

Opportunities and Benefits of Watershed Collaboration for Water Utilities

Kelly Anderson, Watershed Protection Program Manager

Philadelphia Water Department



PHILADELPHIA
WATER
— DEPARTMENT —

Philadelphia Water Department



Drinking Water

- 1.6 million drinking water customers
- Three Water Treatment Facilities
- Over 300 million gallons treated per day
- 3,000 miles of water mains, 25+ pumping stations



Wastewater

- 2.2 million wastewater customers
- 3 Water Pollution Control Plants
- Over 522 million gallons treated per day
- 3,716 miles of sewers, 19 pumping stations
- Biosolids handling facility



Stormwater

- Roughly 60% Combined Sewer, 40% Separate Sewer
- Green City, Clean Water - Large-scale green stormwater infrastructure program
- To date, the program has reduced CSOs by more than 1.5 billion gallons annually with over 440 GSI sites

All system components influenced by the
Schuylkill and Delaware River Watersheds!



Source Water Protection Program

Philadelphia Water Department's Source Water Assessment led to a carefully developed, multifaceted plan that extends into two keys watersheds



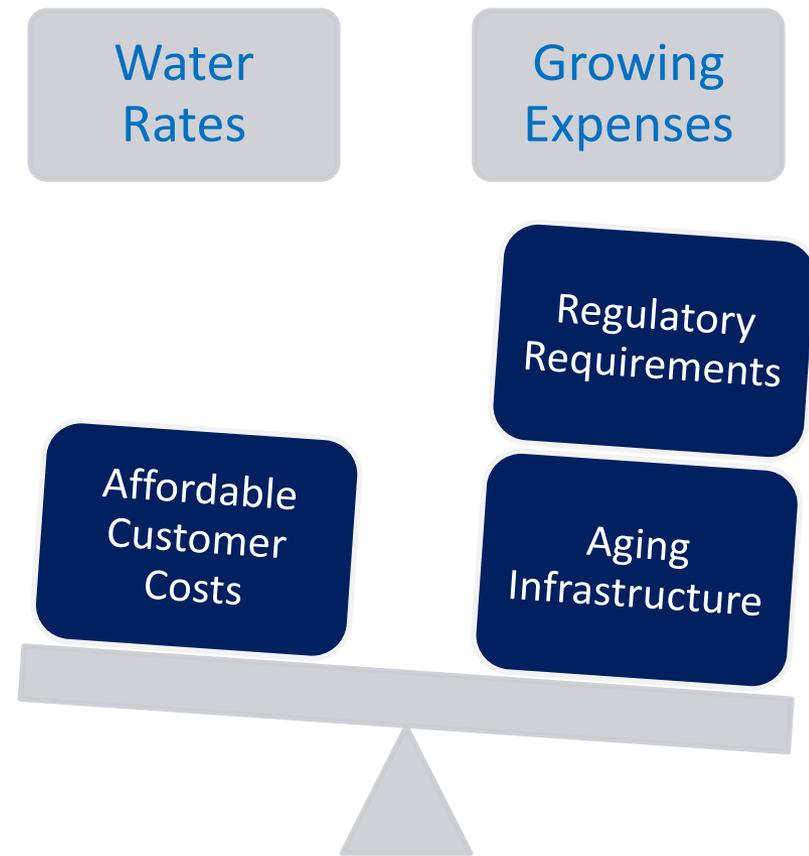
Priority Objectives

- Building watershed partnerships
- Increasing communication around emergency events
- Developing sustainable funding for restoration and education projects
- Increasing public awareness of the regional importance of watersheds
- Reducing the impact of point and nonpoint source pollution

Watershed Protection Planning

Watershed Protection techniques are a flexible and cost-effective approach to unite the priorities of the Clean Water Act and Safe Drinking Water Act

- Balancing Clean Water Act and Safe Drinking Water Act objectives
- Strategic source water protection can maximize watershed benefits while minimizing costs to utility rate payers



Watershed Protection Planning

Watershed protection is a sustainable, flexible alternative capable of delivering triple-bottom-line benefits to communities and utilities



- Triple Bottom Line (TBL) approach considers the greatest total value to the community, beyond traditional cost-benefit
- TBL approach to watershed protection planning considers a project's ability to provide environmental, social, public health, and other values
- Identifying TBL benefits are easy, quantifying them is the challenge

