Mid-Barataria Sediment Diversion – Overview

Presentation to the Diversion Panel
April 30, 2014
2012 Coastal Master Plan

Mid-Barataria Sediment Diversion
Master Plan Assumptions

- The 50,000 cfs sediment diversion would **build and maintain 30 to 50 square miles of land over 50 years** depending on future environmental conditions.

- Land building potential was analyzed under two scenarios – a moderate and a less optimistic.

  **S12 – Moderate**
  Near Term 20 years – (7089 acres)
  Long Term 50 years – (32152 acres)

  **S13 – Less Optimistic**
  Near Term 20 years – (2944 acres)
  Long Term 50 years – (19705 acres)
For the modeling, the diversion was
  • operated at 50,000 cfs capacity when Mississippi River discharge exceeds 600,000 cfs,
  • operated at 8% of the river flow when the Mississippi River discharge was between 200,000 to 600,000 cfs, and
  • closed with the Mississippi River flow was below 200,000 cfs.

The diversion was included in the 1st Implementation Period (2012-2032) of the Master Plan.
Modeling Analysis

Pontchartrain/Barataria Basin Model Domain

Legend

- PB Offshore Nodes
- PB Model Domain
- PB Polygons

Miles 0  12.5  25  50  75  100  125
Project Specific Background Information
This Project Has Been Planned, Evaluated and Discussed with Stakeholders For 10+ Years

The E&D Phase of the Project is Being Funded by the National Fish and Wildlife Foundation through the Gulf Environmental Benefit Fund
#1 – Capacity

75,000 cfs – Dr. Ehab Meselhe’s results (sediment/water ratios)

<table>
<thead>
<tr>
<th>Water Discharge (m³/s)</th>
<th>Mississippi River Channel (Main Stem)</th>
<th>Diversion Channel OA - RM60.2 - 15K</th>
<th>Diversion Channel ND - RM60.7 - 15K</th>
<th>Diversion Channel MA - RM60.7 - 45K</th>
<th>Diversion Channel ND - RM60.7 - 45K</th>
<th>Diversion Channel ND - RM60.7 - 75K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Discharge (CFS)</td>
<td>700,000</td>
<td>11,369</td>
<td>12,733</td>
<td>33,735</td>
<td>33,075</td>
<td>60,918</td>
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</tbody>
</table>

#2 – Alignment

Based on an intensive Mississippi River data collection and modeling effort, the location of the intake channel and the outfall channel alignment has been carefully selected at river mile 60.7 above Head of Passes to optimize the capture of sediment from the river.
Mid-Barataria Diversion Alignment

NOTE: ALL ELEVATIONS ARE IN FEET NAVD

NOTE: SEE TRANSITION AND OPEN MARSH SECTIONS AT F'-F", G'-G" AND H'-H'" - SHEETS 5E, 6E AND 7E.
Mid-Barataria Sediment Diversion Project Location
MBSD Alternatives Analysis – Design

Use Previous Planning & Feasibility Models and Build Upon to Create Design Level Models

Evaluate Project Parameters to Minimize Impacts and Achieve Optimal Land Building

Identify Project Parameters for Design
MBSD Alternatives Analysis – Environmental Modeling Process to Support Design

Louisiana Coastal Protection and Restoration Authority
<table>
<thead>
<tr>
<th>Civil</th>
<th>Structural</th>
<th>Gates</th>
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<tbody>
<tr>
<td>Lidar, Bathometry, Topography, Control Surveys</td>
<td>Type/Size and Location from Civil</td>
<td>Hydraulic Models</td>
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<tr>
<td>Hydraflow Hydrograph - Drainage</td>
<td>Guide Walls – SPW911</td>
<td>Wind/Debris Loads</td>
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<tr>
<td>Hydraflow Express-Drainage Structures</td>
<td>Transition Walls - Geostudio</td>
<td>Operating Range</td>
</tr>
<tr>
<td>AutoCAD Civil 3D - Earthworks</td>
<td>Outlet Armoring – Geostudio - SlopeW</td>
<td>GT Strudl (Finite element Analysis Software)</td>
</tr>
<tr>
<td></td>
<td>Inlet Channel Walls – Shoring Suite</td>
<td>Bulkhead Design SAP (Finite element Analysis)</td>
</tr>
</tbody>
</table>
## MBSD Alternatives Analysis – Geotechnical Models

<table>
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<tr>
<th>Geotechnical Analysis</th>
<th>Current Phase</th>
<th>Final Design</th>
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<tr>
<td><strong>Slope Stability</strong></td>
<td>SlopeW $^1$</td>
<td>SlopeW and Methods of Planes, PLAXIS$^4$, FLAC$^5$</td>
</tr>
<tr>
<td><strong>Seepage Analysis</strong></td>
<td>SeepW $^1$</td>
<td>SeepW $^1$, Blanket Theory Spreadsheet</td>
</tr>
<tr>
<td><strong>Settlement Analysis</strong></td>
<td>SigmaW $^1$, Settle$^6$, Consol3$^7$ Spreadsheet Based Analysis</td>
<td>SigmaW $^1$, Settle3D$^6$, Consol3$^7$ Spreadsheet Based Analysis</td>
</tr>
<tr>
<td><strong>Pile Capacity</strong></td>
<td>Spreadsheet Based Analysis</td>
<td>Spreadsheet based analysis, Lpile$^2$, Group$^2$, Driven$^3$, Shaft$^3$</td>
</tr>
<tr>
<td><strong>Shoring Wall Analysis</strong></td>
<td>Shoring Suite$^8$</td>
<td>Shoring Suite$^8$, PLAXIS$^4$</td>
</tr>
</tbody>
</table>
MBSD Alternatives Analysis – Design Components
MBSD Alternatives Analysis – Mid-Barataria Sediment Diversion Design

Iterative Design

Geotech
Modeling
Environmental
Coastal Process

Louisiana Coastal Protection and Restoration Authority
Section 10/404

ABOUT SECTION 10:
Section 10 of the Rivers and Harbors Act of 1899 requires authorization for the construction of any structure in or over any navigable water of the United States.

ABOUT SECTION 404:
Requires a permit for any category of activities involving discharges of dredged or fill material into waters of the United States, including wetlands.
Section 408

ABOUT:
Section 408, authorized in the Rivers and Harbors Act of 1899 and as amended in 1985 to include “public works”, allows the Secretary of the Army to grant permission to **alter completed federal public works projects** so long as the alteration does not impair the usefulness of the project and is not injurious to the public interest.

Examples: Levees, weirs, dams, etc.
About:
The purpose of the Coastal Use Permit process is to make certain that any activity affecting the Coastal Zone is performed in accordance with guidelines established in the Louisiana Coastal Resources Program.
Environmental Impact Statement

ABOUT:
An Environmental Impact Statement (EIS) is an environmental document required by the National Environmental Policy Act (NEPA) for actions that **significantly affect the quality of the human environment** (42 USC §4332).
Thank You