Sustainable Remedies

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Sustainable Remedies

- Sustainability means different things to different audiences:
  - "Green" (or "Greener") remediation

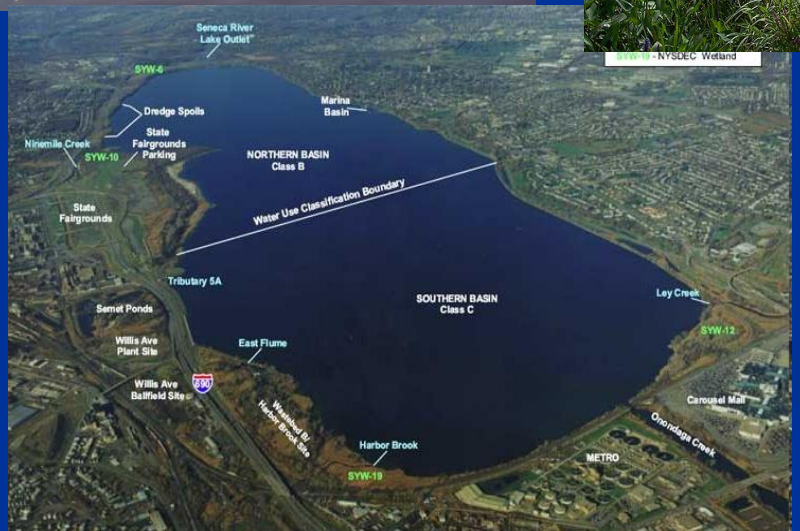
  and/or

  - Long-term viability, reliability & protectiveness of remedies
- Sustainability considerations:
  - Social, Economic, Environmental
  - "Mega" Sites – particularly sediment sites – pose significant sustainability questions

Region 2 SEDIMENT MEGA-SITES:

- Gowanus Canal
- Hudson River
- Passaic River
- Newtown Creek
- Grasse River
- Onondaga Lake
- Black River

Plus: Quanta/Edgewater, Berry's Creek, Roebling Steel, Raritan Bay Slag, Cornell-Dubilier, 18-Mile Creek, Ley Creek, Dewey-Loeffel, Atlantic Resources, Horseshoe Road….



