PACIFIC AFFILIATES
CONSULTING ENGINEERS
990 W. WATERFRONT DRIVE, EUREKA, CA 95501 • TEL (707) 445-3001 FAX (707) 445-3003

March 15, 2019

George Williamson, AICP
District Planner
Humboldt Bay Harbor, Recreation and Conservation District
P.O. Box 1030
Eureka, California 95502-1030

Re: Chevron Eureka Marine Terminal – 401 Certification Application

Mr. Williamson:

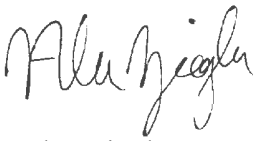
On behalf of the Chevron Products Company, Pacific Affiliates submits the attached application for a Humboldt Bay Harbor, Recreation and Conservation District permit authorizing the proposed maintenance dredging project as described herein. The project proposes to dredge an area of approximately 0.36 acres immediately adjacent to the Chevron Eureka Marine Terminal dock in order to restore the area to design depths and to allow for safe passage of vessel traffic.

The project applicant requests a 10-year permit authorizing the removal of a maximum quantity of 4,999 cubic yards of sediment from the project area throughout the term of the permit. All dredged sediment removed under this permit will be disposed of at the Humboldt Open Ocean Disposal Site in accordance with conditions issued by the Environmental Protection Agency and other relevant regulatory authorities. A copy of the sediment analysis report of findings, full sediment analysis results, and figures and maps pertaining to the project are included with this application. A check in the amount of $100.00 for application processing fees has been mailed along with a copy of this application to the Harbor District offices in Eureka, CA.

Permit applications will also be submitted to the U.S. Army Corps of Engineers and the North Coast Regional Water Quality Control Board. A coastal development permit exemption request for the proposed project will also be submitted to the California Coastal Commission.

Please contact our offices with any questions or concerns relating to this application at your earliest opportunity.

Best regards,



Alec Ziegler

Cc: File 19-1518A

HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT

P.O. BOX 1030
Eureka, California 95502
phone (707) 443-0801
fax (707) 443-0800

PERMIT APPLICATION

Date Filed_____

General Information	For District Use
1.) Name, Address, phone # and email of Developer, Project Sponsor and Legal Owner Mark Langholz, Eureka Terminal Manager Chevron Products Company 3400 Christie Street, Eureka, CA 95503 (707) 445-7580; mxmc@chevron.com	A. Application No._____ Application Type: Franchise ☐ Permit ☐ Lease
2.) Address of Project and Assessor's block, lot and Parcel Number 3400 Christie Street, Eureka, CA 95503 APNs 007-071008, 007-071-013	B. Date Received by Harbor District
	C. Date Accepted for filing by Commission
3.) Contact person Name, Address, phone # Travis Schneider, President Pacific Affiliates 990 W Waterfront Drive Eureka, CA 95501 (707) 445-3001 tschneider@pacaff.com	D. Date of Public Notice
	E. Date of Environmental Compliance
	F. Date of Public Notice
4.) Attach list of names and addresses of all adjoining property owners	G. Date of Public Hearings
5.) List and describe any other related Project Permits & Other Public Approvals required, including those required by City, Regional, State & Federal Agencies. US Army Corps permit CA State Water Board 401 Certification CCC CDP Waiver	H. Date of Commission Action Approval: _____ Conditional _____ Disapproval _____
6.) Existing City/County Zoning Public Utility	I. Expiration Date
7.) Proposed Site Use (Project Title) Chevron Eureka Marine Terminal Maintenance Dredging	Comments

Describe proposed project

PRE-PROJECT EELGRASS CHECKLIST

Please complete the Eelgrass Pre-project Checklist below. Note that the checklist questions relate to the Area of Potential Effect (APE) associated with your project, which incorporates a surrounding buffer inclusive of the limits of potential construction and/or maintenance-related activities that could affect eelgrass habitat. Provide a copy of the completed questionnaire along with your permit application and a map depicting the proposed project location, potential eelgrass depth range-10 to +4 feet, and benchmark eelgrass distribution in the vicinity of the proposed project. Maps should be of an appropriate scale to clearly depict the preliminary/proposed APE boundary in relation to both existing and potential eelgrass resources as provided in the Humboldt Bay Eelgrass Comprehensive Management Plan and associated webpage (humboldtbay.org/eelgrass-management-plan). Here you'll find information and links including eelgrass information for permit applicants, a baseline eelgrass distribution map, and the Humboldt Bay Eelgrass Comprehensive Management Plan. Contact the Harbor District office with questions (443-0801).

For New Projects:

		YES	NO
a)	Is the project located within 100 feet of previously mapped (known) eelgrass habitat?		
b)	Will any construction or new operational traffic occur within the vicinity of existing eelgrass?		
c)	Is any portion of the project located in an area with depths ranging from -10 to +4 feet?		
d)	Does the project result in new cover, shading or other form of light reduction of open water areas ranging in depth from -10 to +4 feet?		
e)	Is the project anticipated to affect wind or tidal circulation patterns within the bay?		
f)	Could the project affect ambient water temperature or clarity or result in new effluent (including stormwater) discharge point?		
g)	Does the project result in any placement of fill, including shoreline armor?		
h)	Is the project anticipated to lead to an increase in boat traffic that could affect nearby eelgrass habitat through grounding, prop scarring, wake, or shading impacts?		

For Maintenance/Repair Projects and Construction Activities:

		YES	NO
i)	Is project construction likely to increase turbidity? To what extent and for what duration?		x
j)	Will construction require the use of a barge or other vessel that may temporarily impact the bay floor (e.g. spud poles, anchoring, prop scarring, etc.) within known eelgrass habitat or within depths ranging from -10 to +4 feet?		x
k)	Will construction require the use of turbidity curtains in proximity to eelgrass habitat?		x
l)	Will project construction result in temporary shading from moored/anchored working vessel(s)?		x

If you responded yes to any of the questions above, your project may have the potential to affect eelgrass habitat and you'll need to conduct a preliminary eelgrass survey. Please refer to the District's Eelgrass Management Plan webpage for further guidance and a list of local agency contacts should you have additional questions.

Answer all questions completely on a separate page. If the question does not apply to your project, so indicate by marking N.A. Contact Harbor District Office with questions.

PROJECT DESCRIPTION

8. Site Size
   The proposed project area is approximately 0.36 acres.
9. Square Footage
   Approximately 15,681.6 sq. ft.
10. Number of floors of construction
    None.
11. Amount of off-street parking provided
    None.
12. Attach plans
13. Proposed scheduling
    Annually from July 1st – October 15th, 2019-2029.
14. Associated projects
    None.
15. Anticipated incremental development
16. None.
17. If residential, include the number of units, schedule of unit sizes, range of sale prices or rents, and type of household size expected.
    None.
18. If commercial, indicate the type, whether neighborhood, city or regionally oriented, square footage of sales area, and loading facilities
    None.
19. If industrial, indicate type, estimated per shift employment & loading facilities.
20. If institutional, indicate the major function, estimated per shift employment, occupancy, loading facilities, and community benefits derived from the project.
21. If the project involves a variance, conditional use or recognizing application, state this and indicate clearly why the application is required.

Are the following items applicable to the project or its effects? Answer yes or no. Discuss all items answered yes.

22. Change in existing features of any bays, tidelands, beaches, lakes or hills, or substantial alteration of ground contours.

23. Change in scenic views or vistas from existing residential areas or public lands or roads.

24. Change in pattern, scale or character of general area of project.

25. Significant amounts of solid waste or litter.

26. Change in dust, ash, smoke, fumes or odors in vicinity.

27. Change in ocean, bay, lake, stream or ground water quality or quantity, or alteration of existing drainage patterns.

28. Substantial change in existing noise or vibration levels in the vicinity.
    A. During Construction
    B. During Project Utilization

29. Site on filled land or on slope of 10% or more.

29. Use of disposal or potentially hazardous materials, such as toxic substances, flammable or explosives.

30. Substantial change in municipal services demand (police, fire, water, sewage, etc.)

31. Substantially increase fossil fuel consumption (electricity, oil, natural gas, etc.).

32. Relationship to larger project or series of projects

ENVIRONMENTAL SETTING:

33. Describe the project site as it exists before the project including information on topography, soil stability, plants and animals, and any cultural, historical, or scenic aspects. Describe any existing structures on the site and the use of the structures. Attach photographs of the site. Photos will be accepted.

34. Describe the surrounding properties, including information on plants and animals and any cultural, historical, or scenic aspects. Indicate the type of land use (residential, commercial, etc.) intensity of land use (one-family, apartment houses, shops, department stores, etc.) and the scale of development (height, frontage, set-back, rear yard, etc.) Attach photographs of the vicinity. Photos accepted.

---------- Questions 35; and 36 MUST BE ANSWERED! ----------

35. How will the proposed use or activity promote the public health, safety, comfort, and convenience?

36. How is the requested grant, permit, franchise, lease, right, or privilege required by the public convenience and necessity?

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37. Financial statement:
    A. Estimated project cost.
    B. How will the project be financed?

38. Describe fully directions necessary to arrive at project site.

39. The Applicant agrees to as a condition of the permit being issued, to indemnify and hold harmless the Humboldt Bay, Harbor Recreation and Conservation District from any and all claims, demands, or liabilities for attorneys' fees obtained from or

against demands for attorney's fees, costs of suit, and costs of administrative records made against District by any and all third parties as a result of third party environmental actions against District arising out of the subject matter of this application and permit, including, but not limited to, attorney's fees, costs of suit, and costs of administrative records obtained by or awarded to third parties pursuant to the California Code of Civil Procedure Section 1021.5 or any other applicable local, state, or federal laws, whether such attorneys' fees, costs of suit, and costs of administrative records are direct or indirect, or incurred in the compromise, attempted compromise, trial, appeal, or arbitration of claims for attorneys' fees and costs of administrative records in connection with the subject matter of this application and permit

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NOTE

The District hereby advises the Applicant that, under California Public Resources Code (PRC) Section 21089, the District when a lead agency under the California Environmental Quality Act (CEQA) of 1970, as amended, pertaining to an Environmental Impact Report (EIR) or a Negative Declaration (MND/ND) may charge and collect from the Applicant a reasonable fee in order to recover the estimated costs incurred by the District in preparing an EIR or MND/ND for the project and the procedures necessary for PRC compliance on the Applicants project.

In the event your project contains an analysis of issues pertaining to CEQA, for which District staff is not competent to independently review, or District requires the same in preparation of an EIR or MND/ND for the project, the District may retain a reviewing consultant to evaluate the content of the Administrative-Draft EIR and Final EIR or MND/ND with respect to these issues. The cost of such reviewing consultant services shall be borne by the Applicant.

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. And I agree to indemnify the District as described in part 39 of this application.

Dated: 3-15-2019

Mark Jay

For _____

PROJECT DESCRIPTION

8. *Site Size*

   The proposed project area is approximately 0.36 acres.

9. *Square Footage*

   Approximately 15,681.6 sq. ft.

10. *Number of floors of construction*

    None.

11. *Amount of off-street parking provided*

    None.

12. *Attach plans*

    See Permit Application Attachments (Figures I-VI)

13. *Proposed scheduling*

    Annually from July 1st – October 15th, 2019-2029.

14. *Associated projects*

    None.

15. *Anticipated incremental development*

16. None.

17. *If residential, include the number of units, schedule of unit sizes, range of sale prices or rents, and type of household size expected.*

    None.

18. *If commercial, indicate the type, whether neighborhood, city or regionally oriented, square footage of sales area, and loading facilities*

    None.

19. *If industrial, indicate type, estimated per shift employment & loading facilities.*

    The project area is an active-use industrial site with a focus on the receipt and shipping of petroleum products via marine vessels and trucks. Per-shift staffing levels are estimated at 12 employees. The loading facilities consist of the CEMT dock, which primarily serve as off-loading points for laden marine vessels, and holding tanks which transfer petroleum products into trucks which transport said products to destinations throughout the region.

20. *If institutional, indicate the major function, estimated per shift employment, occupancy, loading facilities, and community benefits derived from the project.*

    None.

21. *If the project involves a variance, conditional use or recognizing application, state this and indicate clearly why the application is required.*

    There is no anticipated project variance at this time; however, as this project is subject to the review of numerous federal, state, and local agencies, there is potential for a variance to arise per the specific requirements of some individual or multiple agencies.

22. *Change in existing features of any bays, tidelands, beaches, lakes or hills, or substantial alteration of ground contours.*
Changes in the subtidal topography immediately adjacent to the dock will occur as a result of the dredging. Further, changes to the ocean-floor topography may occur as a result of disposal of dredge materials.

23. *Change in scenic views or vistas from existing residential areas or public lands or roads*.
The actual dredging process may be visible to vessel traffic in Humboldt Bay and from vehicle traffic along waterfront roads on both sides of the bay. However, dredging equipment will be on site only temporarily and any impacts on the scenic views will be less than significant.

24. *Change in pattern, scale or character of general area of project.*
Dredging in Humboldt Bay will produce no noticeable changes to the site or its vicinity.

25. *Significant amounts of solid waste or litter.*
There will be no significant amounts of solid waste or litter produced during this project.

26. *Change in dust, ash, smoke, fumes or odors in vicinity.*
A temporary increase in fumes and odors will be produced by the dredge equipment, haul trucks, and other equipment. Also, there will be a temporary increase in odor at the dredge site during removal of the spoils. However, there will be no long-term in effects and these types of activities are common at the site and in the general area.

27. *Change in ocean, bay, lake, stream or ground water quality or quantity, or alteration of existing drainage patterns.*
During dredging activities, there may be a temporary, localized increase in the turbidity of Bay waters. However, no long-term impacts are anticipated.

28. *Substantial change in existing noise or vibration levels in the vicinity.*

A. *During Construction*
During construction, there will be a minor increase in noise and vibration levels due to the operation of dredging equipment. However, this will not pose a lasting impact and is in keeping with the regular industrial operations of the terminal.

B. *During Project Utilization*
There will be no increase in existing noise or vibration levels in the vicinity during project utilization.

29. *Site on filled land or on slope of 10% or more.*
N/A

30. *Use of disposal or potentially hazardous materials, such as toxic substances, flammable or explosives.*
The project will utilize fuel and oil used as required for the operation of dredging equipment; no other potentially hazardous materials will be used.

30. *Substantial change in municipal services demand (police, fire, water, sewage, etc.)*
No.

31. *Substantially increase fossil fuel consumption (electricity, oil, natural gas, etc.)*
No.

32. Relationship to larger project or series of projects
N/a.

ENVIRONMENTAL SETTING:

33. Describe the project site as it exists before the project including information on topography, soil stability, plants and animals, and any cultural, historical, or scenic aspects. Describe any existing structures on the site and the use of the structures. Attach photographs of the site. Photos will be accepted.

Two parcels make up the project site: APN 007-071-013 and APN 007-071-008. The former is a tideland parcel owned by the City of Eureka and the latter is the adjacent upland parcel owned by Chevron Corporation. CEMT owns or leases the two parcels for the purpose of importing and shipping petroleum products.

The project site is located in Humboldt Bay along the western shore of the City of Eureka and on the east side of the maintained North Bay Channel. Tides in this channel range from a low of less than -2.00' MLLW to a high of almost 9.00' MLLW feet.

The upland area behind the dock is mostly developed for industrial use. Improvements include a truck scale, office buildings, maintenance shop, petroleum product storage tanks and equipment for unloading and loading activities within the facility. Vegetation is limited to sparse grasses growing on the unused portions of the site. Other than the small plants growing on the dock pilings, there is essentially no aquatic plant life present in the project area.

Birds

Humboldt Bay is a major wintering area and important stopover site for numerous species of migratory water-birds (Clowell 1994). Many species of shorebirds forage for invertebrates on intertidal mudflats, pastures, beach, sandflats, shoreline eelgrass, and in marshes (Barhart et al. 1992). Black bellied Plover (*Pluvialis squartarola),* Willet *(Catoptrophorus semipalmatus*), Long-billed Curlew (*Numenius americanus*), Marbled Godwit (*Limosa fedoa*), Dunlin (*Calidris alpine*), Western Sandpiper (*Calidras mauri*) and Least Sandpiper (*Calidris minutilla*) are shorebirds species that may occur within the project area at low tide.

Ducks use open-water areas, water covered mudflats and eelgrass areas (Barnhart et al. 1992). Surf Scoters (*Melanitta perspicillata*), Bufflehead (*Bucephala albeola*), and greater Scaup (*Aythya marila*) are among the most commonly observed waterfowl in Eureka (pers. Obs. Ron LeValley). Humboldt Bay is an important migratory stopover site for Black Brant (*Branta bernicla nigricans*), a small migratory goose that feeds almost exclusively on eelgrass, principally in the South Bay (Barnhart et al. 1992). Black Brant show up in numbers in the fall to early winter. Thousands of Black Brant are present on South Bay during the peak period of migration in April.

Diving birds occur primarily in open-water areas of the Bay. Double-crested Cormorants (*phalacrocorax auritus*) are most abundant, followed by Red-throated Loons (*Gavia stellata*) and common Loons (*Gavia immer*). Western (*Aechmophorus occidentails*), Horned (*padiceps auritus*), Eared (*P. nigricollis*) and Pied-billed (*Podilymbus podiceps*) grebes occur in Eureka Channel.

Herons and egrets are regularly seen on Humboldt Bay (Bernhart et al. 1992, Harris 1996). Additionally, Humboldt Bay is important habitat for gulls and terns (Barnhart et al. 1992). In the summer, Western (*Larus occibentails*) and Heermann's (*Larus heermanni*) gulls are most common. From October to March the following gull species are present on Humboldt Bay (listed in approximate order of decreasing abundance): Western Gull, Glaucous-winged Gull (*L. glaucescens*), New Gull (*L. canus*), and California Gull (*L. californicus*).

Marine Mammals

The Pacific harbor seal (*Phoca vitulina*), a small, non-migratory seal species (Griswold 1985), is the most common marine mammal in Humboldt Bay (Barnhart et al. 1992). Seals haul on mudflats exposed during ebb tides adjacent to small tidal channels in upper Arcata and South Bays (pers. Obs.). Harbor seals are present in the Eureka Channel throughout the year.

