Nothing is impossible to the person who doesn’t have to do it!
Calcasieu Ship Channel Authorized Project dimensions: (400ft wide, 40ft deep)

$30-$40 million (in 2014 dollars) needed annually to maintain congressionally authorized dimensions for safe, reliable, and environmentally sound operations on the Calcasieu Ship Channel.
Calcisieu Ship Channel Less Than
Project dimensions: (400ft wide, 40ft deep)

$30-$40 million (in 2014 dollars) needed annually to maintain congressionally authorized dimensions for safe, reliable, and environmentally sound operations on the Calcisieu Ship Channel.
Calcasieu Ship Channel Traffic Study
Traffic Study
Dredging Analysis
Source: Ausenco Traffic Study

In the Base Case, the channel was assumed to be properly maintained and dredged to its congressionally authorized dimensions. The impact of insufficient dredging was investigated in two scenarios:

- **Case 1A: the moderate scenario.** The channel width was reduced to 250 ft or less (such that no vessels were able to pass on the Inner Channel) and the depth was reduced by roughly 1 ft (such that the boarding windows closed at the jetties 1 hour earlier than normal).

- **Case 1B: the more severe scenario.** The channel width was reduced to 250 ft or less (such that no vessels were able to pass on the Inner Channel) and the depth was reduced by roughly 2 ft (such that the boarding windows opened at the jetties 2 hours later and closed 1 hour earlier than normal).
Estimated Change in Vessel Charter Costs for Case 1A and Case 1B in 2023

- Case 1A -- 1 foot draft reduction
- Case 1B -- 2 foot draft reduction

<table>
<thead>
<tr>
<th>Vessel Type</th>
<th>Number of Vessel Calls</th>
<th>Case 1A</th>
<th>Case 1B</th>
<th>Case 1A</th>
<th>Case 1B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large LNG</td>
<td>645</td>
<td>2.8</td>
<td>12.5</td>
<td>$7.6M</td>
<td>$33.7M</td>
</tr>
<tr>
<td>Small LNG</td>
<td>190</td>
<td>&lt;0.1</td>
<td>-0.2</td>
<td>&lt;$0.1M</td>
<td>($0.1M)</td>
</tr>
<tr>
<td>Deep Draft (Laden Inbound)</td>
<td>321</td>
<td>0.6</td>
<td>1.5</td>
<td>$0.2M</td>
<td>$0.4M</td>
</tr>
<tr>
<td>Deep Draft (Laden Outbound)</td>
<td>50</td>
<td>1.4</td>
<td>8.2</td>
<td>$0.1M</td>
<td>$0.3M</td>
</tr>
<tr>
<td>Wide</td>
<td>478</td>
<td>&lt;0.1</td>
<td>-0.3</td>
<td>&lt;$0.1M</td>
<td>&lt;$0.1M</td>
</tr>
<tr>
<td>Narrow</td>
<td>499</td>
<td>1.4</td>
<td>1.1</td>
<td>$0.1M</td>
<td>$0.1M</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,183</strong></td>
<td></td>
<td></td>
<td><strong>$8.0M</strong></td>
<td><strong>$34.4M</strong></td>
</tr>
</tbody>
</table>

The overall economic impact of insufficient dredging on the future channel operations would likely be much greater than just these charter costs – for example, the terminals would have additional costs due to delayed deliveries or shipments. Since the charter cost increases alone are already high, this case emphasizes the economic importance of sufficient dredging to the channel operations.

Charter Costs are a proxy for total Costs. Note the **Exponential Increase** in Costs.

(Source: Ausenco Traffic Study) * Note that “<$0.1M” signifies a negligible increase or decrease to charter costs.
Draft Reductions Delay
LNG Vessels

Source: Ausenco Traffic Study
Draft Reductions Delay Tanker Vessels

Source: Ausenco Traffic Study
Large LNG carriers and Deep Draft vessels were impacted most significantly by insufficient dredging because of the direct impact on the boarding windows. For example, the 99th percentile wait times for these vessels more than doubled.

Such increases indicate that insufficient dredging dramatically affected the ability of the channel to handle large vessel traffic when it experienced heavy weather events.

Source: Ausenco Traffic Study
Weather Events

• **Boarding Windows (tides)** – Deep draft vessels
  – Year round

• **Wind** – All vessels (LNG has lower wind threshold)
  – September through May – 3% to 16% of the time

• **Visibility** – All vessels
  – October through April – 6% to 14% of the time

• **Low Water Events** – All vessels
  – November through February – 13% to 16% of the time

• **Unpredictable Events**

*Source: Ausenco Traffic Study*
Example of a Long Wait Time
Worst Case (100<sup>th</sup> Percentile) Scenario

Source: Ausenco

Several vessels per year experienced excessive wait times. The figure below demonstrates a series of events that prevented a vessel from entering the channel, and shows how wait time can be the result of multiple causes.
Low Water Event
Calcasieu Pass
Weather Induced Tsunami/Seiche
Cameron Parish Shoreline

For a more detailed explanation see: http://oceanservice.noaa.gov/facts/seiche.html
Dredging Impacts Recovery from Weather Events

3-day Closure in 2023 – Properly Maintained Channel

Source: Ausenco Traffic Study

Channel Recovery After Downtime Event

Threshold for Recovery: 2 vessels

Average: 1 vessel waiting to enter

Average Number of Waiting Inbound Vessels

Days after Weather Closure Ends (at t = 0)
Dredging Impacts Recovery from Weather Events

3-day Closure in 2023 – Poorly Maintained Channel

Source: Ausenco Traffic Study

Case 1B - Average Vessels Waiting for a 3 Day Closure in 2023

Average Number of Waiting Inbound Vessels

WEATHER

RECOVERY PERIOD

RECOVERED

Average: 2.3 vessels waiting to enter

Threshold for Recovery: 3.3 vessels
Proper dredging of the channel is essential to maintain the present performance and to ensure that future traffic will not experience significant delays that could prevent the terminals from meeting their targets.

As a result of insufficient dredging, the overall charter costs increased, by $8.0M per year in Case 1A and by $34.4M per year in Case 1B based on 2023 expected traffic. This increase was primarily driven by the additional delays imposed on Large LNG Carriers, although almost all vessel categories were negatively impacted.

Source: Ausenco Traffic Study
Users Expect A Reliable Channel At Authorized Dimensions

Operational Safety
Provides a Margin of Safety for Operations

Environmental Protection
From a Safer Operating Environment

Commercial Efficiency
Eliminate additional vessel and terminal costs

$30-$40 million (in 2014 dollars) needed annually to maintain congressionally authorized dimensions for safe, reliable, and environmentally sound operations on the Calcasieu Ship Channel.
Dredging Must Be A National Priority

• Navigation funding is an essential component for the Nation’s Energy Development and Global Trade

• America’s Marine Transportation System infrastructure must be a National priority with consistent, adequate funding

• A national commitment to shipping, global trade and navigation infrastructure is absolutely essential

• Current O&M funding levels for deep draft channels are grossly inadequate. HMTF collections must be used for their intended purpose

• Navigation funding is key to Energy Development, the Economy, Jobs, and Exports
Questions?

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