



BAE SYSTEMS SAN FRANCISCO SHIP REPAIR 2014 DREDGING PROGRAM

Prepared for

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1 INTRODUCTION

BAE Systems San Francisco Ship Repair, Inc. (BAE Systems), operates and maintains a large-scale ship repair facility at the Port of San Francisco's Pier 70 complex (Figure 1). This facility consists of two piers and two dry docks (Figure 2). BAE Systems currently provides ship repair services to the U.S. Coast Guard, U.S. Navy, and commercial cruise lines. To provide these services, BAE Systems performs regular maintenance dredging to ensure consistent navigational capacity to and from the dry docks and piers. Table 1 provides a brief history of BAE Systems's past maintenance dredging efforts at the site. In addition to the areas mentioned in Table 1, BAE Systems occasionally needs to dredge portions of the Central Basin outside of their leasehold.

Table 1
Past BAE Systems Maintenance Dredging Volumes

Dredge Area	Permit Depth (ft MLLW)*	Dredge Volumes by Year (cy)							
		2006	2007	2008	2009	2010	2011	2012	2013
Pier 3 West	-32	ND	ND	ND	ND	ND	ND	ND	ND
Pier 3 East	-32	ND	ND	ND	ND	ND	ND	ND	ND
Pier 4 East	-34	ND	ND	ND	ND	17,067	ND	ND	ND
Pier 4 East (Sump)	-37								
Dry Dock 1	-49	ND	36,361	ND	ND	ND	ND	ND	ND
Dry Dock 2	-62.5	ND	ND	93,832	ND	ND	95,205	ND	ND

Notes:

*Permit depths do not include allowable 2-feet of overdepth

cy = cubic yards

ft = feet

MLLW = mean lower low water

ND = No dredging

Dredging and dredged material disposal and placement is regulated by the San Francisco Bay Long-Term Management Strategy (LTMS), as outlined in their Management Plan (USACE et al. 2001). Beginning in 2001, the LTMS Management Plan has required a gradual reduction in the volume of dredged material disposed in San Francisco Bay with a final target of 1.25 million cubic yards (cy) cumulatively among all dredgers after 2012. Applicants such as BAE Systems who do not qualify as small dredgers are required to meet the following LTMS goals:

- To dispose of 80% of material out-of-Bay.
- To prepare an Integrated Alternatives Analysis (IAA) that outlines a mid- to long-term plan, identifying alternatives to in-Bay disposal that will enable the dredger to either dispose or reuse a substantial portion of the material they intend to dredge during an extended planning period.

Past BAE Systems dredging activities were addressed in a 2007 IAA (Anchor Environmental) that was updated in 2011 (Weston). This IAA presents BAE Systems's recent and projected dredging program for 2013 through 2018 (a 6-year period) and includes an analysis of dredged material placement options in conformance with the LTMS goals.

Based on past testing, it is anticipated that sediment within the dredge footprint will be suitable for placement either in-Bay or at San Francisco Deep Ocean Disposal Site (SFDODS), or for beneficial reuse as clean cover material at the Montezuma Wetlands Restoration Project (Montezuma), while contaminated sediment that is not suitable for unconfined placement will be disposed of at an appropriate location, potentially including Montezuma (not as clean cover) or an upland landfill.

1.1 Current Episode

BAE Systems is currently pursuing regulatory approval for the proposed 2014 dredge episode (Figure 3). All dredging episodes will be conducted under the approvals outlined in Table 2.

For 2014, BAE Systems seeks to dredge a total of approximately 108,000 cy (including a 2-foot overdepth) from Pier 4 East (40,000 cy) and Dry Dock 2 (68,000 cy). This IAA identifies disposal options for the 2014 episode that will allow BAE Systems to meet the LTMS goal of

diverting 80% of their projected dredging volume to sites other than in-Bay aquatic disposal. From 2013 through 2018, the projected dredge volume is approximately 463,000 cy.

Table 2
BAE Systems Dredging Approvals

Agency and Approval	Status	Permit Duration
U.S. Army Corps of Engineers; Individual Permit (Permit No. 400192S)	Issued	December 31, 2018
San Francisco Bay Regional Water Quality Control Board; 401 Water Quality Certification	Pending	2014 (single dredging episode)
San Francisco Bay Conservation and Development Commission; Non-material Amendment to Minor Permit (Permit No. M93-13)	Pending	2014 (single dredging episode)
State Lands Commission dredging lease (PRC 6759.9)	Issued	October 15, 2018

2 DREDGING VOLUMES FOR 2013 TO 2018

Actual and projected maintenance dredging volumes for the period of 2013 through 2018 are shown in Table 3.

