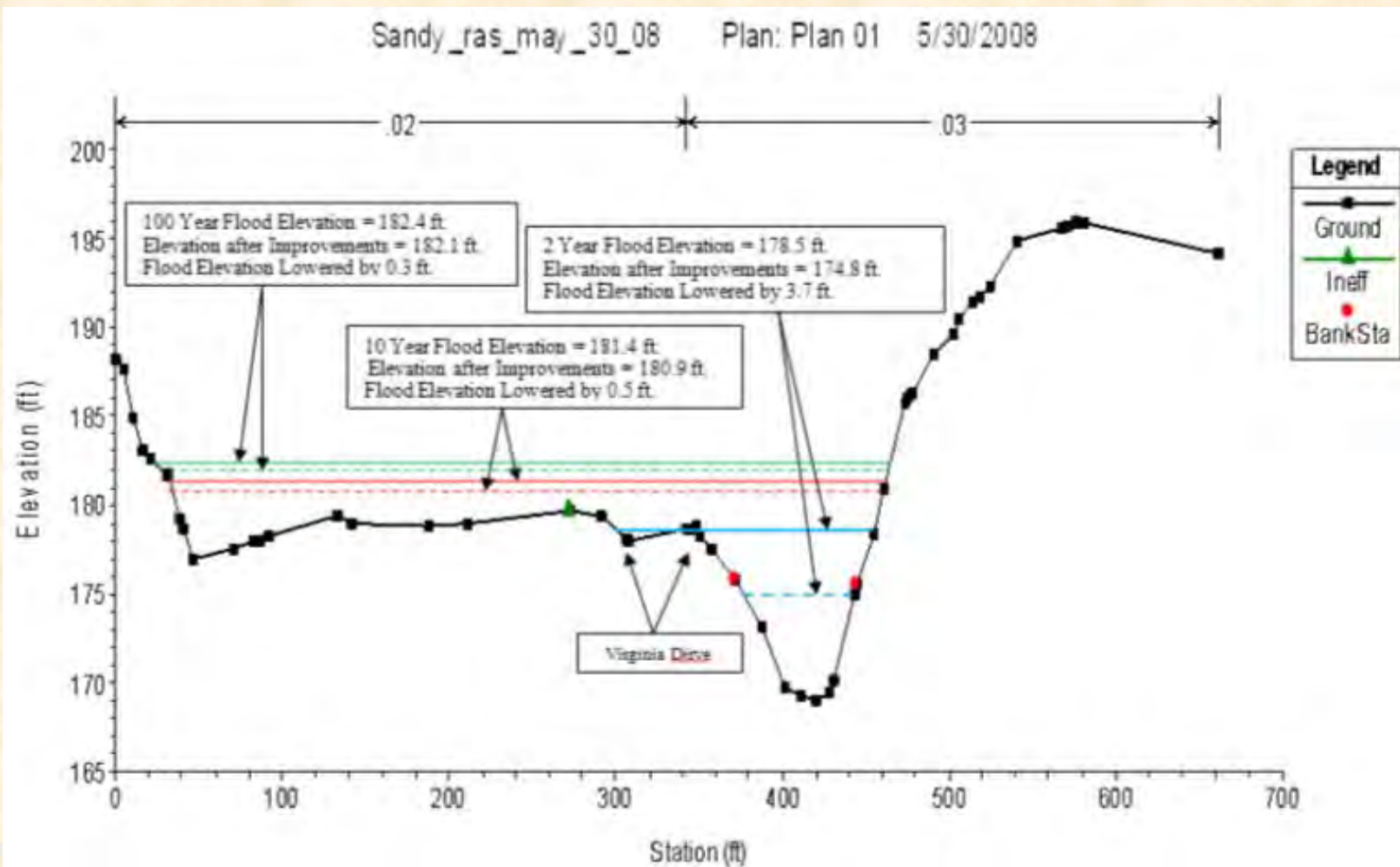


Map Prepared by Center for Sustainable Communities, Temple University Ambler, PA, July 31, 2008



Revitalizing Fort Washington Office Park

Cross Section 415 showing 2, 10, and 100 Year Flood Elevations Before and After Improvements



