Diversion Panel Briefing
4/30/2014
Mid-Barataria Sediment Diversion Project
Major Design Elements

1/30/14 - 30% BASIS OF DESIGN

1/30/13 - CONCEPT
Adaptive Engineering and Design Planning

Draft Project Delivery Plan
Mid-Barataria Sediment Diversion
HDR Engineering, Inc.
1/10/2013
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**PROJECT RISK REGISTER**

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<tr>
<th>Risk ID</th>
<th>Risk Category</th>
<th>Risk Description</th>
<th>Cause &amp; Effect</th>
<th>Proba bility</th>
<th>Cost Impact</th>
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<th>Strategy</th>
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<th>HDR Action Items</th>
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<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>R12</td>
<td>Technical</td>
<td>Diversion Location Pre-determined</td>
<td>Limitations on Diversion geometry</td>
<td>100%</td>
<td>Minor</td>
<td>Minor</td>
<td>High</td>
<td>Accept</td>
<td>Develop and implement adaptive management plan. Diversion geometry is satisfactory.</td>
<td>Design diversion per CPRA direction.</td>
<td>Acknowledge and document direction provided to HDR.</td>
<td>Completed</td>
</tr>
<tr>
<td>R13</td>
<td>Technical</td>
<td>Modeling Reliability</td>
<td>Adequacy of previous work/modeling output. Limitations on diversion performance.</td>
<td>100%</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
<td>Accept</td>
<td>Develop and implement adaptive management plan. Previous modeling output is satisfactory.</td>
<td>Establish an appropriate modeling timeline satisfactory to CPRA.</td>
<td>Acknowledge and document direction provided to HDR.</td>
<td>Active</td>
</tr>
<tr>
<td>R14</td>
<td>Technical</td>
<td>Data Collection Delays</td>
<td>Geotechnical sampling is not permitted within 1,500 ft of the MRT levee while the gage at Carrollton is at 11 ft or higher. Significant project schedule delays.</td>
<td>75%</td>
<td>Significant</td>
<td>Significant</td>
<td>Extreme</td>
<td>Mitigate</td>
<td>Expedite data collection activities. Completion of all data collection activities within 1,500 ft of MRT levee.</td>
<td>Expedite Section 214 Agreement with USACE</td>
<td>Authorization of Scope of Work for project initiation activities</td>
<td>Active</td>
</tr>
<tr>
<td>R15</td>
<td>Technical</td>
<td>Project Optimization</td>
<td>Expedited timeline/phasing. Limitations on diversion performance.</td>
<td>100%</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Accept</td>
<td>Provide Scope of Work for project initiation activities.</td>
<td></td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>R16</td>
<td>Technical</td>
<td>Soil Conditions</td>
<td>Unknown soil conditions. Poor soil conditions may complicate design.</td>
<td>25%</td>
<td>Significant</td>
<td>Significant</td>
<td>High</td>
<td>Accept</td>
<td>Detailed sampling and analyses. Good Soil Conditions.</td>
<td></td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>R17</td>
<td>Operations &amp; Maintenance</td>
<td>Shaleing / Scar</td>
<td>Impacts to river sand bar and/or adjacent shorelines. Limitations on diversion performance.</td>
<td>25%</td>
<td>Minor</td>
<td>Minor</td>
<td>Medium</td>
<td>Mitigate</td>
<td>Develop Operations and Maintenance Plan. No effects to sandbar and adjacent shorelines.</td>
<td></td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>R18</td>
<td>Operations &amp; Maintenance</td>