Table 3
Dredging Volumes for 2013 to 2018

Dredge Area	Permitted Depth (ft MLLW)	Dredge Volumes by Year (cy)*							
		2013	2014	2015	Estimated Total 3-Year Volume	2016	2017	2018	Estimated Total 6-Year Volume
Pier 3 West	-32	ND	ND	ND	0	ND	43,000	ND	43,000
Pier 3 East	-32	ND							
Pier 4 East	-34	ND	40,000	ND	40,000	ND	42,000	ND	82,000
Pier 4 East (Sump)	-37	ND							
Dry Dock 1 (Eureka)	-49	ND	ND	ND	0	60,000	ND	ND	60,000
Dry Dock 2	-62.5	ND	68,000	ND	68,000	ND	ND	210,000	278,000
Central Basin	-32	ND	ND	ND	0	ND	ND	ND	0
Total		0	108,000	0	108,000	60,000	85,000	210,000	463,000

Notes:

cy = cubic yards

ft = feet

ND = No dredging

MLLW = mean lower low water

NUAD = not suitable for unconfined aquatic disposal

*= Includes 2-foot allowable dredging overdepth

3 SEDIMENT PLACEMENT AND DISPOSAL OPTIONS ANALYSIS

This section includes a summary of potential in-Bay and out-of-bay sediment placement and displacement and disposal options. Placement at the in-Bay Alcatraz Island disposal site (SF-11) remains the most economical option for disposal, but is limited by LTMS goals. SFDODS remains an available disposal option for out-of-Bay placement, but it is understood that the LTMS goals target increased beneficial reuse of dredged material. For highly contaminated sediment, disposal at an upland landfill may be required.

As summarized in Table 4, BAE Systems has evaluated a variety of out-of-Bay options as alternatives to in-Bay disposal at SF-11. Currently, five beneficial reuse sites in the San Francisco Bay Area are permitted and may potentially accept sediment during the period analyzed in this IAA, including the following:

- Cullinan Ranch
- Montezuma
- Winter Island
- Suisun Marsh Levee Maintenance
- Van Sickle

Options for beneficial reuse were considered based on their availability and capacity to receive material, tipping fees, ability to accept contaminated sediment, and logistical factors which may affect site viability and disposal costs (e.g., shipping distances and equipment requirements). Additional beneficial reuse options may become available in the future, including potential placement for levee repair and ecosystem restoration. These options may be considered as they become available, although distance and capacity issues may keep them from being cost feasible.

Table 4
Placement and Disposal Options Evaluation

Placement/ Disposal Site	Capacity	Distance (miles)	Tipping Fee	Site Logistic Notes
In-Bay				
SF-11	Limited to 400,000 cy per month from October to April and 300,000 cy per month from May to September	~2-3	No fee	<ul style="list-style-type: none"> Up to 150,000 cy per month Volume limits further restricted by the overall annual in-Bay disposal volume limits of the LTMS.
Out-of-Bay				
SFDODS	4.8 million cy per year	~57	No fee	<ul style="list-style-type: none"> Site users are responsible for a volume-based <i>pro rata</i> share of annual site monitoring costs.
Cullinan Ranch	405,000 cy	~27	No fee	<ul style="list-style-type: none"> Offloading equipment must be provided by the contractor. Recently received a State Lands lease to use an offloader at Napa River, which will allow access by larger scows.
Montezuma Wetland Restoration Project	14,000,000 cy	~49	\$9 to \$13 per cy (cover material); \$25-30/cy (foundation material)	<ul style="list-style-type: none"> Has an offloader in place and operating. Site can accommodate most scows with a light draft height of less than 24 feet.
Winter Island	353,265 cy under existing permits	~49	\$1 per cy	<ul style="list-style-type: none"> Offloading equipment must be provided by the contractor. Placement of sediment on levees requires wetland cover quality material. Site can only accept small to moderate sized scows.

Placement/ Disposal Site	Capacity	Distance (miles)	Tipping Fee	Site Logistic Notes
Suisun Marsh Levee Maintenance	Limited; varies by location	~43	No fee	<ul style="list-style-type: none"> • Offloading equipment must be provided by the contractor. • Most of these levees would be accessed through shallow sloughs, which limits scow size. • Levee projects must be identified and coordinated individually.
Van Sickle	19,000 cy per year	~46	No fee	<ul style="list-style-type: none"> • Offloading equipment must be provided by the contractor.

