OCTOBER 13, 2022

REMEDIAL DESIGN PROGRESS UPDATE

LOWER 8.3 MILES OF THE PASSAIC RIVER

Diamond Alkali Superfund Site Operable Unit 2 (OU2)

OXY GLENN SPRINGS HOLDINGS, INC.

AGENDA

- Remedial Design Progress – 95% Design
- Select Design Components
  - Dredging Resuspension Management
  - Cap Design
- Project Timeline

REMEDIAL DESIGN PROGRESS – 95% DESIGN

REMEDIAL DESIGN PROGRESS — CAG UPDATES

2017

- Project Overview (May)
- Pre-Design Investigation (Sept, Nov)
- Sediment Processing Facility Site Selection (Sept)

2018

- Pre-Design Investigation (Mar, Jul)
- Sediment Processing Facility Site Selection (Mar)
- Design Approach (Jul)

2019

- Preliminary 30% Design (May)

2020

- Intermediate 60% Design (Mar)

2021

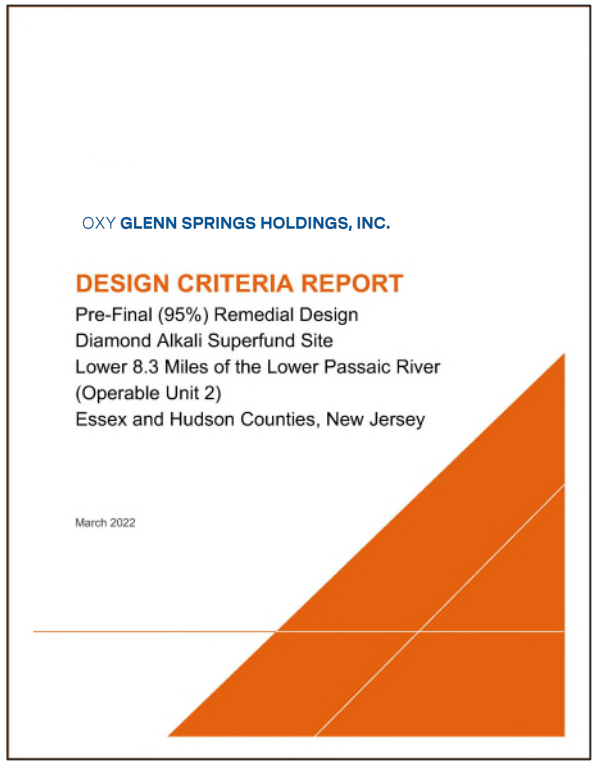
- Pre-Final 95% Design (Mar)

2022

- Community Health and Safety Plan (Mar, ***Dec***)
- ***Pre-Final 95% Design (Oct)***

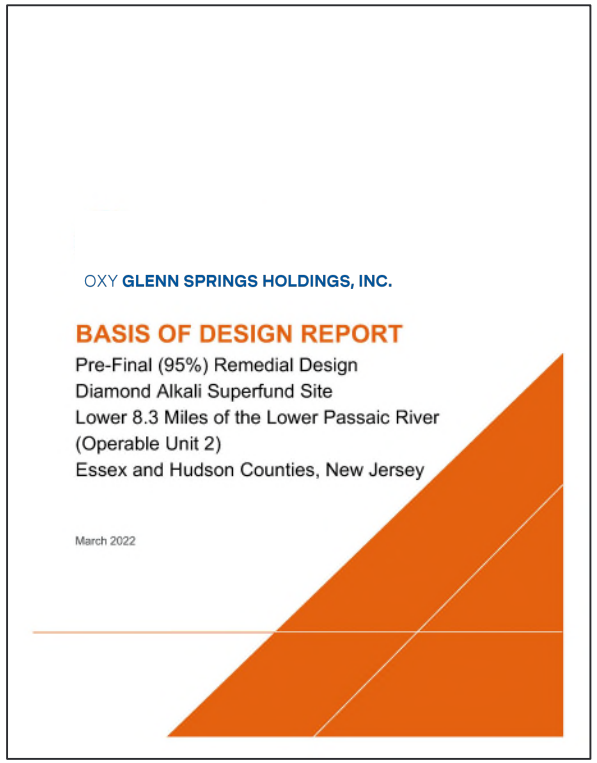
95% DESIGN COMPONENTS

DESIGN CRITERIA REPORT



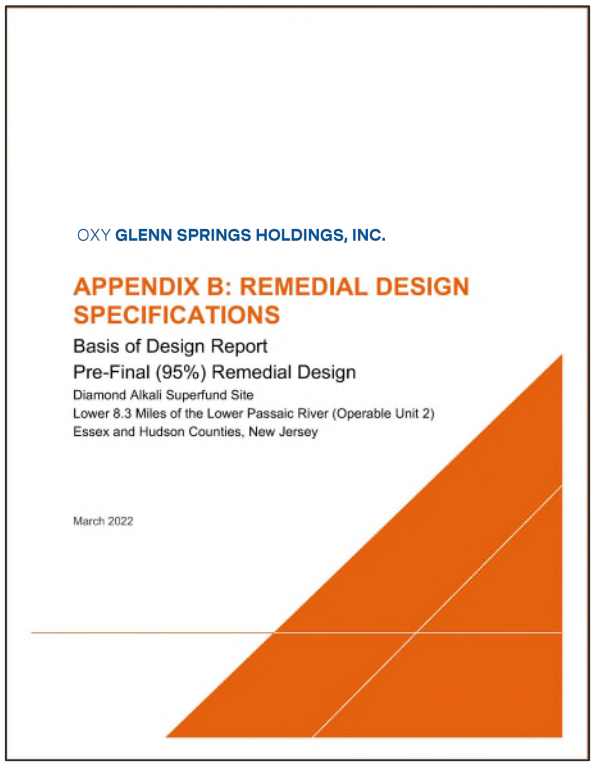
Compiles the criteria and requirements that the design will need to meet

BASIS OF DESIGN REPORT



- Engineering evaluations and analyses on which the design components are to be based:
  - In-River Design: 19 Appendices
  - Upland Facilities Design: 4 Appendices

