DATA REPORT

Characterization of WesPac Energy Pittsburg LLC Marine Terminal Dredging Project Sediments: Dredge Materials Sampling and Analysis Results

Prepared for

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List of Acronyms

ASTM	American Society for Testing and Materials
Bay	San Francisco Bay
BCDC	Bay Conservation and Development Commission
COC	Chain-of-custody
DMMO	Dredged Material Management Office
DU	Dredge unit
GPS	Global positioning system
HDPE	High density polyethylene
ITM	Inland Testing Manual
MET	Modified elutriate test
MLLW	Mean lower low water
MWP	Montezuma Wetland Project
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyls
PER	Pacific EcoRisk
QA/QC	Quality assurance/quality control
RPD	Relative percent difference
SAP	Sampling and Analysis Plan
SFRWQCB	San Francisco Regional Water Quality Control Board
SOP	Standard operating procedures
TOC	Total organic carbon
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
WesPac	WesPac Energy – Pittsburg LLC
WQOs	Water quality objectives

1. INTRODUCTION

WesPac Energy-Pittsburg LLC (WesPac), is proposing to dredge sediments from the area directly north of its marine terminal, located on the Sacramento River (Figures 1-1 and 1-2). To support permit and subsequent dredging activities at the marine terminal, Treadwell & Rollo contracted Pacific EcoRisk to perform sampling and analyses of the WesPac marine terminal sediments following a previously-submitted and DMMO-approved Sampling and Analysis Plan ([SAP] Olberding 2011).

The proposed dredging to be performed under permits with the United States Army Corps of Engineers (USACE) and the Bay Conservation and Development Commission (BCDC) will require the removal of accumulated sediment in order to achieve a berth design depth that will allow unencumbered maneuvering of commercial vessels. The proposed dredge depth is -38 ft below Mean Lower Low Water (-38 ft MLLW) plus a two-ft over dredge tolerance, resulting in a project depth of -40 ft MLLW. The estimated total volume of dredged material to be removed from the berth area (Table 1-1), including material accounted for by the two-ft over dredge tolerance, is approximately170,000 cubic yards (yds^3).

This Data Report has been prepared to provide the required characterization of these sediments. In order to meet permit requirements, a total of four sediment cores were sampled from each of four dredge units (DU). Each of these areas were sampled to a total depth of –40.0 ft MLLW; composite samples representative of each of these DU areas (i.e., a composite of the four cores collected from within the respective DUs) were then analyzed and tested as per the Inland Testing Manual (ITM) testing, DMMO guidance, and placement site permits (to determine the suitability of the proposed dredged materials for upland placement) for Winter Island and the Montezuma Wetland Project (MWP). A Z-layer, consisting of sediment 0.5 ft below the permitted depth (plus over-depth), was also collected and archived.

Table 1-1. Proposed Maintenance Dredging for the Marine Terminal, WesPac Energy.

Dredge Unit (DU)	Permitted Depth (ft MLLW)	Over-depth (ft)	Permitted Depth + Over-depth (ft MLLW)	Total Estimated Volume (yds^3)
TR-DU1	-38	+2.0	-40	64,000
TR-DU2	-38	+2.0	-40	55,000
TR-DU3	-38	+2.0	-40	35,000
TR-DU4	-38	+2.0	-40	16,000
			Total:	**170,000**

1.1 Objectives of the Sediment Investigation

The purpose of this sampling and testing was to evaluate the proposed dredged material to determine whether it will represent an adverse impact during removal operations and placement at currently permitted upland reuse sites and/or future alternative reuse sites. The procedures for sediment sample collection, sample processing and preparation, physical and chemical analyses, biological testing and data analyses were presented in a previously approved SAP (Olberding 2011). The specific objectives of the SAP scope-of-work were as follows:

- Collect core samples from within the designated sampling areas following field protocol detailed in the SAP; and
- Conduct chemical and biological analyses to determine whether sediments are suitable for beneficial reuse at Winter Island or the MWP.

1.2 Organization of this Document

Sample collection and handling procedures are discussed in Sections 2 and 3. Results of chemical analyses and biological testing are provided in Section 4. Section 5 consists of a quality control summary and Section 6 presents the conclusions regarding suitability of the material for placement at currently permitted upland reuse sites and/or future alternative reuse sites.

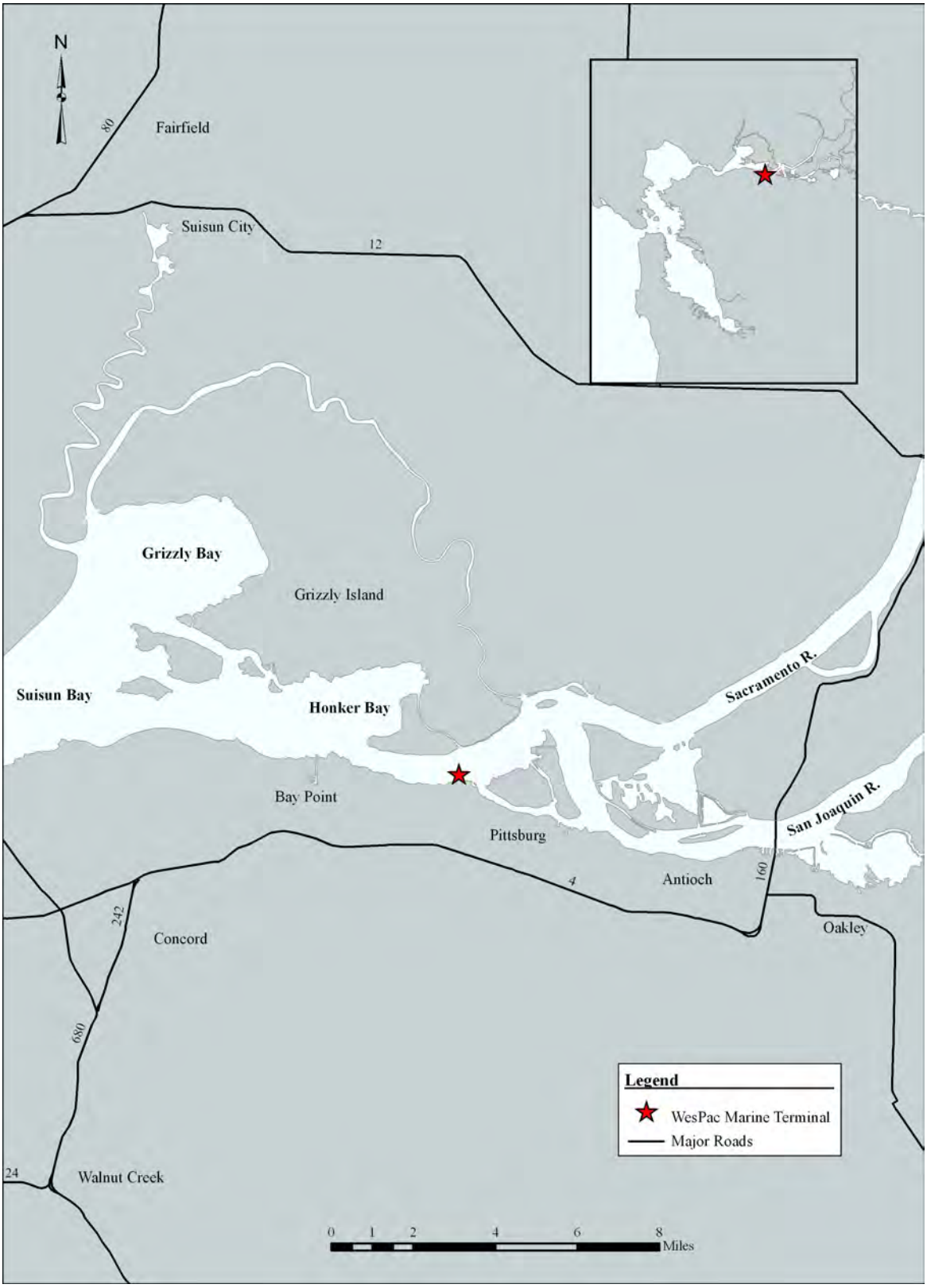


Figure 1-1. Location Map: WesPac Marine Terminal

Figure 1-2. Vicinity Map: WesPac Marine Terminal

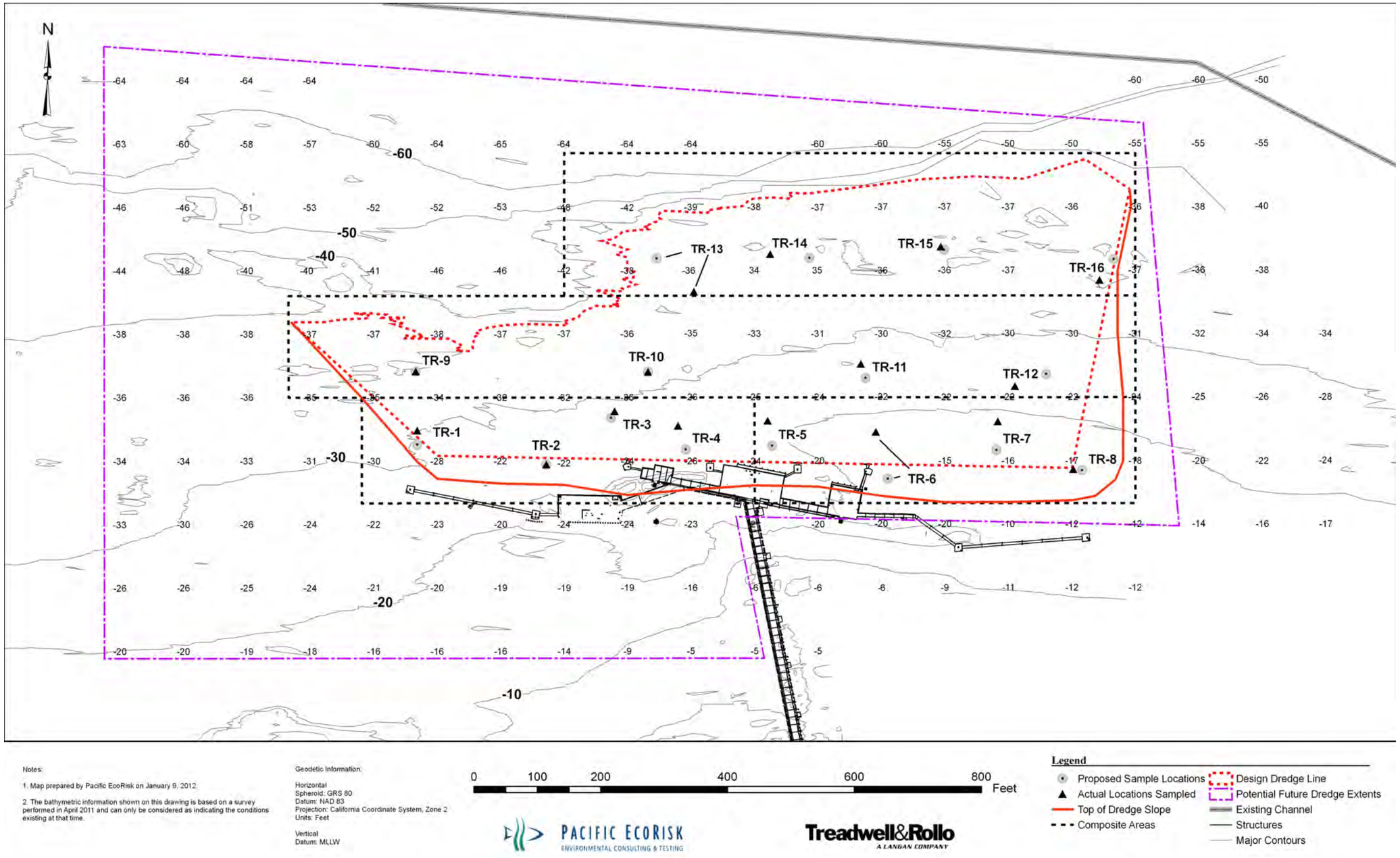


Figure 1-3. Project Map: WesPac Marine Terminal Sediment Sampling Locations

2. FIELD SEDIMENT SAMPLE COLLECTION

All sediments were collected in accordance with guidelines and procedures outlined in the SAP (Olberding 2011). All sediment sampling field activities at the WesPac Marine Terminal were performed on November 2 and 3, 2011, under the direction of Mr. Jeffrey Cotsifas of Pacific EcoRisk (PER). Gregg Drilling provided the sampling vessel, on-board positioning system, and sampling equipment. Treadwell and Rollo provided the sample location coordinates and a Field Scientist; PER also provided additional Field Scientists to assist in sediment core collection. A total of 16 sediment cores were collected from the designated sites (Figure 1-3). Final site positions were determined with a differential global positioning system (GPS). Table 2-1 lists station identifiers, GPS coordinates for all core locations, mudline elevations, and core penetration depths for all stations. Field log sheets are presented in Appendix A.

It should be noted that refusal was encountered for sediment cores TR-08, TR-12, TR-13, and TR-14 below the design depth, but above the 'design depth plus over-depth' due to the presence of consolidated sand. In addition, due to scouring at the site, originally planned locations of the TR-13, and TR-14 sediment cores were at water depths below the design depth. Sediment cores were relocated appropriately. It should also be noted that due to the substrate encountered at for sediment core locations TR-04, TR-05, TR-06, and TR-07 site were relocated north such sediment cores could be sampled to design depth plus over-depth.

Otherwise, there were no other unusual circumstances encountered during the fieldwork, and no major deviations from the SAP (Olberding 2011).

Sectioning of cores to separate the 'design depth plus over-depth' and the Z-layer sections was performed on the boat. The contents of the respective core sections were transferred into polybags, which were maintained on ice until transported to the PER testing lab for processing. Upon receipt at PER, all samples were logged in and placed in cold storage at ≤4°C in the dark until needed.

Table 2-1. Locations of Sampling Stations and Core Depths.

Dredge Unit (Area)	SAMPLE ID	Latitude (decimal-deg)	Longitude (decimal-deg)	Mudline Elevation (ft MLLW)	Core Penetration Depth (ft)	Cored Depth (ft MLLW)	Z-Layer (ft)	Total Depth Cored (ft MLLW)
Area A	TR-01	38° 02.597	121° 53.662	-31.8	8.2	-40.0	0.5	-40.5
	TR-02	38° 02.588	121° 53.620	-21.7	18.3	-40.0	0.5	-40.5
	TR-03	38° 02.602	121° 53.597	-30.5	9.5	-40.0	0.5	-40.5
	TR-04	38° 02.599	121° 53.577	-28.5	11.5	-40.0	0.5	-40.5
Area B	TR-05	38° 02.601	121° 53.548	-23.3	16.7	-40.0	0.5	-40.5
	TR-06	38° 02.598	121° 53.512	-19.9	20.1	-40.0	0.5	-40.5
	TR-07	38° 02.601	121° 53.472	-18.4	21.6	-40.0	0.5	-40.5
	TR-08	38° 02.589	121° 53.447	-17.1	9.2	-26.3	0.5	-26.8[A,B]
Area C	TR-9	38° 02.612	121° 53.663	-35.3	4.7	-40.0	0.5	-40.5
	TR-10	38° 02.613	121° 53.587	-30.1	9.9	-40.0	0.5	-40.5
	TR-11	38° 02.616	121° 53.517	-30.9	9.1	-40.0	0.5	-40.5
	TR-12	38° 02.610	121° 53.467	-24.0	14.6	-38.6	0.5	-39.1[B]
Area D	TR-13	38° 02.634	121° 53.572	-34.0	4.2	-38.2	0.5	-38.7[B]
	TR-14	38° 02.644	121° 53.548	-36.7	2.0	-38.7	0.5	-39.2[B]
	TR-15	38° 02.646	121° 53.491	-36.0	4.0	-40.0	0.5	-40.5
	TR-16	38° 02.638	121° 53.439	-34.0	6.0	-40.0	0.5	-40.5

A - Sample location is outside the design dredge limits as per DMMO request at the October 12 DMMO meeting. As this sample location is on a 4:1 slope, the predicted previous dredged depth at this location may range from -26 ft MLLW to -32 ft MLLW.

B - Refusal encountered; however, core penetration was below the design depth and into over-depth layer.

3. SAMPLE PROCESSING

3.1 Homogenization and Compositing of Sediments

Homogenization and compositing of individual sediment cores was performed at the PER laboratory facility in Fairfield, CA. The sediment core sections from each individual core were individually homogenized in a stainless-steel bowl or high-density polyethylene (HDPE) container. The separate Z-layer core sections of sediments were similarly individually homogenized. A 500-mL sub-sample of the homogenized sediment from each individual sediment core was archived to allow for additional chemical analyses, if necessary (a sub-sample of each Z-layer sediment was similarly archived); archived samples will be stored frozen at –20 ± 10˚C for up to one [1] year after sample collection.

Proportionate volumes of the four homogenized core sediments from within each of the respective DUs were composited and homogenized within a stainless steel container to comprise the composite sediment for each DU; a sub-sample of each homogenized composite sediment sample was frozen for archival storage. Each DU composite sample was analyzed for the full suite of compounds and biological testing as described in the SAP (Olberding 2011). The Z-layer sediments were similarly processed, and were frozen for archival storage.

All sediment was processed following procedures outlined in the SAP (Olberding 2011), with no deviations.

3.2 Preparation of the Modified Elutriate

Modified Elutriate Tests (MET) were also performed to address potential impacts from any decant water resulting from the placement of dredged material at one of these reuse sites. All MET samples were prepared following procedures outlined in the SAP (Olberding 2011), with no deviations.

3.3 Sample Shipping

Prior to shipping to the analytical laboratory, sample containers were wrapped in bubble wrap and securely packed inside a cooler with ice packs or crushed ice. A temperature blank was included in each cooler. The original signed chain-of-custody (COC) forms were placed in a sealed plastic bag and taped to the inside lid of the cooler. Appropriate packaging tape was wrapped completely around the cooler. A *This Side Up* arrow label was attached on each side of the cooler, a *Glass-Handle with Care* label was attached to the top of the cooler, and the cooler was sealed with custody seals on both the front and the back lid seams.

Sediment samples were shipped the contract analytical lab (Calscience) by overnight delivery. The analytical lab has been instructed to not dispose of any samples for this project unless notified by PER in writing.

3.3.1 Chain-of-Custody (COC) Protocol

COC procedures were followed for all samples throughout the collection, handling, and analyses activities. A COC form accompanied each cooler of samples to the respective analytical laboratories. The Sampling and Analysis Project Manager of each participating lab, or their designee, was responsible for all sample tracking and COC procedures. This person was responsible for final sample inventory, maintenance of sample custody documentation, and completion of COC forms prior to transferring samples to the analytical laboratory. Each custodian of the samples signed the COC form; copies of the COC forms are retained in the project file.

4. RESULTS OF LABORATORY ANALYSES

4.1 Results of Conventional and Chemical Analyses

Analysis of the sediment samples for the conventional and chemical parameters specified in the SAP (Olberding 2011) was performed by CalScience. Sediment conventional parameters included total organic carbon (TOC), total solids, and grain size. Chemical analyses of the sediments for trace metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), chlorinated pesticides, and butyltins were also performed to determine suitability for placement at wetland beneficial reuse sites such as Winter Island or the MWP. CalScience's full Data Report for the sediment conventional and chemical analyses is provided in Appendix B.

Sediment physical and chemical characteristics provide information about chemicals of concern present in the sediment and their potential bioavailability, and about non-chemical factors that could affect toxicity. As per DMMO guidance, the results of the physical and chemical analyses of WesPac-Energy sediments were compared to Bay ambient sediment concentrations (SFRWQCB 1998) to assess suitability for placement at Winter Island or the MWP; analytical results are summarized in Tables 4-1 through 4-6.

Briefly, the results of chemical analysis indicated that sediment metals, organotin, organochlorine, PAH and PCB concentrations were similar to or below Bay ambient concentrations.

4.2 Modified Elutriate Test Chemistry Analyses

Analysis of the MET samples for select metals and total suspended solids (as specified in the SAP (Olberding 2011)) was performed by CalScience. CalScience's full Data Report for the metals and TSS analyses of the MET is provided in Appendix C.

The results of the MET elutriate analyses are summarized in Table 4-7 and were evaluated to predict concentrations of metals in decant water discharged from a wetland beneficial reuse site following the placement of dredged material. TSS and metals concentrations were compared to water quality objectives (WQOs) defined in the SF Bay Basin Plan (RWQCB 2007, 2008, and 2009) for surface waters.

Briefly, the measured TSS concentrations were ≤11 mg/L. All metals measured in the sediment elutriate were below SFRWQCB WQOs.

Table 4-1. WesPac Marine Terminal Sediment Grain Size, Total Solids (%), and Total Organic Carbon (%).

Analytes	TR-DU1	TR-DU2	TR-DU3	TR-DU4
% Gravel	0.78	0.00	0.00	0.12
% Sand	86.97	78.74	82.22	68.71
% Silt	10.29	18.38	15.78	27.11
% Clay	1.94	2.87	2.00	4.06
Total % Fines (silt & clay)	12.24	21.25	17.78	31.17
Total Solids (%)	78.0	70.1	69.4	64.5
Total Organic Carbon (%)	0.51	1.4	1.1	2.5

Table 4-2. WesPac Marine Terminal Sediment Metals Concentrations (mg/kg, dry wt).

Metals	TR-DU1	TR-DU2	TR-DU3	TR-DU4	Bay Ambient (SFRWQCB 1998)	
					<40% Fines	<100% Fines
Arsenic	4.09	4.37	4.40	6.78	13.5	15.3
Cadmium	0.269	0.358	0.255	0.299	0.25	0.33
Chromium	31.4	36.3	34.0	40.1	91.4	112
Copper	13.1	16.6	13.4	17.9	31.7	68.1
Lead	4.56	6.36	5.71	6.91	20.3	43.2
Mercury	0.0280	0.0543	0.0349	<0.0201	0.25	0.43 (0.46[a])
Nickel	52.7	53.1	51.8	56.7	92.9	112
Selenium	<0.0649	<0.0722	<0.0729	<0.0784	0.59	0.64
Silver	0.0430 J	0.0628 J	0.0448 J	0.0427 J	0.31	0.58
Zinc	47.3	58.4	52.4	54.4	97.8	158

All results below laboratory method detection limit (MDL) are reported as < the MDL

a - San Francisco Bay 99th percentile mercury concentration (SFRWQCB 2011).

J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit; the reported value is therefore an estimate

Table 4-3. WesPac Marine Terminal Sediment PCB Congener Concentrations (µg/kg, dry wt).

PCBs	TR-DU1	TR-DU2	TR-DU3	TR-DU4	Bay Ambient (SFRWQCB 1998)	
					<40% Fines	<100% Fines
PCB 008	<0.11	0.13 J	<0.12	<0.13	a	a
PCB 018	0.57 J	0.41 J	<0.23	<0.24	a	a
PCB 028	0.40 J	0.38 J	0.15 J	<0.15	a	a
PCB 033	0.24 J	0.33 J	<0.16	<0.17	a	a
PCB 044	0.59 J	0.33 J	0.30 J	<0.20	a	a
PCB 052	0.54 J	0.39 J	0.29 J	<0.15	a	a
PCB 056	0.22 J	<0.20	<0.20	<0.21	a	a
PCB 066	0.45 J	0.24 J	0.24 J	<0.14	a	a
PCB 070	0.56 J	0.29 J	0.36 J	<0.13	a	a
PCB 074	<0.12	<0.13	<0.14	<0.15	a	a
PCB 087	<0.64	0.16 J	<0.15	<0.16	a	a
PCB 097	<0.64	<0.19	<0.20	<0.21	a	a
PCB 099	0.13 J	0.15 J	0.12 J	<0.13	a	a
PCB 101	0.27 J	0.42 J	0.22 J	<0.13	a	a
PCB 110	0.26 J	0.44 J	0.35 J	<0.16	a	a
PCB 132	<0.21	<0.24	<0.24	<0.26	a	a
PCB 138	<0.26	<0.29	<0.29	<0.31	a	a
PCB 141	<0.14	<0.16	<0.16	<0.17	a	a
PCB 151	<0.13	<0.15	<0.15	<0.16	a	a
PCB 156	<0.13	<0.14	<0.14	<0.15	a	a
PCB 177	<0.16	<0.18	<0.18	<0.19	a	a
PCB 180	<0.078	0.11 J	<0.088	<0.095	a	a
PCB 183	<0.14	<0.16	<0.16	<0.17	a	a
PCB 187	<0.13	<0.15	<0.15	<0.16	a	a
PCB 194	<0.12	<0.14	<0.14	<0.15	a	a
PCB 195	<0.068	<0.075	<0.076	<0.082	a	a
PCB 201	<0.073	<0.081	<0.082	<0.088	a	a
PCB 203	<0.14	<0.15	<0.15	<0.17	a	a
PCB 206	<0.11	<0.12	<0.12	<0.13	a	a
PCB 209	<0.14	<0.15	<0.15	<0.17	a	a
PCB 031	0.38 J	0.36 J	<0.17	<0.18	a	a
PCB 049	0.30 J	0.22 J	<0.17	<0.18	a	a
PCB 060	0.18 J	<0.15	<0.15	<0.16	a	a
PCB 095	<0.21	0.38 J	<0.24	<0.26	a	a
PCB 105	<0.13	0.46 J	<0.15	<0.16	a	a
PCB 118	0.22 J	0.33 J	<0.19	<0.21	a	a

Table 4-3. *(continued)* WesPac Marine Terminal Sediment PCB Congener Concentrations (*µ*g/kg, dry wt).

PCBs	TR-DU1	TR-DU2	TR-DU3	TR-DU4	Bay Ambient (SFRWQCB 1998)	
					<40% Fines	<100% Fines
PCB 128	<0.13	<0.15	<0.15	<0.16	a	a
PCB 149	<0.11	0.25 J	<0.13	<0.14	a	a
PCB 153	<0.13	0.38 J	0.18 J	<0.16	a	a
PCB 158	<0.26	<0.29	<0.29	<0.31	a	a
PCB 170	<0.12	<0.13	<0.13	<0.14	a	a
PCB 174	<0.14	<0.15	<0.15	<0.17	a	a
Total Detected PCBs	**5.31 J**	**6.16**	**2.21 J**	**0.0**	8.6	21.6 (26.4)[b]

All results below laboratory method detection limit (MDL) are reported as < the MDL

a - No reference value has been established for the individual congeners; the Total Detected PCB congener reference value (SFRWQCB 1998) is used as a default value.

b - San Francisco Bay 99th percentile PCB concentration (SFRWQCB 2011).

J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit; the reported value is therefore an estimate.

Table 4-4. WesPac Marine Terminal Sediment Organotin Concentrations (*µ*g/kg, dry wt).

Organotins	TR-DU1	TR-DU2	TR-DU3	TR-DU4	Bay Ambient (SFRWQCB 1998)[A]	
					<40% Fines	<100% Fines
Butyltin	<0.84	<0.93	<0.94	<1.0	a	a
Dibutyltin	<0.84	<0.93	<0.94	<1.0	a	a
Tributyltin	<0.74	8.3	2.3 J	1.6 J	a	a
Tetrabutyltin	<0.99	<1.1	<1.1	<1.2	a	a
Total Detected Organotins	**0.0**	**8.3**	**2.3 J**	**1.6 J**	a	a

All results below laboratory method detection limit (MDL) are reported as < the MDL

a - no data available.

J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit; the reported value is therefore an estimate

Table 4-5. WesPac Marine Terminal Sediment PAH Concentrations (*µ*g/kg, dry wt).

PAHs	TR-DU1	TR-DU2	TR-DU3	TR-DU4	Bay Ambient (SFRWQCB 1998)	
					<40% Fines	<100% Fines
Acenaphthene	<1.9	2.8 J	2.8 J	<2.3	2.2	31.7
Acenaphthylene	<1.8	<2.0	<2.0	<2.1	11.3	26.6
Anthracene	2.1 J	6.0 J	4.2 J	3.9 J	9.3	88
Benzo(a)anthracene	6.4 J	17	9.8 J	9.6 J	15.9	244
Benzo(a)pyrene	<1.2	14 J	7.4 J	9.1 J	18.1	412
Benzo(b)fluoranthene	4.0 J	11 J	7.0 J	11 J	32.1	371
Benzo(e)pyrene	3.4 J	10 J	7.7 J	9.1 J	17.3	294
Benzo(g,h,i)perylene	2.8 J	7.9 J	7.9 J	7.3 J	22.9	310
Benzo(k)fluoranthene	<2.5	12 J	<2.8	8.5 J	29.2	258
Biphenyl	<1.8	<2.0	2.7 J	2.4 J	6.5	12.9
Chrysene	6.7 J	19	10 J	12 J	19.4	289
Dibenzo(a,h)anthracene	<1.2	<1.4	<1.4	<1.5	3	32.7
2,6-Dimethylnaphthalene	<2.1	<2.4	<2.4	<2.6	5	12.1
Fluoranthene	20	34	30	27	78.7	514
Fluorene	1.7 J	4.6 J	4.7 J	4.5 J	4	25.3
Indeno(1,2,3-c,d)pyrene	2.3 J	6.8 J	5.8 J	6.2 J	19	382
2-Methylnaphthalene	2.1 J	3.1 J	4.3 J	2.9 J	11.3	26.6
1-Methylnaphthalene	<2.7	<3.0	<3.0	<3.2	6.8	12.1
1-Methylphenanthrene	<2.1	<2.3	<2.3	5.8 J	4.5	31.7
Naphthalene	3.0 J	3.9 J	6.1 J	4.5 J	8.8	55.8
Perylene	10 J	20	15	74	24	145
Phenanthrene	7.4 J	13 J	14 J	14 J	17.8	237
Pyrene	20	38	28	24	64.6	665
1,6,7-Trimethylnaphthalene	<1.8	<2.0	3.1 J	<2.2	3.3	9.8
Dibenzothiophene	<1.7	<1.9	2.0 J	<2.1	-[a]	-[a]
Total Detected PAHs	**91.9**	**223.1**	**172.5**	**235.8**	211	3390

All results below laboratory method detection limit (MDL) are reported as < the MDL

a - No reference value has been established for this PAH.

J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit; the reported value is therefore an estimate.

Table 4-6. WesPac Marine Terminal Sediment Organochlorine Pesticide Concentrations (*µ*g/kg, dry wt).

Organochlorine Pesticides	TR-DU1	TR-DU2	TR-DU3	TR-DU4	Bay Ambient (SFRWQCB 1998)	
					<40% Fines	<100% Fines
Aldrin	<0.4	<0.44	<0.45	<0.48	0.42	1.1
alpha-BHC	<0.38	<0.42	<0.42	<0.46	-	-
beta-BHC	<0.33	<0.36	<0.37	<0.40	-	-
delta-BHC	<0.41	<0.45	<0.46	<0.49	-	-
gamma-BHC (Lindane)	<0.29	<0.33	<0.33	<0.35	-	-
Total Detected BHCs	**0.0**	**0.0**	**0.0**	**0.0**	**0.31**	**0.78**
alpha-Chlordane	<0.33	<0.37	<0.37	<0.40	-	-
gamma-Chlordane	<0.33	<0.37	<0.37	<0.40	-	-
Chlordane	<5.1	<5.7	<5.8	<6.2	0.42	1.1
Dieldrin	<0.29	<0.32	<0.33	<0.35	0.18	0.44
Endosulfan I	<0.46	<0.51	<0.51	<0.55	-	-
Endosulfan II	<0.22	<0.25	<0.25	<0.27	-	-
Endosulfan Sulfate	<0.34	<0.38	<0.38	<0.41	-	-
Endrin	<0.26	<0.29	<0.29	0.33 J	0.31	0.78
Endrin Aldehyde	<0.25	<0.28	<0.28	<0.30	-	-
Heptachlor	<0.29	<0.32	<0.32	<0.35	-	-
Heptachlor Epoxide	<0.24	<0.26	<0.26	<0.28	-	-
Toxaphene	<11	<12	<12	<13	-	-
2,4'-DDD	<0.26	<0.29	<0.29	<0.31	see total DDT	see total DDT
4,4'-DDD	<0.33	0.72 J	<0.37	<0.40	see total DDT	see total DDT
2,4'-DDE	<0.23	<0.25	<0.26	<0.28	see total DDT	see total DDT
4,4'-DDE	<0.39	0.52 J	<0.43	0.61 J	see total DDT	see total DDT
2,4'-DDT	<0.18	<0.20	<0.20	<0.22	see total DDT	see total DDT
4,4'-DDT	<0.42	<0.47	<0.47	<0.51	see total DDT	see total DDT
Total Detected DDT	**0.0**	**1.24 J**	**0.0**	**0.61 J**	**2.8**	**7.0**

All results below laboratory method detection limit (MDL) are reported as < the MDL.

J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit; the reported value is therefore an estimate.

Table 4-7. WesPac Marine Terminal MET Metals Concentrations (mg/kg, dry wt).

