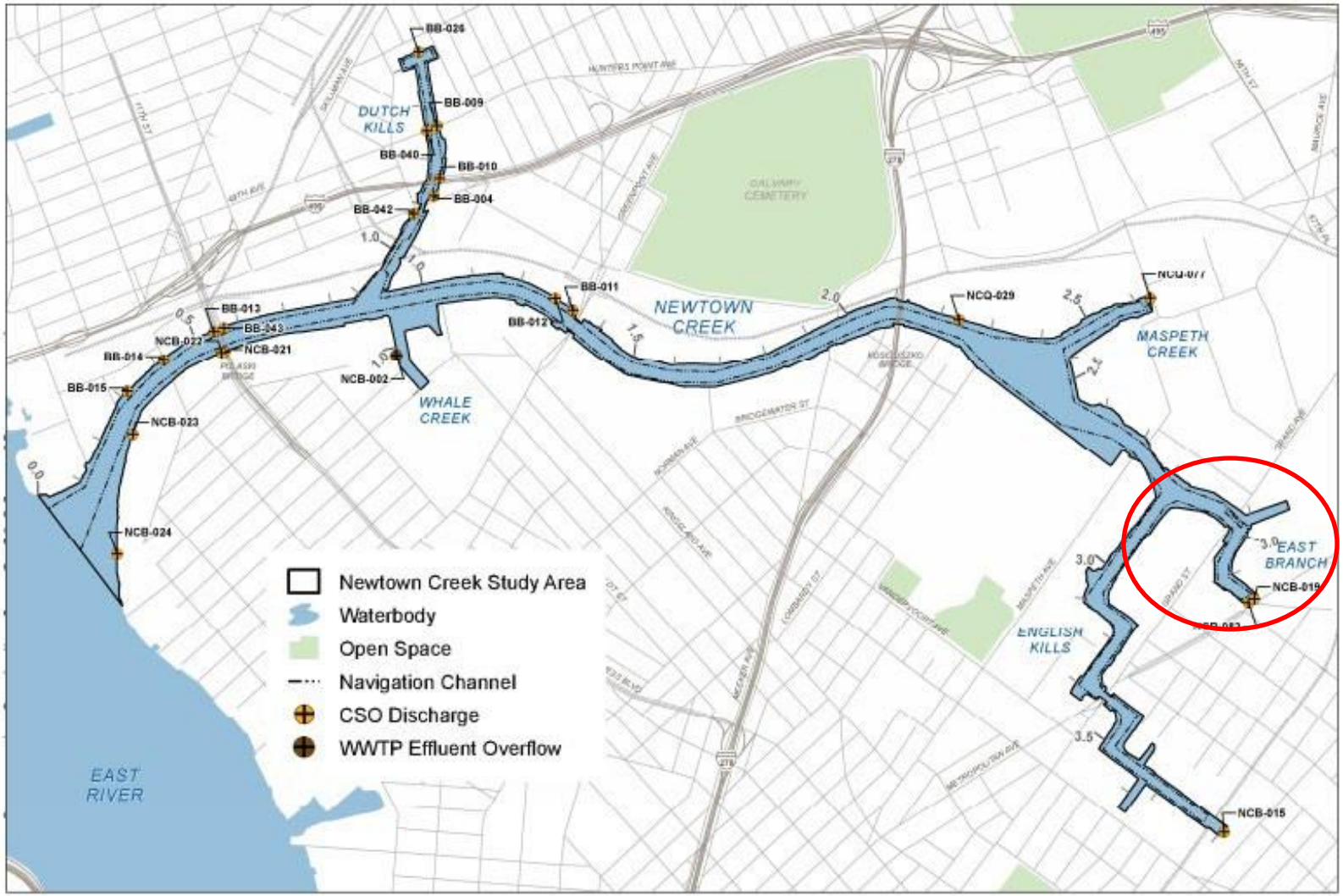
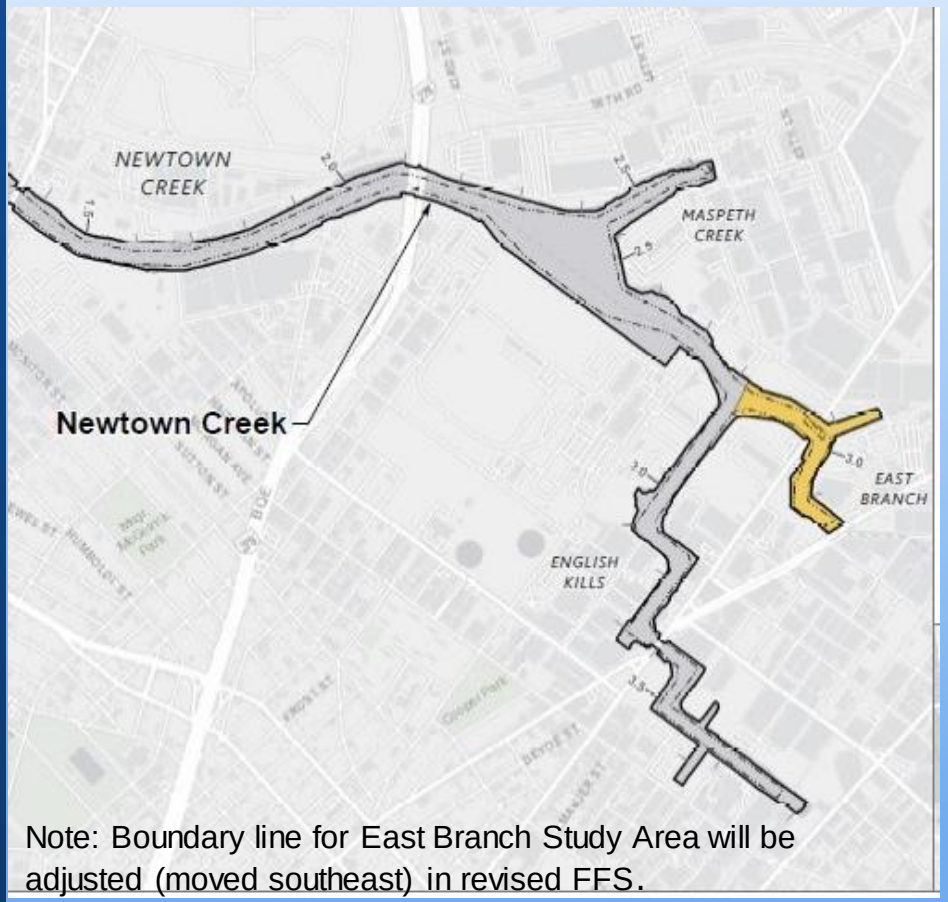
East Branch Early Action
Overview of Remedial Alternatives Evaluated in the Draft Focused Feasibility Study and Data Review
Newtown Creek Superfund Site CAG Meeting
June 18, 2024
(continuation of May 22, 2024 meeting)

Study Area


DUTCH KILLS
NEWTOWN CREEK
WHALE CREEK
MASPETH CREEK
EAST BRANCH
ENGLISH KILLS
EAST RIVER
BB-026
BB-009
BB-040
BB-010
BB-004
BB-042
BB-011
BB-012
BB-013
BB-043
NCB-022
NCB-021
BB-014
BB-015
NCB-023
NCB-024
NCB-002
NCQ-029
NCB-019
NCB-015
Newtown Creek Study Area
Waterbody
Open Space
Navigation Channel
CSO Discharge
WWTP Effluent Overflow

East Branch Early Action Study Area



Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

- Tributary of Newtown Creek
- Approximately 0.5 miles in length
- Surface area ~11 acres
- Depth 10.3-16.5 ft in channel and shallower at head of tributaries
- Extensive investigations completed as part of the Remedial Investigation/Feasibility Study Process
- Focused Feasibility Study (FFS) was developed to evaluate remedial alternatives for the East Branch

*Additional detail on the rationale for conducting the East Branch Early Action can be found in a June 20, 2023 presentation to the CAG (available on the CAG website).

Recap from May CAG meeting….

- We were able to discuss slides 5 through 18 below (included again for ease of reference)
- Based on feedback from the CAG steering committee, we are back this month to discuss
  - Any follow up questions on the alternatives evaluated
  - The alternative review process (aka, the Nine Criteria)
  - The post-implementation evaluation plan
  - The Schedule for moving forward
  - A review of data from the Remedial Investigation used to support the East Branch Early Action process
- We will continue to work with the CAG leadership to assure all technical review supports are in place prior to release of the Proposed Plan

Common Elements of Each Active Alternative

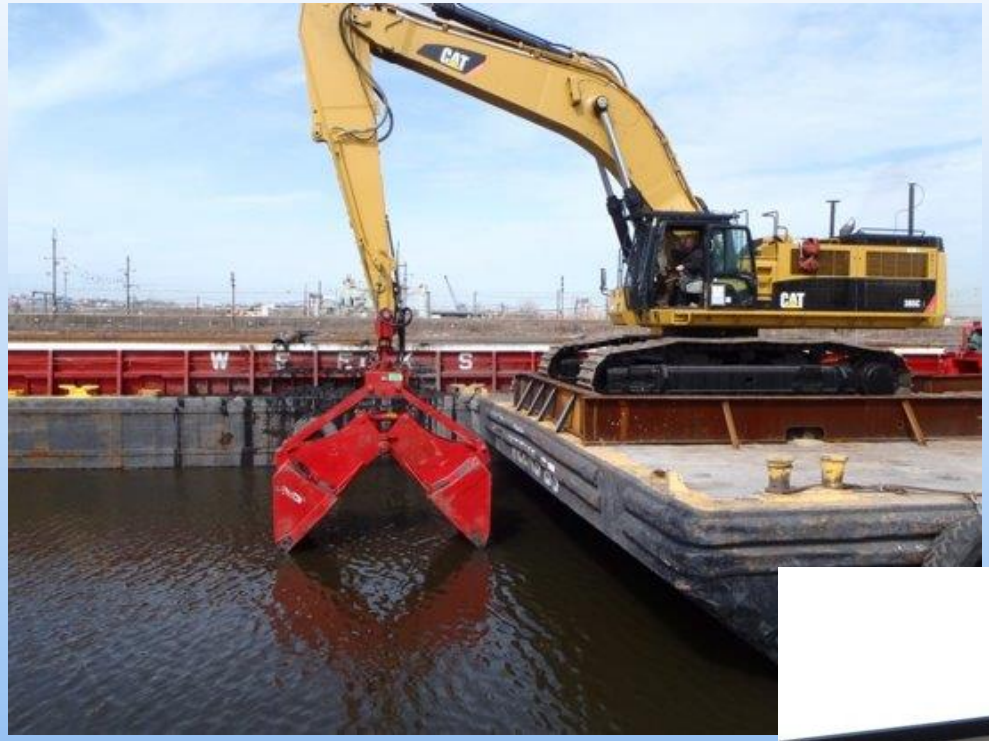
- Robust pre-design investigation
- Dredging
- Capping
- In-situ stabilization
  - where needed to reduce migration, to treat NAPL
- Sealed bulkheads
  - where needed to reduce migration, as a temporary measure to address seeps while upland cleanup measures are evaluated and implemented
- Stabilization measures
- Dredged material management
- Institutional controls
- Evaluation monitoring
  - This is key!!

Key Terminology: Pre-Design Investigation

- A preliminary-design investigation (PDI) involves collecting additional information to support the remedial design
- The PDI will include at least the following:
  - Additional sediment sampling to refine the delineation of contaminants of concern (COCs) in sediment;
  - Additional porewater and/or groundwater COC data collection, primarily to refine cap designs;
  - Data collection to further delineate NAPL and investigate NAPL mobility;
  - Geotechnical data collection to support dredge design, cap design and shoreline stability evaluations;
  - Investigations to inform decisions on the need for upland controls.
- Will also be used to help develop the long-term evaluation monitoring program.