Gowanus Canal

Figure 1

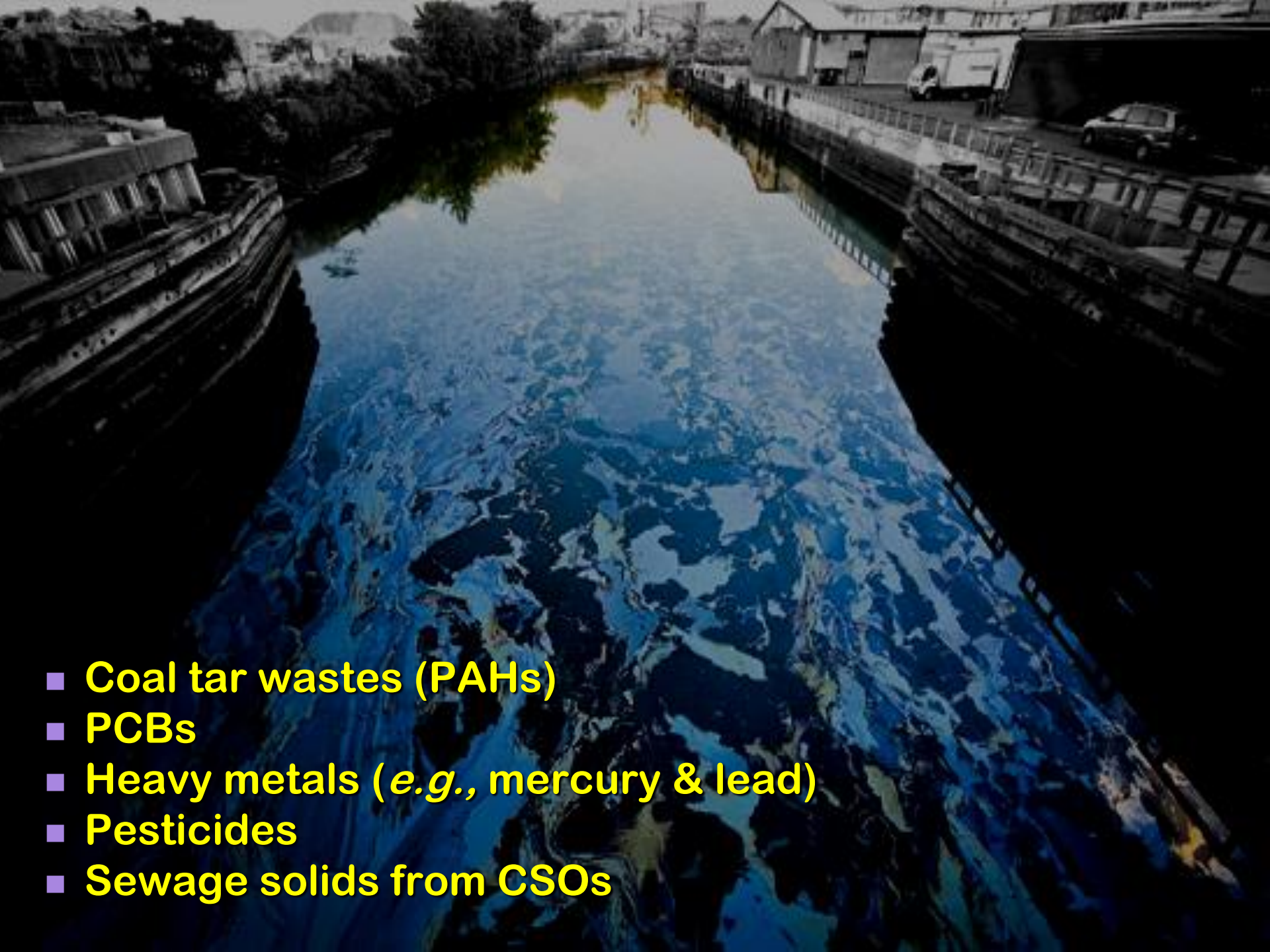
SITE LOCATION MAP
GOWANUS CANAL HEP/ERA MODELING
BROOKLYN, NEW YORK

amec
285 DAVIDSON AVENUE, SUITE 100
SOMERSET, NJ 08873
(732) 302-9500

Gowanus Canal

- 1.8 miles long
- Three MGP sites, multiple other industrial activities over 150+ years
- Sediments heavily contaminated:
  - 4.5% PAHs
  - 42 ppm PCBs
  - Heavy metals


BOWNE
TONS STORES
AMBROSE 310 NEW YORK.
C.A.L. 508.



- Coal tar wastes (PAHs)
- PCBs
- Heavy metals (*e.g.*, mercury & lead)
- Pesticides
- Sewage solids from CSOs

- Densely populated area
- Mixed land use:
  industrial, commercial & residential
- 10+ feet of accumulated soft sediment
- Poorly flushed waterway
  - Flushing Tunnel being rehabilitated
- 377 MGY of combined sewer overflow (CSO)
  - Dominant source of sediment loading

A Gowanus “Poo-nami”

Gowanus Canal

- **Remedial Record of Decision issued 9/30/13:**
  - Dredge ~600,000 CY
  - Stabilize & Cap canal bottom
  - **CSO Controls (retention tanks)**
  - $506 M
- 8-10 years expected for Design & Construction

Sustainability Issues

- **Social:**
  - **High degree of local interest & support**
    - Very informed & engaged public
    - Largest Community Advisory Group (CAG) in nation (~60 members)
    - Overwhelming public support for cleanup, particularly CSOs
    - Opposition to local disposal of contaminated sediments
    - Concern about possible temporary loss of swimming pool
  - **Intense opposition from local government (NYC)**
    - Opposed to Superfund listing (2009-2011)
    - Opposed to inclusion of CSO controls in ROD

GOWANUS CANAL SUPER FUND ME!