Metals	TR-DU1	TR-DU2	TR-DU3	TR-DU4	SFRWQCB Basin Plan Water Quality Objectives	
					Continuous Conc. (4-day avg.)	Maximum Conc. (1-hr avg.)
Dissolved Arsenic	0.843	1.79	1.07	2.10	36[a]	69[a]
Dissolved Cadmium	0.205	0.0428	0.0332	0.0432	9.3[a]	42[a]
Dissolved Chromium	<0.0937	<0.0937	<0.0937	<0.0937	-[f]	-[f]
Dissolved Copper	0.235	0.196	0.163	0.251	6.0[c]	9.4[e]
Dissolved Lead	<0.0124	<0.0124	<0.0124	<0.0124	8.1[a]	210[a]
Dissolved Mercury	<0.005	<0.005	<0.005	<0.005	-[f]	-[f]
Total Mercury	0.00167	0.00179	0.00152	0.00171	-[f]	2.1[d]
Dissolved Nickel	2.35	1.85	1.41	3.17	8.2[b]	74[b]
Total Selenium	0.135	0.0171 J	<0.0112	0.192	5[a]	20[a]
Dissolved Silver	0.180	0.166	0.172	0.164	-[f]	1.9[a]
Dissolved Zinc	2.37	3.90	3.16	5.21	81[a]	90[a]
TSS	5.2	4.6	6.6	11	-	-

a - California Toxics Rule Criteria (USEPA).
b - USEPA National Recommended Ambient Water Quality Criteria.
c - SFRWQCB Basin Plan 2007.
d - SFRWQCB Basin Plan Amendment 2008.
e - SFRWQCB Basin Plan Amendment 2009.
f - no criteria available.
J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit; the reported value is therefore an estimate.

4.3 Results of the Biological Testing

Three different biological tests were performed for each site composite sample:

1. a 10-day amphipod survival test with the amphipod *Eohaustorius estuarius*,
2. a 10-day juvenile polychaete survival test with the polychaete *Neanthes arenaceodentata*,
3. a 96-hr mysid survival test with the mysid shrimp *Americamysis bahia*.

All tests were performed following appropriate protocols as outlined in the SAP (Olberding 2011). Test data and summaries of the statistical analyses for the bioassays are provided in Appendices D-J. Summaries of test conditions and test acceptability criteria are provided in Appendix K.

4.3.1 Benthic Toxicity Testing

Solid-phase bioassays were conducted with the amphipod *E. estuarius* and the polychaete *N. arenaceodentata*. A summary of the measured concentrations of total ammonia and total sulfides in the sediment porewaters, and summary tables of the total ammonia concentrations measured in the test overlying waters are presented in Appendix D.

Positive and negative Control treatments were tested concurrently with the bioassays. The positive Control for both benthic species consisted of a 96-hr waterborne reference toxicant test. The results of these tests were compared to PER's in-house reference toxicant test response databases to determine whether these test organisms were responding to toxic stress in a typical fashion. The negative Control for *E. estuarius* consisted of the "Home" sediment from which the organisms were originally collected. The negative Control for *N. arenaceodentata* consisted of a homogenized mixture of previously collected clean reference site sediments that has been maintained at the PER lab.

Site sediments were compared to the concurrent Control sediment test to determine the potential impact of whole sediment on benthic organisms at the placement site (i.e. Winter Island or the MWP). Comparative guidelines for acceptance were followed as listed below:

1. If survival is greater in the proposed dredged sediments than in Control sediment, the proposed dredged sediments are <u>not</u> acutely toxic to benthic organisms.
2. If the difference between the survival response in the site sediment and the Control sediment is ≤20% for amphipods or ≤10% for polychaetes, the test sediments are <u>not</u> acutely toxic to benthic organisms.
3. If the difference between the survival response in the site sediment and the Control sediment is >20% for amphipods or >10% for polychaetes, then the respective survival responses must be statistically compared. If a statistically significant reduction in survival is observed for the site sediment, then the site sediment is considered to be acutely toxic to benthic organisms.

4.3.1.1 Sediment Porewater Characterization

Prior to the initiation of the sediment tests, composited, homogenized sediments were removed from refrigerated storage, and each sample was re-homogenized in a large stainless steel bowl. Aliquots of the re-homogenized composite sediments were centrifuged at 2,500 g for 15 minutes; the resulting supernatant porewaters were carefully collected and analyzed for ammonia (Table 4-8).

Table 4-8. Sediment Porewater Initial Water Ammonia Levels.

Sample ID	Total Ammonia (mg/L N)
TR-DU1-Comp	-*
TR-DU2-Comp	9.92
TR-DU3-Comp	-*
TR-DU4-Comp	16.8

* - Insufficient volume of porewater retrieved for measurement.

4.3.1.2 Purging of Sediment Porewater Ammonia for the Amphipod and Polychaete Tests

Due to the measurement of elevated sediment porewater ammonia concentrations in the TR-DU4-COMP composite samples that exceeded the US ACOE guidelines-recommended threshold of 15 mg/L, these sediments were 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. The tests were initiated when analysis of the sediment porewater indicated that the total ammonia concentration for the site sediments were below 15 mg/L. The sediment porewater ammonia data (along with sediment porewater water quality characteristics measured at test termination) are presented in Appendix D.

4.3.1.3 Effects of the WesPac Marine Terminal Sediments on *Eohaustorius estuarius*

The results of these tests are summarized in Table 4-9. There was 100% survival in the Control treatment, indicating an acceptable survival response by the test organisms. There was ≥87% survival in each of the WesPac sediments. There was <20% reduction in survival in each of the site sediments relative to the Control, indicating that the sediments are ***not*** toxic to amphipods.

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

Table 4-9. *Eohaustorius estuarius* Survival in the WesPac Marine Terminal Sediments.

Sediment Site	Mean % Survival
Control	100
TR-DU1-Comp	100
TR-DU2-Comp	94
TR-DU3-Comp	96
TR-DU4-Comp	87

4.3.1.3.1 Reference Toxicant Toxicity to *Eohaustorius estuarius*

The results of this test are presented in Table 4-10. There was 100% survival in the Lab Control treatment. The LC_{50} was 1.7 g/L KCl, which is consistent with PER's 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 F.

Table 4-10. Reference Toxicant Testing: Effects of KCl on *Eohaustorius estuarius*.

KCl Treatment (g/L)	Mean % Survival
Lab Control	100
0.25	100
0.5	100
1	100
2	**25***
4	**0***
LC_{50} =	1.7 g/L KCl
Typical Response Range (mean ± 2 SD) =	1.1 – 2.3 g/L KCl

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

4.3.1.4 Effects of the WesPac Marine Terminal Sediments on *Neanthes arenaceodentata*

The results of these tests are summarized in Table 4-11. There was 100% survival at the Control treatment, indicating an acceptable survival response by the test organisms. There was ≥96% survival in each of the WesPac sediments. There was <10% reduction in survival in each of the site sediments relative to the Control, indicating that the sediments are ***not*** toxic to polychaetes.

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

Table 4-11. *Neanthes arenaceodentata* Survival in the WesPac Marine Terminal Sediments.

Sediment Site	Mean % Survival
Control	100
TR-DU1-Comp	98
TR-DU2-Comp	96
TR-DU3-Comp	98
TR-DU4-Comp	96

4.3.1.4.1 Reference Toxicant Toxicity to *Neanthes arenaceodentata*

The results of this test are presented in Table 4-12. There was 100% survival in the Lab Control treatment. The EC_{50} was 2.8 g/L KCl, which is consistent with PER's 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 H.

Table 4-12. Reference Toxicant Testing: Effects of KCl on *Neanthes arenaceodentata*.

KCl Treatment (g/L)	Mean % Survival
Lab Control	100
0.25	100
0.5	100
1	100
2	100
4	**0***
LC_{50} =	2.8 g/L KCl
Typical Response Range (mean ± 2 SD) =	0.81 – 2.9 g/L KCl

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

4.3.2 Effects of WesPac Marine Terminal MET on *Americamysis bahia*

The results of these tests are summarized below in Table 4-13. There was 97.8% survival at the Control treatment, indicating an acceptable survival response by the test organisms. There was ≥92% survival in each of the MET elutriates, none of which were significantly less than the Control, indicating that the MET samples were not toxic to *A. bahia*.

The test data and summary of statistical analyses for these tests are attached as Appendix I.

Table 4-13. Effects of WesPac Marine Terminal MET elutriates on *Americamysis bahia*.

Test Treatment	Mean % Survival
Lab Control	97.8
TR-DU1-Comp	100
TR-DU2-Comp	98
TR-DU3-Comp	100
TR-DU4-Comp	92

4.3.2.1 Reference Toxicant Toxicity to *Americamysis bahia*

The results of this test are summarized in Table 4-14. There was 100% survival in the Lab Control treatment; the LC_{50} was 0.42 g/L KCl, which is consistent with the typical response range established by the reference toxicant test database, 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 J.

Table 4-14. Reference Toxicant Testing: Effects of KCl on *Americamysis bahia*.

KCl Treatment (g/L)	Mean % Survival
Lab Control	100
0.125	100
0.25	92.5
0.5	**32.5***
1	**0***
2	**0***
LC_{50} =	0.42 g/L KCl
Typical Response Range (mean ± 2 SD)	0.34–0.72 g/L KCl

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

5. QUALITY CONTROL REVIEW

Any analyses that did not comply with the analytical laboratory QA/QC limits are presented below (also, see final analytical reports in Appendices B and C for full case narratives).

5.1 Sediment Conventional and Chemical Analytical QA/QC Summary

The QA/QC review entailed reviewing the contract lab Data Report(s) for sample integrity, correct methodology, and compliance with all appropriate Lab QA/QC requirements. The overall data quality assessment found that all data were usable. Appendix B contains the conventional and chemical analyses reports, which include contract laboratory QA/QC narratives.

Organochlorine Pesticides (Sediment analysis)– The MS, MSD, and/or RPDs for gamma-BHC, dieldrin, 4.4'-DDT, endosulfan I, endosulfan sulfate, and endrin aldehyde compounds (by EPA 8081A) fell outside the established control limits due to matrix interference. However, since the LCS/LCSD recoveries/RPDs were within control limits, no further action was taken.

Organotins (Sediment analysis) – The tetrabutyltin matrix spike duplicate recovery was above the established control limit due to matrix interference. However, since the associated MS, LCS, and LCSD recoveries were within control limits, no further action was taken.

5.2 MET Analytical QA/QC Summary

Appendix C contains the MET analyses reports, which include contract laboratory QA/QC narratives.

Metals (MET analysis) – The MS, MSD, and/or RPDs recovery for chromium, copper, and lead exceeded control limits due to matrix interference. The associated LCS and/or LCSD recoveries/RPDs were within control limits and, therefore, no further action was taken. Spike recovery and RPD control limits for nickel do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.

5.3 Biological Testing Quality Lab Control Summary

The biological testing of the WesPac Marine Terminal sediments incorporated standard QA/QC procedures to ensure that the test results were valid. Standard QA/QC procedures included the use of negative control treatments, positive control treatments, 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/ACOE (1998). Sediments for the bioassay testing were stored appropriately at ≤4°C and were used within the 8 week holding time period. Sediment interstitial

water characteristics were within test acceptability limits at the start of the tests. The overlying water in the benthic sediment toxicity tests and the sediment bioaccumulation tests consisted of high-quality natural seawater diluted to the test salinity using Type 1 lab water. Sediment elutriates were prepared using site water, and high-quality natural seawater diluted to the test salinity using Type 1 lab water was used as the dilution medium.

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. Standard test conditions are presented in Appendix K.

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

Positive Lab Control – The accuracy of the responses of the test organisms to toxic stress was evaluated using positive Lab Controls (reference toxicant testing). The key test concentration-response LC and/or EC point estimates determined for each test species were all within the respective typical response ranges for these species, indicating that these test organisms were responding to toxic stress in a typical fashion.

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

6. SUMMARY

The WesPac Marine Terminal sediments were analyzed to determine suitability of the material to be dredged for placement at Winter Island or MWP.

All sediment analytical chemistry results were similar to or below Bay ambient concentrations and MET metals concentrations were below WQOs (SFRWQCB 1998); toxicity test results indicate that the sediments were not toxic. As a result, all of the WesPac sediments would be considered suitable for placement at the Winter Island or MWP. These results indicate that the sediments would also be suitable for placement at other wetland beneficial reuse sites. Sediments will be archived for up to a year should additional site-specific analytical chemistry be required for other alternative disposal sites.

7. REFERENCES

ASTM (2008) 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 (2008) 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.

Olberding Environmental, Inc. (2011) Sediment Sampling Plan for the WesPac Energy-Pittsburg LLC: Marine Terminal Dredging Project. Prepared for WesPac Energy-Pittsburg, LLC, 2355 Main Street, Suite 210, Irvine, CA, 92614.

SFRWQCB (1998) Ambient concentrations of toxic chemicals in San Francisco Bay Sediments: Draft Staff Report. San Francisco Regional Water Quality Lab Control Board, Oakland, CA.

USACE (1985) Technical Note EEDP 04-2. Interim Guidance for Predicting Quality of Effluent Discharged from Confined Dredged Material Disposal Areas During Dredging Operations. U.S. Army Engineer Waterways Experiment Station, Environmental Laboratory, June 1985.

US EPA (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.

U.S.EPA/ACOE (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.

US EPA (1991) '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.

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. U.S. Environmental Protection Agency, Office of Water (4305).

Appendix A

Sampling Field Logs and Data Sheets

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-01 **Date:** 11/3/11

Project Name: WESPAC **Project No.:** 18916

Coordinates: #2: 38°02.597' #2: 121°53.~~660~~ 662'

Lat/Northing: ~~38° 02.566~~ 38°02.595' Long/Easting: ~~121°53.445~~ 121°53.657'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' + Z

	Attempt 1	Attempt 2
Time:	0750	10:20
(A) Measured Water Depth	33.0'	35.2'
(B) Tide Height	2.7'	3.4'
(C) Mudline Elevation (A–B=C)	30.3'	31.8'
(D) Calculated Core Length (PD+OD-C=D)	~~10.2~~ 9.7'	8.2'
Estimated Penetration	~.2'	8.2'
Description of Core Drive	Slow - refusal @ -6.2'	Slow, smooth penetration
Refusal Encountered?	Yes	No
Total Core Length Recovered	5.0'	6.9'

Core Characteristics

Sediment Type	cobble, gravel, (sand) C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray), black, (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	homogenous	

Comments: Very strong current (flood) at time of core deployment
Hard refusal @ -6.2' Core time ~10 min.
- Core split into 2 sections. (ATT #1)

Due to refusal, Returned to site and moved ~20' North of dolphin. for a second attempt

Recorded by:

ATTempt #2 split into 3 sections for transport to Lab

~~Because ATT 2 was successful~~

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-02 **Date:** 11/3/11

Project Name: WESPAC **Project No.:** 18916

Coordinates:

Lat/Northing: 38° 02.568' Long/Easting: 121° 53.615' .620'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' + Z

	Attempt 1	Attempt 2
Time:	09:20	
(A) Measured Water Depth	25.1'	
(B) Tide Height	~~2.9~~ 3.4'	
(C) Mudline Elevation (A–B=C)	21.7'	
(D) Calculated Core Length (PD+OD-C=D)	18.3'	
Estimated Penetration	18.3'	
Description of Core Drive	Slow but smooth.	
Refusal Encountered?	No	
Total Core Length Recovered	12.0'	

Core Characteristics

Sediment Type	cobble, gravel, (sand) C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray), black, (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	homogenous	

Comments: Core kept intact (5 sections). - 5 sections.
- Z layer is located in the last 0.5' of core tube. will section out at lab.

Recorded by: AB

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-03 **Date:** 11/3/11

Project Name: WESPAC **Project No.:** 18916

Coordinates: 38° 02.602' 121° 53.597

Lat/Northing: ~~38° 02.604'~~ Long/Easting: ~~121° 53.595'~~

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' + 2

	Attempt 1	Attempt 2
Time:	10:45	
(A) Measured Water Depth	33.7'	
(B) Tide Height	3.2'	
(C) Mudline Elevation (A–B=C)	30.5'	
(D) Calculated Core Length (PD+OD-C=D)	9.5'	
Estimated Penetration	~~6.8'~~ 9.5'	
Description of Core Drive	slow, smooth	
Refusal Encountered?	No	
Total Core Length Recovered	6.8'	

Core Characteristics

Sediment **Type**	cobble, gravel, sand C M F, silt clay, organic **matter**	cobble, **gravel, sand C M F,** silt clay, organic **matter**
Sediment **Color**	gray, black, brown, brown **surface, olivine**	gray, **black, brown,** brown **surface,** olivine
Sediment **Odor**	None, slight, **mod, strong** H_2S, **petroleum,** septic	None, **slight,** mod, strong H_2S, petroleum, septic
Any **Layering Homogenous**	homogenous	

Comments: Core split into 3 sections
- Due to high winds + current, moved location ~10-15' away from wharf for safety.
- Z Layer located in bottom 0.5' of Core.

Recorded by: dg

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-04 **Date:** 11/3/11

Project Name: WESPAC **Project No.:** 1896

Coordinates: 38° 02.599' 121° 53.577

Lat/Northing: ~~38° 02.601'~~ Long/Easting: ~~121° 53.573'~~

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0+2

	Attempt 1	Attempt 2
Time:	11:10	
(A) Measured Water Depth	31.7'	
(B) Tide Height	3.2'	
(C) Mudline Elevation (A–B=C)	28.5'	
(D) Calculated Core Length (PD+OD-C=D)	11.5'	
Estimated Penetration	~~8.5'~~ 11.5'	
Description of Core Drive	Slow	
Refusal Encountered?	No	
Total Core Length Recovered	8.5'	

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray) black (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	homogenous	

Comments: Good Core
3 Layer located @ bottom of Core (for sectioning @ Lab)
-Core split into 3 sections for processing @ Lab.

-Station moved north due to hard substrate resulting in refusal above Project Depth

Recorded by: DS

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-05 **Date:** 11/3/11

Project Name: WESPAC **Project No.:** 18916

Coordinates:

Lat/Northing: ~~38°02.604'~~ 38°02.601' Long/Easting: ~~121°53.546'~~ 121°53.548'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' + Z

	Attempt 1	Attempt 2
Time:	1200	
(A) Measured Water Depth	25.9'	
(B) Tide Height	2.6'	
(C) Mudline Elevation (A–B=C)	23.3'	
(D) Calculated Core Length (PD+OD-C=D)	16.7'	
Estimated Penetration	16.7'	
Description of Core Drive	Steel Smooth	
Refusal Encountered?	No	
Total Core Length Recovered	12.9'	

Core Characteristics

Sediment Type	cobble, gravel, (sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray), black, (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	Homogenous	

Comments: Good Core.
2 Cores located @ bottom of Core tube for processing @ PER
Core split into 5 sections

- Station moved north due to hard substrate resulting in refusal above project depth.

Recorded by: dc

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-6 **Date:** 11/3/11

Project Name: WESPAC **Project No.:** 18916

Coordinates: Att #2: 38° 02. 598' Att #2: 121° 53. 509'. 512'

Lat/Northing: 38° 02. 595' Long/Easting: 121° 53. 503'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' + 2

	Attempt 1	Attempt 2
Time:	1340	1410
(A) Measured Water Depth	~~20.9~~ 21.9'	22.9'
(B) Tide Height	2.0'	2.0'
(C) Mudline Elevation (A–B=C)	19.9'	20.9'
(D) Calculated Core Length (PD+OD-C=D)	20.1'	19.1'
Estimated Penetration	16.0'	19.1'
Description of Core Drive	slow/hard refusal	slow
Refusal Encountered?	Yes	No
Total Core Length Recovered	11.75'	14.5'

Core Characteristics

Sediment Type	cobble, gravel, sand, (C) M F, silt clay, organic matter	cobble, gravel, sand, C (M) F, silt clay, organic matter
Sediment Color	(gray), black, (brown), brown surface, olivine	(gray), black, (brown), brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	(None), slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	homogenous	homogenous

Comments: Hit hard refusal on 1st attempt. ~~Moved ~30' off wharf pool for 2nd attempt.~~
- 2nd attempt was located ~30' off wharf-pool in the vicinity of the proposed sampling location.

Att #1 not retained as it did not reach full P.D. ~~note~~

Recorded by: DB

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-7 **Date:** 11/3/11

Project Name: WESPAC **Project No.:** 18916

Coordinates:
Lat/Northing: 38° 02.601' ~~38° 02.604'~~ Long/Easting: 121° 53.472' ~~121° 53.474'~~

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' +Z

	Attempt 1	Attempt 2
Time:	1625	
(A) Measured Water Depth	19.5'	
(B) Tide Height	1.1'	
(C) Mudline Elevation (A–B=C)	18.4'	
(D) Calculated Core Length (PD+OD-C=D)	21.6'	
Estimated Penetration	21.6'	
Description of Core Drive	Slow/smooth	
Refusal Encountered?	No	
Total Core Length Recovered	18.1'	

Core Characteristics

Sediment Type	cobble, gravel, (sand C M F), silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray), black, (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	homogenous	

Comments: Peat @ bottom of Core
Core Catcher material retained as Z Layer
Core split into 6 sections.

- Lat/Long provided placed as outside dredge limits (towards shore). Sample was collected a location as best we could locate it based on the charts provided.

Recorded by: DG

- Station moved north due to hard substrate resulting in refusal above project depth

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-08 **Date:** 11/2/11

Project Name: WESPAC **Project No.:** 18916

Coordinates: #2: 38° 02.~~5880~~.589' #2: 122° 53.~~4490~~.447'

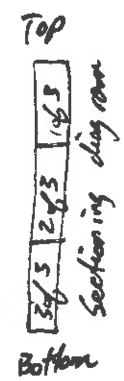
Lat/Northing: 38° 02.5880' Long/Easting: 122°53.4450'

Vertical Datum: **MLLW** (circled) MLW Other:

Depth Measurement: Sounder **Leadline** (circled)

Project Depth: 38.0' **Overdredge:** 2.0' +2

	Attempt 1	Attempt 2
Time:	10:00	1040
(A) Measured Water Depth	20.2	19.5'
(B) Tide Height	3.1	3.5
(C) Mudline Elevation (A–B=C)	17.1	16
(D) Calculated Core Length (PD+OD-C=D)	23.4'	24.5'
Estimated Penetration	9.2'	9.2'
Description of Core Drive	9.2'	9.3'
Refusal Encountered?	Yes	Yes
Total Core Length Recovered	9.2'	9.3'



Core Characteristics

Sediment Type	cobble, gravel, **sand** **C** **M** F, silt clay, organic matter	cobble, gravel, **sand** C M F, silt clay, **organic matter**
Sediment Color	**gray**, black, **brown**, brown surface, olivine	**gray**, black, **brown**, brown surface, olivine
Sediment Odor	**None**, slight, mod, strong H_2S, petroleum, septic	**None**, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	homogenous	homogenous
Comments: Collected 2 cores. Both hit refusal about ~~nine~~ 9' below Sediment surface. Both Cores were mostly sand. ATT #2 had a large ammount of dry peat/pulp like material.		

Recorded by: DG

Each Core was retained and cut into 3 sections for transport to The Lab.

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-09 **Date:** 11/2/11

Project Name: WESPAC **Project No.:** 18916

Coordinates:
Lat/Northing: 38°02.612' Long/Easting: 121° 53.665+.663

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 36' **Overdredge:** 2.0' + 2

	Attempt 1	Attempt 2
Time:	1755	
(A) Measured Water Depth	38.0'	
(B) Tide Height	2.7'	
(C) Mudline Elevation (A–B=C)	35.3'	
(D) Calculated Core Length (PD+OD-C=D)	4.7'	
Estimated Penetration	4.7'	
Description of Core Drive	slow - very slow	
Refusal Encountered?	No	
Total Core Length Recovered	~~4.7~~ 3.6'	

Core Characteristics

Sediment Type	cobble, gravel, (sand) C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	~~gray~~, ~~black~~, (brown) brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	Homogenous	

Comments: Sand in Core liner was very hard. Compaction is a highly probable reason for the short recovery. Vibracore ran ~10 min to collect the Core

Recorded by: DG

Pacific EcoRisk
Environmental Consulting and Testing

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2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-10 **Date:** 11/2/11

Project Name: WESPAC **Project No.:** 1896

Coordinates:
Lat/Northing: 38° 02.610' .613' Long/Easting: 121° 53.593' .587'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' + Z

	Attempt 1	Attempt 2
Time:	16:45	
(A) Measured Water Depth	32.0'	
(B) Tide Height	1.9'	
(C) Mudline Elevation (A–B=C)	~~31.0~~ 30.1'	
(D) Calculated Core Length (PD+OD-C=D)	9.9'	
Estimated Penetration	9.9'	
Description of Core Drive	Slow, smooth	
Refusal Encountered?	No	
Total Core Length Recovered	5.1'	

Core Characteristics

Sediment Type	cobble, gravel, (sand) C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray), black, (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	Homogenous	

Comments: Core penetrated to 9.9', however due to the 10 min time taken to collect the core, it is possible that the sand inside the core tube compacted and shrank. The core was placed inside a bag and returned.

Recorded by: DB

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID:	TR-11	**Date:**	11/3/11
Project Name:	WESPAC	**Project No.:**	18916
Coordinates: Lat/Northing:	38° 02.~~619~~ .616'	Long/Easting:	~~122~~ 121° 53.~~516~~ .517'
Vertical Datum:	(MLLW) (circled)	MLW	Other:
Depth Measurement:	Sounder	Leadline (circled)	
Project Depth:	38.0'	**Overdredge:**	2.0' + Z

	Attempt 1	Attempt 2
Time:	1500	/
(A) Measured Water Depth	32.0	/
(B) Tide Height	1.1'	/
(C) Mudline Elevation (A–B=C)	30.9'	/
(D) Calculated Core Length (PD+OD-C=D)	9.1'	/
Estimated Penetration	9.1'	/
Description of Core Drive	Smooth	/
Refusal Encountered?	No	/
Total Core Length Recovered	6.5'	/

Core Characteristics

Sediment Type	cobble, gravel, (sand) (C) M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray), black, (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	homogenous	/

Comments: - Due to foul weather, we could not position over proposed location. Core was collected ~20' N of proposed location.
- Core cut into 3 sections, Z layer is @ bottom of core for sectioning @ PER

Recorded by: [signature]

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-12 **Date:** 11/3/11

Project Name: WESPAC **Project No.:** 18916

Coordinates:

Lat/Northing: 38°02.607*.610 Long/Easting: 121°53.462*.467'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' +Z

	Attempt 1	Attempt 2
Time:	1605	
(A) Measured Water Depth	25.0'	
(B) Tide Height	1.0'	
(C) Mudline Elevation (A–B=C)	24.0'	
(D) Calculated Core Length (PD+OD-C=D)	16.0'	
Estimated Penetration	15.1'	
Description of Core Drive	slow.	
Refusal Encountered?	Yes	
Total Core Length Recovered	12.0'	

Core Characteristics

Sediment Type	cobble, gravel, (sand) C M F, silt clay, organic matter	cobble, **gravel**, sand C M F, silt clay, organic matter
Sediment Color	(gray), black, (brown), brown surface, olivine	gray, **black**, brown, brown **surface**, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, **strong** H_2S, petroleum, septic
Any Layering Homogenous	homogenous	

Comments: material in cutter head retained as Z-layer
Core split into 5 sections

Recorded by: DS

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-13 **Date:** 11/2/11

Project Name: WESPAC **Project No.:** 18916

Coordinates: ~~N 38°02.628'~~ ~~W 121°53.572'~~

Lat/Northing: 38°02.628'.634' Long/Easting: 121°53.572'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0 + 2

	Attempt 1	Attempt 2
Time:	16:00	
(A) Measured Water Depth	35.6'	
(B) Tide Height	1.6'	
(C) Mudline Elevation (A-B=C)	34.0'	
(D) Calculated Core Length (PD+OD-C=D)	6.0'	
Estimated Penetration	4.2'	
Description of Core Drive	very slow.	
Refusal Encountered?	Yes	
Total Core Length Recovered	~~+5'~~ 4.2'	

Core Characteristics

Sediment Type	cobble, gravel, (sand) C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray) black (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	Layering	

Comments: Water was too ~~shallow~~ deep over proposed location. moved boat towards TR-14, as the water shoaled up a little bit.
core penetration. took ~15 min to penetrate as far as core did.

Recorded by: DS

Pacific EcoRisk
Environmental Consulting and Testing

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Sediment Core Collection Form

Station ID: TR-15 14 **Date:** 11/2/11

Project Name: WESPAC **Project No.:** 18916

Coordinates: #2 38° 02.644' #2: 121° 53.548'

Lat/Northing: 38° 02.6410' Long/Easting: 121° 53.540'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38.0' **Overdredge:** 2.0' + 2

	Attempt 1	Attempt 2
Time:	14:30	14:50
(A) Measured Water Depth	38.0'	37.8'
(B) Tide Height	1.2'	1.1'
(C) Mudline Elevation (A–B=C)	36.8'	36.7'
(D) Calculated Core Length (PD+OD-C=D)	3.2'	3.3'
Estimated Penetration	2.0'	1.5'
Description of Core Drive	very slow	very slow
Refusal Encountered?	Yes	Yes
Total Core Length Recovered	~~2.0~~ 1.0'	1.5'

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, (organic matter)	cobble, gravel, sand C M F, silt clay, (organic matter)
Sediment Color	gray, black, (brown), brown surface, olivine	(gray), black, (brown), brown surface, olivine
Sediment Odor	None, slight, (mod), strong (H_2S), petroleum, septic	None, (slight), mod, strong (H_2S), petroleum, septic
Any Layering Homogenous	Homogenous	Layering
Comments:	ATT#1: The only material remaining in core was chunks of peat. ATT#2: 1.5' recovered - kept material as it made it into O.D. - 3rd attempt made.	

Recorded by: DC

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TIZ-15 **Date:** 11/2/11

Project Name: WESPAC **Project No.:** 1896

Coordinates: ~~#238° 02.6500', 646'~~ #2: 121°53.491~~0~~'

Lat/Northing: 38° 02.6500' Long/Easting: ~~122°~~121° 53.4910'

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38.0 **Overdredge:** 2.0'

	Attempt 1	Attempt 2
Time:	13:10	13:30
(A) Measured Water Depth	~~38.1~~ 37.5'	37.6'
(B) Tide Height	1.5'	1.4'
(C) Mudline Elevation (A–B=C)	36.0'	36.2'
(D) Calculated Core Length (PD+OD-C=D)	~~4.5~~ 4.0'	3.8'
Estimated Penetration	4.0'	3.8'
Description of Core Drive	slow	very slow
Refusal Encountered?	Yes	Yes
Total Core Length Recovered	1.5'	3.8'

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown, brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	homogenous	Layering

Comments: Lots of peat in Core Catcher. Very Spongy.
Attempt #1: top 1.0' was coarse sand, below that was a peat layer that the Core could not penetrate.

ATT #2 was retained due to better recovery

Recorded by: DB

ATT#2: Drive was very slow Top 1.0' was peat, Bottom 2.8' was sand
2-Layer was dry peat.

Pacific EcoRisk
Environmental Consulting and Testing

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2250 Cordelia Road
Fairfield, CA 94534
Phone: (707) 207-7760
Fax: (707) 207-7916

Sediment Core Collection Form

Station ID: TR-16 **Date:** 11/2/11

Project Name: WESPAC **Project No.:** 18916

Coordinates: 38° 02.6440' .638' 121° 53.444' .439'

Lat/Northing: ~~38° 04394~~ Long/Easting: ~~121 89079~~

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: Sounder (Leadline)

Project Depth: 38' **Overdredge:** 2.0' +2

	Attempt 1	Attempt 2
Time:	11:15	
(A) Measured Water Depth	~~40.0'~~ 37.2'	
(B) Tide Height	~~3.3'~~ 3.2'	
(C) Mudline Elevation (A–B=C)	~~36.7'~~ 34'	
(D) Calculated Core Length (PD+OD-C=D)	~~3.8'~~ 6.0'	
Estimated Penetration	6.0'	
Description of Core Drive	Slow refusal encountered at very end of drive.	
Refusal Encountered?	Yes	
Total Core Length Recovered	6.0'	

Core Characteristics

Sediment Type	cobble, gravel, (sand) C M F, silt clay, (organic matter)	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	(gray) black, (brown), brown surface, olivine	gray, black, brown, brown surface, olivine
Sediment Odor	(None), slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogenous	* layered	
Comments: Due to deep water, moved sampling location ~ 40' towards wharf face. Peat material in Cutter-head. - Core cut into 3 sections.		

Recorded by: DG

2-Cores Collected

Appendix B

Analytical Chemistry Laboratory Data Report Submitted by CalScience: Results of Sediment Analysis

Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 11-11-1599

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Pacific Ecorisk

Client Project Name: Marine Terminal Dredging Project

Attention: Jeff Cotsifas
2250 Cordelia Road
Fairfield, CA 94534-1912

Approved for release on 12/8/2011 by:
Danielle Gonsman
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.

Calscience Environmental Laboratories, Inc.

Contents

Client Project Name: Marine Terminal Dredging Project
Work Order Number: 11-11-1599

Calscience Environmental Laboratories, Inc.