Key Terminology: Dredging

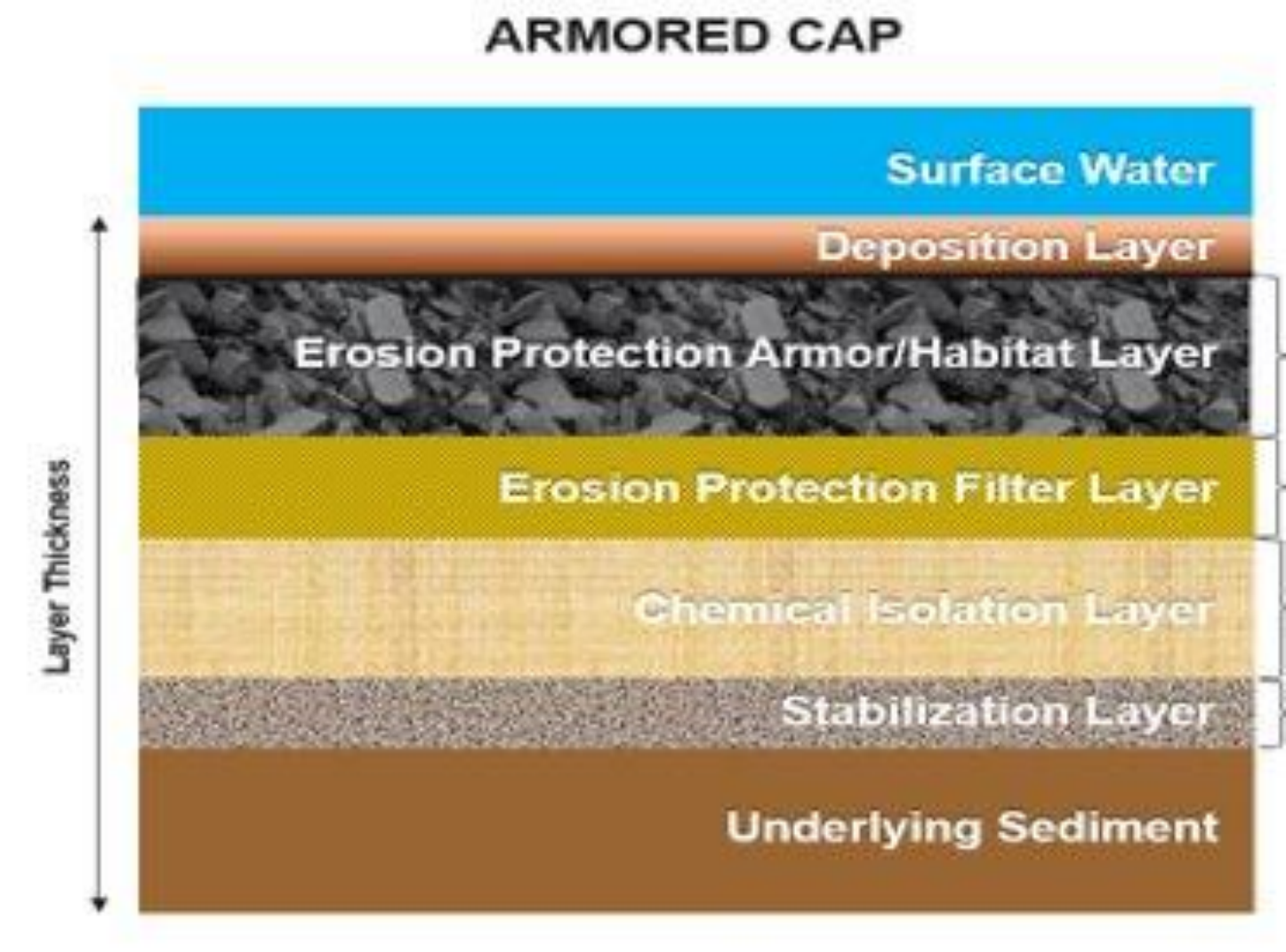
- Sediment removal, aka dredging, removes contaminated sediment from aquatic settings.
- Common types of dredging:
  - Mechanical
    - Uses an excavator or other heavy equipment to remove sediment
    - Usually situated on a barge
    - Clamshell or enclosed bucket
  - Hydraulic
    - Cutterhead
    - Horizontal auger
  - Specialty
    - Suction-vacuum dredge
    - Better for small-scale areas



Mechanical Dredging

Key Terminology: Armored and Amended Cap

General example of a multi-layer armored and amended cap

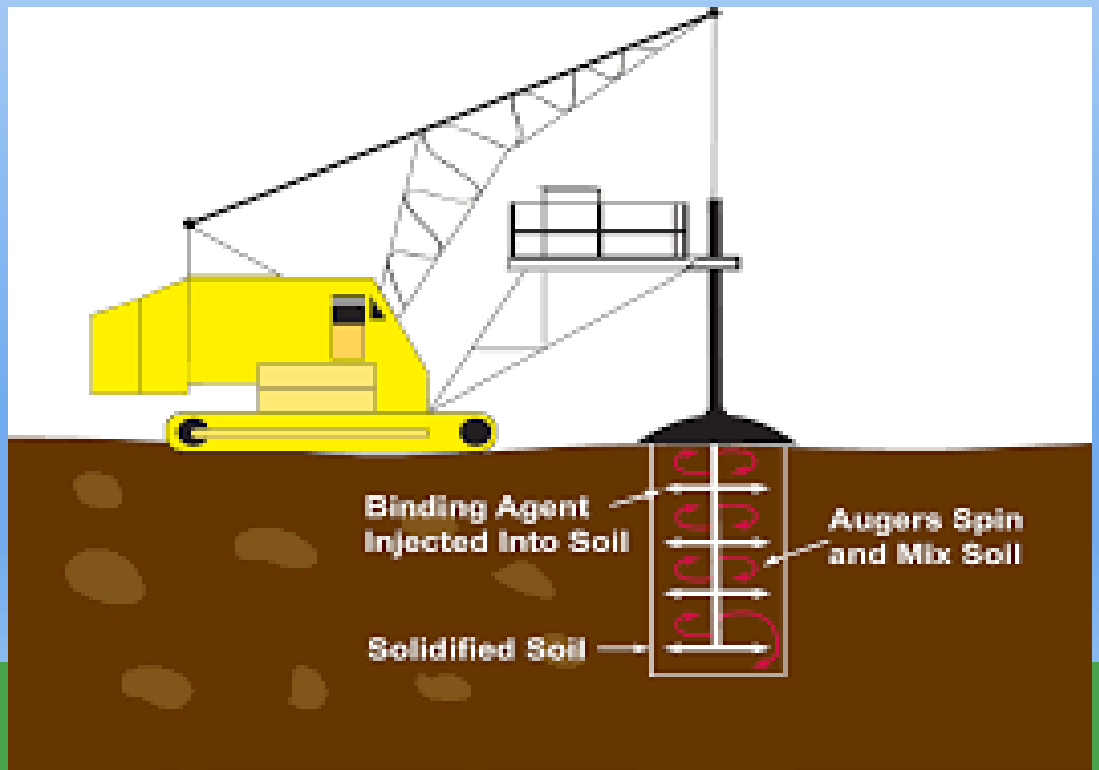


Key Terminology: Dredged Material Management

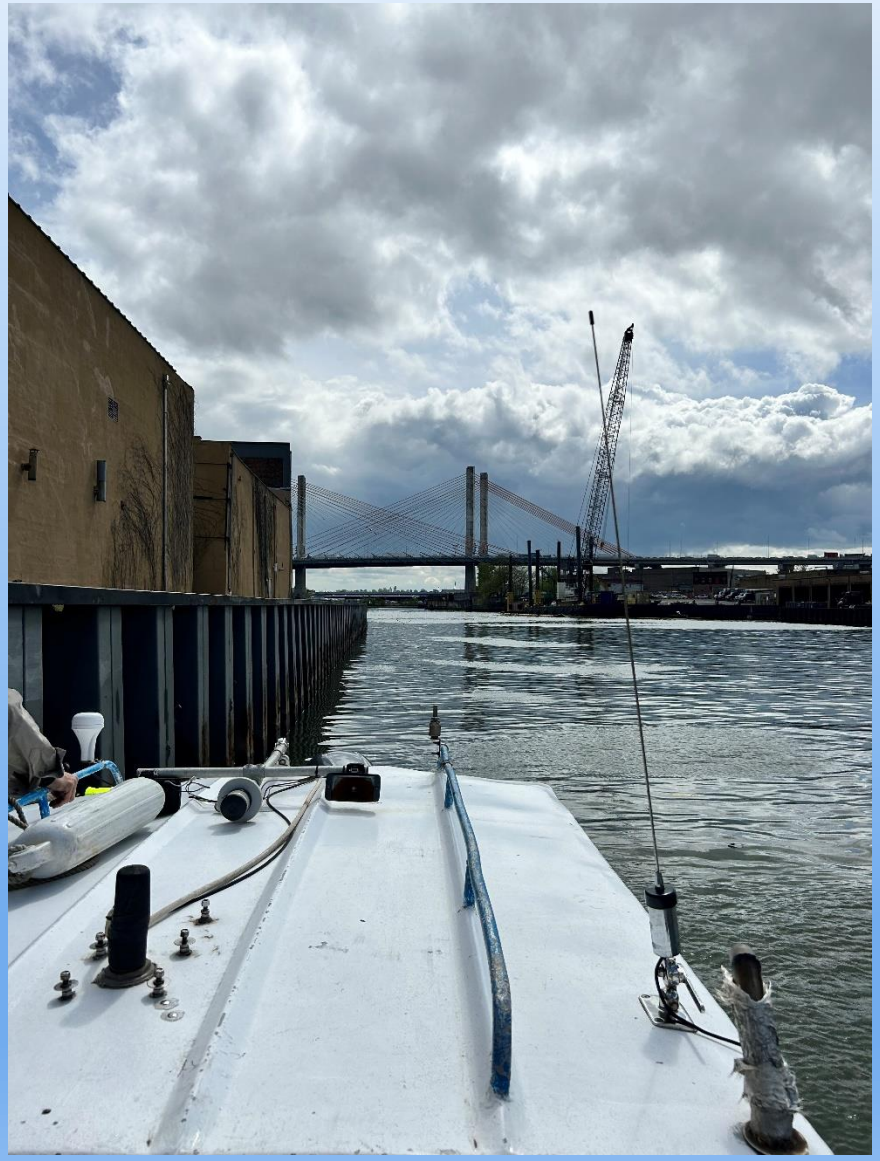
- Tentative plan is as follows:
  - Dredged material will be loaded into scows
  - The material will be transported to a commercially available upland processing facility.
  - Water that settles out from the sediment will be treated on the barge using a treatment system.
  - Dewatered dredged material would be offloaded at the regional sediment processing facility for additional management and stabilization, as needed.
  - Sediment will be sent for final offsite disposition.

Key Terminology: In-Situ Stabilization

- In-situ stabilization (ISS) is a method that can be used to prevent or slow the release of contaminants from sediment
- The process involves mixing or injecting solidification agents or chemical reagents (e.g., Portland cement) to solidify, stabilize, and immobilize contaminants in sediment.