Notes:

cy = cubic yards

IAA = Integrated Alternatives Analysis

LTMS = Long-term Management Strategy

Sources: LTMS 2013, USACE 2004, USEPA 2011, Ducks Unlimited 2014, Calone 2014, Lipton 2014, Suisun Resource Conservation District 2014.

3.1 Projected Sediment Placement and Disposal Site Use

Currently, three sites stand out as the preferred disposal/placement sites: in-Bay placement at SF-11 for up to 20% of the total volume; and disposal at SFDODS or beneficial reuse at Montezuma for out-of-Bay placement. In-Bay placement is the lowest cost option with the fewest logistical challenges, but is limited by LTMS goals. For out-of-Bay placement, SFDODS appears to have costs for placement in the range of clean cover placement at Montezuma. Montezuma can accommodate large quantities of material, has an off-loader on-site, and can accept contaminated sediments. Furthermore, SFDODS and Montezuma offer predictability and reliability critical to planning dredging programs, as these sites have routinely accepted material in recent years. However, alternative beneficial reuse sites may be chosen if they can offer equal or greater service benefits at a lower or similar cost.

BAE Systems is committed to meeting the LTMS goal of diverting at least 80% of dredged material from in-Bay disposal for the current planning period. Although recently proposed amendments to LTMS guidance allow for this goal to be met over periods of up to 5 years (i.e., amortizing disposal of 80% out-of-Bay over 5 years) instead of 3 years, due to the uncertainty associated with future dredging volumes and timing, BAE Systems currently proposes to meet the LTMS diversion goals on an annual per-episode basis. Using this approach, should diversions from the anticipated dredging program occur (e.g., not dredging

in a given year, dredging different quantities than projected, using a different disposal/placement site due to logistical reasons, etc.), LTMS goals would still be met. Table 5 provides the proposed annual disposal/placement scenarios for BAE Systems's 2013 through 2018 maintenance dredging schedule. While the 2011 IAA noted that additional dredging would occur in the 2013 to 2015 period, Table 5 provides an updated estimation of realistic dredging needs and supersedes information presented in the 2011 IAA. No dredging occurred in 2013, and no dredging is anticipated to occur in 2015.

Table 5
Projected Dredging Projects and Potential Disposal Sites for 2013 to 2018

Disposal/ Placement Option	Annual Disposal Volumes (cy)									
	2013	2014	2015	3-Year Total		2016	2017	2018	3-Year Total	
				CY	%				CY	%
In-Bay (SF-11)	0	21,600	0	21,600	20	12,000	17,000	42,000	71,000	20
Out-of-Bay (SFDODS or Montezuma)	0	86,400	0	86,400	80	48,000	68,000	168,000	284,000	80
Total	0	108,000	0	108,000	100	60,000	85,000	210,000	355,000	100

Notes:

