

# Flat Rock Dam and Manayunk Canal Improvement Project

Water Quality | Ecology | Aesthetics & Recreation

Presented by:

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Office of Watersheds

**PHILADELPHIA**  
**WATER**  
EST. 1801

# Key Points

1

Due to its age and structural concerns, Manayunk Canal Feeder Structure portion of Flat Rock Dam needed significant structural repairs

2

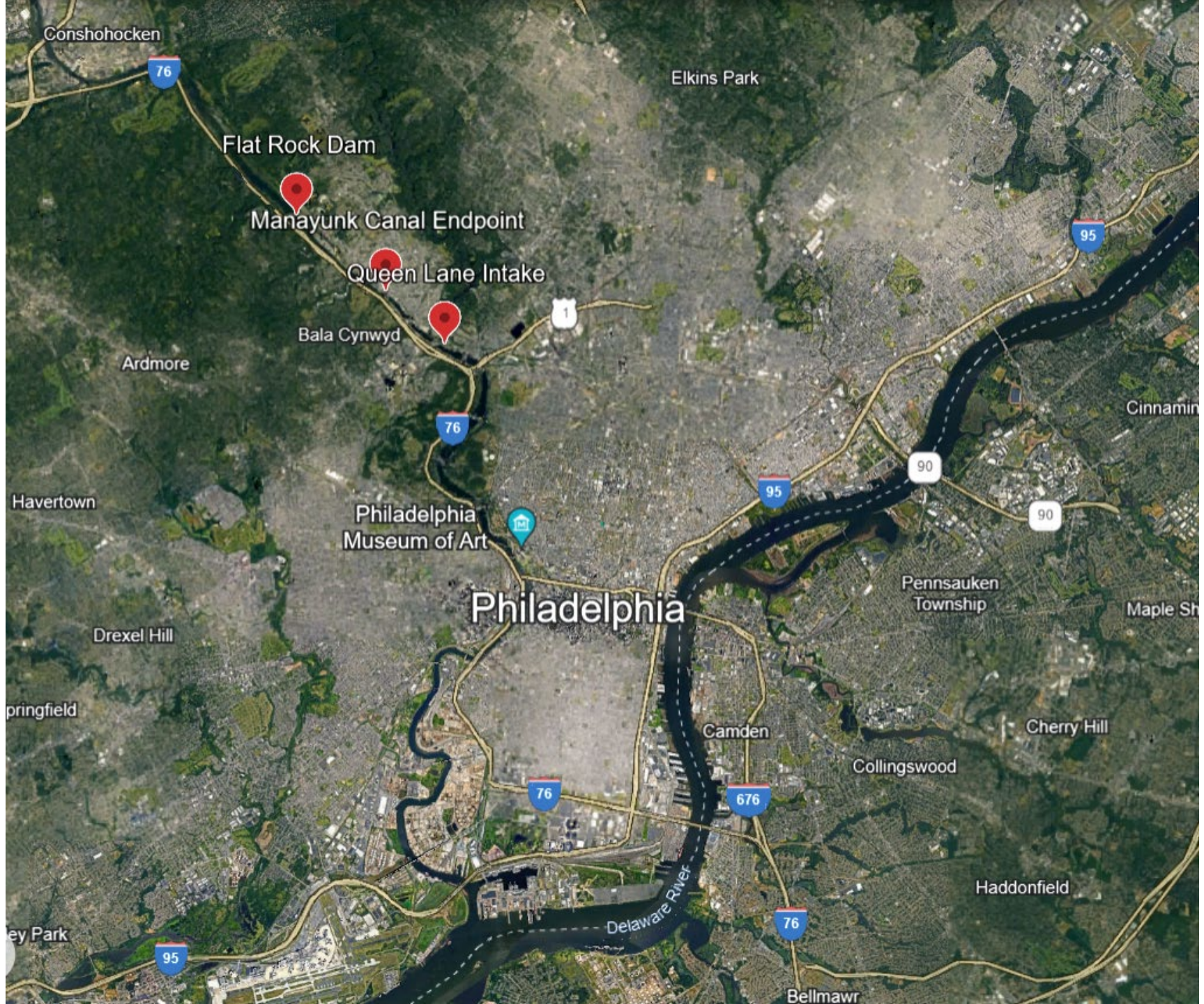
Water quality and aesthetics have been a concern to the Department, Manayunk residents and local businesses for years

3

The Flat Rock Dam-Manayunk Canal Improvement Project addresses these concerns in a comprehensive manner