ACCREDITED IN ACCORDANCE WITH nelac

CASE NARRATIVE

Calscience Work Order No.: 11-11-1599
Project ID: Marine Terminal Dredging Project

Provided below is a narrative of our analytical effort, including any unique features or anomalies encountered as part of the analysis of the sediment samples.

Sample Condition on Receipt

Four sediment samples (housed in 16-oz glass containers and poly bags) were received for this project on November 19, 2011. The samples were transferred to the laboratory in an ice-chest with wet ice, following strict chain-of-custody (COC) procedures. The temperature of the samples upon receipt at the laboratory was 1.5°C. All samples were given laboratory identification numbers, logged into the Laboratory Information Management System (LIMS) and then stored under refrigeration pending sediment chemistry testing.

Tests Performed

Trace Metals by EPA 6020/7471A
Chlorinated Pesticides by EPA 8081A
PCB Congeners by EPA 8270C SIM
PAHs by EPA 8270C SIM
Total Organic Carbon by EPA 9060A
Organotins by Krone et al.
Total Solids by SM 2540B
Grain Size by ASTM 4464M

Data Summary

The sample results and reporting limits were dry weight corrected.

All samples were homogenized prior to preparation and analysis.

Holding times

All holding times were met unless otherwise noted.

All samples were received outside the EPA Method recommended 14-day holding time for OC Pesticides, Organotins, PCBs and PAHs, and the 10-day holding time for Total Solids. We have been advised by the client that these samples were frozen after collection (prior to receipt at the laboratory) and remained in that condition until received by Calscience. Calscience follows standard industry practice and the Puget Sound protocol for holding times in sediment samples, which states the holding time may be extended up to one year if kept frozen after collection. Therefore, the results have not been flagged as exceeding the EPA recommended extractions holding time.

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Calibration

Frequency and control criteria for initial and continuing calibration verifications were met.

Reporting Limits

All Method Detection Limits were met. The results were evaluated to the MDL, and where applicable, "J" flags were reported.

Blanks

Concentrations of target analytes in the method blank were found to be below reporting limits for all testing.

Laboratory Control Samples

A Laboratory Control Sample (LCS) analysis was performed at the required frequencies, and unless otherwise noted, all parameters were within the established control limits.

Matrix Spikes

Matrix spike analyses were performed for each applicable analysis on project sample TR-DU1-Comp. All parameters were within the established control limits with the following exceptions.

The Tetrabutyltin (by Krone et. al.) matrix spike duplicate recovery was above the established control limit due to matrix interference. However, since the associated MS, LCS and LCSD recoveries were in control, the data are released with no further action.

The MS, MSD and/or RPDs for several Chlorinated Pesticide compounds (by EPA 8081A) fell outside the established control limits due to matrix interference. The results are flagged with the appropriate qualifiers and are released with no further action since the LCS/LCSD recoveries are in control.

Surrogates

Surrogate recoveries for all applicable tests and samples were within the established control limits.

Laboratory Duplicate

A laboratory duplicate was created for this project using Sample TR-DU1-Comp. The lab dup was analyzed for the requested analyses and the precision between the two samples was acceptable.

Return to Contents

Acronyms

LCS/LCSD- Laboratory Control Sample/Laboratory Control Sample Duplicate
PDS/PDSD- Post Digestion Spike/Post Digestion Spike Duplicate
MS/MSD- Matrix Spike/Matrix Spike Duplicate
ME-Marginal Exceedance
RPD- Relative Percent Difference

Return to Contents

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	EPA 9060A

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp	**11-11-1599-1-A**	**11/03/11 07:50**	**Sediment**	**TOC 5**	**N/A**	**11/30/11 13:03**	**B1130TOCL2**

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

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	0.51	0.064	0.016	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-Comp	**11-11-1599-2-A**	**11/02/11 10:00**	**Sediment**	**TOC 5**	**N/A**	**11/30/11 13:03**	**B1130TOCL2**

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

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	1.4	0.071	0.017	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-Comp	**11-11-1599-3-A**	**11/02/11 16:45**	**Sediment**	**TOC 5**	**N/A**	**11/30/11 13:03**	**B1130TOCL2**

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

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	1.1	0.072	0.017	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-Comp	**11-11-1599-4-A**	**11/02/11 13:10**	**Sediment**	**TOC 5**	**N/A**	**11/30/11 13:03**	**B1130TOCL2**

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

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	2.5	0.078	0.019	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp (LAB DUP)	**11-11-1599-9-A**	**11/03/11 07:50**	**Sediment**	**TOC 5**	**N/A**	**11/30/11 13:03**	**B1130TOCL2**

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

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	0.49	0.064	0.016	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-06-013-657**	**N/A**	**Solid**	**TOC 5**	**N/A**	**11/30/11 13:03**	**B1130TOCL2**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Carbon, Total Organic	ND	0.050	0.012	1		%

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	SM 2540 B

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp	**11-11-1599-1-A**	**11/03/11 07:50**	**Sediment**	**N/A**	**11/21/11**	**11/21/11 14:00**	**B1121TSB2**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	78.0	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-Comp	**11-11-1599-2-A**	**11/02/11 10:00**	**Sediment**	**N/A**	**11/21/11**	**11/21/11 14:00**	**B1121TSB2**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	70.1	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-Comp	**11-11-1599-3-A**	**11/02/11 16:45**	**Sediment**	**N/A**	**11/21/11**	**11/21/11 14:00**	**B1121TSB2**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	69.4	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-Comp	**11-11-1599-4-A**	**11/02/11 13:10**	**Sediment**	**N/A**	**11/21/11**	**11/21/11 14:00**	**B1121TSB2**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	64.5	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp (LAB DUP)	**11-11-1599-9-A**	**11/03/11 07:50**	**Sediment**	**N/A**	**11/21/11**	**11/21/11 14:00**	**B1121TSB2**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	78.1	0.100	1		%

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-05-019-1,775**	**N/A**	**Solid**	**N/A**	**11/21/11**	**11/21/11 14:00**	**B1121TSB2**

Parameter	Result	RL	DF	Qual	Units
Solids, Total	ND	0.100	1		%

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8081A
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp	**11-11-1599-1-A**	**11/03/11 07:50**	**Sediment**	**GC 51**	**11/22/11**	**11/30/11 15:16**	**111122L16**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.3	0.40	1		Endosulfan I	ND	1.3	0.46	1	
Alpha-BHC	ND	1.3	0.38	1		Endosulfan II	ND	1.3	0.22	1	
Beta-BHC	ND	1.3	0.33	1		Endosulfan Sulfate	ND	1.3	0.34	1	
Delta-BHC	ND	1.3	0.41	1		Endrin	ND	1.3	0.26	1	
Gamma-BHC	ND	1.3	0.29	1		Endrin Aldehyde	ND	1.3	0.25	1	
Chlordane	ND	13	5.1	1		Endrin Ketone	ND	1.3	0.39	1	
Dieldrin	ND	1.3	0.29	1		Heptachlor	ND	1.3	0.29	1	
Trans-nonachlor	ND	1.3	0.70	1		Heptachlor Epoxide	ND	1.3	0.24	1	
2,4'-DDD	ND	1.3	0.26	1		Methoxychlor	ND	1.3	0.21	1	
2,4'-DDE	ND	1.3	0.23	1		Toxaphene	ND	26	11	1	
2,4'-DDT	ND	1.3	0.18	1		Alpha Chlordane	ND	1.3	0.33	1	
4,4'-DDD	ND	1.3	0.33	1		Oxychlordane	ND	1.3	0.38	1	
4,4'-DDE	ND	1.3	0.39	1		Gamma Chlordane	ND	1.3	0.33	1	
4,4'-DDT	ND	1.3	0.42	1		Cis-nonachlor	ND	1.3	0.69	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	110	50-130		Decachlorobiphenyl	72	50-130	

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 3545
		Method:	EPA 8081A
		Units:	ug/kg
Project: Marine Terminal Dredging Project			Page 2 of 5

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-Comp	**11-11-1599-2-A**	**11/02/11 10:00**	**Sediment**	**GC 51**	**11/22/11**	**11/30/11 15:31**	**111122L16**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.4	0.44	1		Endosulfan I	ND	1.4	0.51	1	
Alpha-BHC	ND	1.4	0.42	1		Endosulfan II	ND	1.4	0.25	1	
Beta-BHC	ND	1.4	0.36	1		Endosulfan Sulfate	ND	1.4	0.38	1	
Delta-BHC	ND	1.4	0.45	1		Endrin	ND	1.4	0.29	1	
Gamma-BHC	ND	1.4	0.33	1		Endrin Aldehyde	ND	1.4	0.28	1	
Chlordane	ND	14	5.7	1		Endrin Ketone	ND	1.4	0.43	1	
Dieldrin	ND	1.4	0.32	1		Heptachlor	ND	1.4	0.32	1	
Trans-nonachlor	ND	1.4	0.78	1		Heptachlor Epoxide	ND	1.4	0.26	1	
2,4'-DDD	ND	1.4	0.29	1		Methoxychlor	ND	1.4	0.24	1	
2,4'-DDE	ND	1.4	0.25	1		Toxaphene	ND	29	12	1	
2,4'-DDT	ND	1.4	0.20	1		Alpha Chlordane	ND	1.4	0.37	1	
4,4'-DDD	0.72	1.4	0.37	1	J	Oxychlordane	ND	1.4	0.43	1	
4,4'-DDE	0.52	1.4	0.43	1	J	Gamma Chlordane	ND	1.4	0.37	1	
4,4'-DDT	ND	1.4	0.47	1		Cis-nonachlor	ND	1.4	0.77	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	72	50-130		Decachlorobiphenyl	51	50-130	

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8081A
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-Comp	**11-11-1599-3-A**	**11/02/11 16:45**	**Sediment**	**GC 51**	**11/22/11**	**11/30/11 15:45**	**111122L16**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.4	0.45	1		Endosulfan I	ND	1.4	0.51	1	
Alpha-BHC	ND	1.4	0.42	1		Endosulfan II	ND	1.4	0.25	1	
Beta-BHC	ND	1.4	0.37	1		Endosulfan Sulfate	ND	1.4	0.38	1	
Delta-BHC	ND	1.4	0.46	1		Endrin	ND	1.4	0.29	1	
Gamma-BHC	ND	1.4	0.33	1		Endrin Aldehyde	ND	1.4	0.28	1	
Chlordane	ND	14	5.8	1		Endrin Ketone	ND	1.4	0.43	1	
Dieldrin	ND	1.4	0.33	1		Heptachlor	ND	1.4	0.32	1	
Trans-nonachlor	ND	1.4	0.79	1		Heptachlor Epoxide	ND	1.4	0.26	1	
2,4'-DDD	ND	1.4	0.29	1		Methoxychlor	ND	1.4	0.24	1	
2,4'-DDE	ND	1.4	0.26	1		Toxaphene	ND	29	12	1	
2,4'-DDT	ND	1.4	0.20	1		Alpha Chlordane	ND	1.4	0.37	1	
4,4'-DDD	ND	1.4	0.37	1		Gamma Chlordane	ND	1.4	0.37	1	
4,4'-DDE	ND	1.4	0.43	1		Oxychlordane	ND	1.4	0.43	1	
4,4'-DDT	ND	1.4	0.47	1		Cis-nonachlor	ND	1.4	0.78	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	65	50-130		Decachlorobiphenyl	51	50-130	

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received:	11/19/11
Work Order No:	11-11-1599
Preparation:	EPA 3545
Method:	EPA 8081A
Units:	ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-Comp	**11-11-1599-4-A**	**11/02/11 13:10**	**Sediment**	**GC 51**	**11/22/11**	**11/30/11 15:59**	**111122L16**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.6	0.48	1		Endosulfan I	ND	1.6	0.55	1	
Alpha-BHC	ND	1.6	0.46	1		Endosulfan II	ND	1.6	0.27	1	
Beta-BHC	ND	1.6	0.40	1		Endosulfan Sulfate	ND	1.6	0.41	1	
Delta-BHC	ND	1.6	0.49	1		Endrin	0.33	1.6	0.31	1	J
Gamma-BHC	ND	1.6	0.35	1		Endrin Aldehyde	ND	1.6	0.30	1	
Chlordane	ND	16	6.2	1		Endrin Ketone	ND	1.6	0.47	1	
Dieldrin	ND	1.6	0.35	1		Heptachlor	ND	1.6	0.35	1	
Trans-nonachlor	ND	1.6	0.85	1		Heptachlor Epoxide	ND	1.6	0.28	1	
2,4'-DDD	ND	1.6	0.31	1		Methoxychlor	ND	1.6	0.26	1	
2,4'-DDE	ND	1.6	0.28	1		Toxaphene	ND	31	13	1	
2,4'-DDT	ND	1.6	0.22	1		Alpha Chlordane	ND	1.6	0.40	1	
4,4'-DDD	ND	1.6	0.40	1		Oxychlordane	ND	1.6	0.47	1	
4,4'-DDE	0.61	1.6	0.47	1	Z,J	Gamma Chlordane	ND	1.6	0.40	1	
4,4'-DDT	ND	1.6	0.51	1		Cis-nonachlor	ND	1.6	0.83	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	91	50-130		Decachlorobiphenyl	60	50-130	

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8081A
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp (LAB DUP)	**11-11-1599-9-A**	**11/03/11 07:50**	**Sediment**	**GC 51**	**11/22/11**	**11/30/11 16:28**	**111122L16**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.3	0.40	1		Endosulfan I	ND	1.3	0.46	1	
Alpha-BHC	ND	1.3	0.38	1		Endosulfan II	ND	1.3	0.22	1	
Beta-BHC	ND	1.3	0.33	1		Endosulfan Sulfate	ND	1.3	0.34	1	
Delta-BHC	ND	1.3	0.41	1		Endrin	ND	1.3	0.26	1	
Gamma-BHC	ND	1.3	0.29	1		Endrin Aldehyde	ND	1.3	0.25	1	
Chlordane	ND	13	5.1	1		Endrin Ketone	ND	1.3	0.38	1	
Dieldrin	ND	1.3	0.29	1		Heptachlor	ND	1.3	0.29	1	
Trans-nonachlor	ND	1.3	0.70	1		Heptachlor Epoxide	ND	1.3	0.24	1	
2,4'-DDD	ND	1.3	0.26	1		Methoxychlor	ND	1.3	0.21	1	
2,4'-DDE	ND	1.3	0.23	1		Toxaphene	ND	26	11	1	
2,4'-DDT	ND	1.3	0.18	1		Alpha Chlordane	ND	1.3	0.33	1	
4,4'-DDD	ND	1.3	0.33	1		Oxychlordane	ND	1.3	0.38	1	
4,4'-DDE	ND	1.3	0.38	1		Gamma Chlordane	ND	1.3	0.33	1	
4,4'-DDT	ND	1.3	0.42	1		Cis-nonachlor	ND	1.3	0.69	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	104	50-130		Decachlorobiphenyl	64	50-130	

Method Blank	099-12-858-118	N/A	Solid	GC 51	11/22/11	11/30/11 11:40	111122L16

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Aldrin	ND	1.0	0.31	1		Endosulfan I	ND	1.0	0.36	1	
Alpha-BHC	ND	1.0	0.29	1		Endosulfan II	ND	1.0	0.18	1	
Beta-BHC	ND	1.0	0.25	1		Endosulfan Sulfate	ND	1.0	0.26	1	
Delta-BHC	ND	1.0	0.32	1		Endrin	ND	1.0	0.20	1	
Gamma-BHC	ND	1.0	0.23	1		Endrin Aldehyde	ND	1.0	0.20	1	
Chlordane	ND	10	4.0	1		Endrin Ketone	ND	1.0	0.30	1	
Dieldrin	ND	1.0	0.23	1		Heptachlor	ND	1.0	0.22	1	
Trans-nonachlor	ND	1.0	0.55	1		Heptachlor Epoxide	ND	1.0	0.18	1	
2,4'-DDD	ND	1.0	0.20	1		Methoxychlor	ND	1.0	0.17	1	
2,4'-DDE	ND	1.0	0.18	1		Toxaphene	ND	20	8.5	1	
2,4'-DDT	ND	1.0	0.14	1		Alpha Chlordane	ND	1.0	0.26	1	
4,4'-DDD	ND	1.0	0.26	1		Oxychlordane	ND	1.0	0.30	1	
4,4'-DDE	ND	1.0	0.30	1		Gamma Chlordane	ND	1.0	0.26	1	
4,4'-DDT	ND	1.0	0.33	1		Cis-nonachlor	ND	1.0	0.54	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2,4,5,6-Tetrachloro-m-Xylene	129	50-130		Decachlorobiphenyl	96	50-130	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp	**11-11-1599-1-A**	**11/03/11 07:50**	**Sediment**	**GC/MS AAA**	**11/22/11**	**12/01/11 22:02**	**111122L15**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	ND	13	1.9	1		Fluoranthene	20	13	1.4	1	
Acenaphthylene	ND	13	1.8	1		Fluorene	1.7	13	1.4	1	J
Anthracene	2.1	13	1.0	1	J	Indeno (1,2,3-c,d) Pyrene	2.3	13	1.7	1	J
Benzo (a) Anthracene	6.4	13	1.4	1	J	2-Methylnaphthalene	2.1	13	1.6	1	J
Benzo (a) Pyrene	ND	13	1.2	1		1-Methylnaphthalene	ND	13	2.7	1	
Benzo (b) Fluoranthene	4.0	13	0.91	1	J	1-Methylphenanthrene	ND	13	2.1	1	
Benzo (e) Pyrene	3.4	13	1.9	1	J	Naphthalene	3.0	13	2.1	1	J
Benzo (g,h,i) Perylene	2.8	13	1.7	1	J	Perylene	10	13	2.2	1	J
Benzo (k) Fluoranthene	ND	13	2.5	1		Phenanthrene	7.4	13	2.8	1	J
Biphenyl	ND	13	1.8	1		Pyrene	20	13	1.5	1	
Chrysene	6.7	13	1.9	1	J	1,6,7-Trimethylnaphthalene	ND	13	1.8	1	
Dibenz (a,h) Anthracene	ND	13	1.2	1		Dibenzothiophene	ND	13	1.7	1	
2,6-Dimethylnaphthalene	ND	13	2.1	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	88	14-146		Nitrobenzene-d5	93	18-162	
p-Terphenyl-d14	80	34-148					

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-Comp	**11-11-1599-2-A**	**11/02/11 10:00**	**Sediment**	**GC/MS AAA**	**11/22/11**	**12/01/11 22:28**	**111122L15**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	2.8	14	2.1	1	J	Fluoranthene	34	14	1.6	1	
Acenaphthylene	ND	14	2.0	1		Fluorene	4.6	14	1.6	1	J
Anthracene	6.0	14	1.2	1	J	Indeno (1,2,3-c,d) Pyrene	6.8	14	1.9	1	J
Benzo (a) Anthracene	17	14	1.5	1		2-Methylnaphthalene	3.1	14	1.8	1	J
Benzo (a) Pyrene	14	14	1.4	1	J	1-Methylnaphthalene	ND	14	3.0	1	
Benzo (b) Fluoranthene	11	14	1.0	1	J	1-Methylphenanthrene	ND	14	2.3	1	
Benzo (e) Pyrene	10	14	2.1	1	J	Naphthalene	3.9	14	2.3	1	J
Benzo (g,h,i) Perylene	7.9	14	1.9	1	J	Perylene	20	14	2.5	1	
Benzo (k) Fluoranthene	12	14	2.8	1	J	Phenanthrene	13	14	3.1	1	J
Biphenyl	ND	14	2.0	1		Pyrene	38	14	1.7	1	
Chrysene	19	14	2.2	1		1,6,7-Trimethylnaphthalene	ND	14	2.0	1	
Dibenz (a,h) Anthracene	ND	14	1.4	1		Dibenzothiophene	ND	14	1.9	1	
2,6-Dimethylnaphthalene	ND	14	2.4	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	93	14-146		Nitrobenzene-d5	107	18-162	
p-Terphenyl-d14	89	34-148					

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-Comp	**11-11-1599-3-A**	**11/02/11 16:45**	**Sediment**	**GC/MS AAA**	**11/22/11**	**12/02/11 02:52**	**111122L15**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	2.8	14	2.1	1	J	Fluoranthene	30	14	1.6	1	
Acenaphthylene	ND	14	2.0	1		Fluorene	4.7	14	1.6	1	J
Anthracene	4.2	14	1.2	1	J	Indeno (1,2,3-c,d) Pyrene	5.8	14	1.9	1	J
Benzo (a) Anthracene	9.8	14	1.5	1	J	2-Methylnaphthalene	4.3	14	1.8	1	J
Benzo (a) Pyrene	7.4	14	1.4	1	J	1-Methylnaphthalene	ND	14	3.0	1	
Benzo (b) Fluoranthene	7.0	14	1.0	1	J	1-Methylphenanthrene	ND	14	2.3	1	
Benzo (e) Pyrene	7.7	14	2.2	1	J	Naphthalene	6.1	14	2.3	1	J
Benzo (g,h,i) Perylene	7.9	14	1.9	1	J	Perylene	15	14	2.5	1	
Benzo (k) Fluoranthene	ND	14	2.8	1		Phenanthrene	14	14	3.1	1	J
Biphenyl	2.7	14	2.0	1	J	Pyrene	28	14	1.7	1	
Chrysene	10	14	2.2	1	J	1,6,7-Trimethylnaphthalene	3.1	14	2.0	1	J
Dibenz (a,h) Anthracene	ND	14	1.4	1		Dibenzothiophene	2.0	14	1.9	1	J
2,6-Dimethylnaphthalene	ND	14	2.4	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	87	14-146		Nitrobenzene-d5	99	18-162	
p-Terphenyl-d14	79	34-148					

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-Comp	**11-11-1599-4-A**	**11/02/11 13:10**	**Sediment**	**GC/MS AAA**	**11/22/11**	**12/02/11 20:13**	**111122L15**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	ND	16	2.3	1		Fluoranthene	27	16	1.7	1	
Acenaphthylene	ND	16	2.1	1		Fluorene	4.5	16	1.7	1	J
Anthracene	3.9	16	1.3	1	J	Indeno (1,2,3-c,d) Pyrene	6.2	16	2.0	1	J
Benzo (a) Anthracene	9.6	16	1.7	1	J	2-Methylnaphthalene	2.9	16	1.9	1	J
Benzo (a) Pyrene	9.1	16	1.5	1	J	1-Methylnaphthalene	ND	16	3.2	1	
Benzo (b) Fluoranthene	11	16	1.1	1	J	1-Methylphenanthrene	5.8	16	2.5	1	J
Benzo (e) Pyrene	9.1	16	2.3	1	J	Naphthalene	4.5	16	2.5	1	J
Benzo (g,h,i) Perylene	7.3	16	2.0	1	J	Perylene	74	16	2.7	1	
Benzo (k) Fluoranthene	8.5	16	3.0	1	J	Phenanthrene	14	16	3.3	1	J
Biphenyl	2.4	16	2.1	1	J	Pyrene	24	16	1.9	1	
Chrysene	12	16	2.3	1	J	1,6,7-Trimethylnaphthalene	ND	16	2.2	1	
Dibenz (a,h) Anthracene	ND	16	1.5	1		Dibenzothiophene	ND	16	2.1	1	
2,6-Dimethylnaphthalene	ND	16	2.6	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	87	14-146		Nitrobenzene-d5	111	18-162	
p-Terphenyl-d14	73	34-148					

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp (LAB DUP)	**11-11-1599-9-A**	**11/03/11 07:50**	**Sediment**	**GC/MS AAA**	**11/22/11**	**12/01/11 22:54**	**111122L15**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	ND	13	1.9	1		Fluoranthene	21	13	1.4	1	
Acenaphthylene	ND	13	1.8	1		Fluorene	1.9	13	1.4	1	J
Anthracene	2.3	13	1.0	1	J	Indeno (1,2,3-c,d) Pyrene	2.6	13	1.7	1	J
Benzo (a) Anthracene	7.1	13	1.4	1	J	2-Methylnaphthalene	2.4	13	1.6	1	J
Benzo (a) Pyrene	3.9	13	1.2	1	J	1-Methylnaphthalene	ND	13	2.7	1	
Benzo (b) Fluoranthene	4.5	13	0.90	1	J	1-Methylphenanthrene	ND	13	2.1	1	
Benzo (e) Pyrene	3.8	13	1.9	1	J	Naphthalene	3.3	13	2.1	1	J
Benzo (g,h,i) Perylene	3.2	13	1.7	1	J	Perylene	11	13	2.2	1	J
Benzo (k) Fluoranthene	ND	13	2.5	1		Phenanthrene	7.8	13	2.8	1	J
Biphenyl	ND	13	1.8	1		Pyrene	22	13	1.5	1	
Chrysene	7.6	13	1.9	1	J	1,6,7-Trimethylnaphthalene	ND	13	1.8	1	
Dibenz (a,h) Anthracene	ND	13	1.2	1		Dibenzothiophene	ND	13	1.7	1	
2,6-Dimethylnaphthalene	ND	13	2.1	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	97	14-146		Nitrobenzene-d5	106	18-162	
p-Terphenyl-d14	88	34-148					

Method Blank	**099-14-437-5**	**N/A**	**Solid**	**GC/MS AAA**	**11/22/11**	**12/01/11 17:12**	**111122L15**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Acenaphthene	ND	10	1.5	1		Fluoranthene	ND	10	1.1	1	
Acenaphthylene	ND	10	1.4	1		Fluorene	ND	10	1.1	1	
Anthracene	ND	10	0.82	1		Indeno (1,2,3-c,d) Pyrene	ND	10	1.3	1	
Benzo (a) Anthracene	ND	10	1.1	1		2-Methylnaphthalene	ND	10	1.2	1	
Benzo (a) Pyrene	ND	10	0.96	1		1-Methylnaphthalene	ND	10	2.1	1	
Benzo (b) Fluoranthene	ND	10	0.71	1		1-Methylphenanthrene	ND	10	1.6	1	
Benzo (e) Pyrene	ND	10	1.5	1		Naphthalene	ND	10	1.6	1	
Benzo (g,h,i) Perylene	ND	10	1.3	1		Perylene	ND	10	1.7	1	
Benzo (k) Fluoranthene	ND	10	1.9	1		Phenanthrene	ND	10	2.2	1	
Biphenyl	ND	10	1.4	1		Pyrene	ND	10	1.2	1	
Chrysene	ND	10	1.5	1		1,6,7-Trimethylnaphthalene	ND	10	1.4	1	
Dibenz (a,h) Anthracene	ND	10	0.96	1		Dibenzothiophene	ND	10	1.3	1	
2,6-Dimethylnaphthalene	ND	10	1.7	1							

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	97	14-146		Nitrobenzene-d5	107	18-162	
p-Terphenyl-d14	97	34-148					

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp	**11-11-1599-1-A**	**11/03/11 07:50**	**Sediment**	**GC/MS HHH**	**11/22/11**	**12/02/11 14:09**	**111122L14**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB003	ND	0.64	0.15	1		PCB126	ND	0.64	0.18	1	
PCB008	ND	0.64	0.11	1		PCB128	ND	0.64	0.13	1	
PCB018	0.57	0.64	0.20	1	J	PCB132	ND	0.64	0.21	1	
PCB028	0.40	0.64	0.13	1	J	PCB138/158	ND	1.3	0.26	1	
PCB031	0.38	0.64	0.15	1	J	PCB141	ND	0.64	0.14	1	
PCB033	0.24	0.64	0.14	1	J	PCB149	ND	0.64	0.11	1	
PCB037	ND	0.64	0.17	1		PCB151	ND	0.64	0.13	1	
PCB044	0.59	0.64	0.17	1	J	PCB153	ND	0.64	0.13	1	
PCB049	0.30	0.64	0.15	1	J	PCB156	ND	0.64	0.13	1	
PCB052	0.54	0.64	0.12	1	J	PCB157	ND	0.64	0.12	1	
PCB056	0.22	0.64	0.18	1	J	PCB167	ND	0.64	0.13	1	
PCB060	0.18	0.64	0.14	1	J	PCB168	ND	0.64	0.11	1	
PCB066	0.45	0.64	0.12	1	J	PCB169	ND	0.64	0.10	1	
PCB070	0.56	0.64	0.11	1	J	PCB170	ND	0.64	0.12	1	
PCB074	ND	0.64	0.12	1		PCB174	ND	0.64	0.14	1	
PCB077	ND	0.64	0.12	1		PCB177	ND	0.64	0.16	1	
PCB081	ND	0.64	0.16	1		PCB180	ND	0.64	0.078	1	
PCB087	ND	0.64	0.13	1		PCB183	ND	0.64	0.14	1	
PCB095	ND	0.64	0.21	1		PCB184	ND	0.64	0.072	1	
PCB097	ND	0.64	0.17	1		PCB187	ND	0.64	0.13	1	
PCB099	0.13	0.64	0.11	1	J	PCB189	ND	0.64	0.11	1	
PCB101	0.27	0.64	0.10	1	J	PCB194	ND	0.64	0.12	1	
PCB105	ND	0.64	0.13	1		PCB195	ND	0.64	0.068	1	
PCB110	0.26	0.64	0.13	1	J	PCB200	ND	0.64	0.12	1	
PCB114	0.45	0.64	0.13	1	J	PCB201	ND	0.64	0.073	1	
PCB118	0.22	0.64	0.17	1	J	PCB203	ND	0.64	0.14	1	
PCB119	ND	0.64	0.11	1		PCB206	ND	0.64	0.11	1	
PCB123	ND	0.64	0.11	1		PCB209	ND	0.64	0.14	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	98	50-125		p-Terphenyl-d14	95	50-125	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-Comp	**11-11-1599-2-A**	**11/02/11 10:00**	**Sediment**	**GC/MS HHH**	**11/22/11**	**12/02/11 14:36**	**111122L14**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB003	ND	0.71	0.17	1		PCB126	ND	0.71	0.20	1	
PCB008	0.13	0.71	0.12	1	J	PCB128	ND	0.71	0.15	1	
PCB018	0.41	0.71	0.22	1	J	PCB132	ND	0.71	0.24	1	
PCB028	0.38	0.71	0.14	1	J	PCB138/158	ND	1.4	0.29	1	
PCB031	0.36	0.71	0.17	1	J	PCB141	ND	0.71	0.16	1	
PCB033	0.33	0.71	0.15	1	J	PCB149	0.25	0.71	0.13	1	J
PCB037	ND	0.71	0.19	1		PCB151	ND	0.71	0.15	1	
PCB044	0.33	0.71	0.19	1	J	PCB153	0.38	0.71	0.15	1	J
PCB049	0.22	0.71	0.17	1	J	PCB156	ND	0.71	0.14	1	
PCB052	0.39	0.71	0.14	1	J	PCB157	ND	0.71	0.14	1	
PCB056	ND	0.71	0.20	1		PCB167	ND	0.71	0.14	1	
PCB060	ND	0.71	0.15	1		PCB168	ND	0.71	0.12	1	
PCB066	0.24	0.71	0.13	1	J	PCB169	ND	0.71	0.12	1	
PCB070	0.29	0.71	0.12	1	J	PCB170	ND	0.71	0.13	1	
PCB074	ND	0.71	0.13	1		PCB174	ND	0.71	0.15	1	
PCB077	ND	0.71	0.14	1		PCB177	ND	0.71	0.18	1	
PCB081	ND	0.71	0.17	1		PCB180	0.11	0.71	0.087	1	J
PCB087	0.16	0.71	0.14	1	J	PCB183	ND	0.71	0.16	1	
PCB095	0.38	0.71	0.24	1	J	PCB184	ND	0.71	0.080	1	
PCB097	ND	0.71	0.19	1		PCB187	ND	0.71	0.15	1	
PCB099	0.15	0.71	0.12	1	J	PCB189	ND	0.71	0.12	1	
PCB101	0.42	0.71	0.12	1	J	PCB194	ND	0.71	0.14	1	
PCB105	0.46	0.71	0.15	1	J	PCB195	ND	0.71	0.075	1	
PCB110	0.44	0.71	0.15	1	J	PCB200	ND	0.71	0.13	1	
PCB114	1.2	0.71	0.14	1		PCB201	ND	0.71	0.081	1	
PCB118	0.33	0.71	0.19	1	J	PCB203	ND	0.71	0.15	1	
PCB119	ND	0.71	0.12	1		PCB206	ND	0.71	0.12	1	
PCB123	ND	0.71	0.12	1		PCB209	ND	0.71	0.15	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	87	50-125		p-Terphenyl-d14	81	50-125	

