OBG PRESENTS:
Remediation of an MGP Site Utilizing a Design/Build Approach
October 17, 2017
AGENDA

Project Background
Bid Phase
Design Phase
Construction Phase
Lessons Learned / Summary
# Project Background

**1.7 acre former MGP adjacent to Rondout Creek**

- MGP operated from the 1890s until 1958

**Central Hudson enters into Brownfield Cleanup Agreement with NYSDEC in 2008**

- Remedial Investigation (RI)
  - Identified MGP impacts up to 28 ft. below grade on-site

**25+ years of investigation starting in 1986**

- Historic MGP related impacts to sediments in Rondout Creek
Selected Remedy

- Construction of permanent sheetpile bulkhead along existing wood bulkhead
- Excavation of MGP structures and upper 4 ft. of soil
- *In-situ* solidification of majority of upland on-site property and limited areas off-site
- Construction of a cover system
- Dredging of NAPL or PAH containing sediment
- Capping of NAPL impacted sediment above submerged gas lines
- Install NAPL recovery wells
Bid Phase
## Central Hudson Bidding Approach

| Prepare a 60% Remedial Design | Obtain bids from qualified Engineer-led Design-Build Contractors | Selected team to prepare Remedial Work Plan and perform remedial construction |

### RESULT
Recognize savings due to value engineering during bid phase
Project Considerations

- Safety
- Effectiveness of selected remedy
- Permitting
- Presence of utilities including submerged pipelines
- Presence of USACE Navigation Channel
- Restrictive in-river work window
- Site restoration
- Cost
<table>
<thead>
<tr>
<th>Design / Build Advantages</th>
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<tbody>
<tr>
<td>Value engineering during preparation of the bid</td>
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<td>Significant investment in design advancement during bid phase</td>
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<td>Cooperation between engineer and construction subcontractor</td>
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<td>Facilitated compressed design/permitting schedule</td>
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<td>Competitive pricing for overall project costs</td>
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<tr>
<td>Integrate design of replacement bulkhead and ISS component of upland soil remedy</td>
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<tr>
<td>Alternate bulkhead construction</td>
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**RESULT**
Savings of approximately $13.8 M compared to feasibility study estimates.
Design Phase
### Design Approach

- Advance design elements from bid phase
- Central Hudson real-time review of design deliverables
- Incorporation of additional aquatic habitat enhancements
- Sediment cap over submerged pipelines designed to a preliminary stage – finalized during construction
- Engaged regulators early in the design phase
- OBG/LRI worked in conjunction to prepare design deliverables
Permitting During Design

USACE Nationwide Permit 38

Section 401 Water Quality Certification
Construction Phase
Design / Build Advantages

- Construction starts prior to finalization of design
- Mobilization in May 2016
- Remedial Work Plan approved June 27, 2016
- Subsequent design submittals on bulkhead and sediment cap
Design / Build Advantages

Location of submerged pipelines during construction
Design / Build Advantages

- Permitting Requirements Changed
- No “hard fill” in USACE Navigation Channel above elevation -20 NAVD88
- Ability to adjust construction sequencing to maintain schedule
- Cooperative approach to addressing the change
Design / Build Advantages

- Increased sediment quantity
- 25,000 cubic yards actual vs. 20,000 cubic yards bid
- No “finger pointing”
- Minimal schedule increase
Design / Build Advantages

- Value engineering during construction
- Alternate pricing for debris disposal
- Alternate pricing for soil and sediment disposal
- Elimination of temporary fabric structure for odor control
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<tr>
<th>Design / Build Advantages</th>
<th>RESULT</th>
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<tr>
<td>970% increase in debris disposal</td>
<td>32% more work for 4.5% increase in contract costs</td>
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<td>25% increase in sediment dredging, transportation, and disposal</td>
<td>28% increase is soil excavation, transportation and disposal</td>
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<td>Credit for elimination of temporary fabric structure</td>
<td>Soil and sediment disposal alternate savings</td>
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<td>38% decrease in creek backfill</td>
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# Lessons Learned / Conclusions

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<td>Get permitting done as soon as possible</td>
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<td>Maintain ongoing engagement with regulators</td>
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<td>Address community concerns by robust air/odor monitoring and health and safety program</td>
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<td>Work as a team (Owner and Design/Builder) for continuous change management</td>
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<td>Despite unknowns, Design/Build can be cost-effective approach to remediation</td>
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<td>NYSDEC – “...this is the way a project should be done...”</td>
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THANK YOU

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