Conshohocken



Elkins Park

Flat Rock Dam



Manayunk Canal Endpoint



Queen Lane Intake



Bala Cynwyd



Ardmore



Havertown

Philadelphia Museum of Art



Pennsauken Township



Cinnamin

Philadelphia

Drexel Hill

Maple St

Springfield

Camden

Cherry Hill



Collingswood



Haddonfield

Key Park

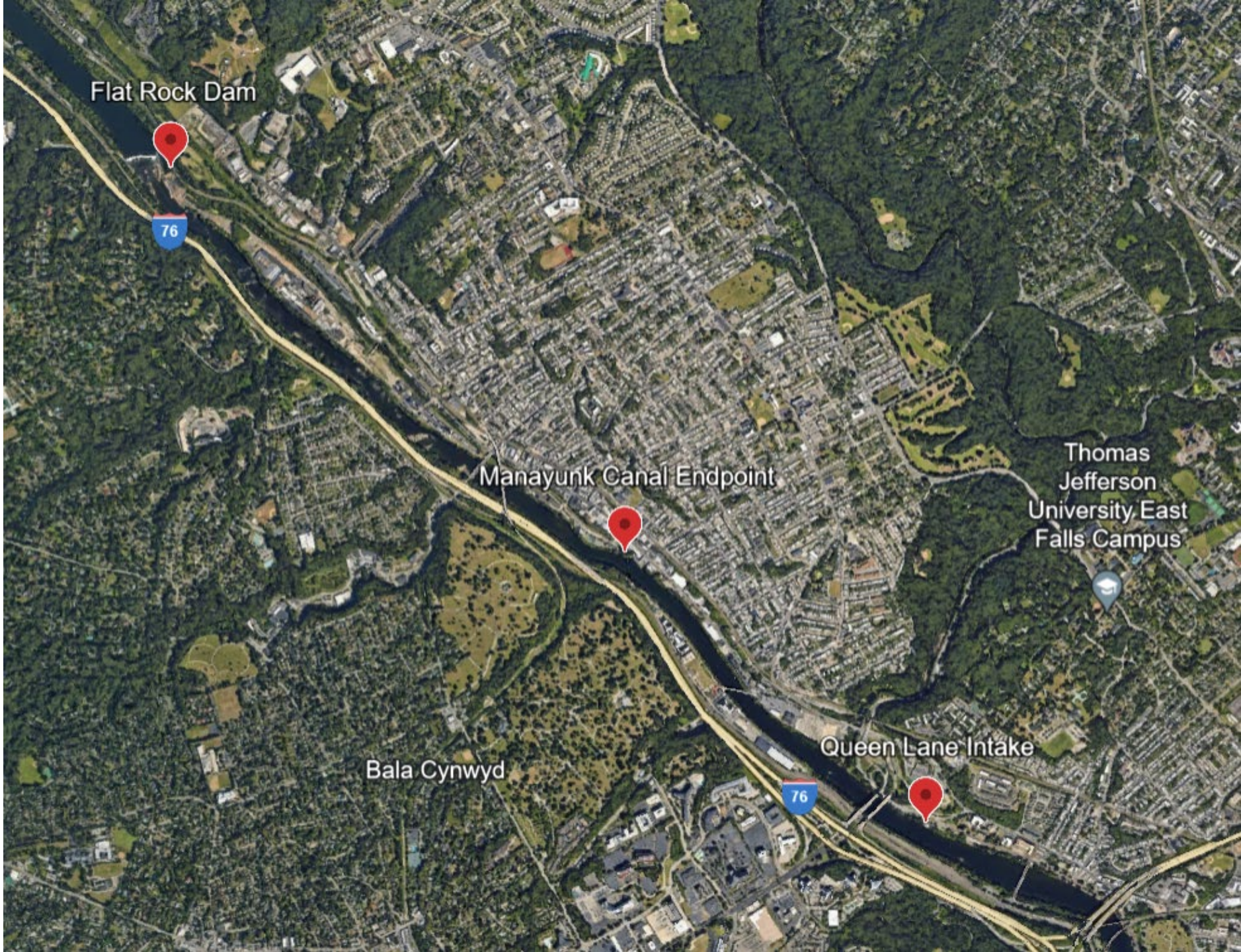


Delaware River



Bellmawr





Flat Rock Dam

76

Manayunk Canal Endpoint

Thomas  