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: Marine Terminal Dredging Project			Page 3 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-Comp	**11-11-1599-3-A**	**11/02/11 16:45**	**Sediment**	**GC/MS HHH**	**11/22/11**	**12/02/11 15:03**	**111122L14**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB003	ND	0.72	0.17	1		PCB126	ND	0.72	0.20	1	
PCB008	ND	0.72	0.12	1		PCB128	ND	0.72	0.15	1	
PCB018	ND	0.72	0.23	1		PCB132	ND	0.72	0.24	1	
PCB028	0.15	0.72	0.14	1	J	PCB138/158	ND	1.4	0.29	1	
PCB031	ND	0.72	0.17	1		PCB141	ND	0.72	0.16	1	
PCB033	ND	0.72	0.16	1		PCB149	ND	0.72	0.13	1	
PCB037	ND	0.72	0.19	1		PCB151	ND	0.72	0.15	1	
PCB044	0.30	0.72	0.19	1	J	PCB153	0.18	0.72	0.15	1	J
PCB049	ND	0.72	0.17	1		PCB156	ND	0.72	0.14	1	
PCB052	0.29	0.72	0.14	1	J	PCB157	ND	0.72	0.14	1	
PCB056	ND	0.72	0.20	1		PCB167	ND	0.72	0.14	1	
PCB060	ND	0.72	0.15	1		PCB168	ND	0.72	0.12	1	
PCB066	0.24	0.72	0.13	1	J	PCB169	ND	0.72	0.12	1	
PCB070	0.36	0.72	0.12	1	J	PCB170	ND	0.72	0.13	1	
PCB074	ND	0.72	0.14	1		PCB174	ND	0.72	0.15	1	
PCB077	ND	0.72	0.14	1		PCB177	ND	0.72	0.18	1	
PCB081	ND	0.72	0.18	1		PCB180	ND	0.72	0.088	1	
PCB087	ND	0.72	0.15	1		PCB183	ND	0.72	0.16	1	
PCB095	ND	0.72	0.24	1		PCB184	ND	0.72	0.081	1	
PCB097	ND	0.72	0.20	1		PCB187	ND	0.72	0.15	1	
PCB099	0.12	0.72	0.12	1	J	PCB189	ND	0.72	0.12	1	
PCB101	0.22	0.72	0.12	1	J	PCB194	ND	0.72	0.14	1	
PCB105	ND	0.72	0.15	1		PCB195	ND	0.72	0.076	1	
PCB110	0.35	0.72	0.15	1	J	PCB200	ND	0.72	0.13	1	
PCB114	1.0	0.72	0.14	1		PCB201	ND	0.72	0.082	1	
PCB118	ND	0.72	0.19	1		PCB203	ND	0.72	0.15	1	
PCB119	ND	0.72	0.13	1		PCB206	ND	0.72	0.12	1	
PCB123	ND	0.72	0.13	1		PCB209	ND	0.72	0.15	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	72	50-125		p-Terphenyl-d14	63	50-125	

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PCB Congeners
		Units:	ug/kg
Project: Marine Terminal Dredging Project			Page 4 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-Comp	**11-11-1599-4-A**	**11/02/11 13:10**	**Sediment**	**GC/MS HHH**	**11/22/11**	**12/05/11 13:13**	**111122L14**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB003	ND	0.78	0.18	1		PCB126	ND	0.78	0.21	1	
PCB008	ND	0.78	0.13	1		PCB128	ND	0.78	0.16	1	
PCB018	ND	0.78	0.24	1		PCB132	ND	0.78	0.26	1	
PCB028	ND	0.78	0.15	1		PCB138/158	ND	1.6	0.31	1	
PCB031	ND	0.78	0.18	1		PCB141	ND	0.78	0.17	1	
PCB033	ND	0.78	0.17	1		PCB149	ND	0.78	0.14	1	
PCB037	ND	0.78	0.20	1		PCB151	ND	0.78	0.16	1	
PCB044	ND	0.78	0.20	1		PCB153	ND	0.78	0.16	1	
PCB049	ND	0.78	0.18	1		PCB156	ND	0.78	0.15	1	
PCB052	ND	0.78	0.15	1		PCB157	ND	0.78	0.15	1	
PCB056	ND	0.78	0.21	1		PCB167	ND	0.78	0.15	1	
PCB060	ND	0.78	0.16	1		PCB168	ND	0.78	0.13	1	
PCB066	ND	0.78	0.14	1		PCB169	ND	0.78	0.13	1	
PCB070	ND	0.78	0.13	1		PCB170	ND	0.78	0.14	1	
PCB074	ND	0.78	0.15	1		PCB174	ND	0.78	0.17	1	
PCB077	ND	0.78	0.15	1		PCB177	ND	0.78	0.19	1	
PCB081	ND	0.78	0.19	1		PCB180	ND	0.78	0.095	1	
PCB087	ND	0.78	0.16	1		PCB183	ND	0.78	0.17	1	
PCB095	ND	0.78	0.26	1		PCB184	ND	0.78	0.087	1	
PCB097	ND	0.78	0.21	1		PCB187	ND	0.78	0.16	1	
PCB099	ND	0.78	0.13	1		PCB189	ND	0.78	0.13	1	
PCB101	ND	0.78	0.13	1		PCB194	ND	0.78	0.15	1	
PCB105	ND	0.78	0.16	1		PCB195	ND	0.78	0.082	1	
PCB110	ND	0.78	0.16	1		PCB200	ND	0.78	0.14	1	
PCB114	ND	0.78	0.15	1		PCB201	ND	0.78	0.088	1	
PCB118	ND	0.78	0.21	1		PCB203	ND	0.78	0.17	1	
PCB119	ND	0.78	0.13	1		PCB206	ND	0.78	0.13	1	
PCB123	ND	0.78	0.14	1		PCB209	ND	0.78	0.17	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	64	50-125		p-Terphenyl-d14	55	50-125	

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk	Date Received:	11/19/11
2250 Cordelia Road	Work Order No:	11-11-1599
Fairfield, CA 94534-1912	Preparation:	EPA 3545
	Method:	EPA 8270C SIM PCB Congeners
	Units:	ug/kg
Project: Marine Terminal Dredging Project		Page 5 of 6

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp (LAB DUP)	**11-11-1599-9-A**	**11/03/11 07:50**	**Sediment**	**GC/MS HHH**	**11/22/11**	**12/02/11 15:31**	**111122L14**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB003	ND	0.64	0.15	1		PCB126	ND	0.64	0.18	1	
PCB008	ND	0.64	0.11	1		PCB128	ND	0.64	0.13	1	
PCB018	0.34	0.64	0.20	1	J	PCB132	ND	0.64	0.21	1	
PCB028	0.21	0.64	0.13	1	J	PCB138/158	ND	1.3	0.26	1	
PCB031	0.23	0.64	0.15	1	J	PCB141	ND	0.64	0.14	1	
PCB033	0.23	0.64	0.14	1	J	PCB149	ND	0.64	0.11	1	
PCB037	ND	0.64	0.17	1		PCB151	ND	0.64	0.13	1	
PCB044	0.33	0.64	0.17	1	J	PCB153	ND	0.64	0.13	1	
PCB049	0.18	0.64	0.15	1	J	PCB156	ND	0.64	0.13	1	
PCB052	0.42	0.64	0.12	1	J	PCB157	ND	0.64	0.12	1	
PCB056	ND	0.64	0.18	1		PCB167	ND	0.64	0.13	1	
PCB060	ND	0.64	0.14	1		PCB168	ND	0.64	0.11	1	
PCB066	0.27	0.64	0.12	1	J	PCB169	ND	0.64	0.10	1	
PCB070	0.30	0.64	0.11	1	J	PCB170	ND	0.64	0.12	1	
PCB074	ND	0.64	0.12	1		PCB174	ND	0.64	0.14	1	
PCB077	ND	0.64	0.12	1		PCB177	ND	0.64	0.16	1	
PCB081	ND	0.64	0.16	1		PCB180	ND	0.64	0.078	1	
PCB087	ND	0.64	0.13	1		PCB183	ND	0.64	0.14	1	
PCB095	ND	0.64	0.21	1		PCB184	ND	0.64	0.072	1	
PCB097	ND	0.64	0.17	1		PCB187	ND	0.64	0.13	1	
PCB099	ND	0.64	0.11	1		PCB189	ND	0.64	0.11	1	
PCB101	0.16	0.64	0.10	1	J	PCB194	ND	0.64	0.12	1	
PCB105	ND	0.64	0.13	1		PCB195	ND	0.64	0.067	1	
PCB110	0.18	0.64	0.13	1	J	PCB200	ND	0.64	0.12	1	
PCB114	0.57	0.64	0.13	1	J	PCB201	ND	0.64	0.073	1	
PCB118	ND	0.64	0.17	1		PCB203	ND	0.64	0.14	1	
PCB119	ND	0.64	0.11	1		PCB206	ND	0.64	0.11	1	
PCB123	ND	0.64	0.11	1		PCB209	ND	0.64	0.14	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	93	50-125		p-Terphenyl-d14	79	50-125	

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-341-25**	**N/A**	**Solid**	**GC/MS HHH**	**11/22/11**	**12/01/11 12:23**	**111122L14**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
PCB003	ND	0.50	0.12	1		PCB126	ND	0.50	0.14	1	
PCB008	ND	0.50	0.085	1		PCB128	ND	0.50	0.10	1	
PCB018	ND	0.50	0.16	1		PCB132	ND	0.50	0.17	1	
PCB028	ND	0.50	0.099	1		PCB138/158	ND	1.0	0.20	1	
PCB031	ND	0.50	0.12	1		PCB141	ND	0.50	0.11	1	
PCB033	ND	0.50	0.11	1		PCB149	ND	0.50	0.089	1	
PCB037	ND	0.50	0.13	1		PCB151	ND	0.50	0.10	1	
PCB044	ND	0.50	0.13	1		PCB153	ND	0.50	0.10	1	
PCB049	ND	0.50	0.12	1		PCB156	ND	0.50	0.098	1	
PCB052	ND	0.50	0.097	1		PCB157	ND	0.50	0.096	1	
PCB056	ND	0.50	0.14	1		PCB167	ND	0.50	0.10	1	
PCB060	ND	0.50	0.11	1		PCB168	ND	0.50	0.086	1	
PCB066	ND	0.50	0.091	1		PCB169	ND	0.50	0.082	1	
PCB070	ND	0.50	0.082	1		PCB170	ND	0.50	0.093	1	
PCB074	ND	0.50	0.094	1		PCB174	ND	0.50	0.11	1	
PCB077	ND	0.50	0.097	1		PCB177	ND	0.50	0.12	1	
PCB081	ND	0.50	0.12	1		PCB180	ND	0.50	0.061	1	
PCB087	ND	0.50	0.10	1		PCB183	ND	0.50	0.11	1	
PCB095	ND	0.50	0.17	1		PCB184	ND	0.50	0.056	1	
PCB097	ND	0.50	0.14	1		PCB187	ND	0.50	0.10	1	
PCB099	ND	0.50	0.085	1		PCB189	ND	0.50	0.086	1	
PCB101	ND	0.50	0.081	1		PCB194	ND	0.50	0.096	1	
PCB105	ND	0.50	0.10	1		PCB195	ND	0.50	0.053	1	
PCB110	ND	0.50	0.10	1		PCB200	ND	0.50	0.093	1	
PCB114	ND	0.50	0.10	1		PCB201	ND	0.50	0.057	1	
PCB118	ND	0.50	0.13	1		PCB203	ND	0.50	0.11	1	
PCB119	ND	0.50	0.087	1		PCB206	ND	0.50	0.083	1	
PCB123	ND	0.50	0.087	1		PCB209	ND	0.50	0.11	1	

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
2-Fluorobiphenyl	100	50-125		p-Terphenyl-d14	94	50-125	

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3550B
Method: Organotins by Krone et al.
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp	**11-11-1599-1-A**	**11/03/11 07:50**	**Sediment**	**GC/MS Y**	**11/22/11**	**12/05/11 11:33**	**111122L10**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	3.8	0.84	1		Tetrabutyltin	ND	3.8	0.99	1	
Monobutyltin	ND	3.8	0.84	1		Tributyltin	ND	3.8	0.74	1	

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	106	50-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-Comp	**11-11-1599-2-A**	**11/02/11 10:00**	**Sediment**	**GC/MS Y**	**11/22/11**	**12/05/11 12:07**	**111122L10**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	4.3	0.93	1		Tetrabutyltin	ND	4.3	1.1	1	
Monobutyltin	ND	4.3	0.93	1		Tributyltin	8.3	4.3	0.82	1	

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	106	50-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-Comp	**11-11-1599-3-A**	**11/02/11 16:45**	**Sediment**	**GC/MS Y**	**11/22/11**	**12/05/11 12:42**	**111122L10**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	4.3	0.94	1		Tetrabutyltin	ND	4.3	1.1	1	
Monobutyltin	ND	4.3	0.94	1		Tributyltin	2.3	4.3	0.83	1	J

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	103	50-130	

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3550B
Method: Organotins by Krone et al.
Units: ug/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-Comp	**11-11-1599-4-A**	**11/02/11 13:10**	**Sediment**	**GC/MS Y**	**11/22/11**	**12/05/11 13:16**	**111122L10**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	4.7	1.0	1		Tetrabutyltin	ND	4.7	1.2	1	
Monobutyltin	ND	4.7	1.0	1		Tributyltin	1.6	4.7	0.89	1	J

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	98	50-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp (LAB DUP)	**11-11-1599-9-A**	**11/03/11 07:50**	**Sediment**	**GC/MS Y**	**11/22/11**	**12/05/11 13:50**	**111122L10**

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

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	3.8	0.84	1		Tetrabutyltin	ND	3.8	0.99	1	
Monobutyltin	ND	3.8	0.84	1		Tributyltin	ND	3.8	0.74	1	

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	99	50-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-07-016-896**	**N/A**	**Solid**	**GC/MS Y**	**11/22/11**	**12/01/11 22:35**	**111122L10**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Dibutyltin	ND	3.0	0.65	1		Tetrabutyltin	ND	3.0	0.77	1	
Monobutyltin	ND	3.0	0.65	1		Tributyltin	ND	3.0	0.58	1	

Surrogates:	REC (%)	Control Limits	Qual
Tripentyltin	126	50-130	

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3050B / EPA 7471A Total
Method: EPA 6020 / EPA 7471A
Units: mg/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-Comp	**11-11-1599-1-A**	**11/03/11 07:50**	**Sediment**	**ICP/MS 04**	**11/21/11**	**11/22/11 05:57**	**111121L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Mercury analysis was performed on 11/23/11 12:34 with batch 111123L02.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	4.09	0.128	0.0117	1		Mercury	0.0280	0.0257		1	
Cadmium	0.269	0.128	0.0160	1		Nickel	52.7	0.128	0.0109	1	
Chromium	31.4	0.128	0.0233	1		Selenium	ND	0.128	0.0649	1	
Copper	13.1	0.128	0.0138	1		Silver	0.0430	0.128	0.0124	1	J
Lead	4.56	0.128	0.00945	1		Zinc	47.3	1.28	0.144	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-Comp	**11-11-1599-2-A**	**11/02/11 10:00**	**Sediment**	**ICP/MS 04**	**11/21/11**	**11/22/11 06:03**	**111121L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Mercury analysis was performed on 11/23/11 12:37 with batch 111123L02.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	4.37	0.143	0.0130	1		Mercury	0.0543	0.0286		1	
Cadmium	0.358	0.143	0.0178	1		Nickel	53.1	0.143	0.0122	1	
Chromium	36.3	0.143	0.0260	1		Selenium	ND	0.143	0.0722	1	
Copper	16.6	0.143	0.0154	1		Silver	0.0628	0.143	0.0138	1	J
Lead	6.36	0.143	0.0105	1		Zinc	58.4	1.43	0.160	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-Comp	**11-11-1599-3-A**	**11/02/11 16:45**	**Sediment**	**ICP/MS 04**	**11/21/11**	**11/22/11 06:09**	**111121L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Mercury analysis was performed on 11/23/11 12:39 with batch 111123L02.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	4.40	0.144	0.0132	1		Mercury	0.0349	0.0289		1	
Cadmium	0.255	0.144	0.0180	1		Nickel	51.8	0.144	0.0123	1	
Chromium	34.0	0.144	0.0262	1		Selenium	ND	0.144	0.0729	1	
Copper	13.4	0.144	0.0156	1		Silver	0.0448	0.144	0.0139	1	J
Lead	5.71	0.144	0.0106	1		Zinc	52.4	1.44	0.161	1	

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3050B / EPA 7471A Total
Method: EPA 6020 / EPA 7471A
Units: mg/kg

Project: Marine Terminal Dredging Project

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-Comp	**11-11-1599-4-A**	**11/02/11 13:10**	**Sediment**	**ICP/MS 04**	**11/21/11**	**11/22/11 06:15**	**111121L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Mercury analysis was performed on 11/23/11 12:41 with batch 111123L02.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	6.78	0.155	0.0142	1		Mercury	ND	0.0311		1	
Cadmium	0.299	0.155	0.0194	1		Nickel	56.7	0.155	0.0132	1	
Chromium	40.1	0.155	0.0282	1		Selenium	ND	0.155	0.0784	1	
Copper	17.9	0.155	0.0167	1		Silver	0.0427	0.155	0.0150	1	J
Lead	6.91	0.155	0.0114	1		Zinc	54.4	1.55	0.174	1	

TR-DU1-Comp (LAB DUP)	**11-11-1599-9-A**	**11/03/11 07:50**	**Sediment**	**ICP/MS 04**	**11/21/11**	**11/22/11 06:21**	**111121L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.
-Mercury analysis was performed on 11/23/11 12:43 with batch 111123L02.
-Results are reported on a dry weight basis.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	3.73	0.128	0.0117	1		Mercury	0.0370	0.0257		1	
Cadmium	0.255	0.128	0.0160	1		Nickel	52.1	0.128	0.0109	1	
Chromium	33.8	0.128	0.0233	1		Selenium	ND	0.128	0.0648	1	
Copper	12.8	0.128	0.0138	1		Silver	0.0371	0.128	0.0124	1	J
Lead	5.01	0.128	0.00944	1		Zinc	48.4	1.28	0.143	1	

Method Blank	**099-12-452-251**	**N/A**	**Solid**	**Mercury**	**11/23/11**	**11/23/11 12:19**	**111123L02**

Comment(s): -Preparation/analysis for Mercury was performed by EPA 7471A.

Parameter	Result	RL	MDL	DF	Qual
Mercury	ND	0.0200		1	

Method Blank	**096-10-002-2,137**	**N/A**	**Solid**	**ICP/MS 04**	**11/21/11**	**11/22/11 04:52**	**111121L04**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	ND	0.100	0.00914	1		Nickel	ND	0.100	0.00853	1	
Cadmium	ND	0.100	0.0125	1		Selenium	ND	0.100	0.0506	1	
Chromium	ND	0.100	0.0182	1		Silver	ND	0.100	0.00966	1	
Copper	ND	0.100	0.0108	1		Zinc	ND	1.00	0.112	1	
Lead	ND	0.100	0.00737	1							

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Calscience Environmental Laboratories, Inc.

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

Pacific EcoRisk		Date Received:	11/19/11
		Work Order No:	11-11-1599
		Date Analyzed:	11/29/11
		Method:	ASTM 4464M
Project:	Marine Terminal Dredging Project		Page 1 of 4

Sample ID	Depth ft	Description	Mean Grain Size mm
TR-DU1-Comp		Medium Sand	0.282

Particle Size Distribution, wt by percent								
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	Total Silt & Clay
0.78	0.87	10.61	26.28	42.55	6.66	10.29	1.94	12.24

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Calscience Environmental Laboratories, Inc.

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

Pacific EcoRisk		Date Received:	11/19/11
		Work Order No:	11-11-1599
		Date Analyzed:	11/29/11
		Method:	ASTM 4464M
Project:	Marine Terminal Dredging Project		Page 2 of 4

Sample ID	Depth ft	Description	Mean Grain Size mm
TR-DU2-Comp		Fine Sand	0.226

Particle Size Distribution, wt by percent								
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	Total Silt & Clay
0.00	2.40	5.93	20.90	38.81	10.70	18.38	2.87	21.25

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Calscience Environmental Laboratories, Inc.

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

Pacific EcoRisk		Date Received:	11/19/11
		Work Order No:	11-11-1599
		Date Analyzed:	11/29/11
		Method:	ASTM 4464M
Project:	Marine Terminal Dredging Project		Page 3 of 4

Sample ID	Depth ft	Description	Mean Grain Size mm
TR-DU3-Comp		Medium Sand	0.274

Particle Size Distribution, wt by percent								
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	Total Silt & Clay
0.00	3.77	6.95	29.21	34.61	7.68	15.78	2.00	17.78

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Calscience Environmental Laboratories, Inc.

PARTICLE SIZE SUMMARY

(ASTM D422 / D4464M)

Pacific EcoRisk		Date Received:	11/19/11
		Work Order No:	11-11-1599
		Date Analyzed:	11/29/11
		Method:	ASTM 4464M
Project:	Marine Terminal Dredging Project		Page 4 of 4

Sample ID	Depth ft	Description	Mean Grain Size mm
TR-DU4-Comp		Medium Sand	0.268

Particle Size Distribution, wt by percent								
Total Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay	Total Silt & Clay
0.12	2.31	14.99	25.48	16.09	9.84	27.11	4.06	31.17

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 3050B
		Method:	EPA 6020

Project Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
TR-DU1-Comp	**Sediment**	**ICP/MS 04**	**11/21/11**	**11/22/11**	**111121S04**

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	25.00	93	98	80-120	4	0-20	
Cadmium	25.00	99	102	80-120	2	0-20	
Chromium	25.00	101	101	80-120	0	0-20	
Copper	25.00	93	94	80-120	0	0-20	
Lead	25.00	97	101	80-120	3	0-20	
Nickel	25.00	91	90	80-120	0	0-20	
Selenium	25.00	87	88	80-120	1	0-20	
Silver	12.50	100	103	80-120	3	0-20	
Zinc	25.00	92	111	80-120	8	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - PDS / PDSD

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 3050B
		Method:	EPA 6020

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	PDS / PDSD Batch Number
TR-DU1-Comp	**Sediment**	**ICP/MS 04**	**11/21/11**	**11/22/11**	**111121S04**

Parameter	SPIKE ADDED	PDS %REC	PDSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	25.00	96	96	75-125	0	0-20	
Cadmium	25.00	101	99	75-125	2	0-20	
Chromium	25.00	97	97	75-125	0	0-20	
Copper	25.00	94	93	75-125	0	0-20	
Lead	25.00	102	104	75-125	1	0-20	
Nickel	25.00	92	91	75-125	0	0-20	
Selenium	25.00	90	91	75-125	2	0-20	
Silver	12.50	98	96	75-125	2	0-20	
Zinc	25.00	91	99	75-125	3	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	EPA 9060A

Project Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
TR-DU1-Comp	**Sediment**	**TOC 5**	**N/A**	**11/30/11**	**B1130TOCS2**

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	3.0	80	81	75-125	0	0-25	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	SM 2540 B

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
TR-DU1-Comp	**Sediment**	**N/A**	**11/21/11**	**11/21/11**	**B1121TSD2**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total	78.0	77.6	1	0-10	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	11/19/11
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 7471A Total
		Method:	EPA 7471A

Project Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
TR-DU1-Comp	**Sediment**	**Mercury**	**11/23/11**	**11/23/11**	**111123S02**

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	0.8350	105	101	76-136	4	0-16	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3550B
Method: Organotins by Krone et al.

Project Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
TR-DU1-Comp	**Sediment**	**GC/MS Y**	**11/22/11**	**12/02/11**	**111122S10A**

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	100.0	129	134	50-130	4	0-20	3
Tributyltin	100.0	108	106	50-130	1	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8081A

Project Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
TR-DU1-Comp	**Sediment**	**GC 51**	**11/22/11**	**11/30/11**	**111122S16C**

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Aldrin	5.000	53	57	50-135	7	0-25	
Alpha-BHC	5.000	53	57	50-135	7	0-25	
Beta-BHC	5.000	51	54	50-135	6	0-25	
Delta-BHC	5.000	51	59	50-135	16	0-25	
Gamma-BHC	5.000	49	55	50-135	12	0-25	3
Dieldrin	5.000	49	57	50-135	16	0-25	3
4,4'-DDD	5.000	66	75	50-135	13	0-25	
4,4'-DDE	5.000	56	62	50-135	11	0-25	
4,4'-DDT	5.000	40	42	50-135	5	0-25	3
Endosulfan I	5.000	49	56	50-135	13	0-25	3
Endosulfan II	5.000	50	55	50-135	10	0-25	
Endosulfan Sulfate	5.000	49	54	50-135	9	0-25	3
Endrin	5.000	52	58	50-135	10	0-25	
Endrin Aldehyde	5.000	42	45	50-135	7	0-25	3
Endrin Ketone	5.000	51	55	50-135	8	0-25	
Heptachlor	5.000	55	59	50-135	8	0-25	
Heptachlor Epoxide	5.000	50	56	50-135	11	0-25	
Methoxychlor	5.000	45	44	50-135	2	0-25	3
Alpha Chlordane	5.000	51	58	50-135	13	0-25	
Gamma Chlordane	5.000	51	57	50-135	12	0-25	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners

Project Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
TR-DU1-Comp	**Sediment**	**GC/MS HHH**	**11/22/11**	**12/02/11**	**111122S14C**

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
PCB018	25.00	92	91	50-125	1	0-30	
PCB028	25.00	98	97	50-125	1	0-30	
PCB044	25.00	93	93	50-125	0	0-30	
PCB052	25.00	91	91	50-125	1	0-30	
PCB066	25.00	98	98	50-125	0	0-30	
PCB077	25.00	95	95	50-125	0	0-30	
PCB101	25.00	93	93	50-125	0	0-30	
PCB105	25.00	92	92	50-125	0	0-30	
PCB118	25.00	99	100	50-125	1	0-30	
PCB126	25.00	87	88	50-125	1	0-30	
PCB128	25.00	86	87	50-125	1	0-30	
PCB153	25.00	88	88	50-125	0	0-30	
PCB170	25.00	92	91	50-125	1	0-30	
PCB180	25.00	87	90	50-125	3	0-30	
PCB187	25.00	86	87	50-125	1	0-30	
PCB206	25.00	96	95	50-125	0	0-30	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 11/19/11
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PAHs

Project Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
TR-DU1-Comp	**Sediment**	**GC/MS AAA**	**11/22/11**	**11/30/11**	**111122S15A**

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Acenaphthene	100.0	93	90	40-160	3	0-20	
Acenaphthylene	100.0	76	78	40-160	3	0-20	
Anthracene	100.0	73	71	40-160	2	0-20	
Benzo (a) Anthracene	100.0	95	93	40-160	2	0-20	
Benzo (a) Pyrene	100.0	78	76	40-160	2	0-20	
Benzo (b) Fluoranthene	100.0	89	89	40-160	1	0-20	
Benzo (g,h,i) Perylene	100.0	82	80	40-160	3	0-20	
Benzo (k) Fluoranthene	100.0	84	79	40-160	6	0-20	
Chrysene	100.0	91	84	40-160	9	0-20	
Dibenz (a,h) Anthracene	100.0	79	79	40-160	1	0-20	
Fluoranthene	100.0	75	73	40-160	3	0-20	
Fluorene	100.0	93	91	40-160	3	0-20	
Indeno (1,2,3-c,d) Pyrene	100.0	86	86	40-160	1	0-20	
2-Methylnaphthalene	100.0	94	95	40-160	2	0-20	
1-Methylnaphthalene	100.0	99	98	40-160	1	0-20	
Naphthalene	100.0	96	95	40-160	1	0-20	
Phenanthrene	100.0	93	88	40-160	5	0-20	
Pyrene	100.0	78	76	40-160	2	0-46	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 3050B
		Method:	EPA 6020

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
096-10-002-2,137	**Solid**	**ICP/MS 04**	**11/21/11**	**11/22/11**	**111121L04**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	25.00	99	100	80-120	0	0-20	
Cadmium	25.00	104	104	80-120	0	0-20	
Chromium	25.00	98	100	80-120	2	0-20	
Copper	25.00	105	105	80-120	1	0-20	
Lead	25.00	103	103	80-120	0	0-20	
Nickel	25.00	103	103	80-120	1	0-20	
Selenium	25.00	101	99	80-120	2	0-20	
Silver	12.50	101	102	80-120	1	0-20	
Zinc	25.00	105	130	80-120	22	0-20	X

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	EPA 9060A

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-06-013-657	**Solid**	**TOC 5**	**N/A**	**11/30/11**	**B1130TOCL2**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	0.60	88	87	80-120	1	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 7471A Total
		Method:	EPA 7471A

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-452-251	**Solid**	**Mercury**	**11/23/11**	**11/23/11**	**111123L02**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Mercury	0.8350	97	97	82-124	0	0-16	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 3550B
		Method:	Organotins by Krone et al.

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-07-016-896	**Solid**	**GC/MS Y**	**11/22/11**	**12/01/11**	**111122L10**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Tetrabutyltin	100.0	95	91	50-130	4	0-20	
Tributyltin	100.0	95	100	50-130	5	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8081A

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-858-118	**Solid**	**GC 51**	**11/22/11**	**11/30/11**	**111122L16**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Aldrin	5.000	77	74	50-135	36-149	4	0-25	
Alpha-BHC	5.000	77	72	50-135	36-149	6	0-25	
Beta-BHC	5.000	76	73	50-135	36-149	5	0-25	
Delta-BHC	5.000	75	70	50-135	36-149	6	0-25	
Gamma-BHC	5.000	81	76	50-135	36-149	6	0-25	
Dieldrin	5.000	79	76	50-135	36-149	4	0-25	
4,4'-DDD	5.000	84	82	50-135	36-149	3	0-25	
4,4'-DDE	5.000	82	79	50-135	36-149	4	0-25	
4,4'-DDT	5.000	86	86	50-135	36-149	0	0-25	
Endosulfan I	5.000	78	76	50-135	36-149	3	0-25	
Endosulfan II	5.000	79	77	50-135	36-149	2	0-25	
Endosulfan Sulfate	5.000	72	68	50-135	36-149	6	0-25	
Endrin	5.000	77	73	50-135	36-149	6	0-25	
Endrin Aldehyde	5.000	82	77	50-135	36-149	5	0-25	
Endrin Ketone	5.000	86	79	50-135	36-149	8	0-25	
Heptachlor	5.000	81	76	50-135	36-149	6	0-25	
Heptachlor Epoxide	5.000	81	77	50-135	36-149	5	0-25	
Methoxychlor	5.000	76	68	50-135	36-149	10	0-25	
Alpha Chlordane	5.000	77	74	50-135	36-149	4	0-25	
Gamma Chlordane	5.000	76	73	50-135	36-149	4	0-25	

Total number of LCS compounds : 20
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: N/A
Work Order No: 11-11-1599
Preparation: EPA 3545
Method: EPA 8270C SIM PCB Congeners

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-341-25	**Solid**	**GC/MS HHH**	**11/22/11**	**11/30/11**	**111122L14**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
PCB018	25.00	112	111	50-125	38-138	1	0-30	
PCB028	25.00	115	115	50-125	38-138	0	0-30	
PCB044	25.00	113	112	50-125	38-138	1	0-30	
PCB052	25.00	109	109	50-125	38-138	1	0-30	
PCB066	25.00	115	115	50-125	38-138	0	0-30	
PCB077	25.00	116	114	50-125	38-138	2	0-30	
PCB101	25.00	115	113	50-125	38-138	1	0-30	
PCB105	25.00	113	111	50-125	38-138	2	0-30	
PCB118	25.00	120	119	50-125	38-138	1	0-30	
PCB126	25.00	104	104	50-125	38-138	1	0-30	
PCB128	25.00	108	107	50-125	38-138	1	0-30	
PCB153	25.00	109	107	50-125	38-138	1	0-30	
PCB170	25.00	109	108	50-125	38-138	1	0-30	
PCB180	25.00	108	107	50-125	38-138	1	0-30	
PCB187	25.00	107	105	50-125	38-138	2	0-30	
PCB206	25.00	109	110	50-125	38-138	1	0-30	

Total number of LCS compounds : 16
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	11-11-1599
Fairfield, CA 94534-1912		Preparation:	EPA 3545
		Method:	EPA 8270C SIM PAHs

Project: Marine Terminal Dredging Project

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-14-437-5	**Solid**	**GC/MS AAA**	**11/22/11**	**12/01/11**	**111122L15**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Acenaphthene	100.0	106	105	48-108	38-118	1	0-11	
Acenaphthylene	100.0	102	102	40-160	20-180	1	0-20	
Anthracene	100.0	89	89	40-160	20-180	0	0-20	
Benzo (a) Anthracene	100.0	105	105	40-160	20-180	1	0-20	
Benzo (a) Pyrene	100.0	91	91	40-160	20-180	0	0-20	
Benzo (b) Fluoranthene	100.0	108	109	40-160	20-180	1	0-20	
Benzo (g,h,i) Perylene	100.0	112	112	40-160	20-180	0	0-20	
Benzo (k) Fluoranthene	100.0	107	105	40-160	20-180	2	0-20	
Chrysene	100.0	106	106	40-160	20-180	1	0-20	
Dibenz (a,h) Anthracene	100.0	118	118	40-160	20-180	0	0-20	
Fluoranthene	100.0	107	107	40-160	20-180	0	0-20	
Fluorene	100.0	107	106	40-160	20-180	0	0-20	
Indeno (1,2,3-c,d) Pyrene	100.0	117	117	40-160	20-180	0	0-20	
2-Methylnaphthalene	100.0	100	100	40-160	20-180	0	0-20	
1-Methylnaphthalene	100.0	110	110	40-160	20-180	0	0-20	
Naphthalene	100.0	105	105	40-160	20-180	0	0-20	
Phenanthrene	100.0	101	100	40-160	20-180	0	0-20	
Pyrene	100.0	107	106	40-160	20-180	1	0-16	

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

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 11-11-1599

Qualifier	Definition
*	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 matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
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.
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.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
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.

