Historic Wingohocking Watershed
Guest Talk – March 5, 2020
Kelly O’Day

Germantown Historical Society
Historic Wingohocking Creek Watershed
Role of Topography & Infrastructure

1. Historic Creek
   - Shown on Philadelphia’s earliest maps
   - Topography supported farming
   - Creek provided power for early mills, helped establish economic vitality of NW Philadelphia

2. Need to understand Watershed’s Infrastructure history to be able tackle today’s problems
   - Roads
   - Railroads
   - Sewers

3. 1680 – 1880 Population growth – without sewers, serious water pollution

4. Combined Sewers addressed public health - nuisance sewage issues, not overall stormwater – flood issues
Let’s start with topography.

Germantown, Pennsylvania chartered 1683 “… because the steep slopes up from the banks of the Schuylkill River and Wissahickon Creek Valleys would be difficult to farm. Instead, Penn settled them on the opposite bank of the Wissahickon Valley which separates Roxborough from Germantown." Nic Tenaglia
Philadelphia – 1777

Scull & Heap Map

Wissahickon

Wingohocking
Philadelphia 1777 – Scull & Heap Map

Wingohocking Creek

Tacony Creek

Frankford Creek
Early development in Wingohocking Creek Watershed. Little development in Wissahickon Creek Watershed.
Philadelphia County – 1854
Townships – Districts Prior to Consolidation
1854

- Philadelphia County Consolidation
- Reading Railroad – extended from Wayne Junction to Chestnut Hill East

Mt Airy Station
1874 – Frank Furness

1850 Census of Manufactures
- 97 - Germantown
- 50 - West side- Germantown Ave
- 47 – East side - GermantowAve

“After that, new industries began to locate east of Germantown Avenue, leaving the area west for residential development.” Harold Spaulding

Pennsylvania RR opened Chestnut Hill West Line in 1884
Reading Railroad - 1895
RR Spurs Used for Local Materials Delivery

Note extent of development before sewers

Lumber Yard
Coal Yards
Wingohocking Creek
Still Open in 1895
Example Industrial – Commercial Activity Along Reading RR’s Line Mt Airy Ave
Robert’s Grist Mill

Built by Richard Townsend, 1683. Later known as Lucan’s Mill, then Robert’s Mill
Scatchard’s Mill, 1885
Magnolia & Chelten

Hexamer General Surveys, Volume 20:
Plate 1942, 1885
Scatchard’s Mill
1889

Near Chelten & Magnolia

Impoundment of Wingohocking Creek

Atlas of the City of Philadelphia, Volume 7, 22nd Ward, 1889, Plate 14

Bromley
Glencairn Mills – Belfield & Wister
Bromley Atlas - 1910

Hexamer General Surveys, Volume 11:
Glencairn Woolen Mills, Plate 1029,
Approx 1876

Renamed Wister St
ESRI Map, 2020

Glen Cairn Mill
Buildings Today

Belfield Ave built over 1890 Sewer

Belfield & Wister
Wingohocking Creek Watershed Tour

Tour created by
C. Drew Brown
Joanne Dahme
Adam Levine
of the
PHILADELPHIA WATER DEPARTMENT

Original Wingohocking Tour Guides
Why was Wingohocking Creek Buried?

Historic Wingohocking Creek Tributaries

August 31, 1874

- "Logan’s Run ... is in very filthy condition and dangerous to the health of the residents."
- All the privy, kitchen and factory filth ... is deposited .. By dams caused by refuse after heavy rains .."
- “The only way to remedy the nuisance is to construct a culvert from Germantown Ave to Wingohocking Creek.”

1683 – 1874: Population growth, no sewers
Why was Wingohocking Creek Buried?

Chew & Washington Lane

- Complaint – June 15, 1888
- “sewerage from row of houses recently built near Washington Lane and Chew street.”
- “Is emptied into Wingohocking Creek.”
- “... inflicting nuisance inimical to public health.”
Why Was Wingohocking Creek Buried?

With such a bad reputation, the Wingohocking Creek didn’t have a chance.

“Culverting” was the solution.

Oct. 14, 1889

THE WINGOHOCKING CREEK.

Germantown People Who Want it Made a Closed Sewer.

The citizens of Germantown have been trying for nearly a year to induce Councils to appropriate a sufficient sum of money to make Wingohocking creek a covered sewer, and remove a serious nuisance which has been an injury to property and a menace to the health of the residents in its neighborhood. On Friday last a property-owner who is very anxious to have the nuisance abated wrote to Herbert Welsh, who is equally interested:

“...It may interest you to know that since I wrote you I have suffered from a severe attack of Wingohocking fever, and am out only for about an hour today, and that against the advice of my doctor. Until this annoyance is abated I shall not feel safe in living at my house till after frost.”