<td>Water Levels</td>
<td>Rise and/or drop in water levels in river and basin. Limitations on diversion performance.</td>
<td>50%</td>
<td>Moderate</td>
<td>Minor</td>
<td>Medium</td>
<td>Mitigate</td>
<td>Develop Operations and Maintenance Plan. Operation with minimal water level changes.</td>
<td></td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>R19</td>
<td>Operations &amp; Maintenance</td>
<td>Navigation Constraints</td>
<td>Effects on ships in river. Limitations on diversion performance.</td>
<td>25%</td>
<td>Minor</td>
<td>Minor</td>
<td>Low</td>
<td>Accept</td>
<td>Develop operations and maintenance plan. No effects on navigation.</td>
<td></td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>R20</td>
<td>Operations &amp; Maintenance</td>
<td>Diversion Operation / River Flow</td>
<td>Low river flow limits diversion operation. Limitations on diversion performance.</td>
<td>50%</td>
<td>Minor</td>
<td>Minor</td>
<td>Medium</td>
<td>Accept</td>
<td>Conduct more-extensive hydraulic modeling and engineering analyses. Limit scours between convergence channel and outfall.</td>
<td></td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>R28</td>
<td>Technical</td>
<td>Diversion Channel / Outlet Adequacy</td>
<td>Discovery of dispersive clays within project footprint. High potential for scours.</td>
<td>100%</td>
<td>Significant</td>
<td>Significant</td>
<td>High</td>
<td>Mitigate</td>
<td>Design armor system suitable for scour control.</td>
<td></td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>R30</td>
<td>Technical</td>
<td>Competing Projects for Borrow Material</td>
<td>Federal and private project potentially occurring simultaneously in the vicinity. Higher construction cost to import borrow material.</td>
<td>75%</td>
<td>Significant</td>
<td>Significant</td>
<td>High</td>
<td>Accept</td>
<td>Develop design solutions that require less borrow material. Design a reasonable constructable project.</td>
<td>Investigate additional borrow sites and structural alternatives</td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>R31</td>
<td>Management</td>
<td>Design progressing ahead of Third Party 16</td>
<td>Delayed Coordination with USACE. Current Design work product is in all Risk and subject to significant revisions.</td>
<td>100%</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Accept</td>
<td>Align Permitting and Design Schedules. Align Permitting and Design Schedules.</td>
<td>Conduct Alternatives Analysis and slow design effort to suit</td>
<td>Expedite Section 214 Agreement with USACE</td>
<td>Active</td>
</tr>
<tr>
<td>R32</td>
<td>Management</td>
<td>Design progressing ahead of Section 408 Process</td>
<td>Delayed Coordination with USACE. Current Design work product is in all Risk and subject to significant revisions.</td>
<td>100%</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Accept</td>
<td>Align Permitting and Design Schedules. Align Permitting and Design Schedules.</td>
<td>Conduct Alternatives Analysis and slow design effort to suit</td>
<td>Expedite Section 214 Agreement with USACE</td>
<td>Active</td>
</tr>
<tr>
<td>R33</td>
<td>Technical</td>
<td>Unexpected Physical Model Results</td>
<td>Limited confidence in numerical modeling.</td>
<td>50%</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Medium</td>
<td>Accept</td>
<td>Conduct Physical Models, Numerical Models and Physical Model in Agreement.</td>
<td></td>
<td></td>
<td>Active</td>
</tr>
</tbody>
</table>