Jefferson  
University East  
Falls Campus

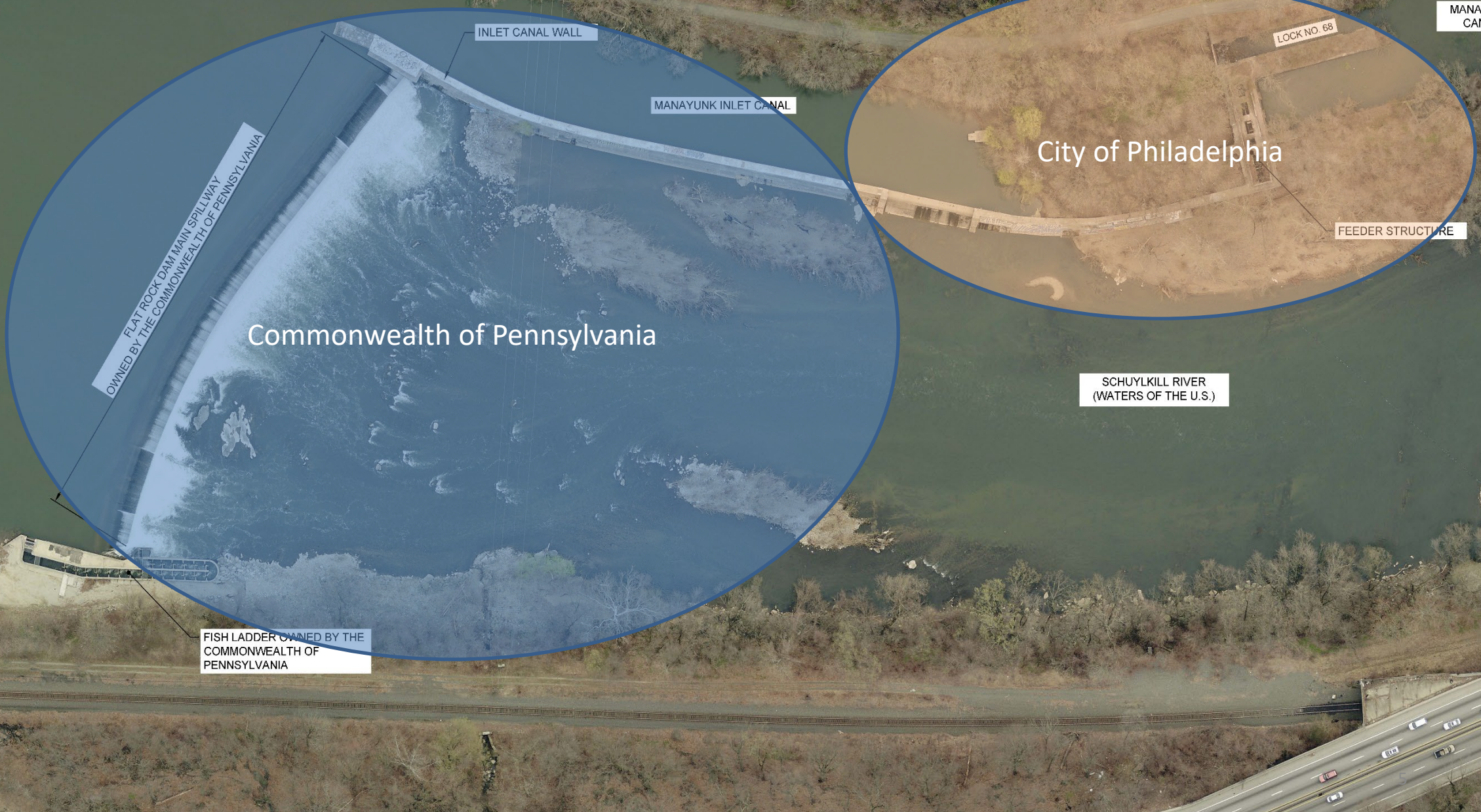
Bala Cynwyd

Queen Lane Intake

76



# Spatial Orientation Of Manayunk Canal Headworks And Flat Rock Dam



Commonwealth of Pennsylvania

City of Philadelphia

OWNED BY THE COMMONWEALTH OF PENNSYLVANIA  
FLAT ROCK DAM MAIN SPILLWAY

INLET CANAL WALL

MANAYUNK INLET CANAL

LOCK NO. 68

FEEDER STRUCTURE

SCHUYLKILL RIVER  
(WATERS OF THE U.S.)

