Hanson Marine Operations / Jerico Products, Inc.

Sand Mining in Central San Francisco and Suisun Bays

Project Description and Overview

January 23, 2014
Proposed Project

- Mine up to 1.54 million cubic yards of sand from Central San Francisco Bay annually for 10 years.

- Mine up to 300,000 cubic yards of sand from Suisun Channel annually for 10 years.

- Mine up to 200,000 cubic yards of sand from Middle Ground Shoal annually for 10 years.
Central Bay Lease Locations

Central Bay - 2,601-acre area: 9 parcels of submerged lands that comprise 4 leases from the California State Lands Commission (SLC) – Hanson only
Suisun Associates - - 938-acre area of submerged lands within the Suisun Channel in Suisun Bay — leased by Suisun Associates, a joint venture between Hanson and Jerico Products.
Middle Ground-367-acre area of submerged lands leased from Grossi Family (same area leased by Hanson and Jerico separately)
Sand Mining History

- Channel and harbor dredging to remove sand and other sediment deposits from the Bay began in the 1800s, and construction sand mining within the Bay-Delta estuary began in the 1930s.

- Sand Mining within the Central Bay and Suisun Bay has occurred for over 70 years.
Sand Mining History

- After acquiring two Bay area sand mining companies, Hanson entered sand mining business in 1999.
- Jerico began sand mining in 1970’s; Middle Ground shoal, Suisun Channel, Chipps Island, and New York Slough in the Delta.
- Suisun Associates is a joint venture between Hanson and Jerico after they both acquired companies of the original joint venture.
Need for Bay Sands

- Key component of building materials including fill and road materials, concrete and hot mix asphalt used in a variety of construction projects.

- *Local Resource* that is efficiently harvested and transported to Bay Area consumers.

- Reduces nearly 5,000,000 truck miles annually compared to other sources – which would generate up to 45 times more GHG and CAP emissions. *(Source: Environ Air Quality Study, 2013)*
# Annual Sand Mining Volumes (cy)

## Historic Permitted vs Proposed

<table>
<thead>
<tr>
<th>Leases</th>
<th>Current Permitted Volumes</th>
<th>Proposed Project Annual Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRC 709: Presidio Shoals (Hanson)</td>
<td>540,000</td>
<td>340,000</td>
</tr>
<tr>
<td>PRC 2036: Point Knox South (Hanson)</td>
<td>300,000</td>
<td>450,000</td>
</tr>
<tr>
<td>PRC 7779: Point Knox Shoal (Hanson)</td>
<td>400,000</td>
<td>550,000</td>
</tr>
<tr>
<td>PRC 7780: Alcatraz South Shoal (Hanson)</td>
<td>150,000</td>
<td>200,000</td>
</tr>
<tr>
<td>PRC 7781: (Suisun Associates – a joint venture between Hanson and Jerico)</td>
<td>100,000</td>
<td>300,000</td>
</tr>
<tr>
<td>PRC 5871</td>
<td>NA</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*State Lands Lease Totals: Central Bay & Suisun Bay* | 1,490,000 | 1,840,000 |

| Hanson - Grossi Middle Ground | 500,000 | 50,000 |
| Jerico – Grossi Middle Ground | 250,000 | 150,000 |

*Middle Ground Private Leases Total* | 750,000 | 200,000 |

**TOTAL ALL LEASES** | **2,240,000** | **2,040,000**

Note: 1 These volumes are the original permitted volumes; recent permit extensions have lower annual volume limits that were agreed to as part of the temporary extension process.
Sand Harvest Equipment
Sand Harvest Equipment

Hanson hydraulic suction drag arm & drag head assembly (retracted position)
Sand Harvest Equipment

Hanson’s hydraulic suction draghead showing articulating “visor” and “grizzly” to exclude >6” material during sand mining
Sand Harvest Equipment

Jerico’s hydraulic suction pipe assembly
Sand Harvest Methods

A - Stationary potholing
   *currently used by Jerico*

B - Trolling (no longer used)

C - Moving Potholing
   *currently used by Hanson*
Sand Harvest Equipment

Loading - barge loading chute and gate
Sand Offloading Locations

Figure 3-12
Marine sand offload locations within the Bay-Delta estuary
### Event Frequency & Durations

<table>
<thead>
<tr>
<th>Year</th>
<th>Hanson # of Events</th>
<th>Jerico # of Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>514</td>
<td>187</td>
</tr>
<tr>
<td>2011</td>
<td>133</td>
<td>68</td>
</tr>
<tr>
<td>2012</td>
<td>108</td>
<td>52</td>
</tr>
<tr>
<td>2013</td>
<td>152</td>
<td>62</td>
</tr>
</tbody>
</table>

- Average Duration ranges between 3 to 6 hours
- At least one complete tidal cycle before barge returns to site
Event Tracking

Site: 709S

Year – 2011

Year 2011
Full Site

Legend
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Lease Boundary
Event Tracking

Site: 709S
Year - 2012

Legend:
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Lease Boundary
Event Tracking

Lease Boundary

Site: 709S

Year: 2013

Legend:
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Year 2013
Full Site

20
Event Tracking

Site: 7779W and 2036
Event Tracking

Site: 7779W and 2036
Year 2013
Full Sites

Legend

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Year – 2013
Central Bay Benthic Disturbance

- Less than 7% of the area over each year has been disturbed from mining activities; monthly average is significantly less.
- % disturbed from mining events ranged over the past three years between 0% and 30.8% within an individual lease area.
- Annual percentages of disturbance ranged between 5.6% and 6.6%. This is a very conservative estimate as it assesses a general area of potential monthly disturbances over the year.

Source: Hanson/Jerico Response to NMFS Questions Regarding Benthic Disturbance and Fishery Habitat
Suisun Channel Benthic Disturbance

- Only 50.4 acres of the 367-acre Middle Ground lease is feasible to mine due to depth restrictions – about 14%.
- Jerico on average disturbs only 0 – 3.4% of the smaller area monthly. Only 18-20% of the small channel area was disturbed on an annual basis – with only 2.6-2.8% of the total lease area disturbed.
- Suisun Associates lease disturbance significantly less - between 0 - 0.08%.

Source: Hanson/Jerico Response to NMFS Questions Regarding Benthic Disturbance and Fishery Habitat
History - Environmental Analysis

- **2001 -2002 Work Group Mtgs** with State and federal regulatory and resource agency staff developed Study Plan to assess potential impacts from Sand Mining

- **2004 Report** Assessment & Evaluation Of The Effects Of Sand Mining On Aquatic Habitat And Fishery Populations Of Central San Francisco Bay And The Sacramento–San Joaquin Estuary
  - Independent panel of scientific peer reviewers

- **Additional Studies after 2004 Report**
  - Entrainment Study

- **EIR development**
  - Entrainment Study (AMS 2009)
  - Benthic Study (AMS 2009)
  - Bathymetric and Hydrodynamic Study (CHE 2009)

- **EIR certified 2012 by California State Lands Commission**
Avoidance & Minimization Measures: an Evolving Process

- 100 ft buffer around hard bottom areas within and adjacent to Central Bay lease areas
- Monitoring mining events/locations
- Water depth limitations to avoid sensitive habitat
- End of pipe shall be held at a height in the water column no greater than 3ft off the bottom when priming the pump or clearing the pipe
- Fish Screens (installed in Fall 2013)
Avoidance/Minimization Measures – Fish Screens
Thank You!

Questions Prior to the Panel Discussion?