

EPA Briefing March 2012

Enforcement Briefing



Gowanus Canal Superfund Site
Brooklyn, NY

Overview:

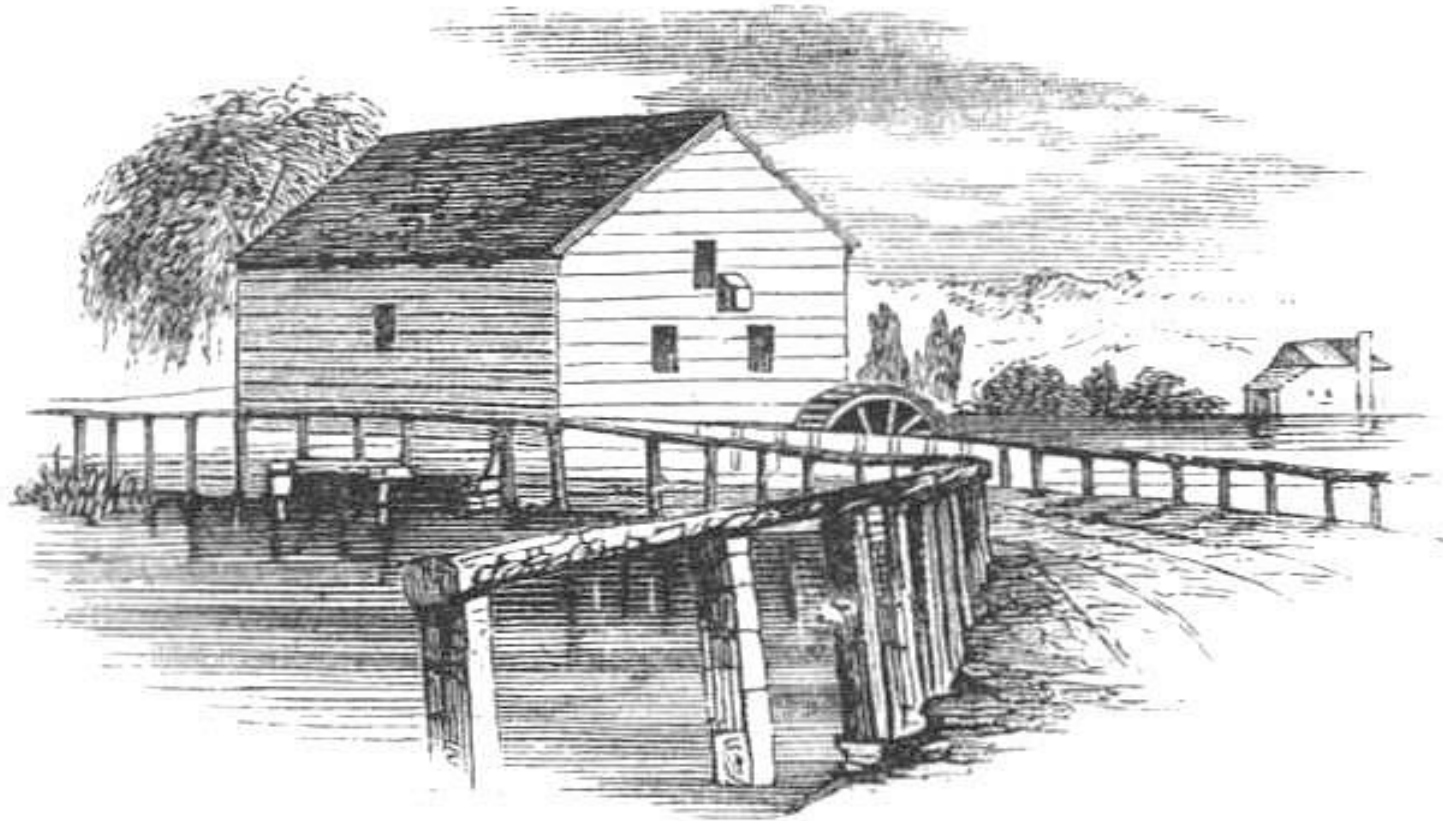
- ◆ **Site-specific geology and hydraulic conditions before and after the Canal was built which exacerbate contamination impacts**
- ◆ **Past and continuing sources to the Canal**
- ◆ **Infrastructure changes that have altered disposal pathways**
- ◆ **EPA's PRP search and Enforcement Actions to date**
- ◆ **Other conditions affecting the need for a cleanup**
- ◆ **Public outreach and stakeholder interaction**
- ◆ **Projected enforcement schedule**
- ◆ **Questions**

- ◆ **Environmental Conditions at Canal affected by:**
- ◆ Original geology and hydrology of the Gowanus Creek
- ◆ **altered** by development into artificial waterway
- ◆ **followed** by historic industrial use
- ◆ **typically** involving direct disposal into Canal and indirect disposal onto uplands and through sewers
- ◆ **in volumes** reduced over time by less industry, more regulation and improved infrastructure (e.g., POTWs)
- ◆ **But...** Canal is still impacted by historic and continuing contamination.

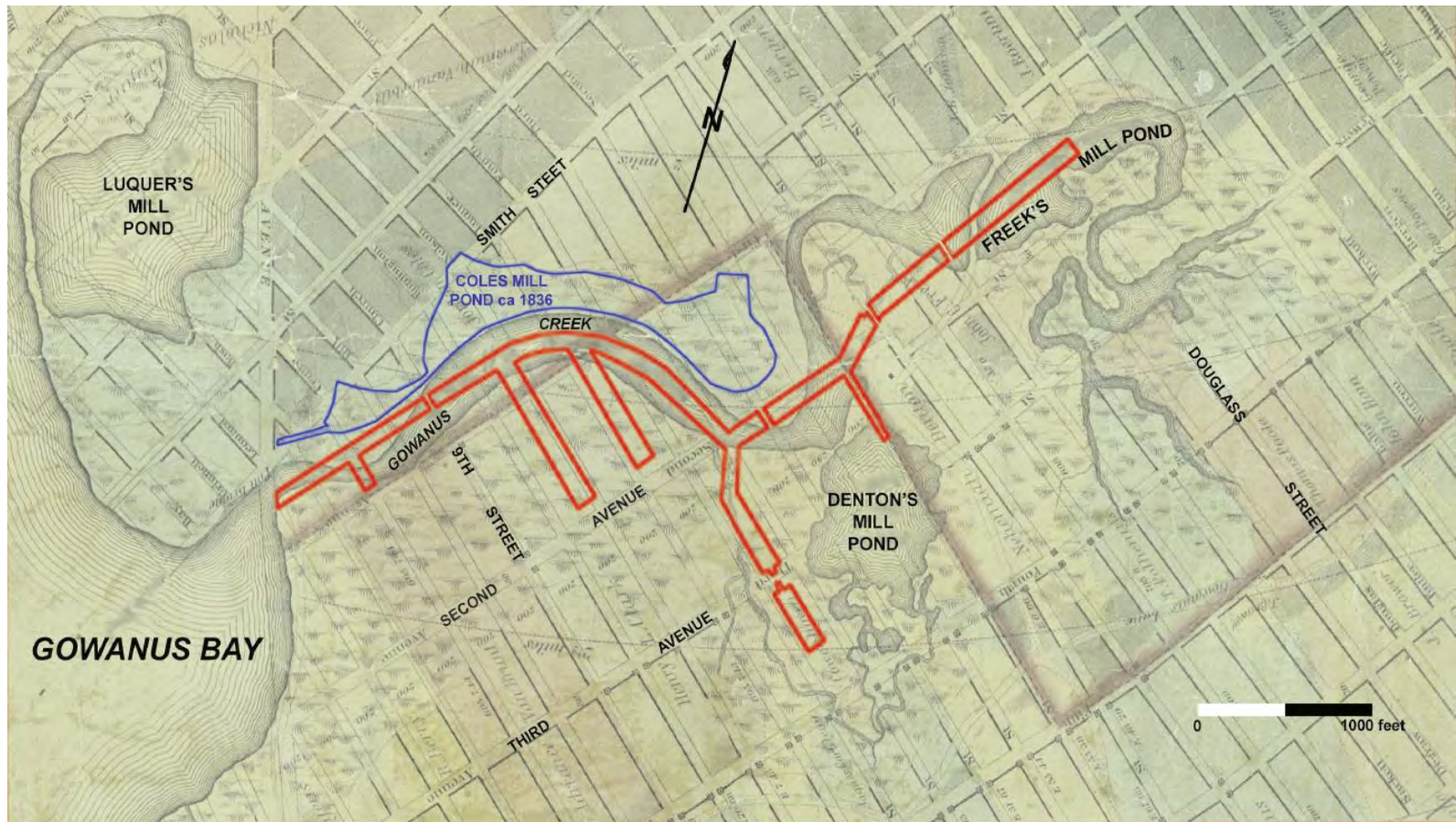
Original condition: Tidal estuary wetlands atop deep central strata of glacial sands