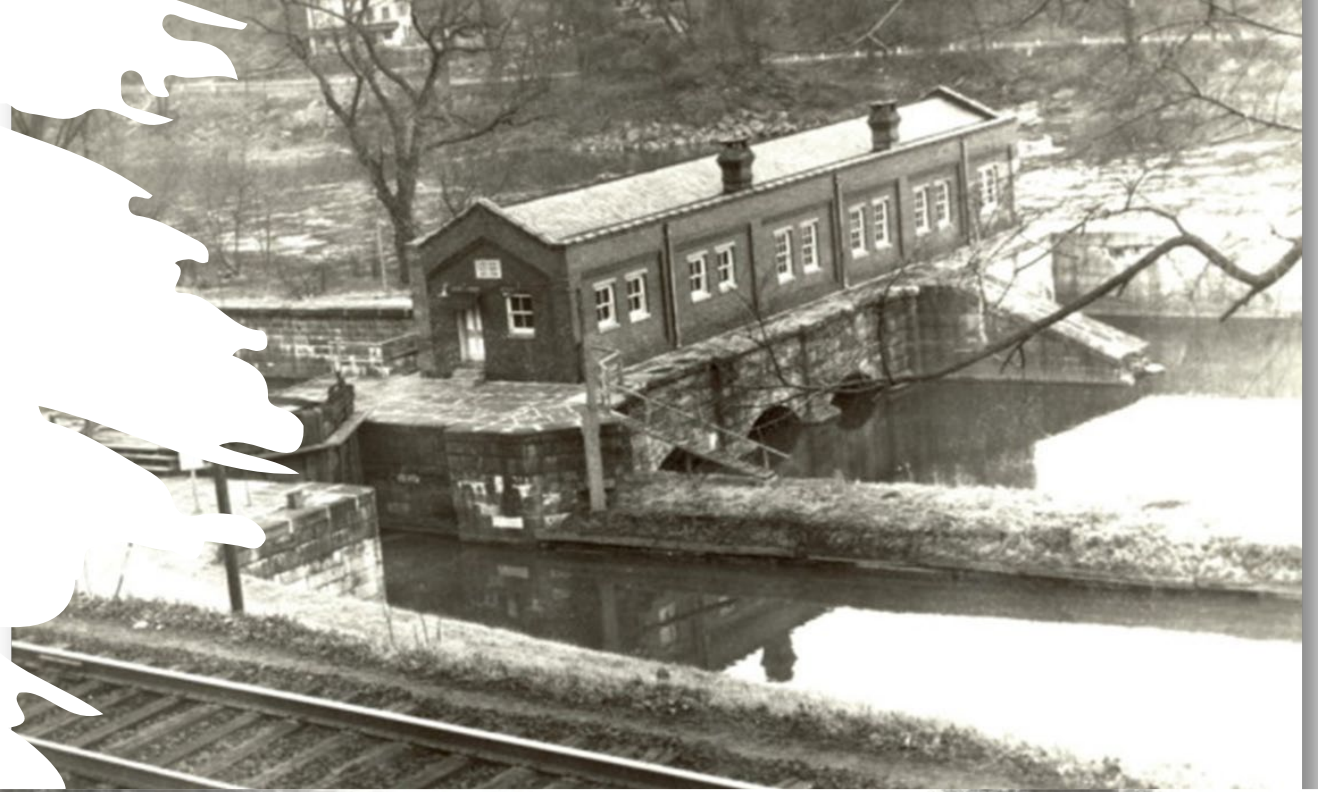
FISH LADDER OWNED BY THE COMMONWEALTH OF PENNSYLVANIA

MANAYUNK CANAL



# Historic Features

**Lock 68 and Feeder  
Structure Prior to 1918**







Photograph of feeder house remnants  
prior to 2022





Photograph of feeder house remnants  
prior to 2022





**Bulkhead of Manayunk Canal**





**Gate Operators**





Towpath



Bulkhead



Lock No. 68



Intake Channel

Accumulated Sediment

Manayunk Canal

Intake Channel Wall



Feeder Structure

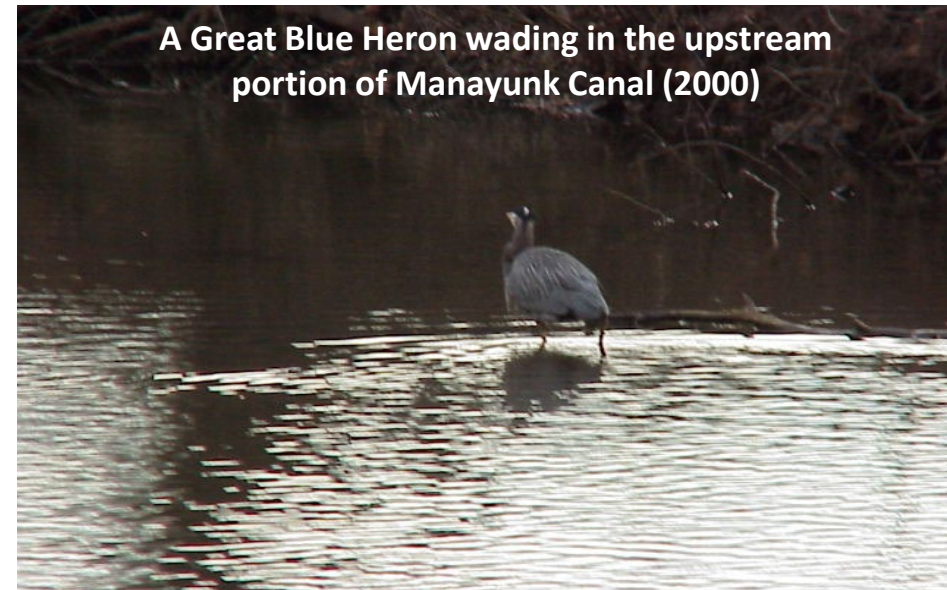
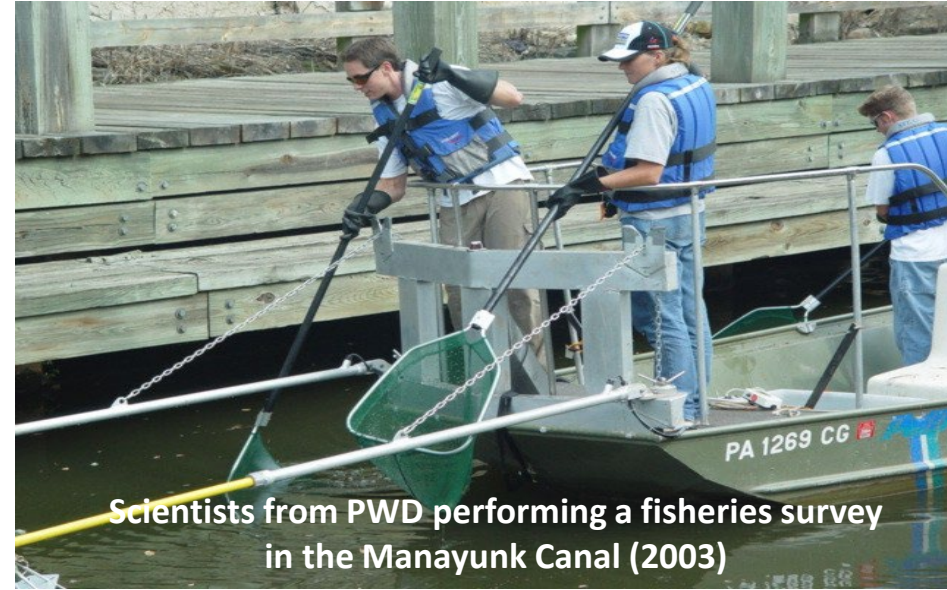


