

SAN FRANCISCO BAY AREA WATER EMERGENCY TRANSPORTATION AUTHORITY

**Terminal Dredging: Vallejo and South San Francisco
RFP Document #18-015**

ADDENDUM NO. 1

July 17, 2018

SCOPE

This Addendum No. 1 consists of 3 pages with 5 attachments. It includes the following:

1. Attendee sign-in sheet for the Pre-Proposal Conference held on July 10, 2018.
2. Corrections
3. Question asked to date with response.
4. Attachments.

This addendum has been listed on WETA's web site for review to all potential bidders.

1. ATTENDEE LIST

See Attachment 1 for the attendance sign-in sheet for the Pre-Proposal Conference and site walk held on July 10, 2018.

2. CORRECTIONS

1. Sealed bids will be received by the Operations Manager of the San Francisco Bay Area Water Emergency Transportation Authority at Pier 9, Suite 111, San Francisco, CA 94111 until 2:00 p.m. on ~~July 10, 2018~~ July 24, 2018, at which time bids will be publicly opened and read.
2. Invitation for Bid 00100; Add the following:
Contractors wishing to visit the site shall schedule and coordinate the visit in advance with the San Francisco Bay Ferry Vallejo Operations Manager, Peter Belden [telephone number (415)850-0413]. The visit shall solely be for contractor access and viewing purposes. Questions will not be answered during these site visits.
3. Section 00001 – Order of Work; 1.1.B.5 – Replace with the following:
 5. Install temporary passenger loading float, four (4) pilings, gangway, new Contractor furnished portal and gate assembly, and railing structures, all utilities and data connections, and electrical system for temporary boarding facility. Coordinate with WETA to ensure that the Clipper terminals on the temporary passenger loading float are fully operational. Contractor shall perform the following work:
 - Extend power and data lines, using temporary conduit, from the head of the permanent gangway to the appropriate utility connection points on the spare passenger float.

- Coordinate with WETA personnel and the ODR to test functionality of power and data feeds to the Clipper system on the temporary passenger loading float.
4. Section 42131 – Vallejo Passenger Float and Gangway; Add the following:
- **Add to Paragraph 6.D** – The Contractor shall remove and dispose of all components associated with the old roll up gate at the float end of the existing gangway.
 - **Add to Paragraph 7.A** – Surface preparation and painting shall include all steel structures compromising the permanent gangway portal and pile cap structures.
 - **Add to Paragraph 11.B** – The design provided in Attachment 2 (Appendix 1) is not a complete design and complete design shall be the responsibility of the Contractor.
 - **Add New Paragraph 12.G** – Following painting of the roof structures on the permanent float and permanent gangway, the Contractor shall install plastic bird spike strips continuously along the top ridge of all roof sections.

3. QUESTION AND ANSWER

Q1: When reviewing the various documents for the Terminal Dredging Vallejo and South San Francisco, Attachment B - PERMITS, as downloaded from the WETA website, consists of 67 pages, the last page of which is entitled Exhibit A - Figure 1: Site Location Map Vallejo Ferry Terminal Dredging Project, but there does not appear to be a Figure 1: Site Location Map Vallejo Ferry Terminal Dredging Project. Please clarify if there is to be such a Site Map, and if so, please provide it.

A1: *The Site Location Map is shown within the USACE Permit for reference.*

Q2: I thought that the sediment analyses was going to be back on Wednesday and would be forwarded. Is this available now?

A2: *See Attachment 4 for the Vallejo Ferry Terminal; Sample Logs (Attachment 5) are available for the South San Francisco Ferry Terminal, however the sediment results are still under review.*

Q3: Is it permissible to submit our DB/SBE goodfaith effort electronically (ie a CD), rather than a paper copy?

A3: *No, electronic submittals are not permitted.*

Q4: Section 42131 in Volume 3, page 71 of 79 indicates that 16 LED lights get replaced and to reuse the existing mounting boxes, but the original referenced plans indicate a different number of lights. Which 16 lights get replaced?

A4: *The ODR will identify which 16 lights that are to be replaced.*

Q5: Section 00001, in Volume 2, page 3 says,

- Provide and install four (4) new Clipper reader pedestals on the temporary passenger float at locations determined by the ODR.
- Remove Clipper heads, wiring, and other components from the permanent passenger loading float to the temporary passenger loading float and install them in an existing electrical box for use, including new conduit and fittings between the existing Clipper box and the new pedestals.

Please review and explain if these Clipper heads are new or to be reused. If new please provide drawing and specifications for the 4 clipper card readers and new pedestals. The new float drawings appear to show them on the deck.

A5: *The Contractor will not be required to perform any work regarding the Clipper reader pedestals or heads. The Contractor shall extend power and communications cabling, in conduit, from the head of the permanent gangway to the temporary passenger float and coordinate with WETA and the ODR to demonstrate that the power and communications extensions support the use of*

Clipper on the temporary float for the duration of dredging. Following completion of use of the temporary passenger loading float the Contractor shall pull back the power and communications cabling and reconnect all back to the new Contractor installed Clipper control cabinet located on the permanent passenger loading float.

Q6: Section 01200, Volume 2 Page 21 of 52 e. says:

- e. Fabrication and installation of a new portal and gate assembly at the head of the temporary passenger loading gangway, equal in the construction details and operability to the existing interior portal and gate at the permanent boarding gangway.

This statement is too vague and does not provide enough details as to what is required. Please provide additional information so that all bidders are bidding on the same project.

A6: *The required details can be determined through site visits by Bidders to inspect existing facilities and by holding discussions with the operating personnel.*

Q7: Provide bulkhead drawing for location of new portal so mounting can be determined. We are understanding that the alternate portal will be left in place at the completion of the project? Please clarify.

A7: *These drawings do not exist. Bidders should conduct site visits and inspect the existing facilities and hold discussions with the operating personnel in order to gain the required information. The new portal to be built and installed at the head of the temporary gangway will not be left in place. The new portal shall be removed after ferry operations have transferred back to the permanent ferry float and gangway. The promenade railings shall be restored to the same condition they were prior to the start of the project. The new portal shall be transported back to Berth 7 along with the temporary float, gangway, and other temporary structures that supported temporary ferry operations during the dredging project.*

4. ATTACHMENTS

1. Attendee List
2. Drawing entitled Adjustable Aprons
3. Amended Appendix A – Contract Award Schedule of Events
4. Report entitled: "Vallejo Ferry: Sediment Characterization Sampling and Analysis Results, dated July 3, 2018".
5. Sediment Logs: South San Francisco Ferry Terminal

ACKNOWLEDGMENT BY BIDDER

Each bidder is required to acknowledge receipt of all Addenda, including this Addenda No. 1. as specified in the IFB Instructions to Bidders.

ISSUED BY:


Keith Stahnke
Project Manager

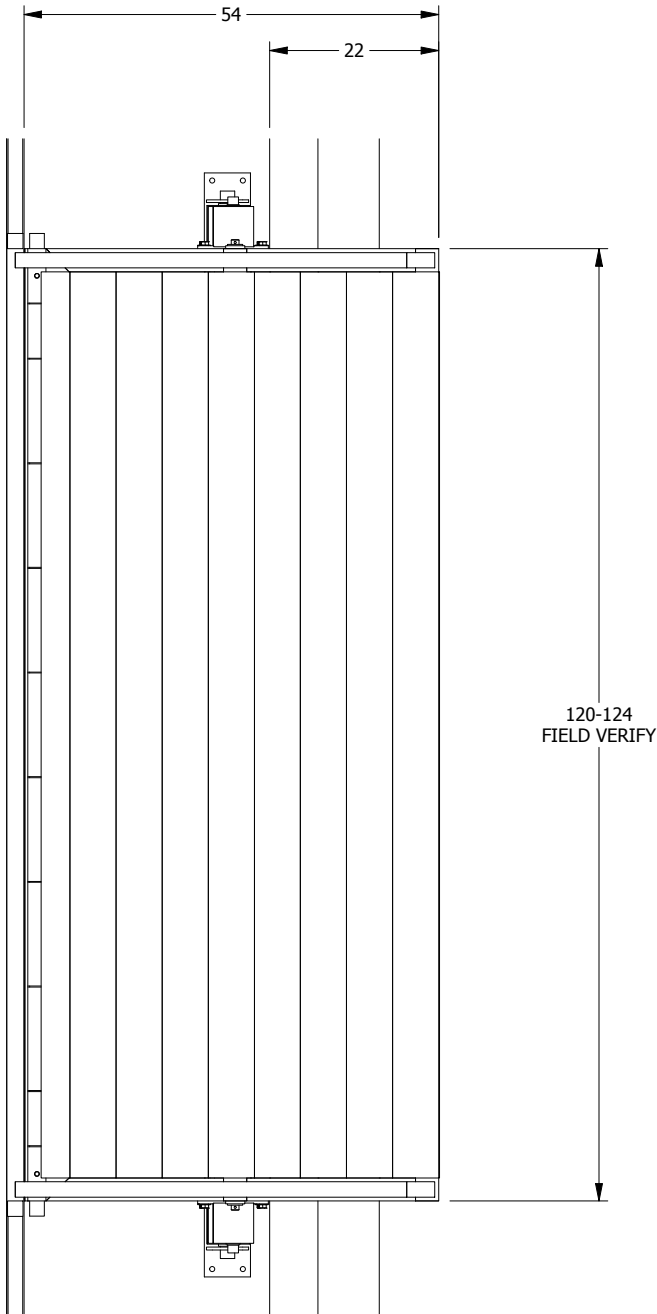
7-17-2018
Date

Project: WETA Terminal Dredging

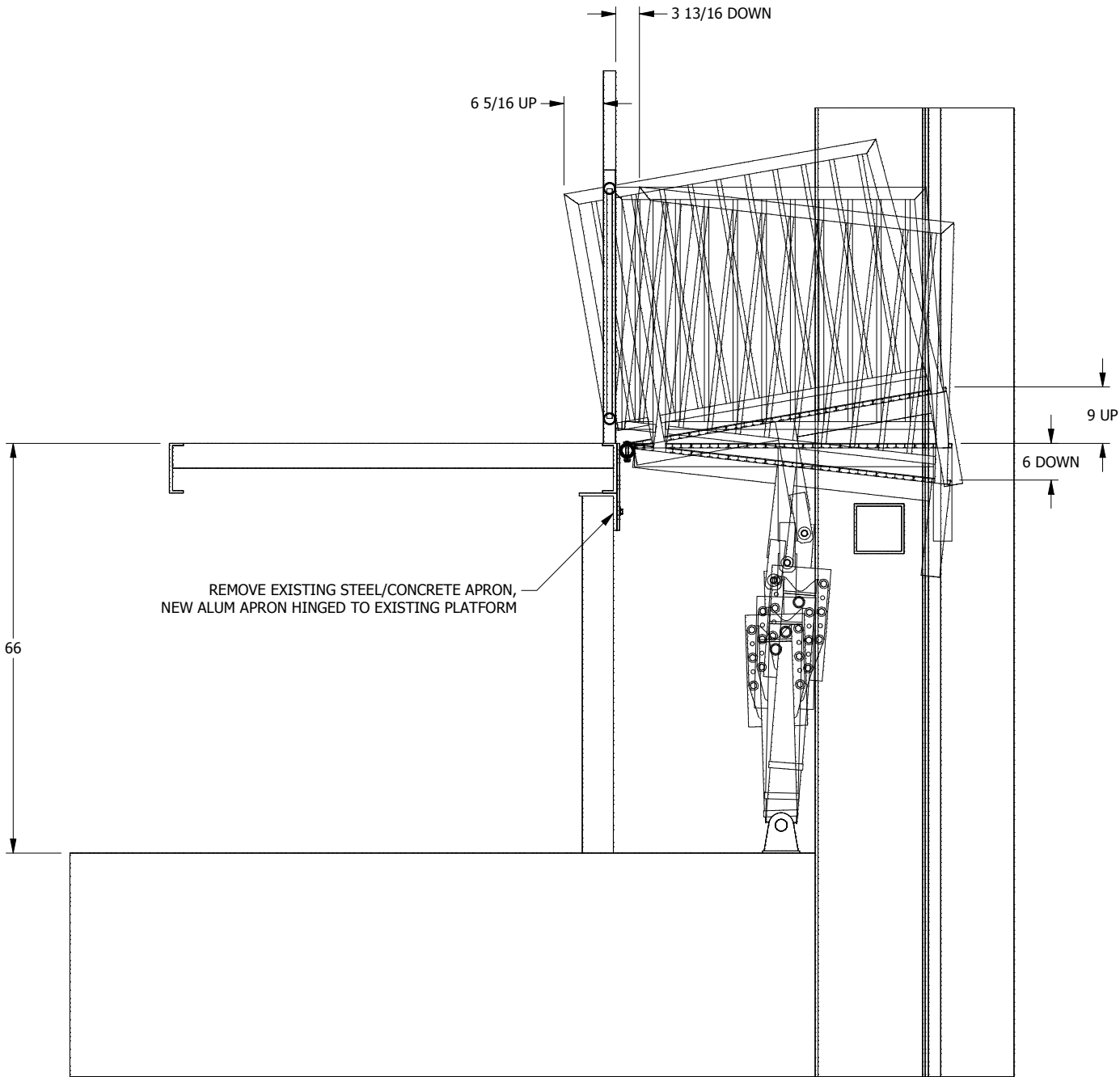
Date: 7/10/18

Pre Bid Meeting
Sign In Sheet

Name	Company	Phone Email
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PLAN VIEW



ELEVATION VIEW

GENERAL STRUCTURAL NOTES
CONFORMS TO 2015 IBC.

DECK LIVE LOAD: 100 PSF
DEFLECTION: L/360


STRUCTURAL MATERIAL:
ALUMINUM SHAPES: 6061-T6, MILL FINISH.

STRUCTURAL WELDING FABRICATION SHALL BE IN ACCORDANCE WITH THE AA SPECIFICATIONS FOR ALUMINUM STRUCTURES. WELD USING ALUMINUM FILLER METAL ER5356. FABRICATION, WELDING, WELDING PROCEDURES AND INSPECTION SHALL CONFORM TO AWS D1.2:2014 , AS APPLICABLE.

DESIGN NOTES

- 1. DECKING IS ALUMINUM SLIP RESISTANT.
- 2. MOTION RANGE IS 9" UP AND 6" DOWN FROM HORIZONTAL.
- 3. APRON IS ELECTRICALLY ADJUSTABLE WITH BATTERY BACKUP (2 DAYS OF OPERATING LIFE) AS WELL AS MANUAL OPERATION..
- 4. LIFTING MECHANISM IS DESIGNED FOR MARINE ENVIRONMENT.
- 5. WATER TIGHT PUSH BUTTON CONTROL PANEL AT EACH PLATFORM.
- 6. 48"x24"x10" 316SS CONTROL PANEL ENCLOSURE WITH BREAKER PANEL, BATTERY CHARGER AND BATTERY.

PRELIMINARY



PO BOX 2050
WOODLAND, WA 98674

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NOTES
1. UNLESS OTHERWISE SPECIFIED:
- DIMENSIONS ARE IN INCHES.

0		JC	DTL	INITIAL RELEASE
NO.	DATE	BY	CHK	REVISION DESCRIPTION
SITE ELEVATIONS VALLEJO FERRY TERMINAL ADJUSTABLE ALUMINUM APRONS VALLEJO, CA				
SIZE B	DWG NO. 100		JOB NO.	

Appendix A (REVISED)**CONTRACT AWARD SCHEDULE OF EVENTS**

Event	Estimated Completion
WETA Manager, Operations Issues Invitation for Bid (“IFB”)	June 21, 2018
Bidders Protest Based on IFB content	June 26, 2018
Bidders (Pre Bid) Conference (attendance is mandatory)	July 10, 2018
Deadline for submissions of questions and clarifications	July 13, 2018
Final Addendum	July 19, 2018
WETA Operations Manager Receives and opens bids	July 24, 2018
Submit bid evaluation results to WETA’s Executive Director	July 26, 2018
WETA Board Meeting	August 2, 2018

July 3, 2018

Ms. Jessica Vargas
U.S. Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, CA 94103-1398

Dear Ms. Vargas:

On behalf of the San Francisco Water Emergency Transportation Authority (WETA), please find enclosed three (3) copies of the "Data Report: Characterization of the Sediment from the Vallejo Ferry Dredging Project: Sediment Characterization Sampling and Analysis Results (SAR)", prepared by Foth-CLE Engineering Group. In addition, one copy of this Data Report has been sent to the other DMMO participating agency representatives.

Please place this item on the agenda for review at the July 11, 2018 DMMO meeting. In addition, an electronic copy of this report has been uploaded to the DMMO website for each DMMO participating agency to review.

If you have any questions or need additional information, please feel free to contact me in the office at 508-762-0777.

Sincerely,

Foth-CLE Engineering Group

A handwritten signature in black ink that reads "Wendy Rocha". The signature is written in a cursive, flowing style.

Wendy P. Rocha
Project Manager

cc (w/enc): Brian Ross, EPA
Beth Christian, SFRWQCB
Arn Aarreberg, CDFW
Craig Weighman, CDFW
Gary Stern, NMFS
Sara Azat, NOAA
Al Franzoia, SLC
Ryan Olah, USFWS
Marty Robbins, WETA

DATA REPORT:

Characterization of the Sediment from the
Vallejo Ferry Terminal Dredging Project: Vallejo, CA

**SEDIMENT CHARACTERIZATION
SAMPLING AND ANALYSIS RESULTS
(SAR)**

**2018 Vallejo Ferry Terminal Dredging Project
(Dredge Episode 8)**

July 3, 2018

Prepared for:

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LIST OF ACRONYMS

ASTM	American Society for Testing and Materials
BCDC	Bay Conservation and Development Commission
Calscience	Calscience Environmental Laboratories, Inc.
CDFW	California Department of Fish and Wildlife
COC	Chain-of-custody
CV	Coefficient-of-variation
DGPS	Differential global positioning system
DMMO	Dredged Material Management Office
DU	Dredge Unit
Foth-CLE	Foth-CLE Engineering Group
GPS	Global positioning system
ITM	Inland Testing Manual
mg/kg	Milligram per kilogram
MLLW	Mean lower low water
MRL	Method reporting limit
µg/kg	Microgram per kilogram
NOAA	National Oceanic and Atmospheric Administration
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyls
QA/QC	Quality assurance/quality control
RMP	Regional Monitoring Program
RPD	Relative percent difference
SFRWQCB	San Francisco Regional Water Quality Control Board
SAP	Sampling and analysis plan
SAR	Sampling and analysis report
SLC	State Lands Commission
SOP	Standard operating procedures
TOC	Total organic carbon
TSS	Total Suspended Solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

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Appendix A	Sampling Field Logs and Data Sheets
Appendix B	Analytical Chemistry Laboratory Data Reports Submitted by Eurofins Calscience
Appendix C	Discrete Chemistry Data Report Submitted by Eurofins Calscience Supplement
Appendix D	MET Laboratory Data Report Submitted by Eurofins Calscience
Appendix E	Biological Testing Report Submitted by Pacific EcoRisk

CASE NARRATIVE

On May 1, 2018 and May 2, 2018, sediment samples were collected from the Vallejo Ferry Terminal located on the eastern shore of Mare Island Strait in Vallejo, CA, and analyzed for physical and chemical constituents in support of the proposed dredge plans of the San Francisco Water Emergency Transit Authority (WETA). After collection, samples were stored in a secured area at $4\pm 2^{\circ}\text{C}$. Samples were then processed and shipped to the analytical laboratories in coolers. All chemical analyses were performed within required holding times from sample collection. Table 1 summarizes sample identifications and participating laboratories involved with sample collection and analysis.

Table 1 - Sample Collection and Analysis Summary

SAMPLE IDENTIFICATION	SAMPLING AND ANALYSIS DELEGATION				
Individual Core I.D.s	Sample Collection	Chemical, TOC, and Grain Size	Selenium	Dioxins / Furans	Biological
Composite	Foth-CLE Novato, CA	Eurofins Calscience Garden Grove, CA	ALS Columbia Analytical Services, Inc. Kelso, WA	Frontier Analytical Laboratories El Dorado Hills, CA	Pacific EcoRisk, Fairfield, CA

1 INTRODUCTION

The San Francisco Bay Water Emergency Transportation Authority (WETA) is planning and proposing to perform maintenance dredging at the docking area for the Vallejo Ferry Terminal (Ferry) located on the eastern shoreline of Mare Island Strait, approximately 2.5 miles upstream of the Carquinez Strait and 1.5 miles upstream from the mouth of the Napa River (see Figure 1). The proposed dredging is part of normal maintenance of the ferry terminal to remove accumulated sediment that is currently causing the passenger loading float to go aground at low tide and the ferry slips to become inaccessible on extreme low tides. The proposed disposal site for material dredged from the terminal was the Cullinan Ranch Restoration Site, however based on results, we are requesting the material be placed as foundation material at the Montezuma Wetlands Restoration Site. Figures 1 and 2 provides a vicinity map depicting the location of the Ferry and the Montezuma Wetlands Restoration Site. Figures 3 and 4 depicts an overall view of the proposed dredge area within the Ferry Basis.

The proposed dredging depth is 15 feet below Mean Lower Low Water (-15 MLLW) including one-foot over dredge allowance. Approximately 6,270 cubic yards (cy) of material would need to be dredged to reach this depth (this calculation includes a 100% achievement of removing all material including the over dredge tolerance). Dredging will be conducted by clamshell dredge within the footprint illustrated on Figure 4. Dredging will not be conducted on the side-slopes adjacent to the outer limits of the dredging footprint. Instead, dredging will be conducted to the toe of the slope, and material from the side-slopes that slumps down past the toe of the slope will be removed to the project depth. WETA is proposing to place the dredged material as foundation material at the Montezuma Wetlands Restoration Site. The following sections and attached tables and figures provide information in support of that request.

Table 2: Proposed maintenance dredging for the Vallejo Ferry Terminal Dredging Project

Dredging Episode	Location	Project Depth (ft)	Project Depth Volume (yds³)	Over-depth (ft)	Over-depth Volume (yds³)	Total Volume (yds³)
Episode 8	Vallejo Ferry Terminal	-15.0	5,550	1.0	720	6,270
Total (cy):			5,550		720	6,270

Foth-CLE Engineering Group (Foth-CLE) collected sediment samples from the Vallejo Ferry located within the in Vallejo, CA for chemical, and physical testing on May 1, 2018 and May 2, 2018. This evaluation was comprised of collecting sediment samples for physical, chemical and biological testing analyses.

1.1 Objectives of the Sediment Investigation

The purpose of the sampling and testing proposed will be to evaluate the proposed dredged material to determine whether it will represent an adverse impact during removal operations and placement at the Cullinan Ranch Restoration Site. The procedures for sediment sample collection, sample processing and preparation, physical, chemical analyses are presented in this SAR.

Guidance concerning necessary sampling and analytical protocols, quality assurance/quality control (QA/QC) procedures, and data interpretation used in preparation of this SAP is found in:

- Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (SF RWQCB 2000);
- Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (ITM; USEPA/USACE 1998);
- Public Notice 01-1: Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region;
- Public Notice 99-4: Proposed Guidance for Sampling and Analysis Plans (Quality Assurance Project Plans) for Dredging Projects within the USACE San Francisco District;
- San Francisco Bay Regional Water Quality Control Board Order No R2-2010-0108 Waste Discharge Requirements for: U.S. Fish and Wildlife Service Cullinan Ranch Restoration Project;
- The Dredged Material Management Office (DMMO) review process.

1.2 Organization

This report follows guidelines as set forth in PN 99-4: Proposed Guidance for Sampling and Analysis Plans for Dredging Projects within the USACE San Francisco District (USEPA/USACE 1999). It includes methods described in the PN 01-01: Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region (USEPA/USACE 2001). It is organized as follows:

- ✓ Introduction – Section 1.0
- ✓ Sampling Program – Section 2.0
- ✓ Results – Section 3.0
- ✓ Discussion – Section 4.0
- ✓ References – Section 5.0

Figure 1 - Vicinity Plan



Figure 2 - Regional location map: Cullinan Ranch & Montezuma Wetlands Restoration Site

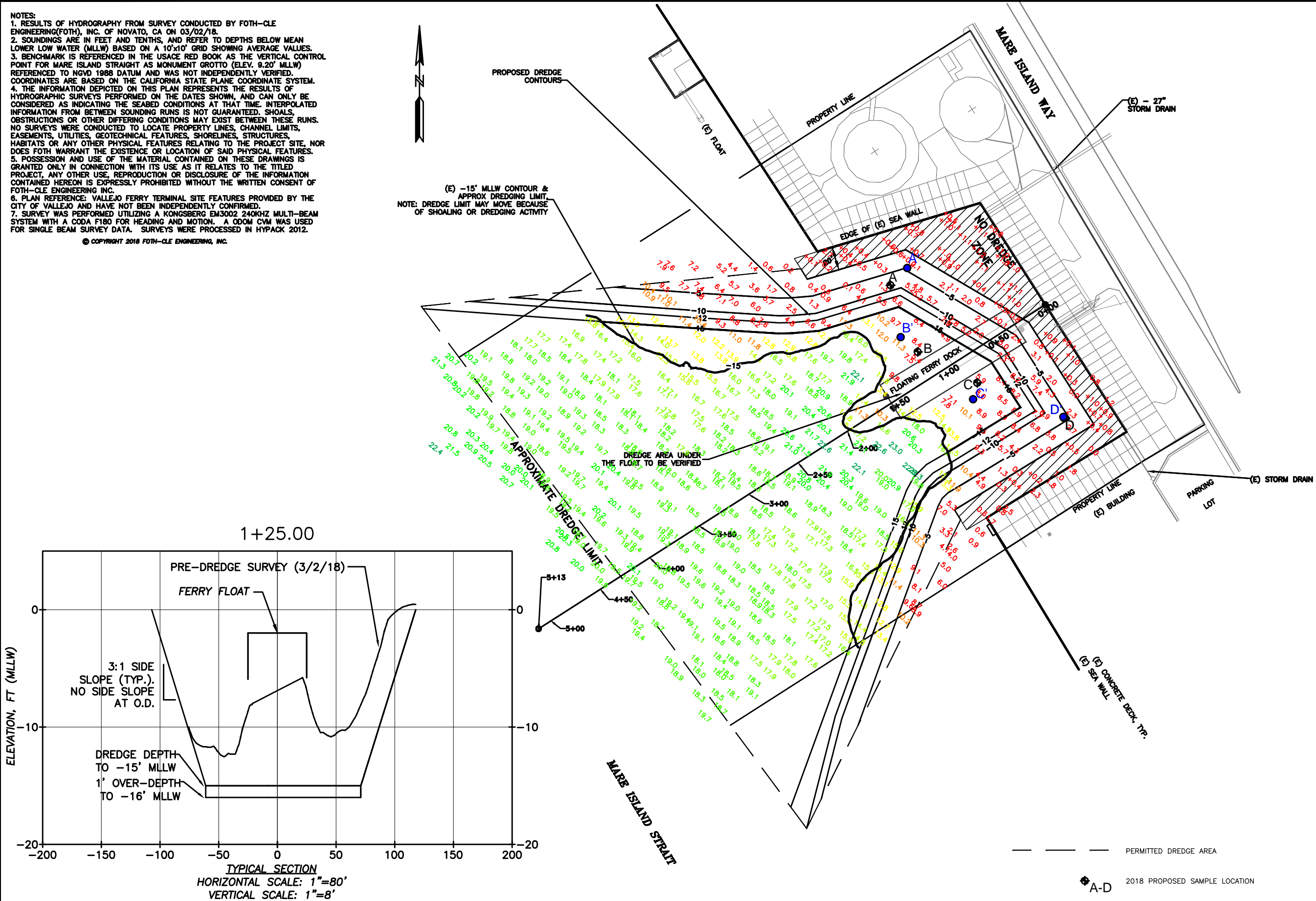


Figure 3 - Vicinity Map: Vallejo Ferry Terminal



NOTES:
1. RESULTS OF HYDROGRAPHY FROM SURVEY CONDUCTED BY FOTH-CLE ENGINEERING(FOTH), INC. OF NOVATO, CA ON 03/02/18.
2. SOUNDINGS ARE IN FEET AND TENTHS, AND REFER TO DEPTHS BELOW MEAN LOWER LOW WATER (MLLW) BASED ON A 10'x10' GRID SHOWING AVERAGE VALUES.
3. BENCHMARK IS REFERENCED IN THE USACE RED BOOK AS THE VERTICAL CONTROL POINT FOR MARE ISLAND STRAIT AS MONUMENT GROTTO (ELEV. 9.20' MLLW) REFERENCED TO NGVD 1988 DATUM AND WAS NOT INDEPENDENTLY VERIFIED.
4. THE INFORMATION DEPICTED ON THIS PLAN REPRESENTS THE RESULTS OF HYDROGRAPHIC SURVEYS PERFORMED ON THE DATES SHOWN, AND CAN ONLY BE CONSIDERED AS INDICATING THE SEAED CONDITIONS AT THAT TIME. INTERPOLATED INFORMATION FROM BETWEEN SOUNDING RUNS IS NOT GUARANTEED. SHOALS, OBSTRUCTIONS OR OTHER DIFFERING CONDITIONS MAY EXIST BETWEEN THESE RUNS. NO SURVEYS WERE CONDUCTED TO LOCATE PROPERTY LINES, CHANNEL LIMITS, EASEMENTS, UTILITIES, GEOTECHNICAL FEATURES, SHORELINES, STRUCTURES, HABITATS OR ANY OTHER PHYSICAL FEATURES RELATING TO THE PROJECT SITE, NOR DOES FOTH WARRANT THE EXISTENCE OR LOCATION OF SAID PHYSICAL FEATURES.
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6. PLAN REFERENCE: VALLEJO FERRY TERMINAL SITE FEATURES PROVIDED BY THE CITY OF VALLEJO AND HAVE NOT BEEN INDEPENDENTLY CONFIRMED.
7. SURVEY WAS PERFORMED UTILIZING A KONGSBERG EM3002 240KHZ MULTI-BEAM SYSTEM WITH A CODA F180 FOR HEADING AND MOTION. A ODOM CYM WAS USED FOR SINGLE BEAM SURVEY DATA. SURVEYS WERE PROCESSED IN HYPACK 2012.

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2 SAMPLING PROGRAM: SEDIMENT COLLECTION AND HANDLING

2.1 SAMPLE DESIGNATION

In accordance with the SAP (CLE 2018), four (4) sediment core samples were collected from the Vallejo Ferry in 2018 DU-1 Composite as depicted in Figure 4.

2.2 Overview of Field Activities and Lab Analyses

All sediments were collected in accordance with guidelines and procedures. A total of four (4) sample locations composited into one (1) analytical sample were evaluated within the proposed dredge areas. The subsamples were archived for possible discrete analysis, should elevated concentrations be detected in the composite sample. A six-inch "Z" sample was also collected and archived at the laboratory in case additional testing is required. The actual composite samples being analyzed are described below.

2.3 TEST SEDIMENT COLLECTION AND HANDLING

2.3.1 Project Site Sample Collection

On May 1, 2018 and May 2, 2018, Foth-CLE and Bay Marine Services (BMS) personnel collected four (4) sediment core samples at the locations shown on Figure 4. BMS personnel pre-plotted sample locations and their corresponding geographic coordinates on a field map prior to field activities. The vessel was maneuvered into position over each sample location using a differential Global Positioning System (dGPS) and visual verification where possible. The dGPS system uses U.S. Coast Guard differential correction data, and is accurate to ± 2 meters.

Continuous sediment cores were collected to the proposed dredge depth plus a one-foot over-dredge allowance and a six-inch 'Z-layer'. Sampling depths and core lengths for each sample station are provided in Table 3. Upon deployment of the core, geographic coordinates were recorded in log sheets. Upon collection of each sample core, penetration depth and sediment retrieval length were measured and recorded. Final sample location coordinates, sampling depths, and core lengths, are provided in Table 3. Core Logs are presented in Appendix A.

Table 3: Dredge Episode 8: Locations of sampling stations and core depths

DREDGE UNIT	SAMPLE ID	Northing*	Easting*	Mudline Elevation (-ft MLLW)	Target Core Length (ft)**	Retrieved Core Depth (ft)	Core Length Sampled (ft)
Composite	A	2227854.811	6054372.392	1.1	9.2	10.3***	9.2
	B	2227795.975	6054366.774	8.5	8.0	16.5	8.0
	C	2227743.032	6054428.519	7.8	8.7	16.5	8.7
	D	2227727.875	6054505.446	2.6	5.1	7.7***	5.1

*State Plane Coordinate System, California Zone 3, NAD 83

**Target Core includes the dredge allowance and a six-inch 'Z-layer' which was archived for additional analyses if needed.

***Sample located on the side-slope.

2.3.2 Sample Processing and Handling

Upon collection of each sample core, penetration depth and sedimentation retrieval length data were measured and recorded. After each sample was retrieved, the sediment core was extruded onto a non-contaminating polyethylene sheets and then characterized for texture,

color, and odor. Prior to the homogenization of each sediment core for evaluation as per the ITM, the "Z" layer (the 0.5 feet of sediment below the proposed permitted depth plus overdepth for each sample) for each core were collected and homogenized. A sub-sample of each "Z" layer sediment for each individual core was archived to allow for additional chemical analyses if necessary.