California Sea Lion (*Zalophus californianus*) and the Steller Sea Lion (*Eumetoopias jubatus*) are rarely observed in the Bay, but increasing numbers of California Sea lions are roosting on docks and boats at Woodley Island. While few California sea lions (*Zalopgus californianus*) breed in Northern California, peak abundance occurs during the fall after the breeding season when the males migrate northward (Reeves et al. 2002). Females tend to stay close to the rookeries all year. The Federally threatened Steller Sea Lion (*Eumetopias jubatus*) favors the outer coast, preferring the haul-out on offshore rocks and rocky islands. Steller sea lions do not breed in Northern California but may occur in this region during fall, winter and spring (Reeves et al. 2002). Steller sea lions are not often found in river mouths, bays, or estuaries (Reeves et al. 2002).

Fish

Four listed anadromous fish species are known to occur within Humboldt Bay (Barnhart et al. 1994, Tauber 2002). Southern Oregon/Northern California Coho Salmon (*Oncorhynchus kisutch*), Chinook Salmon – California coastal ESU (Ecologicaly

Significant Unit), (*Oncorhynchus tshawytscha*) and steelhead – Northern California ESU (*Oncorhynchus mykiss*) likely pass through the project site. Juvenile salmonids that are migrating to the ocean and adults migrating to freshwater streams to spawn use Humboldt Bay as a corridor. Juvenile salmonids also use Humboldt Bay as foraging habitat (Barnhart et al. 1992). Longfin smelt have an established population in Humboldt Bay and spawn in the freshwater streams which are tributaries to the Bay. The federally endangered tidewater goby (*Eucylogobius newberryi*) is also known to exist in Humboldt Bay

34. Describe the surrounding properties, including information on plants and animals and any cultural, historical, or scenic aspects. Indicate the type of land use (residential, commercial, etc.) intensity of land use (one-family, apartment houses, shops, department stores, etc.) and the scale of development (height, frontage, set-back, rear yard, etc.) Attach photographs of the vicinity. Photos accepted.
The surrounding properties are similar in character and appearance compared to the project site property proposed for dredging activity. Immediately adjacent properties are either vacant and undeveloped tidally influenced mudflats or undeveloped and vacant coastal scrub land. Proximal uses include light industrial and commercial uses.

---------- Questions 35; and 36 MUST BE ANSWERED! ----------

35. How will the proposed use or activity promote the public health, safety, comfort, and convenience?
The CEMT serves as the primary import point for petroleum products such as gasoline and diesel for the greater North Coast area. Approximately 80+% of all gasoline in the area is delivered by barge to the CEMT dock. The proposed maintenance dredging project will allow for the continued operation of the CEMT facilities, thus preserving a critical pipeline for a crucial resource to be delivered to the area. Failure to perform the proposed dredging would eliminate the ability of barges to safely approach and moor at the CEMT dock.

36. How is the requested grant, permit, franchise, lease, right, or privilege required by the public convenience and necessity?
As discussed above, approximately 80+% of all gasoline and petroleum products in the greater North Coast area are delivered via barge to CEMT facility, and then transported throughout the vicinity. Failure to properly maintain safe mooring depths for the CEMT dock facilities would threaten the health and safety of the public at large by eliminating the capability of barges to deliver their cargo to the CEMT facility. Without the delivery of petroleum products via the CEMT, regional commerce and public services would be reduced to a stand-still, producing dangerous and potentially life-threatening shortages of a critical resource.

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37. Financial statement:
    A. Estimated project cost.
    $550,000.00
    B. How will the project be financed?
    The project will be financed by the Chevron Products Company.

38. Describe fully directions necessary to arrive at project site.
From Broadway Street (Highway 101) in Eureka, CA, proceed west on Truesdale Street for approximately 0.3 miles. Proceed north on Christie Street for Approximately 0.1 miles. Project site is located at 3400 Christie Street, Eureka, CA 95503.

TABLE OF CONTENTS

- Plan of Operations: CEMT Maintenance Dredging……2
- Report of Findings……...8
- Full Sediment Analysis Laboratory Results……..…31
- Figures……...……72
  - C-1: Vicinity Map
  - C-2: Site Map and Bathymetric Survey
  - C-3: Typical Dredge Cross-Section
  - C-4: HOODS Vicinity Map
  - C-5: HOODS Quadrant Map

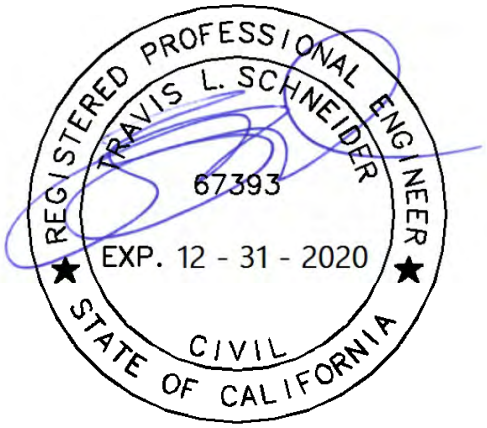
PLAN OF OPERATIONS:
CHEVRON EUREKA MARINE TERMINAL MAINTENANCE DREDGING

CHEVRON EUREKA MARINE TERMINAL
3400 CHRISTIE STREET
EUREKA, CA 95503

PREPARED BY:

PACIFIC AFFILIATES, INC.
A CONSULTING ENGINEERING GROUP
990 WEST WATERFRONT DRIVE
EUREKA, CA 95501
(707) 445-3001

MARCH 15, 2019



TRAVIS L. SCHNEIDER, R.C.E. #67393

Project Description

History

The Chevron Eureka Marine Terminal (CEMT) serves as a focal import point for the majority of petroleum products, such as gasoline, which are distributed throughout the North Coast. The area was last dredged in 2012, when approximately 2,500 cubic yards of sediment were removed from the proposed dredge area.

Purpose of Project

In order to provide vessels continued safe access to the CEMT dock, the applicant requests to secure a ten-year maintenance dredging permit. Vessels utilizing the CEMT dock can be up to 600 ft in length with draft depths of 30 to 35 ft. Dredging is required to maintain adequate berthing depth for the vessels, as well as to ensure the continued safe and efficient operation of the CEMT facility.

Project Description

Maintenance dredging of bay sediment is proposed for the area adjacent to the CEMT dock. The project site is located along the eastern shore of the North Humboldt Bay Channel in the City of Eureka at 990 West Waterfront Drive. Project parcels are described as APN's 003-071-013 and 003-071-008; the former being a tideland parcel owned by the City of Eureka and the latter being an adjacent upland parcel owned by the applicant, Chevron Corporation. The CEMT dock extends approximately 645 feet from the shoreline into Humboldt Bay. Maintenance dredging will restore and maintain sufficient draft depth for moorage and shipping operations to continue at the dock.

It is proposed to remove a maximum of 2,500 cubic yards of sediment during the initial dredging event covered under the requested permit. Calculations based on recent hydrographic surveys show roughly 2,500 cubic yards of material needs to be dredged to achieve the target depth of -22 feet MLLW (plus a two-foot overdredge). Dredging extents comprise an area of approximately 0.36 acres. The dredge footprint measures 84 feet at the widest point by 315 feet long; the dredge footprint is triangular and tapers to a point 315 feet from the southwest corner of the dock.

Hydrographic surveys will be completed annually, and dredging will be performed as needed, but not more than once per 12-month period, for the life of the permit. Dredging volume will not exceed 2,500 cubic yards per dredging event, and the total volume dredged under this permit will not exceed 4,999 cubic yards. Extents of the dredge area(s) will be determined based on the results of the hydrographic survey and may differ from the areas proposed for the initial dredging event. In no case will the dredge area extend beyond the dredging boundaries described above.

The edges of the dredge area will be box cut which will allow the adjacent material to

slough off to its natural angle of repose. The design depth of -22 MLLW feet plus two foot overdredge is consistent with the previously obtained permits for the facility as issued by the Army Corps, State Lands Commission and Regional Water Board. Should siltation rates at the moorage area prove to be higher than predicted, the applicant shall apply for amendments to the existing permits to increase the dredge volume.

In order to minimize the environmental impacts on Humboldt Bay, all dredging activities will be required to take place in a two-week block of time during the period from July 1st to October 15th. Dredging activities will take place approximately 8 to 12 hours per day. Tides will in part determine hours of operation, as dredging of sediment would preferably coincide with ebb to slack tide. Dredging activities will halt for off-loading of any ships or barges arriving at the dock.

Sediment Removal Methods

Dredging will be performed using an excavator and/or crane with a clamshell bucket positioned on a floating work barge. Material will be scooped from the bay floor and deposited in a sealed dump scow situated adjacent to the work barge. Once full, the scow will be transported to the Humboldt Open Ocean Disposal Site (HOODS) located three nautical miles northwest of the Humboldt Bay entrance where the dredged material will be deposited (see Attachments V and IV.) Sediment will be disposed of in the appropriate HOODS quadrants and cells as dictated by conditions issued by the EPA for the project.

At this time, a dredging contractor has not been selected. Each contractor will have unique means and methods to complete the project based on their experience and equipment. As such, specific details of construction, such as types of equipment, barge/scow size, number of trips to HOODS, schedule, etc., are still unknown. However, the general dredging methodology will consist of heavy equipment removing material from the bay floor and placing it into a scow for transport to the disposal site. Prior to dredging, pre-project hydrographic surveys will be completed for the project area. Updated dredge volumes will be generated and verified with post-project hydrographic surveys.

The dredge barge will be moved into position and will anchor, typically by setting two spud piles attached to the barge. A tugboat will then move the dump scow into position nearby the work barge. Areas immediately surrounding the CEMT dock may require use of an excavator due to the relatively shallow water resulting from several years of non-dredging. The excavator bucket will have a thumb to seal the bucket as it retrieves through the water column. Otherwise, and where possible, a crane outfitted with a closed clamshell bucket will be used. Other than the negligible amount of sediment on the exterior of the bucket during loading, there will be no water or sediment released back into Humboldt Bay. Dredged material will be placed in the water tight dump scow positioned adjacent to the work barge. Once the scow is filled to the desired capacity, it will be towed out of Humboldt Bay to the HOODS ocean disposal site. The barge and scow will be repositioned frequently throughout the project in order to access all the areas to be dredged.

During low tides, the work barge may be grounded on the mudflat near the CEMT dock, though this is highly unlikely. This would allow the excavator to dredge sediment that is exposed during minus tides, thus increasing efficiency and decreasing potential environmental impacts. The barge would only ground on land that is scheduled to be dredged, so there would be no negative impacts to sensitive habitat.

Dock structures shall not be dismantled to complete dredging. The excavator will have the capability to reach under the floating docks to some degree. Sediment will be dredged as close to the docks as possible, then a clean-up dredge will be performed to remove any material that sloughed off from underneath the docks. Side slopes shall be cut at 2:1 or the natural angle of repose. Overdredge depth at all locations is assumed to be one foot below the design depth. Maximum pay line shall be two feet below the design dredge depth.

Dredging Schedule

In order to minimize environmental impacts on Humboldt Bay, dredging activities will be performed over a two-week period, and are slated to commence annually between July 1st and October 15th, dependent upon favorable working conditions.

Dredging is, by definition, "in-water" work. As such, there are specific work windows established by the governing agencies to minimize impacts to various fish species present in Humboldt Bay. The in-water work window for Humboldt Bay is from July 1st to October 15th of each year. In this first year of permit coverage, the contractor will begin work as soon as permits are obtained and an agreement with the Chevron Corporation has been reached. Upon the commencement of the anticipated three-week work period, dredging activities will occur up to 24 hours a day until the completion of the project.

Dredge volume during the first year of the permit's issuance will depend on when permits are obtained, dredging costs, contractors' equipment, etc.; however, as much material will be dredged as is possible. In the following years of permit coverage, the remaining sediment will be cleaned up to reach the design dredge depths. Dredged volume shall not exceed 2,500 cubic yards in any 12-month period.

Ocean Disposal

A number of sediment disposal options have been considered in recent years for Humboldt Bay dredging projects and for the CEMT project in particular, but due to the quantity of material and hurdles in permitting upland and near shore disposal sites, ocean disposal at the Humboldt Open Ocean Disposal Site (HOODS) will be implemented for this project. Disposal at HOODS will be performed in accordance with Special Conditions established by the Environmental Protection Agency (EPA) and Army Corps, which may include bathymetric surveys, vessel tracking systems and record keeping/reporting. Scows shall only be transported to HOODS when ocean conditions will not interfere with safe transportation and will not create a risk of spillage, leak or other loss of dredge material. Specific cells within HOODS will be identified by EPA and Army Corps which shall be used for disposal.

Environmental Effects

Dredging activities are not expected to have a significant environmental impact. The dredging equipment is slow moving and makes sufficient noise to alert any animals to allow them time to flee the area. It is not so noisy that it will exceed sound thresholds for disturbance or injury to fish or marine mammals. Short-term, localized increases in suspended sediments will occur, but are expected to disperse within 500 feet. Humboldt Bay waters, which are naturally quite turbid, are in continuous motion and will disperse suspended sediments and restore ambient water quality conditions shortly after the dredging event. Water flow directions vary with the tide changes, but generally travel south to north (or west to east) on a flooding tide and from north to south (or east to west) on an ebbing tide.

Fish and marine mammals, including green sturgeon and longfin smelt, may be in the project area during construction, but would likely flee to other areas of the bay. With the activity taking place between the shore and channel, there is sufficient room for fish and mammals to travel around the area.

Conservation and Protection Measures

The following conservation and protection measures will be employed throughout the project as a safeguard to Humboldt Bay and its occupants:

- Dredging activities will only be performed between July 1 and October 15 of each calendar year to avoid impacts to salmonids migrating through Humboldt Bay.
- Clamshell and excavator dredging is a slow and controlled process allowing marine life time to escape as the equipment approaches. There are no suction or jetting pressures involved. Operator has the ability to limit descent speeds to minimize sediment dispersion.
- Vegetable-based or biodegradable hydraulic fluids shall be used, if possible, in equipment operating over water or without secondary containment. Note, not all equipment is compatible with these types of fluids.
- Equipment shall be inspected and serviced prior to mobilization. Routine inspections shall occur through the project and leaks shall be repaired immediately when discovered.
- Spill kits equipped with enough material to provide preliminary containment for a volume of material that can reasonably be expected to spill shall be maintained on the barge and the dock.
- Dredging will not extend beyond the overdredge depths as described herein and in the attached typical cross-sections.

Figures: (I)Vicinity Map
(II)CEMT – Bathymetric Survey

(III)Cross Section of CEMT Dredge Area
(IV)Region 9 HOODS Disposal Site – Vicinity Map
(V)Region 9 HOODS Disposal Site – Disposal Quadrants and Oceanic Buffer Zones

Appendices: 1. CEMT Report of Findings 2019
2. CEMT 2019 Sediment Analysis – Complete Results

SEDIMENT SAMPLING AND ANALYSIS REPORT

MAINTENANCE DREDGING PROJECT
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TABLE OF CONTENTS

I. INTRODUCTION 1

A. SCOPE OF WORK 1
B. OBJECTIVES 1
C. SITE LOCATION 1
D. BACKGROUND 2

II. SAMPLING ACTIVITIES 2

A. SAMPLE COLLECTION 2
B. SAMPLE HANDLING 3

III. LABORATORY ANALYSIS 3

A. TESTING LABORATORIES 3

IV. QUALITY CONTROL 4

V. DISCUSSION 5

A. GEOLOGY 5
B. HISTORICAL DATA 5
C. ANALYTIC RESULTS 5
- PHYSICAL CHARACTERISTICS 6
- CHEMICAL CHARACTERISTICS 7

VI. CONCLUSIONS 11

VII. REFERENCES 12

APPENDIX I – SEDIMENT CORE SAMPLE LOGS I

APPENDIX II – PROJECT SITE MAPS II

APENDIX III – SUMMARIZED 2012 SEDIMENT ANALYSIS RESULTS III

APPENDIX IV – SEDIMENT SAMPLE ANALYTICAL RESULTS IV

APPENDIX V – SEDIMENT SAMPLE PHOTOGRAPHS V

LIST OF TABLES

Table 1 – Sediment Grain Size 6
Table 2 – 2015 USACE grain size summarized results, HUM-NB-2015-4 6
Table 3 – Total Solids 6
Table 4 – Total Organic Carbon 7
Table 5 – Percent Moisture 7
Table 6 – Metals 7
Table 7 – Mercury 8
Table 8 – PAHs 8
Table 9 – Organochlorine Pesticides and PCBs 8
Table 10 – Chlorinated Herbicides 9
Table 11 – Total Petroleum Hydrocarbons – Diesel and Motor Oil 10
Table 12 – Total Petroleum Hydrocarbons 10
Table 13 – Dioxins and Furans 11
Table 14 – Organotin Compounds 11

ABBREVIATIONS

California Coastal Commission	CCC
California Environmental Quality Act	CEQA
Environmental Protection Agency	EPA
Humboldt Bay Harbor, Recreation and Conservation District	HBHRCD
Laboratory Control Sample	LCS
Laboratory Control Sample Duplicates	LCSD
Matrix spike	MS
Matrix spike Duplicate	MSD
Mean Lower Low Water	MLLW
Pacific Affiliates	PA
Quality Control	QC
Regional Water Quality Control Board	RWQCB
Relative Percent Difference	RPD
Sampling and Analysis Plan	SAP
Sediment Evaluation Framework for the Pacific Northwest	SEF
Chevron Eureka Marine Terminal	CEMT
U.S. Army Corps of Engineers	USACE

I. INTRODUCTION

This Report of Findings presents the results of sampling and analysis of the sediment proposed to be dredged at the Chevron Eureka Marine Terminal (CEMT) dock. A discussion of sampling activities and the sediment testing results is contained herein as well. Sediment sampling was performed at CEMT's dock on December 3, 2018, by Pacific Affiliates (PA).

All investigative activities were performed in general accordance with the Sediment Sampling and Analysis Plan (SAP) dated October 18, 2018 and prepared by PA. The SAP was reviewed and approved by the Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (USACE) and the Humboldt Bay Harbor, Recreation and Conservation District (HBHRCD), among other agencies.