Sustainability Issues

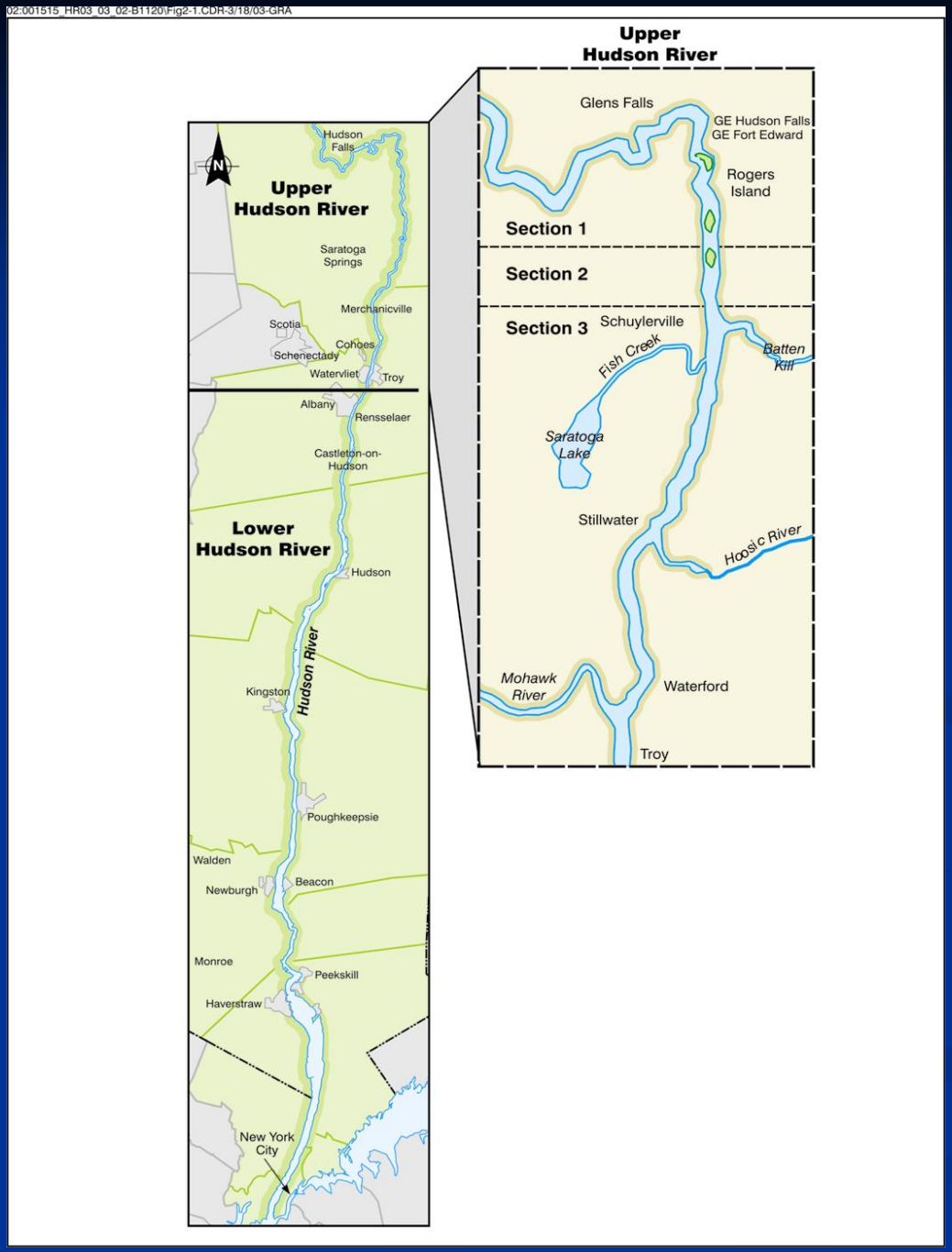
- Economic:
  - Expensive for PRPs (including NYC)
    - $506 million estimate
      - Includes $78 million for CSO controls (NYC asserts CSO controls will be far more expensive)
    - Major PRP (National Grid, public utility) also responsible for remediation of 3 MGP sites adjacent to Canal
      - Possible cost ~$500 Million
  - Real estate boom
    - 52% property value increase from 2008-2012 ($668/ft)
    - Developers supportive of cleanup & CSO controls
  - Local job creation