Table 4: Physical Characterization of Sediment Cores

SAMPLE ID	PENETRATION DEPTH (FT)	COLOR	ODOR	SEDIMENT TYPE
A	0-10.3	Dark Gray	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic and Organic Material Present. No Smell/No Sheen. Dense throughout Core with lamination of Coarse Silt Topping Core.
B	0-16.5	Dark Gray	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic and Organic Material Present. No Smell/No Sheen. Dense throughout Core with lamination of Coarse Silt Topping Core.
C	0-16.5	Dark Gray	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic and Organic Material Present. No Smell/No Sheen. Dense throughout Core with lamination of Coarse Silt Topping Core.
D	0-7.7	Light Gray to Gray	No Odor	Light Gray to Gray Fine Grained Bay Mud. Little to No Bioclastic and Organic Material Present. No Smell/No Sheen. Firm at Base to Loose at Top of Core with Lamination of Coarse Silt Topping Core.

Table 5: Compositing Scheme

SAMPLE ID	Analysis
Composite	Physical, Chemical , Benthic Toxicity

Sediment from each sediment core was thoroughly homogenized in the field to a uniform color and texture. Subsamples of the homogenates of each the four (4) cores were mixed to create composite samples for the physical and chemical tests. The remainder of each individual core homogenate was archived at 4°C. Upon completion of the sampling event, all samples were transported to the Foth-CLE's office where they were stored in darkened conditions at 4°C until released under chain of custody to the laboratory.

3 RESULTS

Results of the chemical, physical, and biological analyses of the sediments collected from the Vallejo Ferry Terminal were evaluated to determine the material's suitability for placement at the Cullinan Ranch Restoration Site. The specific analyses employed for this evaluation are discussed below.

3.1 PHYSICAL AND CHEMICAL ANALYSES

Subsamples from the composite sample were taken and shipped on ice to Eurofins | Calscience for grain-size, TOC and chemistry testing and ALS Environmental for Selenium testing and Frontier Analytical Laboratories for Dioxins and Furans. The State of California has certified Eurofins | Calscience, ALS Environmental and Frontier Analytical Laboratories for the analyses performed. Sediment samples were analyzed for the chemical and conventional parameters specified in the SAP (Foth-CLE 2018). Conventional parameters included total organic carbon (TOC), total solids, and grain size. Chemical analyses of trace metals, polycyclic aromatic hydrocarbons (PAHs), pesticides, polychlorinated biphenyls (PCBs), butyltins and dioxins were performed. The results of these analyses are summarized in Tables 6 through 14. Complete laboratory reports that were submitted are included in Appendix B.

3.1.1 Results of Composite

Total solids for 2018 composite was 45.0% and TOC levels were moderate (2.5%). Grain size analyses indicated that the sediment consisted primarily of fines (silts and clay) with 91.25% fines. Metals concentrations were below limits for Beneficial Reuse with the exception of Cadmium at a slightly elevated level of 0.875 mg/kg (Cullinan acceptance level of 0.7 mg/kg). Total PAHs were detected in the sample at a concentration of 812 µg/kg, below the Beneficial Reuse Limit level (3,390 µg/kg). All pesticides, butyltins, and PCBs were below the method detection limits or below the acceptability criteria for Beneficial Reuse.

Table 6: Summary of Vallejo Ferry Terminal Composite Sample Exceedances

SAMPLE ID	Analytes Exceeding Beneficial Reuse Levels
Composite	Cadmium, 2,6-Dimethylnaphthalene, Perylene*

*Total PAHs were below the Beneficial Reuse Limit Level of (3,390 µg/kg)

Table 7: Analytical Results for Vallejo Ferry Terminal: Grain Size, Total Solids (%), and Total Organic Carbon (%)

Analyte	Method Reference	Reporting Limit	Beneficial Reuse Limit	2018 Composite
Conventionals				
Grain Size				
Gravel	ASTMD4464		N/A	ND
Sand	ASTMD4464			8.75
Silt	ASTMD4464			62.43
Clay	ASTMD4464			28.82
TOC (%)	EPA9060A	0.11		2.5
Percent Solids (%)	SM2540B	0.1		45.0

**Table 8: Analytical Results for Vallejo Ferry Terminal: Metals Concentrations
(mg/kg, dry wt.)**

Analyte	Method Reference	Reporting Limit	Cullinan Ranch Beneficial Reuse Limit	2018 Composite	Duplicate Sample
Metals (mg/kg)					
As	EPA 6020	0.222	15.3	13.5	13.6
Cd	EPA 6020	0.222	0.7	0.875	0.885
Cr	EPA 6020	0.222	112	98.8	100
Cu	EPA 6020	0.222	68.1	66.5	67.3
Pb	EPA 6020	0.222	43.2	26.6	26.9
Hg	EPA 7471A	0.0444	0.33	.286	Not Sampled
Ni	EPA 6020	0.222	112	104.0	105
Se	EPA 7742	0.1	0.64	0.31	Not Sampled
Ag	EPA 6020	0.222	0.58	0.350	0.354
Zn	EPA 6020	2.22	158	141	143

3.1.2 Results of Discrete Samples

Analysis for Cadmium were performed on the discrete sample sites and composite duplicate due to the slightly elevated levels above the Cullinan Ranch Restoration Site. All results were above the acceptance levels for both Cadmium.

**Table 9: Analytical Results for Vallejo Ferry Terminal: Metals Concentrations- Discrete Samples
(mg/kg, dry wt.)**

Analyte	Method Reference	Reporting Limit	Cullinan Ranch Beneficial Reuse Limit	2018 Composite Duplicate	Sample A	Sample B	Sample C	Sample D
Metals (mg/kg)								
Cd	EPA 6020	0.225	0.7	1.4	1.07	1.35	0.975	1.180

**Table 10: Analytical Results for Vallejo Ferry Terminal: PAHs Concentrations
(ug/kg, dry wt.)**

Analyte	Method Reference	Reporting Limit	Beneficial Reuse Limit	2018 Composite
PAHs (ug/kg)				
1-Methylnaphthalene	EPA 8270C	22 µg/kg	12.1	ND
1-Methylphenanthrene	EPA 8270C	22 µg/kg	31.7	ND
1,6,7-Trimethylnaphthalene	EPA 8270C	22 µg/kg	9.8	ND
2,6-Dimethylnaphthalene	EPA 8270C	22 µg/kg	12.1	35
2-Methylnaphthalene	EPA 8270C	22 µg/kg	19.4	ND
Acenaphthene	EPA 8270C	22 µg/kg	26	ND
Acenaphthylene	EPA 8270C	22 µg/kg	88	ND
Anthracene	EPA 8270C	22 µg/kg	88	ND
Benzo(a)anthracene	EPA 8270C	22 µg/kg	412	53
Benzo(a)pyrene	EPA 8270C	22 µg/kg	371	98
Benzo(b)fluoranthene	EPA 8270C	22 µg/kg	371	87
Benzo(e)pyrene	EPA 8270C	22 µg/kg	294	62
Benzo(g,h,i)perylene	EPA 8270C	22 µg/kg	310	82
Benzo(k)fluoranthene	EPA 8270C	22 µg/kg	258	60
Biphenyl	EPA 8270C	22 µg/kg	12.9	ND
Chrysene	EPA 8270C	22 µg/kg	289	59
Dibenz(a,h)anthracene	EPA 8270C	22 µg/kg	32.7	ND
Dibenzothiophene	EPA 8270C	22 µg/kg		ND
Fluoranthene	EPA 8270C	22 µg/kg	514	110
Fluorene	EPA 8270C	22 µg/kg	25.3	ND
Indeno(1,2,3-cd)pyrene	EPA 8270C	22 µg/kg	382	57
Naphthalene	EPA 8270C	22 µg/kg	55.8	ND
Perylene	EPA 8270C	22 µg/kg	145	220
Phenanthrene	EPA 8270C	22 µg/kg	237	32
Pyrene	EPA 8270C	22 µg/kg	665	120
Total PAHs			3,390	1,075

Table 11: Analytical Results for Vallejo Ferry Terminal: PCB Congener Concentrations (ug/kg, dry wt.)

Analyte	Method Reference	Reporting Limit	Beneficial Reuse Limit	2018 Composite
PCB-005/008	EPA 8270C	0.89 µg/kg	22.7	ND
PCB-18	EPA 8270C	0.44 µg/kg		ND
PCB-28	EPA 8270C	0.44 µg/kg		ND
PCB-31	EPA 8270C	0.44 µg/kg		ND
PCB-33	EPA 8270C	0.44 µg/kg		ND
PCB-44	EPA 8270C	0.44 µg/kg		ND
PCB-49	EPA 8270C	0.44 µg/kg		ND
PCB-52	EPA 8270C	0.44 µg/kg		ND
PCB-56	EPA 8270C	0.44 µg/kg		ND
PCB-60	EPA 8270C	0.44 µg/kg		ND
PCB-66	EPA 8270C	0.44 µg/kg		ND
PCB-70	EPA 8270C	0.44 µg/kg		ND
PCB-74	EPA 8270C	0.44 µg/kg		ND
PCB-87	EPA 8270C	0.44 µg/kg		ND
PCB-95	EPA 8270C	0.44 µg/kg		ND
PCB-97	EPA 8270C	0.44 µg/kg		ND
PCB-99	EPA 8270C	0.44 µg/kg		0.68
PCB-101	EPA 8270C	0.44 µg/kg		0.96
PCB-105	EPA 8270C	0.44 µg/kg		ND
PCB-110	EPA 8270C	0.44 µg/kg		0.75
PCB-118	EPA 8270C	0.44 µg/kg		0.94
PCB-128	EPA 8270C	0.44 µg/kg		ND
PCB-132	EPA 8270C	0.89 µg/kg		1.4
PCB-138	EPA 8270C	0.89 µg/kg		ND
PCB-141	EPA 8270C	0.44 µg/kg		ND
PCB-149	EPA 8270C	0.44 µg/kg		0.96
PCB-151	EPA 8270C	0.44 µg/kg		ND
PCB-153	EPA 8270C	0.89 µg/kg		1.4
PCB-156	EPA 8270C	0.44 µg/kg		ND
PCB-158	EPA 8270C	0.84 µg/kg		0.86
PCB-170	EPA 8270C	0.44 µg/kg		0.51
PCB-174	EPA 8082 ECD	0.44 µg/kg		ND
PCB-177	EPA 8082 ECD	0.44 µg/kg		ND
PCB-180	EPA 8082 ECD	0.44 µg/kg		ND
PCB-183	EPA 8082 ECD	0.44 µg/kg		ND
PCB-187	EPA 8082 ECD	0.44 µg/kg		0.67
PCB-194	EPA 8082 ECD	0.44 µg/kg		ND
PCB-195	EPA 8082 ECD	0.44 µg/kg		ND
PCB-201	EPA 8082 ECD	0.44 µg/kg		ND
PCB-203	EPA 8082 ECD	0.44 µg/kg		ND
Total PCBs			22.7	9.13

Table 12: Analytical Results for Vallejo Ferry Terminal: Pesticides Concentrations (ug/kg, dry wt.)

Analyte	Method Reference	Reporting Limit	Beneficial Reuse Limit	2018 Composite
Aldrin	EPA 8081B	2.1 µg/kg	2.2	ND
α-BHC	EPA 8081B	4.4 µg/kg	0.99	ND
β-BHC	EPA 8081B	2.2 µg/kg		ND
γ-BHC (Lindane)	EPA 8081B	2.2 µg/kg		ND
δ-BHC	EPA 8081B	4.4 µg/kg		ND
Chlordane, total	EPA 8081B	2.2 µg/kg	1.1	ND
2,4'-DDD	EPA 8081B	2.1 µg/kg	7	ND
2,4'-DDE	EPA 8081B	4.4 µg/kg		ND
2,4'-DDT	EPA 8081B	2.2 µg/kg		ND
4,4'-DDD	EPA 8081B	2.2 µg/kg		2.3
4,4'-DDE	EPA 8081B	2.2 µg/kg		3.3
4,4'-DDT	EPA 8081B	2.2 µg/kg		ND
Total DDT	EPA 8081B	2 µg/kg		5.6
Dieldrin	EPA 8081B	2.2 µg/kg	0.72	ND
Endosulfan I	EPA 8081B	2.2 µg/kg		2.5
Endosulfan II	EPA 8081B	2.2 µg/kg		ND
Endosulfan sulfate	EPA 8081B	2.2 µg/kg		ND
Endrin	EPA 8081B	2.2 µg/kg	0.78	ND
Endrin aldehyde	EPA 8081B	2.2 µg/kg	6.4	ND
Heptachlor	EPA 8270C	0.44 µg/kg	0.3	ND
Heptachlor epoxide	EPA 8270C	0.44 µg/kg	0.3	ND
Toxaphene	EPA 8081B	44 µg/kg		ND

Table 13: Analytical Results for Vallejo Ferry Terminal: Organochlorine Pesticide Concentrations (ug/kg, dry wt.)

Analyte	Method Reference	Reporting Limit	Beneficial Reuse Limit	2018 Composite
Tetrabutyltin	EPA 3550 B	6.7	N/A	ND
Tributyltin	EPA 3550 B	6.7		ND
Dibutyltin	EPA 3550 B	6.7		ND
Monobutyltin	EPA 3550 B	6.7		ND

Table 14: Analytical Results for Vallejo Ferry Terminal: Dioxins & Furans (µg/kg)

Analyte	Method Reference	Reporting Limit	2018 Composite
Dioxins & Furans (µg/kg)			
2,3,7,8-TCDD	EPA 1613	0.0000273	ND
1,2,3,7,8-PeCDD	EPA 1613	0.0000570	0.000694
1,2,3,4,7,8-HxCDD	EPA 1613	0.0000793	0.000824
1,2,3,6,7,8-HxCDD	EPA 1613	0.000094	0.00255
1,2,3,7,8,9-HxCDD	EPA 1613	0.0000823	0.00164
1,2,3,4,6,7,8-HpCDD	EPA 1613	0.0000842	0.0267
OCDD	EPA 1613	0.0000172	0.155
2,3,7,8-TCDF	EPA 1613	0.0000269	0.00203
1,2,3,7,8-PeCDF	EPA 1613	0.0000449	0.000652
2,3,4,7,8-PeCDF	EPA 1613	0.0000468	0.000127
1,2,3,4,7,8-HxCDF	EPA 1613	0.0000437	0.00104
1,2,3,6,7,8-HxCDF	EPA 1613	0.0000417	0.000877
1,2,3,7,8,9-HxCDF	EPA 1613	0.0000657	0.00042
2,3,4,6,7,8-HxCDF	EPA 1613	0.0000574	0.00104
1,2,3,4,6,7,8-HpCDF	EPA 1613	0.0000747	0.00652
1,2,3,4,7,8,9-HpCDF	EPA 1613	0.0000883	0.00064
OCDF	EPA 1613	0.00017	0.013
Total Tetra-Dioxins	EPA 1613		0.00541
Total Penta-Dioxins	EPA 1613		0.00709
Total Hexa-Dioxins	EPA 1613		0.0266
Total Hepta-Dioxins	EPA 1613		0.0686
Total Tetra-Furans	EPA 1613		0.0208
Total Penta-Furans	EPA 1613		0.0133
Total Hexa-Furans	EPA 1613		0.013
Total Hepta-Furans	EPA 1613		0.018

Analyte	Method Reference	Beneficial Reuse Limit	2018 Composite (TEQ)
Total TCDD TEQ	EPA 1613	0.02 ug/kg	0.00253 ug/kg

3.1.3 Conventional and Chemical Analytical QA/QC Summary

The QA/QC review entailed reviewing the contract lab Data Reports for sample integrity, correct methodology, and compliance with all appropriate quality Lab Control requirements. The overall data quality assessment found that all data were usable. Appendix B and C contains the conventional and chemical analysis report. There were no significant issues with the analytical chemistry QA/QC limits that would affect the overall quality or interpretation of the data.

3.2 MODIFIED ELUTRIATE TESTING

Modified Elutriate Testing (MET) was performed to address the potential impacts from the decant water resulting from the placement of dredged material. The sediment elutriates were analyzed for the suite of heavy metals in accordance with MET methods described in Appendix B of the ITM. Eurofins | Calscience performed the MET analysis as specified in the SAP (CLE 2018). The results of these analyses are summarized in Table 15. Complete laboratory reports that were submitted are included in Appendix C.

Table 15: Analytical Results for Vallejo: MET Metals analytes

Analyte	Method Reference	Reporting Limit	SFRWQCB Basin Water Quality Objectives Cont. Conc. (4-day avg.) (µg/L)	2018 Composite
Dissolved Arsenic	EPA 1640	0.0300	36	4.70
Dissolved Cadmium	EPA 1640	0.0300	9.3	0.0275
Dissolved Chromium	EPA 1640	0.500	50	0.299
Dissolved Copper	EPA 1640	0.0300	6.0	1.21
Dissolved Lead	EPA 1640	0.0300	8.1	0.0455
Dissolved Mercury	EPA 1631E	0.000500	2.0	0.00436
Dissolved Nickel	EPA 1640	0.0500	8.2	2.24
Total Selenium	EPA 1640	0.0500	5.0	0.0844
Dissolved Silver	EPA 1640	0.0500	-	ND
Dissolved Zinc	EPA 1640	0.500	81	0.636
TSS	SM 2540D	1.0	-	17 mg/L

3.2.1 Results of 2018 Composite

MET analysis for metals concentrations were below limits for SFRWQCB Basin Water Quality Objectives Concentrations.

3.2.2 MET QA/QC Summary

The QA/QC review entailed reviewing the contract lab Data Reports for sample integrity, correct methodology, and compliance with all appropriate quality Lab Control requirements. The overall data quality assessment found that all data were usable. Appendix D contains the conventional and chemical analysis report. There were no significant issues with the MET QA/QC limits that would affect the overall quality or interpretation of the data.

3.3 BIOLOGICAL EVALUATION

To assess the potential biological impacts associated with placement of sediments from the Vallejo Ferry Terminal, Pacific EcoRisk performed biological tests on the composite sample:

1. 10-day amphipod survival test with *Leptocheirus plumulosus*,
2. 10-day juvenile polychaete survival test with *Neanthes arenaceodentata*,
3. 96-hr modified elutriate acute test with *Americamysis bahia*.

The results of these analyses are summarized in Table 16-18. Complete laboratory reports that were submitted by Pacific EcoRisk are included in Appendix D.

3.3.1 Effects of WETA Vallejo Ferry Terminal Sediments on *Leptocheirus plumulosus*

There was 100% survival in the Control sediment, indicating an acceptable survival response by the test organisms. There was no significant reduction in survival in the 2018 DU-1 composite sediment (99%). The difference in survival in the site sediment relative to the Control response was <20% indicated that these sediments are not toxic to amphipods. The reference toxicant testing effects of KCl on *Leptocheirus plumulosus* indicated that the LC₅₀ (1.19 g/L KCl for 2018 DU-1 Composite) for these tests are consisted with the typical response range established by the reference test data base for *Leptocheirus plumulosus*.

Table 16: Effects of Vallejo Ferry Terminal on *Leptocheirus plumulosus*

Elutriate Treatment	Mean % Survival:
Lab Control	100%
2018 DU-1 Composite	99%

Table 16a: Effects of Vallejo Ferry Terminal on *Leptocheirus plumulosus*

Sediment Site	% Survival in Test Replicates					Mean % Survival
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	100%	100%	100%	100%	100%	100%
2018 DU-1 Composite	95%	95%	100%	100%	100%	99%

Table 16b: Effects of KCl on *Leptocheirus plumulosus*

KCl Treatment (g/L)	2018 Comp Mean % Survival
Lab Control	100
0.25	95
0.50	100
1	75*
2	0*
4	0*
LC ₅₀	1.19 g/L KCl
Typical Response Range (mean +/- 2SD) =	0.308-1.63 g/L KCl

*The survival response at this treatment was significantly less than the Lab Control response at p<0.05.

3.3.2 Effects of WETA Vallejo Ferry Terminal Sediments on *Neanthes arenaceodentata*

There was 100% survival in the Control sediment, indicating an acceptable survival response by the test organisms. There was no reduction in survival in the 2018 DU-1 Composite sediment (100%). The difference in survival in the site sediment relative to the Control response was <10% indicated that these sediments are not toxic to polychaetes. The reference toxicant testing effects of KCl on *Neanthes arenaceodentata* indicated that the LC₅₀ (1.86 g/L KCl for 2018 DU-1 Composite) for these tests are consisted with the typical response range established by the reference test data base for *Neanthes arenaceodentata*.

Table 17: Effects of Vallejo Ferry Terminal on *Neanthes arenaceodentata*

Elutriate Treatment	Mean % Survival
Lab Control	100%
2018 DU-1 Composite	100%

Table 17a: Effects of Vallejo Ferry Terminal on *Neanthes arenaceodentata*

Sediment Site	% Survival in Test Replicates					Mean % Survival
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	100%	100%	100%	100%	100%	100%
2018 DU-1-Composite	100%	100%	100%	100%	100%	100%

Table 17b: Effects of KCl on *Neanthes arenaceodentata*

KCl Treatment (g/L)	2018 Comp Mean % Survival
Lab Control	100
0.25	100
0.50	100
1	50*
2	0*
4	0*
LC ₅₀	1.86 g/L KCl
Typical Response Range (mean +/- 2SD) =	1.15-2.51 g/L KCl

*The survival response at this treatment was significantly less than the Lab Control response at p<0.05.

3.3.3 Effects of WETA Vallejo Ferry Terminal Sediments on *Americamysis bahia*

There was 100% survival in the Lab Control treatment, indicating an acceptable survival responses by the test organisms. There was 100% (2018 DU-1 Composite) survival in the Vallejo Ferry Terminal site water treatment. There were no significant reductions in survival in any of the modified elutriates, indicating that these modified elutriates were not toxic to mysids. The reference toxicant testing effects of KCl on *Americamysis bahia* indicated that the LC₅₀ (0.61 g/L KCl for DU-1) for these tests are consisted with the typical response range established by the reference test data base for *Americamysis bahia*.

Table 18: Effects of Vallejo Ferry Terminal on *Americamysis bahia*

Elutriate Treatment	Mean % Survival
Lab Control	100%
Site Water	100%
2018 DU-1 Composite	100%

Table 18a: Effects of KCl on *Americamysis bahia*

KCl Treatment (g/L)	2018 Comp Mean % Survival
Lab Control	100
0.25	97.5
0.50	97.5
1	77.5
2	0*
4	0*
LC ₅₀	0.61 g/L KCl
Typical Response Range (mean +/- 2SD) =	0.31-0.70 g/L KCl

*The survival response at this treatment was significantly less than the Lab Control response at $p < 0.05$.

3.3.4 Biological Analytical QA/QC Summary

The biological testing of WETA Vallejo Ferry Terminal sediments incorporated standard QA/QC procedures to ensure that the test results were valid. Standard QA/QC procedures included the use of negative Lab Controls, positive Lab Controls, test replicates and measurements of water quality during testing.

Quality assurance procedures that were used for sediment testing are consistent with methods described in the EPA/USACE (1998). Sediments for the bioassay testing were stored approximately at $\leq 4^{\circ}\text{C}$ and were used within the eight (8) week holding time period. Sediment interstitial water characteristics were within test acceptability limits at the start of the tests. Sediment elutriates were prepared using site water. The toxicity test overlying waters consisted of reconstituted waters.

4 DISCUSSION

To determine whether dredged material from the Vallejo Ferry Terminal sediments are suitable for placement at the Cullinan Ranch Restoration Site, sediment samples representative of the material proposed for dredging were analyzed for chemical and physical parameters.

4.1 SEDIMENT AND CHEMISTRY EVALUATION

All contaminants, organic and inorganic, measured in the Vallejo Ferry Terminal sediments, were at concentration below dredge material acceptance criteria for determining suitability for placement at the Cullinan Ranch Restoration Site (with the exception of the slightly elevated concentrations of Cadmium, 2,6-Dimethylnaphthalene, Perylene). After running Cadmium on the duplicate composite sample and discrete sample, levels were still above the acceptable range for acceptance for Cullinan Ranch Restoration Site.

4.2 MET EVALUATION

MET analysis for metals concentrations were below limits for SFRWQCB Basin Water Quality Objectives Concentrations.

4.3 BIOLOGICAL EVALUATION

The polychaete and amphipod elutriate tests prepared elicited no acute toxicity relative to effects observed in the Vallejo Ferry sediments.

4.4 CONCLUSIONS

Sediments proposed for dredging from the Vallejo Ferry Terminal were above the acceptable limits for beneficial reuse at Cullinan Ranch Restoration for Cadmium. Based on the material composition, level of the contaminant concentrations, WETA is requesting a suitability determination for placement as foundation material at Montezuma Wetlands Restoration Site.

5 REFERENCES

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Appendix A Sampling Field Logs and Data Sheets

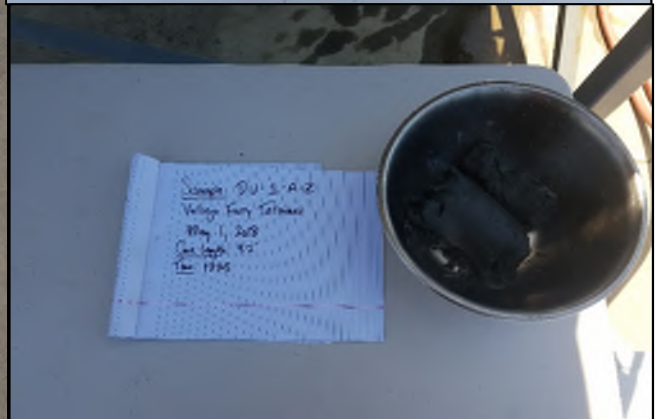
Vallejo Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/1/2018	Sample Time:	1225	Sampler(s):	DG
Sample ID:	DU-1-A	Notes:			
Northing:	2227854.811	Easting:	6054372.392		
Corrected Mudline Depth (ft):	-1.1	Tide Height (ft):	1.5		
Target Core Length (ft):	9.2	Vibra Core Penetration Depth (ft):	10.3		
Core Length Recovered (ft):	9.2	Final Core Length (ft):	9.2		

Sample Processing Information

Process Date:	5/1/2018	Process Time:	1235	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
10.3	Dark Grey	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic and Organic Material Present. No Smell/No Sheen. Dense throughout Core with lamination of Coarse Silt Topping Core.		



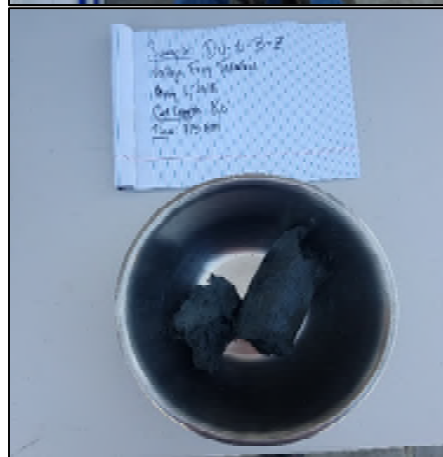
Vallejo Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/1/2018	Sample Time:	1115	Sampler(s):	DG
Sample ID:	DU-1-B	Notes:			
Northing:	2227795.975	Easting:	6054366.774		
Corrected Mudline Depth (ft):	-8.5	Tide Height (ft):	0.4		
Target Core Length (ft):	8.0	Vibra Core Penetration Depth (ft):	16.5		
Core Length Recovered (ft):	8.0	Final Core Length (ft):	8.0		

Sample Processing Information

Process Date:	5/1/2018	Process Time:	1125	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
16.5	Dark Grey	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic and Organic Material Present. No Smell/No Sheen. Dense throughout Core with lamination of Coarse Silt Topping Core.		



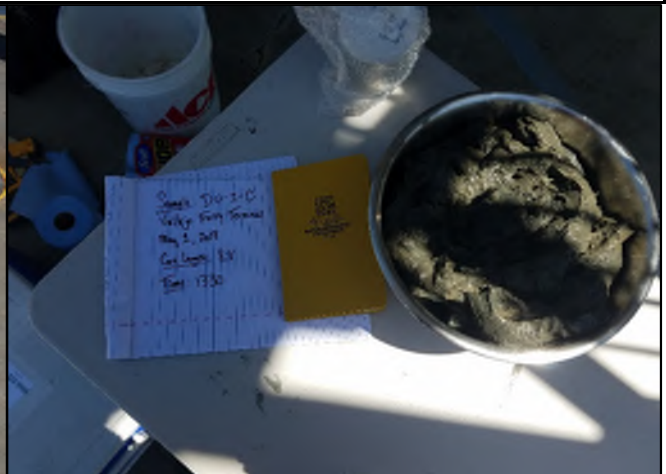
Vallejo Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/1/2018	Sample Time:	1330	Sampler(s):	DG
Sample ID:	DU-1-C	Notes:			
Northing:	2227743.032	Easting:	6054428.519		
Corrected Mudline Depth (ft):	-7.8	Tide Height (ft):	2.9		
Target Core Length (ft):	8.7	Vibra Core Penetration Depth (ft):	16.5		
Core Length Recovered (ft):	8.7	Final Core Length (ft):	8.7		

Sample Processing Information

Process Date:	5/1/2018	Process Time:	1340	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
16.5	Dark Grey	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic and Organic Material Present. No Smell/No Sheen. Dense throughout Core with lamination of Coarse Silt Topping Core.		



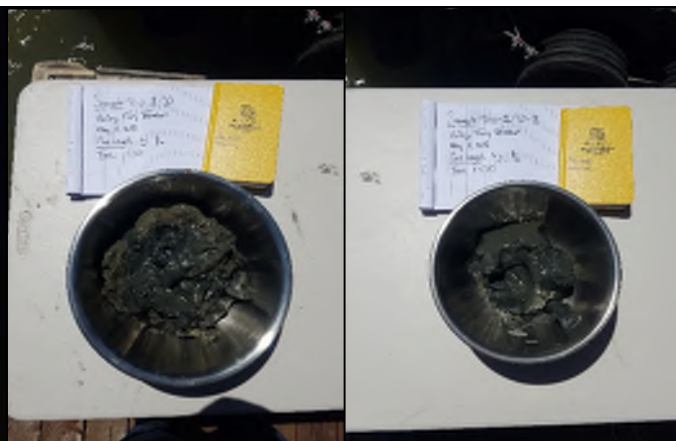
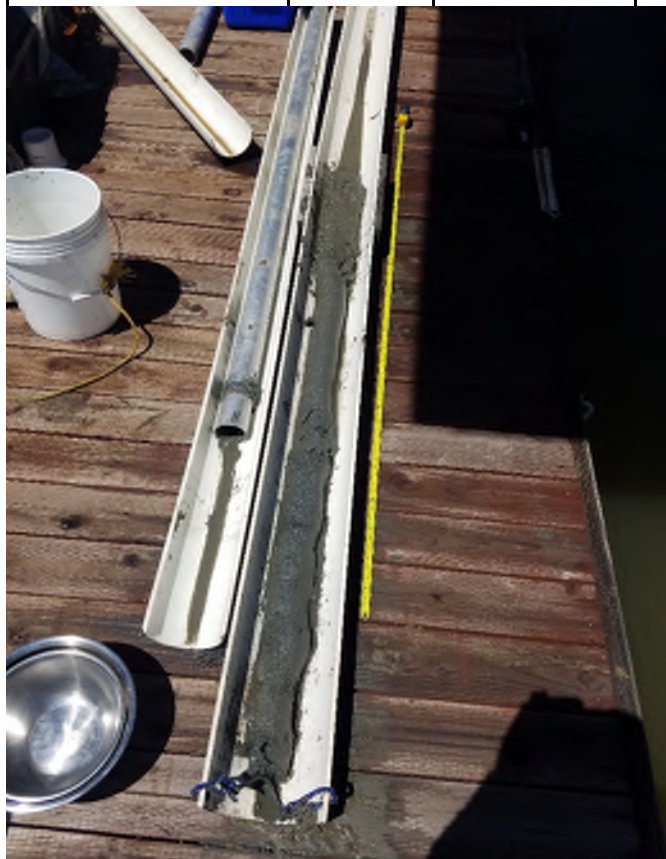
Vallejo Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/2/2018	Sample Time:		Sampler(s):	DG
Sample ID:	DU-1-D	Notes:			
Northing:	2227727.875	Easting:	6054505.446		
Corrected Mudline Depth (ft):	-2.6	Tide Height (ft):	3.9		
Target Core Length (ft):	5.1	Vibra Core Penetration Depth (ft):	7.7		
Core Length Recovered (ft):	5.1	Final Core Length (ft):	5.1		

Sample Processing Information

Process Date:	5/2/2018	Process Time:	1330	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
7.7	Light Gray to Gray	No Odor	Light Gray to Gray Fine Grained Bay Mud. Little to No Bioclastic and Organic Material Present. No Smell/No Sheen. Firm at Base to Loose at Top of Core with Lamination of Coarse Silt Topping Core.		