Study Work Tasks

Tasks 16-20

16. Develop Control Standards, including

Release Rates – 20% Complete

17. Prepare Draft Act 167 Plan

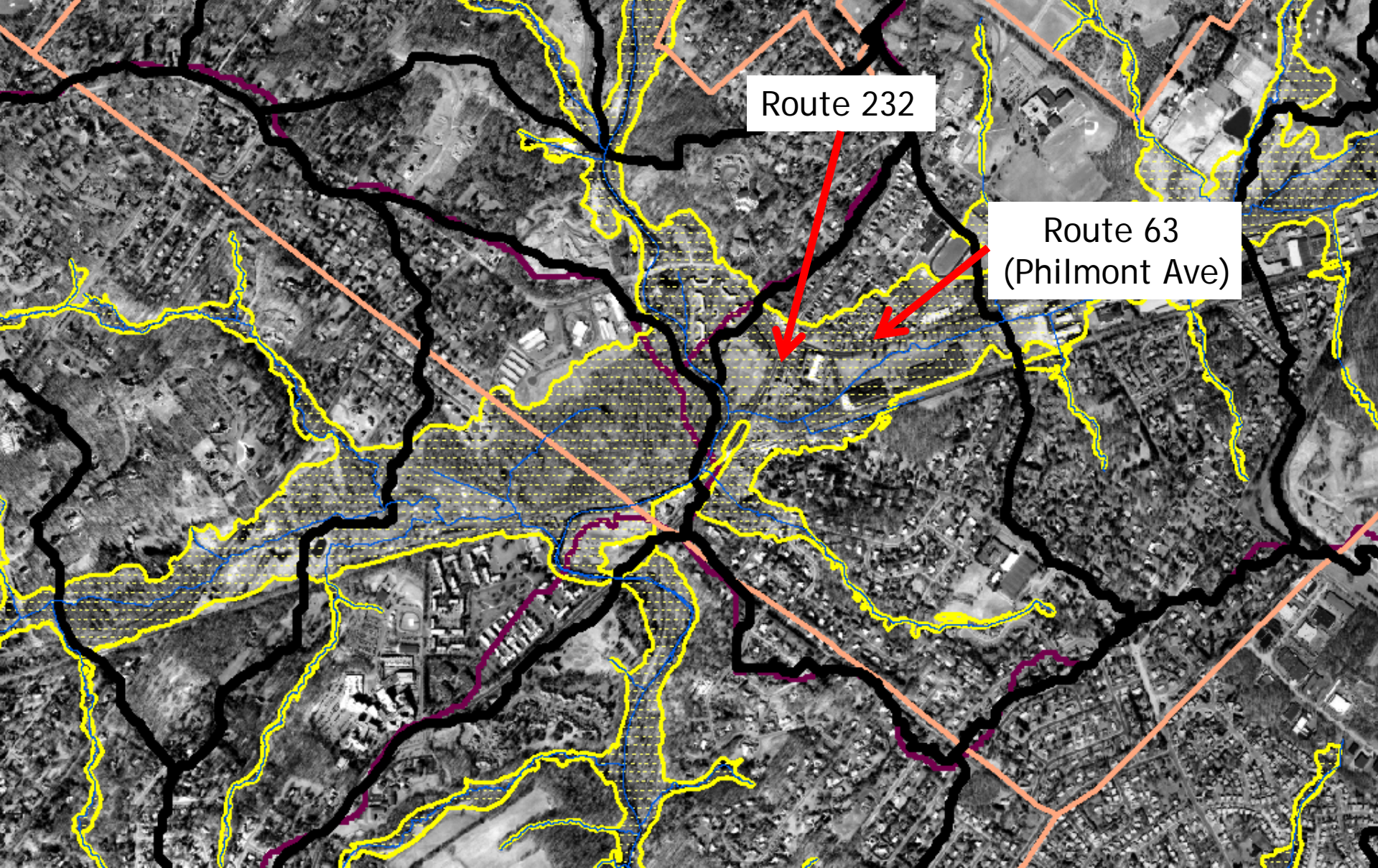
18. Submit Draft Plan

19. Project Oversight

20. Submit Final Plan

Release Rates

Objective is to avoid worsening downstream flooding due to detention of additional runoff volume from development and changing the timing of peak flows.

