**Project Objective**
- Remove an estimated 270,000 cubic yards of sediment from the Canal in order to restore its flow capacity
- Remove and dispose of 45,000 cubic yards of sediment from the Authority’s stockpile site in Delaware Township, Hunterdon County, NJ

**Project Goals**
- Protect the historical integrity of the Canal
- Minimize environmental and social impacts
- Maintain technical quality
- Maintain water supply

**Critical Project Elements**
- Develop dredging plan acceptable to stakeholders
- Focused outreach to public officials and stakeholders
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Project Area
Hydraulic Dredging with Geobags

- Conducted in the wet using hydraulic cutterhead dredge
- Requires separate SAV and debris removal operations prior to dredging to prevent clogging
- Dredge maneuvering with non-penetrative methods
- Booster pumps required to transport of dredged sediment through plastic pipeline to dewatering area for geobag dewatering
- High comparative production rate
- Water generation significantly more than other investigated removal methods
- Requires extensive water treatment / water management operations
- Potential impacts on water treatment plant operations due to use of polymers for sediment dewatering
- Minimizes impacts to recreational users (boating/cycling/hiking)
- Reduced operational risk
- Projected construction cost: $26.1 to $29.3 million
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Dredging Support Equipment

- Silt Curtains
  - Control suspended solids and turbidity in the water column
  - Fabricated of flexible, vinyl fabric and provided with anchors to secure curtain bottom
  - Skirt to extend to bottom surface of the Canal
- Booster Pumps
  - Required to convey dredged sediment through plastic pipeline to dewatering area
  - Located along the western shoreline to facilitate refueling and maintenance operations
  - Equipped with double wall fuel storage tanks
  - Provided with oil containment booms to provide envelope around each booster pump
Geobag Staging Area

- Approximately 6 acres in total area
- Includes:
  - Geobag laydown area
  - Drainage swale/containment dike
  - Return water/stormwater treatment
  - Polymer metering equipment
  - Contractor office
  - Truck loading area
  - Stabilization/mixing area
### Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

**Potentially Required Permits**
- U.S. Army Corps of Engineers
- Delaware and Raritan Canal Commission
- NJ Department of Environmental Protection
  - Freshwater wetlands
  - Flood hazard area
  - No net loss reforestation
  - Water lowering
  - Fish stocking
  - NJPDES Water Quality Certification
  - Section 106 consultation
- Somerset-Union County Soil Conservation District
  - NJPDES Construction
  - Soil erosion and sediment control

### Aesthetic Concerns

<table>
<thead>
<tr>
<th>Dredge Methodology</th>
<th>Mechanical Dredging (in the wet)</th>
<th>Mechanical Excavation (in the dry)</th>
<th>Hydraulic Dredging</th>
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<tbody>
<tr>
<td>Canal Draining</td>
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<td>Staging Areas</td>
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<td>Access Areas</td>
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<tr>
<td>Tree Clearing</td>
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<td>Tree Trimming</td>
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<td>Wetland and Wetland Transition Area Impacts</td>
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<tr>
<td>Species Relocation/Restocking</td>
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<td>Trail Closures/Recreational Impacts</td>
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</table>
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Level II Environmental Information Document

- Key Environmental Issues
  - Public use
  - Surface water
  - Floodplains and riparian zones
  - Biotic (plant and animal communities)
  - Forest
  - Wetlands
  - Threatened and endangered species
  - Cultural resources
  - Impacts on water users
Wetlands and Transition Area

Flood Hazard Area

Riparian Zone

Threatened and Endangered Species Habitat

Staging Area and Site Access Selection Process

Environmental Constraints

- Wetlands and Transition Area
- Flood Hazard Area
- Riparian Zone
- Threatened and Endangered Species Habitat
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

### Sediment Characteristics and Beneficial Reuse

- 32 Individual samples
- Represent vertical average at each location

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>Benz(a)pyrene</td>
<td>0.2 ppm</td>
<td>0.1, 0.09, 0.08</td>
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<tr>
<td>Fluoranthene</td>
<td>2,300 ppm</td>
<td>0.2, 0.18, 0.16</td>
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<tr>
<td>Pyrene</td>
<td>1,700 ppm</td>
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<td>4,4′-DDE</td>
<td>0.05 ppm</td>
<td>0.045, 0.04, 0.035</td>
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<td>Chromium (total)</td>
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<tr>
<td>Vanadium</td>
<td>1 ppm</td>
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</tbody>
</table>

![Graph showing sediment characteristics and beneficial reuse](image)