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Pacific EcoRisk
ENVIRONMENTAL CONSULTING & TESTING
2250 Cordelia Rd., Fairfield, CA 94534
(707)207-7760

CalScience CHAIN-OF-CUSTODY RECORD

11-11-1599

Client Name:	WESPAC Energy-Pittsburg LLC
Client Address:	2355 Main St., Suite 210 Irvine, CA 92614
Sampled By:	Drew Gantner
Phone:	(707) 207-7760
FAX:	(707) 207-7916
Project Manager:	Jeff Cotsifas (PER)
Project Name:	Marine Terminal Dredging Project
PO Number:	18916

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container Number	Container Type	REQUESTED ANALYSIS: * See Analyte List	grain size
PT 11/9/11								
1	TR-DU1-Comp	11/3/11	7:50	Sed	1	500mL glass	x	
2	TR-DU2-Comp	11/2/11	10:00	Sed	1	500mL glass	x	
3	TR-DU3-Comp	11/2/11	16:45	Sed	1	500mL glass	x	
4	TR-DU4-Comp	11/2/11	13:10	Sed	1	500mL glass	x	
5	TR-DU1-Comp	11/3/11	7:50	Sed	1	poly bag		x
6	TR-DU2-Comp	11/2/11	10:00	Sed	1	poly bag		x
7	TR-DU3-Comp	11/2/11	16:45	Sed	1	poly bag		x
8	TR-DU4-Comp	11/2/11	13:10	Sed	1	poly bag		x

Correct Containers:	**Yes**	**No**	
Sample Temperature:	**Ambient**	**Cold**	**Warm**
Sample Preservative:	**Yes**	**No**	
Turnaround Time:	**STD**	**Specify:**	

Comments:

Perform duplicate, MS/MSD, etc. on TR-DU1-Comp.
Sample date and time are when the earliest sample in the composite was collected.

(500mL glass jar) sample frozen 11/10/11.

RELIQUINSHED BY

Signature:		**Signature:**	Tom O'Malley
Print:	M. M'Elroy	**Print:**	Tom O'Malley
Organization:	PER	**Organization:**	CALScience 70650
DATE:	~~11-11-11~~ 11-18-11	**TIME:**	~~1400~~ 1120
		DATE:	11/18/11 **TIME:** 1730

RECEIVED BY

Signature:	Tom O'Malley CEL	**Signature:**	
Print:	Tom O'Malley	**Print:**	Greyson Long
Organization:	CALScience	**Organization:**	CEL
DATE:	11/18/11 **TIME:** 1120	**DATE:**	11/19/11 **TIME:** 0720

***MATRIX CODES**: (**SED** = Sediment); (**FW** = Freshwater); (**WW** = Wastewater); (**STRMW** = Stormwater)

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ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: **Pacific EcoRisk**

Project #: 18916

Site #: TR-DU1-Comp, TR-DU2-Comp, TR-DU3-Comp, and TR-DU4-Comp

Standard Ocean Disposal List (SF Bay)

Analyte	Method Use	SAP Targeted MRL	
Solids, Total	EPA 160.3	±0.1%	X
Total Organic Carbon	EPA 415.1 or Plumb 1981	±0.1%	X
Grain Size	ASTM 1992 or Plumb 1981	±0.1%	X
Arsenic	EPA 6020	2 mg/kg	X
Cadmium	EPA 6020	0.3 mg/kg	X
Chromium	EPA 6020	5 mg/kg	X
Copper	EPA 6020	5 mg/kg	X
Lead	EPA 6020	5 mg/kg	X
Nickel	EPA 6020	5 mg/kg	X
Silver	EPA 6020	0.2 mg/kg	X
Zinc	EPA 6020	1 mg/kg	X
Mercury	EPA 7471A	0.02 mg/kg	X
Selenium	EPA 7742	0.1 mg/kg	X
2,4'-DDD	EPA 8081B	2 µg/kg	X
2,4'-DDE	EPA 8081B	2 µg/kg	X
2,4'-DDT	EPA 8081B	2 µg/kg	X
4,4'-DDD	EPA 8081B	2 µg/kg	X
4,4'-DDE	EPA 8081B	2 µg/kg	X
4,4'-DDT	EPA 8081B	2 µg/kg	X
Total DDT	EPA 8081B	2 µg/kg	X
Aldrin	EPA 8081B	2 µg/kg	X
alpha-BHC	EPA 8081B	2 µg/kg	X
beta-BHC	EPA 8081B	2 µg/kg	X
Chlordane	EPA 8081B	20 µg/kg	X
delta-BHC	EPA 8081B	2 µg/kg	X
Dieldrin	EPA 8081B	2 µg/kg	X
Endosulfan I	EPA 8081B	2 µg/kg	X
Endosulfan II	EPA 8081B	2 µg/kg	X
Endosulfan Sulfate	EPA 8081B	2 µg/kg	X
Endrin	EPA 8081B	2 µg/kg	X
Endrin Aldehyde	EPA 8081B	2 µg/kg	X
gamma-BHC (Lindane)	EPA 8081B	2 µg/kg	X
Heptachlor	EPA 8081B	2 µg/kg	X
Heptachlor Epoxide	EPA 8081B	2 µg/kg	X
Toxaphene	EPA 8081B	20 µg/kg	X
PCB 008	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 018	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 028	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 031	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 033	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 044	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 049	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 052	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 056	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 060	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 066	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 070	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 074	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 087	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 095	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 097	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 099	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 101	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 105	EPA 8082 (congeners)	0.5-1 µg/kg	X

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PCB 110	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 118	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 128	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 132	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 138	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 141	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 149	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 151	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 153	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 156	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 158	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 170	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 174	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 177	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 180	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 183	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 187	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 194	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 195	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 201	EPA 8082 (congeners)	0.5-1 µg/kg	X
PCB 203	EPA 8082 (congeners)	0.5-1 µg/kg	X
Acenaphthene	EPA 8270C	20 µg/kg	X
Acenaphthylene	EPA 8270C	20 µg/kg	X
Anthracene	EPA 8270C	20 µg/kg	X
Benz(a)anthracene	EPA 8270C	20 µg/kg	X
Benzo(a)pyrene	EPA 8270C	20 µg/kg	X
Benzo(e)pyrene	EPA 8270C	20 µg/kg	X
Benzo(b)fluoranthene	EPA 8270C	20 µg/kg	X
Benzo(g,h,i)perylene	EPA 8270C	20 µg/kg	X
Benzo(k)fluoranthene	EPA 8270C	20 µg/kg	X
Biphenyl	EPA 8270C	20 µg/kg	X
Chrysene	EPA 8270C	20 µg/kg	X
Dibenz(a,h)anthracene	EPA 8270C	20 µg/kg	X
Dibenzothiophene	EPA 8270C	20 µg/kg	X
Dimethylnapthalene 2, 6-	EPA 8270C	5 µg/kg	X
Fluoranthene	EPA 8270C	20 µg/kg	X
Fluorene	EPA 8270C	20 µg/kg	X
Indeno(1,2,3-cd)pyrene	EPA 8270C	20 µg/kg	X
Methylnapthalene, 1-	EPA 8270C	5 µg/kg	X
Methylnapthalene, 2-	EPA 8270C	5 µg/kg	X
Methylphenanthrene, 1-	EPA 8270C	5 µg/kg	X
Methylphenanthrene, 2-	EPA 8270C	5 µg/kg	X
Naphthalene	EPA 8270C	20 µg/kg	X
Perylene	EPA 8270C	20 µg/kg	X
Phenanthrene	EPA 8270C	20 µg/kg	X
Pyrene	EPA 8270C	20 µg/kg	X
Trimethylnapthalene, 2, 3, 5-	EPA 8270C	5 µg/kg	X
Di-butyltin	Krone 1989	10 µg/kg	X
Mono-Butyltin	Krone 1989	10 µg/kg	X
Tetra-butyltin	Krone 1989	10 µg/kg	X
Tri-butyltin	Krone 1989	10 µg/kg	X
QA/QC			
DMMO QA/QC	Perform onTR-DU1-Comp site sample.		X

If you have any questions regarding this request as checked,
please call Jeff Cotsifas at (707)207-7760

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GSO

WebShip > > > > >

800-322-5555 www.gso.com

1599

Ship From:
ALAN KEMP
CAL SCIENCE- CONCORD
5063 COMMERCIAL CIRCLE #H
CONCORD, CA 94520

Ship To:
SAMPLE RECEIVING
CEL
7440 LINCOLN WAY
GARDEN GROVE, CA 92841

COD:
$0.00

Reference:
PACIFIC ECORISK

Delivery Instructions:

Signature Type:
SIGNATURE REQUIRED

Tracking #: 517871978

SDS

ORC

D

GARDEN GROVE

D92843A

96218408

Print Date : 11/18/11 15:12 PM

Package 1 of 1

Send Label To Printer | ☑ Print All | Edit Shipment | Finish

LABEL INSTRUCTIONS:

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

STEP 1 - Use the "Send Label to Printer" 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, do not cover the barcode.
STEP 4 - Request an on-call pickup for your package, if you do not have scheduled daily pickup service or Drop-off your package at the nearest GSO drop box. Locate nearest GSO dropbox locations using this link.

ADDITIONAL OPTIONS:

Send Label Via Email | Create Return Label

TERMS AND CONDITIONS:

By giving us your shipment to deliver, you agree to all the service terms and conditions described in this section.
Our liability for loss or damage to any package is limited to your actual damages or $100 whichever is less, unless you pay for and declare a higher authorized value. If you declare a higher value and pay the additional charge, our liability will be the lesser of your declared value or the actual value of your loss or damage. In any event, we will not be liable for any damage, whether direct, incidental, special or consequential, in excess of the declared value of a shipment whether or not we had knowledge that such damage might be incurred including but not limited to loss of income or profit. We will not be liable for your acts or omissions, including but not limited to improper or insufficient packaging, securing, marking or addressing. Also, we will not be liable if you or the recipient violates any of the terms of our agreement. We will not be liable for loss, damage or delay caused by events we cannot control, including but not limited to acts of God, perils of the air, weather conditions, act of public enemies, war, strikes, or civil commotion. The highest declared value for our GSO Priority Letter or GSO Priority Package is $500. For other shipments the highest declared value is $10,000 unless your package contains items of "extraordinary value", in which case the highest declared value we allow is $500. Items of "extraordinary value" include, but or not limited to, artwork, jewelry, furs, precious metals, tickets, negotiable instruments and other items with intrinsic value.

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 11-11-1599

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Pacific EcoRisk DATE: 11/19/11

TEMPERATURE: Thermometer ID: SC1 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 1.0 °C + 0.5 °C (CF) = 1.5 °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.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter Initial: YC

CUSTODY SEALS INTACT:

☑ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☐ N/A Initial: YC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: PT

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☐	☑	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☑16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☑ Z

Water: ☐VOA ☐VOAh ☐VOAna_2 ☐125AGB ☐125AGBh ☐125AGBp ☐1AGB ☐1AGBna_2 ☐1AGBs ☐500AGB ☐500AGJ ☐500AGJs ☐250AGB ☐250CGB ☐250CGBs ☐1PB ☐1PBna ☐500PB ☐250PB ☐250PBn ☐125PB ☐125PBznna ☐100PJ ☐100PJna_2 ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** PT

Container: C: Clear A: Amber P: Plastic G: Glass J: Jar B: Bottle Z: Ziploc/Resealable Bag E: Envelope **Reviewed by:** WSL

Preservative: h: HCL n: HNO_3 na_2:$Na_2S_2O_3$ na: NaOH p: H_3PO_4 s: H_2SO_4 u: Ultra-pure znna: $ZnAc_2$+NaOH f: Filtered **Scanned by:** WSL

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Calscience Environmental Laboratories, Inc.

WORK ORDER #: 11-11-1599

SAMPLE ANOMALY FORM

SAMPLES - CONTAINERS & LABELS:

Comments:

- ☐ **Sample(s) NOT RECEIVED but listed on COC**
- ☐ **Sample(s) received but NOT LISTED on COC**
- ☐ **Holding time expired** – list sample ID(s) and test
- ☐ **Insufficient quantities for analysis** – list test
- ☐ **Improper container(s) used** – list test
- ☐ **Improper preservative used** – list test
- ☐ **No preservative noted on COC or label** – list test & notify lab
- ☐ **Sample labels illegible** – note test/container type
- ☑ **Sample label(s) do not match COC** – Note in comments
  - ☐ **Sample ID**
  - ☑ **Date and/or Time Collected**
  - ☐ **Project Information**
  - ☐ **# of Container(s)**
  - ☐ **Analysis**
- ☐ **Sample container(s) compromised** – Note in comments
  - ☐ **Water present in sample container**
  - ☐ **Broken**
- ☐ **Sample container(s) not labeled**
- ☐ **Air sample container(s) compromised** – Note in comments
  - ☐ **Flat**
  - ☐ **Very low in volume**
  - ☐ **Leaking (Not transferred - duplicate bag submitted)**
  - ☐ **Leaking (transferred into Calscience Tedlar® Bag*)**
  - ☐ **Leaking (transferred into Client's Tedlar® Bag*)**
- ☐ **Other:** _____

Comments:
Collection time per label is :
(-1) 9:20.
(-4) 11:15

HEADSPACE – Containers with Bubble > 6mm or ¼ inch:

Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Cont. received	Analysis

Comments: _____

*Transferred at Client's request.

Initial / Date: PT 11/19/11

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Appendix C

Analytical Chemistry Laboratory Data Report Submitted by CalScience: Results of Metals and TSS Analysis of MET

Calscience Environmental Laboratories, Inc.

CALSCIENCE

WORK ORDER NUMBER: 11-12-0512

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Pacific Ecorisk

Client Project Name: WESPAC

Attention: Jeff Cotsifas
2250 Cordelia Road
Fairfield, CA 94534-1912

Approved for release on 12/28/2011 by:
Danielle Gonsman
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety. Note that the Chain-of-Custody Record and Sample Receipt Form are integral parts of this report.

Calscience Environmental Laboratories, Inc.

Contents

Client Project Name: WESPAC
Work Order Number: 11-12-0512

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	12/08/11
2250 Cordelia Road		Work Order No:	11-12-0512
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	SM 2540 D

Project: WESPAC

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-MET	**11-12-0512-1-I**	**12/07/11 12:00**	**Sea Water**	**N/A**	**12/09/11**	**12/09/11 14:00**	**B1209TSSB1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Solids, Total Suspended	5.2	1.0	0.95	1		mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-MET	**11-12-0512-2-E**	**12/07/11 12:01**	**Sea Water**	**N/A**	**12/09/11**	**12/09/11 14:00**	**B1209TSSB1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Solids, Total Suspended	4.6	1.0	0.95	1		mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-MET	**11-12-0512-3-E**	**12/07/11 12:02**	**Sea Water**	**N/A**	**12/09/11**	**12/09/11 14:00**	**B1209TSSB1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Solids, Total Suspended	6.6	1.0	0.95	1		mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-MET	**11-12-0512-4-E**	**12/07/11 12:03**	**Sea Water**	**N/A**	**12/09/11**	**12/09/11 14:00**	**B1209TSSB1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Solids, Total Suspended	11	1.0	0.95	1		mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-MET-LAB DUP	**11-12-0512-5-J**	**12/07/11 12:00**	**Sea Water**	**N/A**	**12/09/11**	**12/09/11 14:00**	**B1209TSSB1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Solids, Total Suspended	5.7	1.0	0.95	1		mg/L

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-09-010-5,304**	**N/A**	**Aqueous**	**N/A**	**12/09/11**	**12/09/11 14:00**	**B1209TSSB1**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Units
Solids, Total Suspended	ND	1.0	0.95	1		mg/L

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received:	12/08/11
Work Order No:	11-12-0512
Preparation:	EPA 3005A Filt.
Method:	EPA 1640
Units:	ug/L

Project: WESPAC

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-MET	**11-12-0512-1-F**	**12/07/11 12:00**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/13/11 21:15**	**111212L07F**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	0.843	0.0300	0.0133	1		Nickel	2.35	0.0500	0.00736	1	B
Cadmium	0.205	0.0300	0.00650	1	B	Silver	0.180	0.0500	0.00655	1	
Chromium	ND	0.200	0.0937	1		Zinc	2.37	1.00	0.0708	1	
Copper	0.235	0.0300	0.00883	1		Lead	ND	0.0300	0.0124	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-MET	**11-12-0512-2-C**	**12/07/11 12:01**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/13/11 21:38**	**111212L07F**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	1.79	0.0300	0.0133	1		Nickel	1.85	0.0500	0.00736	1	B
Cadmium	0.0428	0.0300	0.00650	1	B	Silver	0.166	0.0500	0.00655	1	
Chromium	ND	0.200	0.0937	1		Zinc	3.90	1.00	0.0708	1	
Copper	0.196	0.0300	0.00883	1		Lead	ND	0.0300	0.0124	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-MET	**11-12-0512-3-C**	**12/07/11 12:02**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/13/11 21:49**	**111212L07F**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	1.07	0.0300	0.0133	1		Nickel	1.41	0.0500	0.00736	1	B
Cadmium	0.0332	0.0300	0.00650	1	B	Silver	0.172	0.0500	0.00655	1	
Chromium	ND	0.200	0.0937	1		Zinc	3.16	1.00	0.0708	1	
Copper	0.163	0.0300	0.00883	1		Lead	ND	0.0300	0.0124	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-MET	**11-12-0512-4-C**	**12/07/11 12:03**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/13/11 22:47**	**111212L07F**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	2.10	0.0300	0.0133	1		Nickel	3.17	0.0500	0.00736	1	B
Cadmium	0.0432	0.0300	0.00650	1	B	Silver	0.164	0.0500	0.00655	1	
Chromium	ND	0.200	0.0937	1		Zinc	5.21	1.00	0.0708	1	
Copper	0.251	0.0300	0.00883	1		Lead	ND	0.0300	0.0124	1	

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 12/08/11
Work Order No: 11-12-0512
Preparation: EPA 3005A Filt.
Method: EPA 1640
Units: ug/L

Project: WESPAC

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-MET-LAB DUP	**11-12-0512-5-F**	**12/07/11 12:00**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/13/11 21:27**	**111212L07F**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	0.800	0.0300	0.0133	1		Nickel	2.41	0.0500	0.00736	1	B
Cadmium	0.210	0.0300	0.00650	1	B	Silver	0.184	0.0500	0.00655	1	
Chromium	ND	0.200	0.0937	1		Zinc	2.48	1.00	0.0708	1	
Copper	0.239	0.0300	0.00883	1		Lead	ND	0.0300	0.0124	1	

Method Blank	099-13-067-129	N/A	Aqueous	ICP/MS 03	12/12/11	12/12/11 20:22	111212L07F

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	ND	0.0300	0.0133	1		Nickel	0.0134	0.0500	0.00736	1	J
Cadmium	0.00947	0.0300	0.00650	1	J	Selenium	ND	0.0500	0.0112	1	
Chromium	ND	0.200	0.0937	1		Silver	ND	0.0500	0.00655	1	
Copper	ND	0.0300	0.00883	1		Zinc	ND	1.00	0.0708	1	
Lead	ND	0.0300	0.0124	1							

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7440 Lincoln Way, Garden Grove, CA 92841-1427 · TEL:(714) 895-5494 · FAX: (714) 894-7501

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 12/08/11
Work Order No: 11-12-0512
Preparation: EPA 3005A Total
Method: EPA 1640
Units: ug/L

Project: WESPAC

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-MET	**11-12-0512-1-H**	**12/07/11 12:00**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/12/11 15:14**	**111212L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual
Selenium	0.135	0.0500	0.0112	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU2-MET	**11-12-0512-2-D**	**12/07/11 12:01**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/12/11 15:25**	**111212L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual
Selenium	0.0171	0.0500	0.0112	1	J

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU3-MET	**11-12-0512-3-D**	**12/07/11 12:02**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/12/11 15:31**	**111212L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual
Selenium	ND	0.0500	0.0112	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU4-MET	**11-12-0512-4-D**	**12/07/11 12:03**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/12/11 15:37**	**111212L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual
Selenium	0.192	0.0500	0.0112	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
TR-DU1-MET-LAB DUP	**11-12-0512-5-H**	**12/07/11 12:00**	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/12/11 15:20**	**111212L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual
Selenium	0.112	0.0500	0.0112	1	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-13-067-128**	**N/A**	**Aqueous**	**ICP/MS 03**	**12/12/11**	**12/12/11 20:10**	**111212L07**

Comment(s): -Results were evaluated to the MDL, concentrations >= to the MDL but < RL, if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qual	Parameter	Result	RL	MDL	DF	Qual
Arsenic	ND	0.0300	0.0133	1		Nickel	0.0102	0.0500	0.00736	1	J
Cadmium	0.00929	0.0300	0.00650	1	J	Selenium	ND	0.0500	0.0112	1	
Chromium	0.172	0.200	0.0937	1	J	Silver	ND	0.0500	0.00655	1	
Copper	ND	0.0300	0.00883	1		Zinc	ND	1.00	0.0708	1	
Lead	ND	0.0300	0.0124	1							

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RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

LABORATORY ID: 11-12-0512

Method: EPA1631 - Mercury
Matrix: Water/Aqueous

CLIENT: Pacific Ecorisk
PROJECT: WESPAC

Results

Sample ID	Mercury (Total) (ug/L)	Dilution Factor	Date Extracted	Date Analyzed
TR-DU1-MET	0.00167	1	12/14/11	12/14/11
TR-DU2-MET	0.00179	1	12/14/11	12/14/11
TR-DU3-MET	0.00152	1	12/14/11	12/14/11
TR-DU4-MET	0.00171	1	12/14/11	12/14/11
TR-DU1-MET-LAB DUP	0.00197	1	12/14/11	12/14/11
Method Blank	ND	1	12/14/11	12/14/11
Reporting Limit:	0.0005			

Quality Assurance and Control Information

Matrix Sample Spike ID: TR-DU1-MET

Batch ID: 111214L01	Spike Conc. ppm	LCS Result ppm	**LCS Rec (%)**	LCS Control Limits	**MS Rec (%)**	**MSD Rec (%)**	Control Limits	**RPD (%)**	RPD Control Limits
Mercury	0.0200	0.0208	**104**	50-130	**88**	**90**	50-130	**2**	0-14

Laboratory Notes

Key: Rec=Recovery, ND=Not Detected at the reporting level

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LABORATORY ID: 11-12-0512

Method: EPA1631 - Mercury
Matrix: Water/Aqueous

CLIENT: Pacific Ecorisk
PROJECT: WESPAC

Results

Sample ID	Mercury (Filtered) (ug/L)	Dilution Factor	Date Extracted	Date Analyzed
TR-DU1-MET	ND	1	12/14/11	12/14/11
TR-DU2-MET	ND	1	12/14/11	12/14/11
TR-DU3-MET	ND	1	12/14/11	12/14/11
TR-DU4-MET	ND	1	12/14/11	12/14/11
TR-DU1-MET-LAB DUP	ND	1	12/14/11	12/14/11
Method Blank	ND	1	12/14/11	12/14/11

Reporting Limit: 0.0005

Laboratory Notes

Key: Rec=Recovery, ND=Not Detected at the reporting level

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Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk
2250 Cordelia Road
Fairfield, CA 94534-1912

Date Received: 12/08/11
Work Order No: 11-12-0512
Preparation: EPA 3005A Filt.
Method: EPA 1640

Project WESPAC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
TR-DU1-MET	**Sea Water**	**ICP/MS 03**	**12/12/11**	**12/13/11**	**111212S07**

Parameter	SPIKE ADDED	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	0.5000	106	107	50-150	0	0-20	
Cadmium	0.5000	88	88	50-150	0	0-20	
Chromium	5.000	42	47	50-150	10	0-20	3
Copper	0.5000	34	37	50-150	4	0-20	3
Lead	0.5000	29	20	50-150	33	0-20	3,4
Nickel	0.5000	4X	4X	50-150	4X	0-20	Q
Selenium	0.5000	75	76	50-150	1	0-20	
Silver	0.2500	54	56	50-150	2	0-20	
Zinc	5.000	88	73	50-150	12	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	12/08/11
2250 Cordelia Road		Work Order No:	11-12-0512
Fairfield, CA 94534-1912		Preparation:	N/A
		Method:	SM 2540 D

Project: WESPAC

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
TR-DU1-MET	**Sea Water**	**N/A**	**12/09/11**	**12/09/11**	**B1209TSSD1**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Solids, Total Suspended	5.2	5.4	4	0-10	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	11-12-0512
Fairfield, CA 94534-1912		Preparation:	EPA 3005A Total
		Method:	EPA 1640

Project: WESPAC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-13-067-128	**Aqueous**	**ICP/MS 03**	**12/12/11**	**12/12/11**	**111212L07**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	0.5000	96	90	70-130	7	0-20	
Cadmium	0.5000	87	92	70-130	6	0-20	
Chromium	5.000	110	116	70-130	5	0-20	
Copper	0.5000	87	92	70-130	6	0-20	
Lead	0.5000	102	107	70-130	5	0-20	
Nickel	0.5000	86	92	70-130	6	0-20	
Selenium	0.5000	83	80	70-130	4	0-20	
Silver	0.2500	93	95	70-130	2	0-20	
Zinc	5.000	95	100	70-130	5	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Pacific Ecorisk		Date Received:	N/A
2250 Cordelia Road		Work Order No:	11-12-0512
Fairfield, CA 94534-1912		Preparation:	EPA 3005A Filt.
		Method:	EPA 1640

Project: WESPAC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-13-067-129	**Aqueous**	**ICP/MS 03**	**12/12/11**	**12/12/11**	**111212L07F**

Parameter	SPIKE ADDED	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Arsenic	0.5000	96	90	70-130	7	0-20	
Cadmium	0.5000	87	92	70-130	6	0-20	
Chromium	5.000	110	116	70-130	5	0-20	
Copper	0.5000	87	92	70-130	6	0-20	
Lead	0.5000	102	107	70-130	5	0-20	
Nickel	0.5000	86	92	70-130	6	0-20	
Selenium	0.5000	83	80	70-130	4	0-20	
Silver	0.2500	93	95	70-130	2	0-20	
Zinc	5.000	95	100	70-130	5	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

ACCREDITED IN ACCORDANCE WITH nelac

Work Order Number: 11-12-0512

Qualifier	Definition
*	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 matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported without further clarification.
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.
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.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
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.
MPN - Most Probable Number

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Pacific EcoRisk
ENVIRONMENTAL CONSULTING & TESTING
2250 Cordelia Rd., Fairfield, CA 94534
(707)207-7760

11-12-0512
CalScience CHAIN-OF-CUSTODY RECORD

Client Name:	Pacific EcoRisk
Client Address:	2250 Cordelia Rd. Fairfield, CA 94534
Sampled By:	Drew Gantner
Phone:	(707) 207-7760
FAX:	(707) 207-7916
Project Manager:	Jeff Cotsifas
Project Name:	WESPAC
PO Number:	18916

	Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container Number	Container Type	Dissolved Arsenic (EPA 6020) Target MRL=0.5ug/L	Dissolved Cadmium(EPA 6020) Target MRL=0.02ug/L	Dissolved Chromium(EPA 6020) Target MRL=0.2ug/L	Dissolved Copper(EPA 6020) Target MRL=0.1ug/L	Dissolved Lead(EPA 6020) Target MRL=0.02ug/L	Dissolved Mercury(EPA 1631A) Target MRL=0.005ug/L	Total Mercury(EPA 1631A) Target MRL=0.005ug/L	Dissolved Nickel(EPA 6020) Target MRL=0.2ug/L	Total Selenium(EPA 6020) Target MRL=1ug/L	Dissolved Zinc(EPA 6020) Target MRL=0.5ug/L	Dissolved Silver (EPA 6020)Target MRL=0.02ug/L	Total Suspended Solids (SM2540D) Target MRL=5mg/L
1	**TR-DU1 - MET**	12/7/11	12:00	MET	4	250 mL HDPE	X	X	X	X	X			X	X	X	X	
2	TR-DU2 - MET	12/7/11	12:01	MET	2	250 mL HDPE	X	X	X	X	X			X	X	X	X	
3	TR-DU3 - MET	12/7/11	12:02	MET	2	250 mL HDPE	X	X	X	X	X			X	X	X	X	
4	TR-DU4 - MET	12/7/11	12:03	MET	2	250 mL HDPE	X	X	X	X	X			X	X	X	X	
5	**TR-DU1 - MET**	12/7/11	12:00	MET	4	250 mL Glass						X	X					
6	TR-DU2 - MET	12/7/11	12:01	MET	2	250 mL Glass						X	X					
7	TR-DU3 - MET	12/7/11	12:02	MET	2	250 mL Glass						X	X					
8	TR-DU4 - MET	12/7/11	12:03	MET	2	250 mL Glass						X	X					
9	**TR-DU1 - MET**	12/7/11	12:00	MET	2	1L HDPE												X
10	TR-DU2 - MET	12/7/11	12:01	MET	1	1L HDPE												X
11	TR-DU3 - MET	12/7/11	12:02	MET	1	1L HDPE												X
12	TR-DU4 - MET	12/7/11	12:03	MET	1	1L HDPE												X

REQUESTED ANALYSIS

Correct Containers:	**Yes**	**No**	
Sample Temperature:	**Ambient**	**Cold**	**Warm**
Sample Preservative:	**Yes**	**No**	
Turnaround Time:	**STD**	**Specify:**	

Comments:

Perform duplicate, MS/MSD, etc. on TR-DU1. Standard TAT.

Sample date and time are when the sample was extracted after 24 hour settling period.

RELIQUINSHED BY		Received By:	
Signature:		**Signature:**	
Print:	Y. Khadizweg	**Print:**	Noel Guise
Organization:	PER	**Organization:**	CCL
DATE:	12/7/11 **TIME:** 1430	**DATE:**	12/08/11 **TIME:** 1030

RECEIVED BY			
Signature:		**Signature:**	
Print:		**Print:**	
Organization:		**Organization:**	
DATE:	**TIME:**	**DATE:**	**TIME:**

***MATRIX CODES**: (**SED** = Sediment); (**FW** = Freshwater); (**WW** = Wastewater); (**STRMW** = Stormwater)

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092

FedEx Ship Manager - Print Your Label(s)

12/7/11 2:46 PM

Label 2 of 2

From: (707) 207-7760
Yuliya Khadiyeva
PACIFIC ECORISK
2250 Cordelia Road

Fairfield, CA 94534

Origin ID: CCRA

FedEx Express

J112011608350225

Ship Date: 07DEC11
ActWgt: 56.0 LB
CAD: 2549479/INET3210

Delivery Address Bar Code

SHIP TO: (714) 895-5494 BILL SENDER

Danielle Gonsman
Calscience Environmental Labs
7440 Lincoln Way

Garden Grove, CA 92841

Ref # PO 18912
Invoice #
PO #
Dept #

2 of 2

MPS# 7954 8692 0734
0263

Mstr# 7954 8692 0675 0201

THU - 08 DEC A1
PRIORITY OVERNIGHT

92841
CA-US
SNA

93 APVA

50FG1/8S9F/F5F4

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FedEx Ship Manager - Print Your Label(s)

12/7/11 2:46 PM

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 11-12-0512

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: Pacific Ecorisk DATE: 12/08/11

TEMPERATURE: Thermometer ID: SC3 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature 3.9 °C - 0.3 °C (CF) = 3.6 °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.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☐ Air ☐ Filter Initial: MC

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☑ Not Present ☐ N/A Initial: MC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: KR

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☑	☐	☐
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☑250CGB ☐250CGB**s** ☑1PB ☐1PB**na** ☐500PB

☑250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☐Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** KR

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:** hl

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:**$Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:** hl

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Appendix D

Ammonia and Sulfide Analyses Performed in Support of Bioassay Testing

Table D-1. Sediment Porewater Initial Water Quality Characteristics for *Eohaustorius estuarius* Toxicity Tests.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.73	20.8	<1.00	0.118
TR-DU1-Comp	7.45	16.9	2.24	0.449
TR-DU2-Comp	7.25	15.2	6.71	0.081
TR-DU3-Comp	7.24	16.5	5.52	0.063
TR-DU4-Comp	7.12	14.2	15.7	0.032

Table D-2. Sediment Porewater Final Water Quality Characteristics for *Eohaustorius estuarius* Toxicity Tests.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.49	20.8	<1.00	0.020
TR-DU1-Comp	7.44	19.1	1.20	0.474
TR-DU2-Comp	7.29	19.0	2.36	0.189
TR-DU3-Comp	7.18	18.4	3.92	0.208
TR-DU4-Comp	7.12	17.8	11.7	0.045

Table D-3. Sediment Overlying Water Total Ammonia Levels for *Eohaustorius estuarius* Tests.