Key Terminology: Bulkheads/Sealed Bulkheads



- Bulkheads
  - Man-made structures used to reduce shoreline erosion or stabilize shorelines. Commonly made of steel sheet piles, wood, concrete, or similar materials
- Sealed bulkheads
  - A type of bulkhead used to prevent contamination from entering the creek from upland properties. Typically uses interlocking joints of sheet pile wall

Alternatives Evaluated

Alternative	Alternative Summary
Alternative EB-A	No Action
Alternative EB-B	**Dredge to Allow Placement of Cap at or Below 0 Foot MLLW:** Dredge sediments down to a specified elevation to facilitate placement of an armored/amended cap entirely at (or below) 0 foot MLLW, which would decrease water depths.
Alternative EB-C	**Dredge to Allow Placement of Cap to Maintain Existing Water Depth:** Dredge sediment to a minimum depth to accommodate placement of an armored/amended cap to maintain the existing water depth.
Alternative EB-D	**Dredge to Allow Placement of Cap to Maintain Existing Water Depth with Localized Deeper Dredging:** Dredge sediment to a minimum depth to accommodate placement of an armored/amended cap to maintain the existing water depth. In select areas, sediment would be dredged deeper considering the depth to uncontaminated materials, COC concentrations in sediment, potential for upward NAPL migration from the deeper soft and/or native sediment.
Alternative EB-E	**Dredge All Within Navigation Channel, Cap Outside:** Dredge the federally authorized navigation channel to a depth necessary to accommodate a cap below the current authorized depth plus a buffer or to native material, whichever is shallower.
Alternative EB-F	**Dredge All:** Dredge all sediments to uncontaminated materials (e.g., uncontaminated native material) and backfill if necessary.

Alternative EB-B

- Dredging where necessary to allow for placement of an armored and amended cap
  - Cap would be placed entirely at or below the mean low water line
  - Thickness of cap would range from 3 to 4.5 feet
- On average, would raise the elevation of the sediment bed
- EB-B would remove ~32,300 cubic yards of sediment over 3.5 acres
- Estimated Total Cost: $171.1 million
- Scow trips: More than 60
- Construction timeframe: 2 years

Alternative EB-C

- Dredging to an average depth of 3 feet across the entire footprint of the East Branch to allow for placement of an armored and/or amended cap
  - Existing water depth would be maintained
  - Thickness of cap would range from 3 to 4.5 feet
- EB-C would remove more than 90,000 cubic yards of sediment over approximately 11.2 acres
- Total Cost: $263.1 million
- Scow trips: More than 100
- Construction timeframe: 2.5 years

Alternative EB-D

- Dredging to an average depth of 3 feet across the entire footprint of the East Branch to allow for placement of an armored and amended cap, with localized deeper dredging where needed based on the remaining depth to uncontaminated material, contaminant concentrations in remaining sediment, potential for exposure to principal threat waste and the potential for upward migration of NAPL.
  - Existing water depth would be maintained
  - Thickness of armored and amended cap would range from 2.5 to 4.5 feet
  - Additional backfill would be needed to maintain water depths
- EB-D would remove more than 100,000 cubic yards of sediment over approximately 11.2 acres
- Total Cost: $268.8 million
- Scow trips: More than 110
- Construction timeframe: 2.5 years

Alternative EB-E

- Dredge the federally authorized navigation channel to a depth necessary to accommodate a cap below the current authorized depth plus a buffer or to native material, whichever is shallower.
  - Areas dredged to native material would be backfilled as necessary
  - Dredging and/or capping outside the navigation channel, including the Western Beef Slip or in areas with high flux of COCs from groundwater
  - Thickness of armored and amended cap to be determined
  - Would result in deeper water depths on average
- Included as an alternative since the navigation channel has not been deauthorized
- EB-E would remove ~233,800 cubic yards of sediment over 10.6 acres
- Total Cost: $483.5 million
- Scow trips: More than 175
- Construction timeframe: 4 years

Alternative EB-F

- Dredge down to uncontaminated material across entire footprint of the East Branch and backfill as needed
  - Armored and/or amended capping would be placed in areas with high flux of COCs from groundwater
  - Would result in deeper water depths on average
- EB-F would remove ~254,700 cubic yards of sediment over 11.2 acres
- Total Cost: $592.1 million
- Scow trips: More than 190
- Construction timeframe: 5 years

The Nine Evaluation Criteria

Threshold Criteria

- Overall Protection of Human Health and the Environment
- Compliance with Applicable or Relevant and Appropriate Standards

Balancing Criteria

- Long-Term Effectiveness and Permanence
- Reduction of Toxicity, Mobility and Volume through Treatment
- Short-Term Effectiveness
- Implementability
- Cost

Modifying Criteria

- Community Acceptance
- State Acceptance

Nine Criteria

1. **Overall protection of human health and the environment.**
   - Is it protective?
   - How are risks eliminated, reduced, or controlled?

2. **Compliance with ARARs.**
   - Does it meet environmental laws or provide grounds for a waiver?

3. **Long-term effectiveness and permanence.**
   - Does it provide reliable protection over time?

4. **Reduction of toxicity, mobility, or volume through treatment.**
   - Does it use a treatment technology?
   - This is preferred, if possible.

5. **Short-term effectiveness.**
   - Will the remedy be implemented fast enough to address short-term risks, and will there be adverse effects (human health or environmental) during construction/ implementation?

6. **Implementability.**
   - How difficult will it be to implement (e.g. availability of materials or coordination of Federal, State, and local agencies)?

7. **Cost effectiveness.**
   - What are the estimated capital and operation and maintenance costs in comparison to other, equally-protective alternatives?

8. **State acceptance.**
   - Does the State agree with, oppose, or have no comment on it?

9. **Community acceptance.**
   - Does the community support, have reservations about, or oppose it?

Threshold Criteria

must be met for an alternative to be eligible.

Balancing Criteria

determines relative strengths and weaknesses among the criteria that meet threshold.

Modifying Criteria

implemented once all public comments are evaluated. They may prompt modifications to the preferred alternative to achieve the end result of a preferred alternative for cleanup in which EPA and the community can be confident.

Post-Implementation Evaluation Program

- Two goals
  - Determine if in-creek remedy is functioning as designed
  - Determine if Remedial Action Objectives are being met
- Provides process for evaluating these questions and, where necessary, taking additional remedial action
- Structured so that potential impacts to the protectiveness of the remedy are addressed as soon as possible

➢ This is a critical aspect of whatever alternative is selected

Evaluation Monitoring Approach

- Set long-term goal for cleanup to risk-based cleanup standards
  - These are expected to be met immediately following cleanup
- Determine Interim Evaluation Measures based on empirical data from surrounding upland inputs
- Develop a long-term monitoring program to:
  - Monitor the performance of the in-creek portion of remedy
  - Evaluate the progress towards meeting the Remedial Action Objectives in the long-term
  - Include sampling of at least sediment, surface water, and external sources of contamination, plus regular bank inspections, for both erosion and seeps, with sampling as needed/appropriate.
- Take additional source control actions, if needed and on an ongoing basis
  - Either through State and/or Federal enforcement authority, to be decided on a case-by-case basis

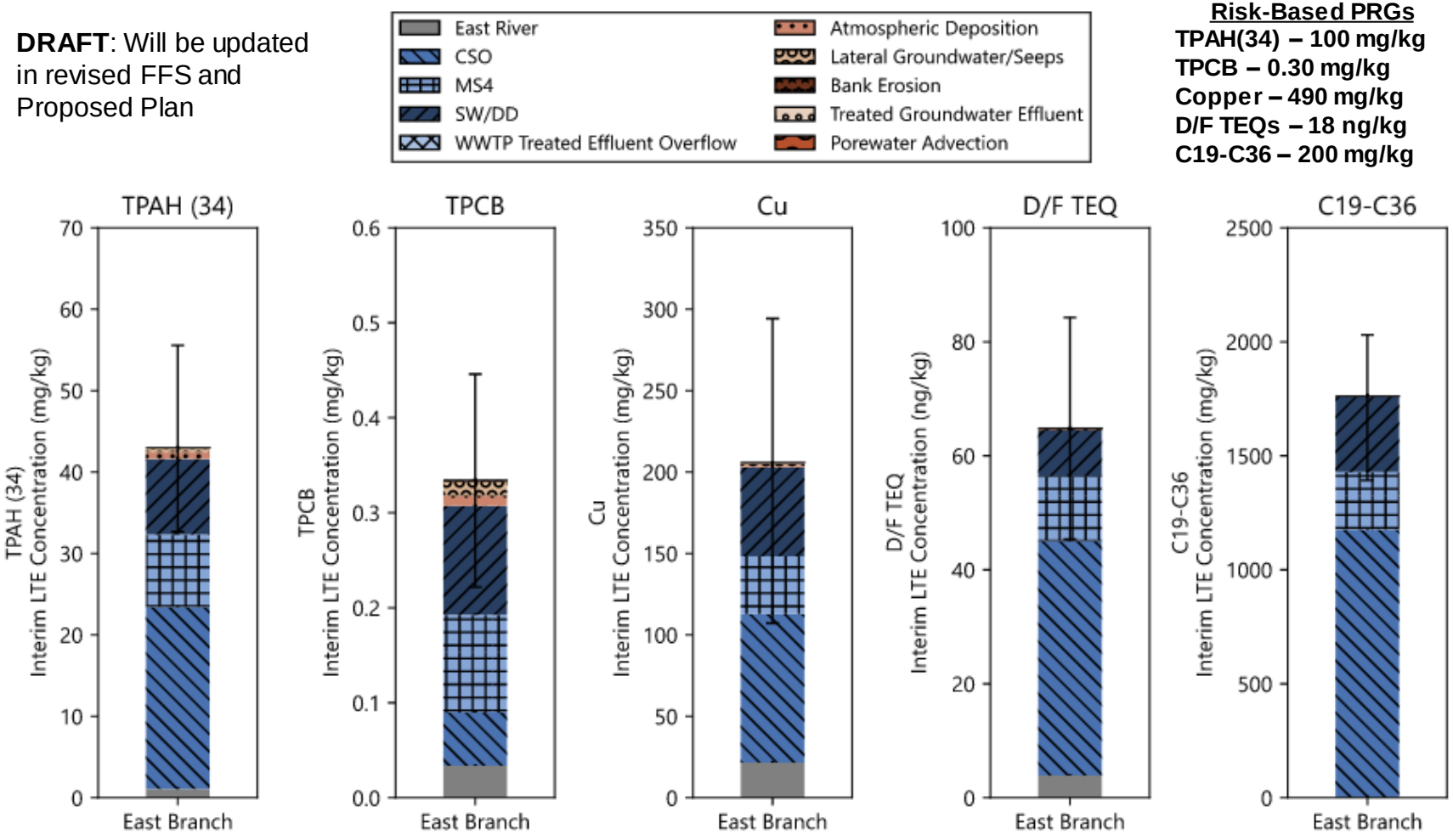
Interim Evaluation Measures

- The measures will be developed using the Long-Term Equilibrium (LTE) model
  - Will be using the version developed by EPA
  - Based on empirical data
  - Will be updated initially with data collected during the predesign investigation
  - Will continue to be updated as additional data is collected during post-implementation monitoring and with data collected as part of OU2
- The LTE model will be replacing the Contaminant Fate and Transport (CFT) model
  - It is more transparent than the CFT model
  - Can be more readily shared and updated
  - The hydrodynamic and sediment transport models, along with the lateral groundwater study, give us a good understanding of the CFT processes occuring in the Creek
  - Will save time in the overall decision-making process for OU1