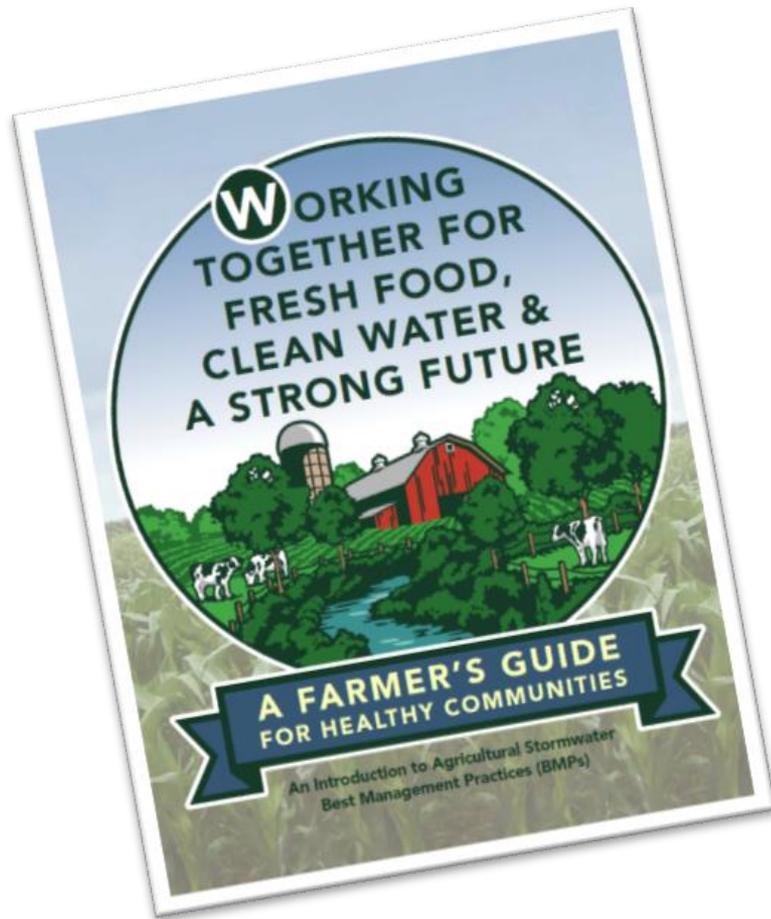
TBL Approach to Pathogen Reduction

Management of Cryptosporidium is an opportunity for watershed protection

- Long Term 2 Enhanced Surface Water Treatment Rule for control of *Cryptosporidium*
 - WWTP largest potential source, >100 WWTP dischargers upstream
 - Costly UV treatment is needed for inactivation, but no Clean Water Act regulatory driver
- Watershed Control Program Plan microbial toolbox option creates incentive for upstream TBL pathogen management practices and opportunities to create collaboratives with other watershed-focused partners

Benefits to Farm Owners

Agricultural best management practices (BMPs) and farmland preservation provide TBL benefits for the land owners.