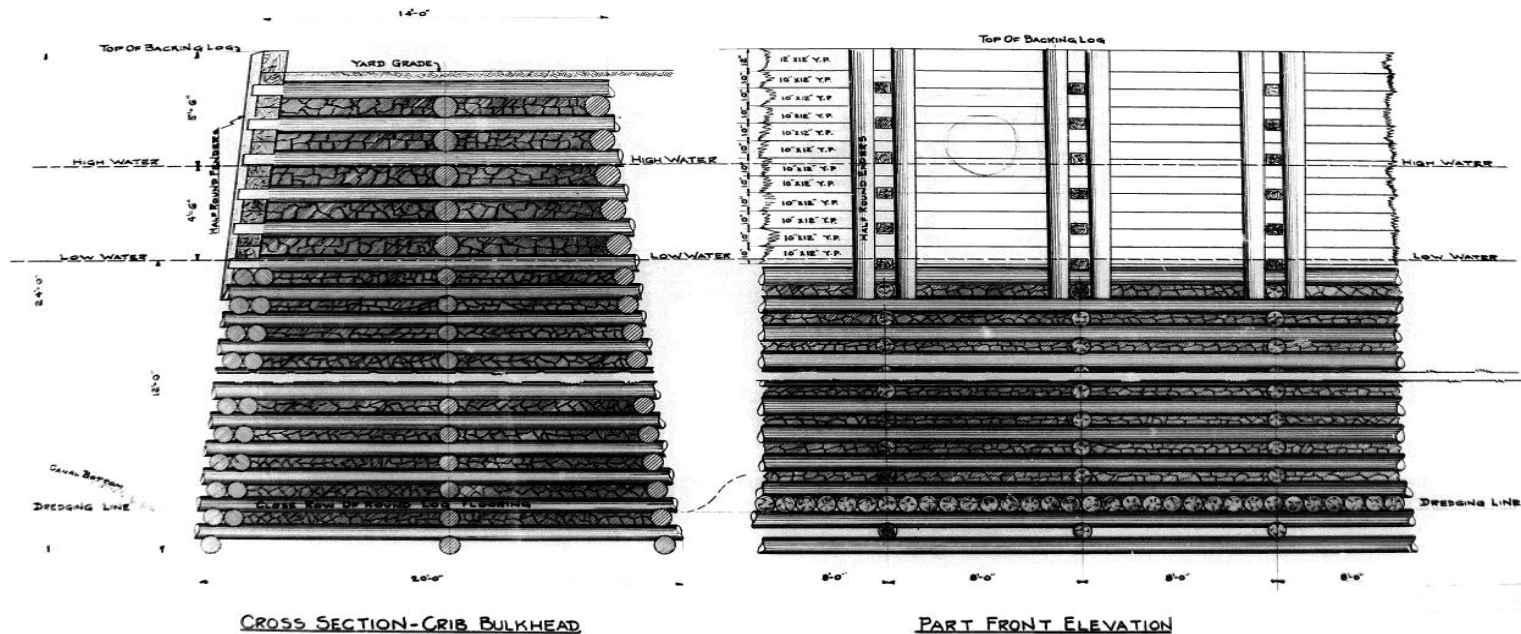
First change: After Dutch purchase from Chief Gowane of the Canarsee/Lenape tribe, three ponds and mills were built beginning in 1645.



Second change: After Erie Canal grain imports make mills obsolete, NYS Legislature in 1849 authorizes canal to promote Brooklyn commerce. Completed @ 1869 by public and private development. 1.5 miles long, plus @ .3 miles of side basins.



Timber crib bulkheads were built, then grade was raised from marsh level with fill, including dredge spoils, garbage and cinders.

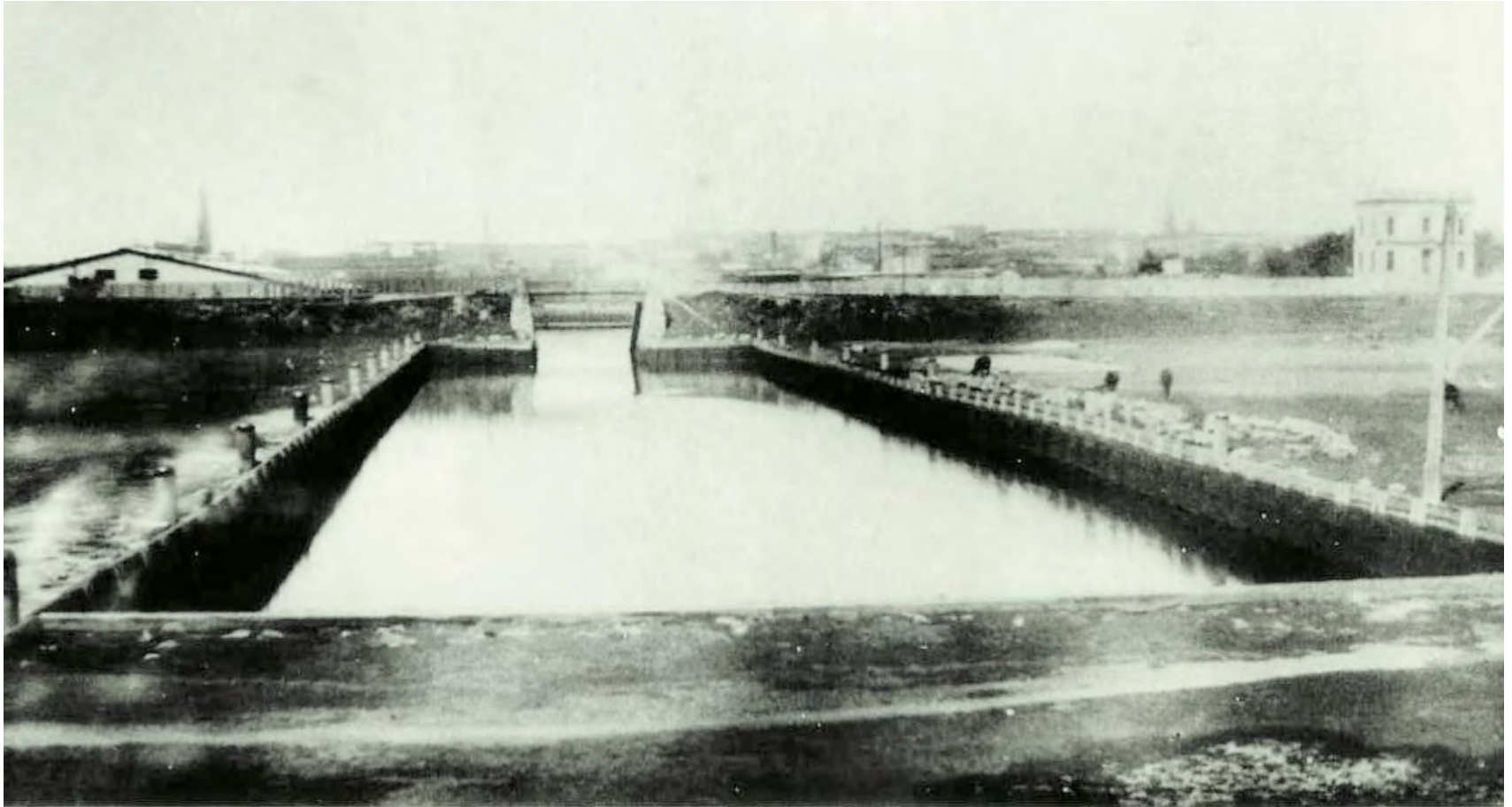


CITIZENS WORKS
CRIB BULKHEAD
 No. 1517
 a. J. H. H. H. H.
 15-89

A section of exposed timber crib bulkhead. Upland disposal and groundwater discharges can migrate through and beneath bulkheads to the Canal.