Sustainability Issues

- **Environmental:**
  - PRPs assert soft sediments could be capped in place
    - EPA, NYS agree: sediments are too soft to hold a cap
    - Much of Canal too shallow for navigation, including for remediation equipment
  - Capping of native sediments necessary after dredging
    - Concerns for long-term reliability of cap
      - Storm surges, sea level rise
  - NYC asserts CSO discharges have background levels of contaminants, need not be addressed by Superfund
    - CSOs are dominant source of sediments (1"-5"/year)
    - CSO sediments carry PAHs, other contaminants
      - Average CSO concentrations = 2X - 3X background

Hudson River

PCBs SUPERFUND SITE



CLEANUP AREA:

40 MILES NORTH OF ALBANY

The Remedial Project

- ~490 acres of Upper Hudson River will be dredged
- ~2.5 million cubic yards of sediment will be dredged
- Estimated total cost = $2 billion
- 4 to 6 dredges operating at one time
- Dredging occurs 24/6 from May to November (when Champlain Canal is open)
- Dewatered sediments disposed of in permitted landfills

Dredging Began May 15, 2009

Phase 1 (2009)
Reassessment (2010)
Phase 2 (2011-2015)

The First Scoop of Mud

5 CY Dredge Buckets

Hopper Barges in
Canal Lock

Locks Open May - November

100+ Acre Sediment Processing Facility

April 2007

Champlain Canal

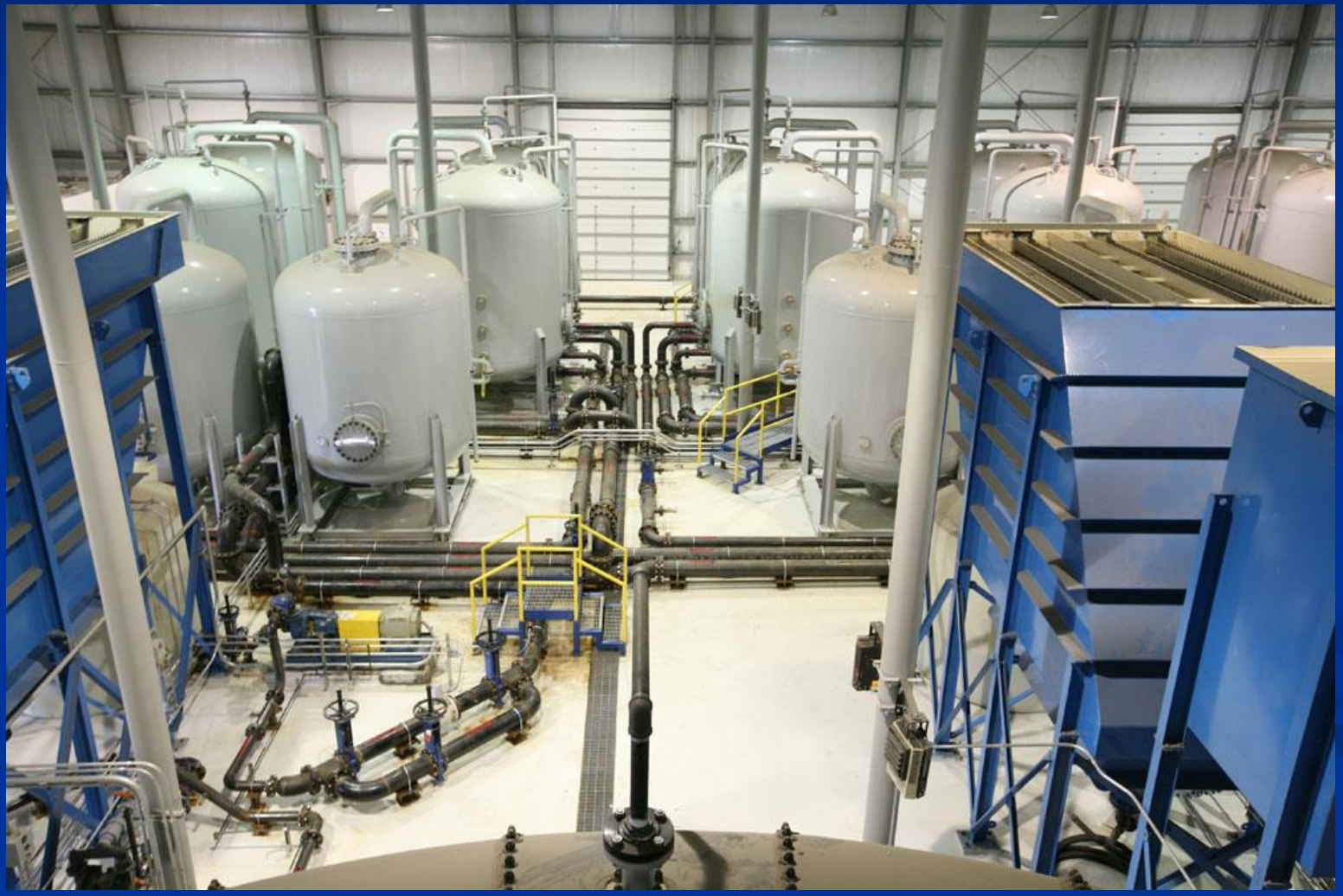
November 2008

Unloading at processing facility

BARGE UNLOADING AREA

FILTER PRESSES

Water Treatment Plant



DRY SEDIMENT STORAGE

7 MILES OF RAIL SIDINGS

Plastic Liners in Rail Cars for Transport of Contaminated Sediment

Loading Rail Cars with Dried Sediment


Dredging crews are adding backfill – clean dirt and rocks of various sizes – back into areas where EPA has certified that dredging is completed.

Progress To Date

- As of 9/26/2013, >1.9 Million CY dredged (>71% of expected total)
- EPA Phase 2 standards required at least 350,000 CY dredged/yr.