Conservation and Nutrient Management Planning

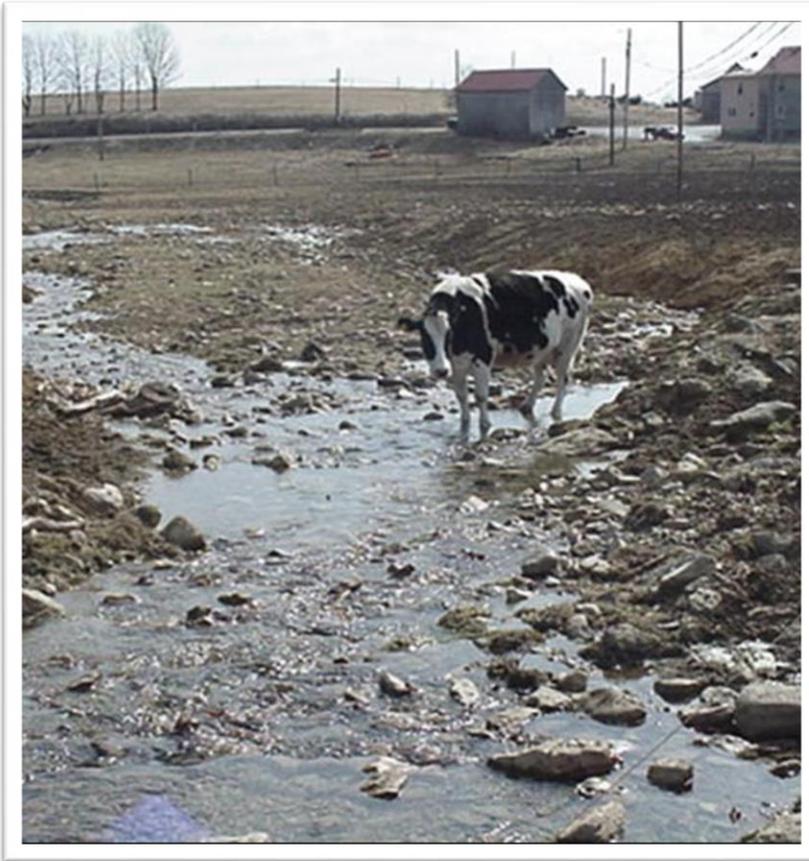
- Increases crop growth and yield
- Reduces need and cost of chemical fertilizers
- More flexibility to use manure as fertilizer when needed
- Healthier livestock, improved productivity and lower veterinary bills
- Assist in meeting regulatory requirements
- Increase property value
- Protecting land and water resources for future generations

BMP Opportunities on Farms



TBL Approach to Pathogen Reduction

Agricultural BMPs benefit the environment, health of the community, and the farmer's business



- Targeted short-term approach to reducing second largest source of *Cryptosporidium* upstream-**agricultural runoff**
- Resources are leveraged through the watershed partnership framework for agricultural BMPs
 - Manure storage basins
 - Stream-bank fencing
 - Riparian Buffers

TBL Approach to Pathogen Reduction

Manure storage basins are cost-effective and provide a societal and environmental benefit



- Manure storage removes pathogens and reduces non-point source runoff of sediment and nutrients
- Provides secure storage until proper time to fertilize fields and reduce quantity of synthetic fertilizer farmers purchase
- Word-of-mouth promotes the implementation of basins in the watershed
 - ✔ Community
 - ✔ Economy
 - ✔ Environment

Schuylkill River Restoration Fund

Leveraging resources through a partnership-based approach

Public-Private Partnership



Schuylkill River Greenways



Philadelphia Water Department



Aqua Pennsylvania



Exelon Corporation



Partnership for the Delaware Estuary



Mom's Organic Market

- Grant awards for projects that improve water quality in the Schuylkill River
 - Agricultural Runoff
 - Abandoned Mine Drainage
 - Urban Stormwater
- Since 2006, distributed more than \$3.3M and leveraged more than \$5M