A. Scope of Work

Sediment sampling and analysis is part of a broader scope of work with the ultimate objective of obtaining permit coverage for maintenance dredging at the CEMT dock. The scope of work includes the following activities:

- Prepare SAP and obtain plan approval from all involved agencies
- Implement SAP
- Prepare Sediment Sampling and Analysis Report based upon results of sediment testing results
- Prepare CEQA and permit application documents for maintenance dredging project
- Obtain dredging permits

B. Objectives

The intent of sediment sampling and analysis is to characterize the sediment proposed to be dredged. Historical data from previous sediment testing episodes have shown Humboldt Bay to have elevated concentrations of several chemicals. In order to properly handle and dispose of the dredged material, it must be characterized by thorough analysis.

C. Site Location

CEMT's dock is located on the eastern shore of the North Bay Channel in Humboldt Bay, approximately ¼ of a mile west of Highway 101 at 3400 Christie Street in Eureka, California. Project parcels are described as APN's 007-071-013 and 007-071-008; the former being a 5.67 acre tideland parcel owned by the City of Eureka and the latter being an adjacent 4.70 upland parcel owned by Chevron USA Inc. The dock itself is situated between the U.S. Bulkhead Line to the U.S. Pierhead Line. The subject properties are located along the northern boundary of Section 28, Township 5 North, Range 1 West. The proposed project involves maintenance dredging of accumulated sediment west of the dock.

D. Background

CEMT dock provides a platform for the import and export of timber products, primarily wood chip export via barges. Cargo is stored on the upland parcel adjacent to the dock. The dock was last dredged in August and September of 2012, when approximately 2,193 cubic yards of sediment were removed from the mooring area. The 2012 dredging episode achieved the proposed depth of -22 feet Mean Lower Low Water (MLLW), with a two foot overdredge allowance. The proposed maintenance dredging project is required to maintain adequate berthing depth for vessels that moor at the dock, as well as to insure the continued safe and convenient operation of the facility.

CEMT currently has previously obtained maintenance dredging permits and permissions from the U.S. Army Corps of Engineers (File No. 2010-00016N) and the California Regional Water Quality Control Board (WDID No. 1B04054WNHU) and a lease with the California State Lands Commission (PRC 8708.9), all of which were set to expire in 2016. The California Coastal Commission issued a permit exemption for the project. Although the specifics of these permits varied, they allowed for the removal of approximately 2,300 cubic yards (cy) of material over the life of the permit. Dredging was permitted for an area of approximately 0.36 acres positioned westward of APN 007-071-013 and the U.S. Pierhead Line.

Permits and permissions sought for dredging to commence in 2019 or 2020 will seek to replicate the conditions, dredge and disposal methods, and total volume of sediment removal with few minor exceptions or alterations pending the acceptance of the sediment sampling results. A clamshell dredge will be used to dredge to a design depth of -22 feet MLLW with a two foot allowable overdredge. A crane outfitted with a clamshell bucket will be positioned on the dock or a barge. Dredged material will then be transferred to dump scows, which will then either be towed to the Humboldt Open-Ocean Disposal Site (HOODS) for open-ocean disposal or stockpiled on-shore for hauling to an appropriate upland disposal site (Anderson Waste Management Landfill in Anderson, CA). A more complete description of the proposed disposal methods and requirements can be found in the Sampling and Analysis Plan previously approved by the EPA, the USACE, and the NCRWQCB, which has been included within the submission packet for this ROF.

In an effort to obtain the new maintenance dredging permits, PA collected three sediment core samples in December 2018 from several locations within the proposed dredge area. A composite sample from the site was tested for: physical characteristics (including grain size distribution, total organic carbon, and liquid content), CAM-17 metals, polycyclic aromatic hydrocarbons (PAHs), dioxins and furans, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH), organotins, organochlorine pesticides, and pentachlorophenol. Complete lists of individual analytes, testing methods, and analytical results have been provided as a component of this ROF. The full range of analysis results are furnished as Appendix III of this ROF.

II. SAMPLING ACTIVITIES

A. Sample Collection

Sediment sampling was performed by Pacific Affiliates staff from a work barge on December 3, 2018. The barge was secured to the dock at pre-determined sampling locations as described in the SAP. Actual sample locations are shown on the bathymetric map in Appendix II.

Core samples were collected using a VibeCore-D coring device which utilizes three-inch diameter sample tubes. Prior to sampling, the sample tubes were decontaminated by washing the interior with a borax solution followed by a rinse with clean water, then a double rinse with distilled water. After securing a sample tube to the VibeCore, the assembly was lowered to the mudline, powered on and vibrated into the sediment. Using pre-measured markings on the rope, the distance the sample tube had advanced into the sediment was monitored. Once adequate depth was achieved, the sampler was hoisted out of the water and placed on the barge deck.

Full depth samples were not achieved at sample locations A-1, A-2 and A-3 due to refusal of the sampler. Sample 1-A was intended to reach a depth of 24.50 ft MLLW, but refusal was met at 23.72 ft MLLW. Target depth at 1-B was 24.5 ft MLLW, but refusal was met at 23.95 ft MLLW. Target depth at 1-C was 24.5 ft MLLW, but refusal was met at 23.48 ft MLLW. A copy of the sediment sampling log is included in Appendix I – Sediment Core Sample Logs

B. Sample Handling

A plunger supplied with the sample tubes was used to push the sample out of the tube onto a sheet of plastic to be documented and cataloged. A fresh sample tube and plastic sheeting were used at each location for each sediment core. As the sampling tubes met refusal before being advanced to the intended depth of 24.5 ft MLLW, no Z-Layer sample was obtained. Logs of the core samples are provided in Appendix I. Each sediment core was homogenized, and the three separate cores were then composited into a single sample.

The composited sample was then split into a primary sample and a backup subsample. The primary sample was labeled with the date, time, location, sample ID, client and the sampler and immediately packed in a cooler with ice. The cooler containing the primary sample was shipped overnight to the testing laboratory along with proper chain-of-custody documentation. Back-up sediment samples collected from the larger composited sample were placed in sample jars consistent with the primary and backup samples. Backup samples were stored in a refrigerator pending approval of the primary sample analysis.

Upon request for submission of additional sediment volume to allow for the analysis of all required analytes, portions of the backup sample sediment stored by PA were shipped overnight to the testing laboratory on December 5, 2018. The testing laboratory initially requested an insufficient amount of sediment to perform all requested analyses.

III. LABORATORY ANALYSIS

A. Testing Laboratories

McCampbell Analytical Inc. was contracted to perform the sediment analyses. McCampbell is an accredited environmental laboratory (ELAP No. 1644) located in Pittsburg, CA. McCampbell subcontracted the analysis of particle size to Cooper Testing Laboratory in Palo Alto, CA.

Appendix III contains a list of all chemical analytes and physical characteristics tested for and the test methods utilized. All testing methods were in accordance with those approved by the EPA and were based on Table 6-1 of the Sediment Evaluation Framework (SEF). The testing criteria were developed based upon EPA guidelines and the requirements of the potential upland disposal

site, Anderson Landfill.

IV. QUALITY CONTROL

Pacific Affiliates received the analytic results for the sediment samples from McCampbell Analytical on December 19, 2018. McCampbell Analytical, or the subcontracted laboratory, provided notes on all anomalies that occurred during testing.

All samples were handled with the appropriate chain-of-custody procedures and samples were analyzed within the required holding times aside from the analysis of total solids. All laboratory QC batches were checked to ensure that the correct number of samples were analyzed, the holding times were not exceeded, surrogate recoveries were within stated control limits, and that Laboratory Method Blank, MS, MSD, LCS and LCSD were all tested and within the acceptable limits except as noted in the laboratory analytical reports.

V. DISCUSSION

A. Geology

Sediment along the face of the dock was explored in three locations. The depth to the mudline, measured from zero feet MLLW, varied from approximately 16 feet on the south end of the dock to nearly 25 feet on the north end. Sediment accumulates more quickly at the south end of the dock primarily due to the City of Eureka storm sewer outfall location. During storm events, runoff from City streets is discharged into Humboldt Bay via a 7 ft by 5 ft box culvert which outlets at the south end of the dock. Depths below the mudline achieved during sampling ranged from approximately 2 feet on the north end to 5 feet on the south end. Sampled depths achieved were between -23.48 feet and -23.95 feet MLLW. Sediments were found to be slightly less coarse than those typically found in and around Humboldt Bay with the gradation being 2.2% gravel, 65.6% fine sands, 22.6% silt, and 9.6% clay. This can be attributed to the proximity of the City storm sewer outfall to the dock. All the sediments were dark gray in color. The upper three to five feet had a sulfuric odor. Logs of the core samples can be found in Appendix I.

B. Historical Data

Extensive sediment sampling and analysis has been performed around Humboldt Bay as part of previous dredging projects. Analytic results from this project were compared to data from sediment testing performed at CEMT dock in 2013 (see Appendix III), as well as from 11 City of Eureka waterfront mooring facilities and Woodley Island Marina which were all sampled in 2017. Results from sampling performed in the Humboldt Bay Channel by the USACE in October 2015 were also compared against the results of the CEMT.

Though not all parameters tested for as part of this project were analyzed in the previous projects, several were. When comparing the recent chemical test results to historical data, the concentrations detected at CEMT in 2018 were within the ranges detected around the Bay and at the dock in previous sampling events.

C. Analytic Results

The sediment sampling procedures used for this project were intended to provide data from a representative sample of the sediment to be dredged. Chemical concentrations were not delineated vertically or horizontally, as the individual core samples were composited into one single sample for analysis.

Sediment quality guidelines for evaluating chemical analytical results consist of chemical screening levels (SLs), which are defined in the Sediment Evaluation Framework for the Pacific Northwest (SEF), Table 6-3. The SLs are designed to be protective of direct biological effects to benthic and aquatic organisms and correspond to a “no adverse effects level.”

The following sections present the analytical results for the chemicals identified in Table 3 of the Sampling Plan. Shown in the following tables are the analytes and the respective detected concentration, Minimum Detection Limit (MDL), and Reporting Limit (RL).

Sediment sample results from the CEMT sampling are presented in comparison with the sediment analysis results from the USACE’s 2015 sampling program to provide comparative background

levels of chemical and physical sediment characteristics found in Humboldt Bay. Specifically, CEMT's 2018 analysis results are compared against Tier III testing results from the Eureka Outer Channel (HUM-EKO), as this area has been deemed to be most representative of the sediment retrieved adjacent to CEMT by the EPA.

PHYSICAL CHARACTERISTICS

As part of the characterization of the sediment, the following "conventional" tests were run to gain an understanding of the makeup of the sediment. The percentage of solids in the sample and a grain size analysis of the solids were used to determine the physical characteristics of the sediment. Additionally, total organic carbon and percent moisture were included in the physical analyses; all results are summarized below.

Table 1 – Sediment Grain Size – CEMT 2018

Grain Size	*(%)*
Cobbles	0
Gravel	2.2
Sand	65.6
Silt	22.6
Clay	9.6

According to accepted standing practice for dredging operations in Humboldt Bay, areas with high sand content sediment (>80% sand composition) are exempted from more extensive Tier II and Tier III testing parameters for biological organisms. The low sand content of the sediment sampled adjacent to CEMT indicates that the composition is not entirely consistent with samples drawn from prior to the most recent dredging operations performed by USACE in the Humboldt Bay Channel. Physical characteristic results from the nearest USACE sampling station (Table 2, below), indicate that further biological testing may be required by the EPA prior to approval of CEMT sediment for HOODS disposal.

Table 2 –Grain size summarized sample comparisons

Location	Solids (%)	TOC (%)	%Gravel	%Sand	%Silt	%Clay
2018 CEMT	70.8	1.5	2.2	65.6	22.6	9.6
HUM-NB-2015-4	84.9	<0.020	1	96	1.7	1.3
HUM-EKO	71	.034	0	74	15	11

The remaining physical characteristic results summarized below support that the CEMT sediment is not entirely in keeping with the sediment found within the North Bay Channel.

Table 3 – Total Solids

Total Solids (%)	*2018 CEMT*	*HUM-EKO*	*MDL*	*RL*
Total Solids	70.8	71	0.00135	0.00135

Table 4 – Total Organic Carbon

Total Organic Carbon (%)	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
Total Organic Carbon	1.5%	0.34%	470	470

Table 5 – Percent Moisture

Percent Moisture (%)	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
Percent Moisture	31.1	n/a	0.100	0.100

CHEMICAL CHARACTERISTICS

As opposed to the physical characteristics of the CEMT sediment, chemical are largely consistent with the results found at dredging sites elsewhere in Humboldt Bay. Chemical analysis results from the USACE 2015 sampling session are not available, and therefore comparison of relative metals levels to the nearest federal sampling station are not provided.

Metals

Concentrations of all metals tested for were detected in the CEMT sample aside from Silver and Thallium; however, compared to background levels of metal contamination in Humboldt Bay derived by comparison to previous maintenance dredging projects, it appears as though no metal was found in a level of concentration which would cause concern.

Table 6 - Metals

Metals (mg/Kg)	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
Antimony	0.2	--	0.094	0.50
Arsenic	3.4	4.58	0.14	0.50
Barium	42	--	0.97	5.0
Beryllium	0.22	--	0.072	0.50
Cadmium	0.079	0.194	0.058	0.25
Chromium	40	59.6	0.092	0.50
Cobalt	6.2	--	0.056	0.50
Copper	13	16.9	0.069	0.50
Lead	4.7	6.38	0.094	0.50
Molybdenum	0.47	--	0.023	0.50
Nickel	49	71	0.072	0.50
Selenium	0.14	0.06	0.13	0.50
Silver	ND	0.06267	0.055	0.50
Thallium	ND	--	0.1	0.50
Vanadium	26	--	0.064	0.50
Zinc	37	54.6	1.4	5.0

Table 7 – Mercury

Mercury (mg/Kg)	*CEMT 2019*	*HUM-EKO*	*MDL*	*RL*
Mercury	0.040	0.0396	0.0087	0.017

Polycyclic Aromatic Hydrocarbons

A number of PAH's were detected in the sediment sample. The reported concentrations were well below the SLs and, in some cases, were below the RLs. Previous testing at the CEMT dock indicated lower levels of PAH's, however, the limit used in testing was 300 ug/L, which is much higher than the current limits.

Table 8 - PAH's

PAHs/PNAs (mg/kg)	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
1-Methylnaphthalene	ND	0.017	0.0088	0.010
2-Methylphenanthrene	ND	0.026	0.014	0.020
Acenaphthene	0.011	0.0042	0.0062	0.010
Acenaphthylene	0.00061	0.0051	0.0033	0.010
Anthracene	0.01	0.0081	0.0066	0.010
Benzo (a) anthracene	0	0.034	0.034	0.040
Benzo (a) pyrene	0.036	0.077	0.0096	0.020
Benzo (b) fluoranthene	0.027	0.130	0.0059	0.010
Benzo (g,h,i) perylene	0.013	0.056	0.0088	0.020
Benzo (k) fluoranthene	0.02	0.054	0.0063	0.010
Chrysene	0.025	0.047	0.0064	0.020
Dibenzo (a,h) anthracene	ND	0.019	0.012	0.020
Fluoranthene	0.063	0.026	0.0088	0.010
Fluorene	0.009	0.014	0.0069	0.020
Indeno (1,2,3-cd) pyrene	0.016	0.034	0.0080	0.020
Naphthalene	ND	0.019	0.0055	0.010
Phenanthrene	0.019	0.041	0.005	0.030
Pyrene	0.071	0.029	0.011	0.020

Organochlorine Pesticides and PCBs

No organochlorine pesticides or PCBs were detected in the CEMT sample.

Table 9 - Organochlorine Pesticides and PCBs

Organochlorine Pesticides + PCBs	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
a-BHC	ND	<0.001	0.00050	0.0050
a-Chlordane	ND	<0.00057	0.0024	0.0050
Aldrin	ND	<0.00062	0.0014	0.0050
Aroclor1016	ND	---	0.18	0.25
Aroclor1221	ND	--	0.026	0.25

Aroclor1232	ND	--	0.055	0.25
Aroclor1242	ND	--	0.034	0.25
Aroclor1248	ND	--	0.020	0.25
Aroclor1254	ND	--	0.034	0.25
Aroclor1260	ND	--	0.030	0.25
b-BHC	ND	<0.00070	0.0012	0.0050
Chlordane (Technical)	ND	<0.0075	0.80	0.12
d-BHC	ND	<0.0012	0.0018	0.0050
Dieldrin	ND	<0.00062	0.0016	0.0050
Endosulfan I	ND	<0.00056	0.0032	0.0050
Endosulfan II	ND	<0.00067	0.0010	0.0050
Endosulfan sulfate	ND	<0.00074	0.0032	0.0050
Endrin	ND	<0.00068	0.0021	0.0050
Endrin aldehyde	ND	<0.00086	0.0010	0.0050
Endrin ketone	ND	<0.00071	0.00065	0.0050
g-BHC	ND	<0.00063	0.00049	0.0050
g-Chlordane	ND	<0.0013	0.0010	0.0050
Heptachlor	ND	<0.00061	0.00065	0.0050
Heptachlor epoxide	ND	<0.0010	0.0010	0.0050
Hexachlorobenzene	ND	--	0.0014	0.050
Hexachlorocyclopentadiene	ND	--	0.0020	0.10
Methoxychlor	ND	<0.00079	0.0044	0.0050
p,p-DDD	ND	--	0.0007	0.0050
p,p-DDE	ND	--	0.0016	0.0050
p,p-DDT	ND	--	0.0022	0.0050
PCBs, total	ND	ND	0.25	0.25
Toxaphene	ND	<0.013	0.18	0.25

Chlorinated Herbicides

No chlorinated herbicides were detected in the CEMT sediment sample.

Table 10 – Chlorinated Herbicides

Chlorinated Herbicides (mg/kg)	***CEMT 2018***	***HUM-EKO***	***MDL***	***RL***
Acifluorfen	ND		0.23	0.50
Bentazon	ND		0.20	0.50
Chlorambern	ND		0.33	0.50
2,4-D (Dichlorophenoxyacetic acid)	ND	<0.40	0.28	0.50
2,4 - DB	ND		0.32	0.50
Dalapon	ND		0.28	0.50
DCPA (mono & diacid)	ND		0.32	0.50
Dicamba	ND		0.20	0.50

3,5-Dichlorobenzoic Acid	ND		0.25	0.50
Dichloroprop	ND		0.20	0.50
Dinoseb	ND		0.19	0.50
MCPA	ND		20	50
MCPP	ND		29	50
4-Nitrophenol	ND		0.21	0.50
Pentachlorophenol (PCP)	ND		0.20	0.50
Picloram	ND		0.34	0.50
2,4,5-T (Trichlorophenoxy acetic acid)	ND		0.20	0.50
2,4,5-TP (Silvex)	ND		0.23	0.50

Total Petroleum Hydrocarbons

TPH concentrations were all reported at low levels, in all cases exceeding the MDL by minimal amounts.