Appendix B Analytical Chemistry Laboratory Data Reports Submitted by Eurofins |Calscience



WORK ORDER NUMBER: 18-05-0353

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: FOTH CLE Engineering

Client Project Name: WETA

Attention: Wendy Rocha
15 Creek Road
Marion, MA 02738-9999



Approved for release on 06/06/2018 by:
Carla Hollowell
Project Manager

ResultLink >

Email your PM >

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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Work Order Number: 18-05-0353

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Work Order Narrative

Work Order: 18-05-0353Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 05/04/18. They were assigned to Work Order 18-05-0353.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

Sample Summary

Client: FOTH CLE Engineering	Work Order: 18-05-0353
15 Creek Road	Project Name: WETA
Marion, MA 02738-9999	PO Number: 0017S414.20
	Date/Time Received: 05/04/18 07:30
	Number of Containers: 13

Attn: Wendy Rocha

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
DU-1 Composite	18-05-0353-1	05/03/18 09:00	4	Sediment
DU-1 Composite ARCHIVE ONLY	18-05-0353-2	05/03/18 09:00	1	Sediment
A-ARCHIVE ONLY	18-05-0353-3	05/01/18 12:25	1	Sediment
A-Z-ARCHIVE ONLY	18-05-0353-4	05/01/18 12:25	1	Sediment
B-ARCHIVE ONLY	18-05-0353-5	05/01/18 11:15	1	Sediment
B-Z-ARCHIVE ONLY	18-05-0353-6	05/01/18 11:15	1	Sediment
C-ARCHIVE ONLY	18-05-0353-7	05/01/18 13:30	1	Sediment
C-Z-ARCHIVE ONLY	18-05-0353-8	05/01/18 13:30	1	Sediment
D-ARCHIVE ONLY	18-05-0353-9	05/02/18 13:30	1	Sediment
D-Z-ARCHIVE ONLY	18-05-0353-10	05/02/18 13:30	1	Sediment

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: N/A
Method: EPA 9060A
Units: %

Project: WETA

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-AA	05/03/18 09:00	Sediment	TOC 10	05/22/18	05/22/18 18:05	I0522TOCL1

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Carbon, Total Organic	2.5	0.11	1.00	

Method Blank	099-06-013-1831	N/A	Solid	TOC 10	05/22/18	05/22/18 18:05	I0522TOCL1
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Carbon, Total Organic	ND	0.050	1.00	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: N/A
Method: SM 2540 B (M)
Units: %

Project: WETA

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-AA	05/03/18 09:00	Sediment	N/A	05/09/18	05/09/18 15:30	I0509TSB2

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Solids, Total	45.0	0.100	1.00	

Method Blank	099-05-019-4033	N/A	Solid	N/A	05/09/18	05/09/18 15:30	I0509TSB2
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Solids, Total	ND	0.100	1.00	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020
Units: mg/kg

Project: WETA

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-CC	05/03/18 09:00	Sediment	ICP/MS 03	05/07/18	05/09/18 18:57	180507L01E

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Arsenic	13.5	0.222	1.00	
Cadmium	0.875	0.222	1.00	
Chromium	98.8	0.222	1.00	
Copper	66.5	0.222	1.00	
Lead	26.6	0.222	1.00	
Nickel	104	0.222	1.00	
Silver	0.350	0.222	1.00	
Zinc	141	2.22	1.00	

Method Blank	099-15-254-604	N/A	Solid	ICP/MS 03	05/07/18	05/09/18 18:42	180507L01E
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Arsenic	ND	0.100	1.00	
Cadmium	ND	0.100	1.00	
Chromium	ND	0.100	1.00	
Copper	ND	0.100	1.00	
Lead	ND	0.100	1.00	
Nickel	ND	0.100	1.00	
Silver	ND	0.100	1.00	
Zinc	ND	1.00	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 7471A Total
Method: EPA 7471A
Units: mg/kg

Project: WETA

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-CC	05/03/18 09:00	Sediment	Mercury 08	05/09/18	05/09/18 14:13	180509L01E

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Mercury	0.286	0.0444	1.00	

Method Blank	099-16-278-413	N/A	Solid	Mercury 08	05/09/18	05/09/18 14:09	180509L01E
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Mercury	ND	0.0207	1.00	

Analytical Report

FOTH CLE Engineering	Date Received:	05/04/18
15 Creek Road	Work Order:	18-05-0353
Marion, MA 02738-9999	Preparation:	N/A
	Method:	ASTM D4464 (M)
	Units:	%
Project: WETA		Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-D	05/03/18 09:00	Sediment	LPSA 1	N/A	05/04/18 17:31	

<u>Parameter</u>	<u>Result</u>	<u>Qualifiers</u>
Clay (less than 0.00391mm)	28.82	
Silt (0.00391 to 0.0625mm)	62.43	
Total Silt and Clay (0 to 0.0625mm)	91.25	
Very Fine Sand (0.0625 to 0.125mm)	6.95	
Fine Sand (0.125 to 0.25mm)	1.80	
Medium Sand (0.25 to 0.5mm)	ND	
Coarse Sand (0.5 to 1mm)	ND	
Very Coarse Sand (1 to 2mm)	ND	
Gravel (greater than 2mm)	ND	

Analytical Report

FOTH CLE Engineering	Date Received:	05/04/18
15 Creek Road	Work Order:	18-05-0353
Marion, MA 02738-9999	Preparation:	EPA 3541
	Method:	EPA 8081A
	Units:	ug/kg
Project: WETA		Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-CC	05/03/18 09:00	Sediment	GC 44	05/11/18	05/17/18 09:55	180511L25

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Aldrin	ND	2.2	1.00	
Alpha-BHC	ND	4.4	1.00	
Beta-BHC	ND	2.2	1.00	
Delta-BHC	ND	4.4	1.00	
Gamma-BHC	ND	2.2	1.00	
Dieldrin	ND	2.2	1.00	
2,4'-DDD	ND	2.2	1.00	
2,4'-DDE	ND	4.4	1.00	
2,4'-DDT	ND	2.2	1.00	
4,4'-DDD	2.3	2.2	1.00	
4,4'-DDE	3.3	2.2	1.00	
4,4'-DDT	ND	2.2	1.00	
Endosulfan I	ND	2.2	1.00	
Endosulfan II	ND	2.2	1.00	
Endosulfan Sulfate	ND	2.2	1.00	
Endrin	ND	2.2	1.00	
Endrin Aldehyde	ND	2.2	1.00	
Toxaphene	ND	44	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
2,4,5,6-Tetrachloro-m-Xylene	59	25-145	
Decachlorobiphenyl	95	24-168	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8081A
Units: ug/kg

Project: WETA

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-858-542	N/A	Solid	GC 44	05/11/18	05/17/18 06:27	180511L25

Parameter	Result	RL	DF	Qualifiers
Aldrin	ND	1.0	1.00	
Alpha-BHC	ND	2.0	1.00	
Beta-BHC	ND	1.0	1.00	
Delta-BHC	ND	2.0	1.00	
Gamma-BHC	ND	1.0	1.00	
Dieldrin	ND	1.0	1.00	
2,4'-DDD	ND	1.0	1.00	
2,4'-DDE	ND	2.0	1.00	
2,4'-DDT	ND	1.0	1.00	
4,4'-DDD	ND	1.0	1.00	
4,4'-DDE	ND	1.0	1.00	
4,4'-DDT	ND	1.0	1.00	
Endosulfan I	ND	1.0	1.00	
Endosulfan II	ND	1.0	1.00	
Endosulfan Sulfate	ND	1.0	1.00	
Endrin	ND	1.0	1.00	
Endrin Aldehyde	ND	1.0	1.00	
Toxaphene	ND	20	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2,4,5,6-Tetrachloro-m-Xylene	69	25-145	
Decachlorobiphenyl	96	24-168	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3545
Method: EPA 8081A
Units: ug/kg

Project: WETA

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-CC	05/03/18 09:00	Sediment	GC 44	05/15/18	05/17/18 14:40	180515L03

Comment(s): - Results are reported on a dry weight basis.
- Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Chlordane	ND	1.1	0.36	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
2,4,5,6-Tetrachloro-m-Xylene	99	24-168	

Method Blank	099-15-817-44	N/A	Solid	GC 44	05/15/18	05/17/18 06:55	180515L03
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Chlordane	ND	0.50	0.16	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
2,4,5,6-Tetrachloro-m-Xylene	83	24-168	



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C PEST-SIM
Units: ug/kg

Project: WETA

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-CC	05/03/18 09:00	Sediment	GC/MS BBB	05/11/18	05/16/18 16:39	180511L24

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Heptachlor	ND	0.44	1.00	
Heptachlor Epoxide	ND	0.44	1.00	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
Dibutylchloroendate	97	25-200		
2,4,5,6-Tetrachloro-m-Xylene	80	25-200		

Method Blank	099-16-154-93	N/A	Solid	GC/MS BBB	05/11/18	05/16/18 15:39	180511L24
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Heptachlor	ND	0.20	1.00	
Heptachlor Epoxide	ND	0.20	1.00	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
Dibutylchloroendate	121	25-200		
2,4,5,6-Tetrachloro-m-Xylene	86	25-200		



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: WETA

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-C	05/03/18 09:00	Sediment	GC/MS AAA	05/09/18	05/12/18 00:55	180509L14

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Dibenzothiophene	ND	22	1.00	
Acenaphthene	ND	22	1.00	
Acenaphthylene	ND	22	1.00	
Anthracene	ND	22	1.00	
Benzo (a) Anthracene	53	22	1.00	
Benzo (a) Pyrene	98	22	1.00	
Benzo (b) Fluoranthene	87	22	1.00	
Benzo (e) Pyrene	62	22	1.00	
Benzo (g,h,i) Perylene	82	22	1.00	
Benzo (k) Fluoranthene	60	22	1.00	
Biphenyl	ND	22	1.00	
Chrysene	59	22	1.00	
Dibenz (a,h) Anthracene	ND	22	1.00	
2,6-Dimethylnaphthalene	35	22	1.00	
Fluoranthene	110	22	1.00	
Fluorene	ND	22	1.00	
Indeno (1,2,3-c,d) Pyrene	57	22	1.00	
2-Methylnaphthalene	ND	22	1.00	
1-Methylnaphthalene	ND	22	1.00	
1-Methylphenanthrene	ND	22	1.00	
Naphthalene	ND	22	1.00	
Perylene	220	22	1.00	
Phenanthrene	32	22	1.00	
Pyrene	120	22	1.00	
1,6,7-Trimethylnaphthalene	ND	22	1.00	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
2-Fluorobiphenyl	69	14-146		
Nitrobenzene-d5	33	18-162		
p-Terphenyl-d14	92	34-148		



 Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: WETA

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-14-097-268	N/A	Solid	GC/MS AAA	05/09/18	05/11/18 14:51	180509L14

Parameter	Result	RL	DF	Qualifiers
Dibenzothiophene	ND	10	1.00	
Acenaphthene	ND	10	1.00	
Acenaphthylene	ND	10	1.00	
Anthracene	ND	10	1.00	
Benzo (a) Anthracene	ND	10	1.00	
Benzo (a) Pyrene	ND	10	1.00	
Benzo (b) Fluoranthene	ND	10	1.00	
Benzo (e) Pyrene	ND	10	1.00	
Benzo (g,h,i) Perylene	ND	10	1.00	
Benzo (k) Fluoranthene	ND	10	1.00	
Biphenyl	ND	10	1.00	
Chrysene	ND	10	1.00	
Dibenz (a,h) Anthracene	ND	10	1.00	
2,6-Dimethylnaphthalene	ND	10	1.00	
Fluoranthene	ND	10	1.00	
Fluorene	ND	10	1.00	
Indeno (1,2,3-c,d) Pyrene	ND	10	1.00	
2-Methylnaphthalene	ND	10	1.00	
1-Methylnaphthalene	ND	10	1.00	
1-Methylphenanthrene	ND	10	1.00	
Naphthalene	ND	10	1.00	
Perylene	ND	10	1.00	
Phenanthrene	ND	10	1.00	
Pyrene	ND	10	1.00	
1,6,7-Trimethylnaphthalene	ND	10	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
2-Fluorobiphenyl	90	14-146	
Nitrobenzene-d5	64	18-162	
p-Terphenyl-d14	94	34-148	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: WETA

Page 1 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-CC	05/03/18 09:00	Sediment	GC/MS HHH	05/11/18	05/16/18 19:58	180511L23

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
PCB005/008	ND	0.89	1.00	
PCB018	ND	0.44	1.00	
PCB028	ND	0.44	1.00	
PCB031	ND	0.44	1.00	
PCB033	ND	0.44	1.00	
PCB044	ND	0.44	1.00	
PCB049	ND	0.44	1.00	
PCB052	ND	0.44	1.00	
PCB056	ND	0.44	1.00	
PCB060	ND	0.44	1.00	
PCB066	ND	0.44	1.00	
PCB070	ND	0.44	1.00	
PCB074	ND	0.44	1.00	
PCB087	ND	0.44	1.00	
PCB095	ND	0.44	1.00	
PCB097	ND	0.44	1.00	
PCB099	0.68	0.44	1.00	
PCB101	0.96	0.44	1.00	
PCB105	ND	0.44	1.00	
PCB110	0.75	0.44	1.00	
PCB118	0.94	0.44	1.00	
PCB128	ND	0.44	1.00	
PCB132/153	1.4	0.89	1.00	
PCB138/158	ND	0.89	1.00	
PCB141	ND	0.44	1.00	
PCB149	0.96	0.44	1.00	
PCB151	ND	0.44	1.00	
PCB156	ND	0.44	1.00	
PCB170	0.51	0.44	1.00	
PCB174	ND	0.44	1.00	
PCB177	ND	0.44	1.00	
PCB180	ND	0.44	1.00	
PCB183	ND	0.44	1.00	
PCB187	0.67	0.44	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: WETA

Page 2 of 4

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
PCB194	ND	0.44	1.00	
PCB195	ND	0.44	1.00	
PCB201	ND	0.44	1.00	
PCB203	ND	0.44	1.00	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
2-Fluorobiphenyl	85	14-146		
p-Terphenyl-d14	104	34-148		

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: WETA

Page 3 of 4

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-16-418-306	N/A	Solid	GC/MS HHH	05/11/18	05/16/18 18:24	180511L23

Parameter	Result	RL	DF	Qualifiers
PCB005/008	ND	0.40	1.00	
PCB018	ND	0.20	1.00	
PCB028	ND	0.20	1.00	
PCB031	ND	0.20	1.00	
PCB033	ND	0.20	1.00	
PCB044	ND	0.20	1.00	
PCB049	ND	0.20	1.00	
PCB052	ND	0.20	1.00	
PCB056	ND	0.20	1.00	
PCB060	ND	0.20	1.00	
PCB066	ND	0.20	1.00	
PCB070	ND	0.20	1.00	
PCB074	ND	0.20	1.00	
PCB087	ND	0.20	1.00	
PCB095	ND	0.20	1.00	
PCB097	ND	0.20	1.00	
PCB099	ND	0.20	1.00	
PCB101	ND	0.20	1.00	
PCB105	ND	0.20	1.00	
PCB110	ND	0.20	1.00	
PCB118	ND	0.20	1.00	
PCB128	ND	0.20	1.00	
PCB132/153	ND	0.40	1.00	
PCB138/158	ND	0.40	1.00	
PCB141	ND	0.20	1.00	
PCB149	ND	0.20	1.00	
PCB151	ND	0.20	1.00	
PCB156	ND	0.20	1.00	
PCB170	ND	0.20	1.00	
PCB174	ND	0.20	1.00	
PCB177	ND	0.20	1.00	
PCB180	ND	0.20	1.00	
PCB183	ND	0.20	1.00	
PCB187	ND	0.20	1.00	
PCB194	ND	0.20	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: WETA

Page 4 of 4

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
PCB195	ND	0.20	1.00	
PCB201	ND	0.20	1.00	
PCB203	ND	0.20	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
2-Fluorobiphenyl	79	14-146	
p-Terphenyl-d14	102	34-148	

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3550B (M)
Method: Organotins by Krone et al.
Units: ug/kg

Project: WETA

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-CC	05/03/18 09:00	Sediment	GC/MS Y	05/10/18	05/15/18 16:07	180510L17

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Dibutyltin	ND	6.7	1.00	
Monobutyltin	ND	6.7	1.00	
Tetrabutyltin	ND	6.7	1.00	
Tributyltin	ND	6.7	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Tripentyltin	74	27-135	

Method Blank	099-07-016-1589	N/A	Solid	GC/MS Y	05/10/18	05/15/18 12:03	180510L17
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Dibutyltin	ND	3.0	1.00	
Monobutyltin	ND	3.0	1.00	
Tetrabutyltin	ND	3.0	1.00	
Tributyltin	ND	3.0	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
Tripentyltin	64	27-135	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

CLE Engineering, Inc.

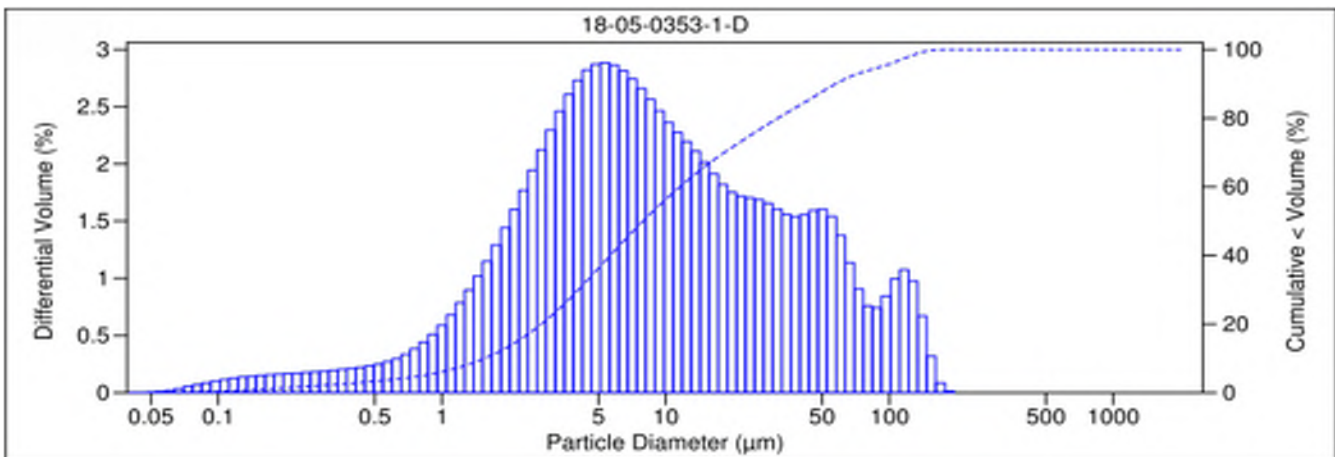
Date Sampled: 05/03/18
 Date Received: 05/04/18
 Work Order No: 18-05-0353
 Date Analyzed: 05/04/18
 Method: ASTM D4464M

Project: WETA

Page 1 of 1

Sample ID	Depth ft	Description	Mean Grain Size mm
DU-1 Composite		Silt	0.020

Particle Size Distribution, wt by percent								Total Silt & Clay
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	
0.00	0.00	0.00	0.00	1.80	6.95	62.43	28.82	91.25



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Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: N/A
Method: EPA 9060A

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
DU-1 Composite	Sample	Sediment	TOC 10	05/22/18	05/22/18 18:05	I0522TOCS1				
DU-1 Composite	Matrix Spike	Sediment	TOC 10	05/22/18	05/22/18 18:05	I0522TOCS1				
DU-1 Composite	Matrix Spike Duplicate	Sediment	TOC 10	05/22/18	05/22/18 18:05	I0522TOCS1				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	1.113	3.000	4.618	117	4.150	101	75-125	11	0-25	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



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Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
DU-1 Composite	Sample	Sediment	ICP/MS 03	05/07/18	05/09/18 18:57	180507S01				
DU-1 Composite	Matrix Spike	Sediment	ICP/MS 03	05/07/18	05/09/18 18:47	180507S01				
DU-1 Composite	Matrix Spike Duplicate	Sediment	ICP/MS 03	05/07/18	05/09/18 18:49	180507S01				
<u>Parameter</u>	<u>Sample Conc.</u>	<u>Spike Added</u>	<u>MS Conc.</u>	<u>MS %Rec.</u>	<u>MSD Conc.</u>	<u>MSD %Rec.</u>	<u>%Rec. CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Arsenic	6.073	25.00	32.97	108	33.92	111	80-120	3	0-20	
Cadmium	0.3938	25.00	28.16	111	29.05	115	80-120	3	0-20	
Chromium	44.48	25.00	76.58	128	77.76	133	80-120	2	0-20	3
Copper	29.94	25.00	59.20	117	59.67	119	80-120	1	0-20	
Lead	11.96	25.00	41.35	118	41.62	119	80-120	1	0-20	
Nickel	46.91	25.00	79.60	131	79.15	129	80-120	1	0-20	3
Silver	0.1576	12.50	13.33	105	13.80	109	80-120	3	0-20	
Zinc	63.64	25.00	97.86	137	100.5	147	80-120	3	0-20	3

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



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Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 7471A Total
Method: EPA 7471A

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
DU-1 Composite	Sample	Sediment	Mercury 08	05/09/18	05/09/18 14:13	180509S01				
DU-1 Composite	Matrix Spike	Sediment	Mercury 08	05/09/18	05/09/18 14:15	180509S01				
DU-1 Composite	Matrix Spike Duplicate	Sediment	Mercury 08	05/09/18	05/09/18 14:18	180509S01				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	0.1288	0.8350	0.9091	93	0.7865	79	76-136	14	0-16	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8081A

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
DU-1 Composite	Sample	Sediment	GC 44	05/11/18	05/17/18 09:55	180511S25				
DU-1 Composite	Matrix Spike	Sediment	GC 44	05/11/18	05/17/18 09:26	180511S25				
DU-1 Composite	Matrix Spike Duplicate	Sediment	GC 44	05/11/18	05/17/18 09:41	180511S25				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Aldrin	ND	5.000	3.725	74	3.426	69	50-135	8	0-25	
Alpha-BHC	ND	5.000	4.426	89	4.043	81	50-135	9	0-25	
Beta-BHC	ND	5.000	4.030	81	3.829	77	50-135	5	0-25	
Delta-BHC	ND	5.000	4.140	83	3.938	79	50-135	5	0-25	
Gamma-BHC	ND	5.000	4.270	85	3.879	78	50-135	10	0-25	
Dieldrin	ND	5.000	4.838	97	4.477	90	50-135	8	0-25	
4,4'-DDD	1.025	5.000	5.759	95	5.941	98	50-135	3	0-25	
4,4'-DDE	1.497	5.000	6.288	96	5.829	87	50-135	8	0-25	
4,4'-DDT	ND	5.000	4.890	98	3.216	64	50-135	41	0-25	4
Endosulfan I	ND	5.000	4.753	95	4.333	87	50-135	9	0-25	
Endosulfan II	ND	5.000	4.600	92	4.283	86	50-135	7	0-25	
Endosulfan Sulfate	ND	5.000	5.455	109	5.455	109	50-135	0	0-25	
Endrin	ND	5.000	3.865	77	3.905	78	50-135	1	0-25	
Endrin Aldehyde	ND	5.000	4.020	80	2.774	55	50-135	37	0-25	4



 Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



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Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3545
Method: EPA 8081A

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
DU-1 Composite	Sample	Sediment	GC 44	05/15/18	05/17/18 14:40	180515S03				
DU-1 Composite	Matrix Spike	Sediment	GC 44	05/15/18	05/17/18 14:12	180515S03				
DU-1 Composite	Matrix Spike Duplicate	Sediment	GC 44	05/15/18	05/17/18 14:26	180515S03				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Chlordane	ND	50.00	59.24	118	58.25	117	50-115	2	0-20	3

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C PEST-SIM

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
DU-1 Composite	Sample	Sediment	GC/MS BBB	05/11/18	05/16/18 16:39	180511S24				
DU-1 Composite	Matrix Spike	Sediment	GC/MS BBB	05/11/18	05/16/18 16:09	180511S24				
DU-1 Composite	Matrix Spike Duplicate	Sediment	GC/MS BBB	05/11/18	05/16/18 16:24	180511S24				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Heptachlor	ND	5.000	4.379	88	3.489	70	25-200	23	0-25	
Heptachlor Epoxide	ND	5.000	5.542	111	5.375	107	25-200	3	0-25	



Calscience

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PAHs

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
DU-1 Composite	Sample	Sediment	GC/MS AAA	05/09/18	05/12/18 00:55	180509S14
DU-1 Composite	Matrix Spike	Sediment	GC/MS AAA	05/09/18	05/11/18 17:27	180509S14
DU-1 Composite	Matrix Spike Duplicate	Sediment	GC/MS AAA	05/09/18	05/11/18 17:47	180509S14

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Acenaphthene	ND	100.0	90.09	90	85.62	86	40-160	5	0-20	
Acenaphthylene	ND	100.0	89.77	90	84.58	85	40-160	6	0-20	
Anthracene	ND	100.0	105.6	106	101.2	101	40-160	4	0-20	
Benzo (a) Anthracene	23.79	100.0	131.9	108	126.7	103	40-160	4	0-20	
Benzo (a) Pyrene	44.07	100.0	156.1	112	151.2	107	40-160	3	0-20	
Benzo (b) Fluoranthene	39.28	100.0	138.5	99	134.3	95	40-160	3	0-20	
Benzo (g,h,i) Perylene	36.92	100.0	153.8	117	147.4	111	40-160	4	0-20	
Benzo (k) Fluoranthene	26.92	100.0	121.5	95	116.8	90	40-160	4	0-20	
Chrysene	26.63	100.0	131.6	105	122.0	95	40-160	8	0-20	
Dibenz (a,h) Anthracene	ND	100.0	112.6	113	109.9	110	40-160	2	0-20	
Fluoranthene	48.18	100.0	156.4	108	151.3	103	40-160	3	0-20	
Fluorene	ND	100.0	96.66	97	92.07	92	40-160	5	0-20	
Indeno (1,2,3-c,d) Pyrene	25.60	100.0	134.0	108	128.8	103	40-160	4	0-20	
2-Methylnaphthalene	ND	100.0	95.74	96	89.70	90	40-160	7	0-20	
1-Methylnaphthalene	ND	100.0	87.58	88	82.24	82	40-160	6	0-20	
Naphthalene	ND	100.0	81.73	82	74.11	74	40-160	10	0-20	
Phenanthrene	14.43	100.0	114.9	100	106.6	92	40-160	7	0-20	
Pyrene	56.16	100.0	174.0	118	160.1	104	40-160	8	0-46	

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RPD: Relative Percent Difference. CL: Control Limits

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PCB Congeners

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
DU-1 Composite	Sample	Sediment	GC/MS HHH	05/11/18	05/16/18 19:58	180511S23				
DU-1 Composite	Matrix Spike	Sediment	GC/MS HHH	05/11/18	05/16/18 19:11	180511S23				
DU-1 Composite	Matrix Spike Duplicate	Sediment	GC/MS HHH	05/11/18	05/16/18 19:34	180511S23				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
PCB018	ND	50.00	48.82	98	45.69	91	50-150	7	0-25	
PCB028	ND	50.00	55.04	110	51.32	103	50-150	7	0-25	
PCB044	ND	50.00	52.30	105	48.74	97	50-150	7	0-25	
PCB052	ND	50.00	54.08	108	50.21	100	50-150	7	0-25	
PCB066	ND	50.00	61.06	122	56.43	113	50-150	8	0-25	
PCB101	0.4328	50.00	49.99	99	45.22	90	50-150	10	0-25	
PCB105	ND	50.00	56.59	113	51.38	103	50-150	10	0-25	
PCB118	0.4224	50.00	56.67	113	52.15	103	50-150	8	0-25	
PCB128	ND	50.00	51.49	103	47.04	94	50-150	9	0-25	
PCB170	0.2286	50.00	49.23	98	43.17	86	50-150	13	0-25	
PCB180	ND	50.00	56.00	112	50.39	101	50-150	11	0-25	
PCB187	0.3031	50.00	51.99	103	46.16	92	50-150	12	0-25	
PCB195	ND	50.00	45.41	91	39.42	79	50-150	14	0-25	

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3550B (M)
Method: Organotins by Krone et al.