  - 2012: 695,000 CY dredged
  - 2013: ~650,000 CY (anticipated)
- Lower than expected resuspension; virtually no exceedances of load or concentration standards
- Well within residuals limits

Sustainability Issues

- **Social:**
  - Many local governments and residents opposed the project prior to start of work
    - GE encouraged local opposition
    - Resource agencies, environmental NGOs strongly supported project
      - Argue more acres should be dredged
  - Since work began, little or no continued opposition
    - Little disruption to recreational & other activities
    - Spectator sport
    - Economic benefits

Sustainability Issues

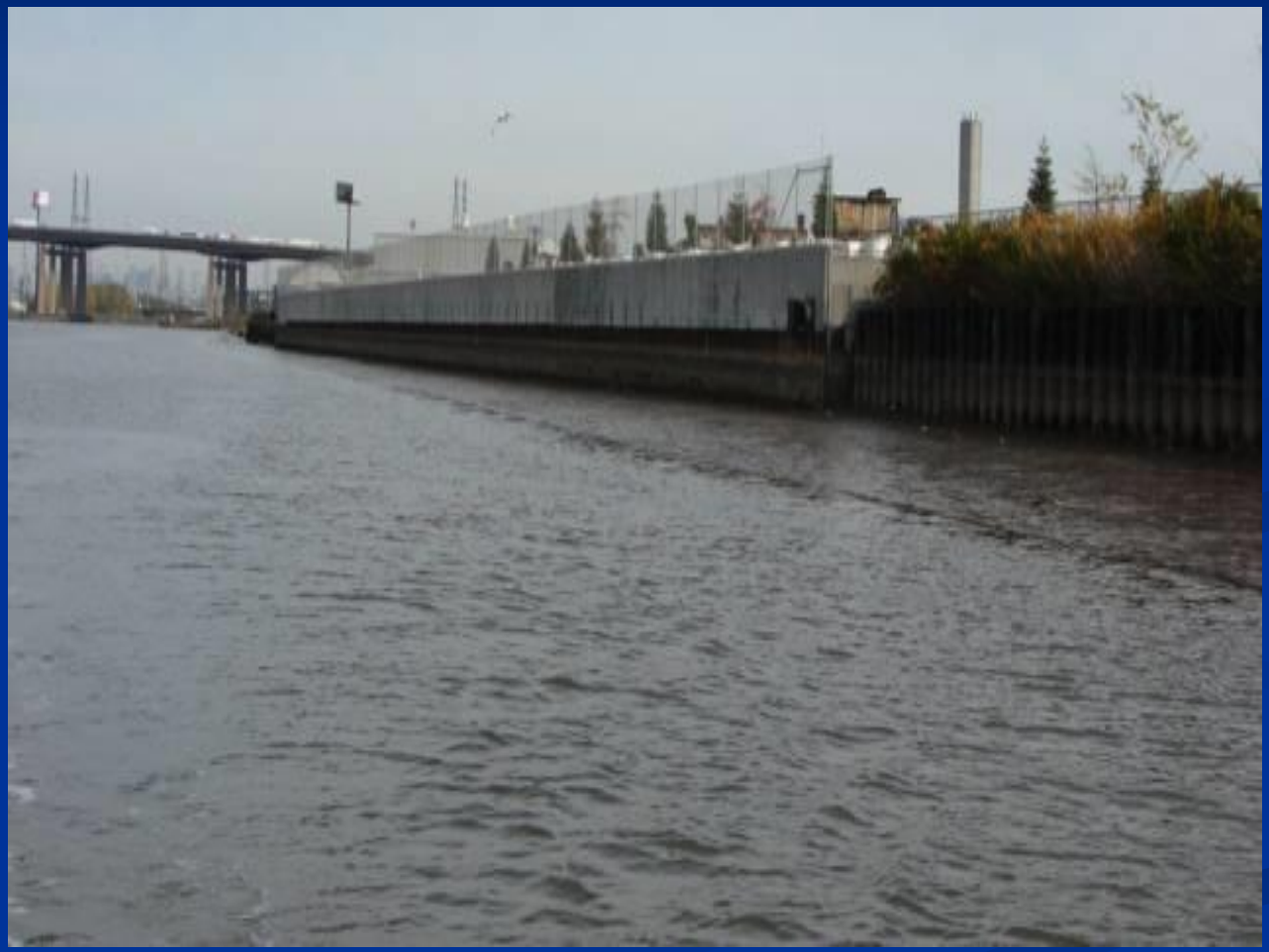
- Economic:
  - Expensive for GE
    - ~$2 billion over ~10 years
  - Economic boom for local communities
    - ~500 jobs
    - Valuable infrastructure
  - NYS Canals Corp. concerned that navigation channel will not be fully dredged
    - PCB contamination = increased cost to maintain channel