Sample ID	Total Ammonia (mg/L N)	
	Test Initiation	Test Termination
Lab Control	<1.00	<1.00
TR-DU1-Comp	<1.00	<1.00
TR-DU2-Comp	1.59	3.10
TR-DU3-Comp	<1.00	1.45
TR-DU4-Comp	3.44	5.65

Table D-4. Sediment Porewater Initial Water Quality Characteristics for *Neanthes arenacoedentata* Tests.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	7.04	29.9	1.06	0.036
TR-DU1-Comp	7.31	24.6	2.71	0.449
TR-DU2-Comp	7.03	25.0	8.55	0.048
TR-DU3-Comp	7.50	20.4	6.30	0.063
TR-DU4-Comp	7.17	20.7	17.8	0.032

Table D-5. Sediment Porewater Final Water Quality Characteristics for *Neanthes arenacoedentata* Tests.

Sample ID	pH	Salinity (ppt)	Total Ammonia (mg/L N)	Total Sulfide (mg/L)
Lab Control	6.89	31.4	<1.00	0.060
TR-DU1-Comp	6.79	28.4	1.51	0.124
TR-DU2-Comp	7.57	32.1	6.49	0.124
TR-DU3-Comp	7.11	27.6	2.42	0.190
TR-DU4-Comp	7.28	27.8	8.72	0.379

Table D-6. Sediment Overlying Water Total Ammonia Levels for *Neanthes arenacoedentata* Tests.

Sample ID	Total Ammonia (mg/L N)	
	Test Initiation	Test Termination
Lab Control	<1.00	<1.00
TR-DU1-Comp	<1.00	2.42
TR-DU2-Comp	1.77	<1.00
TR-DU3-Comp	<1.00	1.09
TR-DU4-Comp	<1.00	2.36

Appendix E

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the WesPac Marine Terminal Sediments to the Amphipod, *Eohaustorius estuarius*

CETIS Summary Report

Eohaustorius 10-d Survival and Reburial Sediment Test

Pacific EcoRisk

Batch ID:	18-8619-0574	**Test Type:**	Survival-Reburial	**Analyst:**	Padrick Anderson
Start Date:	03 Dec-11 11:00	**Protocol:**	ASTM E1367-99 (Amphipod)	**Diluent:**	Not Applicable
Ending Date:	13 Dec-11 10:30	**Species:**	Eohaustorius estuarius	**Brine:**	Not Applicable
Duration:	9d 23h	**Source:**	Northwestern Aquatic Science, CA	**Age:**	N/A

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
WESPAC_EE_C1	11-8839-8123	03 Dec-11 11:00	03 Dec-11 11:00	N/A (15.6 °C)	WESPAC Energy-Pittsburg	18916
TR-DU1-Comp	13-3232-9788	03 Nov-11 07:50	03 Nov-11 19:00	30d 3h (0 °C)		
TR-DU2-Comp	03-1651-2086	02 Nov-11 10:00	02 Nov-11 19:00	31d 1h (0 °C)		
TR-DU3-Comp	09-7787-1456	02 Nov-11 16:45	02 Nov-11 19:00	30d 18h (0 °C)		
TR-DU4-Comp	13-1758-5116	02 Nov-11 13:10	02 Nov-11 19:00	30d 22h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
WESPAC_EE_C1	Sediment	WESPAC Energy-Pittsburg LLC	LABQA		
TR-DU1-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU1-Comp		
TR-DU2-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU2-Comp		
TR-DU3-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU3-Comp		
TR-DU4-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU4-Comp		

Sample Code	vs	Sample Code	P-Value	Alpha	Decision	Analysis ID	Method
WESPAC_EE_C1		TR-DU1-Comp	0.5000	0.05	Non-Significant Effect	16-0971-9258	Wilcoxon Rank Sum Two-Sample Test
		TR-DU2-Comp	0.0159	0.05	Significant Effect	07-9191-9714	Wilcoxon Rank Sum Two-Sample Test
		TR-DU3-Comp	0.0296	0.05	Significant Effect	14-8730-8858	Equal Variance t Two-Sample Test
		TR-DU4-Comp	0.0069	0.05	Significant Effect	05-0984-2276	Equal Variance t Two-Sample Test

Survival Rate Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU1-Comp	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU2-Comp	5	0.94	0.92	0.96	0.85	1	0.0245	0.0548	5.83%	6.0%
TR-DU3-Comp	5	0.96	0.944	0.976	0.9	1	0.0187	0.0418	4.36%	4.0%
TR-DU4-Comp	5	0.87	0.834	0.906	0.8	1	0.0436	0.0975	11.2%	13.0%

Survival Rate Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
WESPAC_EE_C1	1	1	1	1	1
TR-DU1-Comp	1	1	1	1	1
TR-DU2-Comp	0.85	0.95	0.95	1	0.95
TR-DU3-Comp	0.9	1	0.95	1	0.95
TR-DU4-Comp	0.8	0.8	1	0.8	0.95

Eohaustorius 10-d Survival and Reburial Sediment Test — **Pacific EcoRisk**

Analysis ID:	16-0971-9258	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:32	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes survival rate endpoint	1.25%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
WESPAC_EE_C1		TR-DU1-Comp	27.5		8	1	0.5000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	1	65500	<0.0001	Significant Effect
Error	0	0	8			
Total	0	0	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	65500	13.7	<0.0001	Unequal Variances

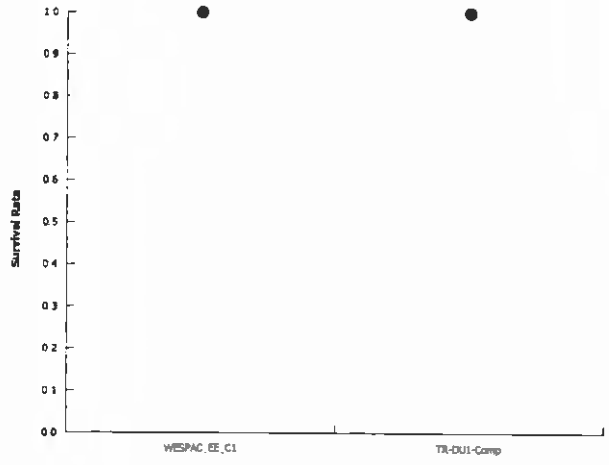
Survival Rate Summary

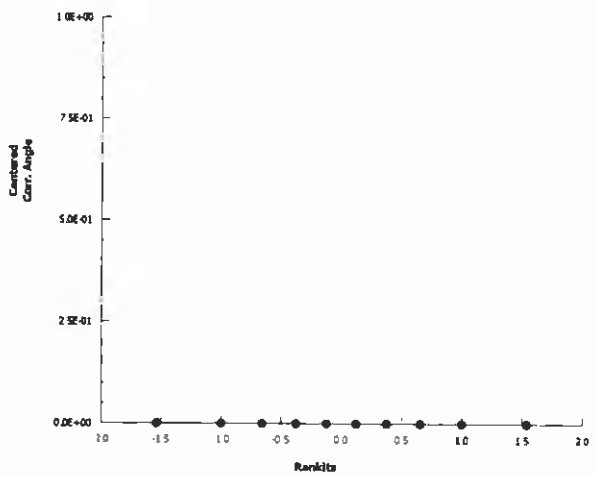
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU1-Comp	5	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1.46	1.46	1.46	1.46	1.46	0	0	0.0%	0.0%
TR-DU1-Comp	5	1.46	1.46	1.46	1.46	1.46	0	0	0.0%	0.0%

Graphics





Eohaustorius 10-d Survival and Reburial Sediment Test — **Pacific EcoRisk**

Analysis ID:	07-9191-9714	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:32	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes survival rate endpoint	3.83%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
WESPAC_EE_C1		TR-DU2-Comp	17.5		8	1	0.0159	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.03919875	0.03919875	1	7.5	0.0255	Significant Effect
Error	0.04183539	0.005229424	8			
Total	0.08103415	0.04442818	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	2.77	13.7	0.1473	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.705	0.741	0.0010	Non-normal Distribution

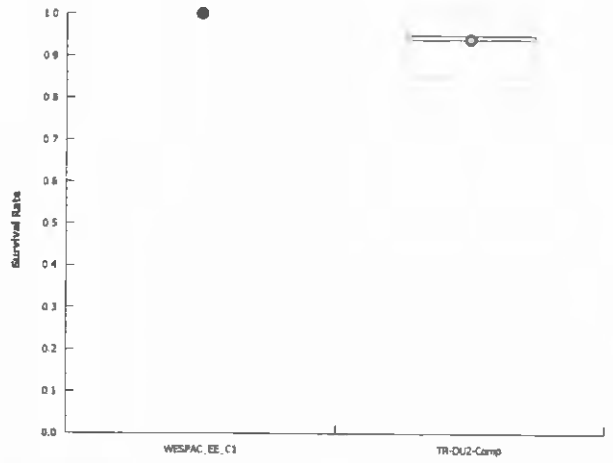
Survival Rate Summary

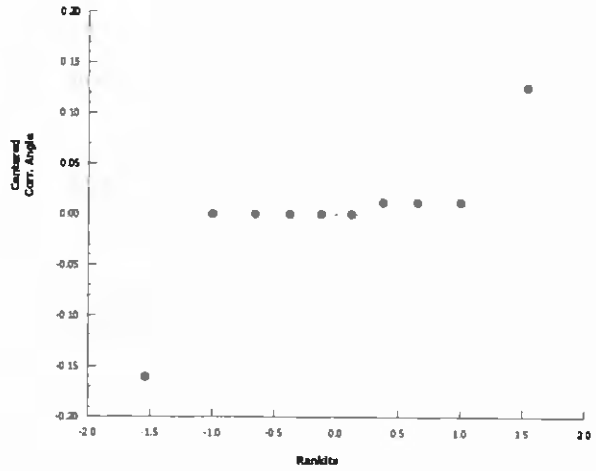
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU2-Comp	5	0.94	0.919	0.961	0.85	1	0.0245	0.0548	5.83%	6.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1.46	1.46	1.46	1.46	1.46	0	0	0.0%	0.0%
TR-DU2-Comp	5	1 33	1 29	1.37	1.17	1.46	0.0457	0.102	7.67%	8.58%

Graphics





Eohaustorius 10-d Survival and Reburial Sediment Test — **Pacific EcoRisk**

Analysis ID:	14-8730-8858	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:32	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes survival rate endpoint	3.42%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
WESPAC_EE_C1		TR-DU3-Comp	2.2	1.86	8	0.0739	0.0296	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01906758	0.01906758	1	4.83	0.0593	Non-Significant Effect
Error	0.03159784	0.00394973	8			
Total	0.05066542	0.02301731	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	8.8	13.7	0.0251	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.843	0.741	0.0485	Normal Distribution

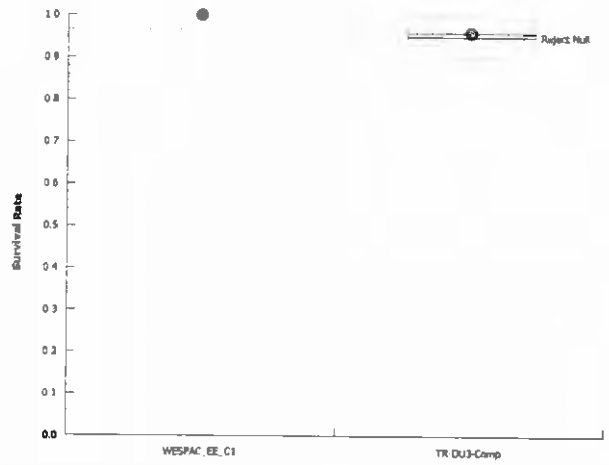
Survival Rate Summary

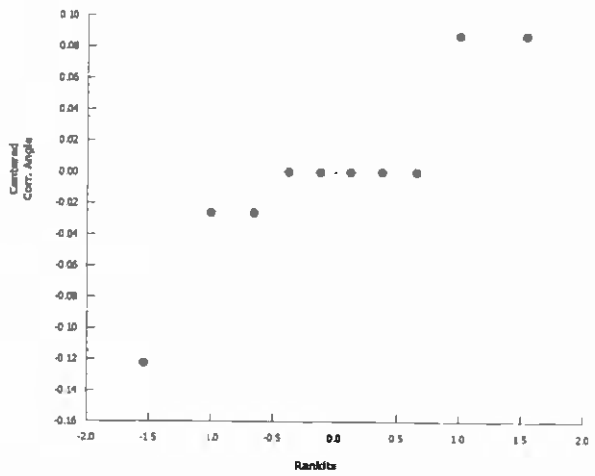
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU3-Comp	5	0.96	0.944	0.976	0.9	1	0.0187	0.0418	4.36%	4.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1.46	1.46	1.46	1.46	1.46	0	0	0.0%	0.0%
TR-DU3-Comp	5	1.37	1.34	1.41	1.25	1.46	0.0397	0.0889	6.48%	5.99%

Graphics





Eohaustorius 10-d Survival and Reburial Sediment Test

Pacific EcoRisk

Analysis ID:	05-0984-2276	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:32	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes survival rate endpoint	6.14%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
WESPAC_EE_C1		TR-DU4-Comp	3.14	1.86	8	0.138	0.0069	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.1364938	0.1364938	1	9.86	0.0138	Significant Effect
Error	0.1107778	0.01384723	8			
Total	0.2472717	0.150341	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	2.79	13.7	0.1457	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.842	0.741	0.0462	Normal Distribution

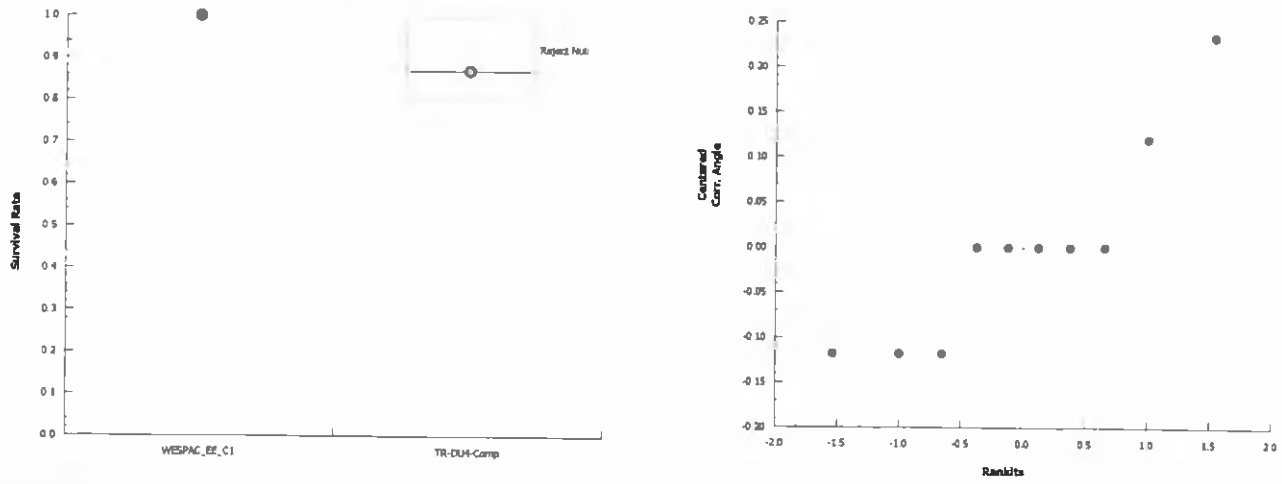
Survival Rate Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU4-Comp	5	0.87	0.833	0.907	0.8	1	0.0436	0.0975	11.2%	13.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_EE_C1	5	1.46	1.46	1.46	1.46	1.46	0	0	0.0%	0.0%
TR-DU4-Comp	5	1.23	1.16	1.29	1.11	1.46	0.0744	0.166	13.6%	16.0%

Graphics



10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC Test ID#: 45743-6 Date (Day 0): 12-3-11

Species: *Eohaustorius estuarius* Project #: 18916 Organism Supplier: Northwest Aquatics

Organism Log # : 6114

Day of Test	Test Replicate	Sample ID: Control					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	15.6	7.77	9.2	19.6	20	Date: 12/3/11
	Rep B	15.6	7.74	9.6	19.7	20	Time: 1100
	Rep C	15.6	7.76	9.7	19.7	20	WQ: JLA/CC
	Rep D	15.6	7.76	9.7	19.7	20	Scientist Initiation:
	Rep E	15.6	7.74	9.7	19.7	20	Scientist Confirmation: KW
Day 1	Rep A	15.4	7.79	8.8	19.7		Date: 12/4/11 Time: 0940 WQ: JA
Day 2	Rep B	15.4	7.58	8.3	19.9		Date: 12/5/11 Time: 1135 WQ: JC
Day 3	Rep C	15.7	7.77	8.7	20.4		Date: 12.6.11 Time: 0830 WQ:
Day 4	Rep D	15.6	7.62	8.3	20.7		Date: 12/7/11 Time: 0915 WQ: JLA
Day 5	Rep E	15.6	7.58	8.8	21.1		Date: 12/8/11 Time: 1415 WQ: JLA
Day 6	Rep A	15.7	7.58	8.5	20.8		Date: 12/9/11 Time: 1130 WQ: SS
Day 7	Rep B	15.8	7.71	8.5	20.7		Date: 12/10/11 Time: 1315 WQ: JLA
Day 8	Rep C	14.0	7.67	8.9	21.6		Date: 12.11.11 Time: 1040 WQ: MO
Day 9	Rep D	14.0	7.64	8.5	21.9		Date: 12.12.11 Time: 0920 WQ: MO
Day 10	Rep A	14.2	7.75	8.6	21.5	20	Date: 12/13/11
	Rep B	14.2	7.73	8.8	20.6	20	Time: 1030
	Rep C	14.2	7.79	8.8	21.8	20	WQ: JLA
	Rep D	14.2	7.71	8.9	21.8	20	Scientist Counts:
	Rep E	14.2	7.78	9.0	19.7	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	7.73	8.3	20.8	0.118	<1.00	Date: 12/3/11 Time: 1230 WQ: JLA
	Overlying Water					<1.00	Date: 12/3/11 Time: 1200 WQ: JLA
	Meter ID	PH16	RDO4	EC02	DR4000U	DR3800	
Day 10	Porewater	7.49	7.9	20.8	0.020	<1.00	Date: 12/13/11 Time: 1100 WQ: JLA
	Overlying Water					<1.00	Date: 12/13/11 Time: 0930 WQ: JLA
	Meter ID	PH17	RDO4	EC06	DR4000U	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC | Test ID#: 45743 | Date (Day 0): ~~12-3-11~~ 12-3-11

Species: *Eohaustorius estuarius* | Project #: 18916 | Organism Supplier: Northwest Aquatics

Organism Log # : 6114

Day of Test	Test Replicate	Sample ID: TR-DU1-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	15.6	7.44	8.6	19.6	20	Date: 12/3/11
	Rep B	15.6	7.44	8.6	19.5	20	Time: 1100
	Rep C	15.6	7.48	8.6	19.4	20	WQ: JLA/CC
	Rep D	15.6	7.51	8.5	19.6	20	Scientist Initiation:
	Rep E	15.6	7.49	8.5	19.6	20	Scientist Confirmation: KW
Day 1	Rep A	15.4	7.59	8.7	19.5		Date: 12/4/11 Time: 0940 WQ: CA
Day 2	Rep B	15.4	7.76	9.0	20.0		Date: 12/5/11 Time: 1125 WQ: K
Day 3	Rep C	15.7	7.72	8.9	19.5		Date: 12.6.11 Time: 0830 WQ: JT
Day 4	Rep D	15.6	7.66	8.3	20.1		Date: 12/7/11 Time: 0915 WQ: JLA
Day 5	Rep E	15.6	7.57	8.5	21.3		Date: 12/8/11 Time: 1445 WQ: JLA
Day 6	Rep A	15.7	7.63	8.8	20.1		Date: 12/9/11 Time: 1130 WQ: SS
Day 7	Rep B	15.8	7.69	8.7	20.9		Date: 12/10/11 Time: 1315 WQ: JLA
Day 8	Rep C	14.0	7.67	9.0	19.5		Date: 12.11.11 Time: 1040 WQ: MO
Day 9	Rep D	14.0	7.75	8.7	19.9		Date: 12.12.11 Time: 0930 WQ: MO
Day 10	Rep A	14.2	7.80	9.0	20.3	20	Date: 12/13/11
	Rep B	14.2	7.83	9.0	20.4	20	Time: 1030
	Rep C	14.2	7.81	9.0	19.8	20	WQ: JLA
	Rep D	14.2	7.81	9.0	19.9	20	Scientist Counts:
	Rep E	14.2	7.82	9.0	21.2	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	7.45	7.5	16.9	0.449	2.24	Date: 12/3/11 Time: 1230 WQ: JLA
	Overlying Water					<1.00	Date: 12/3/11 Time: 1200 WQ: JLA
	Meter ID	PH16	RD04	EC02	DR4000	DR3800	
Day 10	Porewater	7.44	8.1	19.1	0.474	1.20	Date: 12/13/11 Time: 1100 WQ: JLA
	Overlying Water					<1.00	Date: 12/13/11 Time: 0930 WQ: JLA
	Meter ID	PH17	RD04	EC06	DR4000	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC Test ID#: 45744 Date (Day 0): 12-3-11

Species: *Eohaustorius estuarius* Project #: 18916 Organism Supplier: Northwest Aquatics

Organism Log # : 6114

Day of Test	Test Replicate	Sample ID: TR-DU2-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	15.6	7.46	8.6	19.5	20	Date: 12/3/11
	Rep B	15.6	7.47	8.6	19.4	20	Time: 1100
	Rep C	15.6	7.49	8.7	19.4	20	WQ: JLA / CC
	Rep D	15.6	7.52	8.6	19.2	20	Scientist Initiation:
	Rep E	15.6	7.52	8.6	19.1	20	Scientist Confirmation: KW
Day 1	Rep A	15.4	7.66	8.7	19.5		Date: 12/4/11 Time: 0940 WQ: CM
Day 2	Rep B	15.4	7.78	8.9	19.7		Date: 12/5/11 Time: 1135 WQ: JC
Day 3	Rep C	15.7	7.78	8.8	19.2		Date: 12.6.11 Time: 0830 WQ: ~~
Day 4	Rep D	15.6	7.69	8.5	19.1		Date: 12/7/11 Time: 0915 WQ: JLA
Day 5	Rep E	15.6	7.62	8.6	19.9		Date: 12/8/11 Time: 1415 WQ: JLA
Day 6	Rep A	15.7	7.66	8.8	20.0		Date: 12/9/11 Time: 1130 WQ: SS
Day 7	Rep B	15.8	7.70	8.8	20.2		Date: 12/10/11 Time: 1315 WQ: JLA
Day 8	Rep C	14.0	7.67	9.0	19.8		Date: 12/11/11 Time: 1040 WQ: MD
Day 9	Rep D	14.0	7.80	8.9	19.7		Date: 12/12/11 Time: 0930 WQ: MD
Day 10	Rep A	14.2	7.82	8.9	20.5	~~20~~ 17	Date: 12/13/11
	Rep B	14.2	7.82	9.0	20.1	~~20~~ 19	Time: 1030
	Rep C	14.2	7.83	9.0	19.7	~~20~~ 19	WQ: JLA
	Rep D	14.2	7.84	9.0	19.4	20	Scientist Counts: ~~
	Rep E	14.2	7.85	9.0	19.0	19	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.25	6.4	15.2	0.081	6.71	Date: 12/3/11 Time: 1230 WQ: JLA
	Overlying Water					1.59	Date: 12/3/11 Time: 1200 WQ: JLA
	Meter ID	PH16	RDO4	EC02	DR4000U	DR3800	
Day 10	Porewater	7.29	7.4	19.0	0.189	2.36	Date: 12/13/11 Time: 1100 WQ: JLA
	Overlying Water					3.10	Date: 12/15/11 Time: 0930 WQ: JLA
	Meter ID	PH17	RDO4	EC06	DR4000V	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC Test ID#: 45745 Date (Day 0): 12-3-11

Species: *Eohaustorius estuarius* Project #: 18916 Organism Supplier: Northwest Aquatics

Organism Log # : 6114

Day of Test	Test Replicate	Sample ID: TR-DU3-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	15.6	7.48	8.5	19.3	20	Date: 12/3/11
	Rep B	15.6	7.48	8.6	19.4	20	Time: 1100
	Rep C	15.6	7.48	8.7	19.3	20	WQ: JLA / CC
	Rep D	15.6	7.48	8.7	19.4	20	Scientist Initiation:
	Rep E	15.6	7.48	8.7	19.5	20	Scientist Confirmation: KW
Day 1	Rep A	15.4	7.61	8.7	19.2		Date: 12/4/11 Time: 0940 WQ: CN
Day 2	Rep B	15.4	7.77	8.7	19.8		Date: 12/5/11 Time: 1125 WQ: JC
Day 3	Rep C	15.7	7.73	8.8	19.0		Date: 12.6.11 Time: 0830 WQ:
Day 4	Rep D	15.6	7.66	8.3	19.2		Date: 12/7/11 Time: 0915 WQ: JLA
Day 5	Rep E	15.6	7.55	8.7	20.5		Date: 12/8/11 Time: 1415 WQ: JLA
Day 6	Rep A	15.7	7.69	7.9	19.5		Date: 12/9/11 Time: 1130 WQ: BS
Day 7	Rep B	15.8	7.67	8.7	20.1		Date: 12/10/11 Time: 1315 WQ: JLA
Day 8	Rep C	14.0	7.66	9.0	19.4		Date: 12.11.11 Time: 1040 WQ: MO
Day 9	Rep D	14.0	7.78	8.9	18.8		Date: 12.12.11 Time: 0930 WQ: MO
Day 10	Rep A	14.2	7.80	8.9	19.8	18	Date: 12/13/11
	Rep B	14.2	7.81	8.9	19.4	20	Time: 1030
	Rep C	14.2	7.72	8.7	19.3	19	WQ: JLA
	Rep D	14.2	7.79	8.8	18.6	20	Scientist Counts:
	Rep E	14.2	7.80	8.9	20.3	19	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.24	6.1	16.5	0.063	5.52	Date: 12/3/11 Time: 1230 WQ: JLA
	Overlying Water					<1.00	Date: 12/3/11 Time: 1200 WQ: JLA
	Meter ID	PH16	RDO4	Eco2	DR4000U	DR3800	
Day 10	Porewater	7.18	7.1	18.4	0.189 (0.208 JLA)	3.92	Date: 12/13/11 Time: 1100 WQ: JLA
	Overlying Water					1.45	Date: 12/13/11 Time: 0930 WQ: JLA
	Meter ID	PH17	RDO4	Eco6	DR4000U	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC Test ID#: 45746 Date (Day 0): 12-5-11

Species: *Eohaustorius estuarius* Project #: 18916 Organism Supplier: Northwest Aquatics

Organism Log # : 6114

Day of Test	Test Replicate	Sample ID: TR-DU4-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	15.6	7.39	8.3	19.0	20	Date: 12/3/11
	Rep B	15.6	7.42	8.4	19.0	20	Time: 1100
	Rep C	15.6	7.41	8.4	18.9	20	WQ: JLA/CC
	Rep D	15.6	7.42	8.5	19.1	20	Scientist Initiation:
	Rep E	15.6	7.43	8.5	19.6	20	Scientist Confirmation: KW
Day 1	Rep A	15.4	~~7.64~~ 7.58	8.8	19.1		Date: 12/4/11 Time: 0940 WQ: CN
Day 2	Rep B	15.4	7.67	8.7	19.3		Date: 12-5-11 Time: 1125 WQ: JC
Day 3	Rep C	15.7	7.69	8.4	19.0		Date: 12.6.11 Time: 0850 WQ: [illegible]
Day 4	Rep D	15.6	7.59	8.5	19.1		Date: 12/7/11 Time: 0915 WQ: JLA
Day 5	Rep E	15.6	7.44	8.7	20.9		Date: 12/8/11 Time: 1415 WQ: JLA
Day 6	Rep A	15.7	7.60	8.6	19.4		Date: 12/9/11 Time: 1130 WQ: SS
Day 7	Rep B	15.8	7.58	8.6	19.4		Date: 12/10/11 Time: 1315 WQ: JLA
Day 8	Rep C	14.0	7.59	8.9	19.0		Date: 12.11.11 Time: 1040 WQ: MD
Day 9	Rep D	14.0	7.68	9.0	19.3		Date: 12.12.11 Time: 0930 WQ: MD
Day 10	Rep A	14.2	7.60	8.7	19.6	16	Date: 12/13/11
	Rep B	14.2	7.66	8.8	19.2	16	Time: 1030
	Rep C	14.2	7.67	8.8	19.2	20	WQ: JLA
	Rep D	14.2	7.68	8.9	19.0	16	Scientist Counts:
	Rep E	14.2	7.67	8.9	19.3	19	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.12	6.7	14.2	0.032	15.7	Date: 12/3/11 Time: 1230 WQ: JLA
	Overlying Water					3.44	Date: 12/3/11 Time: 1200 WQ: JLA
	Meter ID	PH16	RD04	EC02	DR4000U	DR3800	
Day 10	Porewater	7.12	7.2	17.8	0.045	11.7	Date: 12/13/11 Time: 1100 WQ: JLA
	Overlying Water					5.65	Date: 12/13/11 Time: 0930 WQ: JLA
	Meter ID	PH17	RD04	EC06	DR4000U	DR3800	

Appendix F

Test Data and Summary of Statistics for the Reference Toxicant Evaluation of the Amphipod, *Eohaustorius estuarius*

CETIS Summary Report

Acute Amphipod Survival Test — **Pacific EcoRisk**

Batch ID:	07-8020-7577	**Test Type:**	Survival (96h)	**Analyst:**	Stevi Vasquez
Start Date:	03 Dec-11 15:30	**Protocol:**	EPA/600/R-94/025 (1994)	**Diluent:**	Seawater
Ending Date:	07 Dec-11 15:45	**Species:**	Eohaustorius estuarius	**Brine:**	Not Applicable
Duration:	4d 0h	**Source:**	Northwestern Aquatic Science, OR	**Age:**	NA

Sample ID:	07-5780-7166	**Code:**	KCl	**Client:**	Reference Toxicant
Sample Date:	03 Dec-11 15:30	**Material:**	Potassium chloride	**Project:**	18952
Receive Date:	03 Dec-11 15:30	**Source:**	Reference Toxicant		
Sample Age:	N/A (15.1 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
08-2264-6138	96h Survival Rate	1	2	1.414	19.3%		Dunnett's Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
04-7176-4206	96h Survival Rate	EC50	1.68	1.47	1.92		Spearman-Kärber

96h Survival Rate Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	2	1	1	1	1	1	0	0	0.0%	0.0%
0.25		2	1	1	1	1	1	0	0	0.0%	0.0%
0.5		2	1	1	1	1	1	0	0	0.0%	0.0%
1		2	1	1	1	1	1	0	0	0.0%	0.0%
2		2	0.25	0.171	0.329	0.1	0.4	0.15	0.212	84.9%	75.0%
4		2	0	0	0	0	0	0	0		100.0%

96h Survival Rate Detail

Conc-g/L	Control Type	Rep 1	Rep 2
0	Lab Water Contr	1	1
0.25		1	1
0.5		1	1
1		1	1
2		0.1	0.4
4		0	0

96 Hour Marine Reference Toxicant Test Data

Client: Reference Toxicant
Test Material: Potassium Chloride
Test ID#: 45755 Project # 18952
Test Date: 12-3-11 Randomization: 2-6-8

Organism Log #: 6114
Organism Supplier: Northwest Aquatics
Species: *Eohaustorius estuarius*
Control/Diluent: 20 ppt Seawater