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
DU-1 Composite	Sample	Sediment	GC/MS Y	05/10/18	05/15/18 16:07	180510S17
DU-1 Composite	Matrix Spike	Sediment	GC/MS Y	05/10/18	05/15/18 15:33	180510S17
DU-1 Composite	Matrix Spike Duplicate	Sediment	GC/MS Y	05/10/18	05/15/18 15:50	180510S17

<u>Parameter</u>	<u>Sample Conc.</u>	<u>Spike Added</u>	<u>MS Conc.</u>	<u>MS %Rec.</u>	<u>MSD Conc.</u>	<u>MSD %Rec.</u>	<u>%Rec. CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Tetrabutyltin	ND	100.0	87.05	87	91.34	91	33-129	5	0-36	
Tributyltin	ND	100.0	65.23	65	66.20	66	34-142	1	0-50	

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RPD: Relative Percent Difference. CL: Control Limits

Quality Control - PDS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number	
DU-1 Composite	Sample	Sediment	ICP/MS 03	05/07/18 00:00	05/09/18 18:57	180507S01	
DU-1 Composite	PDS	Sediment	ICP/MS 03	05/07/18 00:00	05/09/18 18:52	180507S01	
<u>Parameter</u>		<u>Sample Conc.</u>	<u>Spike Added</u>	<u>PDS Conc.</u>	<u>PDS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Arsenic		6.073	25.00	31.67	102	75-125	
Cadmium		0.3938	25.00	27.09	107	75-125	
Chromium		44.48	25.00	70.16	103	75-125	
Copper		29.94	25.00	56.42	106	75-125	
Lead		11.96	25.00	38.33	105	75-125	
Nickel		46.91	25.00	73.93	108	75-125	
Silver		0.1576	12.50	13.12	104	75-125	
Zinc		63.64	25.00	92.29	115	75-125	

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RPD: Relative Percent Difference. CL: Control Limits

Quality Control - Sample Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: N/A
Method: SM 2540 B (M)

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
18-04-2252-1	Sample	Sediment	N/A	05/09/18 00:00	05/09/18 15:30	I0509TSD2
18-04-2252-1	Sample Duplicate	Sediment	N/A	05/09/18 00:00	05/09/18 15:30	I0509TSD2

<u>Parameter</u>	<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Solids, Total	58.60	58.70	0	0-10	

Quality Control - LCS/LCSD

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: N/A
Method: EPA 9060A

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-06-013-1831	LCS	Solid	TOC 10	05/22/18	05/22/18 18:05	I0522TOCL1
099-06-013-1831	LCSD	Solid	TOC 10	05/22/18	05/22/18 18:05	I0522TOCL1

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	0.6000	0.6464	108	0.6407	107	80-120	1	0-20	

Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-254-604	LCS	Solid	ICP/MS 03	05/07/18	05/09/18 18:44	180507L01E
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Arsenic		25.00	26.67	107	80-120	
Cadmium		25.00	27.09	108	80-120	
Chromium		25.00	27.22	109	80-120	
Copper		25.00	26.96	108	80-120	
Lead		25.00	27.25	109	80-120	
Nickel		25.00	26.54	106	80-120	
Silver		12.50	13.06	105	80-120	
Zinc		25.00	29.04	116	80-120	

Quality Control - LCS

FOTH CLE Engineering	Date Received:	05/04/18
15 Creek Road	Work Order:	18-05-0353
Marion, MA 02738-9999	Preparation:	EPA 7471A Total
	Method:	EPA 7471A
Project: WETA		Page 3 of 9

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-16-278-413	LCS	Solid	Mercury 08	05/09/18	05/09/18 14:11	180509L01E
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Mercury		0.8350	0.7931	95	82-124	

Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8081A

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-12-858-542	LCS	Solid	GC 44	05/11/18	05/17/18 06:41	180511L25
<u>Parameter</u>	<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>ME CL</u>	<u>Qualifiers</u>
Aldrin	5.000	4.272	85	50-135	36-149	
Alpha-BHC	5.000	4.335	87	50-135	36-149	
Beta-BHC	5.000	4.773	95	50-135	36-149	
Delta-BHC	5.000	4.938	99	50-135	36-149	
Gamma-BHC	5.000	4.542	91	50-135	36-149	
Dieldrin	5.000	4.891	98	50-135	36-149	
4,4'-DDD	5.000	5.255	105	50-135	36-149	
4,4'-DDE	5.000	5.193	104	50-135	36-149	
4,4'-DDT	5.000	5.170	103	50-135	36-149	
Endosulfan I	5.000	4.855	97	50-135	36-149	
Endosulfan II	5.000	5.496	110	50-135	36-149	
Endosulfan Sulfate	5.000	5.040	101	50-135	36-149	
Endrin	5.000	4.806	96	50-135	36-149	
Endrin Aldehyde	5.000	2.530	51	50-135	36-149	

Total number of LCS compounds: 14

Total number of ME compounds: 0

Total number of ME compounds allowed: 1

LCS ME CL validation result: Pass



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Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3545
Method: EPA 8081A

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-817-44	LCS	Solid	GC 44	05/15/18	05/17/18 07:10	180515L03

<u>Parameter</u>	<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Chlordane	50.00	48.09	96	55-115	

Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C PEST-SIM

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-16-154-93	LCS	Solid	GC/MS BBB	05/11/18	05/16/18 15:54	180511L24
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Heptachlor		5.000	4.539	91	25-200	
Heptachlor Epoxide		5.000	4.580	92	25-200	

Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PAHs

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-097-268	LCS	Solid	GC/MS AAA	05/09/18	05/11/18 15:10	180509L14
Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Acenaphthene	100.0	82.14	82	40-160	20-180	
Acenaphthylene	100.0	80.18	80	40-160	20-180	
Anthracene	100.0	86.00	86	40-160	20-180	
Benzo (a) Anthracene	100.0	95.89	96	40-160	20-180	
Benzo (a) Pyrene	100.0	99.62	100	40-160	20-180	
Benzo (b) Fluoranthene	100.0	96.55	97	40-160	20-180	
Benzo (g,h,i) Perylene	100.0	100.4	100	40-160	20-180	
Benzo (k) Fluoranthene	100.0	97.57	98	40-160	20-180	
Chrysene	100.0	94.69	95	40-160	20-180	
Dibenz (a,h) Anthracene	100.0	97.51	98	40-160	20-180	
Fluoranthene	100.0	92.18	92	40-160	20-180	
Fluorene	100.0	83.29	83	40-160	20-180	
Indeno (1,2,3-c,d) Pyrene	100.0	96.54	97	40-160	20-180	
2-Methylnaphthalene	100.0	83.65	84	40-160	20-180	
1-Methylnaphthalene	100.0	78.92	79	40-160	20-180	
Naphthalene	100.0	71.90	72	40-160	20-180	
Phenanthrene	100.0	84.05	84	40-160	20-180	
Pyrene	100.0	97.99	98	40-160	20-180	

Total number of LCS compounds: 18

Total number of ME compounds: 0

Total number of ME compounds allowed: 1

LCS ME CL validation result: Pass



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Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3541
Method: EPA 8270C SIM PCB Congeners

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-16-418-306	LCS	Solid	GC/MS HHH	05/11/18	05/16/18 18:48	180511L23
Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
PCB018	50.00	42.58	85	24-132	6-150	
PCB028	50.00	46.00	92	31-133	14-150	
PCB044	50.00	48.31	97	36-120	22-134	
PCB052	50.00	45.60	91	31-121	16-136	
PCB066	50.00	56.47	113	43-139	27-155	
PCB101	50.00	45.35	91	37-121	23-135	
PCB105	50.00	49.35	99	48-132	34-146	
PCB118	50.00	51.71	103	46-136	31-151	
PCB128	50.00	44.76	90	40-130	25-145	
PCB170	50.00	45.73	91	40-124	26-138	
PCB180	50.00	49.22	98	41-143	24-160	
PCB187	50.00	45.85	92	39-129	24-144	
PCB195	50.00	45.39	91	44-128	30-142	

Total number of LCS compounds: 13

Total number of ME compounds: 0

Total number of ME compounds allowed: 1

LCS ME CL validation result: Pass



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Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3550B (M)
Method: Organotins by Krone et al.
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Project: WETA

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-07-016-1589	LCS	Solid	GC/MS Y	05/10/18	05/15/18 16:48	180510L17
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Tetrabutyltin		100.0	43.33	43	40-142	
Tributyltin		100.0	37.25	37	33-147	

Glossary of Terms and Qualifiers

Work Order: 18-05-0353

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

0353

ORIGIN ID:SRFA (415) 884-8011
 KATHY LESE
 FOTH
 10 COMMERCIAL BVD
 SUITE 100
 NOVATO, CA 94949
 UNITED STATES US

SHIP DATE: 03MAY18
 ACTWGT: 35.00 LB
 CAD: 5963206/NET3980
 DIMS: 23x13x13 IN
 BILL SENDER

TO ATTN: SAMPLE CONTROL
 EUROFINS CALSCIENCE
 7440 LINCOLN WAY

GARDEN GROVE CA 92841

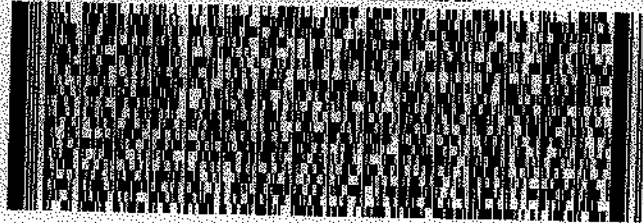
(415) 884-8011
 INV
 PO

REF: /SEDIMENT SAMPLING

DEPT:

552.12/7928/DC/5

FedEx Ship Manager - Print Your Label(s)



FedEx
 Express



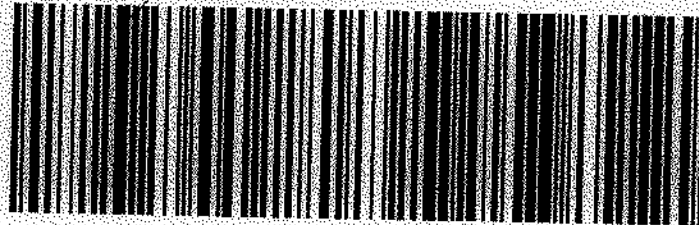
411116/265111

TRK#
 0201 7721 4960 6316

FRI - 04 MAY 8:00A
 FIRST OVERNIGHT

W1 APVA

92841
 CA-US SNA



5/3/2018

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SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: FORTH + VAN DYKE + ASSOCIATES

DATE: 05/04/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: +0.1°C); Temperature (w/o CF): 3.1 °C (w/ CF): 3.2 °C; ☒ Blank ☐ Sample☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling☐ Sample(s) received at ambient temperature; placed on ice for transport by courierAmbient Temperature: ☐ Air ☐ Filter

Checked by: 426

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/A

Checked by: 426

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/A

Checked by: 426

SAMPLE CONDITION:

Chain-of-Custody (COC) document(s) received with samples ☒ Yes ☐ No ☐ N/ACOC document(s) received complete ☒ Yes ☐ No ☐ N/A☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished timeSampler's name indicated on COC ☒ Yes ☐ No ☐ N/ASample container label(s) consistent with COC ☒ Yes ☐ No ☐ N/ASample container(s) intact and in good condition ☒ Yes ☐ No ☐ N/AProper containers for analyses requested ☒ Yes ☐ No ☐ N/ASufficient volume/mass for analyses requested ☒ Yes ☐ No ☐ N/ASamples received within holding time ☒ Yes ☐ No ☐ N/A

Aqueous samples for certain analyses received within 15-minute holding time

☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen ☐ Yes ☐ No ☒ N/AProper preservation chemical(s) noted on COC and/or sample container ☐ Yes ☐ No ☒ N/A

Unpreserved aqueous sample(s) received for certain analyses

☐ Volatile Organics ☐ Total Metals ☐ Dissolved MetalsAcid/base preserved samples - pH within acceptable range ☐ Yes ☐ No ☒ N/AContainer(s) for certain analysis free of headspace ☐ Yes ☐ No ☒ N/A☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)Tedlar™ bag(s) free of condensation ☐ Yes ☐ No ☒ N/A

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 100PJ ☐ 100PJ_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 125PB ☐ 125PB_{znna} (pH__9)☐ 250AGB ☐ 250CGB ☐ 250CGBs (pH__2) ☐ 250PB ☐ 250PB_h (pH__2) ☐ 500AGB ☐ 500AGJ ☐ 500AGJs (pH__2) ☐ 500PB☐ 1AGB ☐ 1AGB_{na2} ☐ 1AGBs (pH__2) ☐ 1AGBs (O&G) ☐ 1PB ☐ 1PB_{na} (pH__12) ☐ _____ ☐ _____Solid: ☒ 4ozCGJ ☐ 8ozCGJ ☒ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® (____) ☐ TerraCores® (____) ☒ 202ccs ☒ 200cc ☐ _____Air: ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ Other Matrix (____): ☐ _____ ☐ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄, Labeled/Checked by: 426s = H₂SO₄, u = ultra-pure, x = Na₂SO₃ + NaHSO₄ · H₂O, znna = Zn (CH₃CO₂)₂ + NaOH

Reviewed by: 778

Subcontractor Analysis Report

Work Order: 18-05-0353Page 1 of 1

One or more samples in this work order have tests that were subcontracted. The subcontract report(s) follows.

For subcontracted tests, please reference the laboratory information noted below.

1. ALS - Columbia Analytical Services, Inc. - Kelso, WA CA ELAP 2286, NELAP WA100010
EPA 7742 Selenium
2. Frontier Analytical Laboratories - El Dorado Hills, CA NELAP 02113CA
Dioxins / Furans

June 5, 2018

FAL Project ID: 11566

Ms. Carla Lee Hollowell
Eurofins Calscience, Inc.
7440 Lincoln Way
Garden Grove, CA 92841-1427

Dear Ms. Hollowell,

The following results are associated with Frontier Analytical Laboratory project **11566**. This corresponds to your project number **18-05-0353 / WETA**. One sediment sample was received on 5/10/2018. This sample was extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your sample has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Eurofins Calscience Inc. requested a fifteen business day turnaround time for project **11566**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and a sample photo. The attached results and electronic data deliverable (EDD) are specifically for the sample referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041** and our State of California ELAP certificate number is **2934**. This report and the EDD have been emailed to you. A hardcopy of this report will not be sent to you unless specifically requested.

If you have any questions regarding project **11566**, please contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,



Thomas C. Crabtree
Director



Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **11566**

Received on: **05/10/2018**

Project Due: **06/04/2018** Storage: **R-4**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
11566-001-SA	0	18-05-0353	DU-1 Composite	EPA 1613 D/F	Sediment	05/03/2018	09:00 am	05/03/2019


Return to Contents

EPA Method 1613

PCDD/F



FAL ID: 11566-001-MB
Client ID: Method Blank
Matrix: Sediment
Batch No: X4528

Date Extracted: 05-25-2018
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL4-12-20-17
GC Column: DB5MS
Units: pg/g

Acquired: 05-31-2018
2005 WHO TEQ: 0.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.105		-	0.0273				
1,2,3,7,8-PeCDD	ND	0.213		-	0.0570				
1,2,3,4,7,8-HxCDD	ND	0.207		-	0.0793				
1,2,3,6,7,8-HxCDD	ND	0.211		-	0.0940	Total TCDD	ND	0.105	
1,2,3,7,8,9-HxCDD	ND	0.192		-	0.0823	Total PeCDD	ND	0.213	
1,2,3,4,6,7,8-HpCDD	ND	0.174		-	0.0842	Total HxCDD	ND	0.211	
OCDD	ND	0.314		-	0.172	Total HpCDD	ND	0.174	
2,3,7,8-TCDF	ND	0.0846		-	0.0269				
1,2,3,7,8-PeCDF	ND	0.179		-	0.0449				
2,3,4,7,8-PeCDF	ND	0.184		-	0.0468				
1,2,3,4,7,8-HxCDF	ND	0.114		-	0.0437				
1,2,3,6,7,8-HxCDF	ND	0.121		-	0.0417				
2,3,4,6,7,8-HxCDF	ND	0.131		-	0.0574				
1,2,3,7,8,9-HxCDF	ND	0.150		-	0.0657	Total TCDF	ND	0.0846	
1,2,3,4,6,7,8-HpCDF	ND	0.147		-	0.0747	Total PeCDF	ND	0.184	
1,2,3,4,7,8,9-HpCDF	ND	0.166		-	0.0883	Total HxCDF	ND	0.150	
OCDF	ND	0.308		-	0.170	Total HpCDF	ND	0.166	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	76.5	25.0 - 164	
13C-1,2,3,7,8-PeCDD	76.3	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	78.3	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	77.0	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	76.1	23.0 - 140	
13C-OCDD	73.2	17.0 - 157	
13C-2,3,7,8-TCDF	74.4	24.0 - 169	
13C-1,2,3,7,8-PeCDF	74.2	24.0 - 185	
13C-2,3,4,7,8-PeCDF	73.9	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	81.8	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	80.7	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	81.3	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	80.7	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	82.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	84.2	26.0 - 138	
13C-OCDF	79.2	17.0 - 157	

Cleanup Surrogate

37Cl-2,3,7,8-TCDD	69.9	35.0 - 197
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- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 

Date: 6/4/2018

Reviewed By: 

Date: 6/4/2018

EPA Method 1613

PCDD/F



FAL ID: 11566-001-OPR
Client ID: OPR
Matrix: Sediment
Batch No: X4528

Date Extracted: 05-25-2018
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL4-12-20-17
GC Column: DB5MS
Units: ng/ml

Acquired: 05-31-2018
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	10.9	6.70 - 15.8	
1,2,3,7,8-PeCDD	55.5	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	52.8	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	53.7	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	53.5	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	54.7	35.0 - 70.0	
OCDD	107	78.0 - 144	
2,3,7,8-TCDF	10.9	7.50 - 15.8	
1,2,3,7,8-PeCDF	51.1	40.0 - 67.0	
2,3,4,7,8-PeCDF	50.5	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	53.1	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	52.8	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	52.7	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	54.3	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	53.6	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	54.6	39.0 - 69.0	
OCDF	102	63.0 - 170	
Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	89.1	20.0 - 175	
13C-1,2,3,7,8-PeCDD	95.0	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	93.3	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	92.9	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	91.3	26.0 - 166	
13C-OCDD	75.1	13.0 - 198	
13C-2,3,7,8-TCDF	95.4	22.0 - 152	
13C-1,2,3,7,8-PeCDF	87.5	21.0 - 192	
13C-2,3,4,7,8-PeCDF	89.6	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	97.5	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	93.8	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	94.0	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	96.7	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	94.8	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	99.7	20.0 - 186	
13C-OCDF	86.3	13.0 - 198	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	82.6	31.0 - 191	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 

Date: 6/4/2018

Reviewed By: 

Date: 6/4/2018

EPA Method 1613

PCDD/F



FAL ID: 11566-001-SA
Client ID: DU-1 Composite
Matrix: Sediment
Batch No: X4528

Date Extracted: 05-25-2018
Date Received: 05-10-2018
Amount: 5.03 g
% Solids: 45.03

ICal: PCDDFAL4-12-20-17
GC Column: DB5MS
Units: pg/g

Acquired: 05-31-2018
2005 WHO TEQ: 2.53
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.215		-	0.0273				
1,2,3,7,8-PeCDD	0.694	-	J	0.694	0.0570				
1,2,3,4,7,8-HxCDD	0.824	-	J	0.0824	0.0793				
1,2,3,6,7,8-HxCDD	2.55	-	J	0.255	0.0940	Total TCDD	5.41	-	
1,2,3,7,8,9-HxCDD	1.64	-	J	0.164	0.0823	Total PeCDD	7.09	-	
1,2,3,4,6,7,8-HpCDD	26.7	-		0.267	0.0842	Total HxCDD	26.6	-	
OCDD	155	-		0.0465	0.172	Total HpCDD	68.6	-	
2,3,7,8-TCDF	2.03	-	F	0.203	0.0269				
1,2,3,7,8-PeCDF	0.652	-	J	0.0196	0.0449				
2,3,4,7,8-PeCDF	1.27	-	J	0.381	0.0468				
1,2,3,4,7,8-HxCDF	1.04	-	J	0.104	0.0437				
1,2,3,6,7,8-HxCDF	0.877	-	J	0.0877	0.0417				
2,3,4,6,7,8-HxCDF	1.04	-	J	0.104	0.0574				
1,2,3,7,8,9-HpCDF	0.420	-	J	0.0420	0.0657	Total TCDF	20.8	-	D,M
1,2,3,4,6,7,8-HpCDF	6.52	-		0.0652	0.0747	Total PeCDF	13.3	-	
1,2,3,4,7,8,9-HpCDF	0.640	-	J	0.00640	0.0883	Total HxCDF	13.0	-	
OCDF	13.0	-		0.00390	0.170	Total HpCDF	18.0	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.3	25.0 - 164	
13C-1,2,3,7,8-PeCDD	93.7	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	102	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	97.7	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	94.1	23.0 - 140	
13C-OCDD	87.5	17.0 - 157	
13C-2,3,7,8-TCDF	93.0	24.0 - 169	
13C-1,2,3,7,8-PeCDF	83.9	24.0 - 185	
13C-2,3,4,7,8-PeCDF	86.8	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	122	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	113	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	99.4	28.0 - 136	
13C-1,2,3,7,8,9-HpCDF	103	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	99.2	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	104	26.0 - 138	
13C-OCDF	90.8	17.0 - 157	

Cleanup Surrogate

37Cl-2,3,7,8-TCDD	85.5	35.0 - 197
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- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 

Date: 6/4/2018

Reviewed By: 

Date: 6/4/2018



Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **11566**

Client:	Eurofins Calscience, Inc.
Client Project ID:	18-05-0353
Date Received:	05/10/2018
Time Received:	10:05 am
Received By:	KZ
Logged In By:	SL
# of Samples Received:	1
Duplicates:	0
Storage Location:	R-4

Method of Delivery:	Golden State Overnight
Tracking Number:	540523440
Shipping Container Received Intact	Yes
Custody seals(s) present?	Yes
Custody seals(s) intact?	Yes
Sample Arrival Temperature (C)	0
Cooling Method	Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	No
pH Range of Aqueous Sample	N/A
Anomalies or additional comments:	
Please note that the sample was received in a clear glass jar. NELAP requires samples be received in amber glass bottles or jars. Although this anomaly will not affect your results, we are required by NELAP to make a note of it. We will proceed with analysis unless directed otherwise by you.	

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7440 Lincoln Way, Garden Grove, CA 92641-1427 • (714) 895-5434
For courier service / sample drop off information, contact us@eurofinsus.com or call us.

FRONTIER - EL DORADO HILLS **CHAIN OF CUSTODY RECORD**

LABORATORY CLIENT: **EUROFINS CALSCIENCE** **11566** **901**

DATE: **05/09/18**

PAGE: **1** OF **1**

ADDRESS: **GARDEN GROVE** STATE: **CA** ZIP: **92641**

CITY: **GARDEN GROVE**

TEL: **carlahollowell@eurofinsus.com**

E-MAIL: **carlahollowell@eurofinsus.com**

CLIENT PROJECT NAME / NUMBER: **18-05-0353 / WETA**

PROJECT CONTACT: **CARLA LEE HOLLOWELL**

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD")

☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ STANDARD

☐ COELT EDF

SPECIAL INSTRUCTIONS: **Report in dry weight (ng/kg)**
15 day TAT
Please provide DMMO EDD

REQUESTED ANALYSES

Please check box or fill in blank as needed

LAB USE ONLY	SAMPLE ID	SAMPLING		MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	TPH (g) <input type="checkbox"/> GED	TPH (g) <input type="checkbox"/> DRO	TPH <input type="checkbox"/> CE-C38 <input type="checkbox"/> CE-C44	TPH	BTX / MTBE <input type="checkbox"/> B200 <input type="checkbox"/>	VOCs (8202)	Organics (8202)	Prep (8202) <input type="checkbox"/> En Core <input type="checkbox"/> Terra Core	SVOCs (8270)	PAHs (8281)	PCBs (8282)	PAHs <input type="checkbox"/> 8270 <input type="checkbox"/> 8270 SM	T22 Metals <input type="checkbox"/> 6015/147X <input type="checkbox"/> 6020/147X	C/VI <input type="checkbox"/> 7196 <input type="checkbox"/> 7199 <input type="checkbox"/> 218.6	Dioxins/Furans 1613B	ECI Sample #	
	DU-1 Composite	5/3/18	900	SED	1																			X	1

Relinquished by: (Signature) *[Signature]*

Relinquished by: (Signature)

Relinquished by: (Signature)

Frontier Analytical Laboratory
11566-001-SA
Client ID: DU-1 Composite
Storage: R-4 (01 of 01)

Thermo
DU-1 Composite
DIF

Date: **5/9/18** Time: **1:55**
Date: **5/10/18** Time: **10:05**

05/02/14 Revision



May 24, 2018

Service Request No:K1804396

Carla Hollowell
Calscience Environmental Laboratories, Incorporated
7440 Lincoln Way
Garden Grove, CA 92841-1427

Laboratory Results for: WETA

Dear Carla,

Enclosed are the results of the sample(s) submitted to our laboratory May 10, 2018
For your reference, these analyses have been assigned our service request number **K1804396**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3342. You may also contact me via email at Amanda.Juell@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Amanda Juell
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents


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ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Eurofins Calscience Environmental Laboratory
Project: WETA
Sample Matrix: Soil

Service Request: K1804396
Date Received: 05/10/2018

CASE NARRATIVE

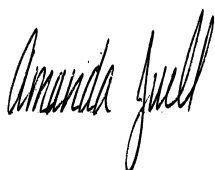
All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt:

One soil sample was received for analysis at ALS Environmental on 05/10/2018. The sample was received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Metals:

No significant anomalies were noted with this analysis.



Approved by _____

Date 05/24/2018



SAMPLE DETECTION SUMMARY

CLIENT ID: DU-1 Composite			Lab ID: K1804396-001			
Analyte	Results	Flag	MDL	PQL	Units	Method
Selenium	0.31		0.04	0.18	mg/Kg	7742
Solids, Total	46.6				Percent	160.3 Modified



Sample Receipt Information


Return to Contents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

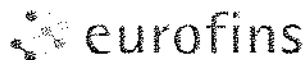
Client: Eurofins Calscience Environmental Laboratory
Project: WETA/18-05-0353

Service Request: K1804396

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K1804396-001	DU-1 Composite	5/3/2018	0900


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ALS (Kelso)

K1804396

CA

CHAIN OF CUSTODY RECORD

Calscience

7440 Lincoln Way, Garden Grove, CA 92641-1427 • (714) 895-5494

For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

WO # / LAB USE ONLY

DATE: 05/09/18

PAGE: 1 OF 1

LABORATORY CLIENT:

EUROFINS CALSCIENCE

ADDRESS:

7440 LINCOLN WAY

CITY:

GARDEN GROVE

STATE:

CA

ZIP:

TEL:

E-MAIL:

CARLAHOLLOWELL@EUROFINSUS.COM

CLIENT PROJECT NAME / NUMBER

18-05-0353 / WETA

P.O. NO.:

PROJECT CONTACT:

CARLA LEE HOLLOWELL

SAMPLER(S): (PRINT)

REQUESTED ANALYSES

Please check box or fill in blank as needed.

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):

☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ STANDARD☐ COELT EDF

GLOBAL ID:

LOG CODE:

SPECIAL INSTRUCTIONS:

Standard TAT

Please provide DMMO EDD; mg/kg units

Dry weight reporting.

LAB
USE
ONLY

SAMPLE ID

SAMPLING

DATE

TIME

MATRIX

NO.
OF
CONT.

Unpreserved

Preserved

Field Filtered

Se by 7742

MS/MSD

ECI SAMPLE NUMBER

DU-1 Composite

5/3/2018

900

SED

1

X

X

1

Relinquished by: (Signature)

Relinquished by: (Signature)

Relinquished by: (Signature)

Received by: (Signature/Affiliation)

Received by: (Signature/Affiliation)

Received by: (Signature/Affiliation)

Date:

Date:

Date:

Time:

Time:

Time:

5/9/18

5/10/18

1455

1000



Cooler Receipt and Preservation Form

Client Eurofins Service Request K18 04396
Received: 5/10/18 Opened: 5/10/18 By: CG Unloaded: 5/10/18 By: CG

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
<u>-0.3</u>	<u>-0.5</u>	<u>—</u>	<u>—</u>	<u>-0.2</u>	<u>361</u>	<u>NA</u>	<u>7721 9675 3592</u>		

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Were samples received in good condition (temperature, unbroken)? Indicate in the table below. NA Y N
If applicable, tissue samples were received: Frozen Partially Thawed Thawed
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
11. Were VOA vials received without headspace? Indicate in the table below. NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____



Miscellaneous Forms


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Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdwlabservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Analyst Summary report

Client: Eurofins Calscience Environmental Laboratory
Project: WETA/18-05-0353

Service Request: K1804396

Sample Name: DU-1 Composite
Lab Code: K1804396-001
Sample Matrix: Soil

Date Collected: 05/3/18
Date Received: 05/10/18

Analysis Method
160.3 Modified
7742

Extracted/Digested By

KLINN

Analyzed By
DMADDEN
JCHAN





Sample Results


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Metals


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Analytical Report

Client: Eurofins Calscience Environmental Laboratory
Project: WETA/18-05-0353
Sample Matrix: Soil
Sample Name: DU-1 Composite
Lab Code: K1804396-001

Service Request: K1804396
Date Collected: 05/03/18 09:00
Date Received: 05/10/18 10:00
Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Selenium	7742	0.31	mg/Kg	0.18	0.04	2	05/22/18 12:19	05/21/18	





General Chemistry


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Analytical Report

Client: Eurofins Calscience Environmental Laboratory
Project: WETA/18-05-0353
Sample Matrix: Soil
Sample Name: DU-1 Composite
Lab Code: K1804396-001

Service Request: K1804396
Date Collected: 05/03/18 09:00
Date Received: 05/10/18 10:00
Basis: As Received

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Solids, Total	160.3 Modified	46.6	Percent	-	-	1	05/10/18 16:23	





QC Summary Forms


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Metals


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Analytical Report

Client: Eurofins Calscience Environmental Laboratory
Project: WETA/18-05-0353
Sample Matrix: Soil
Sample Name: Method Blank
Lab Code: KQ1806606-01

Service Request: K1804396
Date Collected: NA
Date Received: NA
Basis: Dry

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Selenium	7742	ND U	mg/Kg	0.10	0.02	2	05/22/18 11:46	05/21/18	



QA/QC Report

Client: Eurofins Calscience Environmental Laboratory
Project: WETA/18-05-0353
Sample Matrix: Soil

Service Request: K1804396
Date Analyzed: 05/22/18

Lab Control Sample Summary
Total Metals

Units:mg/Kg
Basis:Dry

Lab Control Sample
KQ1806606-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Selenium	7742	163	191	85	69-132



Appendix C Discrete Chemistry Data Report Submitted by Eurofins | Calscience Supplement



Supplemental Report 1

Additional requested analyses are reported as a stand-alone report.



WORK ORDER NUMBER: 18-05-0353

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: FOTH CLE Engineering

Client Project Name: WETA

Attention: Wendy Rocha
15 Creek Road
Marion, MA 02738-9999



Approved for release on 06/22/2018 by:
Carla Hollowell
Project Manager

ResultLink >

Email your PM >

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Contents

Client Project Name: WETA
 Work Order Number: 18-05-0353

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Work Order Narrative

Work Order: 18-05-0353

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Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 05/04/18. They were assigned to Work Order 18-05-0353.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

Sample Summary

Client: FOTH CLE Engineering	Work Order: 18-05-0353
15 Creek Road	Project Name: WETA
Marion, MA 02738-9999	PO Number: 0017S414.20
	Date/Time Received: 05/04/18 07:30
	Number of Containers: 13

Attn: Wendy Rocha

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
DU-1 Composite	18-05-0353-1	05/03/18 09:00	4	Sediment
A-ARCHIVE ONLY	18-05-0353-3	05/01/18 12:25	1	Sediment
B-ARCHIVE ONLY	18-05-0353-5	05/01/18 11:15	1	Sediment
C-ARCHIVE ONLY	18-05-0353-7	05/01/18 13:30	1	Sediment
D-ARCHIVE ONLY	18-05-0353-9	05/02/18 13:30	1	Sediment

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: N/A
Method: SM 2540 B (M)
Units: %

Project: WETA

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-AA	05/03/18 09:00	Sediment	N/A	06/14/18	06/14/18 14:30	I0614TSB1
<u>Parameter</u>		<u>Result</u>	<u>RL</u>		<u>DF</u>		<u>Qualifiers</u>
Solids, Total		44.5	0.100		1.00		
A-ARCHIVE ONLY	18-05-0353-3-AA	05/01/18 12:25	Sediment	N/A	06/14/18	06/14/18 14:30	I0614TSB1
<u>Parameter</u>		<u>Result</u>	<u>RL</u>		<u>DF</u>		<u>Qualifiers</u>
Solids, Total		45.0	0.100		1.00		
B-ARCHIVE ONLY	18-05-0353-5-AA	05/01/18 11:15	Sediment	N/A	06/14/18	06/14/18 14:30	I0614TSB1
<u>Parameter</u>		<u>Result</u>	<u>RL</u>		<u>DF</u>		<u>Qualifiers</u>
Solids, Total		52.3	0.100		1.00		
C-ARCHIVE ONLY	18-05-0353-7-AA	05/01/18 13:30	Sediment	N/A	06/14/18	06/14/18 14:30	I0614TSB1
<u>Parameter</u>		<u>Result</u>	<u>RL</u>		<u>DF</u>		<u>Qualifiers</u>
Solids, Total		49.3	0.100		1.00		
D-ARCHIVE ONLY	18-05-0353-9-AA	05/02/18 13:30	Sediment	N/A	06/14/18	06/14/18 14:30	I0614TSB1
<u>Parameter</u>		<u>Result</u>	<u>RL</u>		<u>DF</u>		<u>Qualifiers</u>
Solids, Total		40.9	0.100		1.00		
Method Blank	099-05-019-4083	N/A	Solid	N/A	06/14/18	06/14/18 14:30	I0614TSB1
<u>Parameter</u>		<u>Result</u>	<u>RL</u>		<u>DF</u>		<u>Qualifiers</u>
Solids, Total		ND	0.100		1.00		

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020
Units: mg/kg

Project: WETA

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Composite	18-05-0353-1-CC	05/03/18 09:00	Sediment	ICP/MS 03	05/07/18	05/09/18 18:57	180507L01E

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Arsenic	13.6	0.225	1.00	
Cadmium	0.885	0.225	1.00	
Chromium	100	0.225	1.00	
Copper	67.3	0.225	1.00	
Lead	26.9	0.225	1.00	
Nickel	105	0.225	1.00	
Silver	0.354	0.225	1.00	
Zinc	143	2.25	1.00	

DU-1 Composite	18-05-0353-1-AA	05/03/18 09:00	Sediment	ICP/MS 05	06/08/18	06/14/18 22:38	180608L01
-----------------------	------------------------	-----------------------	-----------------	------------------	-----------------	-----------------------	------------------

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Cadmium	1.40	0.225	1.00	

A-ARCHIVE ONLY	18-05-0353-3-AA	05/01/18 12:25	Sediment	ICP/MS 05	06/08/18	06/14/18 22:42	180608L01
-----------------------	------------------------	-----------------------	-----------------	------------------	-----------------	-----------------------	------------------

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Cadmium	1.07	0.222	1.00	

B-ARCHIVE ONLY	18-05-0353-5-AA	05/01/18 11:15	Sediment	ICP/MS 05	06/08/18	06/14/18 22:46	180608L01
-----------------------	------------------------	-----------------------	-----------------	------------------	-----------------	-----------------------	------------------

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Cadmium	1.35	0.191	1.00	

C-ARCHIVE ONLY	18-05-0353-7-AA	05/01/18 13:30	Sediment	ICP/MS 05	06/08/18	06/14/18 22:49	180608L01
-----------------------	------------------------	-----------------------	-----------------	------------------	-----------------	-----------------------	------------------

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Cadmium	0.975	0.203	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020
Units: mg/kg

Project: WETA

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
D-ARCHIVE ONLY	18-05-0353-9-AA	05/02/18 13:30	Sediment	ICP/MS 05	06/08/18	06/14/18 22:35	180608L01

Comment(s): - Results are reported on a dry weight basis.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Cadmium	1.18	0.244	1.00	

Method Blank	099-15-254-604	N/A	Solid	ICP/MS 03	05/07/18	05/09/18 18:42	180507L01E
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Arsenic	ND	0.100	1.00	
Cadmium	ND	0.100	1.00	
Chromium	ND	0.100	1.00	
Copper	ND	0.100	1.00	
Lead	ND	0.100	1.00	
Nickel	ND	0.100	1.00	
Silver	ND	0.100	1.00	
Zinc	ND	1.00	1.00	

Method Blank	099-15-254-614	N/A	Solid	ICP/MS 05	06/08/18	06/14/18 22:02	180608L01
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Cadmium	ND	0.100	1.00	



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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
DU-1 Composite	Sample	Sediment	ICP/MS 03	05/07/18	05/09/18 18:57	180507S01
DU-1 Composite	Matrix Spike	Sediment	ICP/MS 03	05/07/18	05/09/18 18:47	180507S01
DU-1 Composite	Matrix Spike Duplicate	Sediment	ICP/MS 03	05/07/18	05/09/18 18:49	180507S01

