

TECHNICAL MEMORANDUM

To: David Barker, San Diego Regional Water Quality Control Board

Date: July 28, 2015

From: Michael Whelan, P.E., and Adam Gale, Anchor QEA, LLC

Project: 131002-01.03

Cc: David Gibson, Alan Monji, and Eric Becker, San Diego Regional Water Quality Control Board
Shaun Halvax, BAE Systems San Diego Ship Repair
Mike Palmer, de maximis, Inc.
David Templeton, Anchor QEA, LLC

Re: Corrective Action Work Plan for Barge Dredged Material Spill
San Diego Shipyard Sediment Site, North Shipyard, San Diego, California

This technical memorandum presents details of the corrective action planned to address a recent spill of dredged material from the R.E. Staite Engineering Inc. (RES) 3002 split hill barge (RES 3002). Details of the spill, the sequence of events preceding and following it, and the overall location and area of resulting spill material, are summarized in the following accompaniments to this memorandum:

- Figure 1 graphically depicts the location of the RES 3002 spill event, as well as its route to and from this location before and after the event.
- Attachment 1 is the *Supplemental Incident Report* prepared by RES, dated July 1, 2015.
- Attachment 2 is a comparison between bathymetric surveys performed by RES before and after the event, which shows the evident area of spilled material and its extent and size.

Introduction

A detailed chronological timeline of the spill is presented in Attachment 1. In accordance with the project permits, Anchor QEA notified the Port of San Diego, California State Lands Commission, San Diego Regional Water Quality Control Board, U.S. Army Corps of Engineers, and National Oceanic and Atmospheric Administration (NOAA) the next

working day (email from David Templeton on Friday, June 26, 2015 at 4:53 pm) following confirmation of the incident.

Scow 3002 Return to Service

The cause of the spill, as described in the *Supplemental Incident Report* (Attachment 1) appears to have been a malfunctioning hydraulic closure system for the hull of the barge. Due to several schedule limitations, the Scow 3002's immediate return to service was necessary to complete the remedial work. To bring the barge back into service, RES immediately repaired the hydraulic closure system, and conducted various other retrofits, including welding metal plates to the split hull of the barge to ensure closure. These repairs and retrofits are described in the Attachment 1. Anchor QEA observed and documented the repairs and retrofits prior to the barge's return to service.

In order to confirm that the repairs continue to perform successfully, RES will monitor draft levels of the barge daily throughout the remainder of the project. If a release were to occur, the reduction of weight from the scow will raise the scow from the bay, decreasing the draft. Checking these draft levels daily will be the first line of evidence used to identify any additional potential spillage. In addition and as discussed in Attachment 1, RES will inspect the mechanical pressure system, integrity of the welded plates, and barge condition daily while the barge is in use. All inspections will be documented in the RES daily log.

Spill Action Plan

Based on a RES internal evaluation, an estimated 250 cubic yards of dredged sediment was released from the RES 3002 (as shown in Figure 1). RES has identified a boundary of approximately 40 feet by 200 feet within which the misplaced material had fallen. The spill removal activities will include removing all misplaced material, as well as removing an additional 1-foot overdredge below the original bathymetry within the identified 40-foot by 200-foot area. The dredging of the misplaced material as well as overdredge will generate approximately 500 to 800 cubic yards of material removed from the area.

The area of the spill delineated on Figure 1 will be targeted by cleanup dredging. Material will be removed to below the pre-existing subgrade elevation, sufficient to accomplish full

removal of the spilled material. RES will evaluate historical bathymetric surveys of the potential spill areas (including the route of barge to the offloading location [Figure 1]), and conduct additional surveys as necessary to evaluate whether further leakage occurred during movement or outside of the identified spill area. The evaluation will include comparing the historical bathymetric survey elevations with post-spill bathymetric survey elevations (where applicable) to evaluate whether any significant increases in elevation are noted.