DRAWINGS AND SPECIFICATIONS



- Drawings detail existing conditions, cap and dredge plans, cap profile designs
- Specifications to detail how remedy will be implemented by contractors, including performance standards

SUPPORTING DELIVERABLES – REMEDIAL CONSTRUCTION

- **Construction QA/QC Plan**: Standards and processes to verify construction performed to specifications
- **Transportation and Offsite Disposal Plan**: Plan for managing transportation and disposal of debris and processed sediment waste
- **Community HASP**: Construction requirements and monitoring to protect the public during construction

- Community Health and Safety Plan to be reviewed again at 12/8/22 CAG meeting
- Further opportunity for review prior to finalizing as part of 100% design

SUPPORTING DELIVERABLES — POST REMEDIAL CONSTRUCTION

- **Site Wide Monitoring Plan**: Monitoring activities to evaluate the performance of the remedy
- **Operation and Maintenance Plan**: Procedures for development and implementation of corrective measures if needed based on data collected under the SWMP
- **Institutional Controls Implementation and Assurance Plan**: Administrative controls to be implemented and maintained post-construction to protect the integrity of the cap and fish advisory enhancements

DREDGING RESUSPENSION MANAGEMENT

DREDGING RESUSPENSION MANAGEMENT OVERVIEW

Best Management Practices During Dredging	• Methods employed during dredging to minimize resuspension • Effectiveness will be evaluated through monitoring
Residual Stabilization Layer	• A sand layer placed after dredging to reduce contaminated sediment mobility during construction
Sediment Traps	• Dredging in the most northern and southern portions of the federal navigation channel will occur first increasing sediment deposition in the deeper channel before it reaches Newark Bay

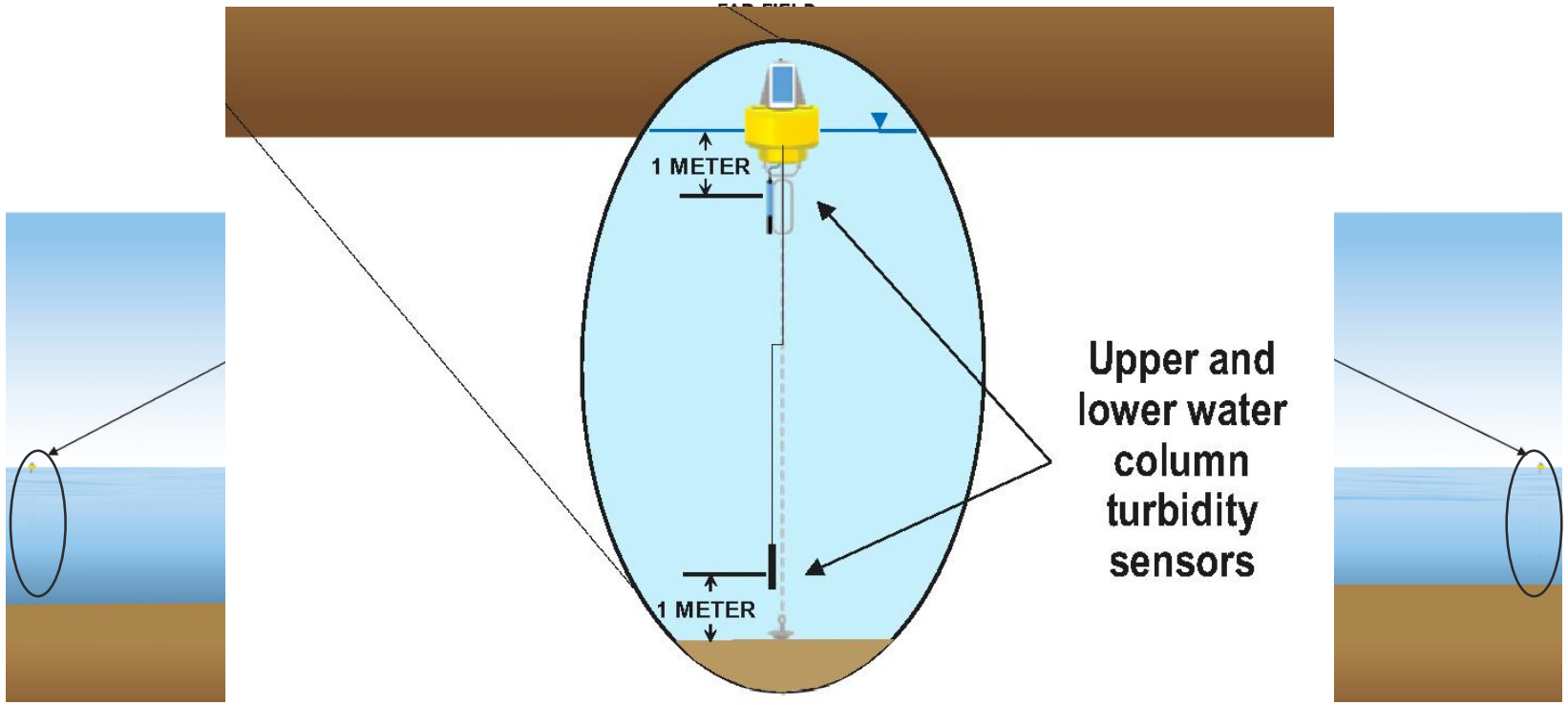
RESUSPENSION MONITORING PROGRAM – TURBIDITY

- **Best management practices** to mitigate resuspension of sediment
- Real-time continuous **turbidity monitoring** during dredging and debris removal
- Project-specific **turbidity advisory values** developed based on data collected during pre-design investigation and dredge plume dispersion modeling
- Data evaluation and decision framework to be applied to evaluate **operational adjustments** that may be needed

Turbidity measures water's cloudiness (the amount of particulates in the water column)