<u>Parameter</u>	<u>Sample Conc.</u>	<u>Spike Added</u>	<u>MS Conc.</u>	<u>MS %Rec.</u>	<u>MSD Conc.</u>	<u>MSD %Rec.</u>	<u>%Rec. CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Arsenic	6.073	25.00	32.97	108	33.92	111	80-120	3	0-20	
Cadmium	0.3938	25.00	28.16	111	29.05	115	80-120	3	0-20	
Chromium	44.48	25.00	76.58	128	77.76	133	80-120	2	0-20	3
Copper	29.94	25.00	59.20	117	59.67	119	80-120	1	0-20	
Lead	11.96	25.00	41.35	118	41.62	119	80-120	1	0-20	
Nickel	46.91	25.00	79.60	131	79.15	129	80-120	1	0-20	3
Silver	0.1576	12.50	13.33	105	13.80	109	80-120	3	0-20	
Zinc	63.64	25.00	97.86	137	100.5	147	80-120	3	0-20	3

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number				
D-ARCHIVE ONLY	Sample	Sediment	ICP/MS 05	06/08/18	06/14/18 22:35	180608S01				
D-ARCHIVE ONLY	Matrix Spike	Sediment	ICP/MS 05	06/08/18	06/14/18 22:20	180608S01				
D-ARCHIVE ONLY	Matrix Spike Duplicate	Sediment	ICP/MS 05	06/08/18	06/14/18 22:24	180608S01				
Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Cadmium	0.4842	0.02500	26.94	4X	27.37	4X	80-120	4X	0-20	Q

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RPD: Relative Percent Difference. CL: Control Limits

Quality Control - PDS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number	
DU-1 Composite	Sample	Sediment	ICP/MS 03	05/07/18 00:00	05/09/18 18:57	180507S01	
DU-1 Composite	PDS	Sediment	ICP/MS 03	05/07/18 00:00	05/09/18 18:52	180507S01	
<u>Parameter</u>		<u>Sample Conc.</u>	<u>Spike Added</u>	<u>PDS Conc.</u>	<u>PDS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Arsenic		6.073	25.00	31.67	102	75-125	
Cadmium		0.3938	25.00	27.09	107	75-125	
Chromium		44.48	25.00	70.16	103	75-125	
Copper		29.94	25.00	56.42	106	75-125	
Lead		11.96	25.00	38.33	105	75-125	
Nickel		46.91	25.00	73.93	108	75-125	
Silver		0.1576	12.50	13.12	104	75-125	
Zinc		63.64	25.00	92.29	115	75-125	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Quality Control - PDS

FOTH CLE Engineering	Date Received:	05/04/18
15 Creek Road	Work Order:	18-05-0353
Marion, MA 02738-9999	Preparation:	EPA 3050B
	Method:	EPA 6020
Project: WETA		Page 2 of 2

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	PDS/PDSD Batch Number	
D-ARCHIVE ONLY	Sample	Sediment	ICP/MS 05	06/08/18 00:00	06/14/18 22:35	180608S01	
D-ARCHIVE ONLY	PDS	Sediment	ICP/MS 05	06/18/18 00:00	06/20/18 11:07	180608S01	
<u>Parameter</u>		<u>Sample Conc.</u>	<u>Spike Added</u>	<u>PDS Conc.</u>	<u>PDS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Cadmium		0.4842	25.00	25.88	102	75-125	

Quality Control - Sample Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: N/A
Method: SM 2540 B (M)

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
DU-1 Composite	Sample	Sediment	N/A	06/14/18 00:00	06/14/18 14:30	I0614TSD1
DU-1 Composite	Sample Duplicate	Sediment	N/A	06/14/18 00:00	06/14/18 14:30	I0614TSD1

<u>Parameter</u>	<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Solids, Total	44.50	44.70	0	0-10	

Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-254-604	LCS	Solid	ICP/MS 03	05/07/18	05/09/18 18:44	180507L01E
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Arsenic		25.00	26.67	107	80-120	
Cadmium		25.00	27.09	108	80-120	
Chromium		25.00	27.22	109	80-120	
Copper		25.00	26.96	108	80-120	
Lead		25.00	27.25	109	80-120	
Nickel		25.00	26.54	106	80-120	
Silver		12.50	13.06	105	80-120	
Zinc		25.00	29.04	116	80-120	

Quality Control - LCS

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/04/18
Work Order: 18-05-0353
Preparation: EPA 3050B
Method: EPA 6020

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-254-614	LCS	Solid	ICP/MS 05	06/08/18	06/14/18 22:06	180608L01

<u>Parameter</u>	<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
Cadmium	25.00	27.14	109	80-120	

Glossary of Terms and Qualifiers

Work Order: 18-05-0353

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<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

0353

ORIGIN ID:SRFA (415) 884-8011
 KATHY LESE
 FOTH
 10 COMMERCIAL BVD
 SUITE 100
 NOVATO, CA 94949
 UNITED STATES US

SHIP DATE: 03MAY18
 ACTWGT: 35.00 LB
 CAD: 5963206/NET3980
 DIMS: 23x13x13 IN
 BILL SENDER

TO ATTN: SAMPLE CONTROL
 EUROFINS CALSCIENCE
 7440 LINCOLN WAY

GARDEN GROVE CA 92841

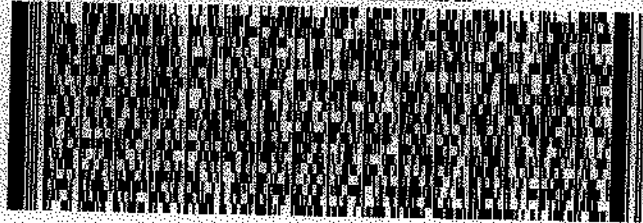
(415) 884-8011
 INV
 PO

REF: /SEDIMENT SAMPLING

DEPT:

552.12/7928/DC/5

FedEx Ship Manager - Print Your Label(s)



FedEx
 Express



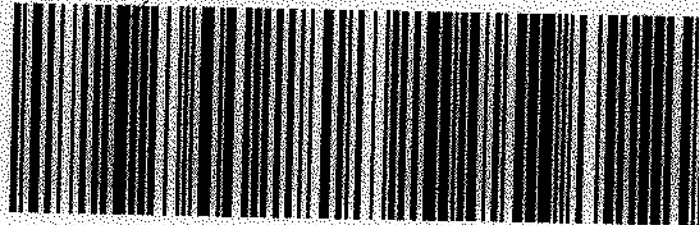
411116/265111

TRK#
 0201 7721 4960 6316

FRI - 04 MAY 8:00A
 FIRST OVERNIGHT

W1 APVA

92841
 CA-US SNA



5/3/2018

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SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1CLIENT: FOTH + VAN DYKE + ASSOCIATESDATE: 05/04/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: +0.1°C); Temperature (w/o CF): 3.1 °C (w/ CF): 3.2 °C; ☒ Blank ☐ Sample☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling☐ Sample(s) received at ambient temperature; placed on ice for transport by courierAmbient Temperature: ☐ Air ☐ FilterChecked by: 426

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/AChecked by: 426Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/AChecked by: 426

SAMPLE CONDITION:

Chain-of-Custody (COC) document(s) received with samples ☒ Yes ☐ No ☐ N/ACOC document(s) received complete ☒ Yes ☐ No ☐ N/A☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished timeSampler's name indicated on COC ☒ Yes ☐ No ☐ N/ASample container label(s) consistent with COC ☒ Yes ☐ No ☐ N/ASample container(s) intact and in good condition ☒ Yes ☐ No ☐ N/AProper containers for analyses requested ☒ Yes ☐ No ☐ N/ASufficient volume/mass for analyses requested ☒ Yes ☐ No ☐ N/ASamples received within holding time ☒ Yes ☐ No ☐ N/A

Aqueous samples for certain analyses received within 15-minute holding time

☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen ☐ Yes ☐ No ☒ N/AProper preservation chemical(s) noted on COC and/or sample container ☐ Yes ☐ No ☒ N/A

Unpreserved aqueous sample(s) received for certain analyses

☐ Volatile Organics ☐ Total Metals ☐ Dissolved MetalsAcid/base preserved samples - pH within acceptable range ☐ Yes ☐ No ☒ N/AContainer(s) for certain analysis free of headspace ☐ Yes ☐ No ☒ N/A☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)Tedlar™ bag(s) free of condensation ☐ Yes ☐ No ☒ N/A

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA_h ☐ VOA_{na2} ☐ 100PJ ☐ 100PJ_{na2} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 125PB ☐ 125PB_{znna} (pH 9)☐ 250AGB ☐ 250CGB ☐ 250CGB_s (pH 2) ☐ 250PB ☐ 250PB_h (pH 2) ☐ 500AGB ☐ 500AG_J ☐ 500AG_J_s (pH 2) ☐ 500PB☐ 1AGB ☐ 1AGB_{na2} ☐ 1AGB_s (pH 2) ☐ 1AGB_s (O&G) ☐ 1PB ☐ 1PB_{na} (pH 12) ☐ _____ ☐ _____Solid: ☒ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® (____) ☐ TerraCores® (____) ☒ 202ccs ☒ 202cc ☐ _____Air: ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ Other Matrix (____): ☐ _____ ☐ _____ ☐ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄, Labeled/Checked by: 426s = H₂SO₄, u = ultra-pure, x = Na₂SO₃ + NaHSO₄ · H₂O, znna = Zn (CH₃CO₂)₂ + NaOHReviewed by: 778

Appendix D MET Laboratory Data Report Submitted by Eurofins | Calscience

**WORK ORDER NUMBER: 18-05-1060***The difference is service*

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For**Client:** FOTH CLE Engineering**Client Project Name:** WETA**Attention:** Wendy Rocha
15 Creek Road
Marion, MA 02738-9999

Approved for release on 06/04/2018 by:
Carla Hollowell
Project Manager

[ResultLink >](#)[Email your PM >](#)

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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 Work Order Number: 18-05-1060

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Work Order Narrative

Work Order: 18-05-1060

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Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 05/11/18. They were assigned to Work Order 18-05-1060.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

Sample Summary

Client: FOTH CLE Engineering	Work Order: 18-05-1060
15 Creek Road	Project Name: WETA
Marion, MA 02738-9999	PO Number:
	Date/Time Received: 05/11/18 10:00
	Number of Containers: 4

Attn: Wendy Rocha

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
DU-1 Comp	18-05-1060-1	05/10/18 11:10	4	Aqueous

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: N/A
Method: SM 2540 D
Units: mg/L

Project: WETA

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Comp	18-05-1060-1-A	05/10/18 11:10	Aqueous	N/A	05/16/18	05/16/18 18:00	I0516TSSL1

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Solids, Total Suspended	17	1.0	0.83	1.00	

Method Blank	099-09-010-9140	N/A	Aqueous	N/A	05/16/18	05/16/18 18:00	I0516TSSL1
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Solids, Total Suspended	ND	1.0	0.83	1.00	

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: EPA 1631E Total
Method: EPA 1631E
Units: ug/L

Project: WETA

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Comp	18-05-1060-1-D	05/10/18 11:10	Aqueous	Hg/AF 1	05/11/18	05/11/18 00:00	180510LA1A

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Mercury	0.00436	0.000500	0.000113	1.00	

Method Blank	099-15-224-226	N/A	Aqueous	Hg/AF 1	05/10/18	05/11/18 00:00	180510LA1A
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Mercury	ND	0.000500	0.000113	1.00	



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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

FOTH CLE Engineering	Date Received:	05/11/18
15 Creek Road	Work Order:	18-05-1060
Marion, MA 02738-9999	Preparation:	EPA 3005A Total
	Method:	EPA 1640
	Units:	ug/L
Project: WETA		Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Comp	18-05-1060-1-B	05/10/18 11:10	Aqueous	ICP/MS 06	05/17/18	05/22/18 18:43	180517LA1A

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Selenium	0.0844	0.0500	0.0121	1.00	

Method Blank	099-13-067-795	N/A	Aqueous	ICP/MS 06	05/17/18	05/22/18 15:38	180517LA1A
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Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Selenium	ND	0.0500	0.0121	1.00	

Analytical Report

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: EPA 3005A Filt.
Method: EPA 1640
Units: ug/L

Project: WETA

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DU-1 Comp	18-05-1060-1-C	05/10/18 11:10	Aqueous	ICP/MS 06	05/17/18	05/17/18 15:24	180517LA1F

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Arsenic	4.70	0.0300	0.0122	1.00	
Cadmium	0.0275	0.0300	0.00567	1.00	J
Chromium	0.299	0.500	0.164	1.00	J
Copper	1.21	0.0300	0.00898	1.00	
Lead	0.0455	0.0300	0.0135	1.00	
Nickel	2.24	0.0500	0.00607	1.00	
Silver	ND	0.0500	0.00822	1.00	
Zinc	0.636	0.500	0.0736	1.00	

Method Blank	099-15-823-332	N/A	Aqueous	ICP/MS 06	05/17/18	05/17/18 13:08	180517LA1F
---------------------	-----------------------	------------	----------------	------------------	-----------------	-----------------------	-------------------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>MDL</u>	<u>DF</u>	<u>Qualifiers</u>
Arsenic	ND	0.0300	0.0122	1.00	
Cadmium	ND	0.0300	0.00567	1.00	
Chromium	ND	0.500	0.164	1.00	
Copper	ND	0.0300	0.00898	1.00	
Lead	ND	0.0300	0.0135	1.00	
Nickel	ND	0.0500	0.00607	1.00	
Silver	0.0110	0.0500	0.00822	1.00	J
Zinc	ND	0.500	0.0736	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: T22.11.5.All DI
Method: EPA 1631E

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
18-04-1194-1	Sample	Sediment	Hg/AF 1	05/01/18	05/11/18 00:00	180510SA1B
18-04-1194-1	Matrix Spike	Sediment	Hg/AF 1	05/01/18	05/11/18 00:00	180510SA1B
18-04-1194-1	Matrix Spike Duplicate	Sediment	Hg/AF 1	05/01/18	05/11/18 00:00	180510SA1B

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	0.01238	0.02000	0.02948	86	0.02775	77	71-125	6	0-24	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Quality Control - Spike/Spike Duplicate

FOTH CLE Engineering
 15 Creek Road
 Marion, MA 02738-9999

Date Received: 05/11/18
 Work Order: 18-05-1060
 Preparation: EPA 3005A Filt.
 Method: EPA 1640

Project: WETA

Page 2 of 2

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
DU-1 Comp	Sample	Aqueous	ICP/MS 06	05/17/18	05/17/18 15:24	180517SA1
DU-1 Comp	Matrix Spike	Aqueous	ICP/MS 06	05/17/18	05/17/18 14:52	180517SA1
DU-1 Comp	Matrix Spike Duplicate	Aqueous	ICP/MS 06	05/17/18	05/17/18 15:00	180517SA1

<u>Parameter</u>	<u>Sample Conc.</u>	<u>Spike Added</u>	<u>MS Conc.</u>	<u>MS %Rec.</u>	<u>MSD Conc.</u>	<u>MSD %Rec.</u>	<u>%Rec. CL</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Arsenic	4.702	0.5000	5.323	4X	5.111	4X	50-150	4X	0-20	Q
Cadmium	ND	0.5000	0.5346	107	0.5504	110	50-150	3	0-20	
Chromium	ND	5.000	6.154	123	6.397	128	50-150	4	0-20	
Copper	1.210	0.5000	1.794	117	1.867	132	50-150	4	0-20	
Lead	0.04554	0.5000	0.4534	82	0.4531	82	50-150	0	0-20	
Nickel	2.242	0.5000	2.668	4X	2.861	4X	50-150	4X	0-20	Q
Selenium	0.08096	0.5000	0.6037	105	0.5624	96	50-150	7	0-20	
Silver	ND	0.2500	0.1915	77	0.1904	76	50-150	1	0-20	
Zinc	0.6356	5.000	6.637	120	6.863	125	50-150	3	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

Quality Control - Sample Duplicate

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: N/A
Method: SM 2540 D

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
18-05-0738-2	Sample	Aqueous	N/A	05/16/18 00:00	05/16/18 18:00	I0516TSSD2
18-05-0738-2	Sample Duplicate	Aqueous	N/A	05/16/18 00:00	05/16/18 18:00	I0516TSSD2

<u>Parameter</u>	<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Solids, Total Suspended	1126	1186	5	0-20	

Quality Control - LCS/LCSD

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: N/A
Method: SM 2540 D

Project: WETA

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-09-010-9140	LCS	Aqueous	N/A	05/16/18	05/16/18 18:00	I0516TSSL1
099-09-010-9140	LCSD	Aqueous	N/A	05/16/18	05/16/18 18:00	I0516TSSL1

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Solids, Total Suspended	100.0	95.00	95	94.00	94	80-120	1	0-20	

Quality Control - LCS/LCSD

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: EPA 1631E Total
Method: EPA 1631E

Project: WETA

Page 2 of 4

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-224-226	LCS	Aqueous	Hg/AF 1	05/10/18	05/11/18 00:00	180510LA1A
099-15-224-226	LCSD	Aqueous	Hg/AF 1	05/10/18	05/11/18 00:00	180510LA1A

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	0.02000	0.02282	114	0.02152	108	71-125	6	0-20	

Quality Control - LCS/LCSD

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: EPA 3005A Total
Method: EPA 1640

Project: WETA

Page 3 of 4

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-13-067-795	LCS	Aqueous	ICP/MS 06	05/17/18	05/22/18 16:17	180517LA1A
099-13-067-795	LCSD	Aqueous	ICP/MS 06	05/17/18	05/22/18 16:23	180517LA1A

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Selenium	0.5000	0.5937	119	0.5898	118	70-130	1	0-20	

Quality Control - LCS/LCSD

FOTH CLE Engineering
15 Creek Road
Marion, MA 02738-9999

Date Received: 05/11/18
Work Order: 18-05-1060
Preparation: EPA 3005A Filt.
Method: EPA 1640

Project: WETA

Page 4 of 4

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-823-332	LCS	Aqueous	ICP/MS 06	05/17/18	05/17/18 13:40	180517LA1F
099-15-823-332	LCSD	Aqueous	ICP/MS 06	05/17/18	05/17/18 13:48	180517LA1F

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Arsenic	0.5000	0.5446	109	0.5433	109	70-130	0	0-20	
Cadmium	0.5000	0.4817	96	0.4932	99	70-130	2	0-20	
Chromium	5.000	5.226	105	5.351	107	70-130	2	0-20	
Copper	0.5000	0.5052	101	0.5069	101	70-130	0	0-20	
Lead	0.5000	0.4357	87	0.4418	88	70-130	1	0-20	
Nickel	0.5000	0.4726	95	0.4876	98	70-130	3	0-20	
Silver	0.2500	0.2492	100	0.2664	107	70-130	7	0-20	
Zinc	5.000	5.078	102	5.155	103	70-130	1	0-20	



 Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Glossary of Terms and Qualifiers

Work Order: 18-05-1060

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

ENVIRONMENTAL CONSULTING & TESTING
2250 Cordelia Rd., Fairfield, CA 94504
707/207-7760

2250 Cordelia Rd., Fairfield, CA 94534
707/207-7760

Eurofins Calscience CHAIN-OF-CUSTODY RECORD
18-05-1060[illegible]

a GLS company
GLS800-322-5555
www.gso.com

(1060)

Ship FromCAL SCIENCE- CONCORD
ALAN KEMP
5063 COMMERCIAL CIRCLE
#H
CONCORD, CA 94520

Tracking #: 540540075

NPS

**Ship To**CEL
SAMPLE RECEIVING
7440 LINCOLN WAY
GARDEN GROVE, CA 92841**ORC**
GARDEN GROVE**A**

COD: \$0.00

Weight: 0 lb(s)

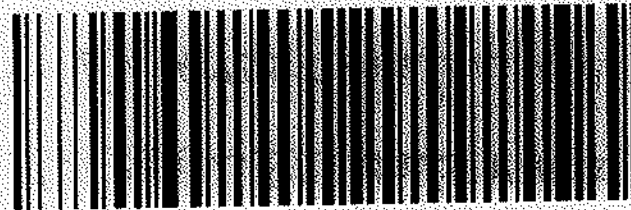
Reference:

PACIFIC ECORISK, AECOM

Delivery Instructions:

Signature Type: STANDARD

D92845A



83976283

Print Date: 5/10/2018 2:39 PM

LABEL INSTRUCTIONS:**Do not copy or reprint this label for additional shipments - each package must have a unique barcode.**

Step 1: Use the "Print Label" button on this page to print the shipping label on a laser or inkjet printer.

Step 2: Fold this page in half.

Step 3: Securely attach this label to your package and do not cover the barcode.

TERMS AND CONDITIONS:By giving us your shipment to deliver, you agree to all of the GSO service terms & conditions including, but not limited to; limits of liability, declared value conditions, and claim procedures which are available on our website at www.gso.com.

SAMPLE RECEIPT CHECKLISTCOOLER 1 OF 1CLIENT: Pacific EcoRiskDATE: 05/11/2018**TEMPERATURE:** (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)Thermometer ID: SC6 (CF: +0.1°C); Temperature (w/o CF): 2.9 °C (w/ CF): 3.0 °C; ☒ Blank ☐ Sample☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling☐ Sample(s) received at ambient temperature; placed on ice for transport by courierAmbient Temperature: ☐ Air ☐ FilterChecked by: IS**CUSTODY SEAL:**Cooler ☒ Present and Intact ☐ Present but Not Intact ☐ Not Present ☐ N/A Checked by: ISSample(s) ☐ Present and Intact ☐ Present but Not Intact ☒ Not Present ☐ N/A Checked by: 1140**SAMPLE CONDITION:**

	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Container(s) for certain analysis free of headspace	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA_h ☐ VOA_{na} ☐ 100PJ ☐ 100PJ_{na} ☐ 125AGB ☐ 125AGB_h ☐ 125AGB_p ☐ 125PB ☐ 125PB_z (pH 9)☐ 250AGB ☐ 250CGB ☐ 250CGB_s (pH 2) ☐ 250PB ☐ 250PB_h (pH 2) ☐ 500AGB ☐ 500AGJ ☐ 500AGJ_s (pH 2) ☐ 500PB☐ 1AGB ☐ 1AGB_{na} ☐ 1AGB_s (pH 2) ☐ 1AGB_s (O&G) ☐ 1PB ☐ 1PB_{na} (pH 12) ☐ _____ ☐ _____ ☐ _____Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (____) ☐ EnCores® (____) ☐ TerraCores® (____) ☐ _____ ☐ _____ ☐ _____Air: ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ Other Matrix (____) ☐ _____ ☐ _____ ☐ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄, Labeled/Checked by: 1140s = H₂SO₄, u = ultra-pure, x = Na₂SO₃+NaHSO₄.H₂O, z_{na} = Zn (CH₃COO)₂ + NaOHReviewed by: 107

Appendix E Biological Testing Report Submitted by Pacific EcoRisk



Ms. Wendy Rocha
FOTH and Van Dyke & Associates, Inc.
10 Commercial Blvd, Suite 100
Novato, CA 94949

June 21, 2018

Dear Ms. Rocha:

Please find attached an electronic copy of the report "Biological Testing of the DU-1 Composite Sediment Sample Collected from WETA Vallejo Ferry Terminal" in PDF format. Hard copies can be provided upon request.

If you have any questions, please give me a call at (707) 207-7761. I look forward to hearing from you.

Sincerely,

Mike McElroy
Senior Project Manager



Pacific EcoRisk is accredited in accordance with NELAP (ORELAP ID 4043). Pacific EcoRisk certifies that the test results reported herein conform to the most current NELAP requirements for parameters for which accreditation is required and available. Any exceptions to NELAP requirements are noted, where applicable, in the body of the report. This report shall not be reproduced, except in full, without the written consent of Pacific EcoRisk. This testing was performed under Lab Order 28839.

DATA REPORT

Biological Testing of the DU-1 Composite Sediment Sample Collected from San Francisco Bay Area Water Emergency Transit Authority Vallejo Ferry Terminal

Prepared for

FOTH and Van Dyke & Associates, Inc.
10 Commercial Blvd, Suite 100
Novato, CA 94949

Prepared by

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534

June 2018



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1. INTRODUCTION

FOTH Van Dyke & Associates Inc. (FOTH) has contracted Pacific EcoRisk (PER) to perform whole sediment and water column (sediment elutriate) bioassay testing of a sediment sample in support of the **San Francisco Bay Area Water Emergency Transit Authority (WETA)** Vallejo Ferry Terminal maintenance dredging sampling and testing program. The performance and results of this testing are presented in this report.

2. METHODS

2.1 Biological Testing Procedures

There were three different biological tests performed for the site composite sample:

1. a 10-day sediment amphipod survival test with *Leptocheirus plumulosus*;
2. a 10-day sediment juvenile polychaete survival test with *Neanthes arenaceodentata*; and
3. a 96-hr modified elutriate mysid survival test with *Americamysis bahia*.

Please note, *Leptocheirus plumulosus* were used in this testing due to a lack of availability of a sufficient number of healthy and appropriately sized *Ampelisca abdita* from the collection locations on both the West and East coasts.

The methods used in conducting these tests followed established guidelines:

- Method E1367-99. Standard Guide for Conducting 10-day Static Toxicity Tests with Marine and Estuarine Amphipods. (ASTM 2016);
- Method E1611-00. Standard Guide for Conducting Sediment Tests with Marine and Estuarine Polychaetous Annelids. (ASTM 2016);
- Testing Manual for the Evaluation of Dredged Material Discharged in Waters of the U.S. (Inland Testing Manual, US EPA/USACE, 1998);
- Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods. (US EPA 1994);
- Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. (US EPA, 2002);
- USACE Technical Note EEDP-04-02. Interim Guidance for Predicting Quality of Effluent Discharged from Confined Dredged Material Disposal Areas-Test Procedures. U.S. Army Corps of Engineers, US Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS. USACE (1985); and
- Public Notice 01-01. DMMO Guidelines for Implementing of the Inland Testing Manual in the San Francisco Bay Region. U.S. Army Corps of Engineers, US Army Corps of Engineers Operations and Readiness Branch, San Francisco, CA. USACE (2001).



2.2 Receipt and Handling of Sediment Sample

On May 3, 2018, a sediment sample designated “DU1-Comp” was collected from WETA Vallejo Ferry Terminal; in addition, a ‘site water’ sample was collected on May 2, 2018 for use in preparing the sediment elutriates. These samples were delivered to the PER testing lab, on ice and under chain-of-custody, on May 3, 2018. Upon receipt at the PER testing laboratory, the samples were logged in and stored in the dark and under refrigeration (i.e., at 4°C for the sediment and 0-6°C for the water sample) until needed. The chain-of-custody record for the collection and delivery of this sample is provided in Appendix A.

2.3 Source of Natural Seawater

The natural seawater used in these tests was obtained from the UC Davis Granite Canyon Marine Laboratory and is characterized as “pristine”; this water was stored at the PER laboratory in a 3000-gallon insulated HDPE tank maintained at 4°C. This seawater was 1-µm filtered and then adjusted to the desired test salinity (e.g., 30 ppt) via addition of Type 1 lab water (reverse-osmosis, de-ionized water) prior to use in these tests (these diluted natural seawaters are referred to using the adjusted salinity level [e.g., ‘30 ppt seawater’]).

2.4 Sediment Porewater Characterization

Upon receipt, the WETA Vallejo Ferry Terminal sediment sample was homogenized in a large stainless steel bowl. Aliquots of the homogenized site sediment were centrifuged at 2,500 rpm for 15 minutes; the resulting supernatant porewaters were carefully collected and analyzed for routine water quality characteristics (Table 2-1).

Table 2-1. Sediment Porewater Initial Water Quality Characteristics.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
DU1-Comp	7.43	15.8	26.5	0.057

2.5 Solid-Phase Sediment Toxicity Testing with *Leptocheirus plumulosus*

The *L. plumulosus* used in this testing were obtained from a commercial supplier (Chesapeake Cultures, Inc., Hayes, VA), and were maintained at a salinity of 20 ppt at 25°C prior to use in the testing.

The sediment porewater ammonia concentration for the sample (Table 2-1) exceeded the USACE guidelines-recommended threshold of 15 mg/L. Accordingly, the test replicates (described below) were prepared for the sediments prior to test initiation so that they could be purged of ammonia by daily replacement of the overlying water with fresh 20 ppt seawater,

coupled with aeration, until the porewater total ammonia levels were below 15 mg/L, after which the testing was initiated. The sediment porewater ammonia concentrations measured at test initiation and at test termination are presented in Appendix B.

The testing was initiated on May 31, 2018. On the day preceding test initiation, the test replicates were set-up. Five replicates were established for the site sample, each replicate consisting of a 1-L glass beaker to which homogenized sediment was added to a depth of approximately 2-cm; additional “porewater” test replicates were similarly prepared for the determination of sediment porewater water quality characteristics at test initiation and at test termination. The overlying water for this testing consisted of 20 ppt seawater; approximately 800 mL of the 20 ppt seawater was carefully poured into each test replicate so as to minimize disturbance of the sediment. Test replicates were similarly established for the Lab Control (Paradise Cove sediment) treatment. All test replicates were maintained in a temperature-controlled room at 25°C under continuous illumination from fluorescent lighting, and each replicate was gently aerated.

The following day, and immediately prior to test initiation, routine water quality characteristics (temperature, pH, dissolved oxygen [D.O.], and salinity) were determined for the overlying water in each test replicate; in addition, a small sample of the overlying water was collected from each replicate and composited for each treatment for determination of the total ammonia in the overlying water at that treatment. At this time, one of the “porewater” test replicates was sacrificed for the determination of “initial” porewater water quality characteristics (Appendix B). The testing was then initiated with the allocation of 20 randomly selected *L. plumulosus* into each replicate container (aeration was shut off until the amphipods re-buried themselves, approximately 1 hr after their introduction). Each day, for the next nine days, the temperature, pH, D.O., and salinity of the overlying water were measured in one test replicate for each treatment.

After 10 days exposure, the testing was terminated and routine water quality characteristics (temperature, pH, D.O., and salinity) were again determined for each test replicate; in addition, a small sample of the overlying water was collected from each replicate and composited for each treatment for determination of the total ammonia in the overlying water at that treatment. At this time, the remaining “porewater” test replicate was sacrificed for the determination of “final” porewater water quality characteristics (Appendix B). The contents of each replicate beaker were then sieved and examined, and the surviving amphipods were collected and counted. The resulting survival data were statistically analyzed using the CETIS® statistical software (Tidepool Scientific, McKinleyville, CA). The results of this testing are summarized in Section 3.1.

2.5.1 Reference Toxicant Testing of the *Leptocheirus plumulosus*

In order to assess the sensitivity of the organisms used in these tests to chemical stress, concurrent reference toxicant testing was performed. The reference toxicant test was performed as a 96-hr static waterborne exposure using test solutions consisting of 20 ppt seawater spiked



with potassium chloride (KCl) at test concentrations of 0.25, 0.5, 1, 2, and 4 g/L. A thin layer of clean Lab Control sediment was added to each test replicate to reduce stress to the organisms.

There were two replicates at each treatment, each replicate consisting of 400 mL of test solution in a 600-mL HDPE beaker. The test was initiated by randomly allocating 10 amphipods into each replicate beaker. The beakers were placed in a temperature-controlled room at 25°C under continual darkness. Routine water quality characteristics (D.O., pH, and temperature) of the treatment waters were measured and recorded for one randomly selected replicate per treatment each day.

After ~96 hrs, the test was terminated and the number of live amphipods in each replicate beaker was determined. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC₅₀); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab. The results of this testing are summarized in Section 3.1.1.

2.6 Solid-Phase Sediment Toxicity Testing with *Neanthes arenaceodentata*

The *N. arenaceodentata* used in this testing were obtained from a commercial supplier (Aquatic Toxicology Support [ATS], Bremerton, WA), and were maintained at a salinity of 30 ppt prior to shipment to the testing lab; upon receipt, the test organisms were held in 30 ppt seawater at 20°C.

The sediment porewater ammonia concentrations for the sample (Table 2-1) exceeded the USACE guidelines-recommended threshold of 15 mg/L. Accordingly, the test replicates (described below) were prepared for the sediment prior to test initiation so that they could be purged of ammonia by daily replacement of the overlying water with fresh 28 ppt seawater, coupled with aeration, until the porewater total ammonia levels were below 15 mg/L, after which the testing was initiated. The sediment porewater ammonia concentrations measured at test initiation and at test termination are presented in Appendix B.

These sediment testing was initiated on May 8, 2018. On the day preceding test initiation, the test replicates were set-up. Five replicates were established for the site sample, each replicate consisting of a 1-L glass beaker to which approximately 200 mL (approximately 2.5 cm depth) of homogenized sediment was added; additional test replicates were set up for the determination of sediment porewater water quality characteristics at test initiation and at test termination. The overlying water consisted of 30 ppt seawater; approximately 800 mL of this water was carefully poured into each test replicate so as to minimize disturbance of the sediment. Test replicates were similarly established for the Lab Control (Paradise Cove sediment) treatment. The test replicates were then placed in a temperature-controlled room at 20°C, under cool white fluorescent lighting on a 12L:12D photoperiod. Each test replicate was gently aerated.

