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## **Appendix A.**

### **Channel Deepening Project Volume History**



**Dredging History (2001 – 2004)**

From 2001 through 2004, the volume of material dredged or excavated as a result of the POLA Channel Deepening Project has increased from 6.6 million cubic yards (mcy) to approximately 13 mcy. Table 1 below shows the history of changes in the volume of dredge material analyzed in the four environmental documents prepared to date.

**Table 1 Estimated Dredge Volumes 2000 through 2004**

Feature Descriptions	Estimated Dredge Volumes				
	1	2	3	4	5
	SEIS/SEIR (February 2001)	Supplemental EA (July 2002)	Design Plans & Specs (August 2002)	Supplemental EA (June 2003)	Sand Mining Supplemental EA (Sept. 2004)
Purpose	Deepen Channels & Berths to -53' MLLW	Design Refinements	Design Refinements	Contaminated Material Removal	Sand Mining, building material
General Navigation Features					
Federal Channel	+6.160	+0.730	-0.450	--	--
SWS Foundation		+0.170	+0.067	--	--
<i>Subtotal</i>	<i>6.160</i>	<i>0.900</i>	<i>-0.383</i>	<i>0.000</i>	<i>0.000</i>
Berth Dredging	<i>0.440</i>		<i>-0.050</i>		
POLA Added Work					
Foundation Trenches	--		+0.372	--	--
Other Channels (Pilot Station)	--	+0.500	+0.119	--	--
Pier 400 Surcharge	--	+1.800	+0.500	--	--
Berth 44-60 Product Removal	--	--	--	+0.300	--
Pit Mining (D203A)	--	--	--	--	+2.000
Future Dike Foundations	--	--	--	--	--
Future Consolidated Slip	--	--	--	--	--
<i>Subtotal</i>	<i>0.000</i>	<i>2.300</i>	<i>0.991</i>	<i>0.300</i>	<i>2.000</i>
<i>Document Total</i>	<i>6.600</i>	<i>3.200</i>	<i>0.558</i>	<i>0.300</i>	<i>2.000</i>
<b>Project Total</b>	<b>6.600</b>	<b>9.800</b>	<b>10.358</b>	<b>10.658</b>	<b>12.658</b>

The project volumes have been separated into the following work features:

- 1) General Navigation Features: This feature includes volumes of material moved to deepen the existing Federal Navigation Channel and turning basins to the currently authorized depth of -53 feet MLLW and for preparing dike foundations at the Southwest Slip disposal site.
- 2) Berth Dredging: This feature includes those volumes of material moved to deepen the berth areas.
- 3) POLA Added Work. This feature includes those volumes of material moved for improving structural stability of the in-harbor landfills or for the Confined Disposal Facility to contain contaminated materials.

#### **Column 1, February 2001 Record of Decision**

An SEIS/SEIR prepared in 2000 and approved in 2001 evaluated impacts associated with deepening the Federal Navigation Channel and some berths to -53-feet MLLW. The total volume of dredge material determined to be necessary to accomplish this was 6.6 mcy.

#### **Column 2, July 2002 Supplemental Environmental Assessment (Supplemental EA)**

In July 2002, a Supplemental Environmental Assessment was prepared to evaluate the impacts of dredging and disposing additional material. The estimated amount of material had changed because of the following reasons:

- Federal Channel (0.730 mcy):
  - the availability of more recent bathymetric data showed more volume in the dredge template (0.13 mcy),
  - the inclusion of maintenance dredging material lying above the previously authorized depth of -45-feet (0.20 mcy); and
  - the design change to deepen the entire East Turning Basin, rather than part of it, in order to facilitate ship safety in this area (0.40 mcy).
- Southwest Slip (SWS) (0.17 mcy): This volume was required for foundation trench construction at the Southwest Slip (SWS) disposal site.

