Alternative Development
Source Control Early Action
Lower Passaic River Restoration Project

Remedial Options Workgroup Meeting
May 7, 2008
### June ’07 FFS – Old Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Volume (MCY)</th>
<th>Flooded Area Change (acres)</th>
<th>Cost ($B) [A - B]*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Dredging</td>
<td>11.0</td>
<td>≤ -17</td>
<td>2.0 - 2.3</td>
</tr>
<tr>
<td>2: Cap w/o navigation or flooding</td>
<td>1.1</td>
<td>+ 93</td>
<td>0.9 - 1.1</td>
</tr>
<tr>
<td>3: Cap w/ Authorized nav channel</td>
<td>7.0</td>
<td>≤ -17</td>
<td>1.5 - 1.9</td>
</tr>
<tr>
<td>4: Cap w/ Current Use nav channel</td>
<td>4.4</td>
<td>+24</td>
<td>1.3 - 1.6</td>
</tr>
<tr>
<td>5: Cap w/ Future Use nav channel</td>
<td>6.1</td>
<td>-17</td>
<td>1.4 - 1.8</td>
</tr>
<tr>
<td>6: Cap with Future Use &amp; Dredge Erosional/Inventory Zones</td>
<td>7.0</td>
<td>≤ -17</td>
<td>1.5 - 1.8</td>
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<td>No Action</td>
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*Costs are for dredged materials management scenarios A & B:*
- Scenario A: Nearshore CDF Disposal
- Scenario B: Nearshore CDF Storage with Thermal Treatment and Nearshore CDF Disposal
Revisions to Alternatives for ‘08 FFS

- Navigation: Lower 2 miles
  → serves current & future use
- Pre-dredging in RM2-8 to control flooding impacts
- Re-evaluated cap design
  - Armor placement criteria (1" → 3")
  - Sand thickness (2.5' → 2')
- Principal Threat removal - est. 350,000 CY
- Dredged Material Management: Added off-site disposal and full decontamination
# Alternatives for ‘08 FFS – As they stand now

<table>
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<tr>
<th>Alternatives*</th>
<th>Dredging Volume (MCY)</th>
<th>Dredged Material Management Scenario</th>
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<tr>
<td></td>
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<td>No Action</td>
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*All alternatives cause no additional flooding
Outline

- Alternative Development
- Conceptual Designs
- Dredged Material Management Scenarios
- Detailed Analyses
- Next Steps
Technology Identification and Screening

- Capping ✓
- Dredging ✓
- *In situ* treatment
- Natural Recovery ✓
- *Ex situ* treatment ✓
- Beneficial use ✓
- CDFs/CADs ✓
- Offsite Disposal ✓
Principal Threat Material

- Adjacent to 80 Lister Avenue
- Remove most highly contaminated sediment
- Estimated volume of 350,000 cubic yards
- Removed within containment
Conceptual Design: Dredging

- Mechanical dredging used as representative process option
- Productivity: 2000 cy/day per dredge
- Accuracy: 1-ft overdredge allowance
- Residuals: 2-ft backfill
- Resuspension: Minimize using BMPs
  - No dredge area containment used in conceptual design/cost estimation (except for Principal Threat Material)
- Side slopes: 3H:1V
Dredging Advantages/Disadvantages

- **Dredging Advantages**
  - Permanently removes inventory
  - Deepens river for navigation and flood protection

- **Dredging Disadvantages/Challenges**
  - Defining vertical limits of contamination; extensively deep
  - Dredged material management
    - Infrastructure, siting, disposal
  - Potential for resuspension to spread contamination that was previously buried
  - Cost
Cap Design

Sand Cap
- Bioturbation = 6”
- Erosion = 6”
- Consolidation/Isolation = 12”

Armored Sand Cap
- Armor = 18”
- Filter = 6”
- Consolidation/Isolation = 18”

Mudflat Reconstruction Cap
- Habitat = 12”
- Isolation = 12”
Capping Advantages/Disadvantages

- **Capping Advantages**
  - Minimizes dredged material management & facility siting efforts
  - Less resuspension of contaminants
  - Cost
  - Beneficial use opportunity (KVK rock)

- **Capping Disadvantages**
  - Maintenance required in perpetuity
  - Reduced depth for navigation
Early Action Dredged Material Management (DMM) Scenarios

- Confined Disposal Facility (CDF)
- Off-site treatment and disposal
- Full decontamination w/ beneficial use (local / regional)
Nearshore CDF Concept

Placed Dredged Material

MHW
MLW

Sub-grade Cell

Final Grade

Existing Surface

CDF Boundary:
Double walled, filled sealed sheetpile

Final Cap

Contaminated Sediment Veneer

Water Treatment Plant

Not to Scale
CDF Siting Considerations

- At least 100 ft from nearest navigation channel
- Draft for approach (need ~20ft @ MLW for scow/barge)
- Depth to bedrock – for storage volume
- Appropriate geological formation for sub-grade cell (red-brown clay or glacial till)
- Air draft
- Flooding impacts
- Minimal presence of contaminated sediments overlying the area
- Water quality (construction, operational)
- Proximity to dredging site

Ref: USACE, 2007
Considered:

- Onsite thermal treatment (Decon)
- Offsite domestic thermal treatment (KS, TX)
- Offsite international thermal treatment (Canada)
Upland Processing Site
Upland Processing Facility – Siting Considerations

- Sufficient acreage
- Suitable current land usage and zoning (industrial, low level of development). Sufficient distance from residential areas, public use/parkland, wetlands.
- Waterfront access (sufficient shoreline frontage, proximity of shoreline to a navigable channel)
- Road access (proximity to highways, routes that do not pass through residential areas)
- Rail access (proximity to rail lines/spurs)
- Soil characteristics to support heavy loads

Ref: USACE, 2007
Water Treatment

Diagram showing the water treatment process, including:
- Rainfall
- Equalization Tank
- Oil/Water Separator
- Solids
- Disposal
- Bag Filter
- Carbon Filter
- Sand Filter

Flow rates:
- D = 3.0 MGD
- C = 3.3 MGD
Process Flow (cont)
Detailed Analyses

- Cap Stability – Hydrodynamic and sediment transport models used to predict cap erosion and design armor.
- Flooding Analysis – No net increase in flooding for any of the alternatives.
- Removal Volumes
- Cost Estimates
- Construction Impacts
- Quality of Life Considerations
Construction Impacts (Under Evaluation)

- Sediment resuspension
- Release of contaminants
- Dredging residuals
- Construction accidents
Quality of Life Considerations

- Siting Concerns
- Air Quality
- Odor
- Noise
- Lighting
- Project-generated traffic (including vessel traffic)
Recap of Alternatives - as they stand now

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*All alternatives cause no additional flooding*
On-going activities

- Flood Modeling
- Sediment Transport Modeling Scenarios
  - Discrete Capping
  - Thin Layer capping
- Evaluation of Construction Impacts
- Cost Estimation
  - Mitigation cost for CDF impacts
DISCUSSION