cy = cubic yards

SFDODS = San Francisco Deep Ocean Disposal Site

SF-11 = in-Bay Alcatraz Island disposal site

3.1.1 Current Episode

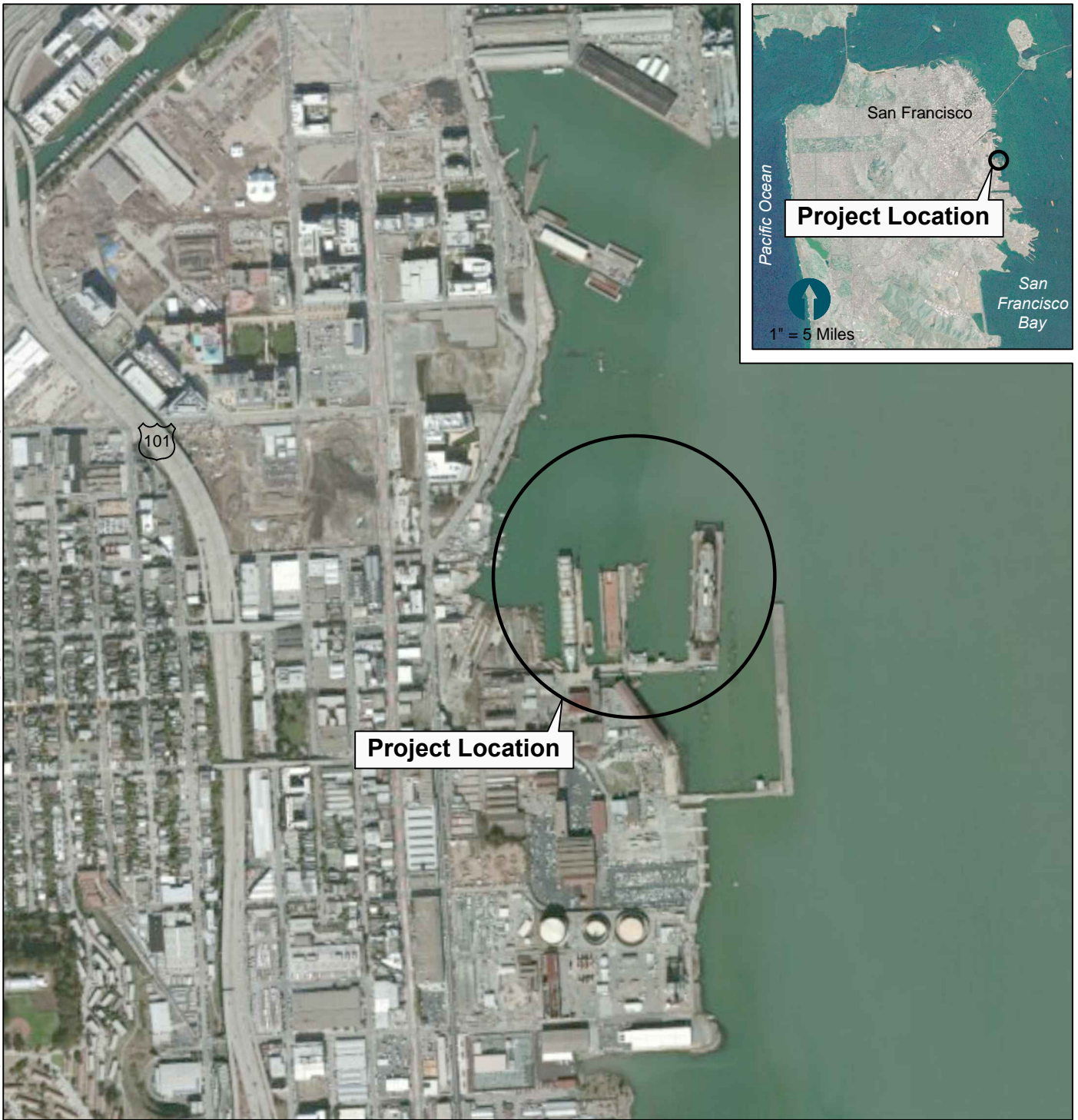
For the 2014 dredging episode, BAE Systems proposes to place up to 20% of material at the SF-11 site. For out-of-Bay commitments, BAE Systems proposes to dispose of sediment at SFDODS, and/or beneficially reuse sediment at Montezuma. BAE systems is willing to commit to placement at Montezuma if the material is suitable for placement as clean cover, if placement is not more expensive than SFDODS, and if the tipping fees and off-loader availability can be guaranteed. Future dredging episodes would also comply with current LTMS diversion goals as per the Table 5.

4 REFERENCES

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<http://www.spn.usace.army.mil/Portals/68/docs/Dredging/LMTS/Final%20Review/Appendix%20B.pdf>.
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- Weston Solutions, Inc., 2011. *BAE Systems Maintenance Dredging Integrated Disposal Alternatives Analysis Update*. August 2011.

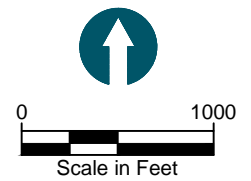
FIGURES

K:\Projects\0277-BAE Systems SFSR, INC\Support BAE Systems' Dredging Needs SF0277-RP-003 (Vicinity).dwg F1