All of the physicians practicing in Germantown and vicinity have united in an opinion setting forth: “We have no hesitation in condemning this open-run sewer as a dangerous nuisance, menacing the health of an important district and inhibiting the development and spread of some of the most fatal and contagious forms of disease.”

The Board of Health has condemned the creek and the Survey Department has prepared the general plans of the extension of the main sewer from Penn street to Fisher’s lane.

Frank J. Firth, H. H. Shoemaker, William Rotch Wister, Charles F. Gummey, Herbert Welsh, Charles E. Morgan, Jr., W. Redwood Wright and William Hacker comprise the committee having the matter in charge.
Sewers: 1890 & 1920
All sewage discharged to Privies, Cesspools or Wingohocking Creek

Few local sewers to move odor, nuisance away from population.

More local sewers to move odor, nuisance away from population.
No treatment.

Historic Wingohocking Creek Watershed
1890 Sewers

Roosevelt Blvd

Historic Wingohocking Creek Watershed
1920 Sewers

Roosevelt Blvd

Kelly O'Day, 8/19/19
Wingohocking Sewer under construction, ca. 1890s

SOURCE: City Archives of Philadelphia

Sections of the Wingohocking sewer includes pipes more than 20 feet across, among the largest in the Philadelphia’s 3000 mile sewer system.

Adam Levine, PhillyH2O.org
Wingohocking Combined Sewers

Carried all stormwater & sewage

Adam Levine, PhillyH2O.org
August 14, 1918

Courtland Street
Sewer Collapse

Cave-in Alarms
Logan Residents

Sewer Collapse on Courtland Street Brings Demands for Quick Repairs

CAVITY FROM CURB TO CURB

Alarm has seized residents of Logan along the line of the Winghocking sewer, which collapsed along Courtland street, between Twelfth and Cane streets.

A great cavity in the street marks the spot where the sewer break occurred. Along the borders rooks a torrent of water and refuse, open to the sky and gushing forth nauseous odors.

According to Chief Vogelien, of the Bureau of Survey, the damage has not been done to houses in the neighborhood but to the street and sidewalks, including the water and underground telephone lines, which broke when the sewer collapsed.

The crater in the street extends from curb to curb. Workmen have been busy shoring up the sides in prospect of possible any further movement of earth. The residents along the "crater," however, fear that any more rain may cause a further earth slide, a buckling of their houses foundations from under-neath, then collapse of the structures.

O. A. Fenn, in the plumbing business at Thirteenth and Courtland streets, said today:

"The sewer is entirely too small. It drains Mount Airy and Germantown, and any heavy downpour puts a tremendous strain upon its walls. The break now extends as you can see from sidewalk to sidewalk, and I figure about 100 yards in length. What I am alarmed about is the chances for a further earth slide, which might have disastrous results.

"I recall the collapse that occurred in August, 1909, along Courtland street, west from Old York road. A motorcar rammed in at that time. I made an examination and warned the city authorities the sewer could not stand the strain put on it, and urged that it be replaced. I am looking for it to collapse right here at my corner.

"Eight years ago it did collapse below Thirteenth street, a half square above the present break.

"Mrs. Catherine A. Timmons, of 5905 North Thirteenth street, spoke of her forbodings concerning the situation. "We only live fifty feet above the break," she said, "and I live in constant fear that the earth slide will extend further. The odor is terrible, and my cellar now contains six inches of sewage and water as a result of the break. All I can do is wait for it to collapse."
Courtland St Sewer Collapse – August 14, 1918
14-ft Brick Sewer

Where is the flood plain?
Courtland & Camac Streets Today

Where is the flood plain?
WINGOHOCKING CREEK IS TO BE PUT UNDER GROUND

OCT 5 - 1924

City Awards Two Big Contracts for Construction of Main Sewers.

Two important improvements, vital to the health and development of the city, will be advanced by the award of two contracts yesterday by Director Biles, of the Department of Public Works. The Pennypack Creek intercepting sewer is being built in sections. Its ultimate cost will be $1,500,000. The contract awarded yesterday was for part of the work to William H. Garas for $102,286.

Wingohocking Creek is to be sewered at an approximate cost of $2,000,000. It is now an open creek from Bodine Street to Frankford Creek, into which it empties. Much land will be reclaimed by the construction of this sewer.

Adolph Jatolla was awarded part of the work at $808,776.