Data-Based Rationale for Remedy Approach

DRAFT: Will be updated in revised FFS and Proposed Plan

Risk-Based PRGs
TPAH(34) – 100 mg/kg
TPCB – 0.30 mg/kg
Copper – 490 mg/kg
D/F TEQs – 18 ng/kg
C19-C36 – 200 mg/kg



Notes: The range on each bar indicates the calculated long-term equilibrium concentrations with upper- and lower-bound ranges, while the bar itself shows the base case scenario.
WWTP treated effluent overflow and treated groundwater effluent are sources that originate outside of East Branch. Their contribution to long-term equilibrium in East Branch is a result of tidal transport.
CSO: combined sewer overflow; MS4: municipal separate storm sewer system; SW/DD: stormwater and direct drainage; WWTP: wastewater treatment plant
TPAH (34): total polycyclic aromatic hydrocarbon (34); TPCB: total polychlorinated biphenyl; Cu: copper; D/F TEQ: total dioxin/furan toxic equivalence quotient (mammal); C19-C36: C19-C36 aliphatics

***Preliminary results, to be updated based on results of predesign investigation and on an ongoing basis as new data obtained.**

More on the approach…

- This evaluation monitoring program will:
  - allow EPA to identify the specific ongoing inputs that may cause PRG exceedances before PRG exceedances actually occur
  - enable EPA to develop an appropriate course of action to ideally prevent PRG exceedances from ever occurring.
- If NAPL from ongoing sources, including upland seeps, is found to be impacting the protectiveness of the implemented remedy, it will need to be addressed through either State or Federal enforcement authorities (to be determined on a case-by-case basis).
- Sheens could potentially be indicative of site-related contamination at elevated concentrations that would impact the protectiveness of the implemented remedy.
  - Any sheen observed in the future would need to be further investigated, including through sampling and analysis.
  - Depending on the results, additional remedial and/or source control efforts could be required

SCHEDULE OVERVIEW

Completed Items
East Branch Early Action Process

Early presentations to CAG on Early Action	11/16/2022, 5/17/2023 and 6/20/23
CSTAG Meeting 3 (all key stakeholders participate)	7/11/2023 to 7/13/2023
Draft FFS Submitted by NCG	7/28/2023
Recommendations Received from CSTAG*	9/26/2023
EPA Region 2's Response to CSTAG Recommendations	11/3/2023
EPA Comments Submitted on the Draft FFS	11/15/2023
EPA Presentation to CAG on CSTAG recommendations and review of Superfund process	11/15/2023
EPA Presentation to CAG on draft FFS comment review process	1/17/2024
CSTAG Meeting 4 (EPA Only)	2/13/24 to 2/14/24
CSTAG Recommendations Received	By 3/27/24 (actual: 4/9/24)
→ NCG Submits Revised FFS	April 2024 (actual: 4/12/24)

*CSTAG is EPA's Contaminated Sediment Technical Advisory Group, which is comprised of members from all 10 EPA regions, EPA Headquarters and the U.S. Army Corps of Engineers.

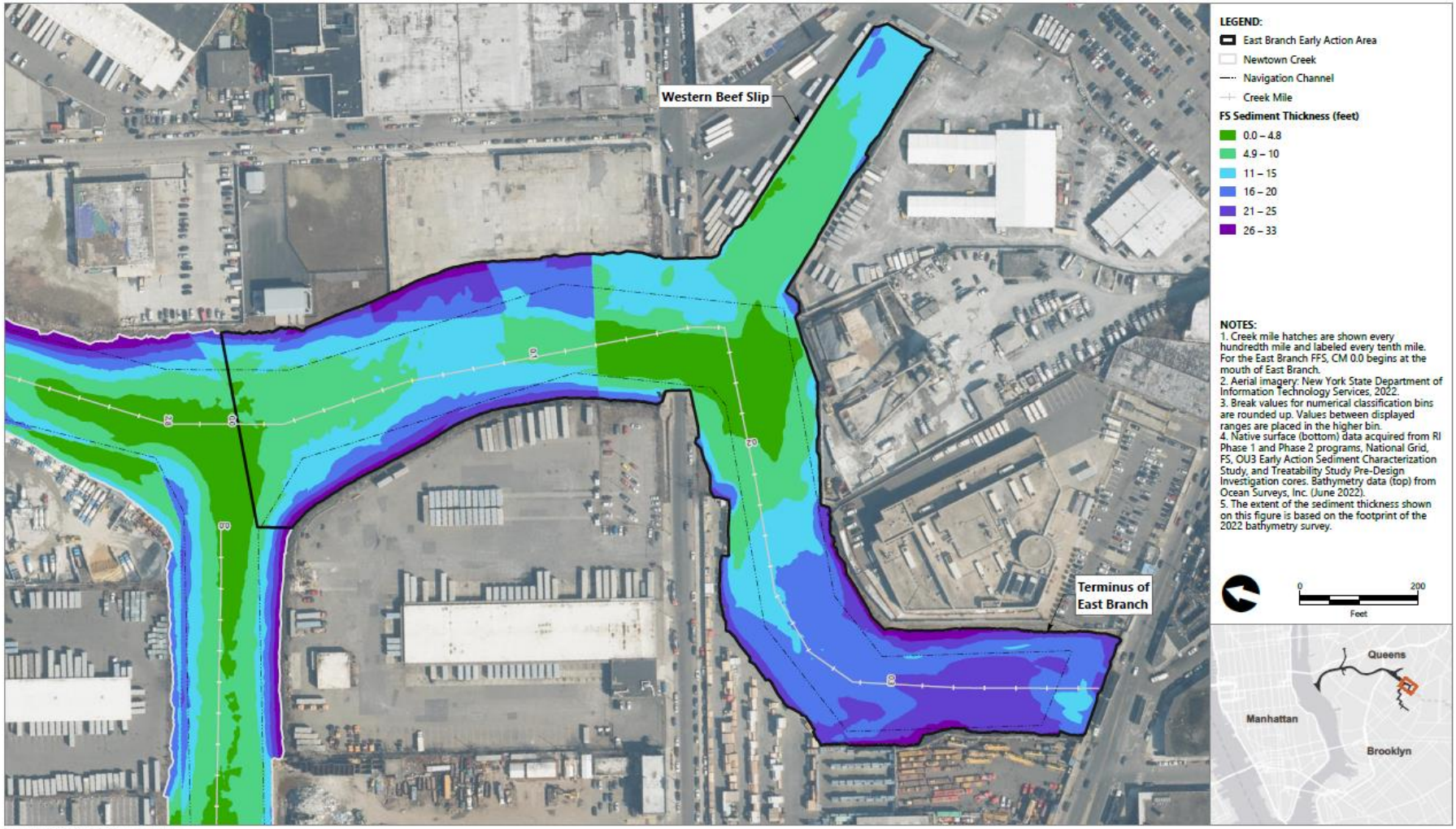
Tentative Schedule for East Branch Proposed Plan Release and Record of Decision

EPA Presentation to CAG – overview of FFS	4/17/24
EPA Presentation to CAG – overview of alternatives evaluated in the FFS	5/22/24
EPA Response to CSTAG Recommendations	By 5/8/24 (actual: 5/24/24)
CSTAG Reply and Headquarters Review	June 2024 (comments on draft Proposed Plan received and initial headquarters briefing conducted 6/17/24)
EPA Presentation to CAG – overview of FFS alternatives (continued) and data review	6/18/24
NCG Submits Draft Final FFS	Late June 2024
→ Release Proposed Plan	Early summer
Public Meeting	About 2 weeks after release of Proposed Plan
End of Public Comment Period (minimum 30 days)	Late summer
→ Record of Decision	Late 2024/Early 2025

OVERVIEW OF DATA

SOME FIGURES FROM THE DRAFT FOCUSED FEASIBILITY STUDY

Sediment Thickness Above Native Layer



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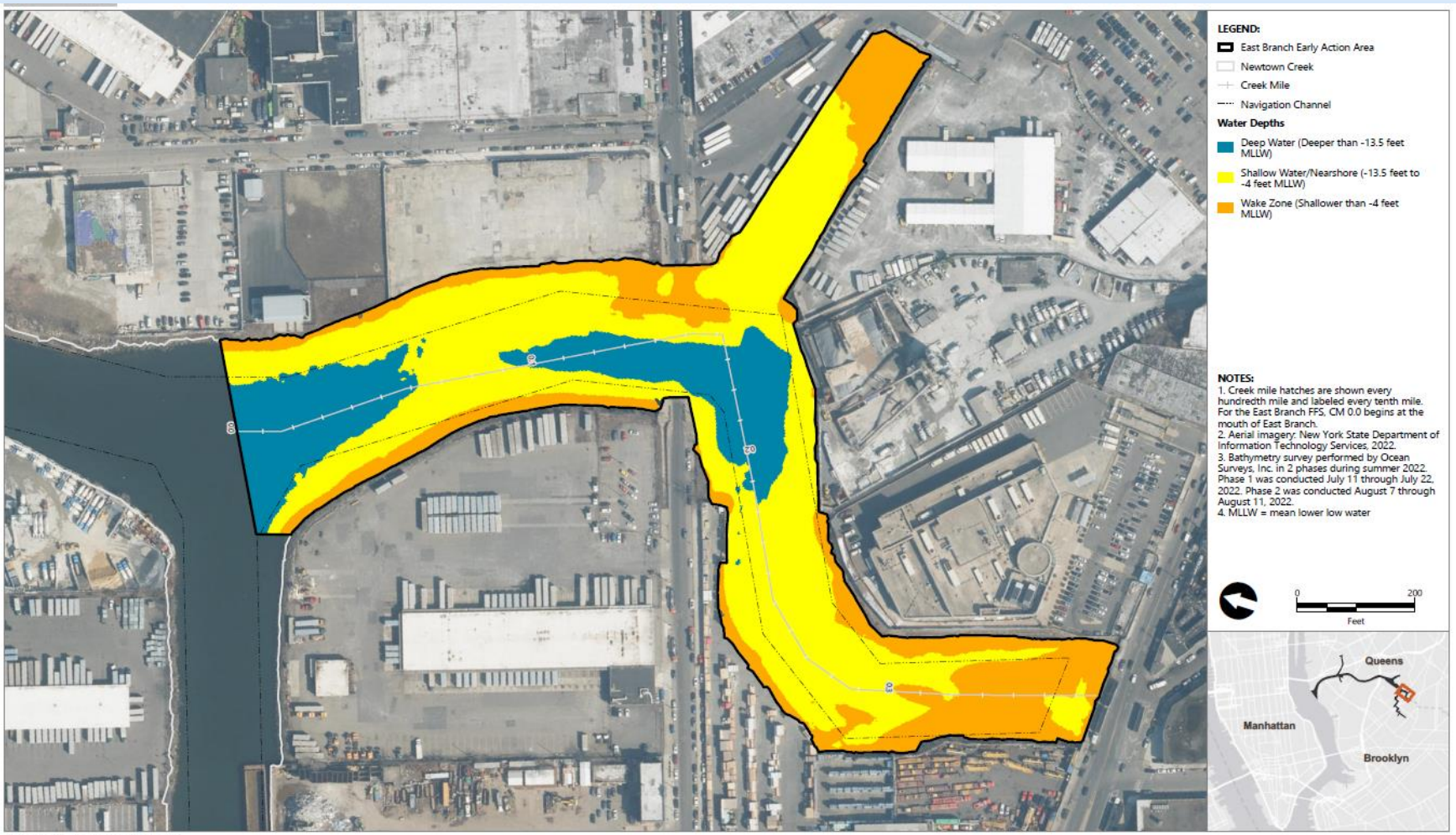
ANCHOR QEA

Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

Figure A2-4
Sediment Thickness
Conceptual Site Model
Newtown Creek RI/FS

Water Depth Zones



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ANCHOR QEA

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Figure 5-8
Water Depth Zones for Capping Evaluations
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

TPAH(34) Risk Based PRG Exceedances Surface Sediment

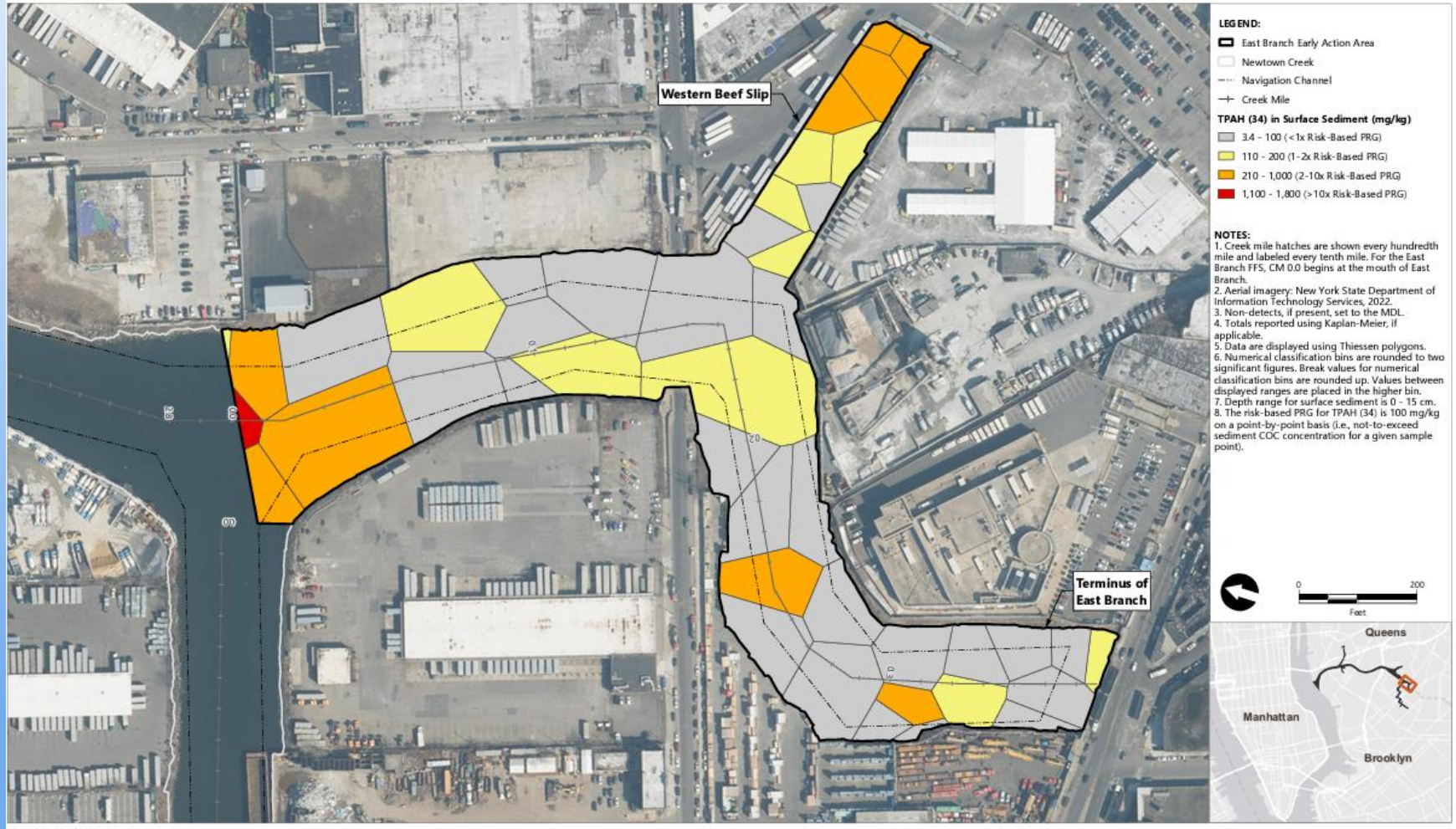

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Figure 3-1
TPAH (34) Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

Total PCB Risk Based PRG Exceedances Surface Sediment

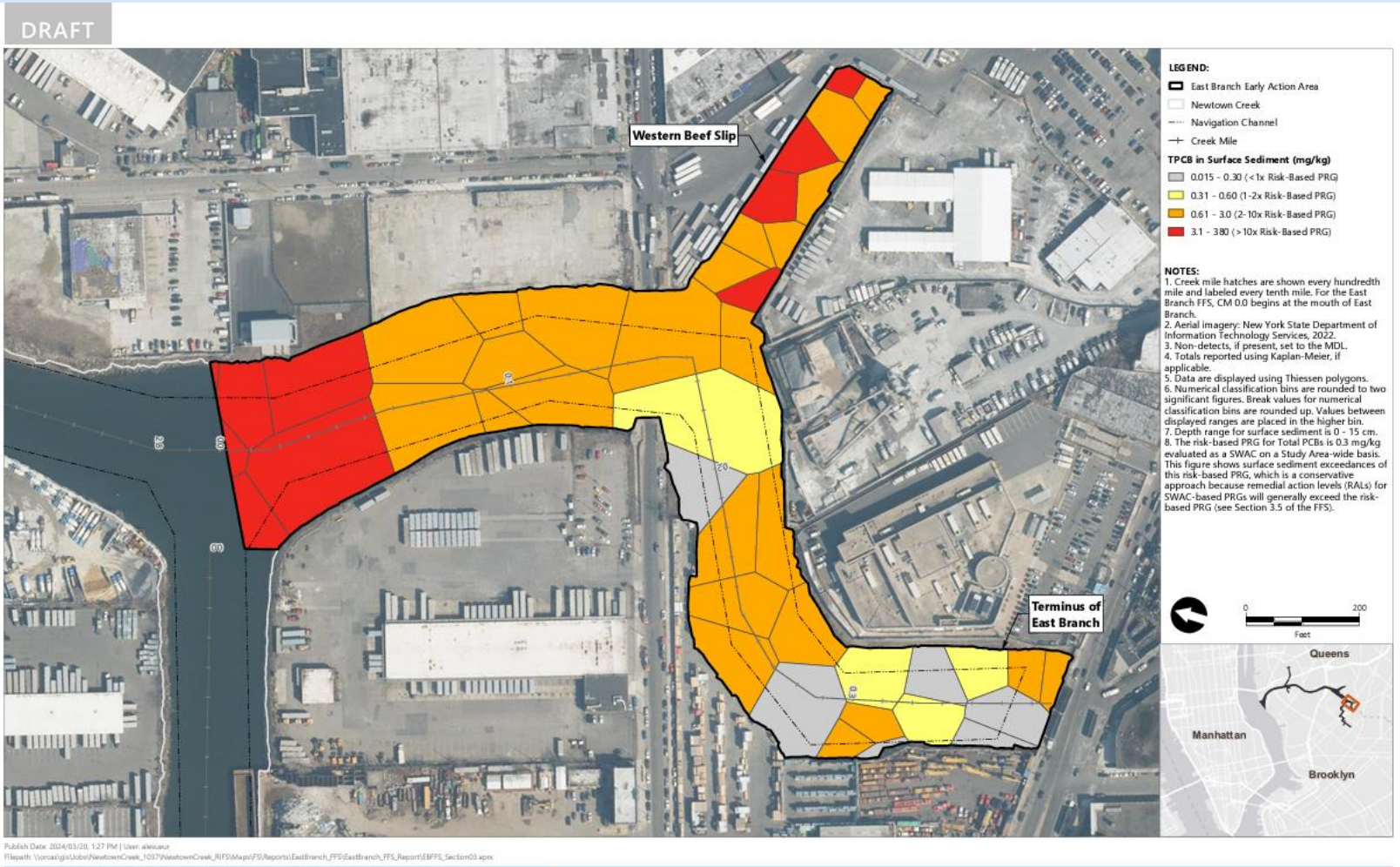

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Figure 3-3
TPCB Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

Copper Risk-Based PRG Exceedances Surface Sediment

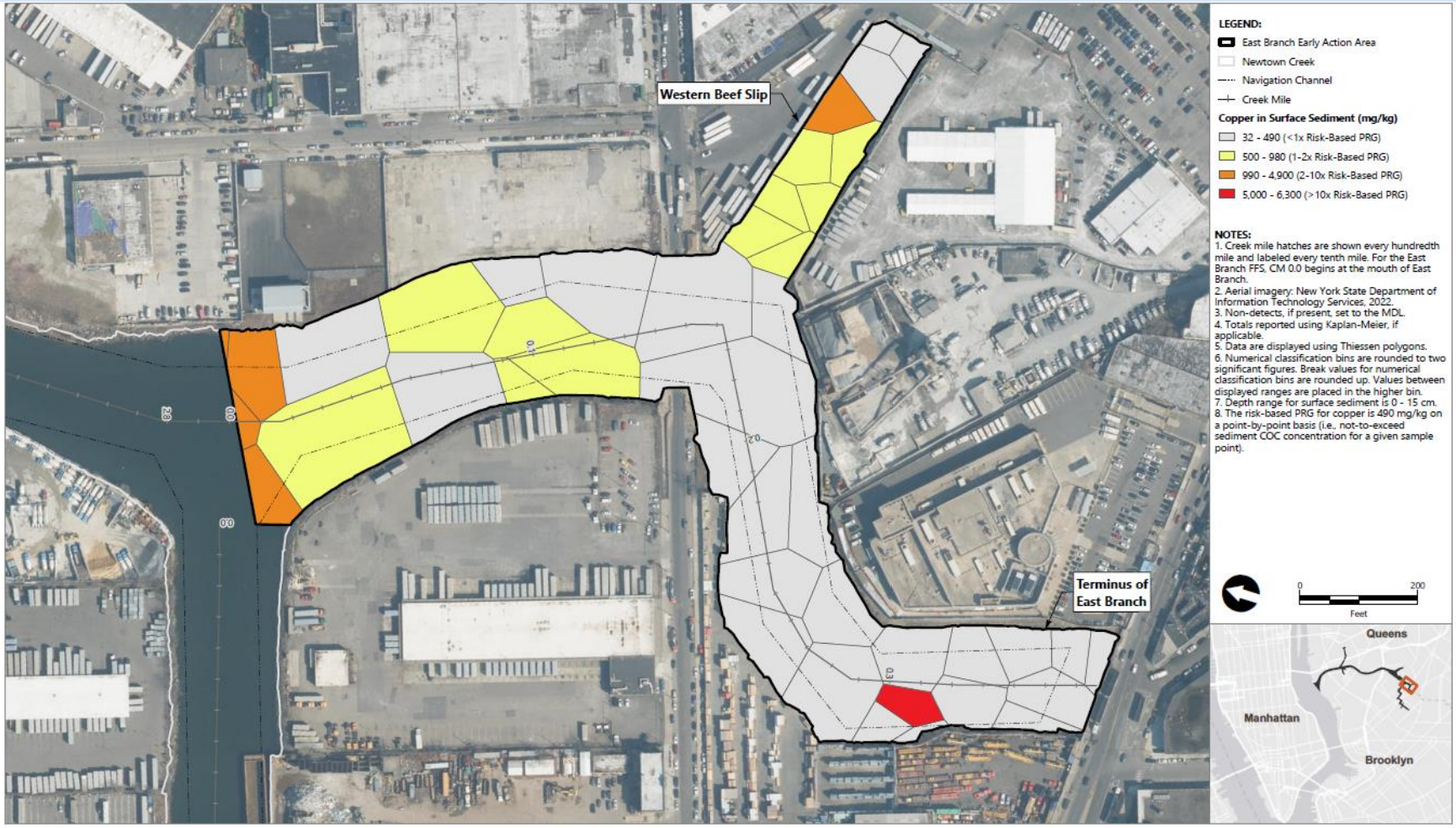

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Figure 3-5
Copper Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