Schuylkill River



# Ecological Perspective

- Highly productive
- Supports significant populations of fish, amphibians, reptiles, birds, and macroinvertebrates
- 2003 survey revealed 13 species of fish
  - Pollution tolerant assemblage
  - Results suggest a stressed community
  - Stunted growth in various species
- Ecology reflects low-gradient, slow-moving water conditions (e.g. wetland)





# Water Quality Concerns

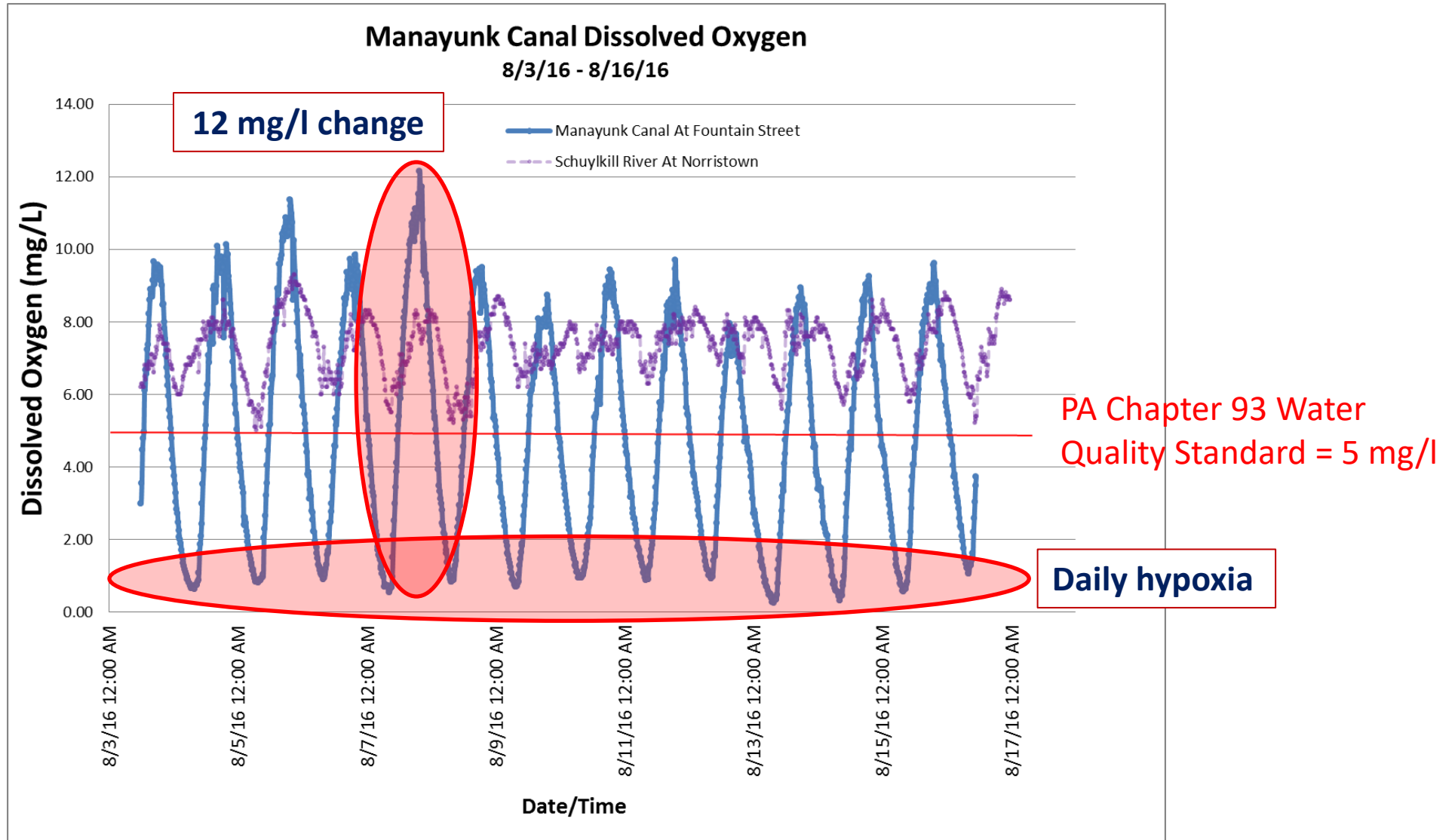
## *Algal Blooms*

- Frequent in summer months
- Aesthetically unpleasing
- Taste and odor concerns for drinking water
- Profound impact on water quality and aquatic organisms