Spill removal will be verified by a post-removal bathymetric survey and one post-dredge confirmation sample to provide verification of cleanup. The location of the confirmation sample will be in the center of the dredge area rectangle (Performing one sample in the cleanup area is consistent with the sampling approach used throughout the remedial dredging, as the cleanup area is within one of the Theissen polygon areas originally used in characterizing the site for the project's Cleanup and Abatement Order). The confirmation sample will be tested for primary contaminants of concern, outlined in Section A.2.a of the Cleanup and Abatement Order, consistent with post-dredge sampling throughout the project, so as to demonstrate that the dredging meets the objective of removing sediments to the CAO-mandated concentrations.

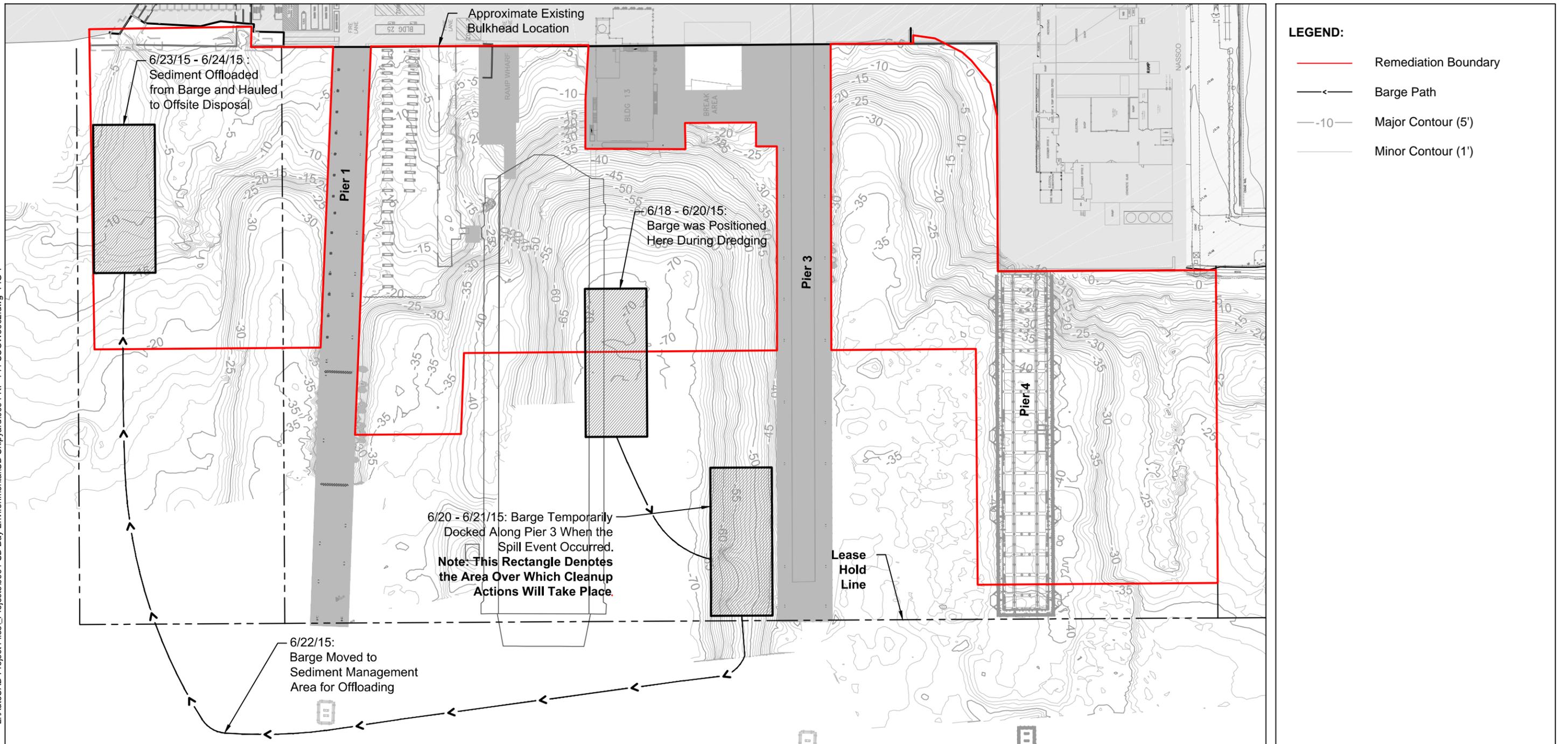
All standard environmental protection elements will be in place during the sediment removal process including the deployment of a double silt curtain to fully surround the dredge area. Water quality monitoring will also be performed, consistent with the monitoring provision of the Waste Discharge Requirements. Anchor QEA will verify and document that environmental protection measures are instituted throughout the work.