C19-C36 Risk Based PRG Exceedances Surface Sediment

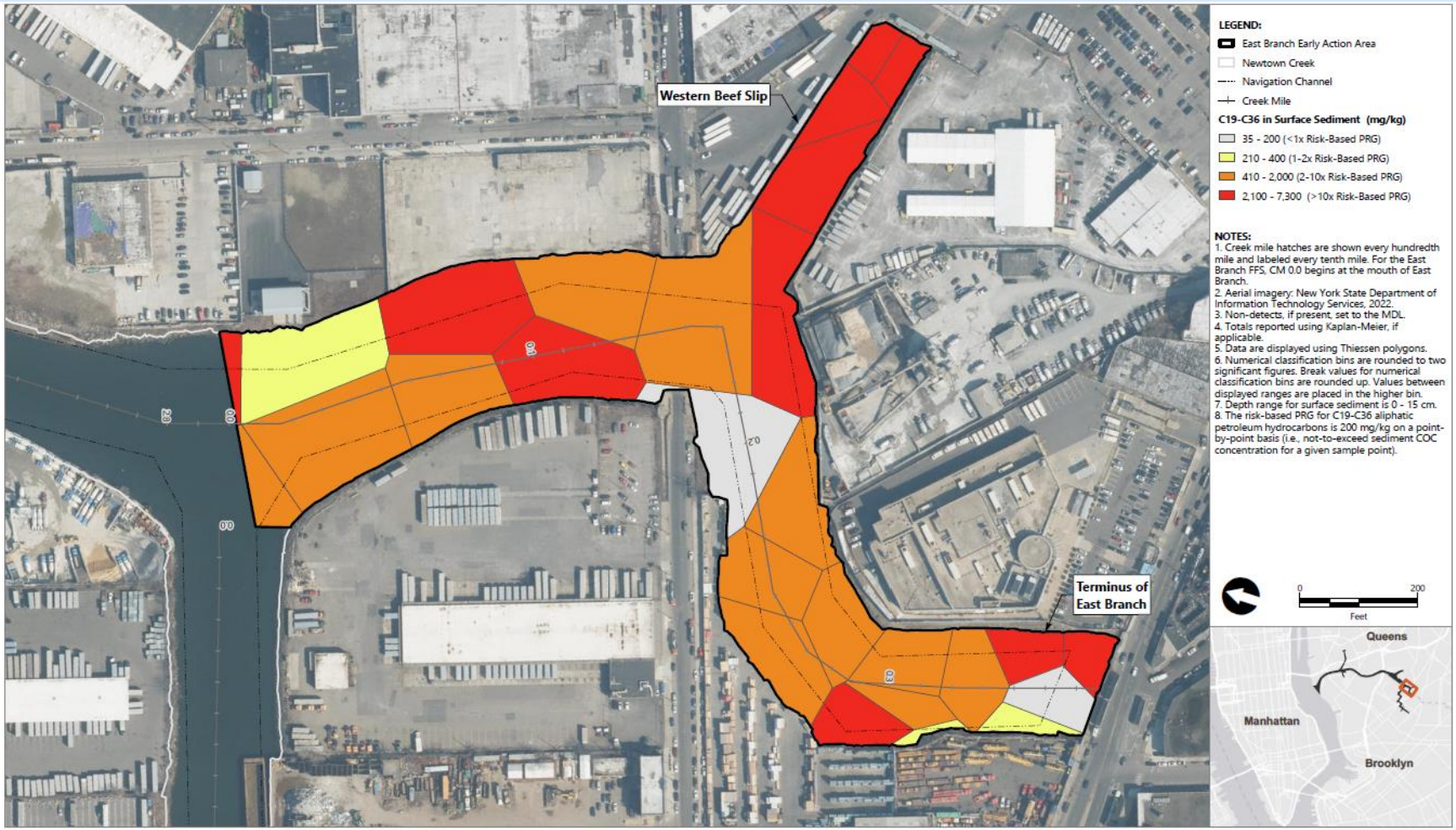

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Figure 3-2
C19-C36 Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

Dioxin/Furan TEQ Risk Based PRG Exceedances Surface Sediment

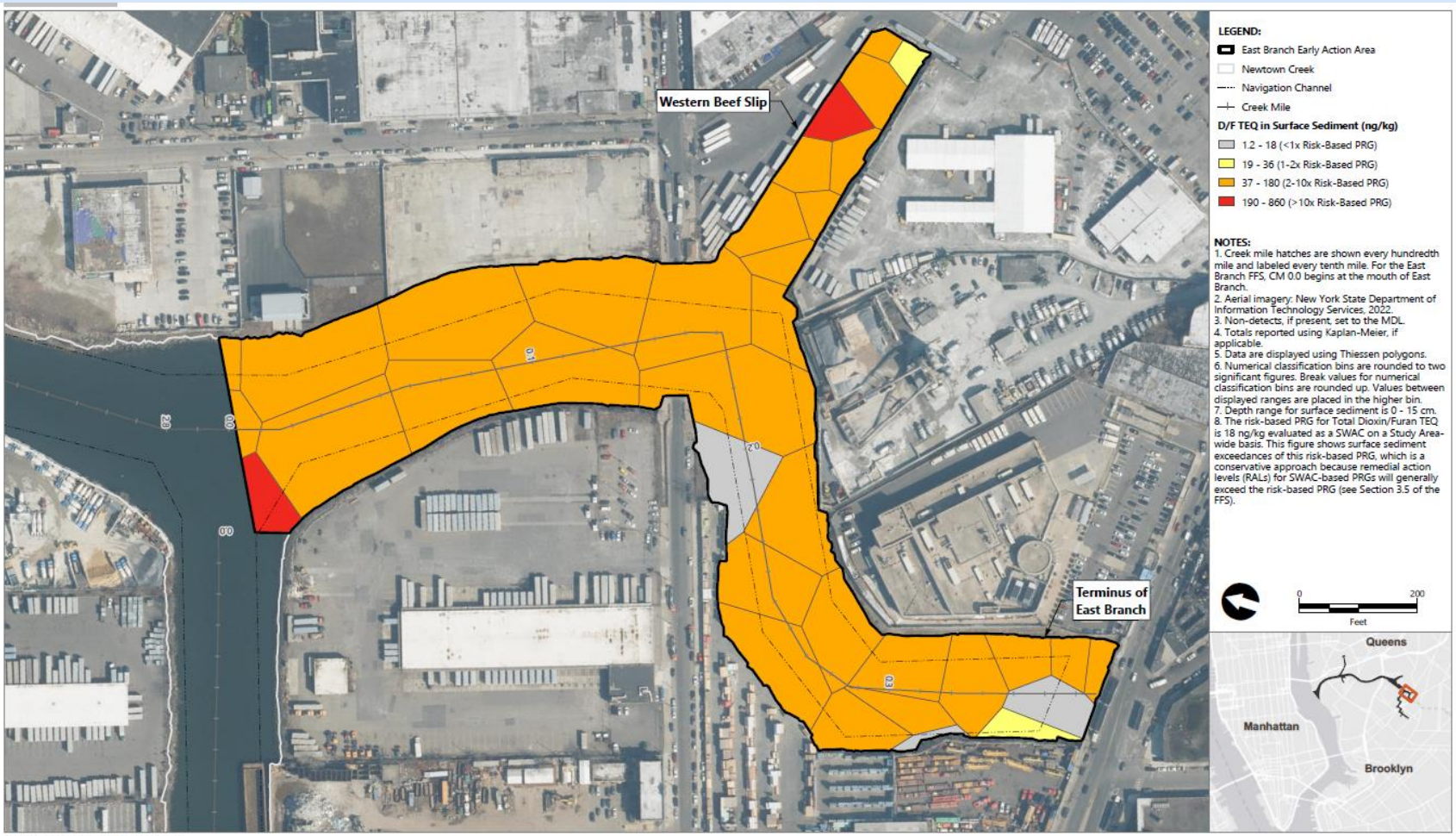

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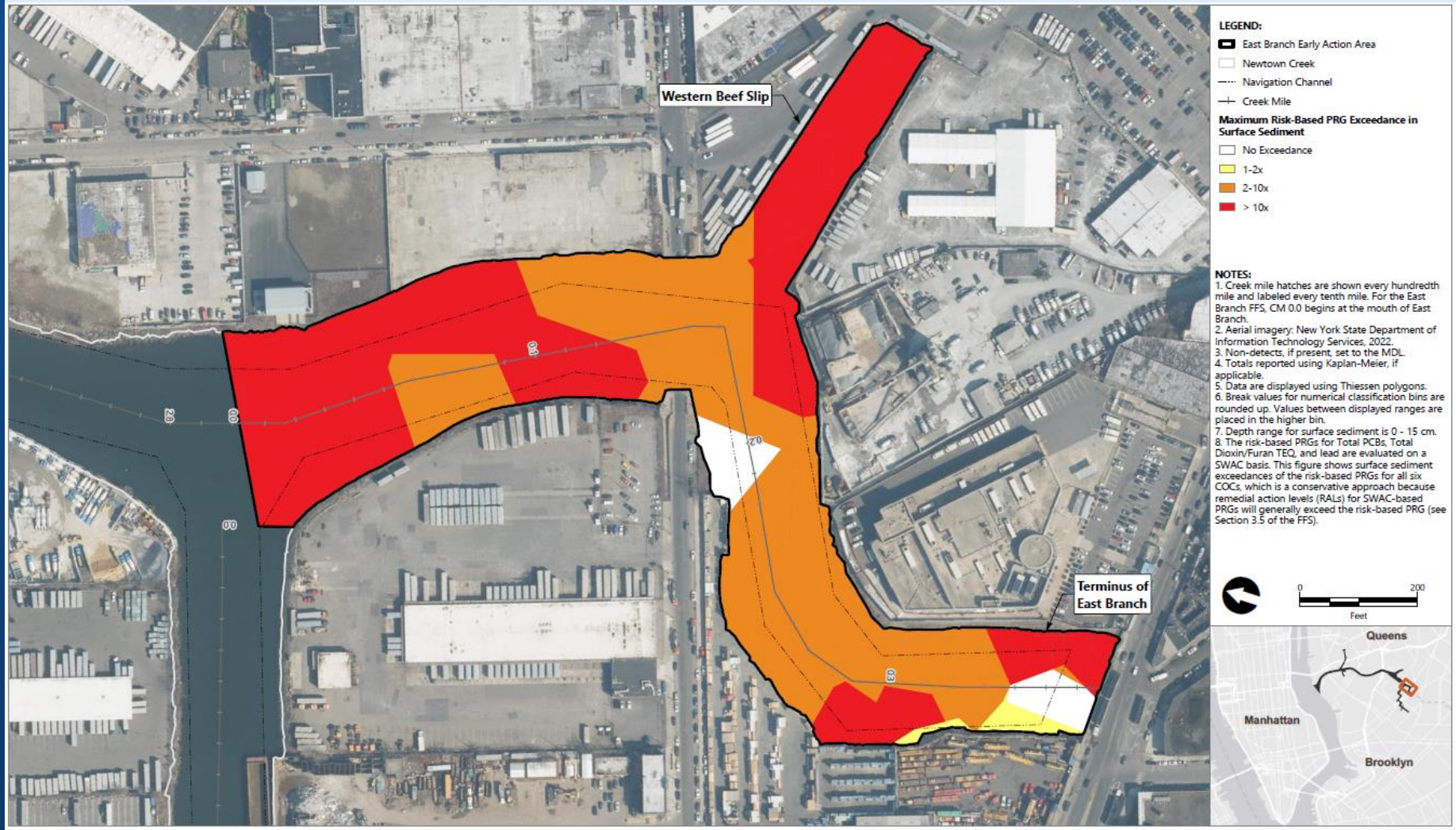
Figure 3-4
D/F TEQ Risk-Based PRG Exceedances in Surface Sediment
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