2016 SRRF Grant Recipient

*Zettlemoyer Farm **BEFORE** project completion*



2016 SRRF Grant Recipient

*Zettlemoyer Farm **AFTER** project completion*



2017 SRRF Grant Recipient

*Irish Creek Stream Restoration **BEFORE** project completion*



2017 SRRF Grant Recipient

Irish Creek Stream Restoration **AFTER** project completion



2017 SRRF Grant Recipient

*Irish Creek Stream Restoration **AFTER** project completion*



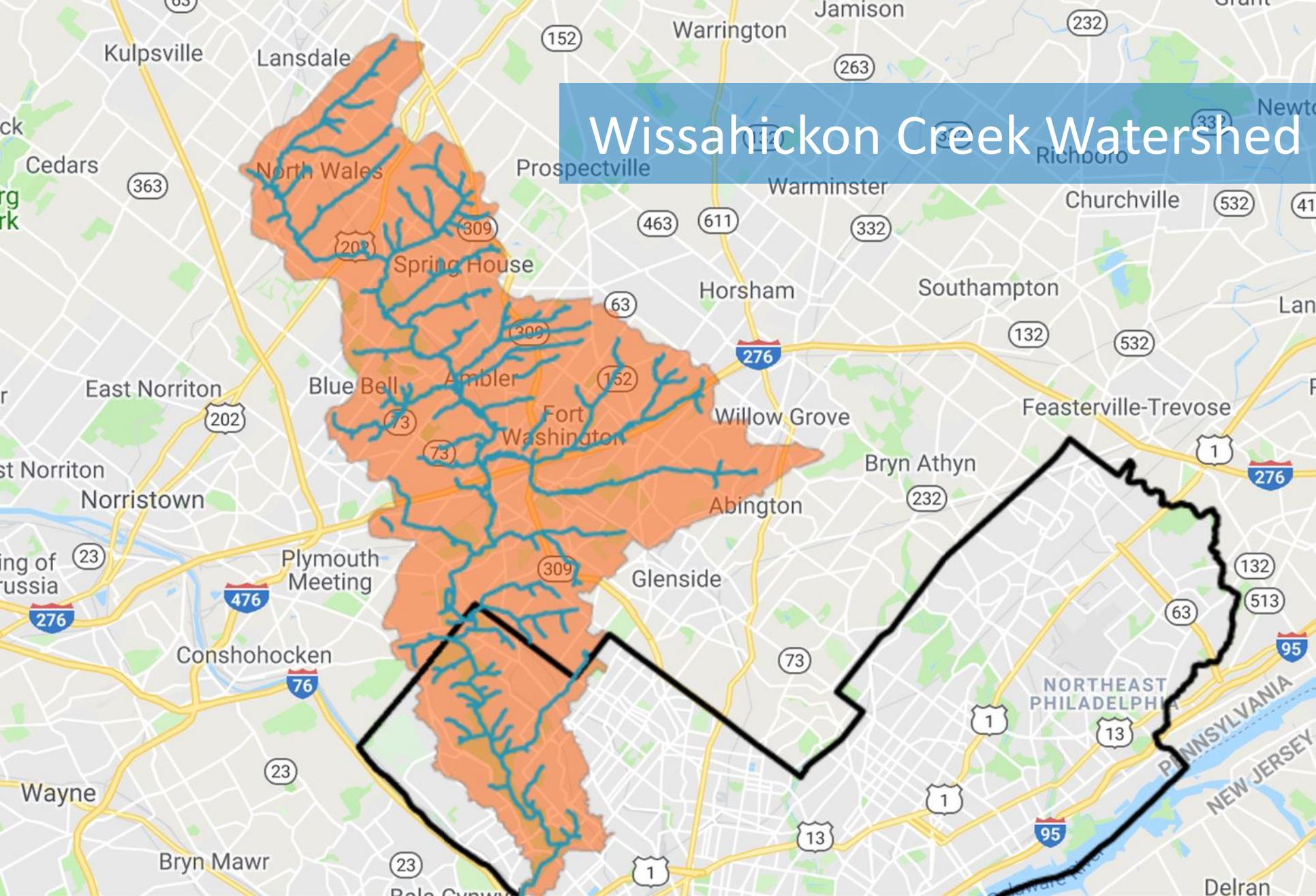
2017 SRRF Grant Recipient

*Irish Creek Stream Restoration **AFTER** project completion*



Ongoing Future and Collaborative Opportunities

Wissahickon Creek Watershed



Wissahickon Considerations

Balancing current regulatory obligations with future unknowns



PWD PRIORITIES

- LT2 Watershed Control Plan
- MS4 Permitting
- Phosphorus TMDL
- Siltation TMDL



UNCERTAINTY

- Climate Change
- Politics
- Agency priorities
- Organizational Structure
- Budgets and funding

Wissahickon Opportunities

Identifying locations with potential to meet multiple regulatory objectives



Ongoing Future Collaborative Opportunities

Utilities can benefit from collaborative networks like the Schuylkill Action Network on both long term planning and the day-to-day operations



- Water quality emergencies and special sampling
- Ongoing watershed monitoring efforts
 - PFAS
 - Harmful algal blooms
- Continuation of pathogen-focused work

Concluding Remarks

Thoughtful planning yields measurable results

- Watershed partnerships, e.g. the Schuylkill Action Network, are critical in coordinating, efficiently using resources, and optimizing benefits
- Grant programs can be used to leverage additional funding for watershed protection
- Utility partnerships are critical resources and we can learn from each other
- Water quality improvements take time, but improvements can be significant
- There's still plenty of work to be done!

Questions?