Additionally, the Port, as authorized under the 1988 WRDA, requested the following design changes:

- Pilot Station (0.500 mcy): Dredging to deepen the navigation channel south of the Pilot Station -51 feet MLLW.
- Pier 400 Surcharge (1.800 mcy): Estimated volume of surcharge material to be moved from Pier 400 into the Pier 400 SMSS for landfill improvement.

#### **Column 3, August 2002 Plans and Specifications**

In August 2002, detailed Plans and Specifications (P&S) prepared for the construction contractor showed slightly different volumes in the Federal Channel (0.450 mcy less) and berths (0.05 mcy less) due to a design offset from the pierhead line.

At this time POLA requested that the following work also be completed:

- Foundation Trenches (0.372 mcy): This included trenching for rock dike foundations at the Pier 300 Expansion Disposal Site D214 (0.355 mcy) and for a future expansion area south of Berth 100, referred to as Southwest Slip Area 3 D211 (0.017 mcy).
- Other Channels (0.119 mcy): This included the -51-foot channel south of the Pilot Station. The volume available based upon design in the P&S increased from 0.5 mcy.

- Pier 400 surcharge (0.5 mcy): Surcharge removal increased by this amount from the original estimate of 1.8 mcy.

#### **Column 4, June 2003 Product Removal Supplemental EA**

The June 2003 Supplemental EA included an estimate for removal of contaminated material at Berths 44 to 60 ("Berth 44-60 Product Removal" in Table 1). These materials were included to take advantage of the Confined Disposal Facility at the SWS Area 1 disposal site. The Supplemental EA states that a total of approximately 0.300 mcy required dredging.

#### **Column 5, September 2004 Sand Mining Supplemental EA**

At the request of POLA, coarse-grained materials from the Main Channel were mined to provide better structural material for the Pier 300 Expansion Site than was available from the dredge template. The September 2004 Supplemental EA states "Dredging for the purposes of sand mining will be to a maximum depth of -90 feet MLLW as required to produce an additional volume of approximately 2.0 mcy of coarse-grained sand." (Pit Mining D203A in Table 1)

### **Current Dredging Need**

As of 2006, the estimated volume of material necessary to be dredged has again changed. The actual volume of material dredged to date is shown below in Table 2. This table includes the same fields as Table 1 as well as two additional fields, Non-Pay Excess and Fill:Cut Balance, which are described below:

- Non-Pay Excess: This feature is the dredging that resulted from materials removed from outside the channel design template and the -2-foot overdepth allowance.
- Fill:Cut Balance: This feature is to account for processes that occur during in-harbor dredge and disposal operations such as, bulking, shoaling, and settlement. When in-situ material is dredged, the material bulks as it is placed into the fill area, typically some of the fine material escapes the fill area as the fill site is dewatered, some of this escaped material shoals at the bottom of the channel where it can be dredged again while some is lost to areas that will not require dredging again. Materials in the fill site settle. A cleanup volume was dredged and is added to the volume history.

**Table 2 Actual and Remaining Dredge Volumes, 2006-2007**

	Column 1	Column 2
Feature Descriptions	Volume Dredged to Date (2006)	Remaining Material to be Dredged
<b>General Navigation Features</b>		
Federal Channel	+5.822	+1.025
SWS Foundation	+0.230	-
<b>Berth Dredging</b>	<i>+0.346</i>	<i>+0.675</i>
<b>POLA Added Work</b>		
Foundation Trenches	+0.364	-
Other Channels (Pilot Station)	+0.615	-
Pier 400 Surcharge	+2.332	-
Berth 44-60 Product Removal	+0.309	-
Pit Mining (D203A)	+1.960	-
Future Dike Foundations	-	-
Future Consolidated Slip	-	-
<b>Non-Pay Excess</b>	+0.750	+0.153
<b>Fill:Cut Balance</b>	+0.863	+0.259
<i>Subtotal</i>	<i>13.591</i>	<i>2.112</i>
<b>Cumulative Project Total</b>	<b>13.591</b>	<b>15.703</b>

**Column 1 Volume Dredged to Date**

Volumes presented are based upon information available regarding dredged material to date under the existing construction contract.