# Water Quality Concerns - *Dissolved Oxygen*





# Water Quality Concerns

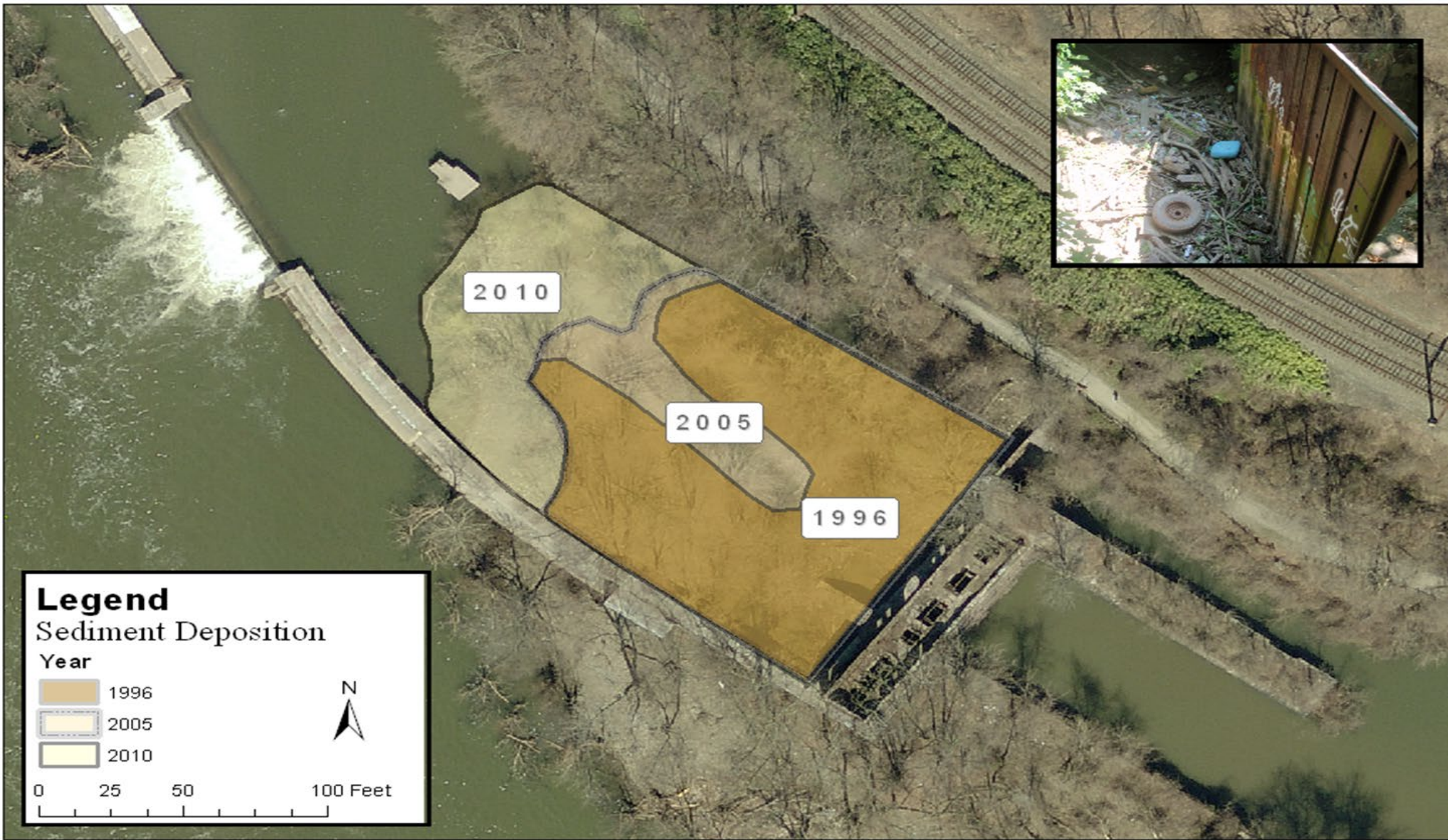
## *Siltation*

- Sediment from hillside (e.g., land use, roads)
- Bank erosion in upstream areas of the canal



Sediment accretion in the Manayunk Canal at Leverington Street and Domino Lane (2011)





**Time sequence of sediment accrual at Lock 68 (Canal Entrance) 1996-2010**



# Water Quality Concerns

## *Trash & Debris*

- Aesthetically unpleasing
- Potential acute effects to aquatic life
- Debris jams at lower portion of canal