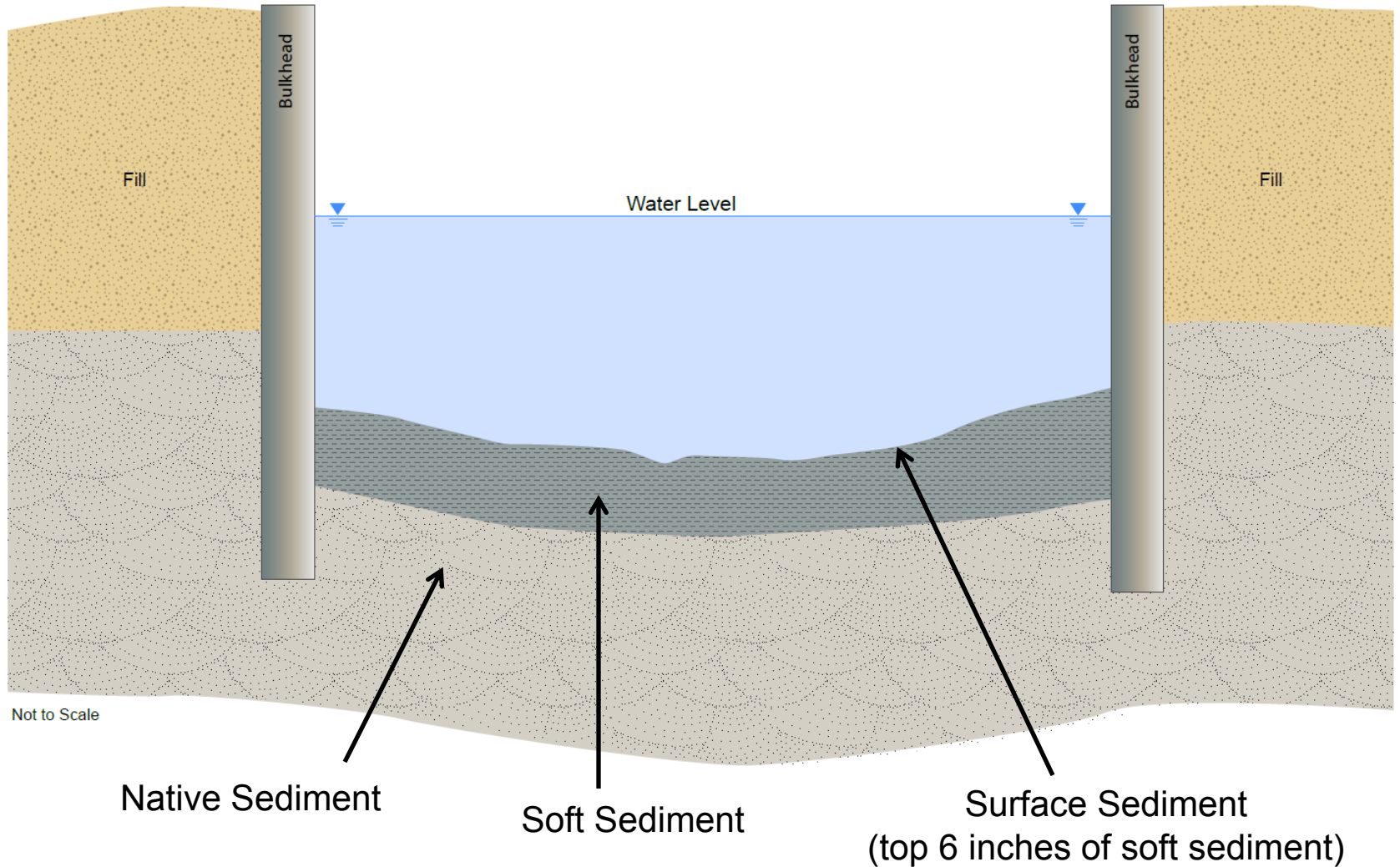
5th Street Basin before 1901, looking from 4th Ave. towards 3rd Ave. Bridge and Canal.



**Same 5th Street Basin, filled @ 1953-1964.
(Reverse view looking towards 4th Ave.)**



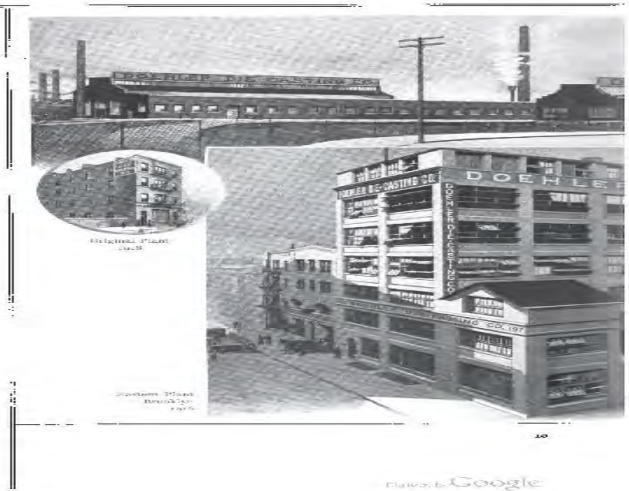
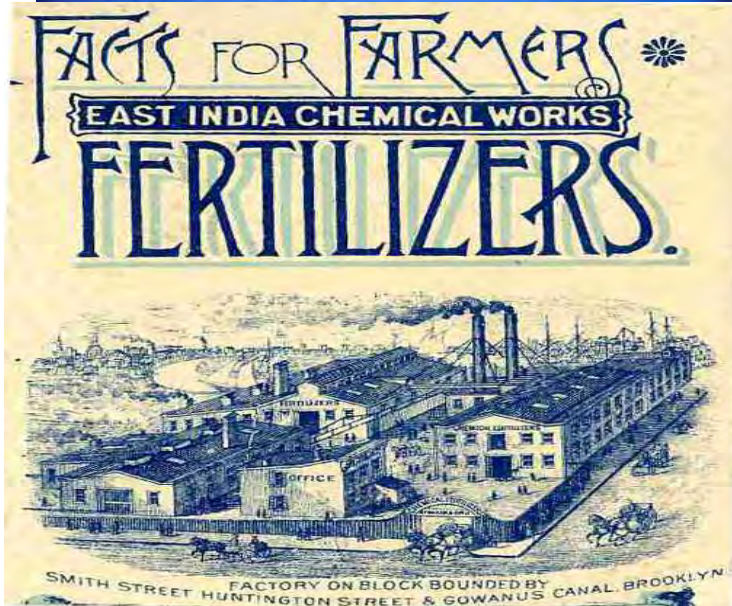
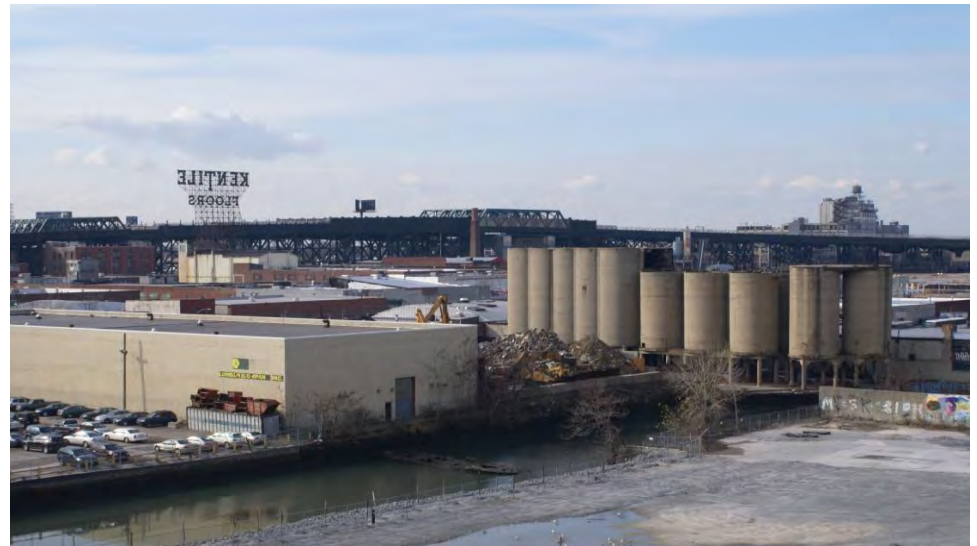
Gowanus Canal Sediment Layers