The following day, and immediately prior to test initiation, routine water quality characteristics (temperature, pH, D.O., and salinity) were determined for the overlying water in each test replicate; in addition, a small sample of the overlying water was collected from each replicate and composited for each treatment for determination of the total ammonia in the overlying water at that treatment. At this time, one of the “porewater” test replicates was sacrificed for the determination of “initial” porewater water quality characteristics (Appendix B). The testing was then initiated with the allocation of 10 randomly selected polychaetes into each replicate container (aeration was shut off until the polychaetes re-buried themselves, approximately 1 hr after their introduction). Each day, for the next 10 days, the temperature, pH, D.O., and salinity of the overlying water were measured in one test replicate for each treatment.

After 10 days exposure, the testing was terminated and routine water quality characteristics (temperature, pH, D.O., and salinity) were again determined for each test replicate; in addition, a small sample of the overlying water was collected from each replicate and composited for each treatment for determination of the total ammonia in the overlying water at that treatment. At this time, the remaining “porewater” test replicate was sacrificed for the determination of “final” porewater water quality characteristics (Appendix B). The contents of each replicate beaker were then sieved and examined, and the surviving polychaetes were collected and counted. The resulting survival data were statistically analyzed using the CETIS[®] statistical software. The results of this testing are summarized in Section 3.2.

2.6.1 Reference Toxicant Testing of the *Neanthes arenaceodentata*

In order to assess the sensitivity of the organisms used in these tests to chemical stress, concurrent reference toxicant testing was performed. The reference toxicant test consists of a static acute 96-hr survival toxicity test of waterborne KCl, at test treatment concentrations of 0.25, 0.5, 1, 2, and 4, g/L.

There were two replicates at each treatment, each replicate consisting of 400 mL of test solution in a 600-mL HDPE beaker. The test was initiated by randomly allocating five polychaetes into each replicate beaker. The beakers were placed in a temperature-controlled room at 20°C under continual darkness. Each replicate container was examined daily, and the number of live polychaetes in each was recorded at this time. Routine water quality characteristics (temperature, pH, D.O., and salinity) of each treatment test solution was measured and recorded for one randomly-selected replicate per treatment each day.

After ~96 hrs, the testing was terminated and the number of live organisms in each replicate beaker was determined. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC₅₀); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most recent previous reference toxicant tests performed by this lab. The results of this test are summarized in Section 3.2.1.

2.7 Modified Elutriate Test (MET) Procedures

2.7.1 Preparation of MET Samples

All elutriate samples were prepared as described in USACE (1985). All elutriates were prepared using a sediment slurry concentration of 150 g/L dry sediment (the dry weight basis of each homogenized sediment was determined by oven-drying a known volume of sediment). The resulting dry weight concentration of each sediment was used to calculate the volume of sediment and water that would be required to prepare an elutriate slurry at a sediment concentration of 150 g/L dry wt. basis. Each elutriate slurry was prepared by mixing site water and sediment for five minutes, followed with vigorous aeration for 1 hr in a 4-L graduated cylinder, after which any suspended material was allowed to settle for 24-hrs. After the settling period, the elutriate supernatant for each sample was collected from the cylinder by siphoning at a point midway between the water surface and settled sediment interface using clean silicone tubing. Extreme care was taken not to re-suspend any of the settled material. An aliquot of the MET supernatant was placed into pre-cleaned bottles and submitted to Eurofins Calscience, Inc. (Garden Grove, CA), as per client instruction; the remaining MET supernatant was used for initiating toxicity testing.

2.7.2 MET Toxicity Testing with *Americamysis bahia*

The MET toxicity test with *A. bahia* consists of exposing the mysids to the MET elutriate for ~96-hrs, after which the effects on survival are determined. The specific procedures used in this testing are described below. The modified elutriate test with *A. bahia* was initiated on May 10, 2018.

The *A. bahia* used in the MET testing were obtained from a commercial supplier (Aquatic Indicators [AI], St Augustine, FL); upon receipt in the laboratory, the mysids were maintained in small tanks of 25 ppt seawater at 20°C, and were fed brine shrimp nauplii *ad libitum*.

The Lab Water Control medium for this testing consisted of 25 ppt seawater. The sediment MET elutriate was tested at the 100% elutriate only. The site water from the area where the sediments samples were collected was also tested (at the 100% concentration). Initial routine water quality characteristics (temperature, pH, D.O., total ammonia, and salinity) were measured for each treatment test solution prior to use in testing.

There were five test replicates at each treatment, each replicate consisting of a 400-mL glass beaker containing 200 mL of appropriate test solution. The testing was initiated with the allocation of 10 randomly selected 5-day old mysids into each test replicate. The test replicates were then placed into a temperature-controlled room at 20°C under a 16L:8D photoperiod.

Each day, water quality conditions were determined for one randomly selected replicate per treatment, and the test replicates were examined to determine the number of surviving organisms, with any dead organisms being removed via pipette. Each replicate was fed brine shrimp nauplii daily.

After 96 (± 2) hrs exposure, the testing was terminated, at which time the final water quality conditions were determined for one randomly selected replicate per treatment, after which each of the test replicates was examined to determine the number of surviving mysids. The resulting survival data were then statistically analyzed and key concentration-response EC point estimates determined for each site sediment elutriate using the CETIS[®] statistical software. The results of this testing are summarized in Section 3.3.

2.7.2.1 Reference Toxicant Testing of the *Americamysis bahia*

In order to assess the sensitivity of these test organisms to chemical stress, a reference toxicant test was performed concurrently with the elutriate test. The reference toxicant test was performed similarly to the sediment elutriate test, but used test solutions consisting of Lab Water Control medium spiked with waterborne KCl at test concentrations of 0.125, 0.25, 0.5, 1, and 2 g/L, instead of elutriate dilutions. The resulting test response data were statistically analyzed to determine key concentration-response point estimates (e.g., EC₅₀); all statistical analyses were made using the CETIS[®] software. These response endpoints were then compared to the typical response range established by the mean \pm 2 SD of the point estimates generated by the 20 most-recent previous reference toxicant tests performed by this lab. The results of this test are summarized in Section 3.3.1.

3. BIOLOGICAL TESTING RESULTS

There were three different biological tests performed for each site composite sample:

1. a 10-day sediment amphipod survival test with *Leptocheirus plumulosus*;
2. a 10-day sediment juvenile polychaete survival test with *Neanthes arenaceodentata*; and
3. a 96-hr modified elutriate mysid survival test with *Americamysis bahia*.

A summary table of the whole-sediment tests' water quality characteristics and sediment porewater water quality characteristics at test initiation and test termination are presented in Appendix B. Summaries of test conditions and test acceptability criteria are provided in Appendix H.

3.1 Effects of WETA Vallejo Ferry Terminal DU1-Comp Sediment on *Leptocheirus plumulosus*.

The results of this test are summarized in Table 3-1. There was 100% survival in the Control sediment, indicating an acceptable survival response by the test organisms. There was no significant reduction in survival in the DU1-Comp sediment. The difference in survival in the site sediment relative to the Control sediment response was <20% indicating that this sediment was **not** toxic to amphipods.

The test data and summary of statistical analyses for this test are attached as Appendix C.

Table 3-1. *Leptocheirus plumulosus* Survival in the Vallejo Ferry Terminal Sediment.

Sediment Site	% Survival in Test Replicates					Mean % Survival
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	100	100	100	100	100	100
DU1-Comp	95	100	100	100	100	99



3.1.1 Reference Toxicant Toxicity to *Leptocheirus plumulosus*

The results of this test are presented in Table 3-2. Although the Laboratory Control survival was below acceptable limits, the LC₅₀ for this test is consistent with the “typical response” range established by the reference toxicant test database for this species, indicating that these test organisms were responding to toxic stress in a typical fashion.

The test data and summary of statistical analyses for this test are attached as Appendix D.

Table 3-2. Reference Toxicant Testing: Effects of KCl on *Leptocheirus plumulosus*

KCl Treatment (g/L)	Mean % Survival
Lab Control	100
0.25	95
0.5	100
1	75*
2	0*
4	0*
LC ₅₀ =	1.19 g/L KCl
Typical Response Range (mean ± 2SD) =	0.308 – 1.63 g/L KCl

* The survival response at this treatment was significantly less than the Lab Control response at $p < 0.05$.

3.2 Effects of WETA Vallejo Ferry Terminal DU1-Comp Sediment on *Neanthes arenaceodentata*

The results of this test are summarized in Table 3-3. There was 100% survival in the Control sediment, indicating an acceptable survival response by the test organisms. There was no significant reduction in survival in DU1-Comp sediment; the difference in survival in the site sediment relative to the Control sediment response was <10% indicating that these sediments were **not** toxic to polychaetes.

The test data and summary of statistical analyses for this test are attached as Appendix E.

Table 3-3. *Neanthes arenaceodentata* Survival in the Vallejo Ferry Terminal Sediment.

Sediment Site	% Survival in Test Replicates					Mean % Survival
	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	100	100	100	100	100	100
DU1-Comp	100	100	100	100	100	100

3.2.1 Reference Toxicant Toxicity to *Neanthes arenaceodentata*

The results of this test are presented in Table 3-4. Although the Laboratory Control survival was below test acceptability criteria, the LC50 for this test are consistent with the “typical response” range established by the reference toxicant test database for this species, indicating that these test organisms were responding to toxic stress in a typical fashion.

The test data and summary of statistical analyses for this test are presented in Appendix F.

Table 3-4. Reference Toxicant Testing: Effects of KCl on *Neanthes arenaceodentata*.

KCl Treatment (g/L)	Mean % Survival
Lab Control	100
0.5	100
1	100
2	50*
3	0*
4	0*
LC50 =	1.86 g/L KCl
Typical Response Range (mean \pm 2SD) =	1.15 – 2.51 g/L KCl

* The response at this test treatment was significantly less than the Control treatment response at $p < 0.05$.

3.3 Effects of WETA Vallejo Ferry Terminal DU1-Comp Modified Elutriate on *Americamysis bahia*

The results of this test are summarized below in Table 3-5. There was 100% survival in the Lab Control treatment, indicating acceptable survival responses by the test organisms; there was 100% survival in the Site Water treatment. There was no significant reduction in survival in DU1-Comp modified elutriate indicating that this modified elutriate was not toxic to mysids.

The test data and summary of statistical analyses for this test are attached as Appendix G.

Table 3-5. Effects of the Vallejo Ferry Terminal Modified Elutriate on *Americamysis bahia*.

Test Treatment	Mean % Survival
Lab Control	100
Site Water	100
DU1-Comp	100

3.3.1 Reference Toxicant Toxicity to *Americamysis bahia*

The results of this test are summarized in Tables 3-6. The LC₅₀ for this test was consistent with the “typical response” range established by the reference toxicant test database for this species, indicating that these test organisms were responding to toxic stress in a typical fashion.

The test data and summary of statistical analyses for this test are attached as Appendix H.

Table 3-6. Reference Toxicant Testing: Effects of KCl on *Americamysis bahia*.

KCl Treatment (g/L)	Mean % Survival
Lab Control	100
0.125	97.5
0.25	97.5
0.5	77.5
1	0*
2	0*
LC ₅₀ =	0.61 g/L KCl
Typical Response Range (mean ± 2SD) =	0.31 – 0.70 g/L KCl

* The response at this test treatment was significantly less than the Control treatment response at $p < 0.05$.

3.4 Biological Testing QA/QC Summary

The biological testing of WETA Vallejo Ferry Terminal sediment incorporated standard QA/QC procedures to ensure that the test results were valid, including the use of negative Lab Controls, positive Lab Controls, test replicates, and measurements of water quality during testing.

Quality assurance procedures that were used for sediment testing are consistent with methods described in the U.S.EPA/USACE (1998). Sediments for the bioassay testing were stored appropriately at $\leq 4^{\circ}\text{C}$ and were used within the eight-week holding time period. Sediment interstitial water characteristics were within test acceptability limits at the start of the tests. Sediment elutriates were prepared using site water. The toxicity test overlying waters consisted of high-quality natural seawater.

All measurements of routine water quality characteristics were performed as described in the PER Lab Standard Operating Procedures (SOPs). All biological testing water quality conditions were within the appropriate limits. Laboratory instruments were calibrated daily according to Lab SOPs, and calibration data were logged and initialed.

Negative Lab Control – The biological responses for test organisms at the negative Lab Control treatments were within acceptable limits for the sediment testing.

Positive Lab Control –The results of the reference toxicant tests were consistent with the “typical response” ranges established by the respective reference toxicant test databases for these species, indicating that the test organisms were responding to toxic stress in a typical and consistent fashion.

Concentration Response Relationships – The concentration-response relationships for the reference toxicant tests were evaluated as per EPA guidelines (EPA-821-B-00-004) and were determined to be acceptable.



4. REFERENCES

ASTM (2016) Method E1367-99. Standard Guide for conducting 10 day static toxicity tests with marine and estuarine amphipods. ASTM Standards on Biological Effects and Environmental Fate. American Society for Testing and Materials, Philadelphia, PA.

ASTM (2016) Method E1611-00. Standard Guide for conducting sediment tests with marine and estuarine polychaetous annelids. ASTM Standards on Biological Effects and Environmental Fate. American Society for Testing and Materials, Philadelphia, PA.

USEPA (1994) 'Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods', EPA-600/R-94/025. U.S. EPA, Env. Research Laboratory, Narragansett, RI.

USACE (1985) USACE Technical Note EEDP-04-02. Interim Guidance for Predicting Quality of Effluent Discharged from Confined Dredged Material Disposal Areas-Test Procedures. U.S. Army Corps of Engineers, US Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

USACE (2001) Public Notice 01-01. DMMO Guidelines for Implementing of the Inland Testing Manual in the San Francisco Bay Region. U.S. Army Corps of Engineers, US Army Corps of Engineers Operations and Readiness Branch, San Francisco, CA.

USEPA/USACE (1998) Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (Inland Testing Manual). U.S. Environmental Protection Agency/U.S. Army Corps of Engineers. EPA/823/B-94/002. Office of Water. Washington, DC 20460.

USEPA (2002) 'Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms', fifth edition, EPA/821/R-02/012. U.S. EPA, Environmental Office of Research and Development, Washington DC.

Appendix A

Chain-of-Custody Records for the Collection and Delivery of WETA Vallejo Ferry Terminal DU1-Comp Sediment



Pacific EcoRisk

2250 Cordelia Road - Fairfield, CA 94534


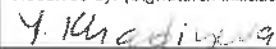
For courier service/sample drop off information, contact us at 707-207-7760 or 707-207-7761

CHAIN OF CUSTODY RECORD

WORK/LAB USE ONLY

DATE: 05/03/18

PAGE: 1 1

LABORATORY CLIENT: Foth and Van Dyke & Associates Inc.						CLIENT PROJECT NAME / NUMBER: WETA				P.O. NO.: 0017S414.10												
ADDRESS: 10 Commercial Blvd. - Suite 100						PROJECT CONTACT: Wendy Rocha				SAMPLER(S): (PRINT) Darren Gewant/Mark Tennison												
CITY: Novato		STATE: CA		ZIP: 94949																		
TEL: 508-762-0777		E-MAIL: wendy.rocha@foth.com				REQUESTED ANALYSES																
TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):						Please check box or fill in blank as needed.																
<input type="checkbox"/> SAME DAY <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 72 HR <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> STANDARD																						
<input type="checkbox"/> COELT EDF		GLOBAL ID:		LOG CODE:																		
SPECIAL INSTRUCTIONS: Coordinate MET testing with Calscience																						
LAB USE ONLY	SAMPLE ID	SAMPLING		MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	10-day whole sediment Amphipod Test	10-day whole sediment Polychaete Test	MET/EET 100% mysid or fish test on M	Site Water Test with Mysids or fish 100% o										
		DATE	TIME																			
	DU-1 Composite	5/3/2018	900	SOIL	1-5Gal	X			1	1	1											
	DU-1	5/2/2018	1400	Water	2	X						1										
Relinquished by: (Signature) 						Received by: (Signature/Affiliation) 						Date: 3-May-18		Time: 1200								
Relinquished by: (Signature)						Received by: (Signature/Affiliation)						Date:		Time:								
Relinquished by: (Signature)						Received by: (Signature/Affiliation)						Date:		Time:								

Appendix B

Whole Sediment Test Porewater and Water Quality Characteristics of Overlying Water



Table B-1. Sediment Porewater Test Initiation Water Quality Characteristics for *Leptocheirus plumulosus* Benthic Toxicity Test.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.37	23.4	2.19	0.065
DU1-Comp	7.31	20.3	8.93	0.069

Table B-2. Sediment Porewater Test Termination Water Quality Characteristics for *Leptocheirus plumulosus* Benthic Toxicity Test.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.04	28.1	<1.00	0.032
DU1-Comp	6.97	27.7	2.88	0.041

Table B-3. Sediment Overlying Water Total Ammonia Concentrations for *Leptocheirus plumulosus* Benthic Toxicity Test.

Sample ID	Total Ammonia (mg/L N)	
	Test Initiation	Test Termination
Lab Control	<1.00	<1.00
DU1-Comp	<1.00	<1.00

Table B-4. Sediment Porewater Test Initiation Water Quality Characteristics for *Neanthes arenaceodentata* Benthic Toxicity Test.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.65	26.7	1.33	0.061
DU1-Comp	7.49	26.5	13.7	0.175

Table B-5. Sediment Porewater Test Termination Water Quality Characteristics for *Neanthes arenaceodentata* Benthic Toxicity Test.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.30	28.2	<1.00	0.044
DU1-Comp	7.30	27.6	<2.00	0.052

**Table B-6. Sediment Overlying Water Total Ammonia Concentrations for
Neanthes arenaceodentata Test.**

Sample ID	Total Ammonia (mg/L N)	
	Test Initiation	Test Termination
Lab Control	<1.00	<1.00
DU1-Comp	<1.00	<1.00

Table B-7. Total Ammonia Concentration for Modified Elutriate Test (MET) Sample.

Sample ID	Total Ammonia (mg/L N)
DU1-Comp	3.75

Appendix C

Test Data and Summary of Statistics for the Toxicity Evaluation of the Vallejo Ferry Terminal DU1-Comp Sediment with the Amphipod, *Leptocheirus plumulosus*



CETIS Summary Report

Report Date: 12 Jun-18 08:28 (p 1 of 1)

Test Code: FVFT_0518LP_C1 | 07-3169-2557

10 Day Marine/Estuarine Sediment Test						Pacific EcoRisk					
Batch ID:	00-5736-0511	Test Type:	Survival	Analyst:	Simin Delijani						
Start Date:	31 May-18 10:37	Protocol:	ASTM E1367-99 (Amphipod)	Diluent:	Not Applicable						
Ending Date:	10 Jun-18 12:56	Species:	Leptocheirus plumulosus	Brine:	Not Applicable						
Duration:	10d 2h	Source:	Aquatic Research Organisms, NH	Age:	N/A						
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
FVFT_0518LP_C1	12-8715-5869	31 May-18 10:37	31 May-18 10:37	n/a (25.8 °C)	Foth (CLE)	28839					
DU1-COMP	09-8853-3218	03 May-18 09:00	03 May-18 12:04	28d 2h (0 °C)							
Sample Code	Material Type	Sample Source		Station Location	Lat/Long						
FVFT_0518LP_C1	Sediment	Vallejo Ferry Terminal		LABQA							
DU1-COMP	Sediment	Vallejo Ferry Terminal		DU1							
Single Comparison Summary											
Analysis ID	Endpoint	Comparison Method			P-Value	Comparison Result					
08-8401-8806	Survival Rate	Wilcoxon Rank Sum Two-Sample Test			0.5000	DU1-COMP passed survival rate					
Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
FVFT_0518LP_C1	CS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
DU1-COMP		5	0.990	0.962	1.000	0.950	1.000	0.010	0.022	2.26%	1.00%
Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
FVFT_0518LP_C1	CS	1.000	1.000	1.000	1.000	1.000					
DU1-COMP		0.950	1.000	1.000	1.000	1.000					
Survival Rate Binomials											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
FVFT_0518LP_C1	CS	20/20	20/20	20/20	20/20	20/20					
DU1-COMP		19/20	20/20	20/20	20/20	20/20					

CETIS Analytical Report

Report Date: 12 Jun-18 08:29 (p 1 of 1)

Test Code: FVFT_0518LP_C1 | 07-3169-2557

10 Day Marine/Estuarine Sediment Test Pacific EcoRisk

Analysis ID: 06-0806-5548	Endpoint: Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 12 Jun-18 8:29	Analysis: Nonparametric-Two Sample	Official Results: Yes

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	DU1-COMP passed survival rate	2.36%

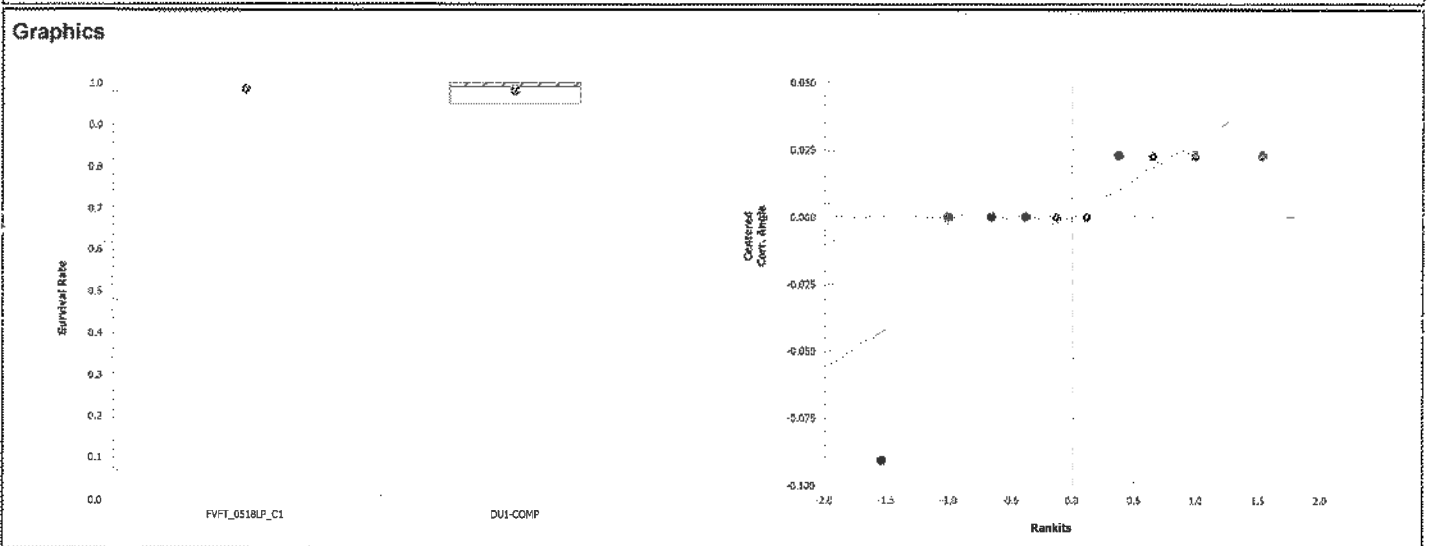
Wilcoxon Rank Sum Two-Sample Test									
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Control Sed		DU1-COMP	25	n/a	1	8	Exact	0.5000	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0012877	0.0012877	1	1	0.3466	Non-Significant Effect
Error	0.0103014	0.0012877	8			
Total	0.0115891		9			

Distributional Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α :1%)
Variances	Levene Equality of Variance Test	7.11	11.3	0.0285	Equal Variances
Variances	Mod Levene Equality of Variance Test	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.625	0.741	1.1E-04	Non-Normal Distribution

Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FVFT_0518LP_C1	CS	5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
DU1-COMP		5	0.990	0.962	1.000	1.000	0.950	1.000	0.010	2.26%	1.00%

Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FVFT_0518LP_C1	CS	5	1.46	1.46	1.46	1.46	1.46	1.46	0	0.00%	0.00%
DU1-COMP		5	1.44	1.37	1.5	1.46	1.35	1.46	0.0227	3.53%	1.56%



10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: Form: Vallejo Ferry Terminal Test ID#: Date (Day 0): 5/31/18
 Species: Leptocheirus plumulosus Project #: 28841139 Organism Supplier: ARO
 Organism Log #: 10988

Day of Test	Test Replicate	Lab Control (Paradise Cove)					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	25.8	7.72	7.1	21.0	20	Date: 5/31/18
	Rep B	25.8	7.70	7.1	21.3	20	Time: 1037
	Rep C	25.8	7.70	7.2	20.9	20	WQ: TA
	Rep D	25.6	7.71	7.1	20.7	20	Scientist Initiation: JL
	Rep E	25.6	7.70	7.2	21.0	20	Scientist Confirmation: CD
Day 1	Rep A	25.8	7.84	7.3	21.7		Date: 6/1/18 Time: 1122
Day 2	Rep B	26.0	7.75	7.1	21.0		Date: 6/2/18 Time: 1119
Day 3	Rep C	26.1	7.95	7.1	20.1		Date: 6/3/18 Time: 0914
Day 4	Rep D	25.1	8.03	7.3	20.8		Date: 6/4/18 Time: 0928
Day 5	Rep E	26.1	8.03	7.2	21.6		Date: 6/5/18 Time: 0945
Day 6	Rep A	26.1	7.95	7.1	21.1		Date: 6/6/18 Time: 1411
Day 7	Rep B	26.0	8.02	7.5	21.0		Date: 6/7/18 Time: 0933
Day 8	Rep C	25.0	7.99	7.5	20.3		Date: 6/8/18 Time: 0950
Day 9	Rep D	25.2	8.01	7.2	20.1		Date: 6/9/18 Time: 1428
Day 10	Rep A	26.0	7.86	7.1	21.1	20	Date: 6/10/18
	Rep B	26.3	7.82	7.2	21.4	20	Time: 1256
	Rep C	26.3	7.78	7.2	21.4	20	WQ: D14
	Rep D	25.9	7.87	7.1	21.4	20	Scientist Counts: EP
	Rep E	25.9	7.77	7.1	21.5	20	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.37	5.1	23.4	0.065	2.14	Date: 5/31/18 Time: 1416
	Overlying Water					21.00	Date: 5/31/18 Time: 1230
	Meter ID	PH24	RD13	EC13	DR4000	DR3800	WQ: TA
Day 10	Porewater	7.04	5.8	28.1	0.032	2.00	Date: 6/10/18 Time: 1545
	Overlying Water					21.00	Date: 6/10/18 Time: 1430
	Meter ID	PH15	RD10	EC13	DR4000	DR3800	WQ: D14

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: Foth (CLE): Vallejo Ferry Terminal

Test ID#: 78445

Date (Day 0): 5/31/18

Species: *Leptocheirus plumulosus*

Project #: 28839

Organism Supplier: ARO

Organism Log #: 10988

Day of Test	Test Replicate	DU-1 Composite					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	25.6	7.67	7.0	20.9	20	Date: 5/31/18
	Rep B	25.5	7.63	7.2	20.9	20	Time: 1041
	Rep C	25.4	7.63	7.2	20.8	20	WQ: TA
	Rep D	25.1	7.63	7.1	21.1	20	Scientist Initiation: JL
	Rep E	25.2	7.67	7.1	21.1	20	Scientist Confirmation: ED
Day 1	Rep A	25.9	7.80	7.1	21.2		Date: 6/1/18 Time: 1122
Day 2	Rep B	25.3	7.83	7.3	21.1		Date: 6/2/18 Time: 1120
Day 3	Rep C	25.7	7.92	7.2	20.4		Date: 6/3/18 Time: 0916
Day 4	Rep D	25.2	7.89	7.0	20.3		Date: 6/4/18 Time: 0928
Day 5	Rep E	25.9	7.96	7.1	20.3		Date: 6/5/18 Time: 0908
Day 6	Rep A	25.8	7.94	7.1	20.4		Date: 6/6/18 Time: 1412
Day 7	Rep B	25.7	7.93	7.5	20.1		Date: 6/7/18 Time: 0930
Day 8	Rep C	25.3	7.97	7.5	20.7		Date: 6/8/18 Time: 0955
Day 9	Rep D	25.4	7.81	7.1	19.7		Date: 6/9/18 Time: 1429
Day 10	Rep A	26.2	7.78	7.0	19.7	19	Date: 6/10/18
	Rep B	26.0	7.77	7.0	20.5	20	Time: 1302
	Rep C	25.8	7.75	7.2	20.9	20	WQ: DH
	Rep D	25.8	7.72	7.1	20.2	20	Scientist Counts: EP
	Rep E	25.8	7.77	7.1	20.4	20	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.31	5.8	20.3	0.069	8.93	Date: 5/31/18 Time: 1416
	Overlying Water					<1.00	Date: 5/31/18 Time: 1230
	Meter ID	PH24	RD13	EC13	DR4000	DR3800	WQ: TA
Day 10	Porewater	6.97	5.9	27.7	0.041	2.88	Date: 6/10/18 Time: 1545
	Overlying Water					<1.00	Date: 6/10/18 Time: 1430
	Meter ID	PH15	RD10	EC13	DR4000	DR3800	WQ: DH

Appendix D

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Amphipod, *Leptocheirus plumulosus*



CETIS Summary Report

 Report Date: 07 Jun-18 16:13 (p 1 of 1)
 Test Code: 78387 | 09-9345-3748

Acute Amphipod Survival Test						Pacific EcoRisk					
Batch ID:	08-9345-4384	Test Type:	Survival (96h)	Analyst:	Mike McElroy						
Start Date:	31 May-18 16:40	Protocol:	EPA/600/R-01/020 (2001)	Diluent:	Diluted Seawater						
Ending Date:	04 Jun-18 15:18	Species:	Leptocheirus plumulosus	Brine:	Not Applicable						
Duration:	95h	Source:	Aquatic Research Organisms, NH	Age:	NA						
Sample ID:	10-2206-7715	Code:	KCl	Client:	Reference Toxicant						
Sample Date:	31 May-18 16:40	Material:	Potassium chloride	Project:	28912						
Receipt Date:	31 May-18 16:40	Source:	Reference Toxicant								
Sample Age:	n/a (25.2 °C)	Station:	In House								
Multiple Comparison Summary											
Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	TU	PMSD	✓			
11-0566-2425	96h Survival Rate	Dunnett Multiple Comparison Test	0.5	1	0.7071		10.0%				
Point Estimate Summary											
Analysis ID	Endpoint	Point Estimate Method	Level	g/L	95% LCL	95% UCL	TU	✓			
13-5145-5761	96h Survival Rate	Trimmed Spearman-Kärber	EC50	1.19	1.03	1.37					
96h Survival Rate Summary											
Conc-g/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	2	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0.25		2	0.950	0.315	1.000	0.900	1.000	0.050	0.071	7.44%	5.00%
0.5		2	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		2	0.750	0.115	1.000	0.700	0.800	0.050	0.071	9.43%	25.00%
2		2	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
4		2	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
96h Survival Rate Detail											
Conc-g/L	Code	Rep 1	Rep 2								
0	LW	1.000	1.000								
0.25		0.900	1.000								
0.5		1.000	1.000								
1		0.800	0.700								
2		0.000	0.000								
4		0.000	0.000								
96h Survival Rate Binomials											
Conc-g/L	Code	Rep 1	Rep 2								
0	LW	10/10	10/10								
0.25		9/10	10/10								
0.5		10/10	10/10								
1		8/10	7/10								
2		0/10	0/10								
4		0/10	0/10								

CETIS QC Plot

Report Date: 07 Jun-18 16:15 (1 of 1)

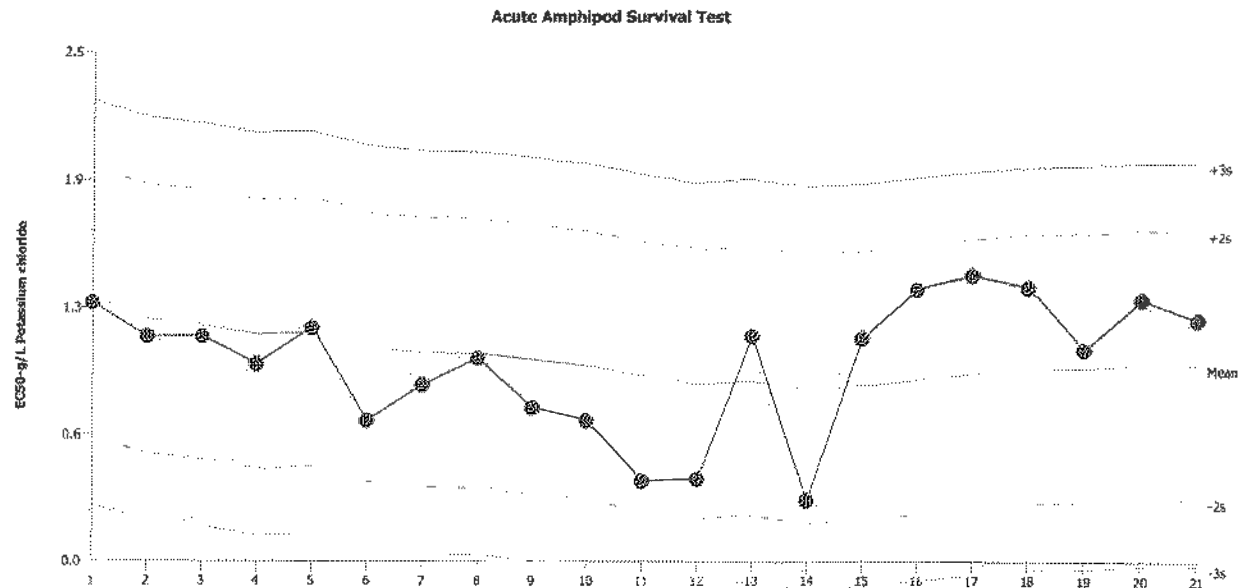
Acute Amphipod Survival Test

Pacific EcoRisk

Test Type: Survival (96h)
Protocol: EPA/600/R-01/020 (2001)