Trash and debris present in the lower portion of the canal (Lock Street, 2002)



# Proposed Conditions



Canal Intake Structure

Green Stormwater Basin

New Channel

Interpretive Historical Panel

Historic Features to Remain

Sluiceway

New Waste Weir

Green Stormwater Basins

New Access Drive

Lowered and Stabilized Canal Intake Channel Wall

**RAMBOLL**





**Pre-Construction,  
Spring 2022**

**Post-Construction,  
Fall 2024**





# Project Benefits – *Flow Restoration*

- Present conditions
  - Spring flow ranges from **3 - 5 cfs**
  - Summer flow ranges from **1 – 3 cfs**
  - Average velocity of 0.03 ft/s
- Post-construction
  - Flow ranges between **50 – 100 cfs**
  - Average velocity between 0.3 -0.5 ft/s



2011 summer flows over Lock Street (~1 cfs)

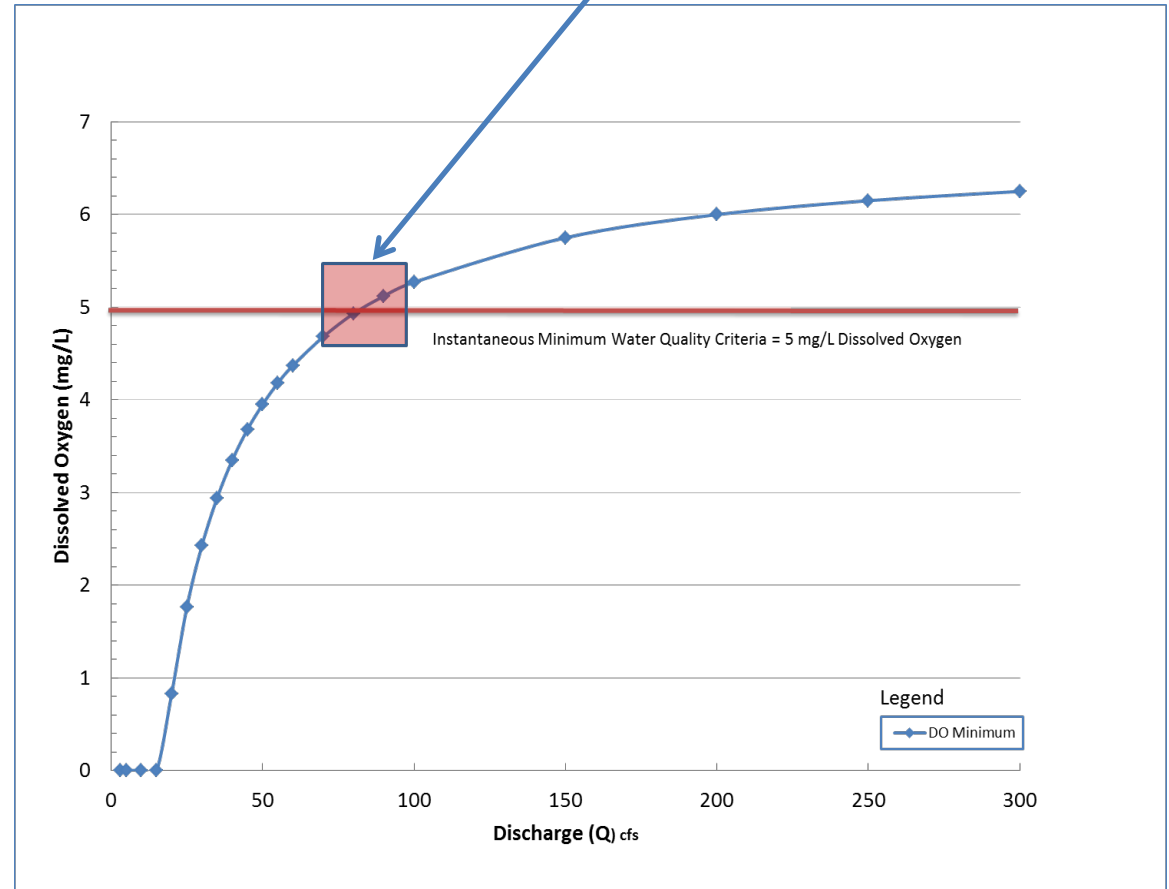
*“A drop of water will flow through the canal in its entirety in 6 hours. . . .not 3 days.”*