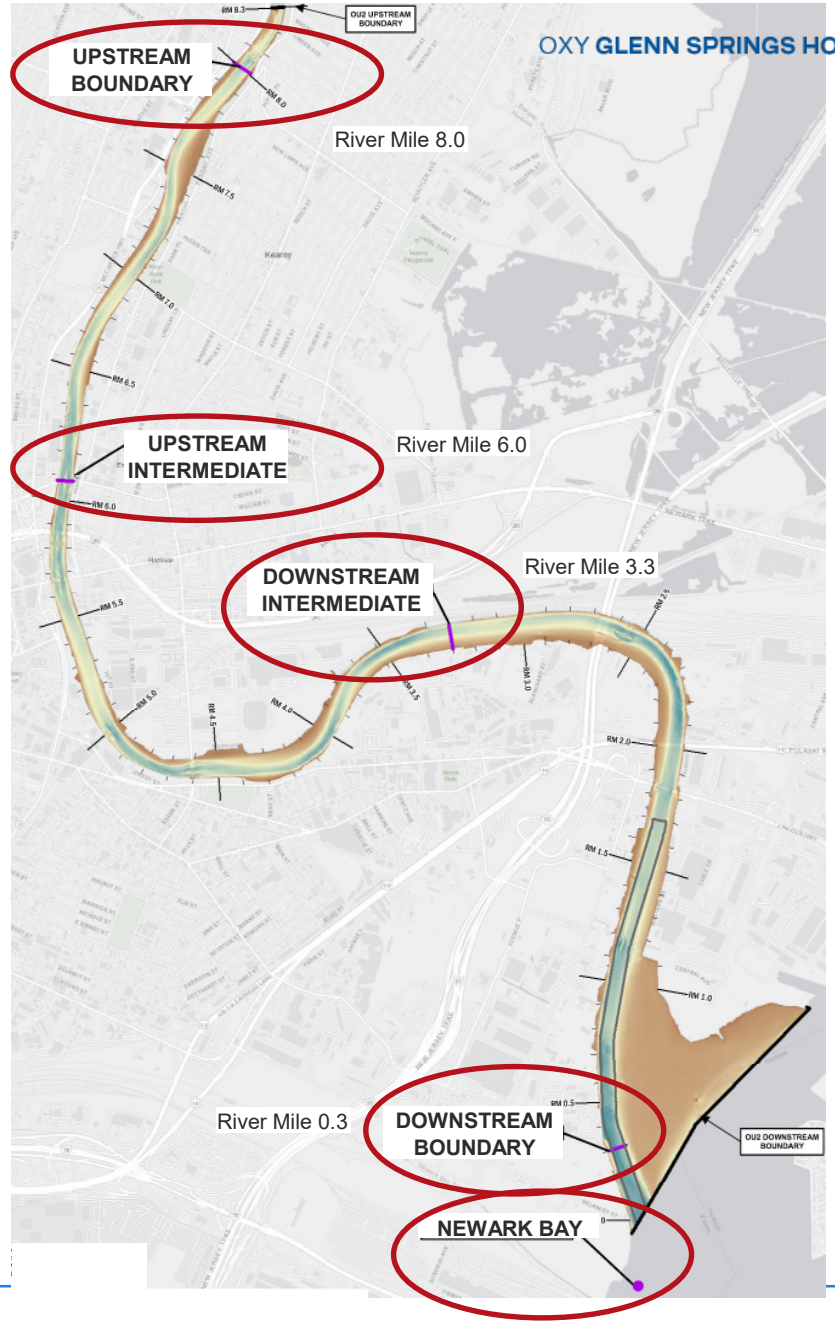
TURBIDITY MONITORING LOCATIONS

- Two near-field locations (immediately upstream and downstream of dredge)
- Two far field locations (ambient conditions)
- Upper and lower water column sensors
- Readings collected continuously
- Transmitted via telemetry to the dredge operator (real-time)



RESUSPENSION MONITORING PROGRAM – CHEMICAL

- **Chemical water column monitoring** to assess how chemical concentrations in the water column vary
- Two upstream locations
- Two downstream locations
- Additional location in Newark Bay