- Federal Channel (5.822 mcy): Volume of dredging that has been completed within the Federal Channel (including Cerritos Channel) has been completed.
- SWS Foundation (0.230 mcy): 0.230 mcy has been removed from the design dredge template and is complete.
- Berth Dredging (0.346): This row represents the volume removed from the current berth design dredge template plus the volume of berth maintenance dredging from Evergreen Terminal Berths 226 to 231 which was conducted under permit action in 2003:
- POLA Added Work:: This heading reflects the actual volumes for the foundation trenches, other channels, surcharge, product removal and pit mining.
  - Foundation Trenches (0.364 mcy): Actual volume removed from the design template for Pier 300 Expansion (0.347 mcy) and SWS Area 3 (0.017 mcy).
  - Other Channels (0.615): Actual volume removed from the design template for the -51-foot Pilot Station Channel (0.584 mcy) and the SWS -37-foot channel D206A (0.031 mcy).

- Pier 400 Surcharge (2.332 mcy): Actual volume moved from Pier 400 to Pier 400 SMSS (2.245 mcy); from Pier 400 to SWS (0.035 mcy); and from Berth 100 to SWS (0.052 mcy)
- Berth 44-60 Product Removal (0.309 mcy): Actual volume removed from the design dredge template and placed into the Confined Disposal Facility at the SWS Area 1.
- Pit Mining (D230A) (1.960 mcy): Actual volume removed from the design dredge template and placed into the Pier 300 Expansion and SWS disposal sites
- Non-Pay Excess (0.750 mcy): Actual volume of material removed outside of the design dredge templates due to field conditions and construction methods (e.g. dredge activities sometimes extract large contiguous pieces of clay that result in an area of deeper dredge than intended). Based on construction activities to date, this volume is computed to be approximately 9% of the available design template volume.
- Fill:Cut Balance (0.863 mcy): This volume accounts for bulking, shoaling, material loss, and settlement that occurs during dredging and in-harbor disposal operations. A cleanup volume was dredged and is added to the volume history.

#### Column 2 Remaining Material to be Dredged (2007 SEIS/SEIR Base)

- Federal Channel (1.025 mcy): This volume includes an estimate of those materials still in the East Basin Channel and East Turning Basin (Dredge Element D210) (0.981 mcy) as well as the material required to complete deepening in the Cerritos Channel area (0.050 mcy). However, there is no deep draft use at berthing areas along the north slope of the Cerritos Channel and there is no need for deep draft access. Furthermore, if deepening were to occur under current conditions, the docks in this area would be destabilized. Therefore, the berthing areas along the north slope of the Cerritos Channel will not be dredged as part of the Proposed Action.
- Berth Dredging (0.675 mcy): This volume includes an estimate of those materials still in the berths along the East Basin Channel (within Dredge Element D210) that are required to be removed to deepen the berths to -53 feet MLLW as well as the rest of the berths originally identified in the 2000 SEIS/SEIR.
- Non-Pay Excess (0.153 mcy): This volume is estimated presuming the same rate of removal as experienced under the current construction contract, 9% of the volume available in the design template.
- Fill:Cut Balance (0.259 mcy): This volume is estimated based upon the increases in Remaining Federal Channel, Remaining Berths and Non-Pay Excess. The Future Fill:Cut Balance is estimated to be 14% of the future material to be dredged, as described above.

Of note is approximately **0.815 mcy** of material temporarily stored on the Southwest Slip Area 1. This is material serving as surcharge, and once proper settlement of the landfill has been reached, the materials will be available for disposal elsewhere. Since it is anticipated that these materials will be transported by land, non-pay excess dredge and fill:cut balance factors are not applied to this volume. Since these materials originated from the Channel Deepening Project, they would be double-counted should they be reflected in the chart and tables.

### POLA Channel Deepening Volume History Chart