Table 11 - Total Petroleum Hydrocarbons – Diesel and Motor Oil

TPH Hydrocarbons (mg/Kg)	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
TPH-Diesel (C10-C23)	1.2	--	0.86	1.0
TPH-Motor Oil (C18-C36)	3.7	--	3.5	5.0

Table 12 – Total Petroleum Hydrocarbons - Gasoline

Gasoline Range (c6-12) Volatile Hydrocarbons (mg/Kg)	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
TPH(g) (C6-C12)	0.034	--	0.090	0.1

Dioxins/Furans

A number of dioxins and furans were detected in the sediment sample. However, several of the positive results were detected below the reporting limit and were flagged as being an estimated concentration.

Table 13 – Dioxins and Furans

Dioxins and Furans (pg/g)	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
1,2,3,4,6,7,8-HpCDD	46.9	9360	0.620	2.50
1,2,3,4,6,7,8-HpCDF	5.94 (J)	1790	0.370	2.50
1,2,3,4,7,8,9-HpCDF	ND	1790	0.440	2.50
1,2,3,4,7,8-HxCDD	ND	190	0.560	2.50
1,2,3,4,7,8-HxCDF	ND	320	0.570	2.50
1,2,3,6,7,8-HxCDD	0.780 (J)	820	0.380	2.50
1,2,3,6,7,8-HxCDF	ND	180	0.570	2.50
1,2,3,7,8,9-HxCDD	ND	640	0.450	2.50

1,2,3,7,8,9-HxCDF	ND	<130	0.520	2.50
1,2,3,7,8-PeCDD	ND	150	0.280	2.50
1,2,3,7,8-PeCDF	ND	120	0.350	2.50
2,3,4,6,7,8-HxCDF	ND	130	0.410	2.50
2,3,4,7,8-PeCDF	ND	140	0.330	2.50
2,3,7,8-TCDD	ND	130	0.110	0.500
2,3,7,8-TCDF	0.360 (J)	310	0.210	0.500
OCDD	593	6040	1.70	5.00
OCDF	29	370	1.30	5.00
Total TEQ	0.829	.731		

Organotin Compounds

No levels of organotin compounds were detected in the CEMT sample.

Table 14 – Organotin Compounds

Organotin Compounds (mg/kg)	*CEMT 2018*	*HUM-EKO*	*MDL*	*RL*
Dibutyltin	ND	<0.0010	0.0058	0.020
Monobutyltin	ND	<0.0019	0.010	0.020
Tetrabutyltin	ND	<0.0010	0.0054	0.020
Tributyltin	ND	<0.0021	0.014	0.020

VI. CONCLUSIONS

Though a number of chemicals were detected in the sediment sample, the concentrations of the detected chemicals were similar to background levels within Humboldt Bay. Provided the dredging is completed as approved by the governing agencies (work windows, equipment, dredging procedures, etc.), the project should not cause or contribute to degradation of water quality in Humboldt Bay. Dredged sediment shall be handled appropriately and disposed of at an upland facility or HOODS pending appropriate approved to accept the material as characterized.

VII. REFERENCES

Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual, Inland Testing Manual, US EPA/ US Army Corps of Engineers. EPA 823-B-98-004, February 1998.

Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region. US EPA/SFBCDC, USACE - SF/SF Bay Regional Board/CA State Lands Commission, September 21, 2001.

Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual, US EPA, EPA-823-B-01-002, October 2001.

Sediment Evaluation Framework for the Pacific Northwest, US EPA, USACE, US Fish & Wildlife Service, National Marine Fisheries Service, Idaho Department of Environmental Quality, Oregon Department of Environmental, Washington Department of Natural Resources, Washington Department of Ecology, May 2009.

Sediment Sampling and Analysis Plan, Chevron Eureka Marine Terminal– Maintenance Dredging, Pacific Affiliates, September, 2018

Partition Coefficients for Metals in Surface Water, Soil and Waste. Allison, Jerry. Allison Terry. Allison Geoscience Consultants, Inc., US EPA, EPA/600/R-05/-74, July 2005, www.epa.gov/athens/publications/reports/Ambrose600R05074PartitionCoefficients.pdf,

QA/QC Guidance for Sampling and Analysis of Sediments, Water, and Tissues for Dredged Material Evaluations, Chemical Evaluations, US EPA/USACE, EPA 823-B-95-001, April 1995.

APPENDIX I – SEDIMENT CORE SAMPLE LOGS

Chevron Marine Terminal Sediment Sampling - Core Log

12-03-2018 - 8:15 a.m. - 10:30 a.m.

Sample Point	Depth	MLLW Depth (Tide-Adjusted)	Core Length	Time
1-A	29.5ft	23.72ft	2.10ft	9:02 a.m.
1-B	28.5ft	23.95ft	3.25ft	9:17 a.m.
1-C	26ft	23.48ft	5.15 ft	9:31 a.m.

APPENDIX III - SUMMARIZED 2012 SEDIMENT ANALYSIS RESULTS, CEMT

Table 1 – Minimum Sediment Sampling Guidelines		
Dredge Volume* (*in situ* cubic yards)	**Minimum # of Sample Stations**	**# of Composites Analyzed ****
5,000 –10,000	4	1
10,000 – 20,000	6	2
** Numbers do not reflect reference and control sediment, or other QC samples.		

Samples were labeled as sub-samples with corresponding depths and kept in separate containers supplied by the laboratory. Portions of the sub-samples were composited into one single sample by NCL. Sub-samples were individually archived at NCL and will be kept for the specified hold time for the individual analyses.

3.4 Analytical Suite and Sediment Sample Results

Samples were analyzed for the following constituents shown in Table 2.

Table 2 – Proposed Dredge Sediments Sample Analysis

Constituent	Test Method	Screening Level* (mg/kg)	Detection Limit (mg/kg)	2012 Concentration (mg/kg)	2012 Compared to 2009 Results
METALS					
Cadmium	EPA Method 6010B	7.5[1]	0.3	<0.3	Decrease
Total Chromium		100[2]	2.0	75.7 [3]	Increase
Chromium VI		37[1]	5.0	ND<0.075	Decrease
Copper		38,000[1]	5.0	16.2	Decrease
Lead		<1,000[4]	5.0	6.9	Increase
Zinc		10,000[1]	1.0	49.4	Decrease
Soluble Threshold Limit Concentration (STLC)[8]		NA	NA	Total Chromium = 0.310 mg/L	NA
POLYAROMATIC HYDROCARBONS (PAHs)					
Acenaphthene	EPA Method 8270	27[5]	0.020	0.063 [6]	Increase
Anthracene		450[5]		0.044 [6]	Increase
Benzo(a)anthracene		2.1[5]		0.075 [6]	Increase
Benzo(a)pyrene		0.13[1]		0.048 [6]	Increase
Benzo(b)fluoranthene		0.047[5]		**0.070** [6]	Increase
Benzo(k)fluoranthene		0.046 [5]		0.028 [6]	Increase
Chrysene		1.4 [5]		0.083 [6]	Increase
Dibenz(a,h)anthracene		0.21 [5]		<0.020 [6]	Decrease
Fluoranthene		210 [5]		0.240 [6]	Increase
Fluorene		33 [5]		0.049 [6]	Increase
Indeno(1,2,3-cd)pyrene		0.16 [5]		<0.020 [6]	Decrease
Acenapthylene		NA		<0.020 [6]	NA
Phenanthrene		NA		<0.020 [6]	NA
Benzo(g,h,i)perylene		NA		0.021[6]	NA

Table 2 – Proposed Dredge Sediments Sample Analysis					
Constituent	**Test Method**	**Screening Level*** (mg/kg)	**Detection Limit** (mg/kg)	**2012 Concentration** (mg/kg)	**2012 Compared to 2009 Results**
Naphthalene		20 [5]		0.066 [6]	Increase
Pyrene		150 [5]		0.220 [6]	Increase
POLYCHLORINATED BIPHENYLS (PCBs)					
Aroclor 1016	EPA Method 8082	0.30 [1]	0.020	<0.020	Increase
Aroclor 1221 [9]		0.30 [1]	0.024 [7]	ND<0.035	Increase
Aroclor 1232		0.30 [1]	0.020	<0.020	Increase
Aroclor 1242		0.30 [1]	0.020	<0.020	Increase
Aroclor 1248		0.30 [1]	0.020	<0.020	Increase
Aroclor 1254		0.30 [1]	0.020	<0.020	Increase
Aroclor 1260		0.30 [1]	0.020	<0.020	Increase
DIOXINS/FURANS [Note: requested TEQ values]					
Polychlorinated Dibenzodioxins (PCDDs)					
2,3,7,8-TCDD	EPA Method 8290	0.000019 [1]	0.000005	<0.000005	Decrease
1,2,3,7,8-PeCDD		0.000019 [8]	0.000005	<0.000005	Decrease
Polychlorinated Dibenzodioxins (PCDDs)					
1,2,3,4,7,8-HxCDD	EPA Method 8290	0.00039 [5]	0.000005	<0.000005	Decrease
1,2,3,6,7,8-HxCDD		0.00039 [5]	0.000005	<0.000005	Decrease
1,2,3,7,8,9-HxCDD		0.00039 [5]	0.000005	<0.000005	Decrease
1,2,3,4,6,7,8-HxCDD		0.00039 [5]	0.000005	<0.000005	NA
OCDD		0.19 [8]	0.05	<0.05	Decrease
Polychlorinated Dibenzofurans (PCDFs)					
2,3,7,8-TCDF	EPA Method 8290	0.015 [9]	0.001	<0.001	Decrease
1,2,3,7,8-PeCDF		0.03 [9]	0.001	<0.001	Decrease
2,3,4,7,8-PeCDF		0.003 [9]	0.001	<0.001	Decrease
1,2,3,4,7,8-HxCDF		0.015 [9]	0.001	<0.001	Decrease
1,2,3,6,7,8-HxCDF		0.015 [9]	0.001	<0.001	Decrease
1,2,3,7,8,9-HxCDF		0.015 [9]	0.001	<0.001	Decrease
2,3,4,6,7,8-HxCDF		0.015 [9]	0.001	<0.001	Decrease
1,2,3,4,6,7,8-HpCDF		0.15 [9]	0.001	<0.001	Decrease
1,2,3,4,7,8,9-HpCDF		0.15 [9]	0.001	<0.001	Decrease
OCDF		15 [9]	0.1	<0.1	Decrease
Total Petroleum Hydrocarbons (TPH)					
Gasoline	EPA Method 5030	10	<1.4	ND<1.4 [10]	Increase

Table 2 – Proposed Dredge Sediments Sample Analysis

Constituent	Test Method	Screening Level* (mg/kg)	Detection Limit (mg/kg)	2012 Concentration (mg/kg)	2012 Compared to 2009 Results
Diesel (with Silica Gel Cleanup)	EPA Method 3550	50	<1.4	**2.5** (10)	Increase
Motor Oil (with Silica Gel Cleanup)	EPA Method 3550	50	<14	ND<14 (10)	Increase
OTHER					
Pentachlorophenol (PCP)	EPA Method 8151A	13(1)	0.29	ND<0.29 (10)	Increase
Moisture Content	ASTM D4442	NA	NA	29%	NA

*Screening levels: these values were developed by using the lowest threshold level based on the following resources:

(1) Based on California Office of Environmental Health Hazard Assessment, *Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil*, January 2005 Revision, Commercial/Industrial Scenario (CHHSL).

(2) CHHSL's are not established for total chromium. The USEPA Region IX *Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites,* April 2009, Industrial Soil Screening Levels were used. The RSL for total chromium is presented as a maximum concentration limit (MCL).

(3) STLC analysis was completed for total chromium as Anderson Landfill requires STLC analysis if the total chromium concentration is greater than 50 mg/kg. STLC analysis indicated a concentration of 0.310 milligrams per liter (mg/L).

(4) CHHSL Industrial lead level is 3,500 mg/kg and recommends using the Title 22, California Code of Regulations, Total Threshold Limit Concentration for lead of 1,000 mg/kg.

(5) CHHSL's are not established for these compounds, the United States Environmental Protection Agency (USEPA) Region IX *Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites,* April 2009, Protection of Groundwater Soil Screening Levels were used.

(6) Laboratory analysis was completed for leachability of each target PAH. Additionally, citric acid was used for the PAH leachability sample digestion as the sediments will be disposed of at a landfill. 2012 leachability analysis did not report concentrations above the reporting limit of 0.09 micrograms per liter (µg/L).

(7) North Coast Laboratories and their sub-labs were unable to achieve a detection limit of 0.020 mg/kg for Aroclor 1221. However, the lowest achievable detection limit 0.024 mg/kg is below the promulgated CHHSL of 0.30 mg/kg.

(8) CHHSL's are not established for these compounds, nor are EPA RSLs so a Toxicity Equivalence Factor of 1.0 for 1,2,3,7,8-PeCDD and 0.0001 for OCDF was used to convert the established RSL for 2,3,7,8-TCDD to a corresponding level for the respective compounds.

(9) CHHSL's are not established for these compounds, USEPA RSLs have a level of 0.015 for "Furans" for protection of the groundwater. This was used as the basis for 2,3,7,8-TCDF level and Toxicity Equivalence Factors of 1.0 were used for the Hx compounds; 0.5 for 1,2,3,7,8-PeCDF; 5.0 for 2,3,4,7,8-PeCDF ; 0.1 for the Hp compounds and 0.001 for OCDF to convert the established RSL to a corresponding level for the other compounds.

(10) Elevated detection limit due to moisture content.

Notes:

The following laboratories provided analytical results:

A. North Coast Labs—TPHG/D/MO, PCP, Total Chromium STLC and Percent Moisture

B. Curtis & Tompkins, Ltd.—PCBs, and PAHs

C. Test America——Dioxin/Furans [reported results in picograms per gram (pg/g) = part per quadrillion (ppq), converted to part per million (ppm)], LUFT Metals and Chromium^{6+}

McCampbell Analytical, Inc.
"When Quality Counts"

Analytical Report

WorkOrder: 1812116

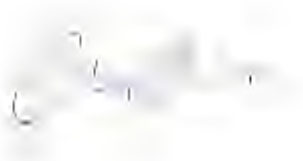
Report Created for: Pacific Affiliates

990 Waterfront Drive
Eureka, CA 95501

Project Contact: Alec Ziegler
Project P.O.:
Project: 1518; Chevron Marine Terminal Sampling

Project Received: 12/04/2018

Analytical Report reviewed & approved for release on 12/18/2018 by:



Christine Askari
Project Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.

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Glossary of Terms & Qualifier Definitions

Client: Pacific Affiliates
Project: 1518; Chevron Marine Terminal Sampling
WorkOrder: 1812116

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ERS	External reference sample. Second source calibration verification.
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
TZA	TimeZone Net Adjustment for sample collected outside of MAI's UTC.
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

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Glossary of Terms & Qualifier Definitions

Client: Pacific Affiliates
Project: 1518; Chevron Marine Terminal Sampling
WorkOrder: 1812116

Analytical Qualifiers

B	Analyte detected in the associated Method Blank and in the sample
H	Samples were analyzed out of holding time
J	Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value.
R	RPD outside accepted recovery limits
S	Spike recovery outside accepted recovery limits
a1	Sample diluted due to matrix interference
a3	Sample diluted due to high organic content.
a4	Reporting limits raised due to the sample's matrix prohibiting a full volume extraction.
e2	Diesel range compounds are significant; no recognizable pattern

Quality Control Qualifiers

F1	MS/MSD recovery and/or RPD is out of acceptance criteria; LCS validates the prep batch.

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	E1613B
Date Prepared:	12/11/18	**Analytical Method:**	E1613B
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	pg/g

Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	GC36	169995

Analytes	TEF WHO '05	Result	Qualifiers	MDL	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
2,3,7,8-TCDD		ND		0.110	0.500	1				12/17/2018 16:00
1,2,3,7,8-PeCDD		ND		0.280	2.50	1				12/17/2018 16:00
1,2,3,4,7,8-HxCDD		ND		0.560	2.50	1				12/17/2018 16:00
1,2,3,6,7,8-HxCDD	0.1	**0.780**	J	0.380	2.50	1	1.21	1	0.078	12/17/2018 16:00
1,2,3,7,8,9-HxCDD		ND		0.450	2.50	1				12/17/2018 16:00
1,2,3,4,6,7,8-HpCDD	0.01	**46.9**		0.620	2.50	1	1.07	1	0.469	12/17/2018 16:00
OCDD	0.0003	**593**		1.70	5.00	1	0.88	1	0.1779	12/17/2018 16:00
2,3,7,8-TCDF	0.1	**0.360**	J	0.210	0.500	1	0.76	1	0.036	12/17/2018 16:00
1,2,3,7,8-PeCDF		ND		0.350	2.50	1				12/17/2018 16:00
2,3,4,7,8-PeCDF		ND		0.330	2.50	1				12/17/2018 16:00
1,2,3,4,7,8-HxCDF		ND		0.570	2.50	1				12/17/2018 16:00
1,2,3,6,7,8-HxCDF		ND		0.570	2.50	1				12/17/2018 16:00
2,3,4,6,7,8-HxCDF		ND		0.410	2.50	1				12/17/2018 16:00
1,2,3,7,8,9-HxCDF		ND		0.520	2.50	1				12/17/2018 16:00
1,2,3,4,6,7,8-HpCDF	0.01	**5.94**		0.370	2.50	1	1.05	1	0.0594	12/17/2018 16:00
1,2,3,4,7,8,9-HpCDF		ND		0.440	2.50	1				12/17/2018 16:00
OCDF	0.0003	**29.0**		1.30	5.00	1	0.96	1.01	0.0087	12/17/2018 16:00
Total-Tetradioxins		**1.44**		0.110	0.500	1				12/17/2018 16:00
Total-Pentadioxins		**1.24**	J	0.280	2.50	1				12/17/2018 16:00
Total-Hexadioxins		**13.2**		0.560	2.50	1				12/17/2018 16:00
Total-Heptadioxins		**237**		0.620	2.50	1				12/17/2018 16:00
Total-Tetrafurans		**1.04**		0.210	0.500	1				12/17/2018 16:00
Total-Pentafurans		**1.68**	J	0.350	2.50	1				12/17/2018 16:00
Total-Hexafurans		**8.30**		0.570	2.50	1				12/17/2018 16:00
Total-Heptafurans		**27.3**		0.440	2.50	1				12/17/2018 16:00
Total Toxicity Equivalence (TEQ):									**0.829**	

Cleanup Standard	REC (%)	Limits	
37Cl-2,3,7,8-TCDD	80	35-197	12/17/2018 16:00
Labeled Compound Recovery	**REC (%)**	**Limits**	
13C-2,3,7,8-TCDD	84	25-164	12/17/2018 16:00
13C-1,2,3,7,8-PeCDD	79	25-181	12/17/2018 16:00
13C-1,2,3,4,7,8-HxCDD	80	32-141	12/17/2018 16:00
13C-1,2,3,6,7,8-HxCDD	87	28-130	12/17/2018 16:00
13C-1,2,3,4,6,7,8-HpCDD	75	23-140	12/17/2018 16:00
13C-OCDD	84	17-157	12/17/2018 16:00

(Cont.)