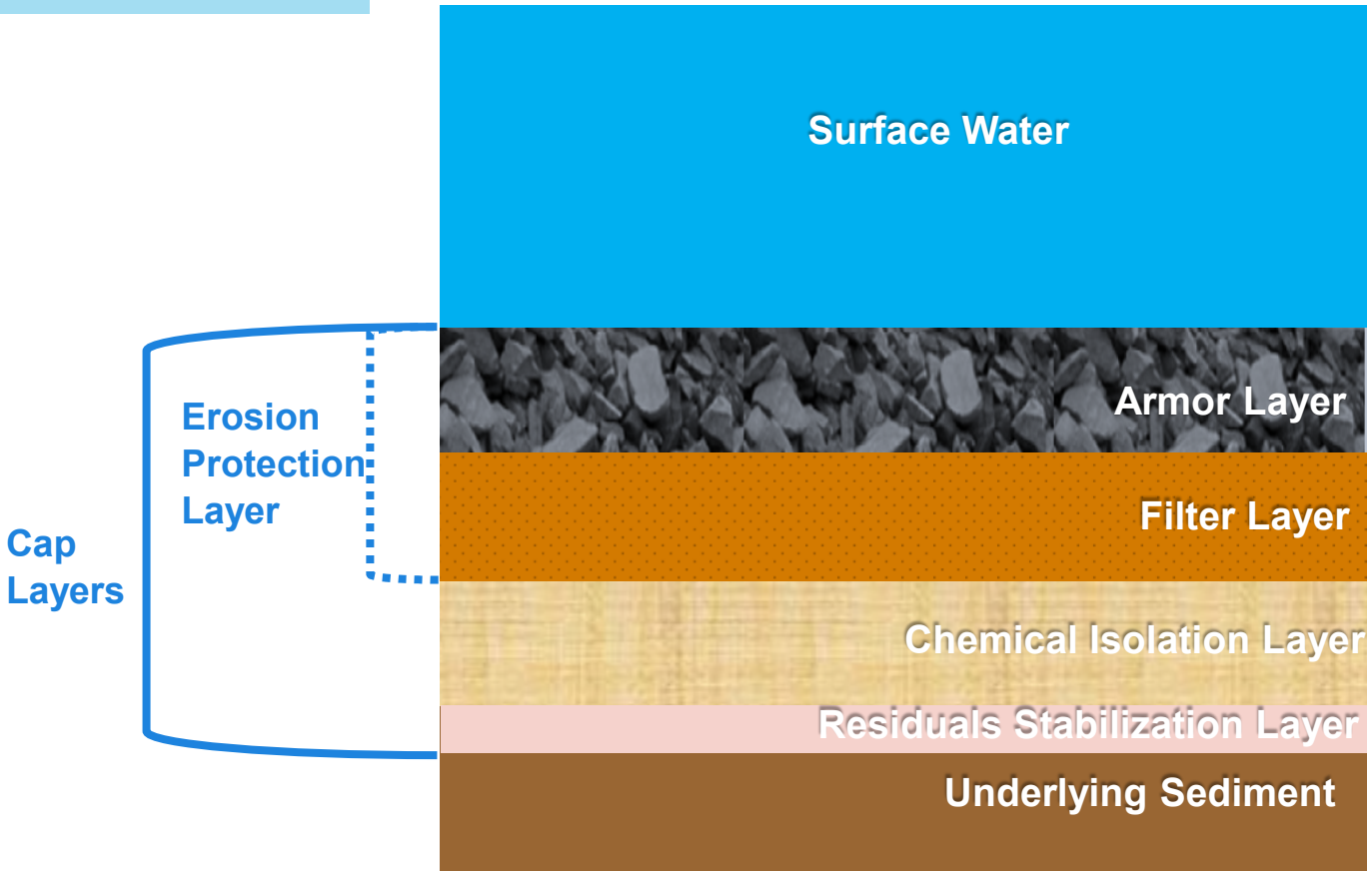


CAP DESIGN

TYPICAL CAP LAYERS

Cap layers function together to isolate underlying contaminated sediment

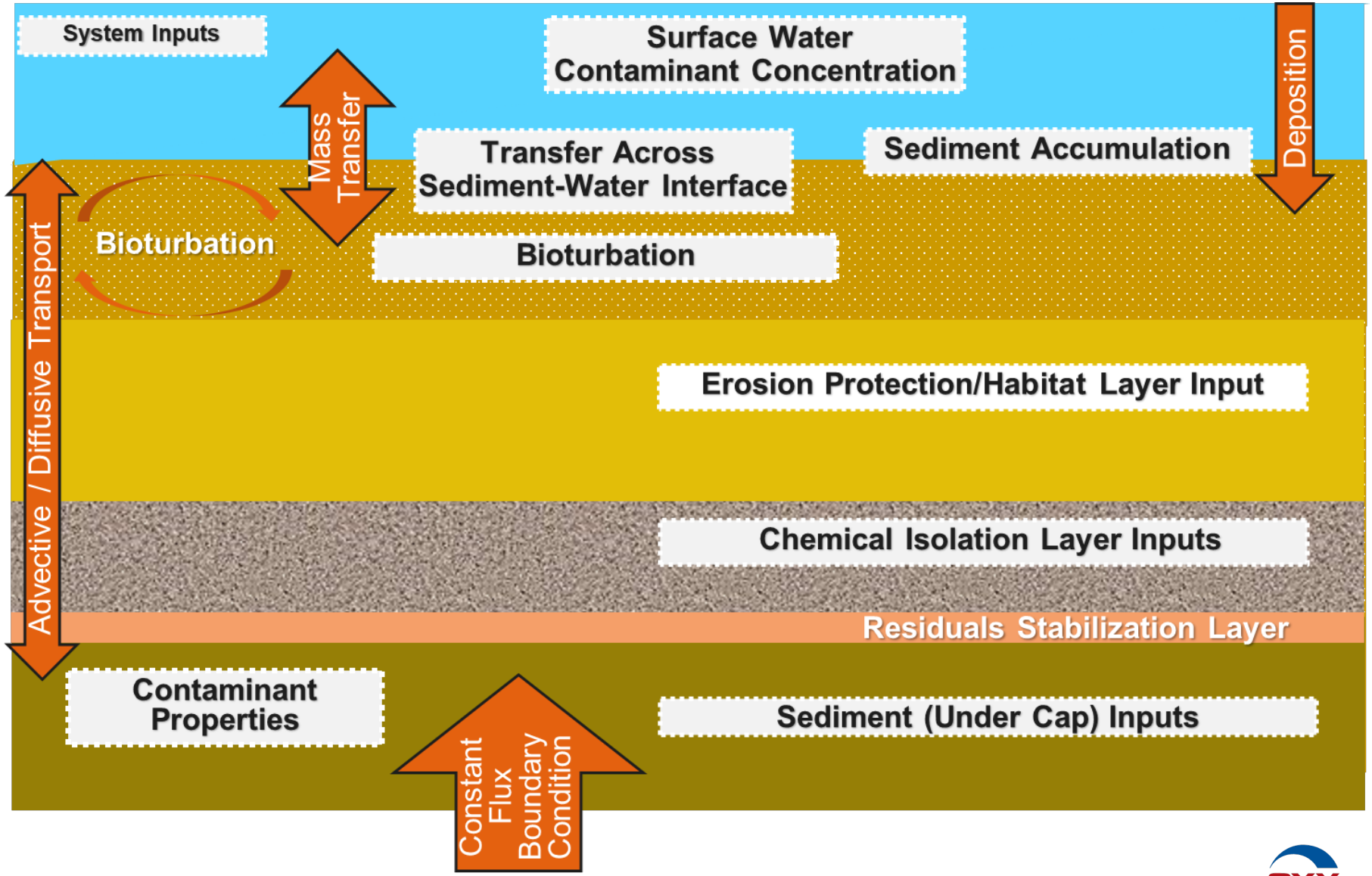
- Residual stabilization layer (sand) placed after dredging
- Chemical isolation layer:
  - Designed to prevent upward migration of contaminants from sediments below cap
- Erosion protection layer:
  - Armor stone or sand
  - Designed to maintain cap integrity
  - Protects against erosion from storms, propeller wash, and other forces
  - Also serves as habitat layer (with habitat substrate in mudflats/wetlands)