All Contaminant of Concern Risk-Based PRG Exceedances – Surface Sediment



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ANCHOR QEA

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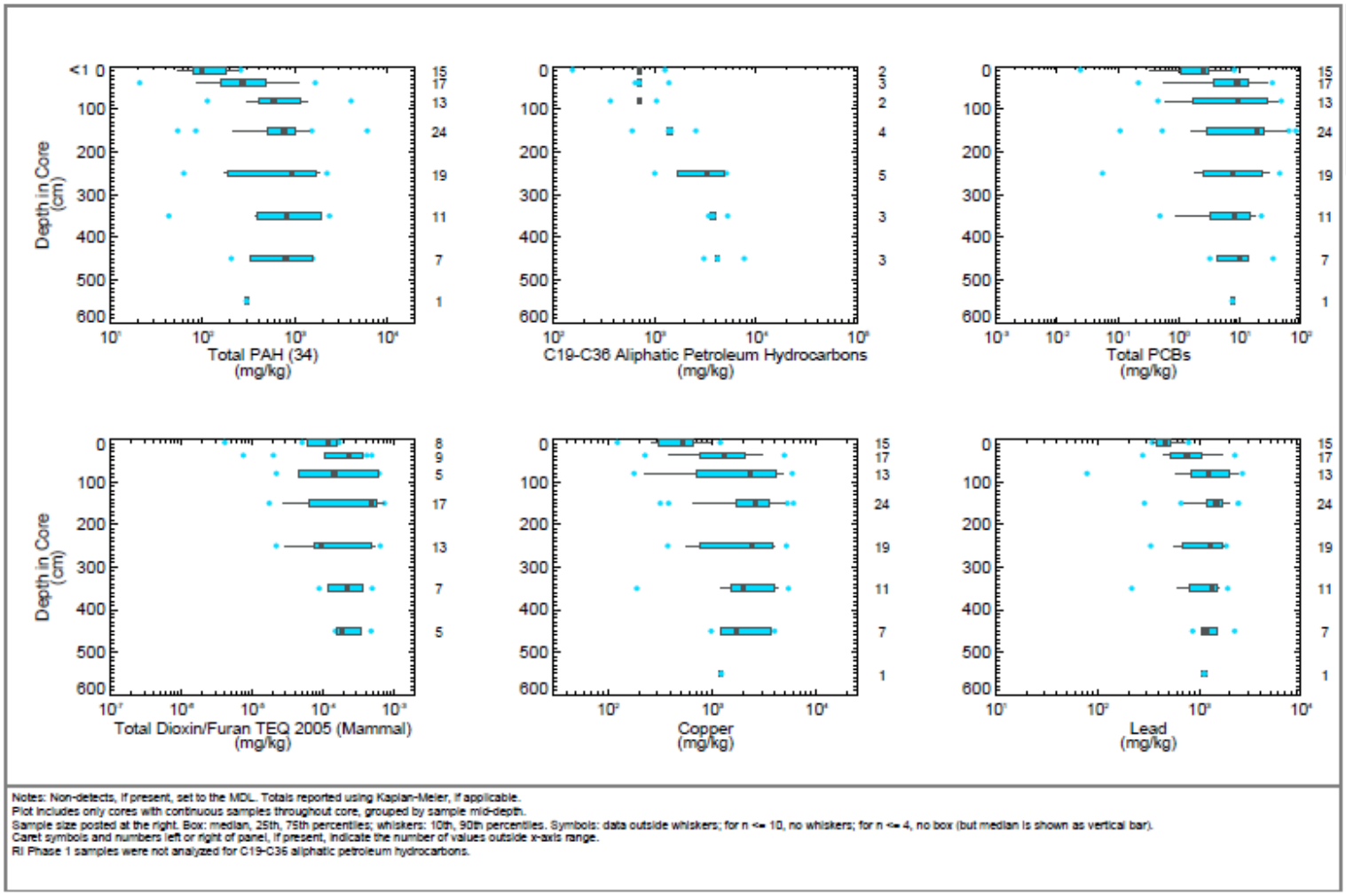
Figure 3-7
Maximum Risk-Based PRG Exceedances in Surface Sediment for All COCs
East Branch Early Action Focused Feasibility Study
Newtown Creek RI/FS

Surface and Subsurface Sediment Concentrations



Notes: Non-detects, if present, set to the MDL. Totals reported using Kaplan-Meier, if applicable.
Plot includes only cores with continuous samples throughout core, grouped by sample mid-depth.
Sample size posted at the right. Box: median, 25th, 75th percentiles; whiskers: 10th, 90th percentiles. Symbols: data outside whiskers; for n <= 10, no whiskers; for n <= 4, no box (but median is shown as vertical bar).
Caret symbols and numbers left or right of panel, if present, indicate the number of values outside x-axis range.
RI Phase 1 samples were not analyzed for C19-C36 aliphatic petroleum hydrocarbons.

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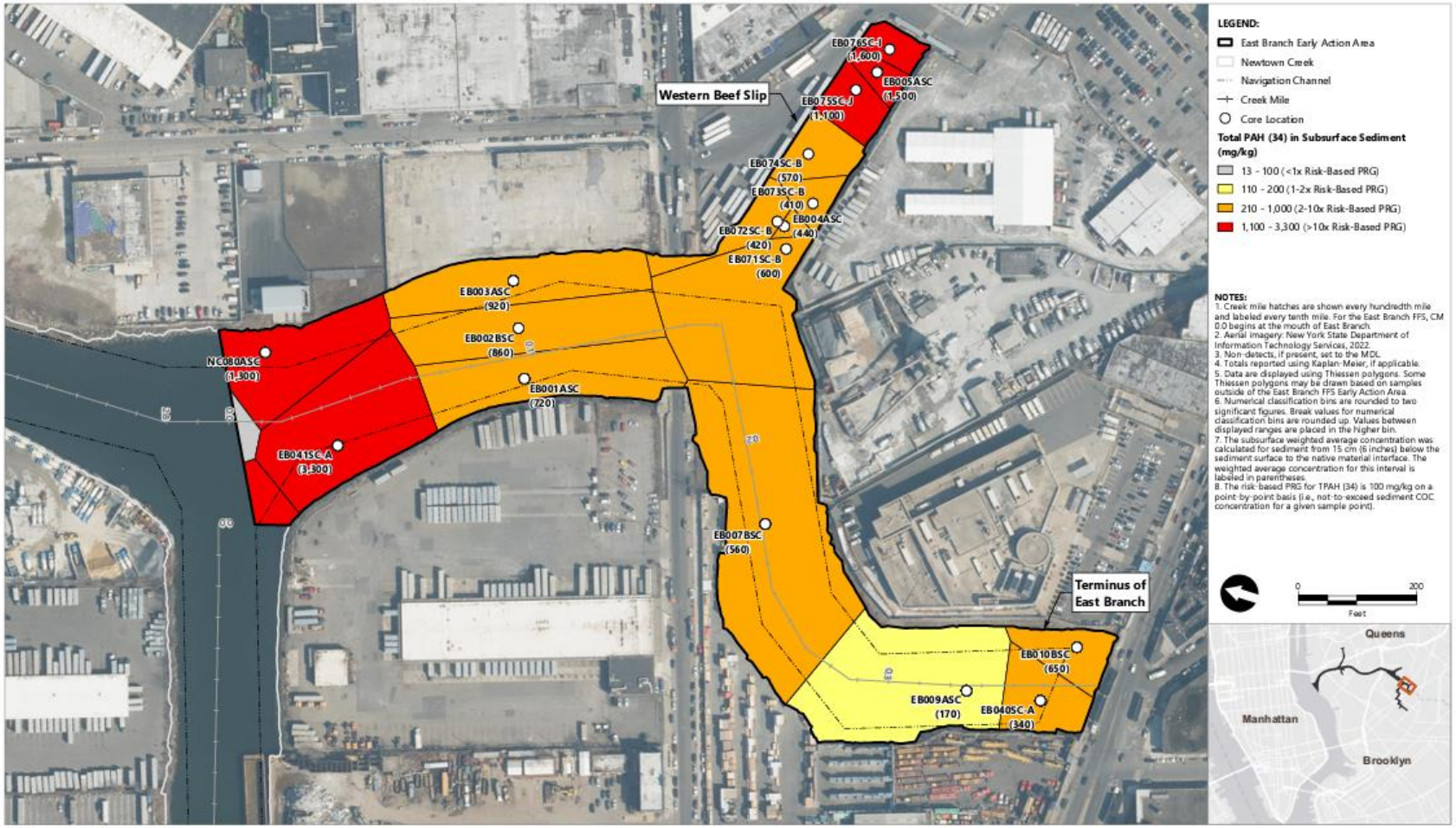
ANCHOR QEA

Figure A2-8

Surface Sediment and Subsurface Sediment Concentrations in East Branch - Box Plots by Depth