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	E1613B
Date Prepared:	12/11/18	**Analytical Method:**	E1613B
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	pg/g

Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	GC36	169995

Analytes	TEF WHO '05	Result	Qualifiers	MDL	RL	DF	Ion Ratio	RRT	TEQ	Date Analyzed
Labeled Compound Recovery		**REC (%)**			**Limits**					
13C-2,3,7,8-TCDF		66			24-169					12/17/2018 16:00
13C-1,2,3,7,8-PeCDF		63			24-185					12/17/2018 16:00
13C-2,3,4,7,8-PeCDF		63			21-178					12/17/2018 16:00
13C-1,2,3,4,7,8-HxCDF		65			26-152					12/17/2018 16:00
13C-1,2,3,6,7,8-HxCDF		66			26-123					12/17/2018 16:00
13C-2,3,4,6,7,8-HxCDF		67			28-136					12/17/2018 16:00
13C-1,2,3,7,8,9-HxCDF		72			29-147					12/17/2018 16:00
13C-1,2,3,4,6,7,8-HpCDF		66			28-143					12/17/2018 16:00
13C-1,2,3,4,7,8,9-HpCDF		72			26-138					12/17/2018 16:00

Analyst(s): KBO

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW3550B
Date Prepared:	12/4/18	**Analytical Method:**	SW8081A/8082
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/kg

Organochlorine Pesticides + PCBs

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	GC40 12051831.d	169422

Analytes	Result	MDL	RL	DF	Date Analyzed
Aldrin	ND	0.0014	0.0050	5	12/05/2018 22:02
a-BHC	ND	0.00050	0.0050	5	12/05/2018 22:02
b-BHC	ND	0.0012	0.0050	5	12/05/2018 22:02
d-BHC	ND	0.0018	0.0050	5	12/05/2018 22:02
g-BHC	ND	0.00049	0.0050	5	12/05/2018 22:02
Chlordane (Technical)	ND	0.080	0.12	5	12/05/2018 22:02
a-Chlordane	ND	0.0024	0.0050	5	12/05/2018 22:02
g-Chlordane	ND	0.0010	0.0050	5	12/05/2018 22:02
p,p-DDD	ND	0.00070	0.0050	5	12/05/2018 22:02
p,p-DDE	ND	0.0016	0.0050	5	12/05/2018 22:02
p,p-DDT	ND	0.0022	0.0050	5	12/05/2018 22:02
Dieldrin	ND	0.0016	0.0050	5	12/05/2018 22:02
Endosulfan I	ND	0.0032	0.0050	5	12/05/2018 22:02
Endosulfan II	ND	0.0010	0.0050	5	12/05/2018 22:02
Endosulfan sulfate	ND	0.0032	0.0050	5	12/05/2018 22:02
Endrin	ND	0.0021	0.0050	5	12/05/2018 22:02
Endrin aldehyde	ND	0.0010	0.0050	5	12/05/2018 22:02
Endrin ketone	ND	0.00065	0.0050	5	12/05/2018 22:02
Heptachlor	ND	0.0010	0.0050	5	12/05/2018 22:02
Heptachlor epoxide	ND	0.0010	0.0050	5	12/05/2018 22:02
Hexachlorobenzene	ND	0.0014	0.050	5	12/05/2018 22:02
Hexachlorocyclopentadiene	ND	0.0020	0.10	5	12/05/2018 22:02
Methoxychlor	ND	0.0044	0.0050	5	12/05/2018 22:02
Toxaphene	ND	0.18	0.25	5	12/05/2018 22:02
Aroclor1016	ND	0.026	0.25	5	12/05/2018 22:02
Aroclor1221	ND	0.055	0.25	5	12/05/2018 22:02
Aroclor1232	ND	0.032	0.25	5	12/05/2018 22:02
Aroclor1242	ND	0.034	0.25	5	12/05/2018 22:02
Aroclor1248	ND	0.020	0.25	5	12/05/2018 22:02
Aroclor1254	ND	0.034	0.25	5	12/05/2018 22:02
Aroclor1260	ND	0.030	0.25	5	12/05/2018 22:02
PCBs, total	ND	NA	0.25	5	12/05/2018 22:02

Surrogates	REC (%)	Limits	
Decachlorobiphenyl	97	69-143	12/05/2018 22:02

Analyst(s): LT Analytical Comments: a3

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW8151A
Date Prepared:	12/5/18	**Analytical Method:**	SW8151A
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/kg

Chlorinated Herbicides by GC-ECD

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	GC15A 12041860.D	169428

Analytes	Result	MDL	RL	DF	Date Analyzed
Acifluorfen	ND	0.23	0.50	10	12/06/2018 13:20
Bentazon	ND	0.20	0.50	10	12/06/2018 13:20
Chloramben	ND	0.33	0.50	10	12/06/2018 13:20
2,4-D (Dichlorophenoxyacetic acid)	ND	0.28	0.50	10	12/06/2018 13:20
2,4-DB	ND	0.32	0.50	10	12/06/2018 13:20
Dalapon	ND	0.28	0.50	10	12/06/2018 13:20
DCPA (mono & diacid)	ND	0.32	0.50	10	12/06/2018 13:20
Dicamba	ND	0.20	0.50	10	12/06/2018 13:20
3,5-Dichlorobenzoic Acid	ND	0.25	0.50	10	12/06/2018 13:20
Dichloroprop	ND	0.20	0.50	10	12/06/2018 13:20
Dinoseb (DNBP)	ND	0.19	0.50	10	12/06/2018 13:20
MCPA	ND	20	50	10	12/06/2018 13:20
MCPP	ND	29	50	10	12/06/2018 13:20
4-Nitrophenol	ND	0.21	0.50	10	12/06/2018 13:20
Pentachlorophenol (PCP)	ND	0.20	0.50	10	12/06/2018 13:20
Picloram	ND	0.34	0.50	10	12/06/2018 13:20
2,4,5-T (Trichlorophenoxy acetic acid)	ND	0.20	0.50	10	12/06/2018 13:20
2,4,5-TP (Silvex)	ND	0.23	0.50	10	12/06/2018 13:20

Surrogates	REC (%)	Limits	
DCAA	88	60-140	12/06/2018 13:20

Analyst(s): DP Analytical Comments: a1

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW3550B
Date Prepared:	12/5/18	**Analytical Method:**	SW8270C-SIM
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/kg

Polynuclear Aromatic Hydrocarbons (PAHs / PNAs) using SIM Mode

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	GC21 12061810.D	169441

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
Acenaphthene	**0.011**		0.0062	0.010	1	12/06/2018 13:44
Acenaphthylene	**0.0061**	J	0.0033	0.010	1	12/06/2018 13:44
Anthracene	**0.010**		0.0066	0.010	1	12/06/2018 13:44
Benzo (a) anthracene	**0.066**		0.034	0.040	1	12/06/2018 13:44
Benzo (a) pyrene	**0.036**		0.0096	0.020	1	12/06/2018 13:44
Benzo (b) fluoranthene	**0.027**		0.0059	0.010	1	12/06/2018 13:44
Benzo (g,h,i) perylene	**0.013**	J	0.0088	0.020	1	12/06/2018 13:44
Benzo (k) fluoranthene	**0.020**		0.0063	0.010	1	12/06/2018 13:44
Chrysene	**0.025**		0.0064	0.020	1	12/06/2018 13:44
Dibenzo (a,h) anthracene	ND		0.012	0.020	1	12/06/2018 13:44
Fluoranthene	**0.063**		0.0088	0.010	1	12/06/2018 13:44
Fluorene	**0.0090**	J	0.0069	0.020	1	12/06/2018 13:44
Indeno (1,2,3-cd) pyrene	**0.016**	J	0.0080	0.020	1	12/06/2018 13:44
1-Methylnaphthalene	ND		0.0088	0.010	1	12/06/2018 13:44
2-Methylnaphthalene	ND		0.014	0.020	1	12/06/2018 13:44
Naphthalene	ND		0.0055	0.010	1	12/06/2018 13:44
Phenanthrene	**0.019**	J	0.0054	0.040	1	12/06/2018 13:44
Pyrene	**0.071**		0.011	0.020	1	12/06/2018 13:44

Surrogates	REC (%)	Limits	
2-Fluorobiphenyl	85	30-130	12/06/2018 13:44
2-Fluorophenol	89	30-130	12/06/2018 13:44

Analyst(s): REB Analytical Comments: a4

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW3050B
Date Prepared:	12/4/18	**Analytical Method:**	SW6020
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/Kg

Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	ICP-MS3 102SMPL.D	169416

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
Antimony	**0.20**	J	0.094	0.50	1	12/06/2018 18:16
Arsenic	**3.4**		0.14	0.50	1	12/06/2018 18:16
Barium	**42**		0.97	5.0	1	12/06/2018 18:16
Beryllium	**0.22**	J	0.072	0.50	1	12/06/2018 18:16
Cadmium	**0.079**	J	0.058	0.25	1	12/06/2018 18:16
Chromium	**40**		0.092	0.50	1	12/06/2018 18:16
Cobalt	**6.2**		0.056	0.50	1	12/06/2018 18:16
Copper	**13**		0.069	0.50	1	12/06/2018 18:16
Lead	**4.7**		0.094	0.50	1	12/06/2018 18:16
Molybdenum	**0.47**	J	0.23	0.50	1	12/06/2018 18:16
Nickel	**49**		0.072	0.50	1	12/06/2018 18:16
Selenium	**0.14**	J	0.13	0.50	1	12/06/2018 18:16
Silver	ND		0.055	0.50	1	12/06/2018 18:16
Thallium	ND		0.10	0.50	1	12/06/2018 18:16
Vanadium	**26**		0.064	0.50	1	12/06/2018 18:16
Zinc	**37**		1.4	5.0	1	12/06/2018 18:16

Surrogates	REC (%)	Limits	
Terbium	101	70-130	12/06/2018 18:16

Analyst(s): MIG

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW5030B
Date Prepared:	12/4/18	**Analytical Method:**	SW8021B/8015Bm
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	GC19 12061806.D	169418

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
TPH(g) (C6-C12)	**0.34**	JB	0.090	1.0	1	12/06/2018 14:58
MTBE	---		0.0023	0.050	1	12/06/2018 14:58
Benzene	---		0.0010	0.0050	1	12/06/2018 14:58
Toluene	---		0.0012	0.0050	1	12/06/2018 14:58
Ethylbenzene	---		0.0020	0.0050	1	12/06/2018 14:58
m,p-Xylene	---		0.0013	0.010	1	12/06/2018 14:58
o-Xylene	---		0.0013	0.0050	1	12/06/2018 14:58
Xylenes	---		NA	0.0050	1	12/06/2018 14:58

Surrogates	REC (%)	Limits	
aaa-TFT	101	72-123	12/06/2018 14:58

Analyst(s): IA

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW7471B
Date Prepared:	12/4/18	**Analytical Method:**	SW7471B
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/Kg

Mercury by Cold Vapor Atomic Absorption

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	AA1 _18	169362

Analytes	Result	MDL	RL	DF	Date Analyzed
Mercury	**0.040**	0.0087	0.017	1	12/06/2018 12:10

Analyst(s): JC

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW3550B
Date Prepared:	12/5/18	**Analytical Method:**	MAI-Organic Tin
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/kg

Organotin Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	GC8 12071822.D	169442

Analytes	Result	MDL	RL	DF	Date Analyzed
Dibutyltin	ND	0.0058	0.020	1	12/08/2018 15:31
Monobutyltin	ND	0.010	0.020	1	12/08/2018 15:31
Tetrabutyltin	ND	0.0054	0.020	1	12/08/2018 15:31
Tributyltin	ND	0.014	0.020	1	12/08/2018 15:31

Surrogates	REC (%)	Limits	
Tripropyltin	53	50-150	12/08/2018 15:31

Analyst(s): HD

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	ASTM D2216-05
Date Prepared:	12/6/18	**Analytical Method:**	ASTM D2216-05
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	wet wt%

Percent Moisture

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	WetChem	169554

Analytes	Result	MDL	RL	DF	Date Analyzed
% Moisture	**31.1**	0.100	0.100	1	12/07/2018 06:01

Analyst(s): RB

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW3550B/3630C
Date Prepared:	12/4/18	**Analytical Method:**	SW8015B
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/Kg

Total Extractable Petroleum Hydrocarbons with Silica Gel Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	GC9a 12061812.D	169421

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	**1.2**		0.86	1.0	1	12/06/2018 13:12
TPH-Motor Oil (C18-C36)	**3.7**	J	3.5	5.0	1	12/06/2018 13:12

Surrogates	REC (%)	Limits	
C9	90	74-123	12/06/2018 13:12

Analyst(s): JIS Analytical Comments: e2

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SM2540 G-1997
Date Prepared:	12/12/18	**Analytical Method:**	SM2540G
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	wet wt%

Total Solids

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	WetChem	169833

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
Total Solids	**70.8**	H	0.00135	0.00135	1.35	12/13/2018 07:36

Analyst(s): RB

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Analytical Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Received:	12/4/18 11:39	**Extraction Method:**	SW9060A
Date Prepared:	12/7/18	**Analytical Method:**	SW9060A
Project:	1518; Chevron Marine Terminal Sampling	**Unit:**	mg/kg

Total Organic Carbon (TOC)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
1	1812116-001A	Sludge	12/03/2018 09:25	WC_CNS F120718-1_0811_	169585

Analytes	Result	MDL	RL	DF	Date Analyzed
TOC	**15,000**	470	470	1	12/07/2018 15:03

Analyst(s): RB

CLIENT: Pacific Affiliates
Work Order: 1812116
Project: 1518; Chevron Marine Terminal Sampling

ANALYTICAL QC SUMMARY REPORT

BatchID: 169995

SampleID **MB-169995**	TestCode: **1613_FULL_S**	Units: **pg/g**	Prep Date: **12/11/2018**
Batch ID: **169995**	TestNo: **E1613B**	Run ID: **GC36_181218E**	Analysis Date: **12/14/2018**

Analyte	Result	MDL	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	ND	0.110	0.500				-				
1,2,3,7,8-PeCDD	ND	0.280	2.50				-				
1,2,3,4,7,8-HxCDD	ND	0.560	2.50				-				
1,2,3,6,7,8-HxCDD	ND	0.380	2.50				-				
1,2,3,7,8,9-HxCDD	ND	0.450	2.50				-				
1,2,3,4,6,7,8-HpCDD	ND	0.620	2.50				-				
OCDD	ND	1.70	5.00				-				
2,3,7,8-TCDF	ND	0.210	0.500				-				
1,2,3,7,8-PeCDF	ND	0.350	2.50				-				
2,3,4,7,8-PeCDF	ND	0.330	2.50				-				
1,2,3,4,7,8-HxCDF	ND	0.570	2.50				-				
1,2,3,6,7,8-HxCDF	ND	0.570	2.50				-				
2,3,4,6,7,8-HxCDF	ND	0.410	2.50				-				
1,2,3,7,8,9-HxCDF	ND	0.520	2.50				-				
1,2,3,4,6,7,8-HpCDF	ND	0.370	2.50				-				
1,2,3,4,7,8,9-HpCDF	ND	0.440	2.50				-				
OCDF	ND	1.30	5.00				-				
Total-Tetradioxins	ND	0.110	0.500				-				
Total-Pentadioxins	ND	0.280	2.50				-				
Total-Hexadioxins	ND	0.560	2.50				-				
Total-Heptadioxins	ND	0.620	2.50				-				
Total-Tetrafurans	ND	0.210	0.500				-				
Total-Pentafurans	ND	0.350	2.50				-				
Total-Hexafurans	ND	0.570	2.50				-				
Total-Heptafurans	ND	0.440	2.50				-				
Cleanup Standard											
37Cl-2,3,7,8-TCDD	8.48			10		85	35 - 197				
Labeled Compound Recovery											
13C-2,3,7,8-TCDD	91.8			100		92	25 - 164				
13C-1,2,3,7,8-PeCDD	91.8			100		92	25 - 181				
13C-1,2,3,4,7,8-HxCDD	89.9			100		90	32 - 141				
13C-1,2,3,6,7,8-HxCDD	91.4			100		91	28 - 130				
13C-1,2,3,4,6,7,8-HpCDD	82.5			100		82	23 - 140				
13C-OCDD	169			200		84	17 - 157				
13C-2,3,7,8-TCDF	86.0			100		86	24 - 169				
13C-1,2,3,7,8-PeCDF	78.3			100		78	24 - 185				
13C-2,3,4,7,8-PeCDF	80.2			100		80	21 - 178				
13C-1,2,3,4,7,8-HxCDF	84.6			100		85	26 - 152				
13C-1,2,3,6,7,8-HxCDF	82.9			100		83	26 - 123				
13C-2,3,4,6,7,8-HxCDF	83.8			100		84	28 - 136				
13C-1,2,3,7,8,9-HxCDF	87.3			100		87	29 - 147				
13C-1,2,3,4,6,7,8-HpCDF	78.9			100		79	28 - 143				
13C-1,2,3,4,7,8,9-HpCDF	87.7			100		88	26 - 138				