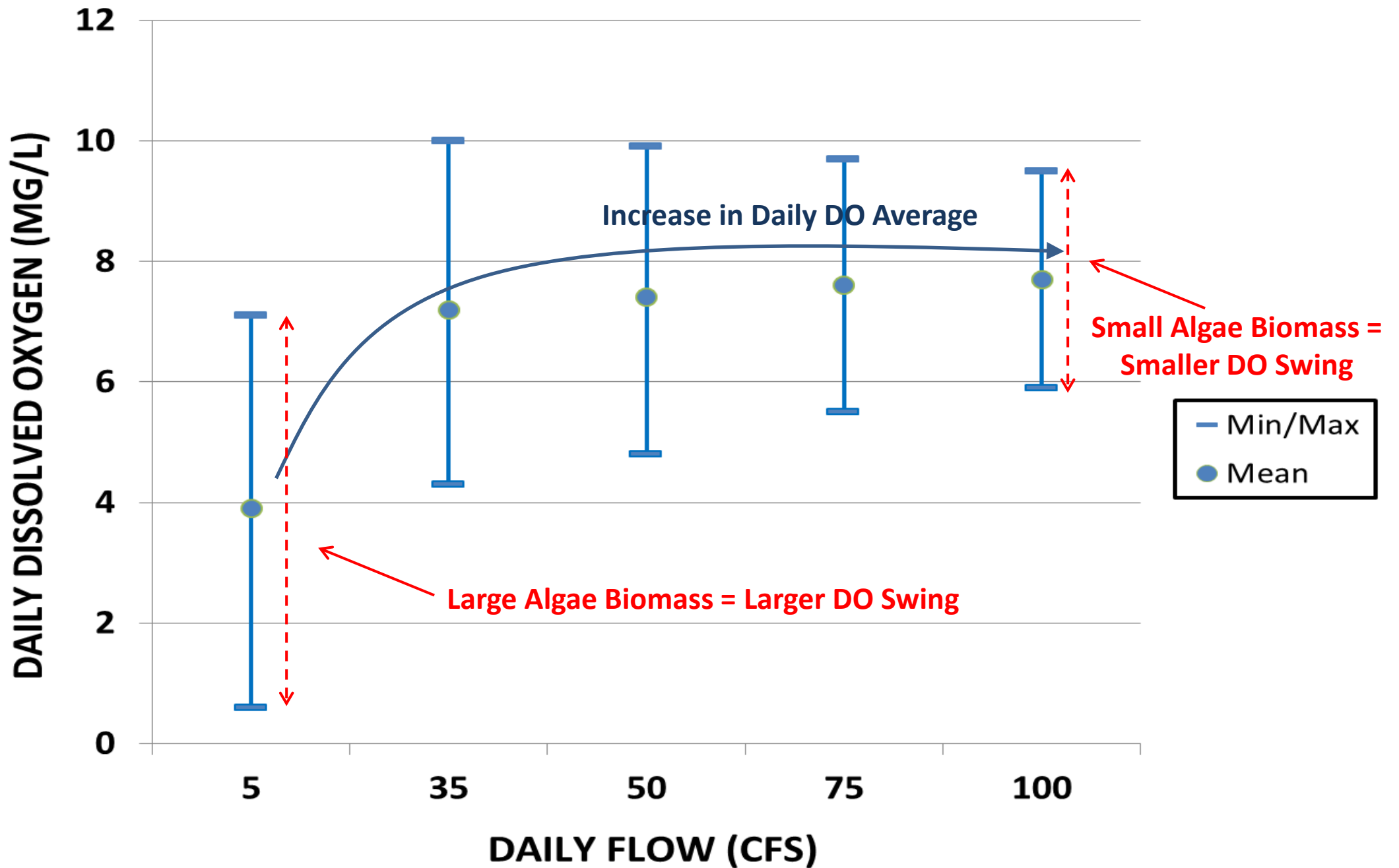
# Project Benefits – *Water Quality*

- Increased velocity and reaeration
- Decreased residence time
- Reduce rooted and floating aquatic vegetation
- Reduced potential of harmful algal blooms
- Improve dissolved oxygen
- Improved health of aquatic organisms (reduced stress)

Increase from 5 to 50-70 cfs projected to achieve WQ standards





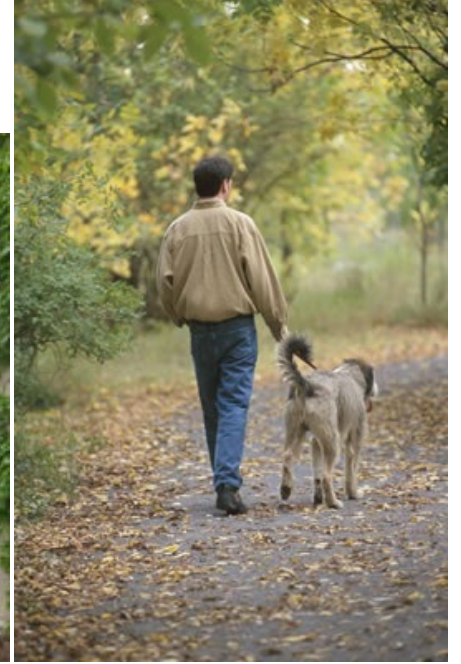




# Project Benefits

## *Aesthetics and Recreation*

- Decreased debris and floatables
- Becomes better fishing amenity with healthier ecology
- Promotes local businesses
- Recreation along Schuylkill River Trail





# Thank you!

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