Typical Layers of an Armored Cap

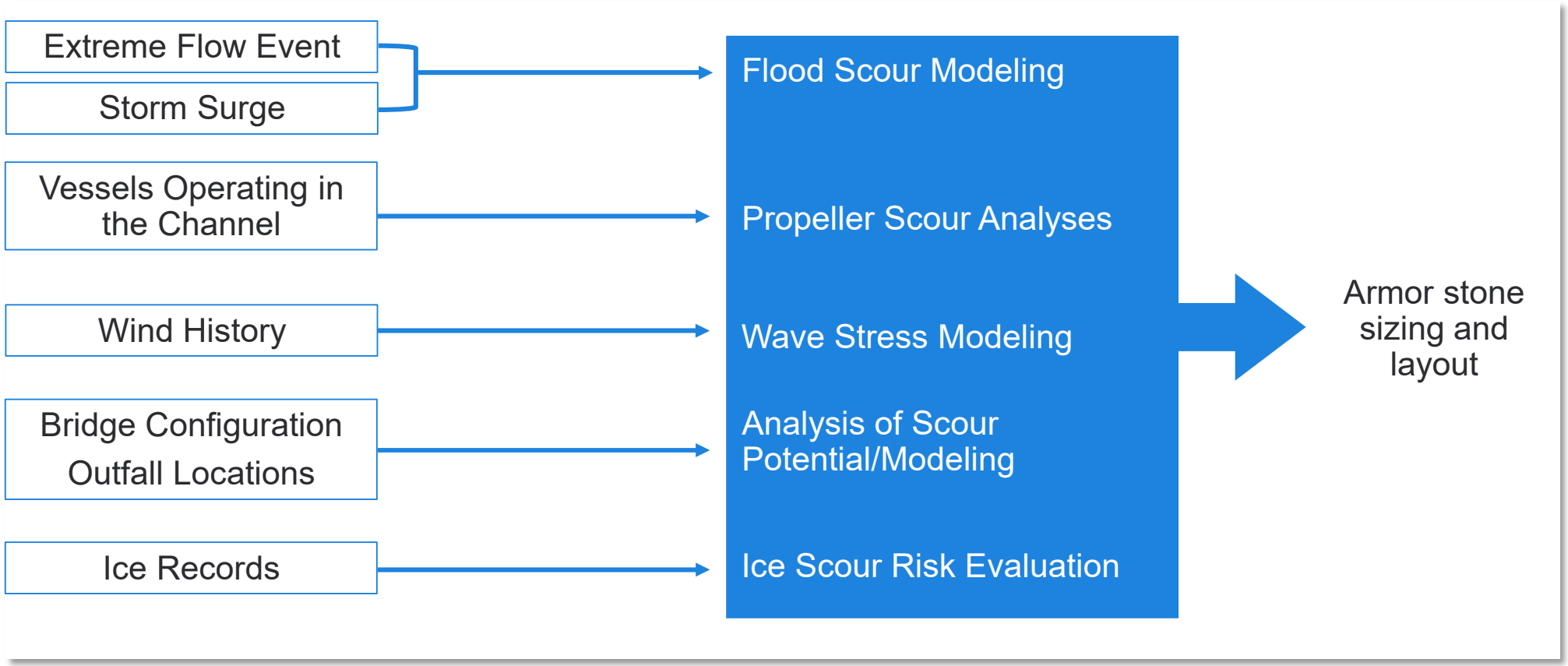
CHEMICAL ISOLATION LAYER DESIGN PROCESS

- Complex computer modeling (CapSim) to determine composition (sand with carbon amendments)
- Computer model used at a variety of sediment sites (standard of practice)
- Many inputs to model from:
  - Pre-design investigation data
  - Treatability study data
  - Literature values
- Complexities of design developed in collaboration with USEPA