Sustainability Issues (Con't.)

- Environmental:
  - Phase 1 – more acreage capped than anticipated (> 30%)
    - Corrected in Phase 2 (< 11%)
  - Concerns that some areas with elevated PCB levels will not be dredged (135+ acres)
  - Concerns about long-term maintenance of caps
    - After 100-year flood in 2011, caps remained unaffected
    - GE responsible for O&M in perpetuity…
    - …but forever is a very long time
  - Will fish recover? How well? How fast?

Passaic River

Diamond Alkali Facility in Newark, NJ and Adjacent Lower Passaic River

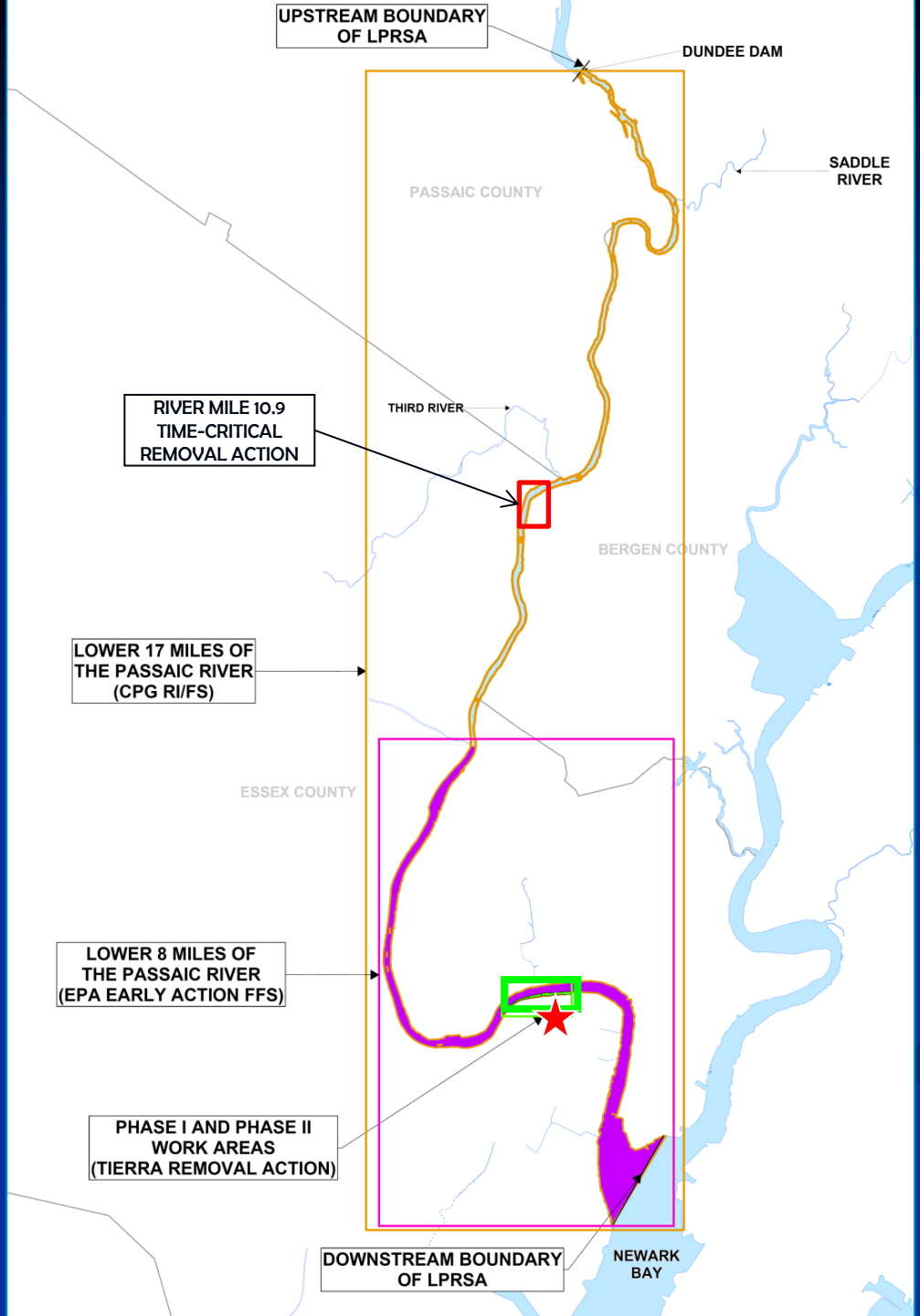


Contaminants:

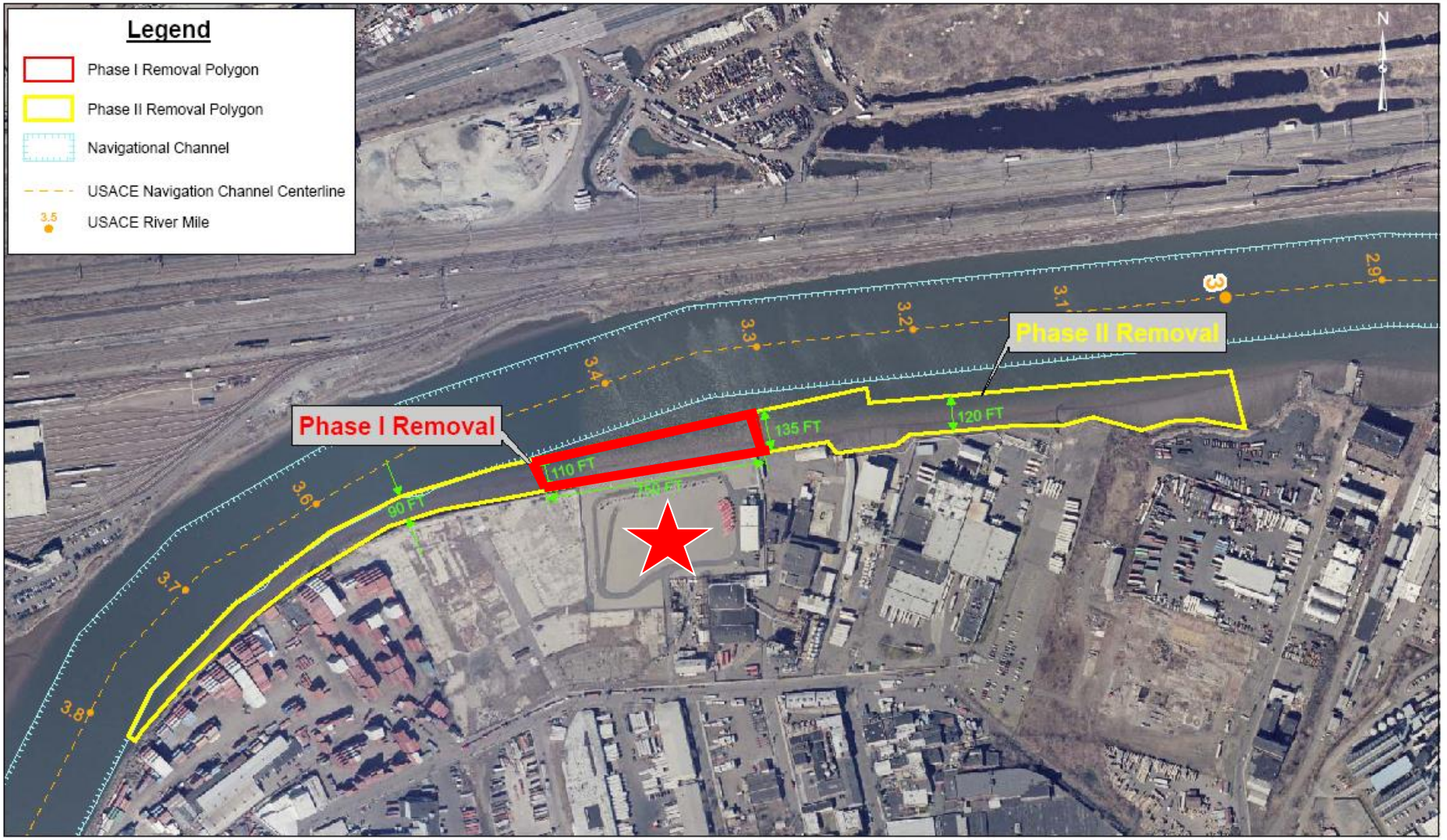
- Dioxins
- PCBs
- Pesticides
- Metals
- PAHs

Phased approach to clean up:

- Removal Actions
- 8 Mile ***and*** 17 Mile Remedial Studies



Contaminated Sediment Removal Project



Phase I and II Removal

Lower 8 Mile Cleanup

- Lower 8 miles contain major source of contamination to the rest of Passaic River and Newark Bay
- Focused Feasibility Study options:
  - No Action (evaluation required by Superfund)
  - Deep Dredging: all fine sediments
    - 10 Million CY; $1.5 - $3.5B, depending on disposal option
  - Capping with Dredging (to ensure no additional flooding and facilitate for navigation)
    - 4 Million CY, $1 - $1.9B, depending on disposal option
- Proposed Plan (due January, 2014) will identify EPA's preferred option and start public comment process

Sustainability Issues

- **Social:**
  - High degree of public interest
    - Active, engaged CAG
    - Wide support for cleanup from NGOs, local governments, state government, resource agencies
    - Widespread opposition to local disposal of contaminated sediments (Confined Aquatic Disposal), which is much less costly than off-site disposal
    - Mixed support & opposition to local treatment or decontamination of sediments
      - Extensive opposition to thermal destruction
      - Less opposition to soil washing (but technique has not proved effective)

Sustainability Issues

- **Economic:**
  - All options very expensive ($1 – $3.5 B)
    - PRP group has splintered
    - Strong PRP opposition to 8-Mile Remedial Study
      - Request deferral to 17-Mile Remedial Study
    - Strong local opposition to less expensive local disposal option (CAD cells)
  - Large number of local jobs would be created
    - Pilot job training initiative
  - Real estate benefits from cleaning river

Sustainability Issues

- Environmental:
  - Off-site vs. local disposal
  - Treatment options
    - Thermal Destruction – strong local opposition
    - Soil Washing – not shown to be effective
  - Fisheries concerns & dredge "windows"
  - Concerns about long-term efficacy of cap
    - Forever is a long time
  - Concerns about potential recontamination from upstream & downstream
    - Tidal estuary; water flows both directions