Organism: *Leptocheirus plumulosus* (Amphipod)
Endpoint: 96h Survival Rate

Material: Potassium chloride
Source: Reference Toxicant-REF



Mean: 0.9678 Count: 20 -2s Warning Limit: 0.3078 -3s Action Limit: -0.0222
Sigma: 0.33 CV: 34.10% +2s Warning Limit: 1.628 +3s Action Limit: 1.958

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Mar	20	13:45	1.275	0.3068	0.9296			15-6554-4790	14-4434-6989
2			26	14:45	1.11	0.1418	0.4296			10-2599-1400	07-4652-5056
3		Apr	2	14:45	1.11	0.1418	0.4296			03-7736-2045	07-0537-3798
4		May	7	15:11	0.9733	0.005484	0.01662			14-7060-7640	06-9489-8995
5			8	14:30	1.149	0.1809	0.5482			20-9419-2363	07-2865-1035
6			21	14:20	0.694	-0.2738	-0.8298			06-6529-5264	19-2949-2496
7			29	11:15	0.8694	-0.09841	-0.2982			03-2668-7249	15-3775-5258
8		Jun	10	15:25	1	0.0322	0.09758			13-6556-4498	09-6406-5730
9		Aug	12	16:42	0.7579	-0.2099	-0.6362			18-9001-6049	18-6580-9693
10		Dec	14	15:15	0.6943	-0.2735	-0.8287			10-3688-8446	15-6335-1863
11	2018	Jan	21	14:30	0.3976	-0.5702	-1.728			17-9027-4290	04-6885-5044
12		Mar	10	16:15	0.4061	-0.5617	-1.702			11-3655-7432	07-2003-1945
13			10	16:20	1.107	0.1395	0.4228			12-8488-1740	17-5853-5233
14			24	16:45	0.302	-0.6658	-2.018	(-)		06-9088-3226	02-7709-3796
15		Apr	10	15:50	1.095	0.1277	0.3869			01-6744-6153	16-3209-5871
16			12	16:52	1.336	0.3685	1.117			14-2749-0047	21-0724-8309
17			18	15:40	1.406	0.4381	1.328			11-3078-9910	21-0077-5534
18			20	17:53	1.347	0.3796	1.15			06-7749-4242	05-1101-4036
19		May	9	17:50	1.042	0.07371	0.2234			13-9937-5878	04-9522-7383
20			23	14:45	1.286	0.3181	0.9638			16-6565-6736	04-9947-7179
21			31	16:40	1.19	0.2218	0.672			09-9345-3748	13-5145-5761

96 Hour *Leptocheirus plumulosus* Marine Reference Toxicant Test Data

Client: Reference Toxicant Organism Log #: 10988
 Test Material: Potassium Chloride Control/Diluent: 20 ppt Seawater (+/-1 ppt)
 Test ID#: 78387 Project #: 28912 Test Date: 5/31/18
 Randomization: 2.6.4

Treatment (g KCl /L)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms		SIGN-OFF
		new	old	new	old	new	old	A	B	
Control	25.2	7.84		7.8		19.5		10	10	Date: 5/31/18
0.25	25.1	7.83		7.8		19.9		10	10	Test Solution Prep: SMC
0.5	25.0	7.81		8.0		20.1		10	10	New WQ: NB
1	25.0	7.79		8.2		20.5		10	10	Initiation Time: 1640
2	24.7	7.71		8.8		21.4		10	10	Initiation Signoff: JL
4	24.6	7.62		7.8		22.9		10	10	RT Stock Batch #: 28
Meter ID:	100A	pH13		P212		EC10				+1hr Inspection: JL
Control	24.5		7.87		7.5	20.1				Date: 6/1/18
0.25	24.6		7.87		7.5	20.5				Count Time: 0831
0.5	24.6		7.87		7.5	20.7				Count Signoff: SMC
1	24.6		7.81		7.5	21.2				Old WQ: MS
2	24.4		7.87		7.5	22.1				PM Inspection: TK
4	24.5		7.86		7.3	23.9				
Meter ID:	103A		pH24		EC12					
Control	25.2		7.84		7.5	21.1				Date: 6/2/18
0.25	25.3		7.84		7.4	21.1				Count Time: 0841
0.5	25.2		7.83		7.4	21.5				Count Signoff: SMC
1	25.3		7.82		7.3	22.0				Old WQ: NB
2	25.0		7.84		7.3	22.7				PM Inspection: TK
4	25.2		7.81		7.2	24.7				
Meter ID:	81A		pH24		EC11					
Control	25.3		7.81		7.6	20.9				Date: 6/3/18
0.25	25.3		7.83		7.5	21.6				Count Time: 0919
0.5	25.2		7.85		7.6	21.4				Count Signoff: TK
1	25.2		7.85		7.5	22.3				Old WQ: ER
2	25.1		7.81		7.4	23.3				PM Inspection: KD
4	25.2		7.81		7.4	24.8				
Meter ID:	100A		pH15		EC10					
Control	24.3		7.77		7.4	22.1	10	10		Date: 6/4/18
0.25	24.1		7.78		7.3	22.8	9	10		Termination Time: 1518
0.5	24.1		7.80		7.3	22.5	10	10		Termination Signoff: JL
1	24.1		7.79		7.3	23.6	8	7		Old WQ: JL
2	24.1		7.79		7.3	24.1	0	0		
4	24.1		7.76		7.3	26.0	0	0		
Meter ID:	103A		pH24		RD13	EC13				

Appendix E

Test Data and Summary of Statistics for the Toxicity Evaluation of Vallejo Ferry Terminal DU1-Comp Sediment with the Polychaete, *Neanthes arenaceodentata*



CETIS Summary Report

Report Date: 23 May-18 11:03 (p 1 of 1)
 Test Code: 78131 | 15-6723-6441

Acute Polychaete Survival Test							Pacific EcoRisk				
Batch ID:	05-9946-7640		Test Type:	Survival		Analyst:	Ashleigh Findley				
Start Date:	08 May-18 16:00		Protocol:	ASTM E1611-00 (2007)		Diluent:	Not Applicable				
Ending Date:	18 May-18 14:27		Species:	Neanthes arenaceodentata		Brine:	Not Applicable				
Duration:	9d 22h		Source:	Aquatic Tox. Sup.		Age:	N/A				
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project					
FVFT_0518_NA_C1	09-5627-8591	08 May-18 16:00	08 May-18 16:00	n/a (20.2 °C)	CLE: Engineering	28839					
DU-1-Comp	19-6811-6934	03 May-18 09:00	03 May-18 12:04	5d 7h							
Sample Code	Material Type	Sample Source		Station Location		Lat/Long					
FVFT_0518_NA_C1	Sediment	CLE: Engineering		LABQA							
DU-1-Comp	Sediment	CLE: Engineering		DU1							
Single Comparison Summary											
Analysis ID	Endpoint	Comparison Method			P-Value	Comparison Result					
05-1644-7459	Survival Rate	Wilcoxon Rank Sum Two-Sample Test			1.0000	DU-1-Comp passed survival rate					
Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
FVFT_0518_NA_C1	CS	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
DU-1-Comp		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
Survival Rate Detail											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
FVFT_0518_NA_C1	CS	1.000	1.000	1.000	1.000	1.000					
DU-1-Comp		1.000	1.000	1.000	1.000	1.000					
Survival Rate Binomials											
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
FVFT_0518_NA_C1	CS	10/10	10/10	10/10	10/10	10/10					
DU-1-Comp		10/10	10/10	10/10	10/10	10/10					

CETIS Analytical Report

Report Date: 23 May-18 11:03 (p 1 of 1)
Test Code: 78131 | 15-6723-6441

Acute Polychaete Survival Test Pacific EcoRisk

Analysis ID: 05-1644-7459 Endpoint: Survival Rate CETIS Version: CETISv1.9.2
Analyzed: 23 May-18 11:03 Analysis: Nonparametric-Two Sample Official Results: Yes

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Control Sed		DU-1-Comp	27.5	n/a	1	8	Exact	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	65500	<1.0E-37	Significant Effect
Error	0	0	8			
Total	0		9			

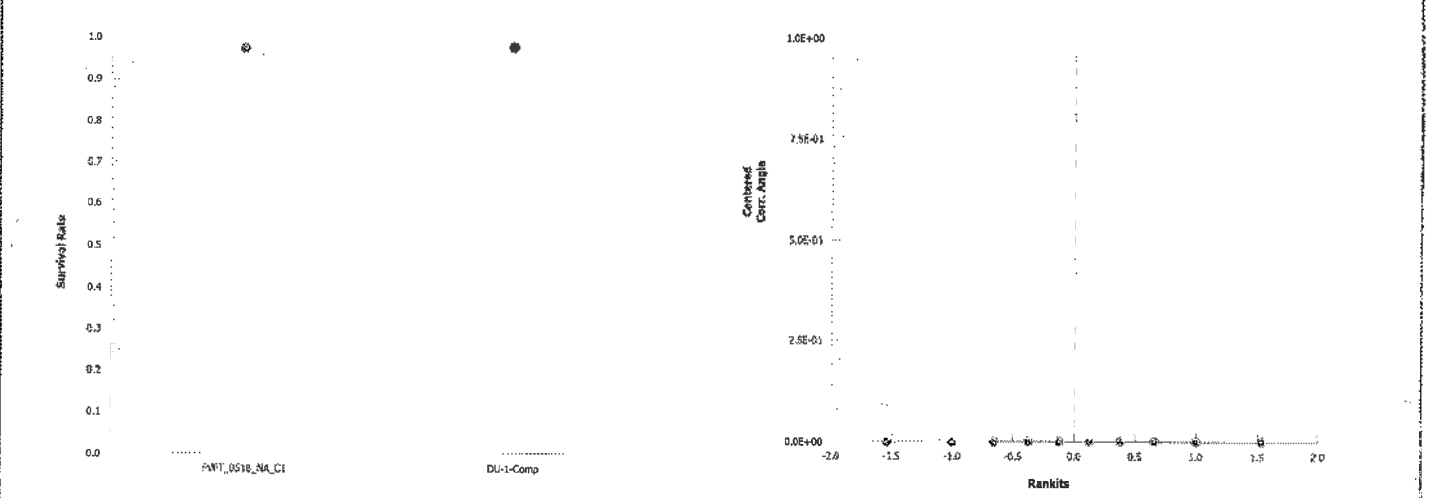
Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FVFT_0518_NA_C1 CS		5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
DU-1-Comp		5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FVFT_0518_NA_C1 CS		5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%
DU-1-Comp		5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%

Graphics



10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: FOTH (CLE): Vallejo Ferry Terminal Test ID#: - Date (Day 0): 5/8/18
 Species: *Neanthes arenocodentata* Project #: 28839 T+1hr Inspection: EP
 Organism Log #: 10947 Organism Supplier: ATS

Day of Test	Test Replicate	Sample ID: Lab Control					Sign-Off
		Temp °C	pH	D.O. mg/L	Salinity ppt	# Alive	
Day 0	Rep A	20.2	7.87	7.5	29.2	10	Date: 5/8/18
	Rep B	20.2	7.88	7.5	29.2	10	WQ Initial & Time: MB 0804
	Rep C	20.2	7.82	7.5	29.1	10	Initiation Time: 1600
	Rep D	20.2	7.79	7.5	29.2	10	Scientist Initiation: W
	Rep E	20.2	7.88	7.5	29.4	10	Scientist Confirmation: SE
Day 1	Rep A	20.6	7.76	7.3	29.2		Date: 5/9/18 Time: 1115
Day 2	Rep B	20.7	7.80	7.5	29.9		Date: 5/9/18 Time: 1533
Day 3	Rep C	20.6	7.72	7.5	30.2		Date: 5/11/18 Time: 0915
Day 4	Rep D	20.4	7.92	7.3	29.6		Date: 5/12/18 Time: 1107
Day 5	Rep E	20.2	7.74	7.3	29.3		Date: 5/15/18 Time: 0847
Day 6	Rep A	20.3	7.84	7.6	30.1		Date: 5/14/18 Time: 1000
Day 7	Rep B	20.2	7.64	7.1	31.0		Date: 5/15/18 Time: 1706
Day 8	Rep C	20.0	7.87	7.2	31.4		Date: 5/16/18 Time: 1458
Day 9	Rep D	20.3	7.79	6.7	30.8		Date: 5/17/18 Time: 1451
Day 10	Rep A	20.0	7.97	7.5	32.0	10	Date: 5/18/18
	Rep B	20.0	7.94	7.5	32.2	10	Time: 0830
	Rep C	20.0	7.96	7.5	32.2	10	WQ: 3R
	Rep D	20.0	7.96	7.2	31.5	10	Termination Time: 1427
	Rep E	20.0	7.98	7.3	32.1	10	Scientist Counts: EP
Day of Test	Matrix	pH	D.O. mg/L	Salinity ppt	Total Sulfide mg/L	Total Ammonia mg/L	Sign-Off
Day 0	Porewater	7.65	4.1	26.7	0.061	1.33	Date: 5/18/18 Time: 1623
	Overlying Water					<1.00	Date: 5/18/18 Time: 0957
	Meter ID	PH21	RD10	EC12	DR4000	DR3800	
Day 10	Porewater	7.30	6.6	28.2	0.044	<1.00	Date: 5/18/18 Time: 1100
	Overlying Water					<1.00	Date: 5/18/18 Time: 1100
	Meter ID	PH19	RD13	EC13	DR4000	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: FOTH (CLE): Vallejo Ferry Terminal Test ID#: 78131 Date (Day 0): 5/8/18
 Species: *Neanthes arenocodentata* Project #: 28839 T+1hr Inspection: ☒
 Organism Log #: 10947 Organism Supplier: ATS

Day of Test	Test Replicate	Sample ID: DU-1 Composite					Sign-Off
		Temp °C	pH	D.O. mg/L	Salinity ppt	# Alive	
Day 0	Rep A	20.3	7.78	7.4	29.5	10	Date: 5/8/18
	Rep B	20.3	7.80	7.5	29.4	10	WQ Initial & Time: MB 0837
	Rep C	20.3	7.81	7.5	29.5	10	Initiation Time: 1600
	Rep D	20.3	7.81	7.5	29.5	10	Scientist Initiation: W
	Rep E	20.3	7.81	7.5	29.7	10	Scientist Confirmation: JF
Day 1	Rep A	19.8	7.81	7.2	29.5		Date: 5/9/18 Time: 1115
Day 2	Rep B	20.6	7.67	6.5	30.0		Date: 5/10/18 Time: 1556
Day 3	Rep C	19.9	7.66	7.4	30.9		Date: 5/11/18 Time: 0915
Day 4	Rep D	20.3	7.70	7.5	29.0		Date: 5/12/18 Time: 1116
Day 5	Rep E	20.2	7.77	7.5	31.1		Date: 5/13/18 Time: 0851
Day 6	Rep A	20.2	7.85	7.7	31.5		Date: 5/14/18 Time: 1000
Day 7	Rep B	20.2	7.64	6.7	28.9		Date: 5/15/18 Time: 1706
Day 8	Rep C	19.8	7.74	7.4	31.4		Date: 5/16/18 Time: 1400
Day 9	Rep D	20.6	7.67	7.7	29.6		Date: 5/17/18 Time: 1457
Day 10	Rep A	20.1	7.88	7.5	34.5	10	Date: 5/18/18
	Rep B	20.1	7.88	7.6	30.5	10	Time: 0830
	Rep C	20.1	7.83	7.5	32.4	10	WQ: SR
	Rep D	20.1	7.89	7.5	30.2	10	Termination Time: 1453
	Rep E	20.1	7.90	7.5	34.6	10	Scientist Counts: EP
Day of Test	Matrix	pH	D.O. mg/L	Salinity ppt	Total Sulfide mg/L	Total Ammonia mg/L	Sign-Off
Day 0	Porewater	7.49	6.6	26.5	0.175	13.7	Date: 5/8/18 Time: 1623
	Overlying Water					<1.00	Date: 5/8/18 Time: 0957
	Meter ID	PH21	RD10	EC12	DR4000	DR3800	
Day 10	Porewater	7.30	6.4	27.6	0.052	<2.00	Date: 5/18/18 Time: 1100
	Overlying Water					<1.00	Date: 5/18/18 Time: 1100
	Meter ID	PH19	RD13	EC13	DR4000	DR3800	

Appendix F

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Polychaete, *Neanthes arenaceodentata*



CETIS Summary Report

Report Date: 23 May-18 09:13 (p 1 of 1)
 Test Code: 78204 | 06-7144-1297

Acute Polychaete Survival Test										Pacific EcoRisk	
Batch ID:	14-9582-8371		Test Type:		Survival			Analyst:		Ashleigh Findley	
Start Date:	08 May-18 16:35		Protocol:		ASTM E1611-00 (2007)			Diluent:		Diluted Seawater	
Ending Date:	12 May-18 15:14		Species:		Neanthes arenaceodentata			Brine:		Not Applicable	
Duration:	95h		Source:		Aquatic Tox. Sup.			Age:		N/A	
Sample ID:	17-0750-7540		Code:		KCl			Client:		Reference Toxicant	
Sample Date:	08 May-18 16:35		Material:		Potassium chloride			Project:		28868	
Receipt Date:	08 May-18 16:35		Source:		Reference Toxicant						
Sample Age:	n/a (19.3 °C)		Station:		In House						
Multiple Comparison Summary											
Analysis ID	Endpoint		Comparison Method			NOEL	LOEL	TOEL	TU	PMSD ✓	
20-6546-2274	Survival Rate		Fisher Exact Test			1	2	1.414		n/a	
Point Estimate Summary											
Analysis ID	Endpoint		Point Estimate Method			Level	g/L	95% LCL	95% UCL	TU	✓
18-2454-8442	Survival Rate		Spearman-Kärber			EC50	1.86	1.56	2.21		
Survival Rate Summary											
Conc-g/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LW	2	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
0.5		2	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
1		2	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%
2		2	0.500	0.000	1.000	0.400	0.600	0.100	0.141	28.28%	50.00%
3		2	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
4		2	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%
Survival Rate Detail											
Conc-g/L	Code	Rep 1	Rep 2								
0	LW	1.000	1.000								
0.5		1.000	1.000								
1		1.000	1.000								
2		0.400	0.600								
3		0.000	0.000								
4		0.000	0.000								
Survival Rate Binomials											
Conc-g/L	Code	Rep 1	Rep 2								
0	LW	5/5	5/5								
0.5		5/5	5/5								
1		5/5	5/5								
2		2/5	3/5								
3		0/5	0/5								
4		0/5	0/5								

Acute Polychaete Survival Test

Pacific EcoRisk

Test Type: Survival

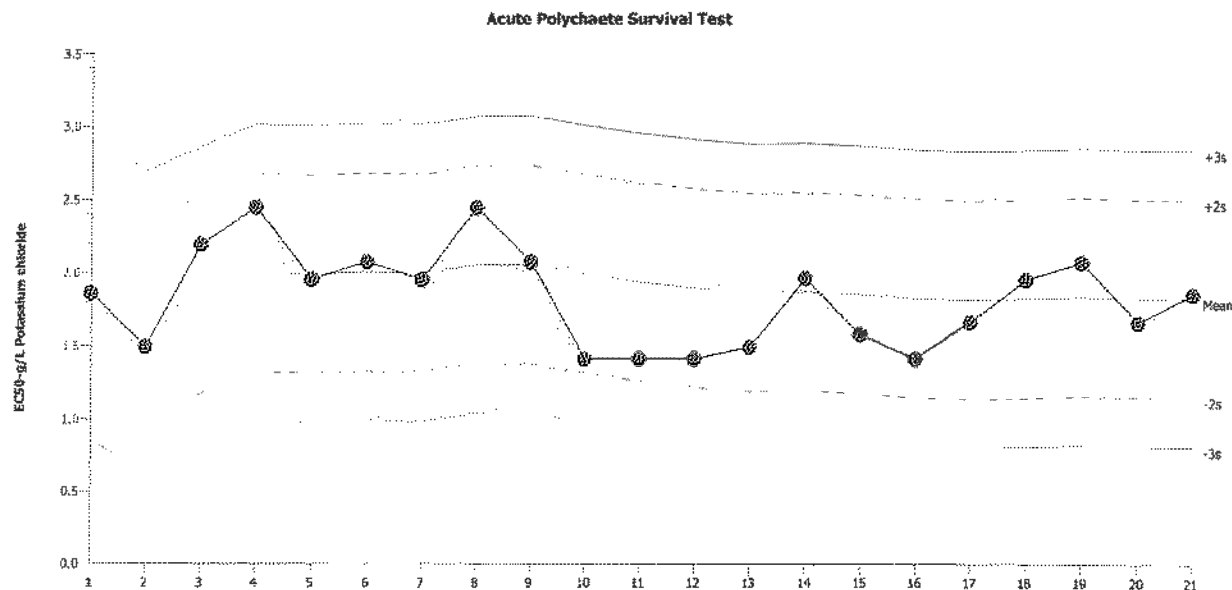
Organism: Nereis arenaceodentata (Polycha

Material: Potassium chloride

Protocol: ASTM E1611-00 (2007)

Endpoint: Survival Rate

Source: Reference Toxicant-REF



Mean: 1.829

Count: 20

-2s Warning Limit: 1.151

-3s Action Limit: 0.8117

Sigma: 0.3392

CV: 18.50%

+2s Warning Limit: 2.508

+3s Action Limit: 2.847

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Apr	22	14:45	1.861	0.03221	0.09496			15-6003-6744	17-4060-2529
2		May	6	15:00	1.494	-0.3349	-0.9874			21-0552-7615	02-8467-7871
3			20	16:10	2.195	0.3656	1.078			09-4474-2182	15-5577-6823
4			28	13:40	2.449	0.6205	1.829			16-3611-1692	13-1210-3384
5		Jun	11	14:00	1.958	0.129	0.3804			11-6380-3068	12-5619-7354
6			28	15:30	2.077	0.2483	0.7321			05-6775-2170	06-4294-8440
7		Aug	13	14:30	1.958	0.129	0.3804			05-1812-8945	06-6187-1856
8		Sep	12	16:25	2.449	0.6205	1.829			12-2089-1598	06-0050-8843
9		Nov	4	17:10	2.077	0.2483	0.7321			09-3141-8749	15-7188-1772
10			20	11:50	1.414	-0.4148	-1.223			12-9226-5787	19-3597-6888
11	2018	Jan	22	13:31	1.414	-0.4148	-1.223			16-8358-9988	19-6612-0527
12		Feb	22	14:30	1.414	-0.4148	-1.223			16-7469-4240	17-7683-8955
13		Mar	5	16:33	1.494	-0.3349	-0.9874			09-9409-5410	03-3515-5372
14			11	16:00	1.966	0.1373	0.4048			16-3781-7875	07-0270-3147
15		Apr	2	14:00	1.578	-0.2506	-0.7387			02-9144-8870	05-3060-4479
16			8	14:20	1.414	-0.4148	-1.223			16-6276-2572	16-8247-3969
17			13	15:53	1.668	-0.1614	-0.4759			12-8278-5353	06-8040-8827
18			16	15:50	1.958	0.129	0.3804			05-0271-4251	13-8059-3791
19			21	16:00	2.077	0.2483	0.7321			20-1755-8965	02-1406-5573
20		May	2	11:43	1.668	-0.1614	-0.4759			18-4228-3270	07-9729-4997
21			8	16:35	1.861	0.03221	0.09496			06-7144-1297	18-2454-8442

96 Hour *Neanthes arenaceodentata* Marine Reference Toxicant Test Data

Client: Reference Toxicant
 Test Material: Potassium Chloride
 Test ID#: 28868 Project # 78204

Organism Log #: 10947
 Control/Diluent: 30 ppt Seawater (+/-2 ppt)
 Test Date: 5/8/18
 Randomization: 2.6.9

Treatment (g KCl /L)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms		SIGN-OFF
		new	old	new	old	new	old	A	B	
Control	19.3	7.73		8.1		29.6		5	5	Date: 5/8/18
0.5	19.3	7.73		8.2		29.7		5	5	Test Solution prep: 13
1	19.2	7.72		8.6		30.5		5	5	New WQ: DM
2	19.2	7.69		8.6		31.7		5	5	Initiation Time: 1635
3	19.1	7.71		8.9		33.1		5	5	Initiation Signoff: W
4	19.2	7.69		8.9		34.3		5	5	RT Stock Batch #: 56
Meter ID:	113A	PH21		RD10		EC12				
Control	20.6		7.63		6.5		30.1	5	5	Date: 5/9/18
0.5	20.6		7.65		6.4		30.9	5	5	Count Time: 0915
1	20.6		7.63		6.4		31.6	5	5	Count Signoff: JPF
2	20.7		7.62		6.2		32.5	5	5	Old WQ: MB
3	20.7		7.62		6.2		33.7	0	0	
4	20.6		7.64		6.2		34.8	0	0	
Meter ID:	113A		PH19		RD12		EC11			
Control	20.8		7.73		7.1		29.7	5	5	Date: 5/10/18
0.5	20.9		7.72		7.1		30.4	5	5	Count Time: 1100
1	20.9		7.70		7.1		30.9	5	5	Count Signoff: W
2	20.8		7.71		7.1		31.8	5	5	Old WQ: FT
3	—		—		—		—	—	—	
4	—		—		—		—	—	—	
Meter ID:	113A		PH19		RD11		EC13			
Control	20.6		7.71		7.2		20.0	5	5	Date: 5/11/18
0.5	20.6		7.70		7.3		20.7	5	5	Count Time: 0944
1	20.6		7.69		7.3		21.2	5	5	Count Signoff: MS
2	20.6		7.69		7.2		22.3	4	5	Old WQ: EP
3	—		—		—		—	—	—	
4	—		—		—		—	—	—	
Meter ID:	117A		PH21		RD10		EC10			
Control	20.6		7.65		7.0		29.7	5	5	Date: 5/12/18
0.5	20.6		7.64		7.1		30.4	5	5	Termination Time: 1514
1	20.6		7.65		7.1		30.9	5	5	Termination Signoff: EP
2	20.7		7.61		7.0		32.0	2	3	Old WQ: RAP
3	—		—		—		—	—	—	
4	—		—		—		—	—	—	
Meter ID:	81A		PH19		RD11		EC13			

Appendix G

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the DU1-Comp Modified Elutriate Test (MET) Sediment Elutriate to Mysids (*Americamysis bahia*)



CETIS Summary Report

 Report Date: 23 May-18 11:25 (p 1 of 1)
 Test Code: 78133 | 04-5663-7382

Acute Mysid Survival Test							Pacific EcoRisk					
Batch ID:	11-3285-0499	Test Type:	Survival (96h)	Analyst:	Ashleigh Findley							
Start Date:	10 May-18 16:00	Protocol:	EPA-821-R-02-012 (2002)	Diluent:	Not Applicable							
Ending Date:	14 May-18 14:15	Species:	Americamysis bahia	Brine:	Not Applicable							
Duration:	94h	Source:	Aquatic Indicators, FL	Age:	5							
Sample Code	Sample ID	Sample Date	Receipt Date	Sample Age	Client Name	Project						
FVFT_0518AB_C1	02-6994-1119	10 May-18 16:00	10 May-18 16:00	n/a (20.5 °C)	CLE: Engineering	28839						
Site Water	00-0997-2020	02 May-18 14:00	03 May-18 12:04	8d 2h (4.1 °C)								
DU-1-COMP-MET	08-7624-5056	03 May-18 09:00	03 May-18 12:04	7d 7h								
Sample Code	Material Type	Sample Source	Station Location	Lat/Long								
FVFT_0518AB_C1	Elutriate	CLE: Engineering	LABQA									
Site Water	Site Water	CLE: Engineering	Site Water									
DU-1-COMP-MET	Elutriate	CLE: Engineering	DU1									
Single Comparison Summary												
Analysis ID	Endpoint	Comparison Method	P-Value	Comparison Result								
03-1876-7835	96h Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	Site Water passed 96h survival rate								
10-1986-0359	96h Survival Rate	Wilcoxon Rank Sum Two-Sample Test	1.0000	DU-1-COMP-MET passed 96h survival rate								
96h Survival Rate Summary												
Sample	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
FVFT_0518AB_C1	LW	5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
Site Water		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
DU-1-COMP-MET		5	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
96h Survival Rate Detail												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
FVFT_0518AB_C1	LW	1.000	1.000	1.000	1.000	1.000						
Site Water		1.000	1.000	1.000	1.000	1.000						
DU-1-COMP-MET		1.000	1.000	1.000	1.000	1.000						
96h Survival Rate Binomials												
Sample	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
FVFT_0518AB_C1	LW	10/10	10/10	10/10	10/10	10/10						
Site Water		10/10	10/10	10/10	10/10	10/10						
DU-1-COMP-MET		10/10	10/10	10/10	10/10	10/10						

CETIS Analytical Report

Report Date: 23 May-18 11:25 (p 2 of 2)

Test Code: 78133 | 04-5663-7382

Acute Mysid Survival Test Pacific EcoRisk

Analysis ID: 10-1986-0359	Endpoint: 96h Survival Rate	CETIS Version: CETISv1.9.2
Analyzed: 23 May-18 11:25	Analysis: Nonparametric-Two Sample	Official Results: Yes

Wilcoxon Rank Sum Two-Sample Test

Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Lab Water Control		DU-1-COMP-MET	27.5	n/a	1	8	Exact	1.0000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	65500	<1.0E-37	Significant Effect
Error	0	0	8			
Total	0		9			

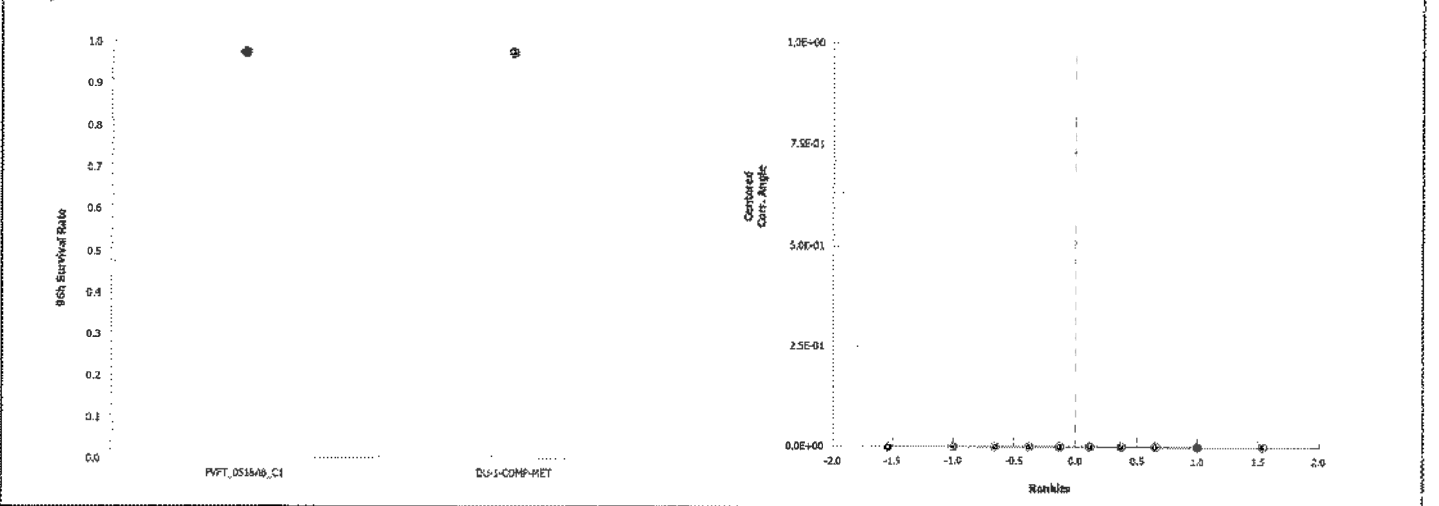
96h Survival Rate Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FVFT_0518AB_C1	LW	5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
DU-1-COMP-MET		5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%

Angular (Corrected) Transformed Summary

Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FVFT_0518AB_C1	LW	5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%
DU-1-COMP-MET		5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%

Graphics



96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: FOTH (CLE): Vallejo Ferry Terminal
 Test Material: DU-1 Composite MET
 Test ID#: 78133 Project #: 28839
 Test Date: 5/10/18 Randomization: 5.3.2

Organism Log #: 10949 Age: 45 DAYS
 Organism Supplier: Aquatic Indicators
 Control/Diluent: 25 ppt Crystal S.
 Control Water Batch: 1279