CAP EROSION PROTECTION DESIGN PROCESS

- Multiple forces evaluated to ensure cap withstands erosion

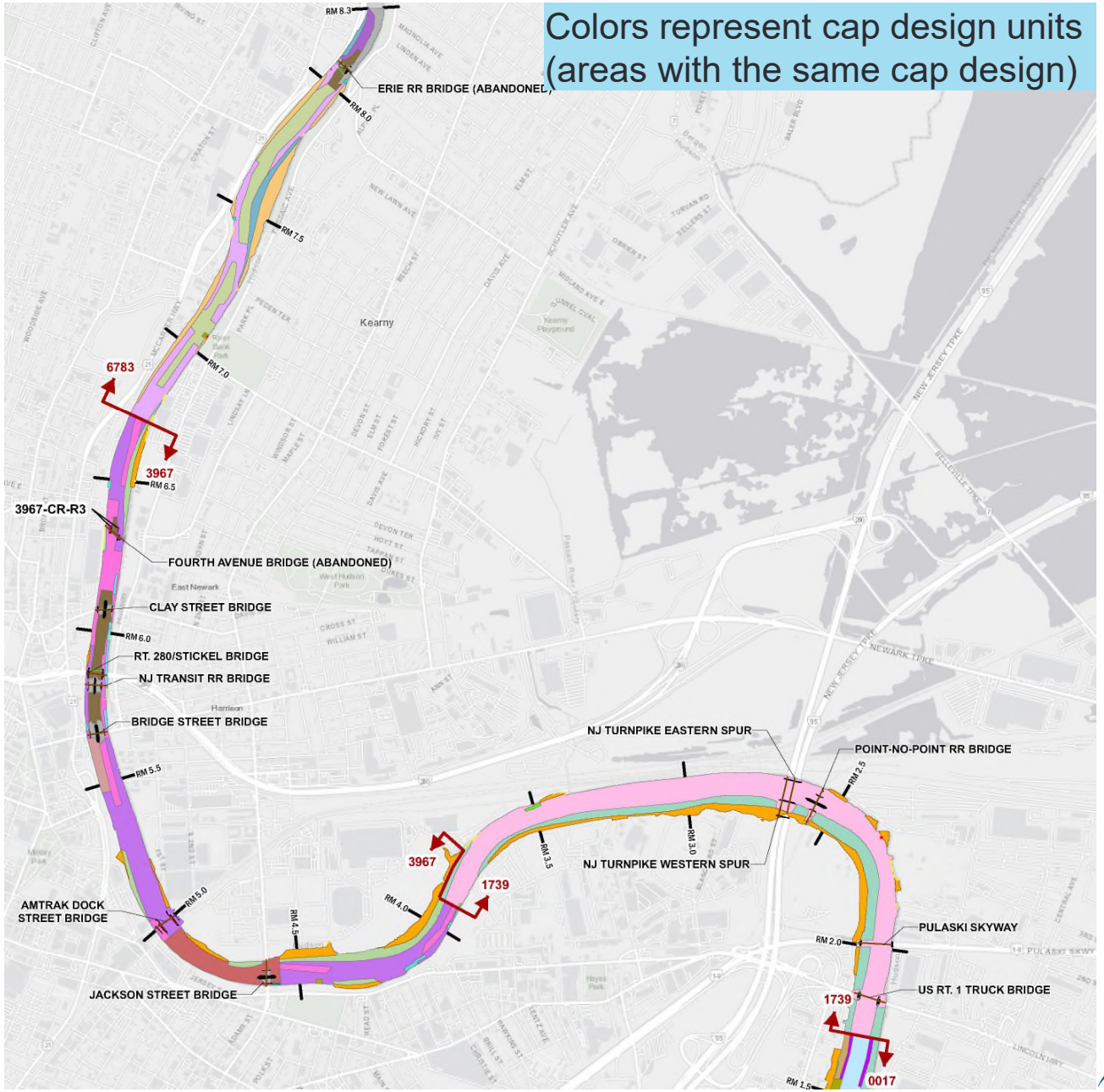


OTHER DESIGN CONSIDERATIONS

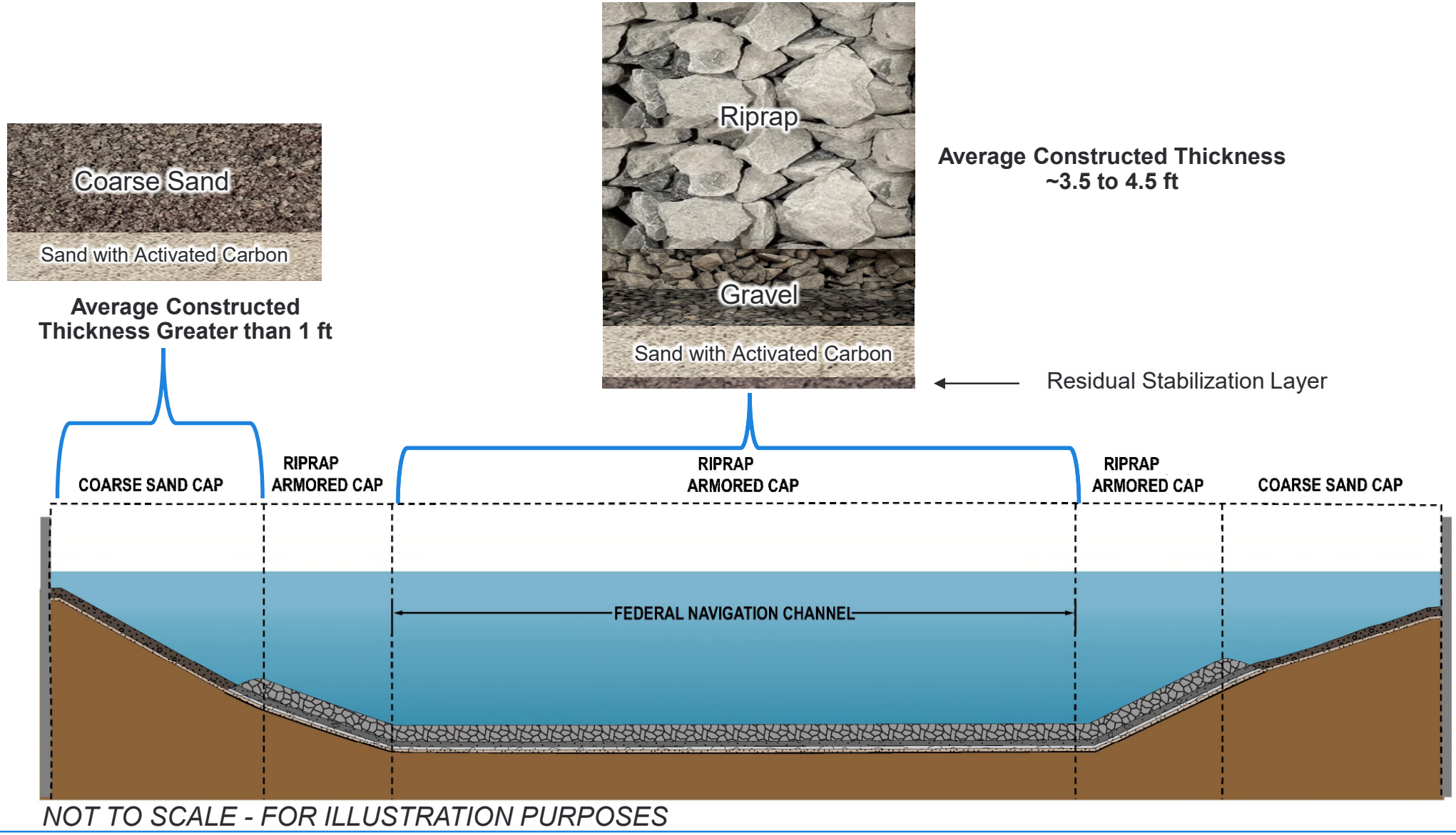
- Certain physical features require unique design:
  - Berth areas
  - Steep slopes
  - Utility and bridge corridors
  - Intertidal mudflats and wetlands
- Details being developed during current design process (95% to 100% design)

CAP DESIGN UNITS

- OU2 divided into cap design units based on:
  - Variations in chemical isolation layer combined with each erosion protection/habitat layer design
  - Physical features
- 24 different cap types
  - Average size 18 acres (up to 124 acres)
  - Smaller units to accommodate unique physical features