Era of Heavy Industry and Uncontrolled Discharges



A variety of upland sources existed



Examples of facilities which may have discharged to the Canal include:

- ◆ **paint and ink factories**
- ◆ **chemical plants**
- ◆ **asphalt and roofing plants**
- ◆ **manufactured gas plants (MGPs)**
- ◆ **fuel terminals**
- ◆ **coal yards, including for power stations**
- ◆ **ship yards and dry docks**
- ◆ **plating, metal working and machine shops**
- ◆ **fleet vehicle service shops**
- ◆ **peak shipping usage @ 1920's 25,000 vessels/yr**

EPA's 2010 RI found 231 non-CSO outfalls,



EPA found few discharges from non-CSO outfalls. Most date from era of uncontrolled direct discharge.

Gowanus Canal - Remedial Investigation
Appendix D-12A - Survey of Outfall Pipes

East Bank of Canal



GC-CF-E-55



GC-CF-E-56



GC-CF-E-57



GC-CF-E-58

History of Infrastructure Changes

- ◆ **@ 1860** – Brooklyn one of first US cities with comprehensive (but untreated) sewer system.
- ◆ Original Canal designs for avoiding sewage buildup were not followed. **@ 1868** plan to divert sewage lines to the East River never implemented.
- ◆ **1891-1904** – as areas rapidly develop around Canal, sewer system is undersized. Relief sewer lines for **@ 7** sq. mile area are run to head of Canal in an attempt to increase flow. Combined sewers only exacerbated problem.
- ◆ **Combined outfalls** included: Nevins St. (78”), Bond St. (60”), Douglass St. (42”), Second Ave. (78”), Bond St. (72”)
- ◆ **Sanitary sewage outfalls** (12-48”) included: Sackett, President, Carroll and Ninth Streets and Hamilton Ave.

1906 MIT Thesis

TECHNOLOGY QUARTERLY

AND

PROCEEDINGS OF THE SOCIETY OF ARTS

VOL. XXQ

SEPTEMBER, 1906

No. 3

CONTRIBUTION FROM THE
SANITARY RESEARCH LABORATORY AND SEWAGE TREATMENT STATION
OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

AN INVESTIGATION OF THE SANITARY CONDITION OF
THE GOWANUS CANAL, BROOKLYN, NEW YORK

BY CHARLES F. BREITZKE

INTRODUCTION

THE following is an abstract of a part of the thesis submitted in May, 1906, by Norman P. Gerhard and the writer, at that time candidates for the Degree of Bachelor of Science at the Massachusetts Institute of Technology.

The object in view in the preparation of the original thesis on file in the Engineering Library at the Institute was to investigate the condition of the Gowanus Canal, Brooklyn, New York, and to suggest a plan for remedying the nuisance. The sanitary investigation was made by the writer. The discussion of the methods which might be applied to remedy the conditions was written by N. P. Gerhard. In view of the fact that the problem has also been considered by the Brooklyn engineers and that a flushing tunnel is now under construction, it was thought best in the publication of this abstract to omit N. P. Gerhard's part of this study.

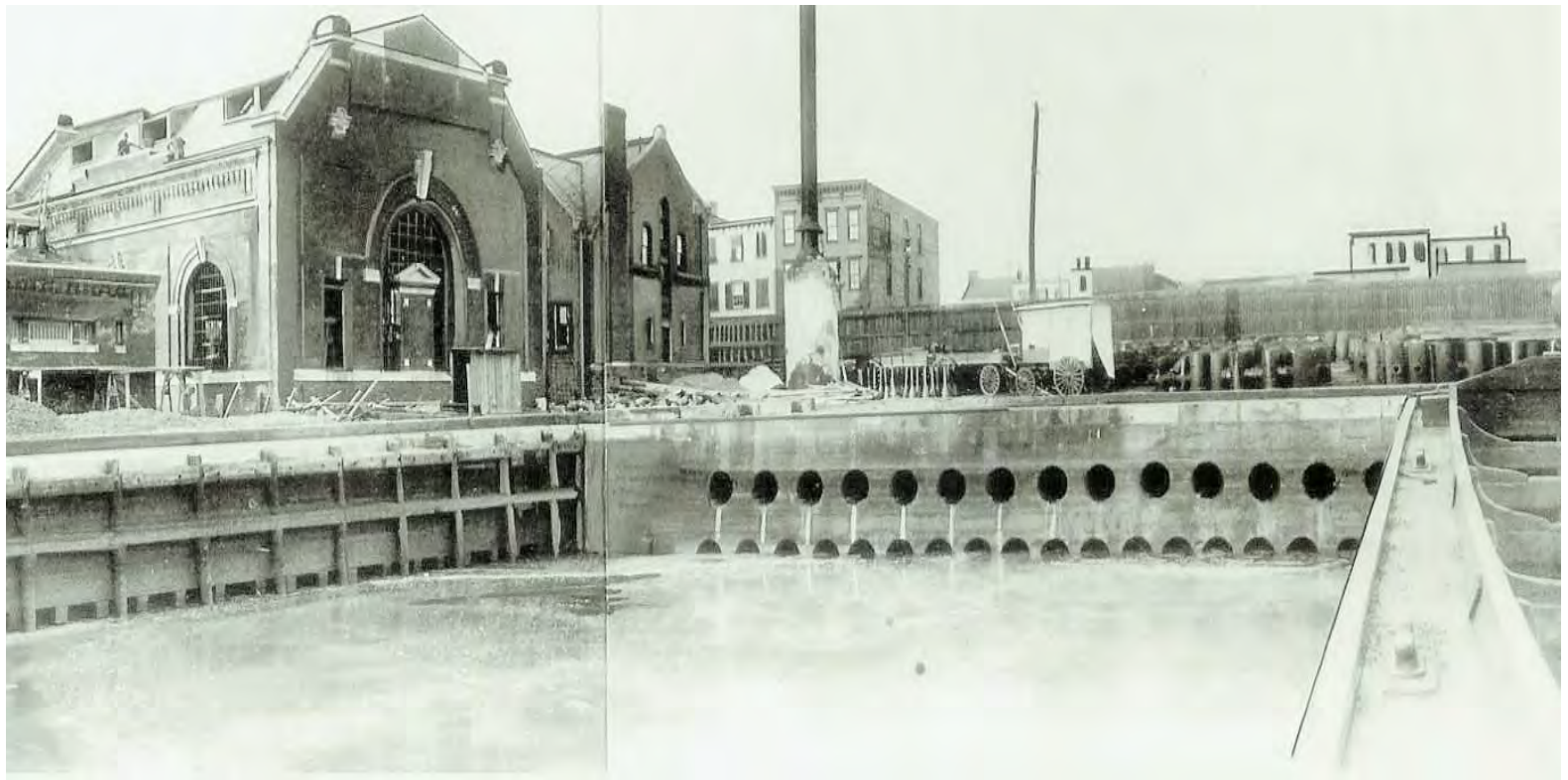
243

“The contents of the canal are of the vilest sort. Practically all the industrial plants discharge directly into it...

[Generally] the streets which terminate at the Canal have been left unsewered.