PHILADELPHIA
WATER
— DEPARTMENT —

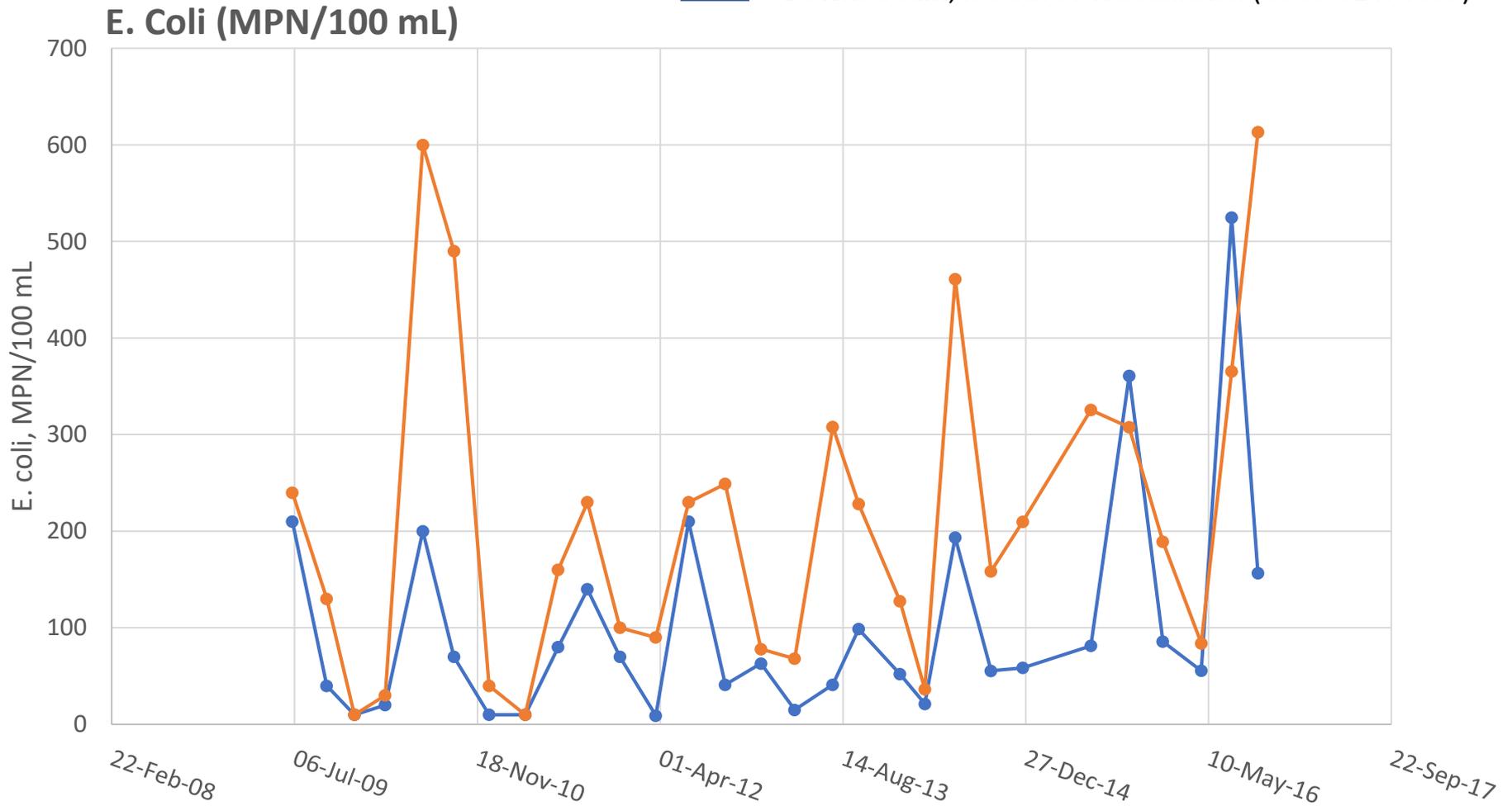
Kelly Anderson
Watershed Protection Manager
Kelly.Anderson@phila.gov

Observations from Wissahickon Creek

(2009-2017)

■ = Upstream, Ft. Washington (USGS 01473900)

■ = Downstream, Mouth of Wissahickon (USGS 01474000)