Following cleanup, a completion report, including documentation of dredging, results of post-dredge sampling and surveying, and implementation of environmental protection measures, will be prepared and submitted to the Water Board and Port.

FIGURE

L:\AutoCAD Project Files\Projects\0994-SD Bay Environmental\SD Shipyard\0994-RP-144 SCOW3002.dwg FIG 1

Jul 09, 2015 2:07pm mpratschmer



- LEGEND:**
- Remediation Boundary
 - ← Barge Path
 - Major Contour (5')
 - Minor Contour (1')

SOURCE: Upland topography from Digital Mapping Inc., dated September 2009, and supplemented by Environmental Data Solutions survey dated April 13, 2013. Bathymetric data is from eTrac surveys dated September 10 and 23, supplemented by survey data dated November 11, December 4 and 19, 2014, April 10, May 22, 2015 and R.E. Staite survey dated January 22, 2015.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.
VERTICAL DATUM: NOAA Tidal Gauge

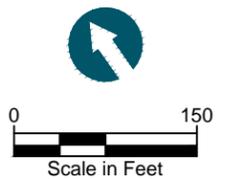


Figure 1
 Movement and Positioning of 3002 Barge, and Spill Cleanup Area
 San Diego Shipyard Sediment Site - North Shipyard

ATTACHMENT 1

RES SUPPLEMENTAL INCIDENT REPORT



R. E. STAITE ENGINEERING INC.

ESTABLISHED. 1938 CLASS A LICENSE. 654631

TO: BAE Systems, Inc.

ATTN: Shaun Halvax

FROM: Ralph Hicks, General Counsel

DATE: July 1, 2105

RE: BAE Remediation Dredging – North Shipyard
San Diego, California

SUBJECT: **SUPPLEMENTAL INCIDENT REPORT**
SCOW SEDIMENT LEAKAGE

Introduction

This incident report concerns a small release of unsuitable material from RES Scow 3002 while docked at Pier 3 at the BAE Systems San Diego Ship Repair facility on or about June 21, 2015. As background, the scow has a capacity of 3,000 cubic yards (CY). It has a split hull design allowing it to open and close by using an internal hydraulic ram system. This type of scow is commonly used throughout the world within the dredging industry and is designed to maintain pressure during long ocean-going voyages. This scow is often used to transport sediments to EPA-approved ocean disposal sites. There are two large hydraulic rams that open and close the hulls. Between each hull is a large strip of rubber shaped like a "D" that is pushed into a flat steel plate thereby ensuring a tight seal along the entire bottom of the scow. The amount of operating pressure used to close the hull ranges between 3,500 and 5,000 PSI. If there is a drop in pressure, the system automatically turns on an engine that is used to re-pressurize the hydraulic system. Pressure checks routinely occur throughout the course of dredging operations and the system is inspected prior to the start of operations.

Analysis of Incident

It appears that over a one-day weekend period of temporary mooring a loss of power occurred in the hydraulic pressure system. The scow lost approximately 8% - 10% of volume as evidenced by a third-party hydrographic survey provided by eTrac.

An oil seal leak on the Cat diesel engine that powers the hydraulic pressure system resulted in an automatic low engine oil switch to prevent the engine from starting. The result was the hydraulic

pressure drop over time allowing a small amount of sediment to leak into the Bay at the mooring. The engine is located in the machinery room and all oil leakage was confined to this room. As a result of the pressure drop and the failure of the engine to start, approximately 250 CY leaked out of the scow while it was docked at BAE Pier 3. A third-party survey was performed and those results were analyzed by RES which was followed by a meeting with BAE to inform them of the results. Following the 6/25/15 meeting, an incident report was provided.