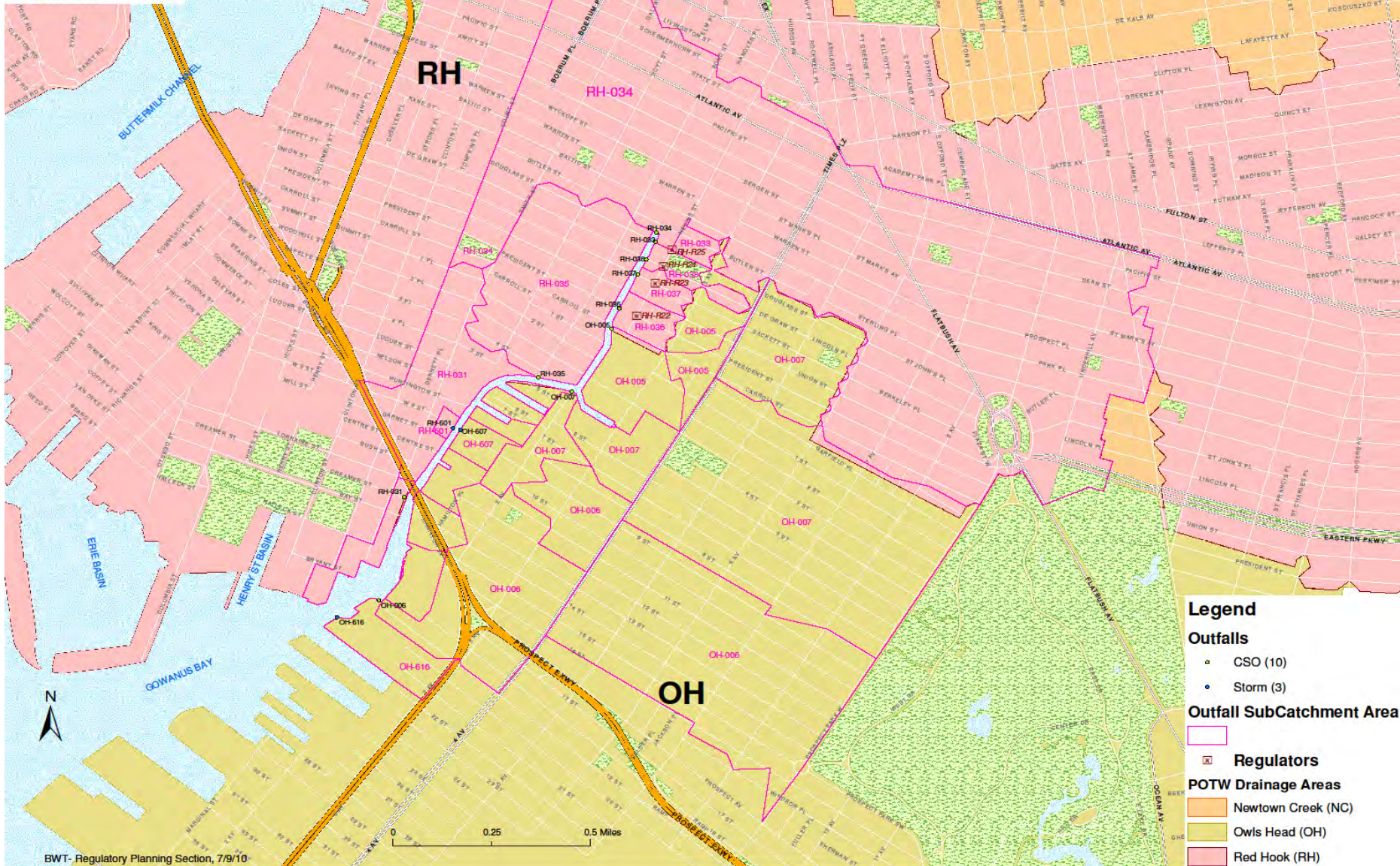
The reason given is that there was not sufficient grade to drain the sewers into the mains in the streets running parallel and on either side of the canal.”

1911 - Flushing Tunnel and Pump Station completed, originally pumping water from head of Canal to the harbor.



- ◆ **1952:** Owl's Head POTW completed, serving Park Slope area.
- ◆ **1960:** Flushing Tunnel ceases operation.
- ◆ **1987:** Red Hook POTW completed, reducing CSO discharges from 20 MGD to current levels of @ 300 MGY.
- ◆ **1999:** Flushing Tunnel re-activated, now bringing @ 154 MGD from NY Harbor to Canal.
- ◆ **2010-2013:** Upgrades to Flushing Tunnel and other CSO improvement underway by New York City.

DEP Regulators, Outfalls and their Catchment Areas that drain to the Gowanus Canal



Pursuant to NYSDEC Consent Order, NYC's current and planned CSO upgrades will reduce discharge volume by an estimated 44%.

Gowanus Canal CSO Discharge Characteristics

Discharge Location and Source		Annual-Average Discharge Characteristics		
Outfall #	Regulator	Overflow Volume (MG)	Percent of Total Discharge	Frequency of Overflows
RH-034	Gowanus PS	188.4	64%	53
OH-007	Second Ave PS	75.8	26%	47
OH-006	19 St-3 Ave	14.6	5%	30
RH-031	Outfall RH-031	7.7	3%	11
RH-035	Outfall RH-035	2.1	1%	8
RH-036	R-22	1.6	1%	19
OH-005	Carroll St-3 Ave	1.0	< 1%	5
RH-038	R-24	0.9	< 1%	13
RH-037	R-23	0.5	< 1%	13
RH-033	R-25	0.2	< 1%	8
OH-008	Storm			
OH-009	Closed			
RH-032	Storm			
RH-039	Closed			
Total Discharge:		292.8		



CSO and Stormwater Outfalls



- ◆ 92% of the watershed is served by combined sewers, 2% by storm sewers, and 6% is uncaptured flow
- ◆ Four outfalls account for 95% of the annual CSO discharges

Three Manufactured Gas Plants (MGPs) operated along the Canal for many decades.



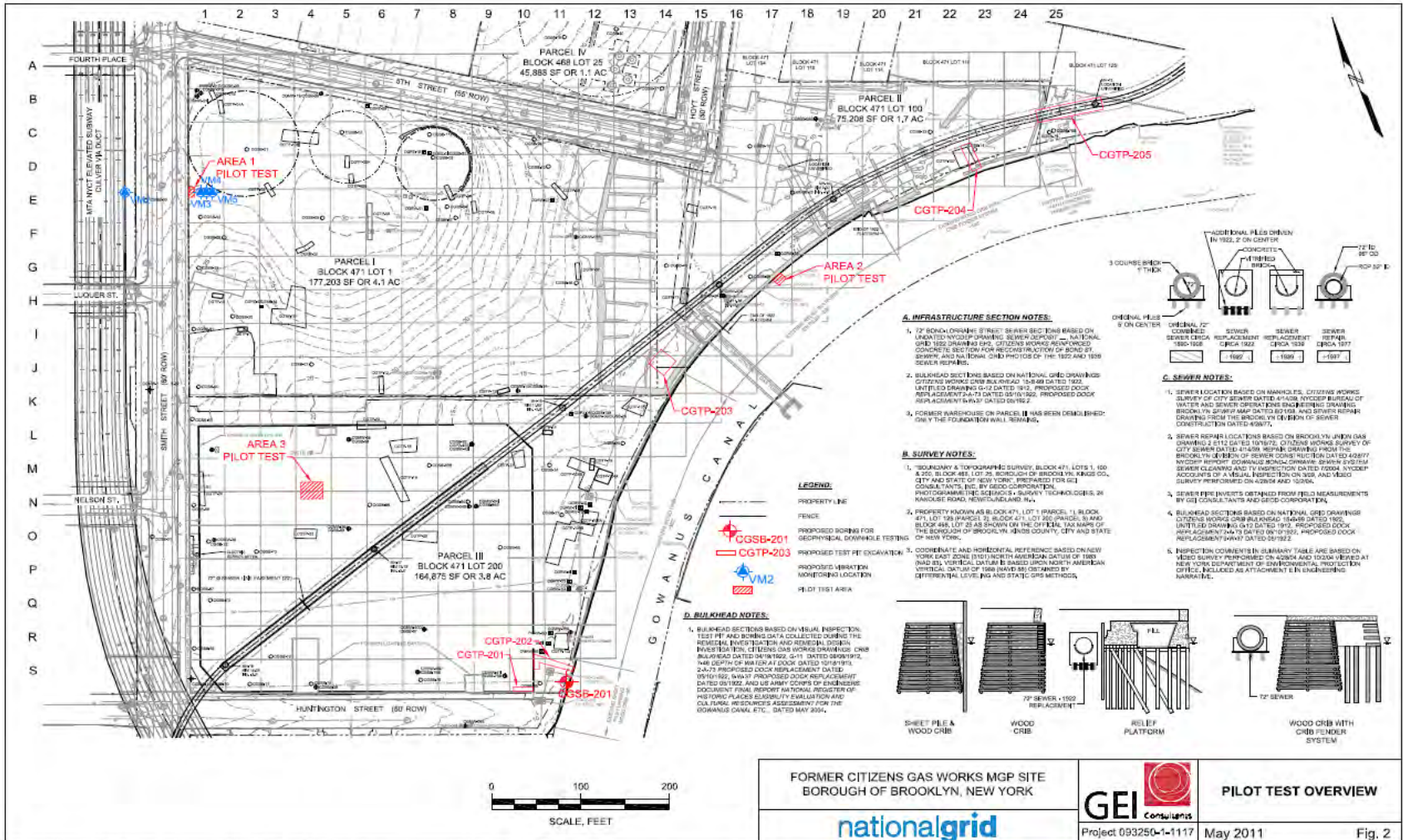
Citizen's Gas Work (circa 1926)