Wingohocking Sewer Outfall
Frankford Creek – Juniata Park
Flooding Not New to Wingohocking Watershed

Sept 8, 1929 to August 10, 1931
Four floods on Courtland St, between 12th & Marvine

Aug. 13, 1931

Aug. 5, 1932
SEWER DEMAND
TAKEN TO CITY HALL

Logan Delegation Sees Mayor's
Secretary-One Man Suggests
Refusal to Pay Taxes
COUNCILMEN ASSAILED

Demand for immediate construction of adequate sewers in the Logan section was made in Mayor Moore's office today.

Heavy damage occurred because of the inadequate sewer facilities during a storm Friday night.

A delegation of Logan residents, most of them from the 4th ward, called upon Harry T. Baxter, the Mayor's secretary, and presented their claims for relief.

Mr. Baxter received them in the absence of Mayor Moore, who is on a trip to Maine on the maiden voyage of the new liner, Manhattan, built in Camden.

Mr. Baxter's statement that Chief John H. Neesan of the Bureau of Engineering and Surveying informed him today that no sewers can be built until City Council passes a tax levy, drew from one of the protestants, Jules M. Stredler, 13th and Courtland sts., the statement that "the Councilmen don't give a damn about what happens in that district."

The area is in the 6th Councilmanic district, made up of the 21st, 22nd, 38th and 42nd wards, and is represented in Council by William W. Roger, Richard S. Harris, Clarence E. Blackburn and Frank L. Kenworthy, S. Davis Wilson, former Deputy City Controller, who attended the meeting, suggested that the city has $2,000,000 available to pay deficiency bills which the Mayor has not yet approved. He asked that Council take one-half of it to build new sewers.

JUL 25 1932

"Council has an emergency borrowing capacity now of $2,000,000 and the building of these sewers is more important than paying deficiency bills," Mr. Wilson said. "There is a bill before the Legislature, which, if passed, would authorize Council to raise revenue on delinquent taxes. The city paid many millions of dollars in sewer bills which were nothing more than moral claims."

Mr. Wilson added that the first storm in the area caused a damage of $200,000 last summer and this year's storm losses will be about $75,000.

"Four houses already have been condemned as the result of Friday's storm, and another storm or two will render uninhabitable all of the houses between 10th and 18th sts., on Belfield iv., and Courtland st.," he said.

"The city owes us as much as we owe the city," Mr. Moskovitz said. "I will be in favor of the property owners between 9th and 20th sts., and between Wingate st. and Wyomissing st. and Wyoming av., refusing to pay taxes until the city builds the sewers."

Others at the meeting did not agree with Mr. Moskovitz's suggestion, saying they could not legally refuse to pay. The city has the upper hand in such matter, one said, as it could levy on the property and sell it if the owners refuse to pay.

Morris Joseph, president of the 42nd Ward Independent Republican Club, was the chief spokesman. Others attending the meeting, which took place around a table in Mayor Moore's reception room, were: Isaac Feinstein, John W. Glover, David Rosen, Hyman Joseph, Samuel Lieberman, Frank Brothers and Ralph W. Duncan.

One of the visitors told Mr. Baxter that Harry Blairax, 4601 N., 12th st., saved a boy from drowning during the storm. He pulled him to safety as he was about to go under in a culvert. In doing so, Blairax lost his wallet.

LOGAN DEMANDING
FLOOD RELIEF

Residents Plan March
On City Hall to Press
EVENING BULLETIN

For Adequate Sewers

Aug 18, 1938

Logan residents, mapping out after the worst flood in seven years, today discussed plans for a "march" on Mayor Wilson at City Hall to demand adequate storm sewers.

The section is without prospect of relief from overflows following heavy rains, said officials at the Borough of Engineering, Zoning and Survey.

Moreover, it is doubtful if any sewers would have carried off the tremendous flood of water in Logan yesterday afternoon, added an employee who visited the scene.

He explained that a "cloudburst" at 5 o'clock over Chestnut Hill, Mt. Airy and Germantown precipitated a flood in Logan, which stepped leading down to Logan. In addition to the heavy rain, that was falling there.

Residents and shopkeepers on Courtland st., between 10th and 11th st., reported the flood swept streets with force sufficient to turn up paving.

Bureau of Highway officials aid the city has been without money for sewer construction since 1922.

City Council has authorized the use of $300,000, representing half of an emergency plan, with Federal WPA funds, in projects designed to improve the water supply and sewerage systems but it expected this money will be used on the water project and the "sewage disposal plant, leaving nothing for sewers."

Mr. Wilson has urged the creation of the Municipal Authority with power to issue bonds on self-sustaining projects for a total of $1,000,000, one of the items being the construction of storm sewers in Logan.

Councilman Arthur P. Keegan has proposed that City Council deal directly with the Federal government, recalleing that the municipality has the right to issue bonds on self-sustaining projects.