D.O. NH₃ = 3.75 mg/L

Treatment	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	20.5	8.05		7.7		24.2		10	10	10	10	10	Test Solution Prep: SK
100%	20.1	8.11		8.4		24.5		10	10	10	10	10	New WQ: YL
													Initiation Date: 5/10/18
													Initiation Time: 1600
													Initiation Signoff: APF
													a.m. Feeding Signoff: KL
													p.m. Feeding Signoff: KL
Meter ID	100A	PH19		PD11		EC13							Count Date: 5/11/18
Lab Control	20.2		7.66	6.6		24.6		10	10	10	10	10	Count Time: 1120
100%	19.9		8.05	7.1		24.9		10	10	10	10	10	Count Signoff: LZ
													Old WQ: EP
													a.m. Feeding Signoff: SMC
													p.m. Feeding Signoff: EP
Meter ID	100A		PH21		PD10		EC10						Count Date: 5/12/18
Lab Control	20.2	—	7.62	6.7		24.9		10	10	10	10	10	Count Time: 1021
100%	20.0	—	7.81	6.3		25.3		10	10	10	10	10	Count Signoff: SMC
													Old WQ: F+
													a.m. Feeding Signoff: TK
													p.m. Feeding Signoff: MS
Meter ID	113A	—	PH19		RD11		EC13						Count Date: 5/13/18
Lab Control	19.7		7.50	4.8		24.9		10	10	10	10	10	Count Time: 0945
100%	19.5		7.85	6.0		25.4		10	10	10	10	10	Count Signoff: MC
													Old WQ: SR
													a.m. Feeding Signoff: KL
													p.m. Feeding Signoff: KL
Meter ID	113A		PH19		RD12		EC12						Count Date: 5/14/18
Lab Control	19.7		7.55	7.2		25.6		10	10	10	10	10	Count Time: 1415
100%	19.5		8.02	7.0		26.2		10	10	10	10	10	Count Signoff: TK
													Old WQ: KL
													a.m. Feeding Signoff: TK
Meter ID	100A		PH21		RD10		EC11						

CETIS Analytical Report

Report Date: 23 May-18 11:25 (p 1 of 2)
Test Code: 78133 | 04-5663-7382

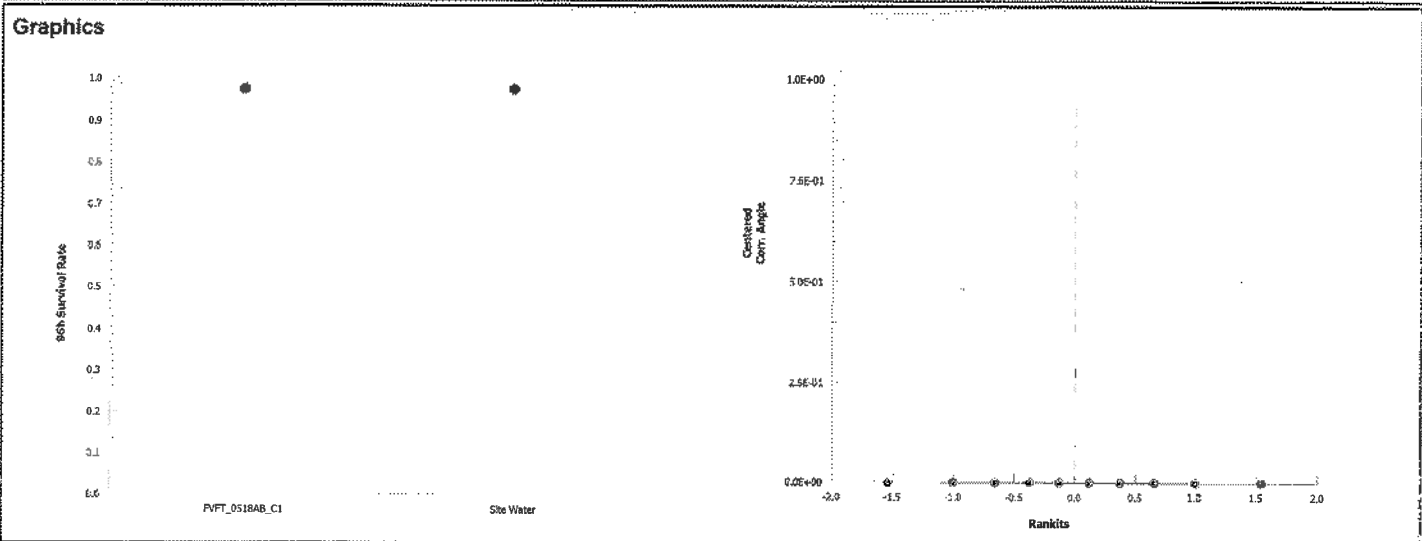
Acute Mysid Survival Test						Pacific EcoRisk					
Analysis ID: 03-1876-7835		Endpoint: 96h Survival Rate		CETIS Version: CETISv1.9.2							
Analyzed: 23 May-18 11:25		Analysis: Nonparametric-Two Sample		Official Results: Yes							

Wilcoxon Rank Sum Two-Sample Test											
Sample I	vs	Sample II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)		
Lab Water Control		Site Water	27.5	n/a	1	8	Exact	1.0000	Non-Significant Effect		

ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0		0		1	65500	<1.0E-37	Significant Effect			
Error	0		0		8						
Total	0				9						

96h Survival Rate Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FVFT_0518AB_C1	LW	5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%
Site Water		5	1.000	1.000	1.000	1.000	1.000	1.000	0.000	0.00%	0.00%

Angular (Corrected) Transformed Summary											
Sample	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
FVFT_0518AB_C1	LW	5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%
Site Water		5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.00%	0.00%



96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: POTH (CLE): Vallejo Ferry Terminal
 Test Material: Site Water
 Test ID#: 78133 Project #: 28839
 Test Date: 5/10/18 Randomization: 5.3.2

Organism Log #: 10949 Age: 5 Days
 Organism Supplier: Aquatic Indicators
 Control/Diluent: 25 ppt unfiltered sea
 Control Water Batch: 1279

Treatment	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms					SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	Rep E	
Lab Control	20.5	8.05		7.7		24.2		10	10	10	10	10	Test Solution Prep: SF
Site Water	20.2	8.14		8.5		24.3		10	10	10	10	10	New WQ: YAC
													Initiation Date: 5/10/18
													Initiation Time: 1600
													Initiation Signoff: APF
													a.m. Feeding Signoff: KL
													p.m. Feeding Signoff: RB
Meter ID	100A	PH19		RD11		EC13							
Lab Control	20.2		7.66		6.6	24.6		10	10	10	10	10	Count Date: 5/11/18
Site Water	20.3		7.85		6.7	25.1		10	10	10	10	10	Count Time: 1120
													Count Signoff: LZ
													Old WQ: EP
													a.m. Feeding Signoff: SMC
													p.m. Feeding Signoff: EP
Meter ID	100A		PH21		RD10		EC10						
Lab Control	20.2	—	7.62		6.7	24.8		10	10	10	10	10	Count Date: 5/12/18
Site Water	20.2	—	7.56		6.7	25.0		10	10	10	10	10	Count Time: 1021
													Count Signoff: SMC
													Old WQ: FT
													a.m. Feeding Signoff: TK
													p.m. Feeding Signoff: RB
Meter ID	113A	—	PH19		RD11		EC13						
Lab Control	19.7		7.50		4.8	24.9		10	10	10	10	10	Count Date: 5/13/18
Site Water	19.7		7.90		6.6	25.3		10	10	10	10	10	Count Time: 0945
													Count Signoff: WC
													Old WQ: SR
													a.m. Feeding Signoff: RB
													p.m. Feeding Signoff: KL
Meter ID	113A		PH19		RD12		EC12						
Lab Control	19.7		7.85		7.2	25.6		10	10	10	10	10	Termination Date: 5/14/18
Site Water	19.7		7.94		7.2	26.2		10	10	10	10	10	Termination Time: 1415
													Termination Signoff: TK
													Old WQ: KL
Meter ID	100A		PH21		RD10		EC11						a.m. Feeding Signoff: TK

Appendix H

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Mysid, *Americamysis bahia*



CETIS Summary Report

Report Date: 23 May-18 08:32 (p 1 of 1)
 Test Code: 78121 | 18-5396-7288

Acute Mysid Survival Test										Pacific EcoRisk		
Batch ID:	17-1660-9487			Test Type:	Survival (96h)			Analyst:	Ashleigh Findley			
Start Date:	10 May-18 16:28			Protocol:	EPA-821-R-02-012 (2002)			Diluent:	Laboratory Water			
Ending Date:	14 May-18 15:05			Species:	Americamysis bahia			Brine:	Crystal Sea			
Duration:	95h			Source:	Aquatic Indicators, FL			Age:	5			
Sample ID:	02-1884-1092			Code:	KCL			Client:	Reference Toxicant			
Sample Date:	10 May-18 16:28			Material:	Potassium chloride			Project:	28835			
Receipt Date:	10 May-18 16:28			Source:	Reference Toxicant							
Sample Age:	n/a (19.8 °C)			Station:	In House							
Multiple Comparison Summary												
Analysis ID	Endpoint			Comparison Method			NOEL	LOEL	TOEL	TU	PMSD ✓	
15-2652-8825	96h Survival Rate			Steel Many-One Rank Sum Test			0.5	> 0.5	n/a		12.7%	
Point Estimate Summary												
Analysis ID	Endpoint			Point Estimate Method			Level	g/L	95% LCL	95% UCL	TU ✓	
05-1953-8969	96h Survival Rate			Trimmed Spearman-Kärber			EC50	0.606	0.549	0.668		
96h Survival Rate Summary												
Conc-g/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	LW	4	1.000	1.000	1.000	1.000	1.000	0.000	0.000	0.00%	0.00%	
0.125		4	0.975	0.895	1.000	0.900	1.000	0.025	0.050	5.13%	2.50%	
0.25		4	0.975	0.895	1.000	0.900	1.000	0.025	0.050	5.13%	2.50%	
0.5		4	0.775	0.503	1.000	0.600	1.000	0.085	0.171	22.04%	22.50%	
1		4	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%	
2		4	0.000	0.000	0.000	0.000	0.000	0.000	0.000		100.00%	
96h Survival Rate Detail												
Conc-g/L	Code	Rep 1	Rep 2	Rep 3	Rep 4							
0	LW	1.000	1.000	1.000	1.000							
0.125		1.000	1.000	0.900	1.000							
0.25		1.000	1.000	0.900	1.000							
0.5		0.600	0.700	1.000	0.800							
1		0.000	0.000	0.000	0.000							
2		0.000	0.000	0.000	0.000							
96h Survival Rate Binomials												
Conc-g/L	Code	Rep 1	Rep 2	Rep 3	Rep 4							
0	LW	10/10	10/10	10/10	10/10							
0.125		10/10	10/10	9/10	10/10							
0.25		10/10	10/10	9/10	10/10							
0.5		6/10	7/10	10/10	8/10							
1		0/10	0/10	0/10	0/10							
2		0/10	0/10	0/10	0/10							

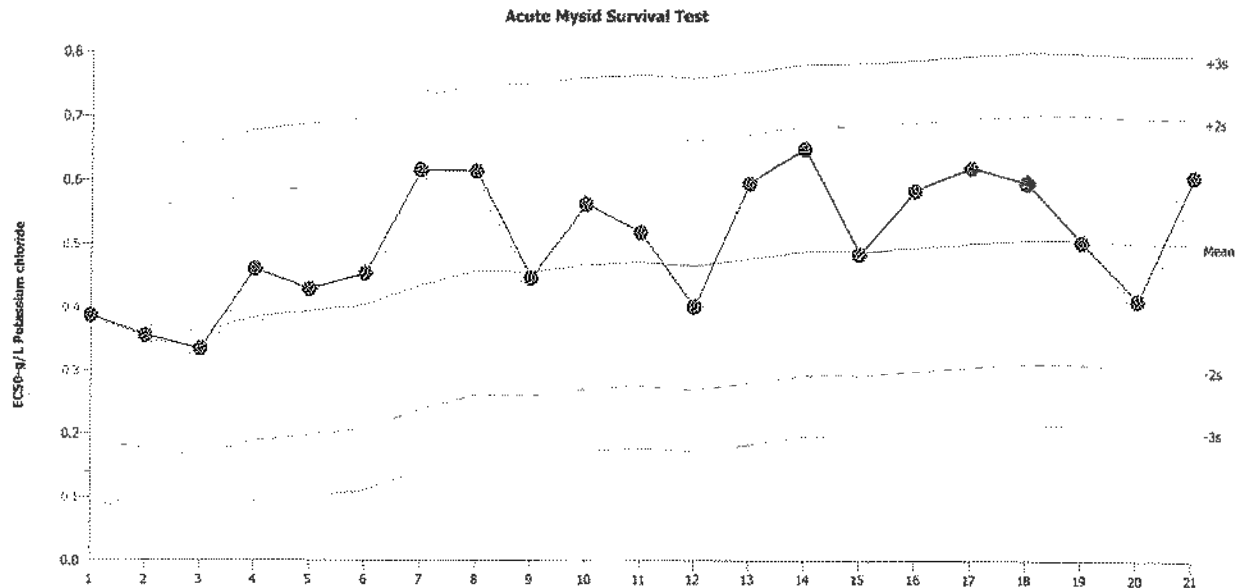
Acute Mysid Survival Test

Pacific EcoRisk

Test Type: Survival (96h)
Protocol: EPA-821-R-02-012 (2002)

Organism: Americamysis bahia (Mysid)
Endpoint: 96h Survival Rate

Material: Potassium chloride
Source: Reference Toxicant-REF



Mean: 0.5009 Count: 20 -2s Warning Limit: 0.3054 -3s Action Limit: 0.2077
Sigma: 0.09774 CV: 19.50% +2s Warning Limit: 0.6964 +3s Action Limit: 0.7941

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Apr	12	16:45	0.3874	-0.1135	-1.161			00-5148-3874	19-8487-9804
2		May	3	15:30	0.3561	-0.1448	-1.481			05-6474-5258	11-7172-7748
3			10	14:50	0.335	-0.1659	-1.697			00-3122-2987	17-4835-2736
4			17	16:05	0.4609	-0.04004	-0.4097			10-4194-8591	14-6825-2260
5			24	15:10	0.4289	-0.072	-0.7367			15-5679-3603	12-2883-7801
6		Jun	7	16:20	0.4534	-0.04746	-0.4856			12-9007-8543	13-6508-7876
7			14	0:00	0.6154	0.1145	1.172			01-3737-6724	15-2602-8100
8		Aug	10	14:30	0.6145	0.1136	1.162			19-9688-6818	09-2359-7727
9			31	16:00	0.4467	-0.05418	-0.5543			18-4672-5904	10-0539-7926
10		Sep	14	14:50	0.5625	0.06165	0.6307			20-4974-5839	15-5996-4331
11		Nov	2	13:50	0.5184	0.01752	0.1792			19-7762-9071	12-2459-8595
12			29	15:50	0.4012	-0.09969	-1.02			13-9037-7762	17-8506-5280
13	2018	Jan	18	16:34	0.5946	0.0937	0.9587			09-4031-9316	09-9985-4118
14			25	15:57	0.6484	0.1475	1.509			07-2068-4059	03-9446-1472
15		Feb	22	15:36	0.4831	-0.01781	-0.1822			12-6599-5677	07-1180-8866
16		Mar	8	14:36	0.583	0.08208	0.8398			19-8800-3981	08-0879-0164
17			21	15:45	0.6184	0.1175	1.203			12-0462-6609	19-4494-0616
18		Apr	12	15:52	0.5946	0.0937	0.9587			12-4726-1936	21-1246-6632
19			26	16:36	0.5029	0.002046	0.02093			04-0425-3250	07-5752-7102
20		May	3	15:58	0.4118	-0.08913	-0.9119			15-1458-0870	17-3212-9907
21			10	16:28	0.6057	0.1048	1.073			18-5396-7288	05-1953-8969

96 Hour Acute *Americamysis bahia* Reference Toxicant Test

Client: Reference Toxicant Organism Log #: 104491 Age: 5 days
 Test Material: Potassium Chloride Organism Supplier: Aquatic Indicators
 Test ID#: 78121 Project #: 28835 Control/Diluent: DI + Crystal Sea @ 25 ppt
 Test Date: 5/10/18 Randomization: 4.6.2 Control Water Batch: 127A

Treatment (g/L KCl)	Temp (°C)	pH		D.O. (mg/L)		Salinity (ppt)		# Live Organisms				SIGN-OFF
		new	old	new	old	new	old	Rep A	Rep B	Rep C	Rep D	
Control	19.6	8.09		7.6		24.4		10	10	10	10	Test Solution Prep: <u>KL</u>
0.125	19.6	8.09		7.7		25.6		10	10	10	10	New WQ: <u>FT</u>
0.25	19.6	8.08		7.8		24.6		10	10	10	10	Initiation Date: <u>5/10/18</u>
0.5	19.7	8.06		8.0		24.9		10	10	10	10	Initiation Time: <u>16:00</u>
1	19.7	8.02		8.2		25.3		10	10	10	10	Initiation Signoff: <u>MA</u>
2	19.6	7.93		9.2		26.3		10	10	10	10	RT Batch #: <u>193</u>
Meter ID	110A	pH19		RD11		EC13						a.m. Feeding Signoff: <u>KL</u>
												p.m. Feeding Signoff: <u>KL</u>
Control	19.9		7.75		6.3		24.5	10	10	10	10	Count Date: <u>5/11/18</u>
0.125	19.8		7.74		6.3		24.6	10	10	10	10	Count Time: <u>11:30</u>
0.25	19.7		7.74		6.8		24.5	10	10	10	10	Count Signoff: <u>TK</u>
0.5	19.6		7.77		6.8		25.0	8	8	10	10	Old WQ: <u>FT</u>
1	19.7		7.69		6.7		25.5	0	0	0	0	a.m. Feeding Signoff: <u>SMC</u>
2	19.7		7.66		6.7		26.5	0	0	0	0	p.m. Feeding Signoff: <u>EP</u>
Meter ID	81A		PH15		RD12		EC13					
Control	20.2	7.94	7.52	7.6	5.8	24.2	25.1	10	10	10	10	Test Solution Prep: <u>EP</u>
0.125	20.1	7.95	7.52	7.7	6.0	24.6	25.0	10	10	10	10	New WQ: <u>EP</u>
0.25	20.2	7.95	7.55	7.8	6.1	24.7	25.1	10	10	9	10	Renewal Date: <u>5/12/18</u>
0.5	20.0	7.94	7.61	7.9	6.3	25.0	25.4	7	7	10	8	Renewal Time: <u>11:00</u>
1	-	-	-	-	-	-	-	-	-	-	-	Renewal Signoff: <u>TK</u>
2	-	-	-	-	-	-	-	-	-	-	-	Old WQ: <u>EP</u>
Meter ID	100A	PH19	PH21	BD11	BD10	EC13	EC10					a.m. Feeding Signoff: <u>TK</u>
												p.m. Feeding Signoff: <u>TK</u>
												RT Batch #: <u>193</u>
Control	20.0		7.67		6.5		25.6	10	10	10	10	Count Date: <u>5/13/18</u>
0.125	20.0		7.71		6.4		25.7	10	10	10	10	Count Time: <u>10:48</u>
0.25	19.9		7.65		6.0		26.0	10	10	9	10	Count Signoff: <u>TK</u>
0.5	19.7		7.66		6.1		26.1	6	7	10	8	Old WQ: <u>BU</u>
1	-	-	-	-	-	-	-	-	-	-	-	a.m. Feeding Signoff: <u>ER</u>
2	-	-	-	-	-	-	-	-	-	-	-	p.m. Feeding Signoff: <u>KL</u>
Meter ID	113A		PH21		BD11		EC11					
Control	19.9		7.86		7.3		25.3	10	10	10	10	Termination Date: <u>5/14/18</u>
0.125	19.7		7.81		7.0		26.0	10	10	9	10	Termination Time: <u>15:05</u>
0.25	19.5		7.85		7.2		25.9	10	10	9	10	Termination Signoff: <u>KL</u>
0.5	19.6		7.81		7.2		26.3	6	7	10	8	Old WQ: <u>KL</u>
1	-	-	-	-	-	-	-	-	-	-	-	a.m. Feeding Signoff: <u>TK</u>
2	-	-	-	-	-	-	-	-	-	-	-	
Meter ID	100A		PH21		RD10		EC11					

Appendix I

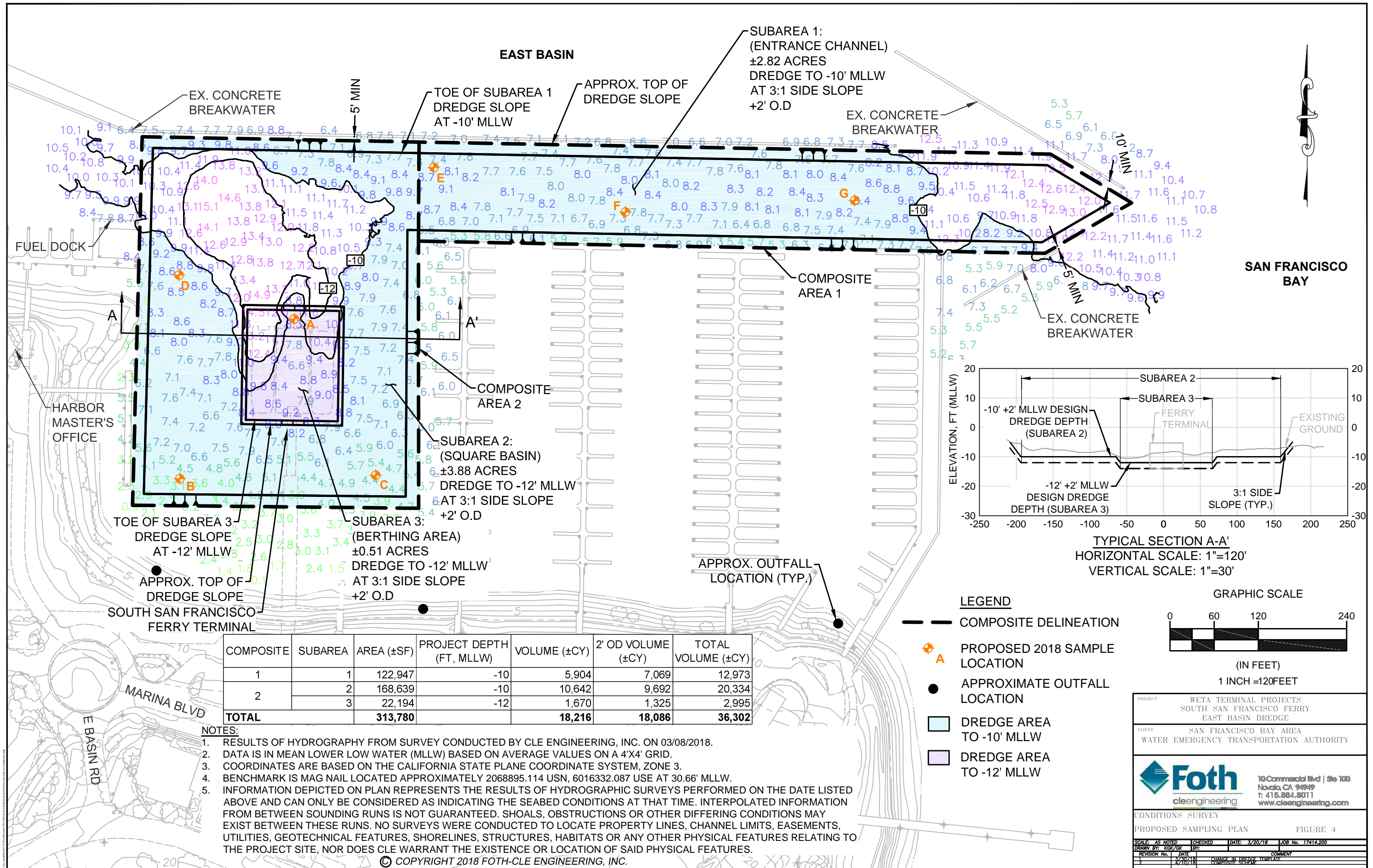
Bioassay Standard Test Conditions



Summary of Test Conditions and Acceptability Criteria for the Amphipod (<i>Leptocheirus plumulosus</i>) 10-Day Sediment Toxicity Test.	
1. Test type	Static non-renewal
2. Test duration	10 d
3. Temperature	25 ± 1°C
4. Salinity	20 ± 2 ppt
5. Light quality	Ambient Laboratory
6. Light intensity	50 – 100 ft candles
7. Photoperiod	Continuous
8. Test chamber size	1 L
9. Seawater volume	800 mL
10. Sediment depth	20 mm
11. Renewal of seawater	None
12. Age of test organisms	Young adults, 2-4 mm
13. # of organisms per test chamber	20
14. # of replicate chambers/concentration	5
15. # of organisms per sediment type	100
16. Feeding regime	None
17. Test chamber cleaning	Lab washing prior to test
18. Test solution aeration	Low bubble (~100/minute)
19. Overlying water	1 µm-filtered seawater (at test salinity)
20. Test materials	Test sites, reference and control
21. Dilution series	None
22. Endpoint	% Survival
23. Sample holding requirements	< 8 weeks
24. Sample volume required	4 L
25. Test acceptability criteria	≥ 90% survival in the Control treatment
26. Reference toxicant results	Within 2 SD of laboratory mean

Summary of Test Conditions and Acceptability Criteria for the Marine Polychaete (<i>Neanthes arenaceodentata</i>) 10-Day Sediment Toxicity Test.		
1.	Test type	Static-renewal
2.	Test duration	10 d
3.	Temperature	20 ± 1°C
4.	Salinity	28 ± 2 ppt
5.	Light quality	Ambient Laboratory
6.	Light intensity	50 – 100 ft c.
7.	Photoperiod	12L/12D
8.	Test chamber size	1 L glass beakers
9.	Test solution volume	800 L
10.	Sediment depth	25 mm (200 mL)
11.	Renewal of seawater	None, unless needed. If needed, renew 80% of overlying water at 48 hour intervals
12.	Age of test organisms	2-3 weeks
13.	# of organisms per test chamber	5
14.	# of replicate chambers/concentration	5
15.	# of organisms per sediment type	25
16.	Feeding regime	None
17.	Test chamber cleaning	Lab washing prior to test
18.	Test solution aeration	Low bubble (~100/minute)
19.	Overlying water	0.45 µm-filtered seawater, at test salinity
20.	Test concentrations	Test sites, reference and Control
21.	Dilution series	None
22.	Endpoint	Survival
23.	Sample holding requirements	< 8 weeks
24.	Sample volume required	4 L
25.	Test acceptability criteria	≥ 90% survival in the Control treatment
26.	Reference toxicant results	Within 2 SD of laboratory mean

Summary of Test Conditions and Acceptability Criteria for the Mysid (<i>Americamysis bahia</i>) Water Column Toxicity Test.	
1. Test type	Static non-renewal
2. Test duration	96 hours
3. Salinity	25-30 ppt \pm 10 ppt
4. Temperature	20 \pm 1°C
5. Light quality	Ambient Laboratory
6. Light intensity	50 – 100 ft c.
7. Photoperiod	16L/8D
8. Test chamber size	400 mL beaker
9. Test solution volume	200 mL
10. Renewal of seawater	None
11. Age of test organisms	1-5 days; 24 hour range in age
12. # of organisms per test chamber	10
13. # of replicate chambers per concentration	5
14. # of organisms per concentration	50
15. Feeding regime	daily
16. Test chamber cleaning	Lab washing prior to test
17. Test chamber aeration	If needed to maintain >40% saturation
18. Elutriate preparation water	Site water or Clean sea water
19. Test concentrations	Test sites, and Lab Control
20. Dilution series	Four concentrations (1, 10, 25, 50, and 100%) and a Lab Control.
21. Dilution water	Natural seawater/artificial seawater
22. Endpoints	% Survival
23. Sampling holding requirements	< 8 weeks
24. Sample volume required	2L
25. Test acceptability criteria	\geq 90% survival in the Lab Controls



South San Francisco Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/22/2018	Sample Time:	1850	Sampler(s):	DG
Sample ID:	DU-1-E	Notes:			
Northing:	2069823.05	Easting:	6018526.53		
Corrected Mudline Depth (ft):	-9	Tide Height (ft):	5.4		
Target Core Length (ft):	3.5	Vibra Core Penetration Depth (ft):	12.5		
Core Length Recovered (ft):	3.5	Final Core Length (ft):	3.5		

Sample Processing Information

Process Date:	5/22/2018	Process Time:	1850	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
12.5	Dark Grey	No Odor	Dark Gray to Gray Fine Grained Bay Mud. Minor to Abundant Bioclastic Material Present. No Smell/No Sheen. Dense at Base, Loose towards top of Core with lamination of Coarse Silt Topping Core.		

South San Francisco Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/22/2018	Sample Time:		Sampler(s):	DG
Sample ID:	DU-1-F	Notes:			
Northing:	2069772.08	Easting:	6018778.56		
Corrected Mudline Depth (ft):	-9.2	Tide Height (ft):	2.7		
Target Core Length (ft):	3.3	Vibra Core Penetration Depth (ft):	12.5		
Core Length Recovered (ft):	3.3	Final Core Length (ft):	3.3		

Sample Processing Information

Process Date:	5/22/2018	Process Time:		Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
12.5	Dark Grey	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic Material Present. No Smell/No Sheen. Dense throughout Core with lamination of Coarse Silt Topping Core.		

South San Francisco Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/22/2018	Sample Time:	1450	Sampler(s):	DG
Sample ID:	DU-1-G	Notes:			
Northing:	2069785.78	Easting:	6019100.57		
Corrected Mudline Depth (ft):	-9.1	Tide Height (ft):	0.4		
Target Core Length (ft):	3.4	Vibra Core Penetration Depth (ft):	12.5		
Core Length Recovered (ft):	3.4	Final Core Length (ft):	3.4		

Sample Processing Information

Process Date:	5/22/2018	Process Time:	1450	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
12.5	Dark Grey	No Odor	Dark Gray to Gray Fine Grained Bay Mud. Minor to Abundant Bioclastic Material Present. No Smell/No Sheen. Dense at Base, Loose towards top of Core.		

South San Francisco Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/22/2018	Sample Time:	1230	Sampler(s):	DG
Sample ID:	DU-2-A	Notes:			
Northing:	2069626.91	Easting:	6018326.85		
Corrected Mudline Depth (ft):	-9.4	Tide Height (ft):	0.6		
Target Core Length (ft):	5.1	Vibra Core Penetration Depth (ft):	14.5		
Core Length Recovered (ft):	5.1	Final Core Length (ft):	5.1		

Sample Processing Information

Process Date:	5/22/2018	Process Time:	1230	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
14.5	Dark Grey	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic Material Present. No Smell/No Sheen. Dense throughout Core.		

South San Francisco Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/22/2018	Sample Time:	930	Sampler(s):	DG
Sample ID:	DU-2-B	Notes:			
Northing:	2069404.02	Easting:	6018169.36		
Corrected Mudline Depth (ft):	-4	Tide Height (ft):	3.9		
Target Core Length (ft):	8.5	Vibra Core Penetration Depth (ft):	12.5		
Core Length Recovered (ft):	8.5	Final Core Length (ft):	8.5		

Sample Processing Information

Process Date:	5/22/2018	Process Time:	930	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
12.5	Dark Grey	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor to Abundant Bioclastic Material Present. No Smell/No Sheen. Dense at Base, Loose at Top of Core.		

South San Francisco Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/22/2018	Sample Time:	830	Sampler(s):	DG
Sample ID:	DU-2-C	Notes:			
Northing:	2069384.28	Easting:	6018443.75		
Corrected Mudline Depth (ft):	-4.7	Tide Height (ft):	5.1		
Target Core Length (ft):	7.8	Vibra Core Penetration Depth (ft):	12.5		
Core Length Recovered (ft):	7.8	Final Core Length (ft):	7.8		

Sample Processing Information

Process Date:	5/22/2018	Process Time:	830	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
12.5	Dark Grey	No Odor	Dark Gray to Black Fine Grained Bay Mud. Minor Bioclastic Material Present. No Smell/No Sheen. Dense at Base, Loose at Top of Core.		

South San Francisco Ferry Terminal Sediment Sample Core Log

Sample Collection Data

Sample Date:	5/22/2018	Sample Time:	1030	Sampler(s):	DG
Sample ID:	DU-2-D	Notes:			
Northing:	2069683.32	Easting:	6018164.08		
Corrected Mudline Depth (ft):	-9.0	Tide Height (ft):	2.3		
Target Core Length (ft):	3.5	Vibra Core Penetration Depth (ft):	12.5		
Core Length Recovered (ft):	3.5	Final Core Length (ft):	3.5		

Sample Processing Information

Process Date:	5/22/2018	Process Time:	1030	Processor(s):	MT
Penetration Depth (ft)	Color	Odor	Material Description		
12.5	Dark Grey	No Odor	Gray to Dark Gray Fine Grained Bay Mud. Abundant Bioclastic Material Present. No Smell/No Sheen. Dense throughout Core with lamination of Coarse Silt Topping Core.		