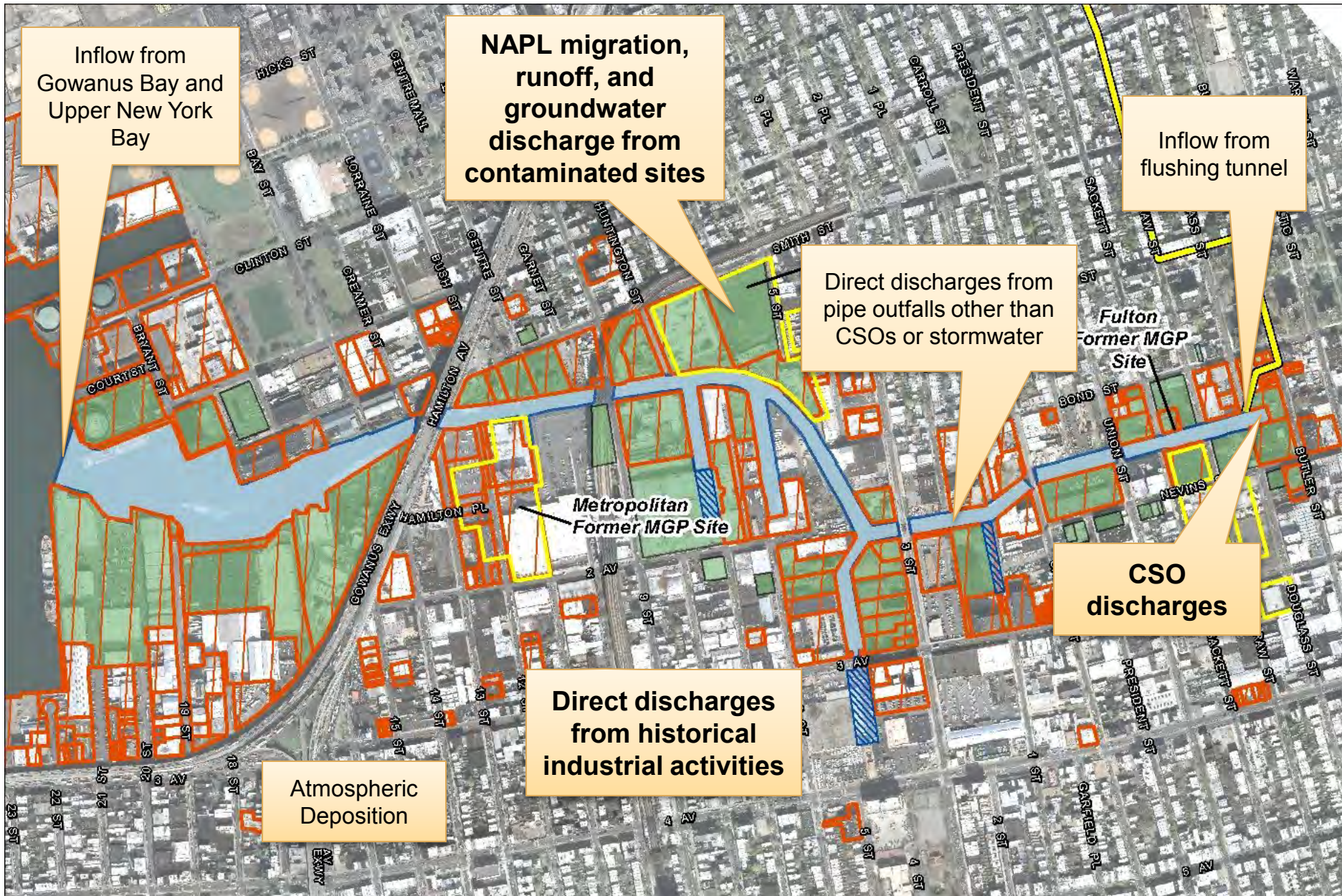
Coal tar upwelling often creates visible sheens



National Grid, successor to Brooklyn Union Gas, is remediating the Fulton, Metropolitan and Public Place MGP's under consent orders with NYSDEC.



Summary of Contaminant Sources



Inflow from Gowanus Bay and Upper New York Bay

NAPL migration, runoff, and groundwater discharge from contaminated sites

Inflow from flushing tunnel

Direct discharges from pipe outfalls other than CSOs or stormwater

Metropolitan Former MGP Site

Fulton Former MGP Site

CSO discharges

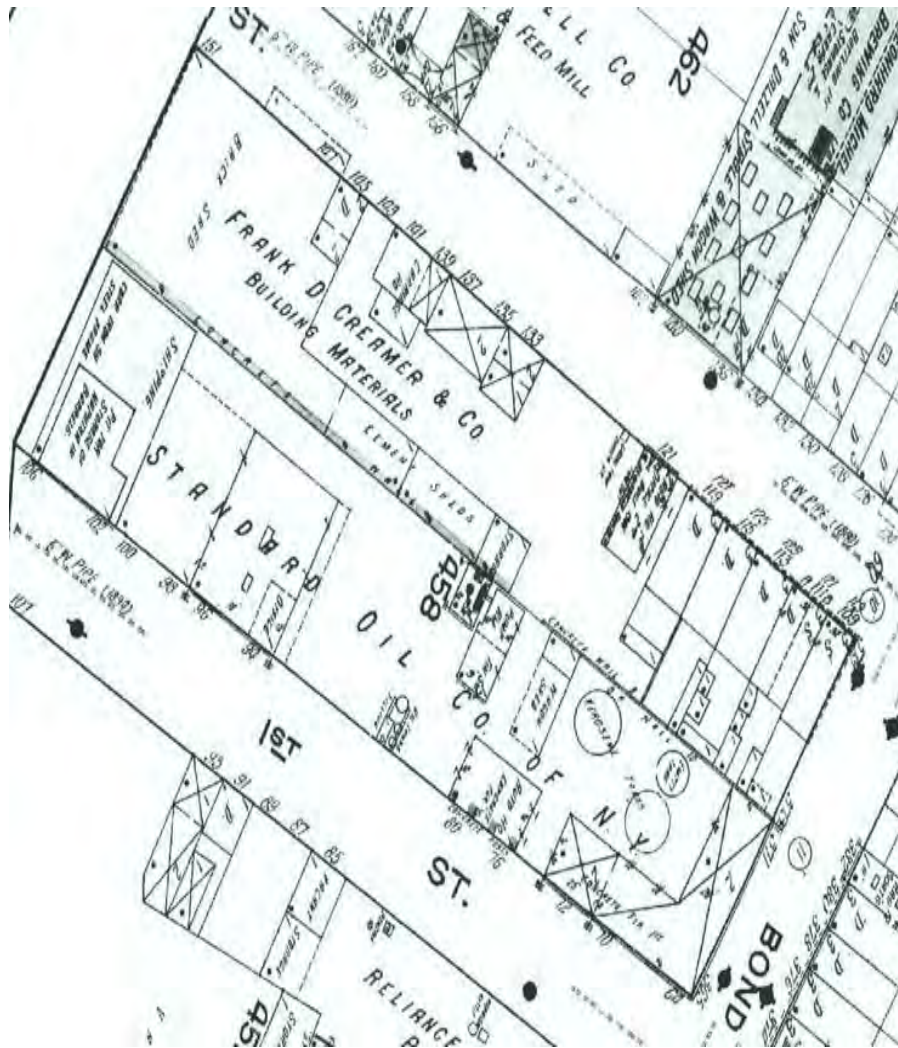
Direct discharges from historical industrial activities