Corrective Action - Dump Scow

Following final offload and cleaning of the RES 3002 Scow, the scow was immediately taken out of rotation and relocated to RES's pier for analysis and corrective action. RES has instituted primary and secondary corrective actions to ensure no further sediment leakage occurs from this scow. As a primary measure, Hawthorne Machinery repaired the engine oil seal as of 7/1/15; a secondary measure includes 1.25"x12"x5' (6) steel plates welded onto the hull both bow and stern to prevent the scow from opening. Thirdly, the hydraulic pressure system will be operational at all times. Lastly, sand bags will be placed along the rubber seam of the doors as an added precaution. In sum, the spilt hull is now welded shut in a closed position (see attachments A & B).

Corrective Action - Clean Up

The leaked sediments will be recovered in the same manner as the means and methods used to meet the Cleanup and Abatement Order (CAO) protocols. The CAO requires the use of double silt curtains that surround the dredge footprint. The sediments will be dredged with an environmental bucket unless the sediment conditions require a heavier digging bucket. Sediments will be loaded into a scow and transported to the Sediment Management Area (SMA) where they will be processed and transported to the Otay landfill by trucks. No decanting will occur. The water from this small dredge area will be transferred from the scow to the SMA onshore storage tanks and discharged into the City's sewer system according to permit conditions. The estimated time to complete this recovery is one to two days. The contractor will be responsible for the direct dredging costs associated with recovering the leaked sediments. All other costs will be mutually agreed upon. Once dredged, the area will be re-surveyed to confirm removal of the leaked sediments.

Maintenance History

Prior to start of the project, the scow was placed in dry dock for complete inspection, hull maintenance, bottom painting, zinc replacement and system inspection all according to ABS loadline standards (American Bureau of Shipping (ABS) is a national standard for ocean-going vessels). The scow is ABS-certified and all certificates are up to date and are good through 2018. Inspection of the mechanical pressure system occurs daily and the pressure is checked on a routine basis when the scow is in use.

Notification Background

A visual observation on Monday, 6/22/15, indicated that the scow might have lost material. At that time the scow was at the SMA. A third-party survey was ordered on 6/22/15 to determine if there was in-fact a sediment loss. Survey data analysis was performed on 6/24/15. These analytical calculations were performed and verified to determine the scope of leakage. On June 25, BAE

was informed of the survey results and all corrective action plans. Corrective action began on 6/25/15 as described above.

Course of Travel

The scow was transported from the SMA loading and offloading facility to the dredging area between Pier 1 and Pier 3; it then traveled to Pier 3 for docking. It then traveled to the SMA ramp for sediment processing and offloading.

Chronology of Events

6/18/15

0630 - Dredge crew receives RES 3002 Scow and begins dredging into it. Throughout the day, crew reports scow remaining above 4,000 PSI receiving pressures up to 5,200 PSI.

6/19/15

Dredge crew continues loading sediment into the RES 3002 Scow. Crews report scow remaining above 4,000 PSI with pressures up to 5,000 PSI.

6/20/15

Dredge crew completes loading of RES 3002 Scow in DC#17 and mobilizes scow to Pier 3 north on the west end of the pier.

6/22/15

1500 - Scow is mobilized to the sediment offload site and mixed with cement slurry.

6/23/15

0430 - Sediment offload begins on RES 3002 Scow.

1300 - Third-party hydrographic surveying firm, eTrac, collected multi-beam data to the west-ward extent of the piers from Pier 1 to Pier 3 to document depths for future anchor placement as well as sand cover thickness in working area of placement (DC#27-28) and dredging in DC#17-21.

6/24/15

1500 – Final cleanout of RES 3002 Scow complete.

1800 – Hydrographic survey data processing complete. RES receives data from eTrac.