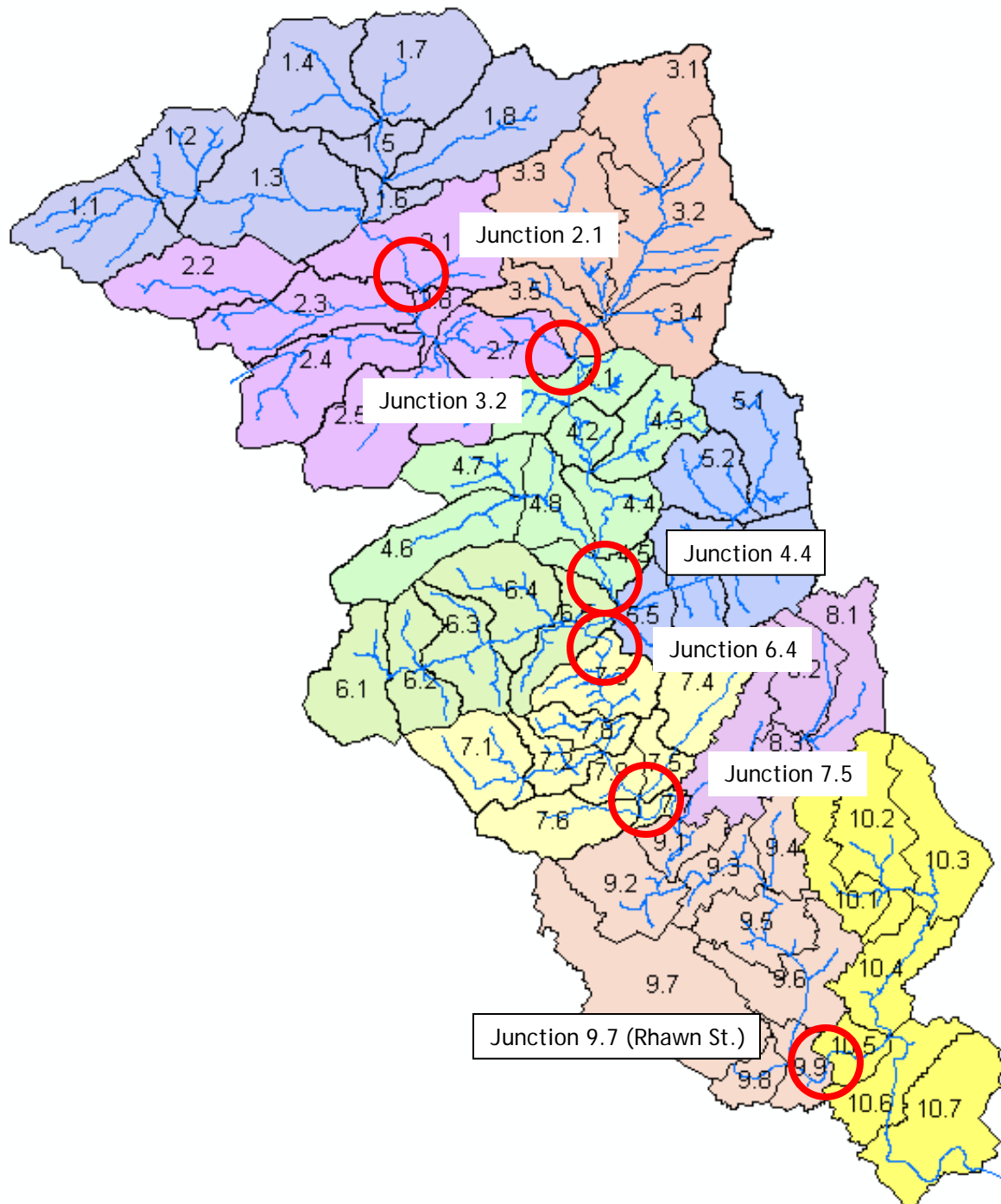


Release Rate Development

Points of interest are selected where there is potential for flood damage.

The hydrologic model is run for each point to determine runoff contributions from different portions of the watershed.

Using the model results management zones for new detention are established to limit post development peak flow rates.



CONTACT

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