Atmospheric Deposition

EPA Enforcement

- ◆ **PRP Search Status**
- ◆ **Consent Orders and Settlements to Date**

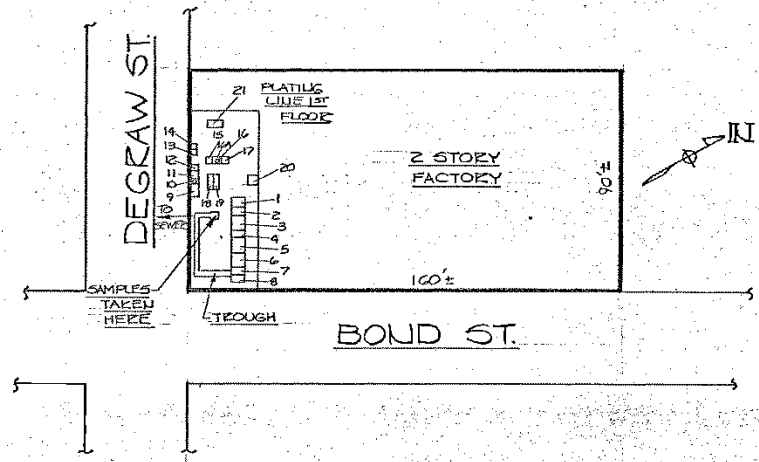
EPA has used Sanborn **fire insurance maps**, **sewer pre-treatment program records** and other sources, including information obtained from or submitted by other parties.



CHARLES M. SHAPIRO & SONS, P.C.
 CONSULTING ENGINEERS
 6315 MILL LAKE, BROOKLYN, N.Y. 11234
 TELEPHONE: 17151 531-8400

BY J.S. DATE 4-17-85 SUBJECT BASELINE MONITORING REPORT SHEET NO. 1 OF 1
 CHKD. DATE O.Z. GEDNEY CO. JOB NO. 85-56
 262 BOND ST. BROOKLYN, N.Y.

• PLOT PLAN • 1"=40'0"



TANK #	CONTENTS	CAPACITY/ GALS.	TANK #	CONTENTS	CAPACITY/ GALS.
1	SOAP	250	12	RINSE	100
2	SOAP	225	13	RINSE	50
3	RINSE	400	14	RINSE	50
4	ACID	175	15	RINSE	50
5	ZINC	450	16	CHROMATE	18
6	RINSE	400	16A	RINSE	100
7	RINSE	175	17	ZINC	150
8	CHROMATE	225	18	ZINC	150
9	SOAP	275	19	ZINC	160
10	ACID	16	20	ZINC	300
11	RINSE	125	21	VAPOUR DEGREASER	100

EPA's PRP search is **continuing**. Please submit any information on additional possible parties.

GOWANUS CANAL ABLAZE

Four Ships Threatened When Gasoline Leak Is Ignited

After a two-hour battle, firemen yesterday brought under control an oil fire in the Gowanus Canal, Brooklyn, that threatened two tankers and two Liberty ships. The fire was started at Seventeenth Street when gasoline leaked into the water and was ignited by sparks from an acetylene torch.

Flames spread toward the tanker Apache Canyon, still reeking with gasoline fumes. From the ship nearly a dozen firemen fought the blaze, preventing it from reaching the tanker. A small fire broke out in the stern of one of the Liberty ships but was quickly extinguished.

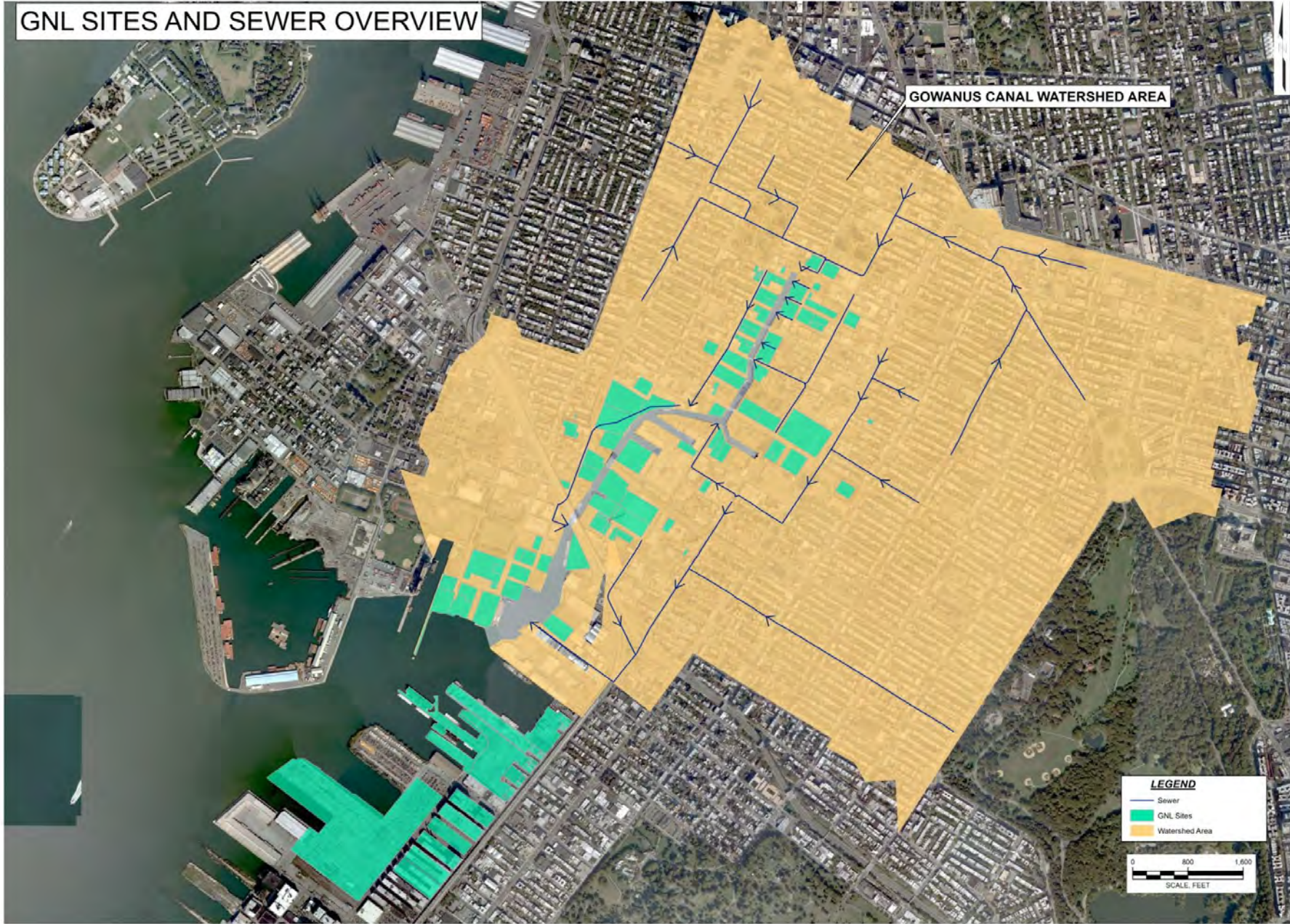
The New York Times

Published: January 6, 1946

Copyright © The New York Times

GNL SITES AND SEWER OVERVIEW

GOWANUS CANAL WATERSHED AREA



LEGEND

- Sewer
- GNL Sites
- Watershed Area

0 800 1,600
SCALE, FEET

Canal sediments contain hazardous substances, many at elevated levels, linked to PRP disposal

- Accumulated sediments are contaminated with a broad spectrum of co-mingled CERCLA hazardous substances, including **PAHs**, **PCBs** and **metals**.
- All of these contaminants will be addressed by the sediment remedy.
- PAHs and metals exceed Preliminary Remediation Goals (PRGs) in samples throughout the Canal.
- PCB levels in sediments throughout the Canal are above the anticipated PRG and Effects Range Median (ER-M).