6/25/15

After final clean out, the 3002 scow was shifted to the RES pier. Survey data analysis begins in-house. During the course of delta comparisons (the overlay of the 6/23/15 survey over an earlier 5/18/15 survey), it was confirmed that an apparent row of material approximately 20'-40' x 180'-190' existed above previous elevations in the footprint of where the 3002 Scow had been previously moored. Volume calculations subsequently performed on the area in question produced a net increase of approximately 250 cubic yards.

Notification to Shaun Halvax of BAE Systems with full survey details commenced to alert the Owner to apparent mechanical failure of the sealing mechanism on the 3002 Scow. Corrective action begins.

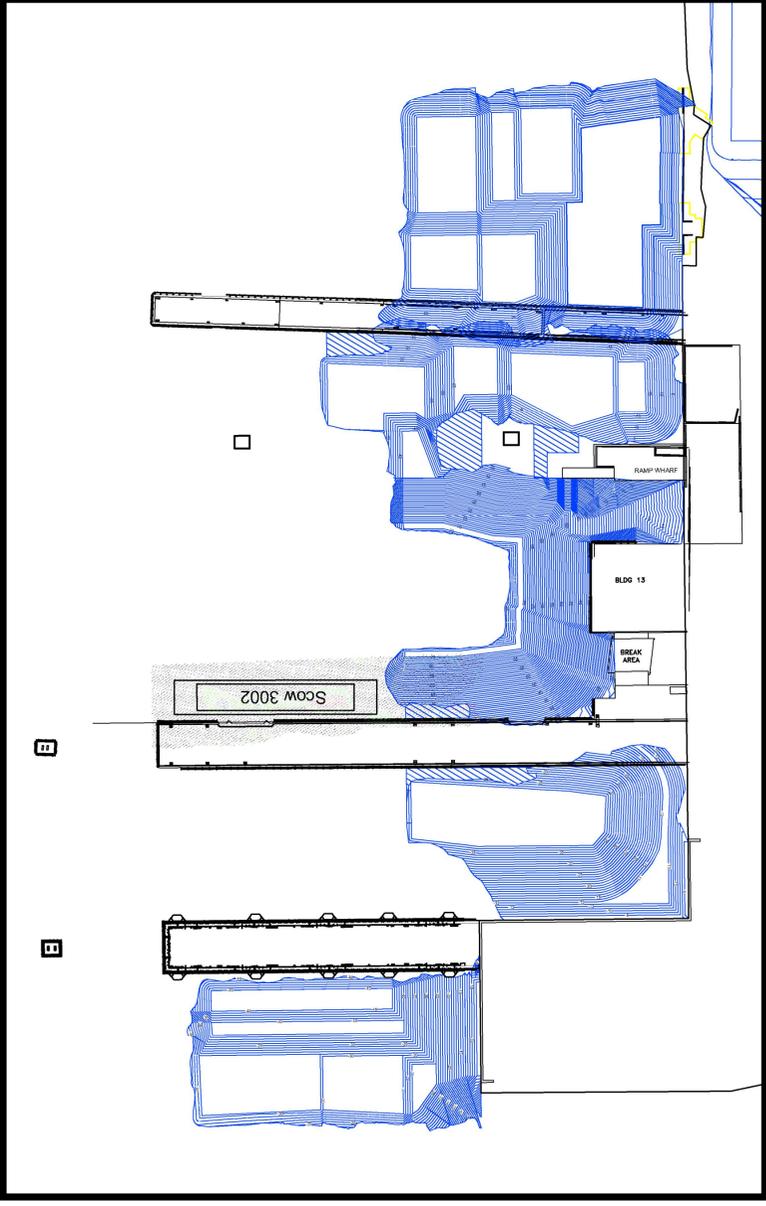
Remedial Action Plan

R.E. Staite Engineering is preparing a dredge management plan for removal of the leaked sediments. It is necessary to remove these sediments prior to 9/28/15. The plan will follow and incorporate all protocols associated with the CAO including deployment of silt curtains, post dredge surveys, handling, storage and discharge of sea water and truck transportation to the Otay landfill.