CLIENT: Pacific Affiliates
Work Order: 1812116
Project: 1518; Chevron Marine Terminal Sampling

ANALYTICAL QC SUMMARY REPORT

BatchID: 169995

SampleID **LCS-169995**	TestCode: **1613_FULL_S**	Units: **pg/g**	Prep Date: **12/11/2018**
Batch ID: **169995**	TestNo: **E1613B**	Run ID: **GC36_181218D**	Analysis Date: **12/14/2018**

Analyte	Result	MDL	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	8.62	0.110	0.500	10	0	86	67 - 158				
1,2,3,7,8-PeCDD	46.1	0.280	2.50	50	0	92	70 - 142				
1,2,3,4,7,8-HxCDD	46.0	0.560	2.50	50	0	92	70 - 164				
1,2,3,6,7,8-HxCDD	47.2	0.380	2.50	50	0	94	76 - 134				
1,2,3,7,8,9-HxCDD	49.3	0.450	2.50	50	0	99	64 - 162				
1,2,3,4,6,7,8-HpCDD	47.2	0.620	2.50	50	0	94	70 - 140				
OCDD	95.8	1.70	5.00	100	0	96	78 - 144				
2,3,7,8-TCDF	9.06	0.210	0.500	10	0	91	75 - 158				
1,2,3,7,8-PeCDF	49.8	0.350	2.50	50	0	100	80 - 134				
2,3,4,7,8-PeCDF	46.8	0.330	2.50	50	0	94	68 - 160				
1,2,3,4,7,8-HxCDF	48.7	0.570	2.50	50	0	97	72 - 134				
1,2,3,6,7,8-HxCDF	48.1	0.570	2.50	50	0	96	84 - 130				
2,3,4,6,7,8-HxCDF	48.7	0.410	2.50	50	0	97	70 - 156				
1,2,3,7,8,9-HxCDF	49.3	0.520	2.50	50	0	99	78 - 130				
1,2,3,4,6,7,8-HpCDF	46.6	0.370	2.50	50	0	93	82 - 122				
1,2,3,4,7,8,9-HpCDF	44.7	0.440	2.50	50	0	89	78 - 138				
OCDF	96.4	1.30	5.00	100	0	96	63 - 170				
Cleanup Standard											
37Cl-2,3,7,8-TCDD	8.26			10		83	31 - 191				
Labeled Compound Recovery											
13C-2,3,7,8-TCDD	85.6			100		86	20 - 175				
13C-1,2,3,7,8-PeCDD	86.2			100		86	21 - 227				
13C-1,2,3,4,7,8-HxCDD	88.6			100		89	21 - 193				
13C-1,2,3,6,7,8-HxCDD	90.2			100		90	25 - 163				
13C-1,2,3,4,6,7,8-HpCDD	89.4			100		89	26 - 166				
13C-OCDD	202			200		101	13 - 199				
13C-2,3,7,8-TCDF	82.7			100		83	22 - 152				
13C-1,2,3,7,8-PeCDF	75.8			100		76	21 - 192				
13C-2,3,4,7,8-PeCDF	77.0			100		77	13 - 328				
13C-1,2,3,4,7,8-HxCDF	81.7			100		82	19 - 202				
13C-1,2,3,6,7,8-HxCDF	82.6			100		83	21 - 159				
13C-2,3,4,6,7,8-HxCDF	81.8			100		82	22 - 176				
13C-1,2,3,7,8,9-HxCDF	85.9			100		86	17 - 205				
13C-1,2,3,4,6,7,8-HpCDF	84.3			100		84	21 - 158				
13C-1,2,3,4,7,8,9-HpCDF	92.5			100		92	20 - 186				

CLIENT: Pacific Affiliates
Work Order: 1812116
Project: 1518; Chevron Marine Terminal Sampling

ANALYTICAL QC SUMMARY REPORT

BatchID: 169995

SampleID **LCSD-169995**	TestCode: **1613_FULL_S**	Units: **pg/g**	Prep Date: **12/11/2018**
Batch ID: **169995**	TestNo: **E1613B**	Run ID: **GC36_181218D**	Analysis Date: **12/14/2018**

Analyte	Result	MDL	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	8.78	0.110	0.500	10	0	88	67 - 158	8.62	1.84	20	
1,2,3,7,8-PeCDD	47.4	0.280	2.50	50	0	95	70 - 142	46.12	2.65	20	
1,2,3,4,7,8-HxCDD	47.8	0.560	2.50	50	0	96	70 - 164	46.02	3.75	20	
1,2,3,6,7,8-HxCDD	46.5	0.380	2.50	50	0	93	76 - 134	47.22	1.49	20	
1,2,3,7,8,9-HxCDD	49.6	0.450	2.50	50	0	99	64 - 162	49.3	0.687	20	
1,2,3,4,6,7,8-HpCDD	49.5	0.620	2.50	50	0	99	70 - 140	47.22	4.76	20	
OCDD	97.2	1.70	5.00	100	0	97	78 - 144	95.82	1.47	20	
2,3,7,8-TCDF	9.30	0.210	0.500	10	0	93	75 - 158	9.06	2.61	20	
1,2,3,7,8-PeCDF	49.6	0.350	2.50	50	0	99	80 - 134	49.76	0.241	20	
2,3,4,7,8-PeCDF	49.6	0.330	2.50	50	0	99	68 - 160	46.8	5.85	20	
1,2,3,4,7,8-HxCDF	48.7	0.570	2.50	50	0	97	72 - 134	48.72	0	20	
1,2,3,6,7,8-HxCDF	51.0	0.570	2.50	50	0	102	84 - 130	48.08	5.89	20	
2,3,4,6,7,8-HxCDF	50.3	0.410	2.50	50	0	101	70 - 156	48.74	3.07	20	
1,2,3,7,8,9-HxCDF	49.3	0.520	2.50	50	0	99	78 - 130	49.34	0.162	20	
1,2,3,4,6,7,8-HpCDF	47.9	0.370	2.50	50	0	96	82 - 122	46.56	2.88	20	
1,2,3,4,7,8,9-HpCDF	47.5	0.440	2.50	50	0	95	78 - 138	44.68	6.12	20	
OCDF	99.0	1.30	5.00	100	0	99	63 - 170	96.4	2.64	20	
Cleanup Standard											
37Cl-2,3,7,8-TCDD	8.42			10		84	31 - 191				
Labeled Compound Recovery											
13C-2,3,7,8-TCDD	89.3			100		89	20 - 175				
13C-1,2,3,7,8-PeCDD	89.2			100		89	21 - 227				
13C-1,2,3,4,7,8-HxCDD	88.0			100		88	21 - 193				
13C-1,2,3,6,7,8-HxCDD	88.5			100		88	25 - 163				
13C-1,2,3,4,6,7,8-HpCDD	83.6			100		84	26 - 166				
13C-OCDD	192			200		96	13 - 199				
13C-2,3,7,8-TCDF	84.0			100		84	22 - 152				
13C-1,2,3,7,8-PeCDF	78.5			100		79	21 - 192				
13C-2,3,4,7,8-PeCDF	78.5			100		79	13 - 328				
13C-1,2,3,4,7,8-HxCDF	79.1			100		79	19 - 202				
13C-1,2,3,6,7,8-HxCDF	77.6			100		78	21 - 159				
13C-2,3,4,6,7,8-HxCDF	80.8			100		81	22 - 176				
13C-1,2,3,7,8,9-HxCDF	87.1			100		87	17 - 205				
13C-1,2,3,4,6,7,8-HpCDF	73.6			100		74	21 - 158				
13C-1,2,3,4,7,8,9-HpCDF	88.7			100		89	20 - 186				

CLIENT: Pacific Affiliates
Work Order: 1812116
Project: 1518; Chevron Marine Terminal Sampling

ANALYTICAL QC SUMMARY REPORT

BatchID: 169995

SampleID **1812116-001AMS**	TestCode: **1613_FULL_S**				Units: **pg/g**			Prep Date: **12/11/2018**			
Batch ID: **169995**	TestNo: **E1613B**				Run ID: **GC36_181218B**			Analysis Date: **12/17/2018**			
Analyte	Result	MDL	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	8.86	0.110	0.500	10	0	89	67 - 158				
1,2,3,7,8-PeCDD	47.7	0.280	2.50	50	0	95	70 - 142				
1,2,3,4,7,8-HxCDD	48.4	0.560	2.50	50	0	97	70 - 164				
1,2,3,6,7,8-HxCDD	47.6	0.380	2.50	50	0.78	94	76 - 134				
1,2,3,7,8,9-HxCDD	50.1	0.450	2.50	50	0	100	64 - 162				
1,2,3,4,6,7,8-HpCDD	86.8	0.620	2.50	50	46.9	80	70 - 140				
OCDD	530	1.70	5.00	100	593.5	-64	78 - 144				S
2,3,7,8-TCDF	10.2	0.210	0.500	10	0.36	98	75 - 158				
1,2,3,7,8-PeCDF	49.9	0.350	2.50	50	0	100	80 - 134				
2,3,4,7,8-PeCDF	49.8	0.330	2.50	50	0	100	68 - 160				
1,2,3,4,7,8-HxCDF	50.1	0.570	2.50	50	0	100	72 - 134				
1,2,3,6,7,8-HxCDF	50.9	0.570	2.50	50	0	102	84 - 130				
2,3,4,6,7,8-HxCDF	52.5	0.410	2.50	50	0	105	70 - 156				
1,2,3,7,8,9-HxCDF	49.7	0.520	2.50	50	0	99	78 - 130				
1,2,3,4,6,7,8-HpCDF	52.3	0.370	2.50	50	5.94	93	82 - 122				
1,2,3,4,7,8,9-HpCDF	48.6	0.440	2.50	50	0	97	78 - 138				
OCDF	132	1.30	5.00	100	29.04	103	63 - 170				
Cleanup Standard											
37Cl-2,3,7,8-TCDD	8.24			10		82	31 - 191				
Labeled Compound Recovery											
13C-2,3,7,8-TCDD	83.8			100		84	20 - 175				
13C-1,2,3,7,8-PeCDD	78.9			100		79	21 - 227				
13C-1,2,3,4,7,8-HxCDD	82.1			100		82	21 - 193				
13C-1,2,3,6,7,8-HxCDD	84.4			100		84	25 - 163				
13C-1,2,3,4,6,7,8-HpCDD	78.8			100		79	26 - 166				
13C-OCDD	177			200		89	13 - 199				
13C-2,3,7,8-TCDF	76.2			100		76	22 - 152				
13C-1,2,3,7,8-PeCDF	71.3			100		71	21 - 192				
13C-2,3,4,7,8-PeCDF	71.6			100		72	13 - 328				
13C-1,2,3,4,7,8-HxCDF	73.3			100		73	19 - 202				
13C-1,2,3,6,7,8-HxCDF	73.1			100		73	21 - 159				
13C-2,3,4,6,7,8-HxCDF	73.5			100		74	22 - 176				
13C-1,2,3,7,8,9-HxCDF	81.0			100		81	17 - 205				
13C-1,2,3,4,6,7,8-HpCDF	76.1			100		76	21 - 158				
13C-1,2,3,4,7,8,9-HpCDF	84.5			100		84	20 - 186				

CLIENT: Pacific Affiliates
Work Order: 1812116
Project: 1518; Chevron Marine Terminal Sampling

ANALYTICAL QC SUMMARY REPORT

BatchID: 169995

SampleID **1812116-001AMSD**	TestCode: **1613_FULL_S**	Units: **pg/g**	Prep Date: **12/11/2018**
Batch ID: **169995**	TestNo: **E1613B**	Run ID: **GC36_181218B**	Analysis Date: **12/17/2018**

Analyte	Result	MDL	PQL	SPKValue	SPKRefVal	%REC	Limits	RPDRefVal	%RPD	RPDLimit	Qual
2,3,7,8-TCDD	8.54	0.110	0.500	10	0	85	67 - 158	8.86	3.68	20	
1,2,3,7,8-PeCDD	48.6	0.280	2.50	50	0	97	70 - 142	47.72	1.87	20	
1,2,3,4,7,8-HxCDD	49.6	0.560	2.50	50	0	99	70 - 164	48.4	2.49	20	
1,2,3,6,7,8-HxCDD	49.8	0.380	2.50	50	0.78	98	76 - 134	47.56	4.68	20	
1,2,3,7,8,9-HxCDD	51.9	0.450	2.50	50	0	104	64 - 162	50.06	3.61	20	
1,2,3,4,6,7,8-HpCDD	124	0.620	2.50	50	46.9	154	70 - 140	86.76	35.2	20	SR
OCDD	1050	1.70	5.00	100	593.5	455	78 - 144	529.78	65.7	20	SR
2,3,7,8-TCDF	9.52	0.210	0.500	10	0.36	92	75 - 158	10.16	6.50	20	
1,2,3,7,8-PeCDF	51.1	0.350	2.50	50	0	102	80 - 134	49.94	2.30	20	
2,3,4,7,8-PeCDF	49.9	0.330	2.50	50	0	100	68 - 160	49.84	0.160	20	
1,2,3,4,7,8-HxCDF	50.8	0.570	2.50	50	0	102	72 - 134	50.12	1.39	20	
1,2,3,6,7,8-HxCDF	51.3	0.570	2.50	50	0	103	84 - 130	50.86	0.900	20	
2,3,4,6,7,8-HxCDF	55.5	0.410	2.50	50	0	111	70 - 156	52.52	5.59	20	
1,2,3,7,8,9-HxCDF	51.0	0.520	2.50	50	0	102	78 - 130	49.66	2.66	20	
1,2,3,4,6,7,8-HpCDF	61.8	0.370	2.50	50	5.94	112	82 - 122	52.3	16.7	20	
1,2,3,4,7,8,9-HpCDF	48.2	0.440	2.50	50	0	96	78 - 138	48.56	0.661	20	
OCDF	167	1.30	5.00	100	29.04	138	63 - 170	132.42	22.9	20	R
Cleanup Standard											
37Cl-2,3,7,8-TCDD	8.20			10		82	31 - 191				
Labeled Compound Recovery											
13C-2,3,7,8-TCDD	82.1			100		82	20 - 175				
13C-1,2,3,7,8-PeCDD	78.2			100		78	21 - 227				
13C-1,2,3,4,7,8-HxCDD	79.4			100		79	21 - 193				
13C-1,2,3,6,7,8-HxCDD	79.7			100		80	25 - 163				
13C-1,2,3,4,6,7,8-HpCDD	77.2			100		77	26 - 166				
13C-OCDD	164			200		82	13 - 199				
13C-2,3,7,8-TCDF	76.2			100		76	22 - 152				
13C-1,2,3,7,8-PeCDF	69.6			100		70	21 - 192				
13C-2,3,4,7,8-PeCDF	70.0			100		70	13 - 328				
13C-1,2,3,4,7,8-HxCDF	71.7			100		72	19 - 202				
13C-1,2,3,6,7,8-HxCDF	72.2			100		72	21 - 159				
13C-2,3,4,6,7,8-HxCDF	72.0			100		72	22 - 176				
13C-1,2,3,7,8,9-HxCDF	77.9			100		78	17 - 205				
13C-1,2,3,4,6,7,8-HpCDF	72.9			100		73	21 - 158				
13C-1,2,3,4,7,8,9-HpCDF	81.3			100		81	20 - 186				

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/4/18	**BatchID:**	169422
Date Analyzed:	12/5/18	**Extraction Method:**	SW3550B
Instrument:	GC40	**Analytical Method:**	SW8081A/8082
Matrix:	Soil	**Unit:**	mg/kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169422

QC Summary Report for SW8081A/8082

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Aldrin	ND	0.00027	0.0010	-	-	-
a-BHC	ND	0.00010	0.0010	-	-	-
b-BHC	ND	0.00025	0.0010	-	-	-
d-BHC	ND	0.00037	0.0010	-	-	-
g-BHC	ND	0.000097	0.0010	-	-	-
Chlordane (Technical)	ND	0.016	0.025	-	-	-
a-Chlordane	ND	0.00047	0.0010	-	-	-
g-Chlordane	ND	0.00021	0.0010	-	-	-
p,p-DDD	ND	0.00014	0.0010	-	-	-
p,p-DDE	ND	0.00032	0.0010	-	-	-
p,p-DDT	ND	0.00043	0.0010	-	-	-
Dieldrin	ND	0.00033	0.0010	-	-	-
Endosulfan I	ND	0.00065	0.0010	-	-	-
Endosulfan II	ND	0.00020	0.0010	-	-	-
Endosulfan sulfate	ND	0.00063	0.0010	-	-	-
Endrin	ND	0.00042	0.0010	-	-	-
Endrin aldehyde	ND	0.00020	0.0010	-	-	-
Endrin ketone	ND	0.00013	0.0010	-	-	-
Heptachlor	ND	0.00021	0.0010	-	-	-
Heptachlor epoxide	ND	0.00020	0.0010	-	-	-
Hexachlorobenzene	ND	0.00027	0.010	-	-	-
Hexachlorocyclopentadiene	ND	0.00040	0.020	-	-	-
Methoxychlor	ND	0.00089	0.0010	-	-	-
Toxaphene	ND	0.035	0.050	-	-	-
Aroclor1016	ND	0.0051	0.050	-	-	-
Aroclor1016	ND	0.0051	0.050	-	-	-
Aroclor1221	ND	0.011	0.050	-	-	-
Aroclor1232	ND	0.0063	0.050	-	-	-
Aroclor1242	ND	0.0067	0.050	-	-	-
Aroclor1248	ND	0.0040	0.050	-	-	-
Aroclor1254	ND	0.0068	0.050	-	-	-
Aroclor1260	ND	0.0061	0.050	-	-	-
Aroclor1260	ND	0.0061	0.050	-	-	-
PCBs, total	ND	N/A	0.050	-	-	-
Surrogate Recovery						
Decachlorobiphenyl	0.060			0.050	120	75-136

(Cont.)