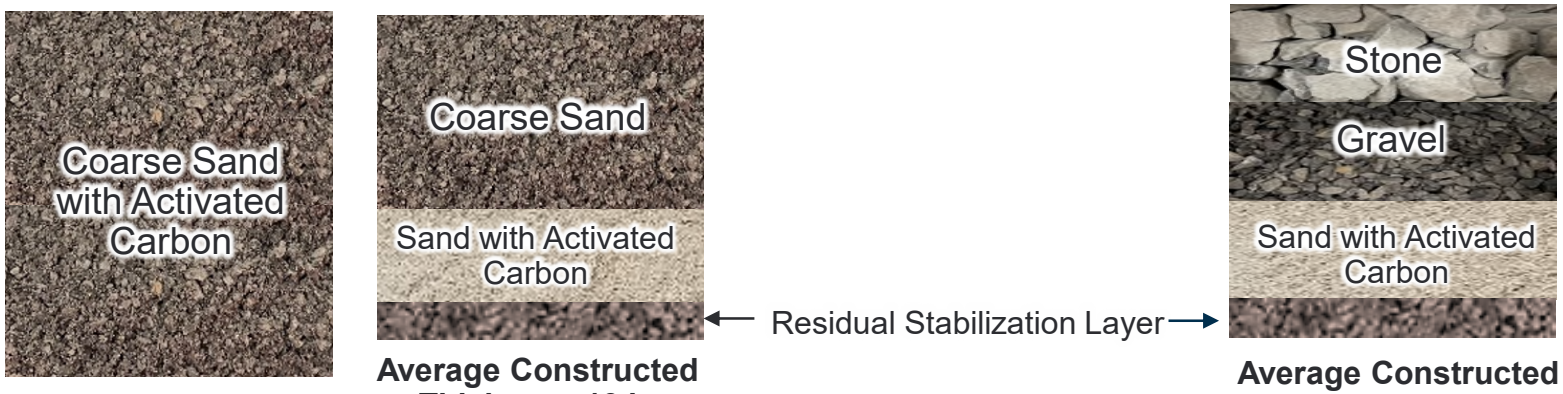


NAVIGATION CHANNEL CAP (RM 1.65)



NOT TO SCALE - FOR ILLUSTRATION PURPOSES

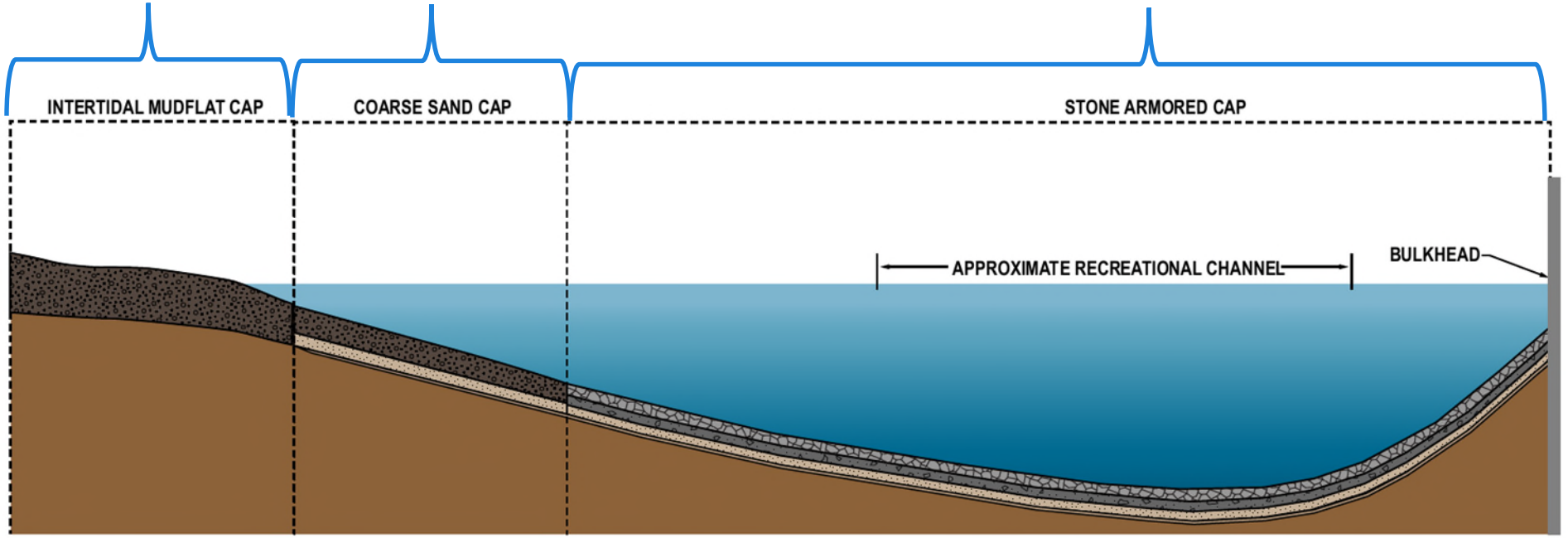
RECREATIONAL CHANNEL CAP (RM 3.0)