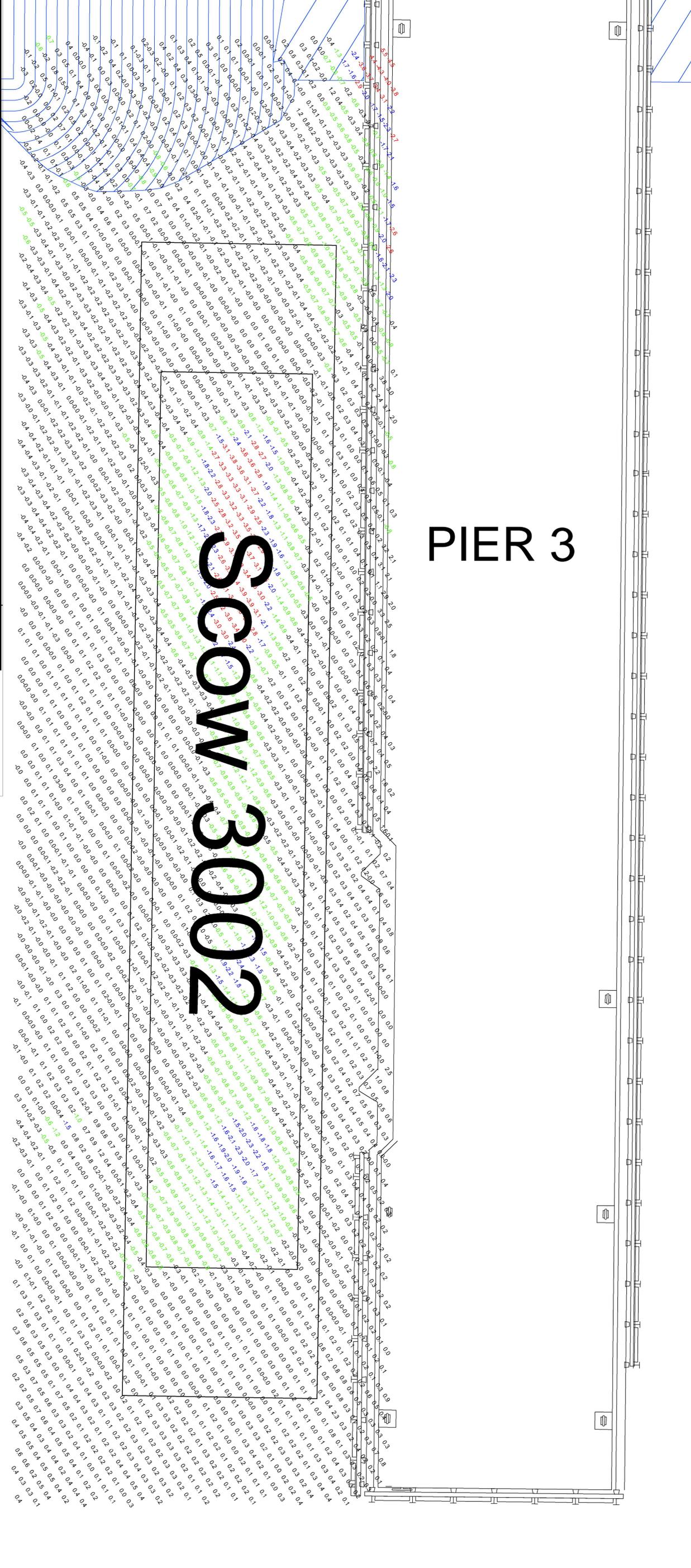
Verification of Corrective Action

Anchor QEA has been briefed on the incident including all planned corrective actions. They have observed the repairs that RES conducted and implemented on the scow and confirmed the scow's immediate return to service. All modifications to the scow will be completed by July 2, 2015.

ATTACHMENT 2
BATHYMETRIC SURVEY INDICATING AREA
OF SPILL



Location Map



PIER 3

SCOW 3002

PROJECT NAME BAE Remediation	SURVEYED BY _____		DATE _____		TIME _____	
	DRAWING TITLE _____		DESIGNED BY _____		CHECKED BY _____	
DRAWING NUMBER _____		PROJECT NUMBER _____		FILE NAME _____		
SIZE _____		PLOT DATE _____		_____		