Conceptual Site Model
Newtown Creek RI/FS

TPAH(34) Risk Based PRG Exceedances
Depth Weighted Average Subsurface Sediment



Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

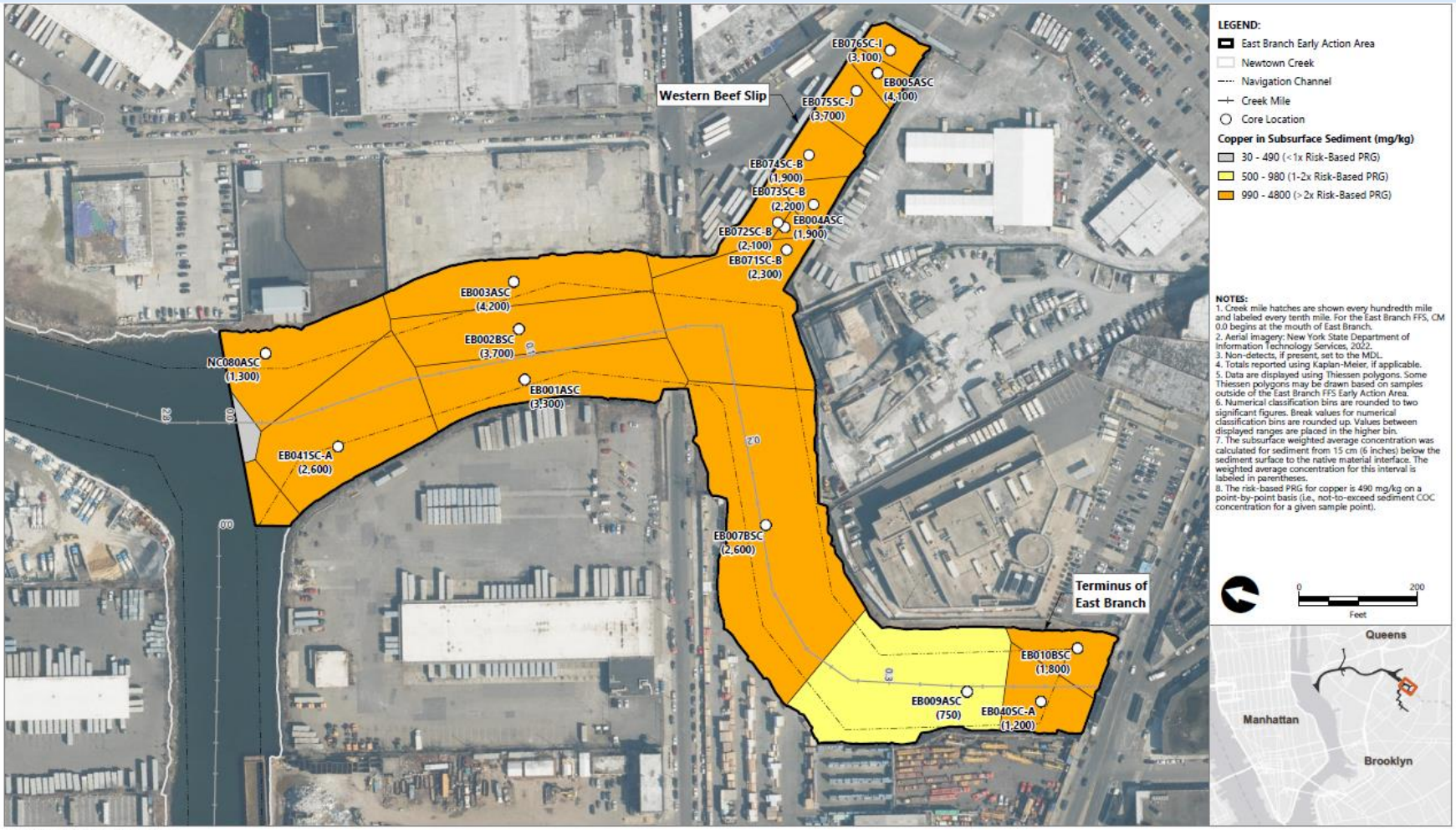
Figure A2-9a
Total PAH (34) Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

Total PCBs Risk Based PRG Exceedances Depth Weighted Average Subsurface Sediment

Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

Figure A2-9c
Total PCBs Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

Copper Risk Based PRG Exceedances
Depth Weighted Average Subsurface Sediment



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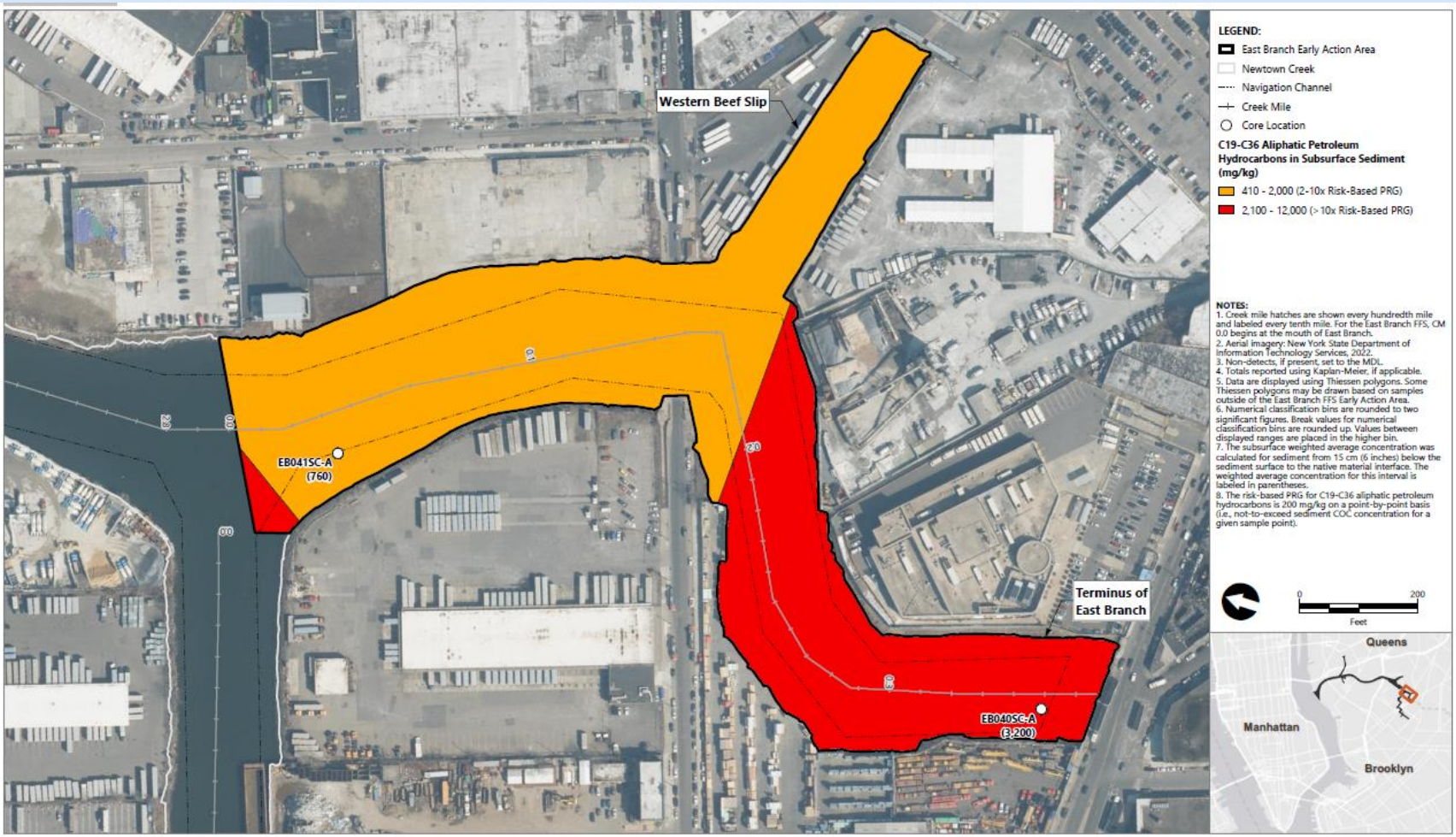
ANCHOR QEA

Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

Figure A2-9e
Copper Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

C19-C36 Risk Based PRG Exceedances
Depth Weighted Average Subsurface Sediment



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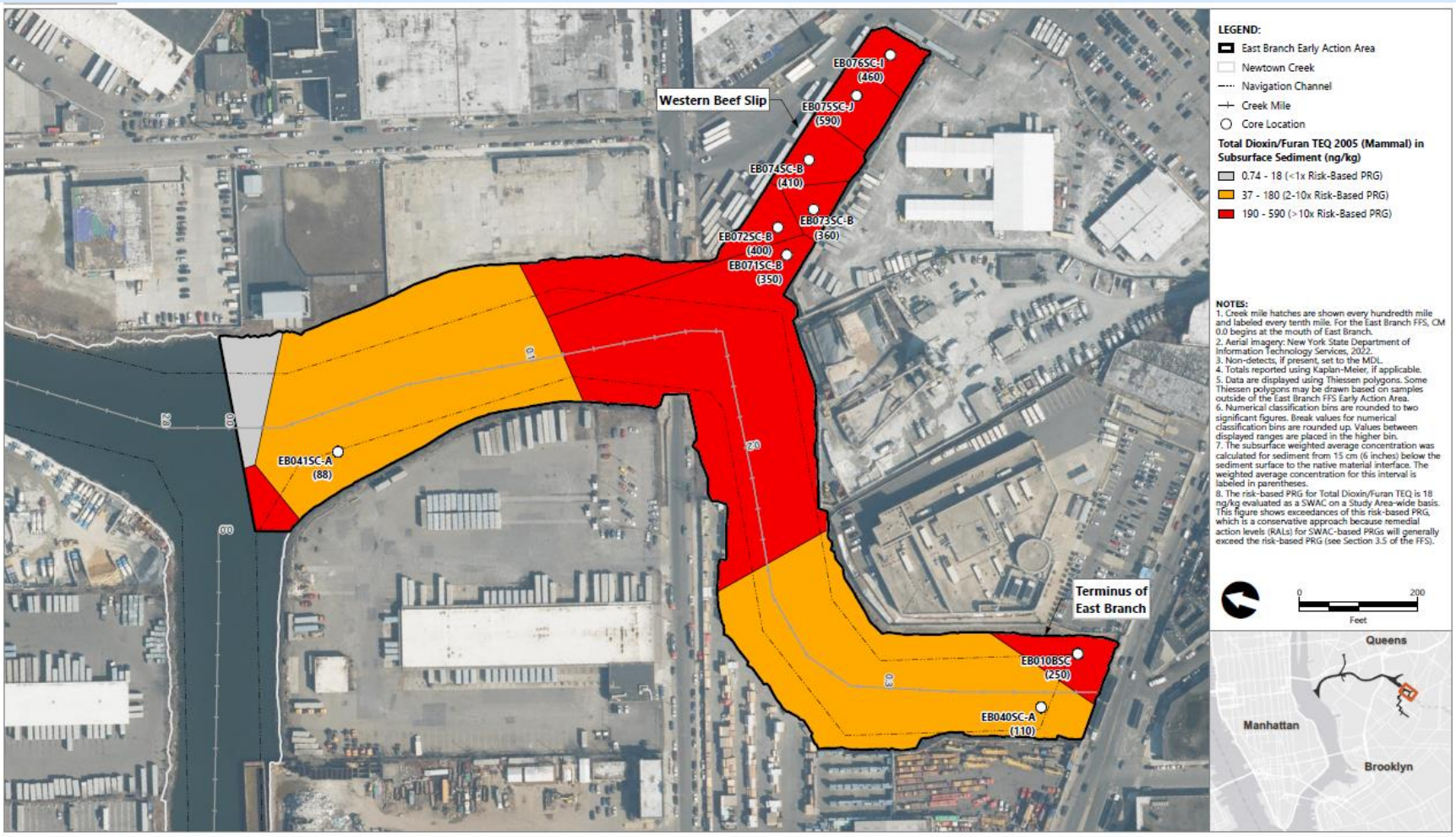
ANCHOR QEA

Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

Figure A2-9b
C19-C36 Aliphatic Petroleum Hydrocarbon Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

Dioxin/Furan TEQ Risk Based PRG Exceedances Depth Weighted Average Subsurface Sediment



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ANCHOR QEA

Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

Figure A2-9d
Total Dioxin/Furan TEQ 2005 (Mammal) Depth-Weighted Average Subsurface Sediment Concentrations
Conceptual Site Model
Newtown Creek RI/FS

Most Notable Observations of NAPL Surface Sediment

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Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

Figure A2-10a
Most Notable NAPL Observations in Surface Sediment
Conceptual Site Model
Newtown Creek RI/FS

Most Notable Observations of NAPL Subsurface Sediment

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ANCHOR QEA

Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

Figure A2-10b
Most Notable NAPL Observations in Subsurface Sediment
Conceptual Site Model
Newtown Creek RI/FS

Ebullition Associated Sheens

Note: Boundary line for East Branch Study Area will be adjusted (moved southeast) in revised FFS.

Figure A2-16
Maximum Spatial Extent of Gas Ebullition Associated Dynamic Sheens
Conceptual Site Model
Newtown Creek RI/FS

Questions?