**Risk ID**

- **R12**: Division Location Pre-determined
- **R13**: Modeling Reliability
- **R14**: Data Collection Delays
- **R15**: Project Optimization
- **R16**: Soil Conditions
- **R17**: Shaleing / Scar
- **R18**: Water Levels
- **R19**: Navigation Constraints
- **R20**: Diversion Operation / River Flow
- **R28**: Diversion Channel / Outlet Adequacy
- **R30**: Competing Projects for Borrow Material
- **R31**: Design progressing ahead of Third Party 16
- **R32**: Design progressing ahead of Section 408 Process
- **R33**: Unexpected Physical Model Results

**Risk Category**

- Technical
- Operations & Maintenance
- Management

**Risk Description**

- Limitations on Diversion geometry
- Adequacy of previous work/modeling output
- Geotechnical sampling is not permitted within 1,500 ft of the MRT levee while the gage at Carrollton is at 11 ft or higher
- Expedited timeline/phasing
- Impacts to river sand bar and/or adjacent shorelines
- Discovery of dispersive clays within project footprint
- Delayed Coordination with USACE
- Delayed Coordination with USACE
- Discovery of dispersive clays within project footprint
- Limited confidence in numerical modeling

**Proba bility**

- 100%
- 50%
- 25%

**Cost Impact**

- Minor
- Moderate
- Significant

**Time Impact**

- Minor
- Moderate
- Significant

**Risk Score**

- High
- Medium
- Low

**Strategy**

- Accept
- Mitigate

**Risk Plan & Desired Outcome**

- Develop and implement adaptive management plan. Diversion geometry is satisfactory
- Develop and implement adaptive management plan. Previous modeling output is satisfactory
- Expedite data collection activities. Completion of all data collection activities within 1,500 ft of MRT levee
- Detailed sampling and analyses. Good Soil Conditions
- Develop Operations and Maintenance Plan. No effects to sandbar and adjacent shorelines
- Develop Operations and Maintenance Plan. Operation with minimal water level changes
- Develop operations and maintenance plan. No effects on navigation
- Conduct more-extensive hydraulic modeling and engineering analyses. Limit scours between convergence channel and outfall
- Design armor system suitable for scour control
- Develop design solutions that require less borrow material
- Align Permitting and Design Schedules
- Align Permitting and Design Schedules
- Conduct Physical Models, Numerical Models and Physical Model in Agreement

**HDR Action Items**

- Design diversion per CPRA direction
- Establish an appropriate modeling timeline satisfactory to CPRA
- Expedite Section 214 Agreement with USACE
- Conduct Alternatives Analysis and slow design effort to suit
- Expedite Section 214 Agreement with USACE
- Conduct Physical Models, Numerical Models and Physical Model in Agreement

**CPRA Action Items**

- Acknowledge and document direction provided to HDR
- Expedite Section 214 Agreement with USACE
- Monitoring USACE construction schedule for NOV Levee project
Cultural Resource Evaluations

- Surveyed only areas not previously surveyed
- Utilized phased approach with varying sampling density to streamline surveys and minimize costs
Adding a Back Structure Reduces Road and Rail Improvements
Or Can We Go Under?

LEGEND
- Future New Orleans Railroad Prior to Sediment Diversion Project
- Highway LA-23 Improvements
- New Orleans Railroad Relocation
- Highway LA-23 Bridge
- New Orleans Railroad Bridge
- Permanent NOV Levee Easement

For Discussion Purposes Only

COASTAL PROTECTION & RESTORATION AUTHORITY
ENGINEERING DIVISION
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

DRAWN BY: EC
DESIGNED BY: RB
APPROVED BY: ROBERT BEDDOON

MID-BARATARIA SEDIMENT DIVERSION
STATE PROJECT NUMBER: BA-153
FEDERAL PROJECT NUMBER: BA-153
DATE: AUG 2013
FIGURE: FIGURE 3

CONVEYANCE COMPLEX WITH BACK STRUCTURE AT NOV LEVEE AND RAILROAD FROM RAM TERMINALS

Confidential Information: Privileged and Confidential Work Product
Or, Can We “Float” The Levee and Avoid Fill and Settlement Costs

Schematic drawing of levee repair using EPS geofoam.
Base Design – In Dry Coffer Dam
Float In Construction
Float In Channel Segments

- New Lock Extension
- Dredged Area
- Sheet Piles Extending 4' Above Bottom Delinutes Excavation
- LANDING PAD (TYP.)
- Existing Lock
- Breasting Dolphin For Positioning
- Breasting Dolphin For Positioning
- Tug Boat

Confidential Information: Privileged and Confidential Work Product
Frame Barge and Pre-Fabricated Wall Sections
Float In Construction Traditionally Uses At Grade Foundation
MBSD Has Deep Cut
Flow Capture Zone Differences

Open Channel Capture Zone

Close Conduit Capture Zone
Basin Variable Boundary Conditions Drive Performance
EIS Scoping and Environmental Analysis will Provide Important Design Feedback

• Boundary Conditions
• Flow Regimes
• Operating Plan
• Permit Conditions
• Maintenance
• Adaptive Management Plan/Monitoring