Four more deaths attributed indirectly to the heat brought the toll for the four days in this area to 1. There were two more drownings and four persons were injured by lightning.

The rain which continued at intervals until today did some flood damage in Germantown, West Philadelphia neighborhoods.
How Wingohocking Sewer was built and Watershed flattened to support development

Once sewer completed:
• Creek diverted to pipe,
• Old creek bed and flood plain filled in
• Streets and houses built over buried sewer and flood plain
Flooding occurs when upstream flows greater than downstream capacity

Natural streams and rivers have flood plains that hold flood waters during extreme flow events

1. Natural Watershed
2. Buried Wingohocking Creek

- No visible creek
- Development in historic flood plain, close to combined sewer
- Developed area floods when combined sewer capacity exceeded
- Flooding risk – not identified on FEMA maps
Areas of Philadelphia at risk of inundation under a 100-year flood (a flood with a one percent chance of happening any year) and a 500-year flood (a flood with a 0.2 percent chance of happening any year).

No flood risk?
Upper Wingohocking Creek Watershed
Flood Prone Intersections

- Flood Prone Intersections
- Trunk Sewers (GTE 48-in)
- Neighborhood
- Historic Wingohocking Watershed

Flood Prone
- 24 Intersections
- 2,759 Basements

Philadelphia Water Department – Oct., 2019
Belfield Ave & Haines Street
Buried Wingohocking Sewer Under Belfield Ave.

102-inch Combined Sewer Beneath Belfield Ave. Built 1894

Italian Ice
Deadly East Germantown Flash Flood
Thursday, Sept. 8, 2011

Germantown flash flood proved deadly as well as damaging
September 10, 2011
By Aaron Moselle and Brian Hickey
for NewsWorks

A 27-year-old woman died Thursday after calling her father, a city police officer – and 911 to report she was trapped inside her car because of flash-flood waters near the Waterview Recreation Center.
“Pastor Todd Dunbar, who heads Praise, Power and Deliverance Church, was left looking for a place to house his congregation after more than six feet of water rushed through the building.” WHYY NewsWorks, 9/10/11
Belfield Ave & Haines Street
Buried Wingohocking Sewer Under Belfield Ave.

Flooding
- Inlets
- Manholes
- House Connections

Sept. 8, 2011
October 2011
After Sept. Flood

Approximate Flood Line: 218-Ft
Flood Level 218-ft
Ground Elevation 212-ft
Sept 8, 2011 Flood Damage
512 – 526 E Haines St

Church

Sept. 2011
Google Street View
Sept. 5-8, 2011 Storm
High Water Level: 218-ft

Belfield Ave & Haines Street

218-Ft Flood Zone
# How Bad was Sept. 5-8, 2011 Storm?

<table>
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<th>Storm Event</th>
<th>Approx Duration (hours)</th>
<th>Peak Intensity (inches/hour)</th>
<th>Total Max Rainfall (inches)</th>
<th>Recurrence Interval Storm Characterization</th>
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<td>25-yr, 24-hr</td>
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Typical Sewer Connection

Street

Manhole

Sewer
Sewer Backup

Wingohocking Watershed
2,759 Basements @ Risk

Street

Manhole

Sewer
512 – 526 E Haines St

Demonstrates Wingohocking Flood Dilemma

- No Historic Wingohocking Creek Flood Plain Map
- Numerous Buildings in Wingohocking Sewer Flood Plain
- Zoning Does Not Address Wingohocking High Flood Risk Areas

Known Flood Prone Area
Good Idea to Leave Room for Sewer Overflows

June 2019
Google Street View

ZBA Zoning Appeal for 2 Plumbing Equipment Supply Buildings
Approved 2/16/19

"...Zoning Code and Building Codes do not have jurisdiction over flooding outside FEMA identified floodplains at this time."
L&I Flood Plain Manager, 3/3/20
Climate Change

Principle #1 – Warm air holds more moisture than cold air. “Atmospheric holding capacity”
Climate Change

National Climate Assessment

“The Northeast has experienced a greater recent increase in extreme precipitation than any other region in the U.S.; between 1958 and 2010, the Northeast saw more than a 70% increase in the amount of precipitation falling in very heavy events (defined as the heaviest 1% of all daily events)” (NCA 2014).
Why Wingohocking Watershed has so much greater flood risk than Wissahickon Watershed

No Room for the Wingohocking Creek

Room for the Wissahickon Creek
What Does Wingohocking Watershed Development History Tell Us?

1. Earliest developed areas experienced environmental problems that later developed areas learned to avoid.

2. Solving one environmental problem at a time does not necessarily solving the overall problem.

3. Yesterday’s solutions can generate today/tomorrow’s problems.
Thank You