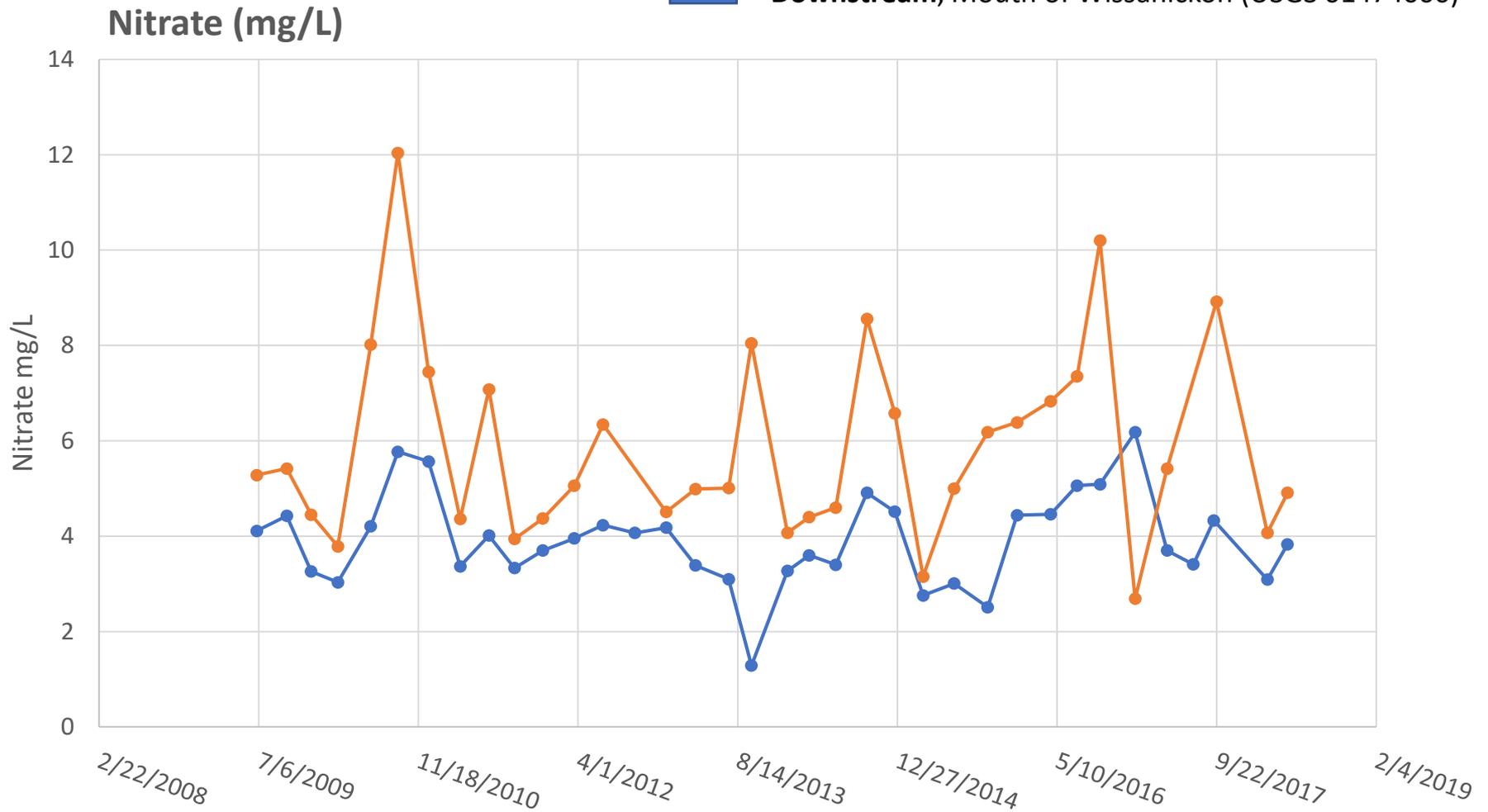


Observations from Wissahickon Creek

(2009-2017)

 = **Upstream, Ft. Washington (USGS 01473900)**

 = **Downstream, Mouth of Wissahickon (USGS 01474000)**



Observations from Wissahickon Creek

(June 2018)

 = **Upstream**, Ft. Washington (USGS 01473900)

 = **Downstream**, Mouth of Wissahickon (USGS 01474000)