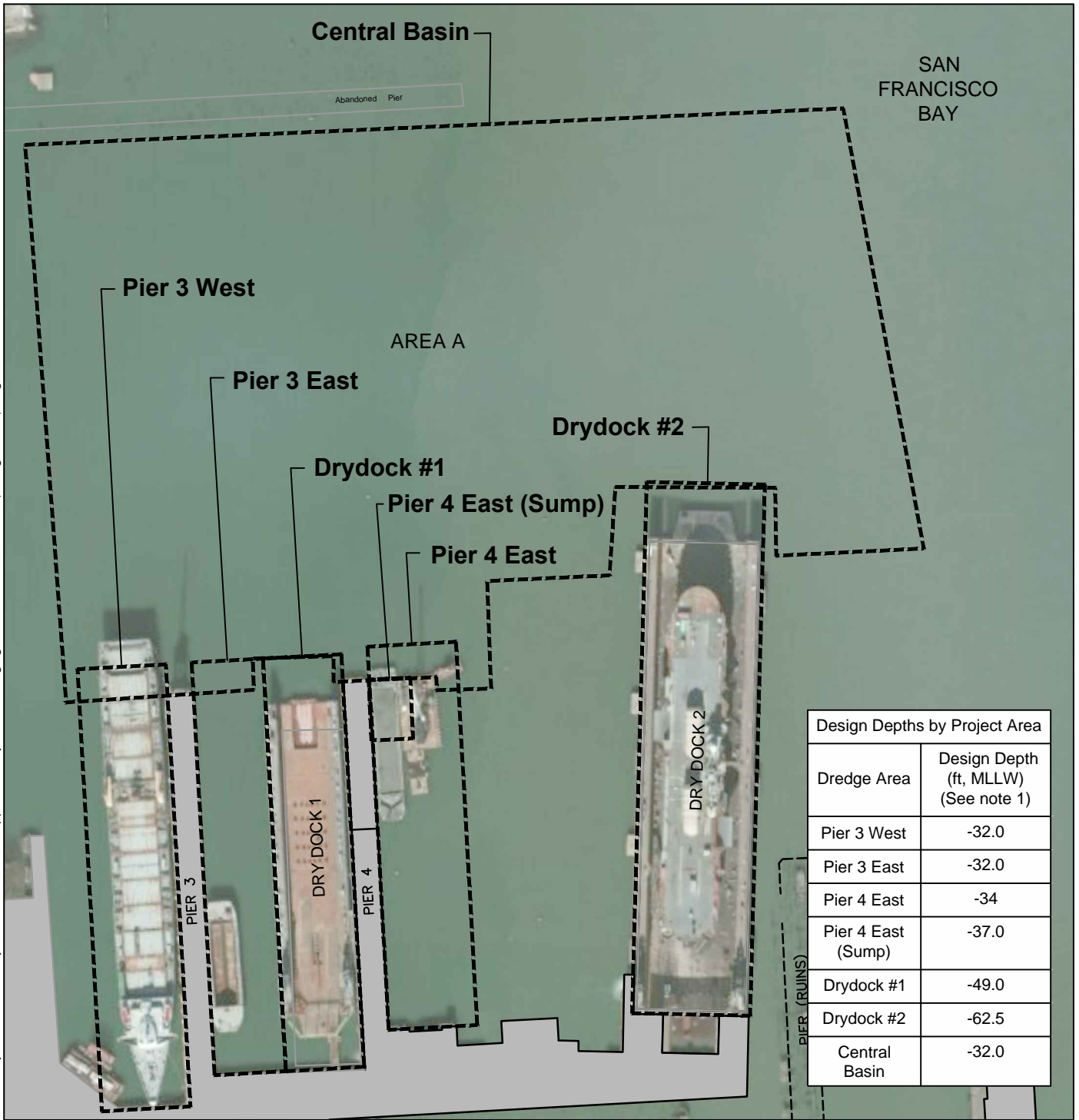


Mar 05, 2014 9:43am chewart

AERIAL SOURCE: ESRI Imagery, dated October 26, 2010.
HORIZONTAL DATUM: California State Plane Zone 3, NAD83,
 U.S. Feet.



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Mar 05, 2014 10:25am chawett

SOURCE: Aerial from ESRI, dated October 26, 2010.
HORIZONTAL DATUM: California State Plane Zone 3, NAD83, U.S. Feet.
NOTES:
 1. Design depths do not include 2 feet overdredge allowance.