Treatment (g KCl /L)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms A	# Live Organisms B	SIGN-OFF
Control	15.1	7.83		8.9		20.7		10	10	Date: 12-3-11
0.25	15.1	7.83		9.1		21.1		10	10	Test Solution Prep:
0.5	15.1	7.79		9.3		21.3		10	10	New WQ: Leo
1	15.1	7.78		9.5		21.8		10	10	Initiation Time: 1530
2	15.1	7.71		9.8		22.6		10	10	Initiation Signoff:
4	15.1	7.59		10.3		24.4		10	10	Ref Tox Stock Batch # 1
Meter ID:	34A	pH17		RDO4		Eco6				
Control	15.5		7.54		8.2		20.9	10	10	Date: 12/4/11
0.25	15.5		7.61		8.3		21.3	10	10	Count Time: 1100
0.5	15.5		7.63		8.3		21.6	10	10	Count Signoff: SVV
1	15.5		7.64		8.3		22.0	10	10	Old WQ: CN
2	15.5		7.64		8.5		22.8	10	10	
4	15.5		7.61		8.2		24.5	0	0	
Meter ID:	34A		pH16		RDO7		ECO6			
Control	15.5		7.59		7.9		20.4	10	10	Date: 12/5/11
0.25	15.5		7.57		7.7		20.9	10	10	Count Time: 0940
0.5	15.5		7.66		7.9		21.1	10	10	Count Signoff: SMH
1	15.5		7.51		7.3		21.6	10	10	Old WQ: N
2	15.5		7.64		7.8		22.3	10	10	
4	—		—		—		—	—	—	
Meter ID:	34A		pH16		RDO4		Eco3			
Control	15.7		7.38		7.8		20.2	10	10	Date: 12-6-11
0.25	15.7		7.47		8.0		20.9	10	10	Count Time: 1045
0.5	15.7		7.45		7.7		21.1	10	10	Count Signoff: MK
1	15.7		7.51		7.7		21.6	10	10	Old WQ: dc
2	15.7		7.44		7.7		22.1	5	3	
4	—		—		—		—	—	—	
Meter ID:	34A		pH15		RDO4		Eco3			
Control	15.5		7.58 7.58		7.7		21.0	10	10	Date: 12-7-11
0.25	15.5		7.57 7.48		7.8		22.3 22.6	10	10	Termination Time: 1545
0.5	15.5		7.50		7.9		21.7	10	10	Termination Signoff:
1	15.5		7.51		7.8		22.0	10	10	Old WQ: CN
2	15.5		7.49		7.9		22.8	1	4	
4	—		—		—		—	—	—	
Meter ID:	34A		pH16		RDO7		ECO6			

Appendix G

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the WesPac Marine Terminal Sediments to the Polychaete, *Neanthes arenaceodentata*

CETIS Summary Report

10 Day Marine/Estuarine Sediment Test — **Pacific EcoRisk**

Batch ID:	02-4098-0692	**Test Type:**	Survival	**Analyst:**	Padrick Anderson
Start Date:	05 Dec-11 18:00	**Protocol:**	ASTM E1611-00 (Polychaete)	**Diluent:**	Not Applicable
Ending Date:	15 Dec-11 11:20	**Species:**	Neanthes arenaceodentata	**Brine:**	Not Applicable
Duration:	9d 17h	**Source:**	Aquatic Tox. Sup.	**Age:**	N/A

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
WESPAC_NA_C1	18-8496-7409	05 Dec-11 18:00	05 Dec-11 18:00	N/A (20.2 °C)	WESPAC Energy-Pittsburg	18916
TR-DU1-Comp	13-3232-9788	03 Nov-11 07:50	03 Nov-11 19:00	32d 10h (0 °C)		
TR-DU2-Comp	03-1651-2086	02 Nov-11 10:00	02 Nov-11 19:00	33d 8h (0 °C)		
TR-DU3-Comp	09-7787-1456	02 Nov-11 16:45	02 Nov-11 19:00	33d 1h (0 °C)		
TR-DU4-Comp	13-1758-5116	02 Nov-11 13:10	02 Nov-11 19:00	33d 5h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
WESPAC_NA_C1	Control Sediment	WESPAC Energy-Pittsburg LLC	LABQA		
TR-DU1-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU1-Comp		
TR-DU2-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU2-Comp		
TR-DU3-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU3-Comp		
TR-DU4-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU4-Comp		

Sample Code	vs	Sample Code	P-Value	Alpha	Decision	Analysis ID	Method
WESPAC_NA_C1		TR-DU1-Comp	0.3452	0.05	Non-Significant Effect	08-6873-1993	Wilcoxon Rank Sum Two-Sample Test
		TR-DU2-Comp	0.0706	0.05	Non-Significant Effect	18-9328-0402	Equal Variance t Two-Sample Test
		TR-DU3-Comp	0.3452	0.05	Non-Significant Effect	00-5216-2555	Wilcoxon Rank Sum Two-Sample Test
		TR-DU4-Comp	0.3452	0.05	Non-Significant Effect	01-1861-2319	Wilcoxon Rank Sum Two-Sample Test

Survival Rate Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU1-Comp	5	0.98	0.963	0.997	0.9	1	0.02	0.0447	4.56%	2.0%
TR-DU2-Comp	5	0.96	0.94	0.98	0.9	1	0.0245	0.0548	5.71%	4.0%
TR-DU3-Comp	5	0.98	0.963	0.997	0.9	1	0.02	0.0447	4.56%	2 0%
TR-DU4-Comp	5	0.96	0.927	0.993	0.8	1	0.04	0.0894	9.32%	4.0%

Survival Rate Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
WESPAC_NA_C1	1	1	1	1	1
TR-DU1-Comp	1	1	1	0.9	1
TR-DU2-Comp	0.9	0.9	1	1	1
TR-DU3-Comp	1	1	0.9	1	1
TR-DU4-Comp	1	1	0.8	1	1

10 Day Marine/Estuarine Sediment Test — Pacific EcoRisk

Analysis ID:	08-6873-1993	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:12	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes survival rate endpoint	4.74%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
WESPAC_NA_C1		TR-DU1-Comp	25		8	1	0.3452	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.002655933	0.002655933	1	1	0.3466	Non-Significant Effect
Error	0.02124747	0.002655933	8			
Total	0.0239034	0.005311866	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.625	0.741	0.0001	Non-normal Distribution

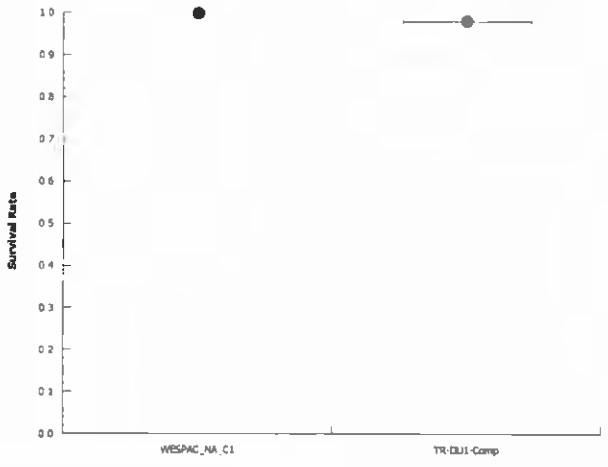
Survival Rate Summary

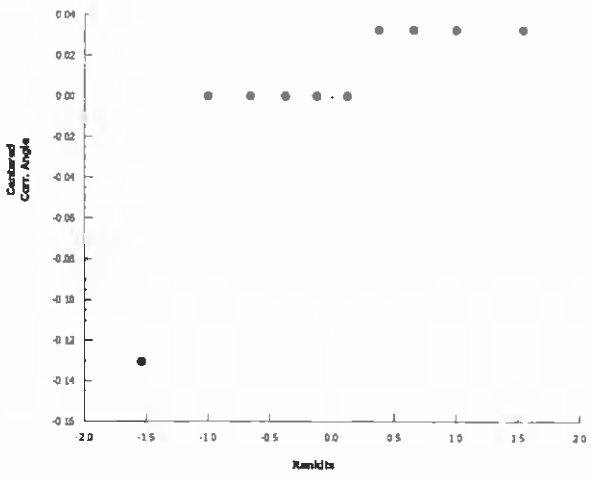
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU1-Comp	5	0.98	0.963	0.997	0.9	1	0.02	0.0447	4.56%	2.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1.41	1.41	1.41	1.41	1.41	0	0	0.0%	0.0%
TR-DU1-Comp	5	1.38	1.35	1.41	1.25	1.41	0.0326	0.0729	5.28%	2.31%

Graphics





10 Day Marine/Estuarine Sediment Test — Pacific EcoRisk

Analysis ID:	18-9328-0402	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes survival rate endpoint	5 33%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
WESPAC_NA_C1		TR-DU2-Comp	1.63	1.86	8	0.0742	0.0706	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01062373	0.01062373	1	2.67	0.1411	Non-Significant Effect
Error	0.0318712	0.0039839	8			
Total	0.04249493	0.01460763	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	3	13.7	0.1340	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.814	0.741	0.0215	Normal Distribution

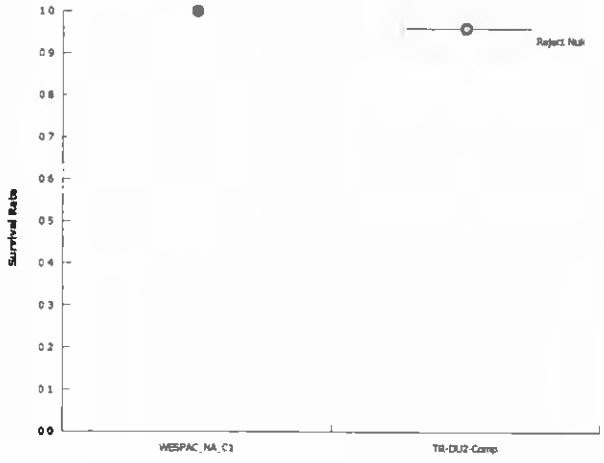
Survival Rate Summary

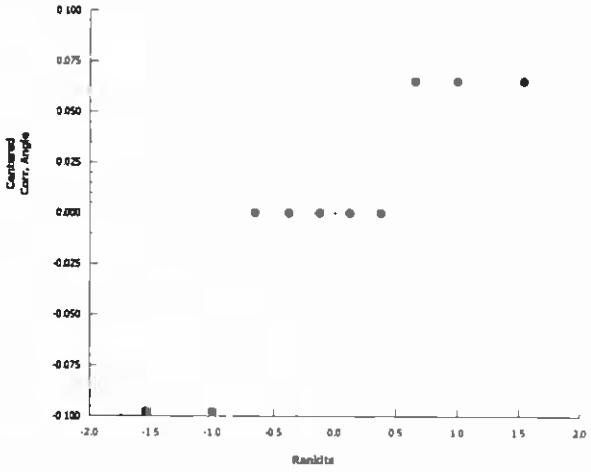
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU2-Comp	5	0.96	0.939	0.981	0.9	1	0.0245	0.0548	5.71%	4.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1.41	1.41	1.41	1.41	1.41	0	0	0.0%	0.0%
TR-DU2-Comp	5	1.35	1.31	1.38	1.25	1.41	0.0399	0.0893	6.63%	4.62%

Graphics





10 Day Marine/Estuarine Sediment Test — Pacific EcoRisk

Analysis ID:	00-5216-2555	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:11	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes survival rate endpoint	4.74%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
WESPAC_NA_C1		TR-DU3-Comp	25		8	1	0.3452	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.002655933	0.002655933	1	1	0.3466	Non-Significant Effect
Error	0.02124747	0.002655933	8			
Total	0.0239034	0.005311866	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.625	0.741	0.0001	Non-normal Distribution

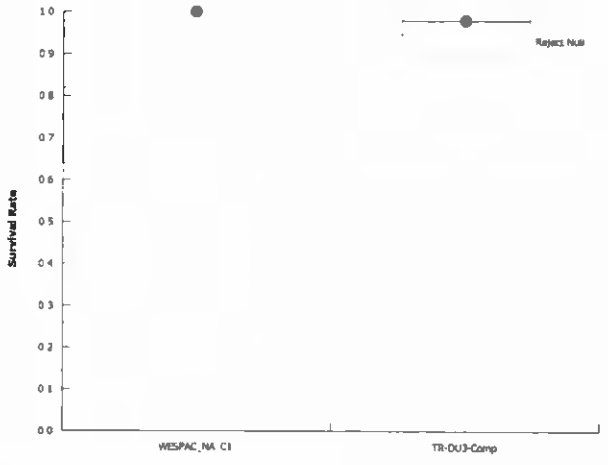
Survival Rate Summary

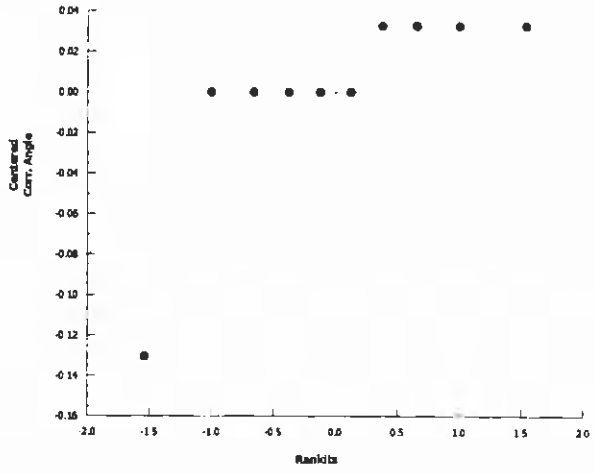
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU3-Comp	5	0.98	0.963	0.997	0.9	1	0.02	0.0447	4.56%	2.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1.41	1.41	1.41	1.41	1.41	0	0	0.0%	0.0%
TR-DU3-Comp	5	1.38	1.35	1.41	1.25	1.41	0.0326	0.0729	5.28%	2.31%

Graphics





10 Day Marine/Estuarine Sediment Test — Pacific EcoRisk

Analysis ID:	01-1861-2319	**Endpoint:**	Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:11	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes survival rate endpoint	7.23%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
WESPAC_NA_C1		TR-DU4-Comp	25		8	1	0.3452	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.009294413	0.009294413	1	1	0.3466	Non-Significant Effect
Error	0.0743553	0.009294413	8			
Total	0.08364972	0.01858883	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.625	0.741	0.0001	Non-normal Distribution

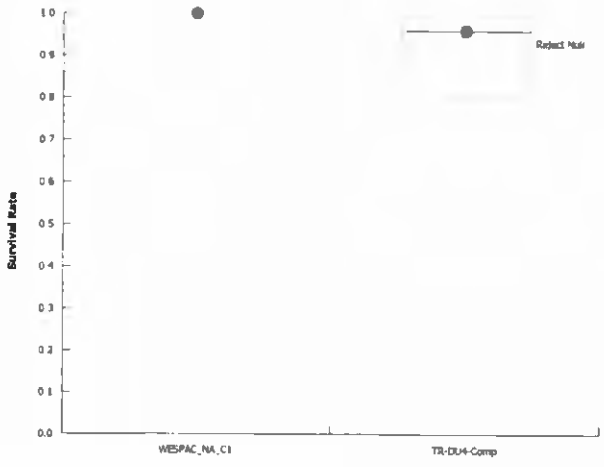
Survival Rate Summary

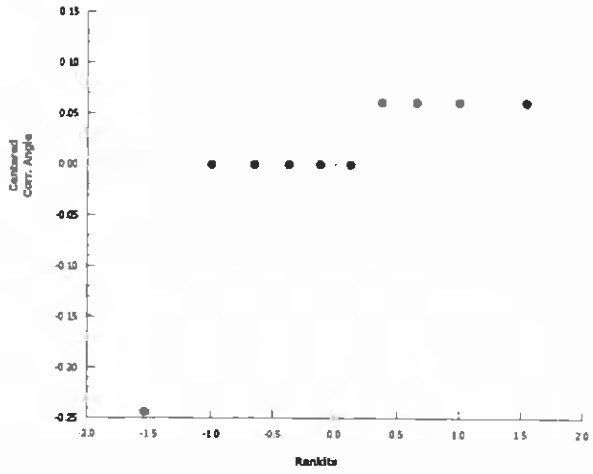
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1	1	1	1	1	0	0	0.0%	0.0%
TR-DU4-Comp	5	0.96	0.926	0.994	0.8	1	0.04	0.0894	9.32%	4.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_NA_C1	5	1.41	1.41	1.41	1.41	1.41	0	0	0.0%	0.0%
TR-DU4-Comp	5	1.35	1.3	1.4	1.11	1.41	0.061	0.136	10.1%	4.32%

Graphics





10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC | Test ID #: 45747-50 | Date (Day 0): 12.05.11

Species: *Neanthes arenaceodentata* | Project #: 1896 | Organism Supplier: ATS

Organism Log # : 6112

Day of Test	Test Replicate	Sample ID: Control					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.2	7.75	7.6	31.2	10	Date: 12.05.11
	Rep B	20.2	7.75	7.7	31.3	10	Time: 1800
	Rep C	20.2	7.77	7.7	31.0	10	WQ: MO
	Rep D	20.2	7.76	7.6	30.9	10	Scientist Initiation: SVV/MF
	Rep E	20.2	7.75	7.6	30.9	10	Scientist Confirmation: MF/SVV
Day 1	Rep A	20.1	7.90	7.7	31.0		Date: 12/6/11 Time: 0900 WQ: LC
Day 2	Rep B	20.1	7.90	7.7	31.4		Date: 12/7/11 Time: 0845 WQ: JLA
Day 3	Rep C	20.2	7.88	7.9	31.5		Date: 12/8/11 Time: 0845 WQ: JLA
Day 4	Rep D	20.1	8.05	7.7	31.9		Date: 12/9/11 Time: 0930 WQ: SS
Day 5	Rep E	20.2	7.86	7.5	31.4		Date: 12/10/11 Time: 1300 WQ: JLA
Day 6	Rep A	20.1	7.66	7.5	30.6		Date: 12.11.11 Time: 1130 WQ: MO
Day 7	Rep B	20.2	7.84	7.8	31.2		Date: 12.12.11 Time: 1040 WQ: MO
Day 8	Rep C	20.3	7.95	7.7	30.5		Date: 12/13/11 Time: 0900 WQ: LC
Day 9	Rep D	20.1	7.85	7.8	31.6		Date: 12/14/11 Time: 0930 WQ: LC
Day 10	Rep A	20.0	7.91	7.8	30.9	10	Date: 12/15/11
	Rep B	20.0	7.96	7.7	31.7	10	Time: 1120
	Rep C	20.0	7.96	7.7	31.2	10	WQ: JLA
	Rep D	20.0	7.96	7.6	31.4	10	Scientist: MF/PA
	Rep E	20.0	7.96	7.7	31.0	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.04	5.6	29.9	0.036	1.06	Date: 12-7-11 Time: 1832 WQ: JC
	Overlying Water					<1.0	Date: 12-7-11 Time: 1225 WQ: JC
	Meter ID	pH16	RDO 9	ECO3	DR 4000	DR3800	
Day 10	Porewater	6.89	4.1	31.4	~~<1.00~~ 40 0.060	~~0.060~~ 40 <1.00	Date: 12.15.11 Time: 1200 WQ: MO
	Overlying Water					<1.00	Date: 12/15/11 Time: 0845 WQ: JLA
	Meter ID	pH17	RDO7	EC04	DR4000V	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC Test ID #: 45747 Date (Day 0): 12.05.11

Species: *Neanthes arenaceodentata* Project #: 18916 Organism Supplier: ATS

Organism Log # : 6112

Day of Test	Test Replicate	Sample ID: TR-DU1-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.2	~~7.82~~ 7.79 MD	7.8	30.0	10	Date: 12.05.11
	Rep B	20.2	~~7.85~~ 7.73 MD	7.7	28.9	10	Time: 1800
	Rep C	20.2	~~7.85~~ 7.76 MD	7.7	28.8	10	WQ: MD
	Rep D	20.2	7.76	7.7	29.7	10	Scientist Initiation: SVV/MF
	Rep E	20.2	7.74	7.6	29.2	10	Scientist Confirmation: MF/SVV
Day 1	Rep A	20.1	7.89	7.7	29.6		Date: 12/6/11 Time: 0900 WQ: CC
Day 2	Rep B	20.1	7.90	7.7	29.4		Date: 12/7/11 Time: 0845 WQ: JLA
Day 3	Rep C	20.2	7.74	7.6	30.0		Date: 12/8/11 Time: 0845 WQ: JLA
Day 4	Rep D	20.1	8.05	7.7	29.9		Date: 12/9/11 Time: 0930 WQ: SS
Day 5	Rep E	20.2	7.79	7.4	30.5		Date: 12/10/11 Time: 1300 WQ: JLA
Day 6	Rep A	20.1	7.92	7.6	31.5		Date: 12.11.11 Time: 1180 WQ: MD
Day 7	Rep B	20.2	7.88	7.4	31.7		Date: 12.12.11 Time: 1040 WQ: MD
Day 8	Rep C	19.7	7.91	7.6	30.8		Date: 12/13/11 Time: 0900 WQ: CC
Day 9	Rep D	20.1	7.82	7.8	31.2		Date: 12/14/11 Time: 0930 WQ: JLA
Day 10	Rep A	20.0	7.93	7.7	30.8	10	Date: 12/15/11
	Rep B	20.0	7.91	7.7	31.6	10	Time: 1120
	Rep C	20.0	7.91	7.6	30.1	10	WQ: JLA
	Rep D	20.0	7.91	7.6	30.3	9	Scientist: MF
	Rep E	20.0	7.91	7.6	31.4	10	

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	7.1	24.6	ND 0.499	2.71	Date: 12.5.11 Time: 1635 WQ: JC
	Overlying Water					<1.0	Date: 12-5-11 Time: 1625 WQ: JC
	Meter ID	pH15	RD07	EC06	DR4000	DR3800	
Day 10	Porewater	~~7.82~~ 7.79 MD	5.0	28.4	0.124	~~2.49~~ 1.91 MD	Date: 12.15.11 Time: 1200 WQ: MD
	Overlying Water					2.42	Date: 12/15/11 Time: 0845 WQ: JLA
	Meter ID	pH17	RD07	EC04	DR4000	DR3800	

~~AS not enough sample~~

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC Test ID #: 45748 Date (Day 0): 12.05.11

Species: *Neanthes arenaceodentata* Project #: 18916 Organism Supplier: ATS

Organism Log # : 6112

Day of Test	Test Replicate	Sample ID: TR-DU2-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.2	~~7.79~~ 7.82	7.6	29.9	10	Date: 12.05.11
	Rep B	20.2	7.83	7.6	29.6	10	Time: 1800
	Rep C	20.2	7.80	7.6	29.1	10	WQ: MO
	Rep D	20.2	7.86	7.5	29.5	10	Scientist Initiation: SVV/MF
	Rep E	20.2	7.85	7.6	29.6	10	Scientist Confirmation: MF/SVV
Day 1	Rep A	20.1	7.94	7.6	30.0		Date: 12/6/11 Time: 0900 WQ: CC
Day 2	Rep B	20.1	7.91	7.8	28.9		Date: 12/7/11 Time: 0845 WQ: JLA
Day 3	Rep C	20.2	7.73	7.6	~~31.0~~ 29.3 JLA		Date: 12/8/11 Time: 0845 WQ: JLA
Day 4	Rep D	20.1	8.05	7.5	30.4		Date: 12/9/11 Time: 0930 WQ: SS
Day 5	Rep E	20.2	7.88	7.6	31.4		Date: 12/10/11 Time: 1300 WQ: JLA
Day 6	Rep A	20.1	7.74	7.7	29.0		Date: 12-11-11 Time: 1130 WQ: MO
Day 7	Rep B	20.2	7.86	7.6	27.8		Date: 12-12-11 Time: 1040 WQ: MO
Day 8	Rep C	20.2	7.84	7.5	28.6		Date: 12/13/11 Time: 0900 WQ: CC
Day 9	Rep D	20.1	7.83	7.7	29.8		Date: 12/14/11 Time: 0945 WQ: CC
Day 10	Rep A	20.0	7.92	7.8	31.8	9	Date: 12/15/11
	Rep B	20.0	7.91	7.6	28.1	9	Time: 1120
	Rep C	20.0	7.80	7.4	29.2	10	WQ: JLA
	Rep D	20.0	7.87	7.4	30.0	10	Scientist: MF
	Rep E	20.0	7.95	7.6	31.4	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.83	5.5 5.8	25.0	0.048	8.55	Date: Time: WQ:
	Overlying Water					1.77	Date: 12-7-11 Time: 1240 WQ: JC
	Meter ID	pH15	RDO-1 ~~EC06~~	EC06	DR4000	DR3800	
Day 10	Porewater	7.57	6.0	32.1	0.124	~~6.49~~ 6.49	Date: 12-15-11 Time: ~~1040~~ 1200 MO WQ: JC MO
	Overlying Water					<1.00	Date: 12/15/11 Time: 0845 WQ: JLA
	Meter ID	pH17	RDO7	EC04	DR4000	DR3800	

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC Test ID #: 45749 Date (Day 0): 12.05.11

Species: *Neanthes arenaceodentata* Project #: 18916 Organism Supplier: ATS

Organism Log # : 6112

Day of Test	Test Replicate	Sample ID: TR-DU3-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.2	7.81	7.6	30.1	10	Date: 12.05.11
	Rep B	20.2	7.81	7.6	29.6	10	Time: 1800
	Rep C	20.2	7.81	7.6	29.4	10	WQ: MO
	Rep D	20.2	7.80	7.6	29.6	10	Scientist Initiation: SVV/MF
	Rep E	20.2	7.80	7.6	31.6	10	Scientist Confirmation: MF/SVV
Day 1	Rep A	20.1	7.89	7.6	29.8		Date: 12/6/11 Time: 0900 WQ: LC
Day 2	Rep B	20.1	7.93	7.7	29.7		Date: 12/7/11 Time: 0845 WQ: JLA
Day 3	Rep C	20.2	7.72	7.5	30.0		Date: 12/8/11 Time: 0845 WQ: JLA
Day 4	Rep D	20.1	8.08	7.6	30.3		Date: 12/9/11 Time: 0930 WQ: SS
Day 5	Rep E	20.2	7.87	7.5	29.6		Date: 12/10/11 Time: 1300 WQ: JLA
Day 6	Rep A	20.1	7.65	7.6	30.0		Date: 12/11/11 Time: 1130 WQ: MO
Day 7	Rep B	20.2	7.86	7.5	29.4		Date: 12.12.11 Time: 1040 WQ: MO
Day 8	Rep C	19.9	7.83	7.5	29.2		Date: 12/13/11 Time: 0900 WQ: LC
Day 9	Rep D	20.1	7.80	6.9	30.2		Date: 12/14/11 Time: 0945 WQ: LEO
Day 10	Rep A	20.0	7.90	7.6	31.6	10	Date: 12/15/11
	Rep B	20.0	7.92	7.6	29.7	10	Time: 1120
	Rep C	20.0	7.84	7.7	29.6	9	WQ: JLA
	Rep D	20.0	7.89	7.6	29.1	10	Scientist:
	Rep E	20.0	7.95	7.6	31.7	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.50	~~7.8~~ 8.0	20.4	~~0.063~~ 0.063	6.30	Date: 12-7-11 Time: 1635 WQ: JC
	Overlying Water					<1.0	Date: 12-5-11 Time: 1240 WQ: JC
	Meter ID	pH15	RD07	EC06	DR4000U	DR3800	
Day 10	Porewater	~~6.99~~ 7.11	5.8	27.6	0.190	~~6.42~~ 2.92	Date: 12.15.11 Time: 1200 WQ: MO
	Overlying Water					1.09	Date: 12/15/11 Time: 0845 WQ: JLA
	Meter ID	pH17	RD07	EC04	DR4000U	DR3800	

~~not enough Sample~~

10-Day Estuarine/Marine Sediment Toxicity Test Data

Client: WESPAC | Test ID #: 45750 | Date (Day 0): 12.05.11

Species: *Neanthes arenaceodentata* | Project #: 18916 | Organism Supplier: ATS

Organism Log # : 6112

Day of Test	Test Replicate	Sample ID: TR-DU4-Comp					Sign-Off
		Temp (°C)	pH	D.O. (mg/L)	Salinity (ppt)	# Alive	
Day 0	Rep A	20.2	7.77	7.7	29.7	10	Date: 12.05.11
	Rep B	20.2	7.77	7.0	29.7	10	Time: 1800
	Rep C	20.2	7.67	7.6	29.6	10	WQ: MO
	Rep D	20.2	7.75	7.4	29.9	10	Scientist Initiation: SVV/MF
	Rep E	20.2	7.75	7.5	30.1	10	Scientist Confirmation: MF/SVV
Day 1	Rep A	20.1	7.84	7.6	29.4		Date: 12/6/11 Time: 0900 WQ: CC
Day 2	Rep B	20.1	7.86	7.7	29.4		Date: 12/7/11 Time: 0845 WQ: JLA
Day 3	Rep C	20.2	7.74	7.6	30.9		Date: 12/8/11 Time: 0845 WQ: JLA
Day 4	Rep D	20.1	8.02	7.7	30.8		Date: 12/9/11 Time: 0930 WQ: JS
Day 5	Rep E	20.2	7.74	7.1	31.4		Date: 12/10/11 Time: 1300 WQ: JLA
Day 6	Rep A	20.1	7.60	7.5	30.8		Date: 12.11.11 Time: 1130 WQ: MO
Day 7	Rep B	20.2	7.78	7.6	30.8		Date: 12.12.11 Time: 1040 WQ: MO
Day 8	Rep C	19.6	7.80	7.6	29.7		Date: 12/13/11 Time: 0900 WQ: JLA
Day 9	Rep D	20.1	7.71	7.7	31.2		Date: 12/14/11 Time: 0945 WQ: JLA
Day 10	Rep A	20.0	7.80	7.5	31.1	10	Date: 12/15/11
	Rep B	20.0	7.81	7.6	30.3	10	Time: 1120
	Rep C	20.0	7.82	7.6	30.5	8	WQ: JLA
	Rep D	20.0	7.81	7.7	31.7	10	Scientist:
	Rep E	20.0	7.79	7.6	30.9	10	

Day of Test	Matrix	pH	D.O. (mg/L)	Salinity (ppt)	Total Sulfide (mg/L)	Total Ammonia (mg/L)	Sign-Off
Day 0	Porewater	7.17	6.2	20.7	0.032	17.8	Date: 12-5-11 Time: 1535 1537 WQ: JC
	Overlying Water					<1.0	Date: 12-5-11 Time: 1240 WQ: JC
	Meter ID	pH 15	RD07	EC06	DR4000	DR3800	
Day 10	Porewater	7.28	6.8	27.8	0.379	8.72	Date: 12.15.11 Time: 1200 WQ: MO
	Overlying Water					2.36	Date: 12/15/11 Time: 0845 WQ: JLA
	Meter ID	pH57	RD07	EC04	DR4000	DR3800	

~~A~~ not enough sample

Appendix H

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

CETIS Summary Report

Acute Polychaete Survival Test — **Pacific EcoRisk**

Batch ID:	11-7018-5758	**Test Type:**	Survival	**Analyst:**	Michelle Avila
Start Date:	05 Dec-11 15:55	**Protocol:**	ASTM E1611-00 (Polychaete)	**Diluent:**	Diluted Seawater
Ending Date:	09 Dec-11 14:20	**Species:**	Neanthes arenaceodentata	**Brine:**	Not Applicable
Duration:	94h	**Source:**	Aquatic Tox. Sup.	**Age:**	NA

Sample ID:	19-0235-9794	**Code:**	KCl	**Client:**	Reference Toxicant
Sample Date:	05 Dec-11 15:55	**Material:**	Potassium chloride	**Project:**	18953
Receive Date:	05 Dec-11 15:55	**Source:**	Reference Toxicant		
Sample Age:	N/A (20.2 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-5659-6364	Survival Rate	2	4	2.828	N/A		Fisher Exact Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
00-6432-6480	Survival Rate	EC50	2.828	2.272	3.522		Binomial/Graphical

Survival Rate Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	2	1	1	1	1	1	0	0	0.0%	0.0%
0.25		2	1	1	1	1	1	0	0	0.0%	0.0%
0.5		2	1	1	1	1	1	0	0	0.0%	0.0%
1		2	1	1	1	1	1	0	0	0.0%	0.0%
2		2	1	1	1	1	1	0	0	0.0%	0.0%
4		2	0	0	0	0	0	0	0		100.0%

Survival Rate Detail

Conc-g/L	Control Type	Rep 1	Rep 2
0	Lab Water Contr	1	1
0.25		1	1
0.5		1	1
1		1	1
2		1	1
4		0	0

96 Hour Marine Reference Toxicant Test Data

Client: **Reference Toxicant**
Test Material: Potassium Chloride
Test ID#: 45756 Project # 18953
Test Date: 12/5/11 Randomization: 2.6.7

Organism Log #: 6112
Organism Supplier: Aquatic Toxicology Support
Species: *Neanthes arenaceodentata*
Control/Diluent: 30 ppt Seawater