Average Constructed Thickness 16 in

Average Constructed Thickness 13 in

Average Constructed Thickness 15 in



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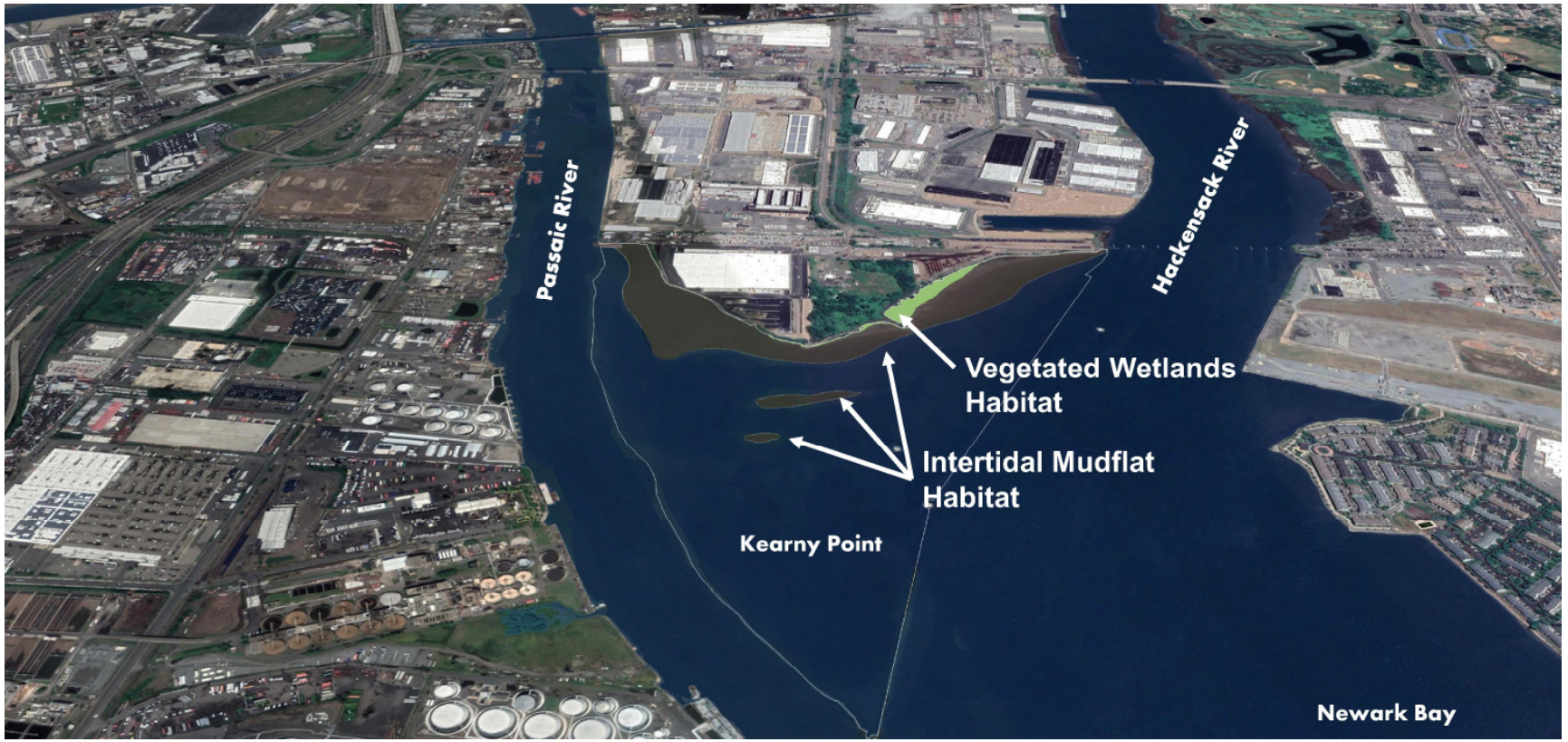
HABITAT RESTORATION

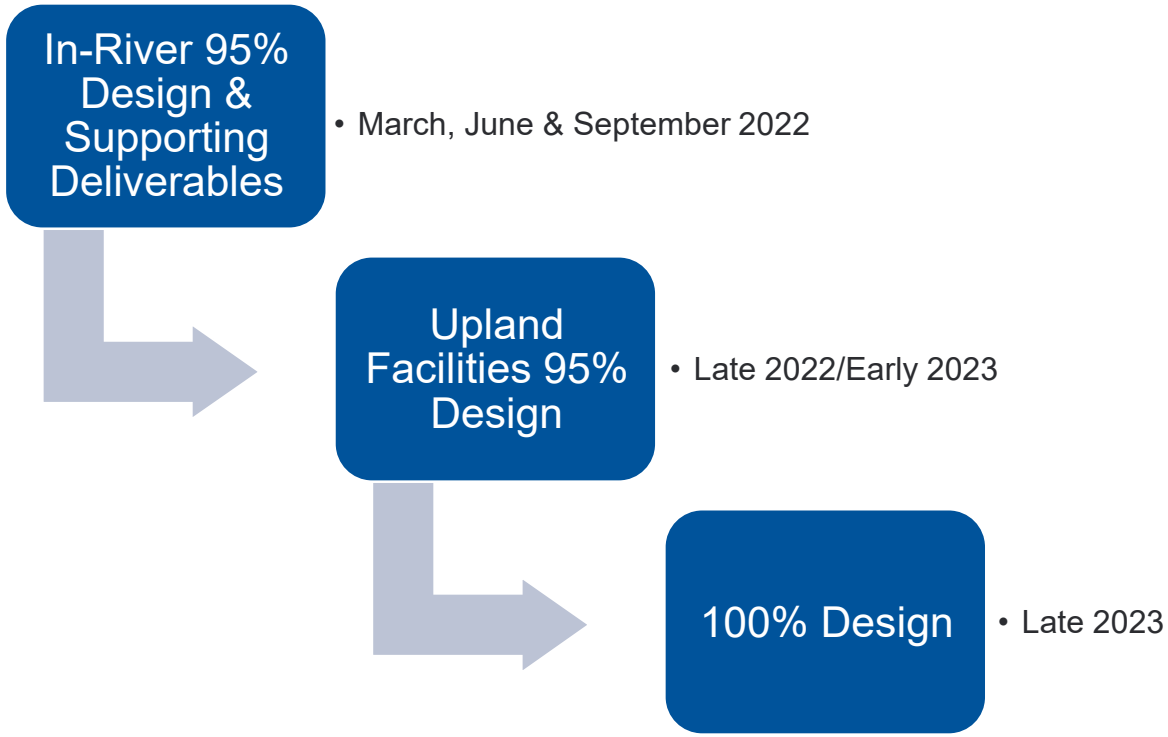


- Over 84 acres of intertidal mudflats and vegetated wetlands will be restored:
  - Over 60 acres at their current location
  - Creation of additional 24 acres at Kearny Point
- Expanded intertidal and vegetated wetlands areas will provide an ecologically valuable habitat in the ecosystem

PROJECT TIMELINE

REMEDIAL DESIGN STATUS

- ☑ Project Management Plan
- ☑ Pre-Design Investigation Work Plan
- ☑ Remedial Design Work Plan
- ☑ Site Selection and Evaluation Work Plan
- ☑ Site Selection and Evaluation Report
- ☑ Preliminary (30%) Remedial Design
- ☑ Intermediate (60%) Remedial Design
- ☑ Pre-Design Investigation Evaluation Report
- ☐ Pre-Final (95%) Remedial Design
  - ☑ In-River 95% Design
  - ☐ Upland Facilities 95% Design
  - ☑ Supporting Deliverables
- ☐ Final (100%) Remedial Design



QUESTIONS?