LEGEND:

----- Dredge Boundary

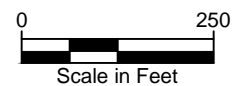
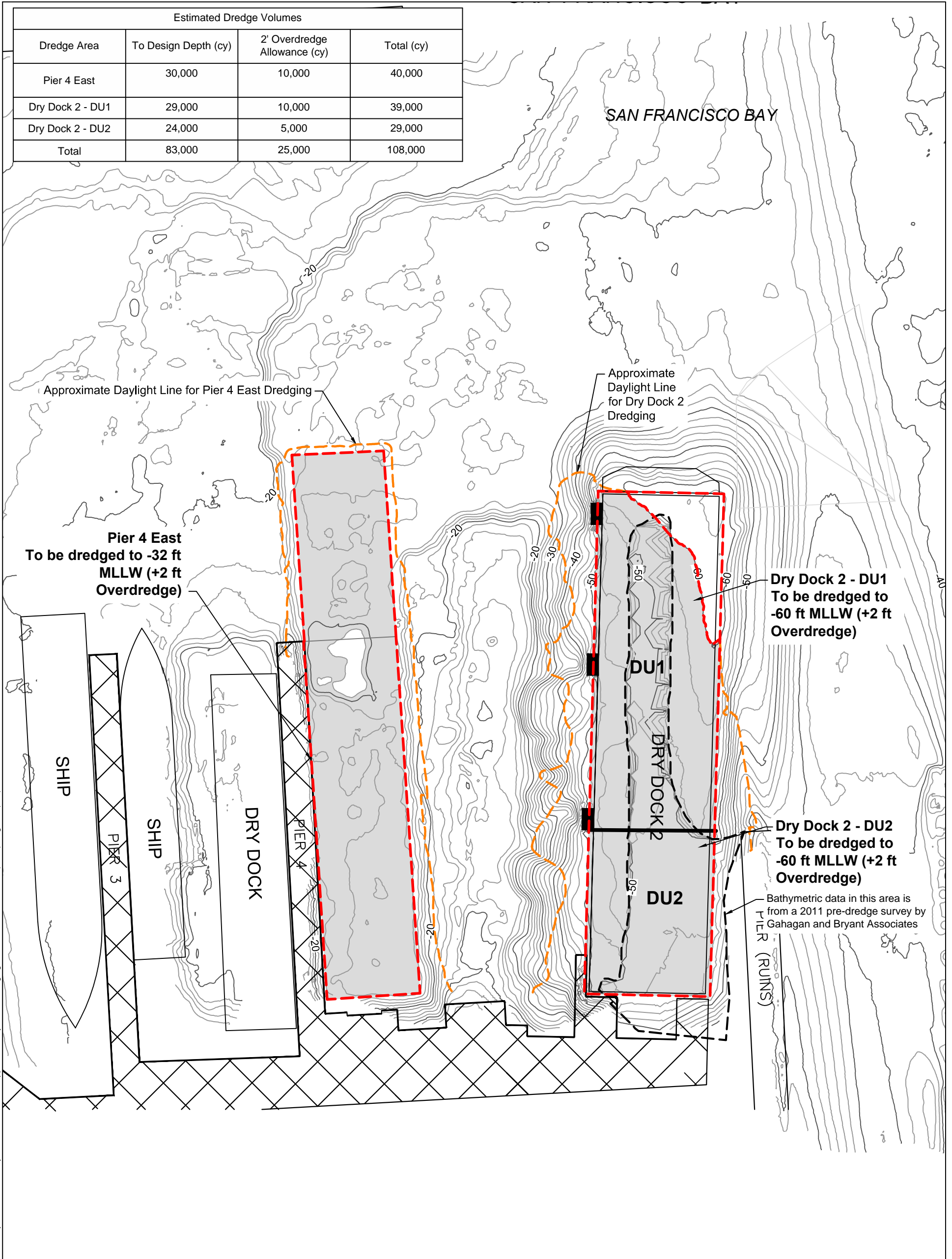


Figure 2
 Maintenance Dredging Areas
 BAE Systems San Francisco Ship Repair Dredging Program

Estimated Dredge Volumes			
Dredge Area	To Design Depth (cy)	2' Overdredge Allowance (cy)	Total (cy)
Pier 4 East	30,000	10,000	40,000
Dry Dock 2 - DU1	29,000	10,000	39,000
Dry Dock 2 - DU2	24,000	5,000	29,000
Total	83,000	25,000	108,000



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SOURCE: Bathymetry from Gahagan and Bryant Associates, Inc., dated September 27, 2011 and January 8, 2014.
HORIZONTAL DATUM: California State Plane Zone 3, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

LEGEND:

- Contours (2' and 10' Interval)
- Area at Elevation Greater than Design Dredging Depth
- Dredge Boundary/Toe of slope
- Approximate Daylight Lines (2H:1V)