Treatment (g KCl /L)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms A	# Live Organisms B	SIGN-OFF
Control	20.2	7.91		8.4		29.5		5	5	Date: 12/5/11
0.25	20.2	7.91		8.5		30.0		5	5	Test Solution Prep: SVV
0.5	20.2	7.91		8.6		30.0		5	5	New WQ: JJ
1	20.2	7.89		8.7		30.1		5	5	Initiation Time: 1555
2	20.2	7.86		8.8		30.4		5	5	Initiation Signoff: KB/SMW/PA/SVV/MF
4	20.2	7.78		8.9		30.9		5	5	Ref Tox Stock Batch # 20
Meter ID:	38A	PH16		RDO4		EC03				
Control	20.1		7.94		7.1		29.9	5	5	Date: 12/6/11
0.25	20.1		7.96		7.1		30.3	5	5	Count Time: 0950
0.5	20.1		7.97		7.1		30.4	5	5	Count Signoff: KB/MF/SVV
1	20.1		7.96		7.1		30.6	5	5	Old WQ: JC
2	20.1		7.92		7.1		30.9	5	5	
4	20.1		7.69		7.0		31.6	0	0	
Meter ID.	38A		pH15		RDO4		EC03			
Control	20.2		7.68		7.3		30.2	5	5	Date: 12/7/11
0.25	20.2		7.71		7.3		30.2	5	5	Count Time: 1500
0.5	20.2		7.71		7.3		30.4	5	5	Count Signoff: KB
1	20.2		7.70		7.3		30.6	5	5	Old WQ: JLA
2	20.2		7.68		7.3		30.8	5	5	
4	~~20.2~~ KB		—		—		—	—	—	
Meter ID:	38A		PH15		RDO4		EC02			
Control	20.2		7.81		7.2		30.9	5	5	Date: 12/8/11
0.25	20.2		7.83		7.3		30.9	5	5	Count Time: 1030
0.5	20.2		7.84		7.4		30.9	5	5	Count Signoff: MG/KB/JW/MK
1	20.2		7.82		7.3		31.0	KB 5	5	Old WQ: MAF
2	20.2		7.80		7.3		31.3	5	5	
4	—		—		—		—	—	—	
Meter ID:	38A		pH15		RDO7		EC06			
Control	20.2		7.95		7.3		30.0	5	5	Date: 12/9/2011
0.25	20.2		8.00		7.4		30.4	5	5	Termination Time: 1420
0.5	20.2		7.99		7.3		30.6	5	5	Termination Signoff: MG/DD/MK
1	20.2		7.99		7.3		30.6	5	5	Old WQ: JW
2	20.2		7.99		7.5		31.0	5	5	
4	—		—		—		—	—	—	
Meter ID:	38A		pH15		RDO7		EC02			

Appendix I

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

CETIS Summary Report

Acute Mysid Survival Test — **Pacific EcoRisk**

Batch ID:	19-8079-0976	**Test Type:**	Survival (96h)	**Analyst:**	Padrick Anderson
Start Date:	07 Dec-11 17:10	**Protocol:**	EPA-821-R-02-012 (2002)	**Diluent:**	Not Applicable
Ending Date:	11 Dec-11 16:30	**Species:**	Americamysis bahia	**Brine:**	Not Applicable
Duration:	95h	**Source:**	Aquatic Biosystems, CO	**Age:**	4

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
WESPAC_AB_METS	14-7212-3100	07 Dec-11 17:10	07 Dec-11 17:10	N/A (20.3 °C)	WESPAC Energy-Pittsburg	18916
TR-DU1-Comp	13-3232-9788	03 Nov-11 07:50	03 Nov-11 19:00	34d 9h (0 °C)		
TR-DU2-Comp	03-1651-2086	02 Nov-11 10:00	02 Nov-11 19:00	35d 7h (0 °C)		
TR-DU3-Comp	09-7787-1456	02 Nov-11 16:45	02 Nov-11 19:00	35d 0h (0 °C)		
TR-DU4-Comp	13-1758-5116	02 Nov-11 13:10	02 Nov-11 19:00	35d 4h (0 °C)		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
WESPAC_AB_METS	Potassium chloride	WESPAC Energy-Pittsburg LLC	LABQA		
TR-DU1-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU1-Comp		
TR-DU2-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU2-Comp		
TR-DU3-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU3-Comp		
TR-DU4-Comp	Sediment	WESPAC Energy-Pittsburg LLC	TR-DU4-Comp		

Sample Code	vs	Sample Code	P-Value	Alpha	Decision	Analysis ID	Method
WESPAC_AB_MET		TR-DU1-Comp	0.6548	0.05	Non-Significant Effect	00-0460-5199	Wilcoxon Rank Sum Two-Sample Test
		TR-DU2-Comp	0.5000	0.05	Non-Significant Effect	19-5616-7641	Wilcoxon Rank Sum Two-Sample Test
		TR-DU3-Comp	0.6548	0.05	Non-Significant Effect	21-0810-3253	Wilcoxon Rank Sum Two-Sample Test
		TR-DU4-Comp	0.1659	0.05	Non-Significant Effect	04-5481-2269	Equal Variance t Two-Sample Test

96h Survival Rate Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	0.978	0.959	0.996	0.889	1	0.0222	0.0497	5.08%	0.0%
TR-DU1-Comp	5	1	1	1	1	1	0	0	0.0%	-2.27%
TR-DU2-Comp	5	0.98	0.963	0.997	0.9	1	0.02	0.0447	4.56%	-0.23%
TR-DU3-Comp	5	1	1	1	1	1	0	0	0.0%	-2.27%
TR-DU4-Comp	5	0.92	0.879	0.961	0.8	1	0.049	0.11	11.9%	5.91%

96h Survival Rate Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
WESPAC_AB_METS	0.889	1	1	1	1
TR-DU1-Comp	1	1	1	1	1
TR-DU2-Comp	1	1	1	1	0.9
TR-DU3-Comp	1	1	1	1	1
TR-DU4-Comp	1	0.8	0.8	1	1

Acute Mysid Survival Test — Pacific EcoRisk

Analysis ID:	00-0460-5199	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:25	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes 96h survival rate endpoint	4.61%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
WESPAC_AB_MET		TR-DU1-Comp	30		8	1	0.6548	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.003278153	0.003278153	1	1	0.3466	Non-Significant Effect
Error	0.02622522	0.003278153	8			
Total	0.02950338	0.006556306	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.625	0.741	0.0001	Non-normal Distribution

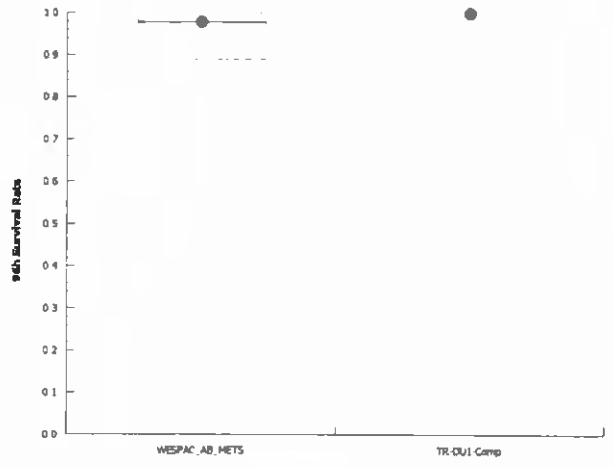
96h Survival Rate Summary

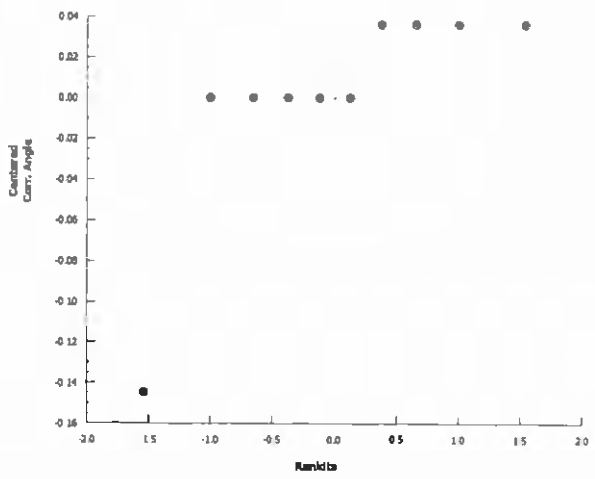
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	0.978	0.959	0.997	0.889	1	0.0222	0.0497	5.08%	0.0%
TR-DU1-Comp	5	1	1	1	1	1	0	0	0.0%	-2.27%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	1.38	1.35	1.41	1.23	1.41	0.0362	0.081	5.89%	0.0%
TR-DU1-Comp	5	1.41	1.41	1.41	1.41	1.41	0	0	0.0%	-2.63%

Graphics





Acute Mysid Survival Test — Pacific EcoRisk

Analysis ID:	19-5616-7641	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.8.0
Analyzed:	27 Dec-11 9:25	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes 96h survival rate endpoint	5.84%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
WESPAC_AB_MET		TR-DU2-Comp	28		8	1	0.5000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.271162E-05	3.271162E-05	1	0.00551	0.9426	Non-Significant Effect
Error	0.04747269	0.005934086	8			
Total	0.0475054	0.005966797	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	1.23	23.2	0.8433	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.539	0.741	<0.0001	Non-normal Distribution

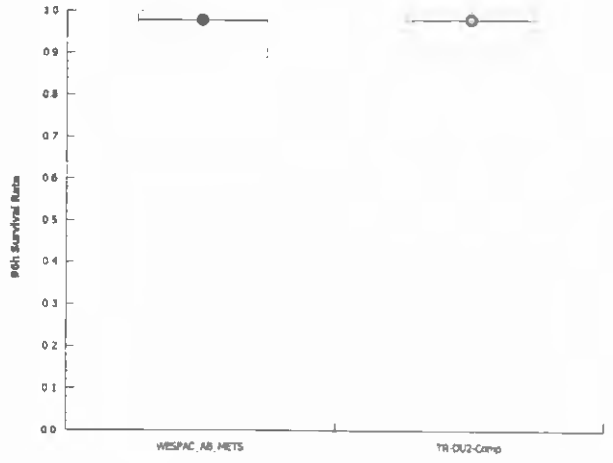
96h Survival Rate Summary

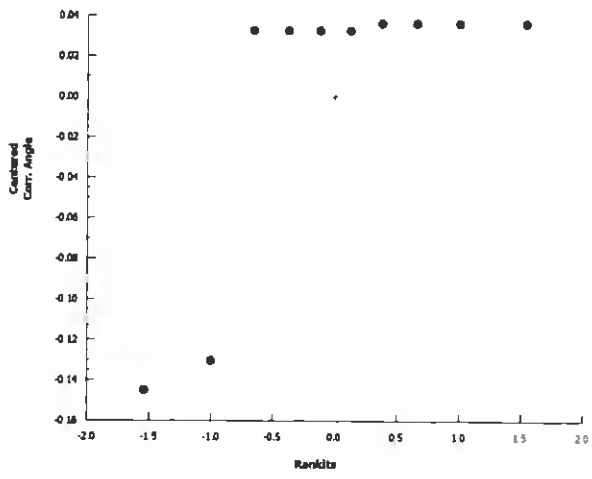
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	0.978	0.959	0.997	0.889	1	0.0222	0.0497	5.08%	0.0%
TR-DU2-Comp	5	0.98	0.963	0.997	0.9	1	0.02	0.0447	4.56%	-0.23%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	1.38	1.35	1.41	1.23	1.41	0.0362	0.081	5.89%	0.0%
TR-DU2-Comp	5	1.38	1.35	1.41	1.25	1.41	0.0326	0.0729	5.28%	-0.26%

Graphics





Acute Mysid Survival Test — **Pacific EcoRisk**

Analysis ID: 21-0810-3253 **Endpoint:** 96h Survival Rate **CETIS Version:** CETISv1.8.0
Analyzed: 27 Dec-11 9:25 **Analysis:** Nonparametric-Two Sample **Official Results:** Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes 96h survival rate endpoint	4.61%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	Ties	P-Value	Decision(α:5%)
WESPAC_AB_MET		TR-DU3-Comp	30		8	1	0.6548	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.003278153	0.003278153	1	1	0.3466	Non-Significant Effect
Error	0.02622522	0.003278153	8			
Total	0.02950338	0.006556306	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.625	0.741	0.0001	Non-normal Distribution

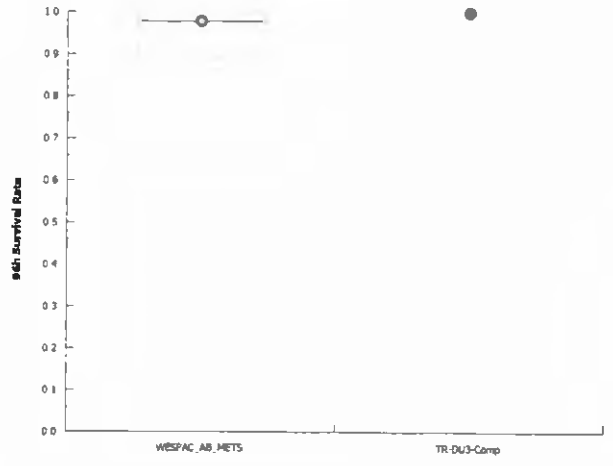
96h Survival Rate Summary

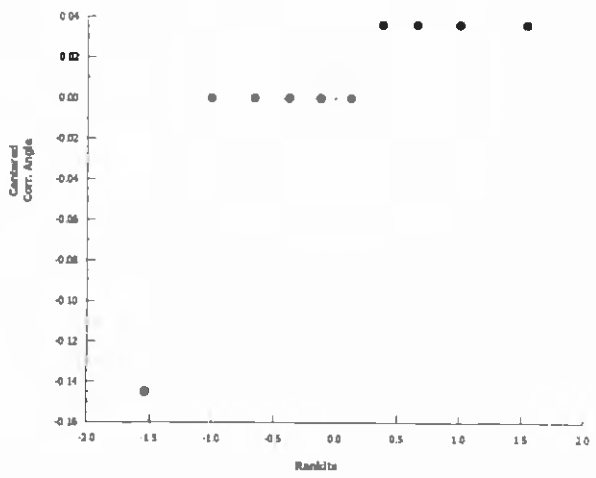
Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	0.978	0.959	0.997	0.889	1	0.0222	0.0497	5.08%	0.0%
TR-DU3-Comp	5	1	1	1	1	1	0	0	0.0%	-2.27%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	1.38	1.35	1.41	1.23	1.41	0.0362	0.081	5.89%	0.0%
TR-DU3-Comp	5	1.41	1.41	1.41	1.41	1.41	0	0	0.0%	-2.63%

Graphics





Acute Mysid Survival Test — Pacific EcoRisk

Analysis ID:	04-5481-2269	Endpoint:	96h Survival Rate	CETIS Version:	CETISv1.8.0
Analyzed:	27 Dec-11 9:25	Analysis:	Parametric-Two Sample	Official Results:	Yes

Data Transform	Zeta	Alt Hyp	MC Trials	Test Result	PMSD
Angular (Corrected)	0	C > T	Not Run	Sample passes 96h survival rate endpoint	9.71%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	DF	MSD	P-Value	Decision(α:5%)
WESPAC_AB_MET		TR-DU4-Comp	1.03	1.86	8	0.154	0.1659	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01837649	0.01837649	1	1.07	0.3318	Non-Significant Effect
Error	0.1377582	0.01721977	8			
Total	0.1561347	0.03559626	9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F	4.25	23.2	0.1899	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.802	0.741	0.0153	Normal Distribution

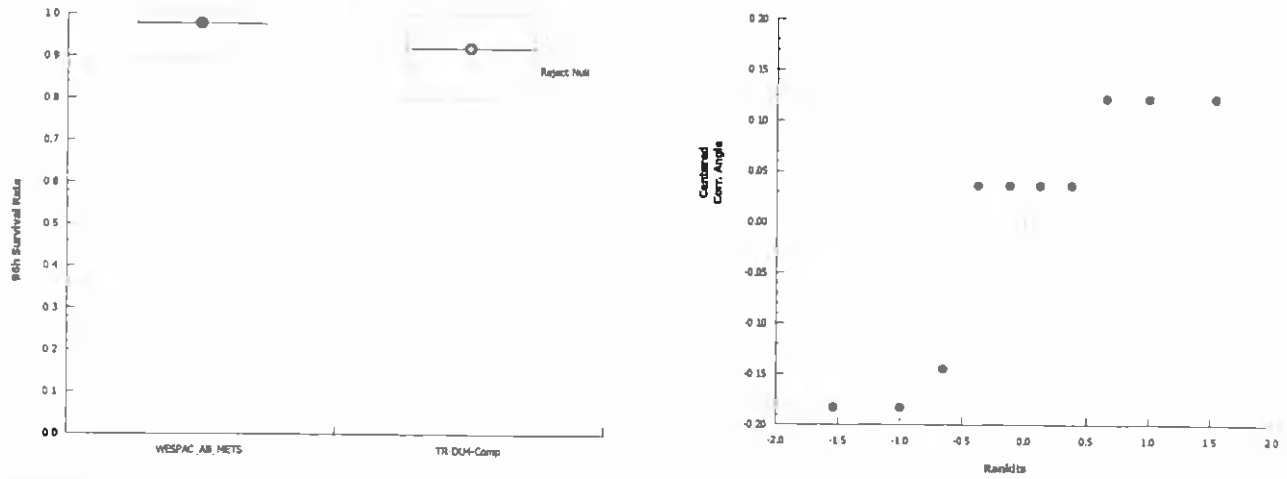
96h Survival Rate Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	0.978	0.959	0.997	0.889	1	0.0222	0.0497	5.08%	0.0%
TR-DU4-Comp	5	0.92	0.878	0.962	0.8	1	0.049	0.11	11.9%	5.91%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
WESPAC_AB_METS	5	1.38	1.35	1.41	1.23	1.41	0.0362	0.081	5.89%	0.0%
TR-DU4-Comp	5	1.29	1.23	1.35	1.11	1.41	0.0747	0.167	12.9%	6.23%

Graphics



Analyst: _____ QA: _____

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: WESPAC
Test Material: TR-DU1-Comp (MET)
Test ID#: 45751 Project #: 18916
Test Date: 12/7/11 Randomization: 5-5-9

Organism Log #: 6121 Age: 4days
Organism Supplier: ABS
Control/Diluent: 20ppt SW
Control Water Batch: ~~20ppt SW~~ -

Treatment (% Elutriate)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms Rep A	Rep B	Rep C	Rep D	Rep E	SIGN-OFF
Control	20.3	7.76		8.0		20.2		10	10	10	10	10	Test Solution Prep
100%	20.3	7.52		7.6		20.8		10	10	10	10	10	New WQ YL
													Initiation Date 12/7/11
													Initiation Time 1710
													Initiation Signoff
													a.m. Feeding
Meter ID	38A	PH16		RD07		EC06							p.m. Feeding MG
Control	20.3		7.61		7.5		20.7	10	10	10	10	10	Count Date 12/8/11
100%	20.3		7.59		7.4		21.4	10	10	10	10	10	Count Time 1015
													Count Signoff DD
													Old WQ JC
													a.m. Feeding SW
Meter ID	38A		pH15		RD07		EC06						p.m. Feeding MK
Control	20.1		7.62		5.8		20.8	9*	10	10	10	10	Count Date 12/9/11
100%	20.1		7.86		7.2		21.1	10	10	10	10	10	Count Time 1005
													Count Signoff MG
													Old WQ JLA
													a.m. Feeding MG
Meter ID	38A		PH15		RD07		EC02						p.m. Feeding DD
Control	20.3		7.52		6.6		21.7	9	10	10	10	10	Count Date 12/10/11
100%	20.3		7.65		7.5		22.3	10	10	10	10	10	Count Time 0945
													Count Signoff OD
													Old WQ LC
													a.m. Feeding MK
Meter ID			PH16		RD07		EC06						p.m. Feeding OD
Control	20.0		7.38		6.6		22.5	8	10	10	10	10	Termination Date 12/11/11
100%	20.0		7.43		6.3		25.7	10	10	10	10	10	Termination Time 1630
													Termination Signoff SMA
													Old WQ KB
Meter ID	38A		pH17		RD04		EC06						a.m. Feeding KB

1 mysid dried on side of beaker removed from stats

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: WESPAC
Test Material: TR-DU2-Comp (MER)
Test ID#: 45752 Project # 18916
Test Date: 12/7/11 Randomization: 55-4

Organism Log #: 6121 Age: 4days
Organism Supplier: ABS
Control/Diluent: 20ppt SW
Control Water Batch: ~~20ppt SW~~ -

Treatment (% Elutriate)	Temp (C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms Rep A	Rep B	Rep C	Rep D	Rep E	SIGN-OFF
Control	20.3	7.76		8.0		20.2		10	10	10	10	10	Test Solution Prep
100%	20.3	7.33		7.0		20.5		10	10	10	10	10	New WQ YY
													Initiation Date 12/7/11
													Initiation Time 1710
													Initiation Signoff
													a m Feeding
Meter ID	38A	pH16		RD07		EC06							p m Feeding MG
Control	20.3		7.61		7.5		20.9	10	10	10	10	10	Count Date 12/8/11
100%	20.3		7.58		7.2		21.2	10	10	10	10	10	Count Time 1015
													Count Signoff DD
													Old WQ JC
													a m Feeding SW
Meter ID	38A		pH15		RD07		EC06						p m Feeding MK
Control	20.1		7.62		5.8		20.8	9	10	10	10	10	Count Date 12/9/11
100%	20.1		7.80		6.9		20.8	10	10	10	10	10	Count Time 1005
													Count Signoff MG
													Old WQ JLA
													a m Feeding MG
Meter ID	38A		pH15		RD07		EC02						p m Feeding DD
Control	20.3		7.52		6.6		21.7	9	10	10	10	10	Count Date 12/10/11
100%	20.3		7.62		7.2		22.2	10	10	10	10	9	Count Time 0945
													Count Signoff DD
													Old WQ CC
													a m Feeding MK
Meter ID	38A		pH16		RD07		EC06						p m Feeding DD
Control	20.0		7.38		6.6		22.5	8	10	10	10	10	Termination Date 12/11/11
100%	20.0		7.42		6.4		24.0	10	10	10	10	9	Termination Time 1630
													Termination Signoff SMH
													Old WQ KB
Meter ID	38A		pH17		RD04		EC06						a m Feeding KB

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: WESPAC
Test Material: TR-DU3-Comp (MET)
Test ID#: 45753 Project # 18916
Test Date: 12/7/11 Randomization: 5-5-4

Organism Log #: 6121 Age: 4days
Organism Supplier: ABS
Control/Diluent: 20ppt SW
Control Water Batch: —

Treatment (% Elutriate)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms Rep A	Rep B	Rep C	Rep D	Rep E	SIGN-OFF
Control	20.3	7.76		8.0		20.2		10	10	10	10	10	Test Solution Prep
100%	20.3	7.31		7.1		20.6		10	10	10	10	10	New WQ
													Initiation Date 12/7/11
													Initiation Time 1710
													Initiation Signoff
													a.m. Feeding
Meter ID	38K	PH16		RD07		EC06							p.m. Feeding MG
Control	20.3		7.61		7.5		20.7	10	10	10	10	10	Count Date 12/8/11
100%	20.3		7.56		7.0		21.2	10	10	10	10	10	Count Time 1015
													Count Signoff DD
													Old WQ JC
													a.m. Feeding SVV
Meter ID	38A		PH15		RD07		EC06						p.m. Feeding MK
Control	20.1		7.62		5.8		20.8	9	10	10	10	10	Count Date 12/9/11
100%	20.1		7.79		7.0		21.2	10	10	10	10	10	Count Time 1005
													Count Signoff MG
													Old WQ JRA
													a.m. Feeding MG
Meter ID	38A		PH15		RD07		EC02						p.m. Feeding DD
Control	20.3		7.52		6.6		21.7	9	10	10	10	10	Count Date 12/10/11
100%	20.3		7.64		7.4		22.2	10	10	10	10	10	Count Time 0945
													Count Signoff DD
													Old WQ CC
													a.m. Feeding MK
Meter ID	38A		PH16		RD07		EC06						p.m. Feeding DD
Control	20.0		7.34		6.6		22.5	8	10	10	10	10	Termination Date 12/11/11
100%	20.0		7.48		6.5		23.3	10	10	10	10	10	Termination Time 1630
													Termination Signoff SMH
													Old WQ KB
Meter ID	38A		PH17		RD04		EC06						a.m. Feeding KB

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: WESPAC
Test Material: TR-DU4-Comp (MET)
Test ID#: 45754 Project # 18916
Test Date: 12/7/11 Randomization: 5-54

Organism Log #: 6121 Age: 4 days
Organism Supplier: ABS
Control/Diluent: 20ppt SW
Control Water Batch: --

Treatment (% Elutriate)	Temp (C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms Rep A	Rep B	Rep C	Rep D	Rep E	SIGN-OFF
Control	20.3	7.76		8.0		20.2		10	10	10	10	10	Test Solution Prep MM
100%	20.3	7.23		6.8		20.2		10	10	10	10	10	New WQ MM
													Initiation Date 12/7/11
													Initiation Time 1710
													Initiation Signoff MM
													a m Feeding MM
Meter ID	38A	PH15		RD07		EC06							p m Feeding MG
Control	20.3		7.61		7.5		20.7	10	10	10	10	10	Count Date 12/8/11
100%	20.3		7.52		7.0		20.7	10	9	8	10	10	Count Time DD 1615
													Count Signoff DD
													Old WQ JC
													a m Feeding MM
Meter ID	38A		pH15		RD07		EC06						p m Feeding MK
Control	20.1		7.62		5.8		20.8	9	10	10	10	10	Count Date 12/9/11
100%	20.1		7.71		6.9		20.6	10	9	8	10	10	Count Time 1005
													Count Signoff MG
													Old WQ JCA
													a m Feeding MG
Meter ID	38A		PH15		RD07		EC02						p m Feeding DD
Control	20.3		7.52		6.6		21.7	9	10	10	10	10	Count Date 12/10/11
100%	20.3		7.49		6.9		22.4	10	9	8	10	10	Count Time DD 0945 DD
													Count Signoff DD
													Old WQ CC
													a m Feeding MK
Meter ID	38A		pH16		RD07		EC06						p m Feeding DD
Control	20.0		7.38		6.6		22.5	8	10	10	10	10	Termination Date 12/11/11
100%	20.0		7.27		6.3		24.4	10	8	8	10	10	Termination Time 1630
													Termination Signoff MM
													Old WQ KB
Meter ID	38A		pH17		RD04		EC06						a m Feeding KB

Appendix J

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

CETIS Summary Report

Acute Mysid Survival Test — **Pacific EcoRisk**

Batch ID:	00-8425-3641	**Test Type:**	Survival (96h)	**Analyst:**	Michelle Avila
Start Date:	07 Dec-11 17:00	**Protocol:**	EPA-821-R-02-012 (2002)	**Diluent:**	Laboratory Water
Ending Date:	11 Dec-11 16:50	**Species:**	Americamysis bahia	**Brine:**	Crystal Sea
Duration:	96h	**Source:**	Aquatic Biosystems, CO	**Age:**	4

Sample ID:	03-0546-1270	**Code:**	KCl	**Client:**	Reference Toxicant
Sample Date:	07 Dec-11 17:00	**Material:**	Potassium chloride	**Project:**	18954
Receive Date:	07 Dec-11 17:00	**Source:**	Reference Toxicant		
Sample Age:	N/A (20.3 °C)	**Station:**	In House		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-3165-4766	96h Survival Rate	0.25	0.5	0.3536	6.19%		Steel Many-One Rank Test

Point Estimate Summary

Analysis ID	Endpoint	Level	g/L	95% LCL	95% UCL	TU	Method
16-8302-1934	96h Survival Rate	EC10	0.2699	0.2442	0.2922		Linear Regression (MLE)
		EC15	0.2936	0.2688	0.3155		
		EC20	0.314	0.2898	0.3356		
		EC25	0.3325	0.3089	0.3541		
		EC40	0.3844	0.3614	0.4072		
		EC50	0.4194	0.3957	0.4444		

96h Survival Rate Summary

Conc-g/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	4	1	1	1	1	1	0	0	0.0%	0.0%
0.125		4	1	1	1	1	1	0	0	0.0%	0.0%
0.25		4	0.925	0.9063	0.9437	0.9	1	0.025	0.05	5.41%	7.5%
0.5		4	0.325	0.2892	0.3608	0.2	0.4	0.04787	0.09574	29.46%	67.5%
1		4	0	0	0	0	0	0	0		100.0%
2		4	0	0	0	0	0	0	0		100.0%

96h Survival Rate Detail

Conc-g/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Lab Water Contr	1	1	1	1
0.125		1	1	1	1
0.25		1	0.9	0.9	0.9
0.5		0.3	0.2	0.4	0.4
1		0	0	0	0
2		0	0	0	0

96 Hour Acute *Americamysis bahia* Reference Toxicant Test

Client: **Reference Toxicant** Organism Log #: 6121 Age: 4 day

Test Material: Potassium chloride Organism Supplier: ABS

Test ID#: 45757 Project #: 18954 Control/Diluent: DI + Crystal Sea @ 25 ppt

Test Date: 12/7/11 Randomization: 4,6,9 Control Water Batch: 842

Treatment (g/L KCl)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms Rep A	Rep B	Rep C	Rep D	SIGN-OFF
Control	20.3	8.21		7.8		24.0		10	10	10	10	Test Solution Prep: JP
0.125	20.3	8.18		8.0		24.6		10	10	10	10	New WQ: JS
0.25	20.3	8.18		8.1		24.7		10	10	10	10	Initiation Date: 12/7/11
0.5	20.3	8.14		8.3		25.0		10	10	10	10	Initiation Time: 1700
1	20.3	8.08		8.6		25.6		10	10	10	10	Initiation Signoff: KB
2	20.3	7.93		9.7		26.7		10	10	10	10	RT Batch #: 65,256
Meter ID	38A	pH15		RDO7		EC03						a.m. Feeding Signoff:
												p.m. Feeding Signoff: MG
Control	20.2		7.93		7.3		24.9	10	10	10	10	Count Date: 12/8/11
0.125	20.2		7.95		7.3		25.3	10	10	10	10	Count Time: 950
0.25	20.2		7.89		6.9		25.6	10	10	9	10	Count Signoff: JW
0.5	20.2		7.93		7.2		25.7	10	10	10	10	Old WQ: MAK
1	20.2		7.84		6.7		26.4	0	0	0	0	a.m. Feeding Signoff: SVJ
2	20.2		7.82		6.9		27.5	0	0	0	0	p.m. Feeding Signoff: MK
Meter ID	38A		pH15		RDO7		EC06					
Control 2D	~~25.3~~	8.14	7.94	8.0	6.7	24.1	25.0	10	10	10	10	Test Solution Prep: CG
0.125 2D	~~25.3~~	8.15	7.97	8.0	6.9	24.6	25.2	10	10	10	10	New WQ:
0.25 2D	~~25.3~~	8.15	7.95	8.1	6.7	24.9	25.3	10	10	9	10	Renewal Date: 12/9/11
0.5 2D	~~25.3~~ MW	8.14	7.97	8.2	6.9	25.2	25.5	5	8	5	6	Renewal Time: 1100
1	—	—	—	—	—	—	—	—	—	—	—	Renewal Signoff: MK
2	~~35A~~ 15A MW	—	—	—	—	—	—	—	—	—	—	Old WQ: JLA
Meter ID		pH15	pH5	RDO7	RDO7	EC02	EC02					a.m. Feeding Signoff: MG
												p.m. Feeding Signoff: DD
												RT Batch #: 65
Control MW	~~20.1~~ 20.1		7.73		7.8		25.3	10	10	10	10	Count Date: 12-10-11
0.125 MW	~~20.1~~ 20.1		7.78		7.5		25.1	10	10	10	10	Count Time: 1000
0.25	20.1		7.80		7.4		25.5	10	10	9	10	Count Signoff: MK
0.5	20.1		7.82		7.3		26.0	3	5	4	6	Old WQ: A
1	—		—		—		—	—	—	—	—	a.m. Feeding Signoff: MK
2	—		—		—		—	—	—	—	—	p.m. Feeding Signoff: DD
Meter ID	38A		pH17		RDO4		EC04					
Control	20.0		7.42		6.4		25.4	10	10	10	10	Termination Date: 12/11/11
0.125	20.0		~~7.74~~		6.1		25.7	10	10	10	10	Termination Time: 1080
0.25	20.0		7.43		6.1		25.8	10	9	9	9	Termination Signoff: SMH
0.5	20.0		7.50		5.9		26.2	3	2	4	4	Old WQ: SMH
1	—		—		—		—	—	—	—	—	a.m. Feeding Signoff: MS
2	—		—		—		—	—	—	—	—	
Meter ID	38A		pH17		RDO4		EC06					

Appendix K

Bioassay Standard Test Conditions

Summary of Test Conditions and Acceptability Criteria for the Amphipod (*Eohaustorius estuarius)* 10-Day Sediment Toxicity Test		
1.	Test type	Static non-renewal
2.	Test duration	10 d
3.	Temperature	15 ± 1°C
4.	Salinity	20 – 35 ppt
5.	Light quality	Ambient Laboratory
6.	Light intensity	50 – 100 ft c.
7.	Photoperiod	Continuous
8.	Test chamber size	1 L
9.	Seawater volume	800 mL
10.	Sediment depth	40 mm
11.	Renewal of seawater	None
12.	Age of test organisms	Wild population, immature juveniles
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	0.45 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 (*Neanthes arenaceodentata)* 10-Day Sediment Toxicity Test	
1. Test type	Static-renewal
2. Test duration	10 d
3. Temperature	20 ± 1°C
4. Salinity	20 – 35 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 (*Americamysis bahia*) Water Column Toxicity Test		
1.	Test type	Static non-renewal
2.	Test duration	96 hours
3.	Salinity	25-30 ppt ± 10 ppt
4.	Temperature	20 ± 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.	1Elutriate preparation water	Site water or Clean sea water
19.	Test concentrations	Test sites, and Lab Control
20.	Dilution series	Four concentrations (1, 10, 50, 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	≥90% survival in the Lab Controls