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/4/18	**BatchID:**	169422
Date Analyzed:	12/5/18	**Extraction Method:**	SW3550B
Instrument:	GC40	**Analytical Method:**	SW8081A/8082
Matrix:	Soil	**Unit:**	mg/kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169422

QC Summary Report for SW8081A/8082

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Aldrin	0.058	0.060	0.050	116	120	92-133	2.75	20
a-BHC	0.057	0.059	0.050	114	117	96-140	2.90	20
b-BHC	0.058	0.060	0.050	116	119	77-137	2.91	20
d-BHC	0.059	0.060	0.050	118	121	89-145	2.72	20
g-BHC	0.056	0.058	0.050	112	116	92-134	2.93	20
a-Chlordane	0.054	0.056	0.050	108	112	72-134	3.14	20
g-Chlordane	0.057	0.058	0.050	113	117	86-132	3.08	20
p,p-DDD	0.051	0.052	0.050	101	104	35-140	2.43	20
p,p-DDE	0.056	0.058	0.050	112	116	83-138	3.15	20
p,p-DDT	0.051	0.053	0.050	103	107	70-137	4.05	20
Dieldrin	0.062	0.064	0.050	124	128	99-141	3.06	20
Endosulfan I	0.056	0.057	0.050	111	115	93-121	3.12	20
Endosulfan II	0.054	0.055	0.050	107	110	74-125	2.97	20
Endosulfan sulfate	0.054	0.055	0.050	107	110	66-138	3.01	20
Endrin	0.053	0.055	0.050	107	110	92-137	3.21	20
Endrin aldehyde	0.055	0.057	0.050	111	114	77-135	3.48	20
Endrin ketone	0.053	0.055	0.050	106	109	72-126	2.97	20
Heptachlor	0.057	0.059	0.050	114	118	89-136	3.51	20
Heptachlor epoxide	0.053	0.054	0.050	105	109	85-121	3.14	20
Hexachlorobenzene	0.049	0.050	0.050	97	100	87-127	2.42	20
Hexachlorocyclopentadiene	0.031	0.033	0.050	62	65	41-145	4.55	20
Methoxychlor	0.056	0.058	0.050	112	116	82-142	3.87	20
Aroclor1016	0.18	0.18	0.15	117	123	90-125	4.42	20
Aroclor1260	0.18	0.18	0.15	117	120	77-122	2.55	20
Surrogate Recovery								
Decachlorobiphenyl	0.057	0.057	0.050	113	115	75-136	1.39	20

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/5/18	**BatchID:**	169428
Date Analyzed:	12/5/18	**Extraction Method:**	SW8151A
Instrument:	GC15A	**Analytical Method:**	SW8151A
Matrix:	Soil	**Unit:**	mg/kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169428

QC Summary Report for SW8151A

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Acifluorfen	ND	0.023	0.050	-	-	-
Bentazon	ND	0.020	0.050	-	-	-
Chloramben	ND	0.033	0.050	-	-	-
2,4-D (Dichlorophenoxyacetic acid)	ND	0.028	0.050	-	-	-
2,4-DB	ND	0.032	0.050	-	-	-
Dalapon	ND	0.028	0.050	-	-	-
DCPA (mono & diacid)	ND	0.032	0.050	-	-	-
Dicamba	ND	0.020	0.050	-	-	-
3,5-Dichlorobenzoic Acid	ND	0.025	0.050	-	-	-
Dichloroprop	ND	0.020	0.050	-	-	-
Dinoseb (DNBP)	ND	0.019	0.050	-	-	-
Dinoseb (DNBP)	ND	0.019	0.050	-	-	-
MCPA	ND	2.0	5.0	-	-	-
MCPP	ND	2.9	5.0	-	-	-
4-Nitrophenol	ND	0.021	0.050	-	-	-
Pentachlorophenol (PCP)	ND	0.020	0.050	-	-	-
Picloram	ND	0.034	0.050	-	-	-
2,4,5-T (Trichlorophenoxy acetic acid)	ND	0.020	0.050	-	-	-
2,4,5-TP (Silvex)	ND	0.023	0.050	-	-	-
Surrogate Recovery						
DCAA	0.10			0.10	100	63-129

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
2,4-D (Dichlorophenoxyacetic acid)	0.088	0.090	0.10	88	90	67-147	1.53	30
2,4-DB	0.10	0.10	0.10	100	103	61-152	2.99	30
Dalapon	0.10	0.098	0.10	100	98	54-153	1.31	30
Dicamba	0.093	0.094	0.10	93	94	60-146	0.855	30
Pentachlorophenol (PCP)	0.094	0.095	0.10	94	95	60-140	1.09	30
2,4,5-TP (Silvex)	0.088	0.089	0.10	88	89	63-145	1.14	30
Surrogate Recovery								
DCAA	0.099	0.10	0.10	99	102	77-116	2.16	30
DCAA	0.10	0.10	0.10	102	103	63-129	1.47	30

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/5/18	**BatchID:**	169441
Date Analyzed:	12/6/18	**Extraction Method:**	SW3550B
Instrument:	GC17, GC21	**Analytical Method:**	SW8270C-SIM
Matrix:	Soil	**Unit:**	mg/Kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169441

QC Summary Report for SW8270C

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
1-Methylnaphthalene	ND	0.0011	0.0013	-	-	-
Acenaphthene	ND	0.00077	0.0013	-	-	-
Acenaphthylene	ND	0.00041	0.0013	-	-	-
Anthracene	ND	0.00082	0.0013	-	-	-
Benzo (a) anthracene	ND	0.0043	0.0050	-	-	-
Benzo (a) pyrene	ND	0.0012	0.0025	-	-	-
Benzo (b) fluoranthene	ND	0.00074	0.0013	-	-	-
Benzo (g,h,i) perylene	ND	0.0011	0.0025	-	-	-
Benzo (k) fluoranthene	ND	0.00079	0.0013	-	-	-
Chrysene	ND	0.00080	0.0025	-	-	-
Dibenzo (a,h) anthracene	ND	0.0015	0.0025	-	-	-
Fluoranthene	ND	0.0011	0.0013	-	-	-
Fluorene	ND	0.00086	0.0025	-	-	-
Indeno (1,2,3-cd) pyrene	ND	0.0010	0.0025	-	-	-
2-Methylnaphthalene	ND	0.0017	0.0025	-	-	-
Naphthalene	ND	0.00069	0.0013	-	-	-
Phenanthrene	ND	0.00067	0.0050	-	-	-
Pyrene	ND	0.0014	0.0025	-	-	-
Surrogate Recovery						
2-Fluorophenol	1.2			1.25	92	30-130
2-Fluorobiphenyl	1.0			1.25	84	30-130

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
1-Methylnaphthalene	0.060	0.051	0.062	96	81	30-130	17.0	30
Benzo (a) pyrene	0.058	0.056	0.062	92	90	53-138	2.79	30
Chrysene	0.054	0.050	0.062	86	80	54-116	7.76	30
2-Methylnaphthalene	0.058	0.052	0.062	93	84	51-121	10.9	30
Phenanthrene	0.053	0.050	0.062	85	81	49-123	5.36	30
Pyrene	0.051	0.045	0.062	81	72	55-124	12.2	30
Surrogate Recovery								
2-Fluorophenol	1.3	1.2	1.25	101	98	47-125	3.54	30
2-Fluorobiphenyl	1.2	1.1	1.25	93	91	35-120	2.12	30

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/4/18	**BatchID:**	169416
Date Analyzed:	12/5/18	**Extraction Method:**	SW3050B
Instrument:	ICP-MS3	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/Kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169416

QC Summary Report for Metals

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Antimony	ND	0.094	0.50	-	-	-
Arsenic	ND	0.14	0.50	-	-	-
Barium	ND	0.97	5.0	-	-	-
Beryllium	ND	0.072	0.50	-	-	-
Cadmium	ND	0.058	0.25	-	-	-
Chromium	ND	0.092	0.50	-	-	-
Cobalt	ND	0.056	0.50	-	-	-
Copper	ND	0.069	0.50	-	-	-
Lead	ND	0.094	0.50	-	-	-
Molybdenum	ND	0.23	0.50	-	-	-
Nickel	ND	0.072	0.50	-	-	-
Selenium	ND	0.13	0.50	-	-	-
Silver	ND	0.055	0.50	-	-	-
Thallium	ND	0.10	0.50	-	-	-
Vanadium	ND	0.064	0.50	-	-	-
Zinc	ND	1.4	5.0	-	-	-
Surrogate Recovery						
Terbium	520			500	103	70-130

(Cont.)

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/4/18	**BatchID:**	169416
Date Analyzed:	12/5/18	**Extraction Method:**	SW3050B
Instrument:	ICP-MS3	**Analytical Method:**	SW6020
Matrix:	Soil	**Unit:**	mg/Kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169416

QC Summary Report for Metals

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Antimony	52	53	50	105	106	75-125	0.929	20
Arsenic	49	50	50	98	100	75-125	1.47	20
Barium	510	520	500	102	103	75-125	0.933	20
Beryllium	50	49	50	100	99	75-125	0.524	20
Cadmium	49	49	50	97	98	75-125	0.778	20
Chromium	48	49	50	96	98	75-125	2.66	20
Cobalt	47	47	50	95	95	75-125	0	20
Copper	49	49	50	98	98	75-125	0	20
Lead	48	48	50	96	96	75-125	0	20
Molybdenum	50	50	50	99	99	75-125	0	20
Nickel	50	49	50	99	99	75-125	0	20
Selenium	51	50	50	101	100	75-125	0.675	20
Silver	49	50	50	99	99	75-125	0	20
Thallium	47	47	50	95	95	75-125	0	20
Vanadium	49	49	50	97	99	75-125	1.59	20
Zinc	500	500	500	101	101	75-125	0	20
Surrogate Recovery								
Terbium	500	510	500	101	102	70-130	0.769	20

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/4/18	**BatchID:**	169418
Date Analyzed:	12/5/18	**Extraction Method:**	SW5030B
Instrument:	GC7	**Analytical Method:**	SW8021B/8015Bm
Matrix:	Soil	**Unit:**	mg/Kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169418

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g) (C6-C12)	0.10,J	0.090	1.0	-	-	-
MTBE	ND	0.0023	0.050	-	-	-
Benzene	ND	0.0010	0.0050	-	-	-
Toluene	ND	0.0012	0.0050	-	-	-
Ethylbenzene	ND	0.0020	0.0050	-	-	-
m,p-Xylene	ND	0.0013	0.010	-	-	-
o-Xylene	ND	0.0013	0.0050	-	-	-
Xylenes	ND	N/A	0.0050	-	-	-
Surrogate Recovery						
2-Fluorotoluene	0.087			0.10	87	75-134

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(btex)	0.62	0.61	0.60	103	101	82-118	1.75	20
MTBE	0.088	0.085	0.10	88	85	61-119	3.80	20
Benzene	0.11	0.11	0.10	114	107	77-128	5.99	20
Toluene	0.11	0.11	0.10	114	109	74-132	4.45	20
Ethylbenzene	0.11	0.11	0.10	108	106	84-127	2.05	20
m,p-Xylene	0.23	0.23	0.20	115	114	80-120	1.60	20
o-Xylene	0.11	0.10	0.10	108	105	80-120	2.62	20
Xylenes	0.34	0.33	0.30	113	111	86-129	1.93	20
Surrogate Recovery								
2-Fluorotoluene	0.082	0.082	0.10	82	82	75-134	0	20

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/4/18	**BatchID:**	169362
Date Analyzed:	12/4/18	**Extraction Method:**	SW7471B
Instrument:	AA1	**Analytical Method:**	SW7471B
Matrix:	Soil	**Unit:**	mg/Kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169362

QC Summary Report for Mercury

Analyte	MB Result	MDL	RL			
Mercury	ND	0.0087	0.017	-	-	-

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Mercury	0.18	0.17	0.17	105	99	80-120	6.16	20

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/5/18	**BatchID:**	169442
Date Analyzed:	12/8/18	**Extraction Method:**	SW3550B
Instrument:	GC8	**Analytical Method:**	MAI-Organic Tin
Matrix:	Soil	**Unit:**	mg/kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169442 1812116-001AMS/MSD

QC Summary Report for Organotin

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
Dibutyltin	ND	0.0058	0.020	-	-	-
Monobutyltin	ND	0.010	0.020	-	-	-
Tetrabutyltin	ND	0.0054	0.020	-	-	-
Tributyltin	ND	0.014	0.020	-	-	-
Surrogate Recovery						
Tripropyltin	1.6			1.5	106	40-160

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Dibutyltin	3.0	3.0	3	99	101	70-130	1.31	20
Monobutyltin	3.3	3.4	3	111	112	70-130	1.25	20
Tetrabutyltin	3.0	3.0	3	99	101	70-130	1.98	20
Tributyltin	3.0	3.1	3	101	103	70-130	2.28	20
Surrogate Recovery								
Tripropyltin	1.5	1.6	1.5	97	106	70-130	8.81	20

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Dibutyltin	1	1.1	1.1	3	ND	36,F1	38,F1	50-150	5.38	20
Monobutyltin	1	1.4	1.2	3	ND	48,F1	42,F1	50-150	13.6	20
Tetrabutyltin	1	1.8	1.7	3	ND	61	58	50-150	5.49	20
Tributyltin	1	1.2	1.3	3	ND	41,F1	42,F1	50-150	2.46	20
Surrogate Recovery										
Tripropyltin	1	0.77	0.79	1.5		51	53	50-150	2.55	20

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/6/18	**BatchID:**	169554
Date Analyzed:	12/7/18	**Extraction Method:**	ASTM D2216-05
Instrument:	WetChem	**Analytical Method:**	ASTM D2216-05
Matrix:	Soil	**Unit:**	wet wt%
Project:	1518; Chevron Marine Terminal Sampling		

QC Summary Report for Percent Moisture

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1812116-001A	31.1	1	31.0	1	0.50	<15

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/4/18	**BatchID:**	169421
Date Analyzed:	12/5/18	**Extraction Method:**	SW3550B/3630C
Instrument:	GC11A, GC11B	**Analytical Method:**	SW8015B
Matrix:	Soil	**Unit:**	mg/Kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169421

QC Report for SW8015B w/ Silica Gel Clean-Up

Analyte	MB Result	MDL	RL	SPK Val	MB SS %REC	MB SS Limits
TPH-Diesel (C10-C23)	ND	0.86	1.0	-	-	-
TPH-Motor Oil (C18-C36)	ND	3.5	5.0	-	-	-
Surrogate Recovery						
C9	25			25	102	72-122

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	40	41	40	100	102	75-128	2.25	30
Surrogate Recovery								
C9	25	25	25	98	98	72-122	0	30

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/12/18	**BatchID:**	169833
Date Analyzed:	12/13/18	**Extraction Method:**	SM2540 G-1997
Instrument:	WetChem	**Analytical Method:**	SM2540G
Matrix:	Soil	**Unit:**	wet wt%
Project:	1518; Chevron Marine Terminal Sampling		

QC Summary Report for SM2540B (Total Solids)

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1812116-001A	70.8	1.354	70.7	1.45	0.16	<10

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Quality Control Report

Client:	Pacific Affiliates	**WorkOrder:**	1812116
Date Prepared:	12/7/18	**BatchID:**	169585
Date Analyzed:	12/7/18	**Extraction Method:**	SW9060A
Instrument:	WC_CNS	**Analytical Method:**	SW9060A
Matrix:	Soil	**Unit:**	mg/kg
Project:	1518; Chevron Marine Terminal Sampling	**Sample ID:**	MB/LCS/LCSD-169585 1812116-001AMS/MSD

QC Summary Report for SW9060A

Analyte	MB Result	MDL	RL			
TOC	ND	200	200	-	-	-

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TOC	8200	8200	8200	100	100	80-120	0	20

Analyte	MS DF	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TOC	1	28,000	26,000	19080	15,000	68,F1	65,F1	80-120	8.63	20

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CHAIN-OF-CUSTODY RECORD

WorkOrder: 1812116 **ClientCode: PAEC** **QuoteID: 182933**

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQuIS ☐ Email ☐ HardCopy ☐ ThirdParty ☑ J-flag
☐ Detection Summary ☐ Dry-Weight

Report to:
Alec Ziegler
Pacific Affiliates
990 Waterfront Drive
Eureka, CA 95501
(707) 445-3001 FAX:
Email: aziegler@pacaff.com
cc/3rd Party:
PO:
Project: 1518; Chevron Marine Terminal Sampling

Bill to:
Alec Ziegler
Pacific Affiliates
990 Waterfront Drive
Eureka, CA 95501
aziegler@pacaff.com

Requested TATs: 15 days; 5 days;

Date Received: **12/04/2018**
Date Logged: **12/04/2018**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1812116-001	1	Sludge	12/3/2018 09:25	☐	A	A	A	A	A	A	A	A	A	A	A	A

Test Legend:

1	1613_FULL_S	2	8081PCB_S	3	8151_S	4	8270_PNA_S
5	CAM17MS_TTLC_S	6	cnsTOC_S	7	G-MBTEX_S	8	Grain Size_S
9	HG_S	10	OrganoTins_S	11	PERmoist_S	12	SpecificGravity_S

Project Manager: Angela Rydelius **Prepared by: Nancy Palacios**

The following SampID: 001A contains testgroup Multi RangeWSG_S.

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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CHAIN-OF-CUSTODY RECORD

WorkOrder: 1812116 **ClientCode: PAEC** **QuoteID: 182933**

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☐ Detection Summary ☐ Dry-Weight

Report to:
Alec Ziegler
Pacific Affiliates
990 Waterfront Drive
Eureka, CA 95501
(707) 445-3001 FAX:

Email: aziegler@pacaff.com
cc/3rd Party:
PO:
Project: 1518; Chevron Marine Terminal Sampling

Bill to:
Alec Ziegler
Pacific Affiliates
990 Waterfront Drive
Eureka, CA 95501
aziegler@pacaff.com

Requested TATs: 15 days; 5 days;

Date Received: **12/04/2018**
Date Logged: **12/04/2018**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					13	14	15	16	17	18	19	20	21	22	23	24
1812116-001	1	Sludge	12/3/2018 09:25	☐	A	A										

Test Legend:

13	TPH(DMO)WSG_S	14	TS_S(%)	15		16	
17		18		19		20	
21		22		23		24	

Project Manager: Angela Rydelius **Prepared by: Nancy Palacios**

The following SampID: 001A contains testgroup Multi RangeWSG_S.