TOTAL PAHs > 7.8 mg/kg



Settlements to Date

- ◆ **National Grid and New York City signed separate consent orders in April 2010 to assist in RI/FS process.**
- ◆ **Under these orders, National Grid and NYC have installed wells at properties associated with their facilities, performed sampling and done additional studies.**
- ◆ **EPA also issued an access UAO in 2010.**

Chemtura Bankruptcy Settlement

- ◆ **Chemtura Corp. (Argus Chemical Co., Witco Chemical Co., Crompton Corp.)**
- ◆ **Operated chemical facility and lab at 633 and 688 Smith Street for approximately 50 years.**
- ◆ **Filed Chapter 11 bankruptcy in 2009.**
- ◆ **EPA issued notice letter and information request.**
- ◆ **DOJ filed EPA's proof of claim.**
- ◆ **EPA entered into \$3.9 million bankruptcy settlement, approved by the Court in December 2010.**
- ◆ **The settlement requires Chemtura to comply with NYSDEC orders for its Smith Street facility cleanups worth approximately \$14 million.**

EPA Costs to date: approximately \$10.4 million as of 1/31/2012

Cost include: Listing, enforcement, oversight and RI/FS, including contractors, laboratory analysis, payroll and indirect costs



Other factors affecting liability, the need for a cleanup, cleanup levels and costs

- ◆ Residential and commercial re-development **and**
- ◆ Increased recreational use, even ecotourism, **despite**
- ◆ Continued flooding and exposure risks **creating**
- ◆ other potential liabilities, such as Natural Resources Damage claims.

Ongoing re-development like these recent high-end residential condos within a block of the Canal



Canal-side residential projects planned: 3 parcels already re-zoned residential (former Toll Brothers Project); broader re-zoning on hold.



Approved Whole Foods market at 3rd Street and 3rd Ave. between 4th Street Basin and Canal



Gowanus Green – City-supported affordable housing/mixed use project on Public Place MGP site



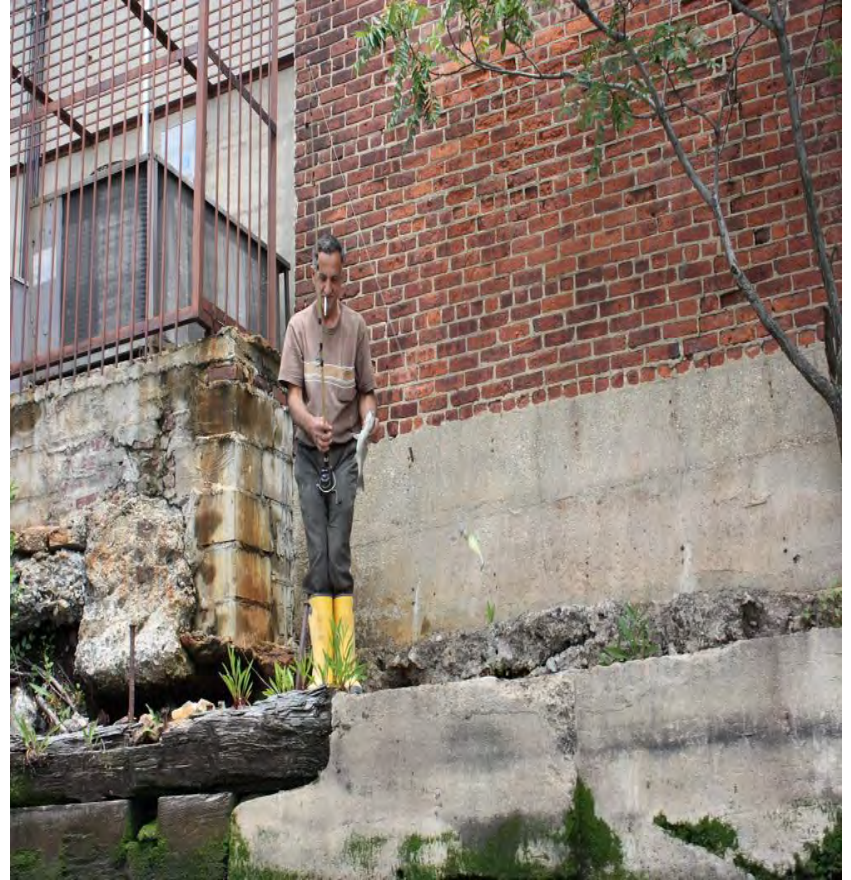
Re-development planned despite flooding problems. Carroll Street (former Toll Brothers site) and 9th Street and Canal across from Public Place.



**Flooding extends beyond 4th Ave. (1947 and 2010).
Exposure pathway for contaminated sediments.**



Recreational uses: Boating and fishing for consumption (despite advisories)

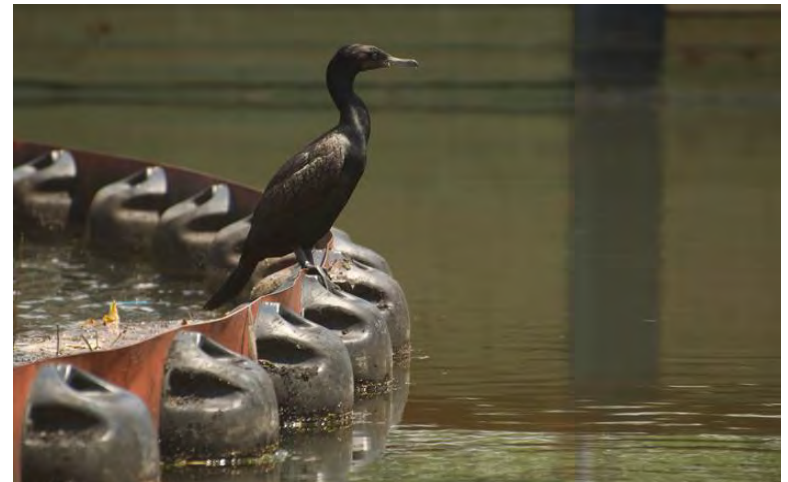


Eco-tourism:

Travel Channel Good Morning Japan



Habitat for natural resources



Required notice has been given to Trustees for Natural Resource Damage claims



Public Outreach and Stakeholder Interaction

EPA's approach seeks to be as transparent and collaborative as possible in recognition of the public interest from:

- ◆ The Local Community
- ◆ Elected Officials
- ◆ PRP Stakeholders
- ◆ Business Owners and Developers
- ◆ Local, Regional, National and International Media

EPA is proactively providing information via our webpage:

<http://www.epa.gov/region02/superfund/npl/gowanus/>

our **Gowanus Facebook** page

and a pending on-line **Administrative Record**.

Gowanus has the largest Superfund **Community Advisory Group (CAG)** in the US. EPA is providing funding for: **Technical Assistance Grant (TAG)**, **Technical Assistance Service for Communities (TASC)** and **Facilitation** (to which National Grid has offered to contribute).



EPA Cleanup and Enforcement Schedules



Remedial Investigation (RI): 12/2009-12/2010

Feasibility Study (FS): 3/2011- 12/2011

Proposed Plan (PRAP): 6/2012

Record of Decision (ROD): 12/2012

Remedial Design 2013-2015

Dredge Area 1, Butler Street to 3rd Street: 2016-2017

Dredge Area 2, 3rd Street to 9th Street: 2017-2018

Dredging of Area 3, 9th Street to 21st Street: 2019-2020

RI/FS AOCs
April 2010

PRP Search - Ongoing

PRP Briefing Invitation 1/2012

PRP Briefing 3/2012

PRN & Draft RD/RA CD @ 6/2012

Oversight Bill @ 7/2012

Special Notice 1/2013

RD/RA Enforcement Options:
RD/RA CD
Amend AOCs to add RD, negotiate RA CD
UAO/107 suit

RD/RA CD or UAO by 6/2013?

RD AOC mods by 6/2013, then RA CD by 2015

Gowanus Canal
EPA Cleanup and Enforcement Schedule

Questions?