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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WORK ORDER SUMMARY

Client Name: PACIFIC AFFILIATES
Client Contact: Alec Ziegler
Contact's Email: aziegler@pacaff.com

Project: 1518; Chevron Marine Terminal Sampling
Comments:

Work Order: 1812116
QC Level:
Date Logged: 12/4/2018

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Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1812116-001A	1	Sludge	SM2540B (Total Solids)	1	16OZ GJ, Unpres	☐	12/3/2018 9:25	5 days		☐	
			ASTM D2937m (Specific Gravity)			☐		5 days		☐	
			ASTM D2216-05 (Percent Moisture)			☐		5 days		☐	
			Organotin Compounds by GC-MS <Dibutyltin, Monobutyltin, Tetrabutyltin, Tributyltin>			☐		5 days		☐	
			SW7471B (Mercury)			☐		5 days		☐	
			Grain Size (ASTM D422)			☐		5 days		☐	SubOut
			Multi-Range TPH(g,d,mo) w/ S.G. Clean-Up			☐		5 days		☐	
			SW9060A (TOC)			☐		5 days		☐	
			SW6020 (CAM 17) <Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc>			☐		5 days		☐	
			SW8270C (PAHs/PNAs)			☐		5 days		☐	
			SW8151A (Chlorinated Herbicides)			☐		5 days		☐	
			SW8081A/8082 (OC Pesticides+PCBs)			☐		5 days		☐	
			E1613B (PCDDs & PCDFs)			☐		15 days		☐	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

General COC

MAI Work Order # 1812116

McCAMPBELL ANALYTICAL, INC.

1534 Willow Pass Rd. Pittsburg, Ca. 94565-1701
Telephone: (877) 252-9262 / Fax: (925) 252-9269
www.mccampbell.com main@mccampbell.com

CHAIN OF CUSTODY RECORD

Turn Around Time: 1 Day Rush | 2 Day Rush | 3 Day Rush | STD | Quote # 182933
J-Flag / MDL | ESL | Cleanup Approved | Bottle Order #
Delivery Format: PDF | GeoTracker EDF | EDD | Write On (DW) | EQuIS

Report To: Alec Ziegler — Bill To: Pacific Affiliates
Company: Pacific Affiliates (PAEC) — PO Box 133
Email: aziegler@pacaff.com — Eureka, CA 95502
Alt Email: tschneider@pacaff.com — Tele: (707) 445-3001 ext. 209
Project Name: Chevron Marine Terminal Sampling — Project #:1518
Project Location: Eureka, CA — PO #
Sampler Signature:

Analysis Requested

SAMPLE ID Location / Field Point	Sampling Date	Sampling Time	#Containers	Matrix	Preservative	TPH(g,d,mo) w/ S.G.	CAM 17 Metals	Hg 7471	8270- PNA/PAH's	1613 Full	Grain Size D422	Total Solids	Specific Gravity	TOC - 9060A	OrganoTins	OC Pesticides+PCBs	Chlorinated Herbicides
1	12/3/18	9825	1	SL	1	●	●	●	●	●	●	●	●	●	●	●	●

MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate $250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

* If metals are requested for water samples and the water type (Matrix) is not specified on the chain of custody, MAI will default to metals by E200.8.

Please provide an adequate volume of sample. If the volume is not sufficient for a MS/MSD a LCS/LCSD will be prepared in its place and noted in the report.

Comments / Instructions

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
Alec Ziegler	12/3/18	10:15 a.m.	TRK# 0201 7841 5695 2786	12-4-18	1139
			Nancy Palacios	12-4-18	1139

Matrix Code: DW=Drinking Water, GW=Ground Water, WW=Waste Water, SW=Seawater, S=Soil, SL=Sludge, A=Air, WP=Wipe, O=Other

Preservative Code: 1=4°C 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=ZnOAc/NaOH 7=None

Temp _____ °C Initials _____

HE REQUD 2 EXTRA MASON JARS. VIA FedEx. 12-07-18 mp/. 2 WET

78424205337 2

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
Phone: (925) 252-9262
Fax: (925) 252-9269

SUB CHAIN-OF-CUSTODY RECORD

WorkOrder: 1812116 **ClientCode: PAEC** **EDF: NO**

Subcontractor:

COOPER TESTING LABORATORY
937 Commercial St.
Palo Alto, CA 94303

TEL: (650) 213-8436
FAX: (650) 968-4228
ProjectNo: Chevron Marine Terminal Sampling
Acct #: N/A

Date Received: **12/04/2018**

Lab ID	Client ID	Matrix	Collection Date	TAT	Requested Tests				
					ASTM D2937m	ASTM D422	SM2540G		
1812116-001A	1	Sludge	12/3/2018 9:25	5	1	1	1		

TS %.
SPECIFIC GRAVITY
GRAIN SIZE.

Comments: **PLEASE USE 'CLIENT ID' AS THE SAMPLE ID AND EMAIL ASAP!**

Please email results to Nancy Palacios at subdata@mccampbell.com upon completion.

	Date/Time		Date/Time
Relinquished by: Nancy Palacios	12.10.18	**Received by:**	
Relinquished by:		**Received by:**	

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Sample Receipt Checklist

Client Name:	**Pacific Affiliates**	Date and Time Received	**12/4/2018 11:39**
Project:	**1518; Chevron Marine Terminal Sampling**	Date Logged:	**12/4/2018**
		Received by:	Nancy Palacios
WorkOrder №:	**1812116** Matrix: Sludge	Logged by:	Nancy Palacios
Carrier:	FedEx		

Chain of Custody (COC) Information

Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Sample IDs noted by Client on COC?	Yes ☑	No ☐	
Date and Time of collection noted by Client on COC?	Yes ☑	No ☐	
Sampler's name noted on COC?	Yes ☐	No ☑	
COC agrees with Quote?	Yes ☐	No ☐	NA ☑

Sample Receipt Information

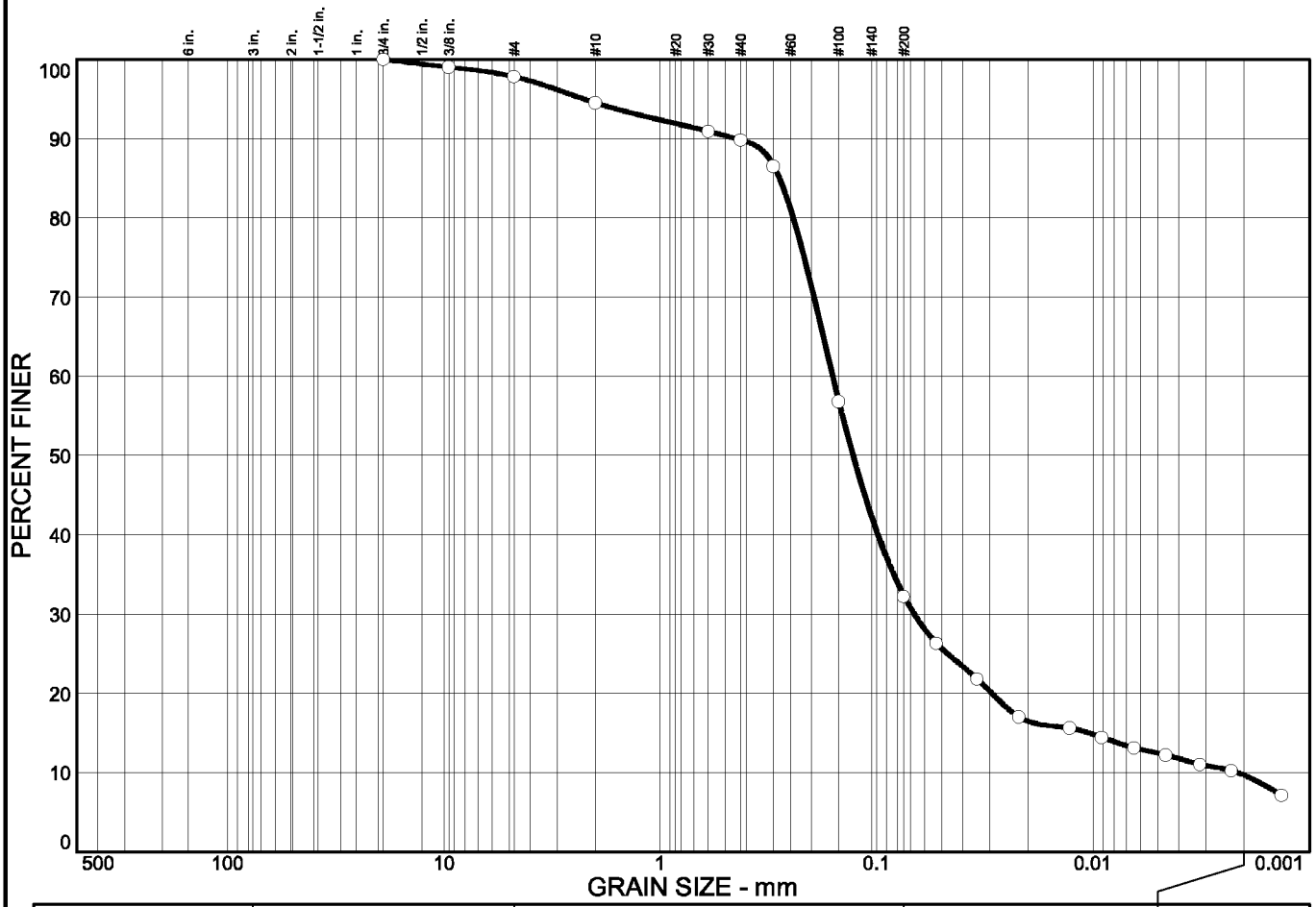
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☑
Shipping container/cooler in good condition?	Yes ☑	No ☐	
Samples in proper containers/bottles?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	NA ☐
Samples Received on Ice?	Yes ☑	No ☐	
	(Ice Type: WET ICE)		
Sample/Temp Blank temperature	Temp: 1.2°C		NA ☐
Water - VOA vials have zero headspace / no bubbles?	Yes ☐	No ☐	NA ☑
Sample labels checked for correct preservation?	Yes ☑	No ☐	
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	Yes ☐	No ☐	NA ☑
UCMR Samples:			
pH tested and acceptable upon receipt (200.8: ≤2; 525.3: ≤4; 530: ≤7; 541: <3; 544: <6.5 & 7.5)?	Yes ☐	No ☐	NA ☑
Free Chlorine tested and acceptable upon receipt (<0.1mg/L)?	Yes ☐	No ☐	NA ☑

Comments:

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.2	65.6	22.6	9.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4 in.	100.0		
3/8 in.	99.0		
#4	97.8		
#10	94.5		
#30	90.9		
#40	89.8		
#50	86.5		
#100	56.8		
#200	32.2		
#270	26.3		
0.0344 mm.	21.8		
0.0220 mm.	17.0		
0.0128 mm.	15.6		
0.0091 mm.	14.4		
0.0065 mm.	13.1		
0.0046 mm.	12.2		
0.0032 mm.	11.0		
0.0023 mm.	10.2		
0.0013 mm.	7.1		

* (no specification provided)

Soil Description

Black Silty SAND w/ organics and shells

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.283 D_{60}= 0.160 D_{50}= 0.129
D_{30}= 0.0674 D_{15}= 0.0105 D_{10}= 0.0022
C_u= 73.85 C_c= 13.09

Classification

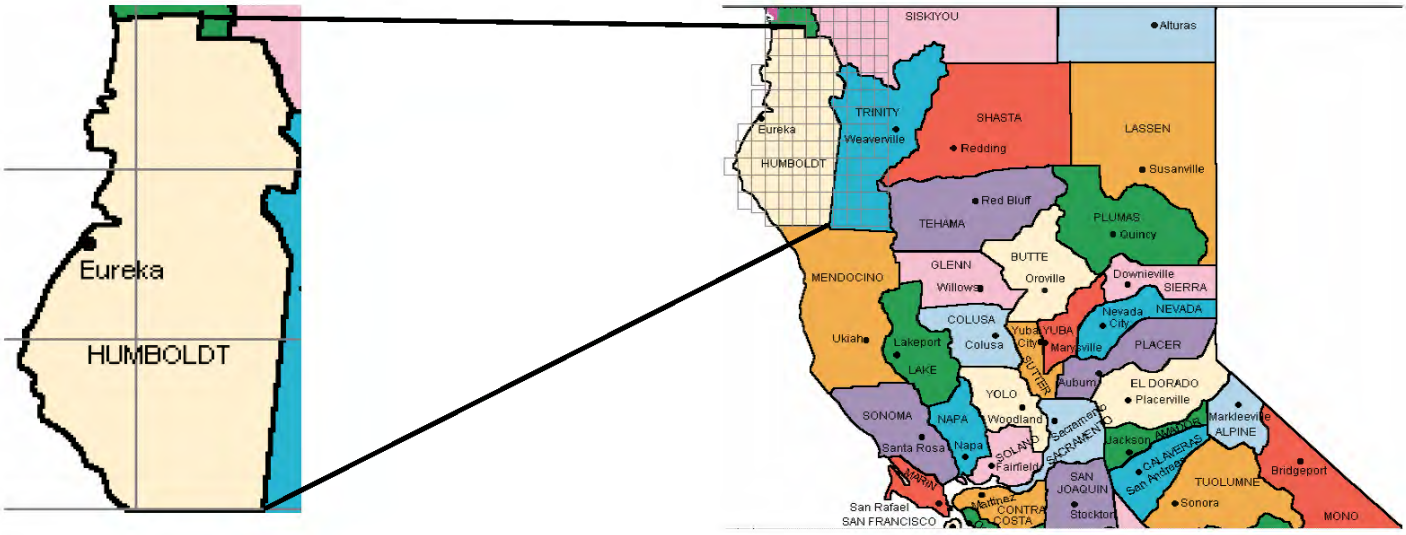
USCS= AASHTO=

Remarks

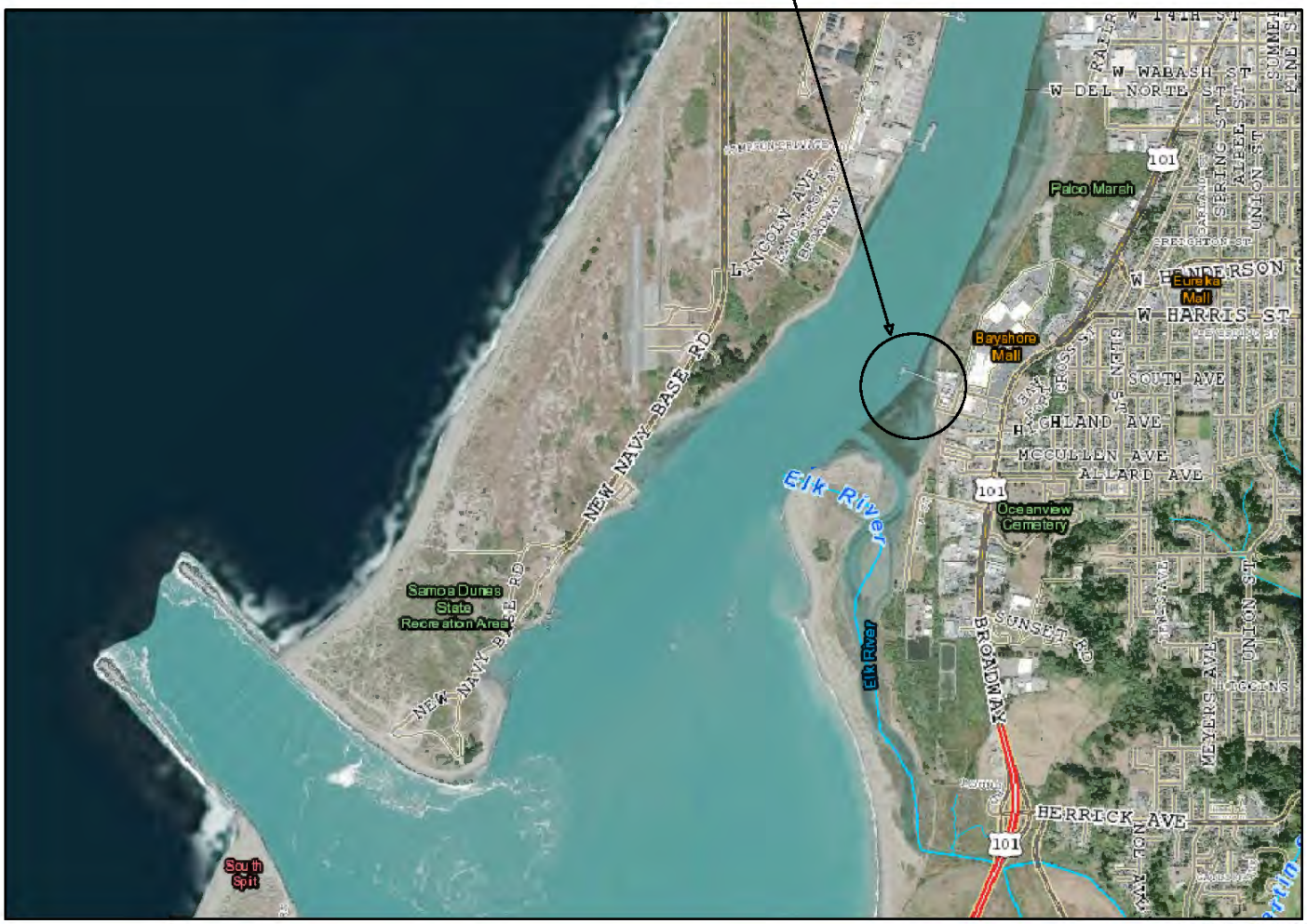
Sample No.: **Source of Sample:** 1812116-001A **Date:** 12/17/18
Location: **Elev./Depth:**

COOPER TESTING LABORATORY

Client: McCampbell Analytical
Project: Chevron Marine Terminal Sampling
Project No: 385-109 **Figure**



CHEVRON EUREKA MARINE TERMINAL



CEMT 3400 CHRISTIE STREET Eureka, California	VICINITY MAP - CEMT FIGURE C-1	PACIFIC AFFILIATES CONSULTING ENGINEERS 990 W. WATERFRONT DRIVE, EUREKA, CA 95501 TEL (707) 445-3001 FAX(707)445-3003

HUMBOLDT BAY

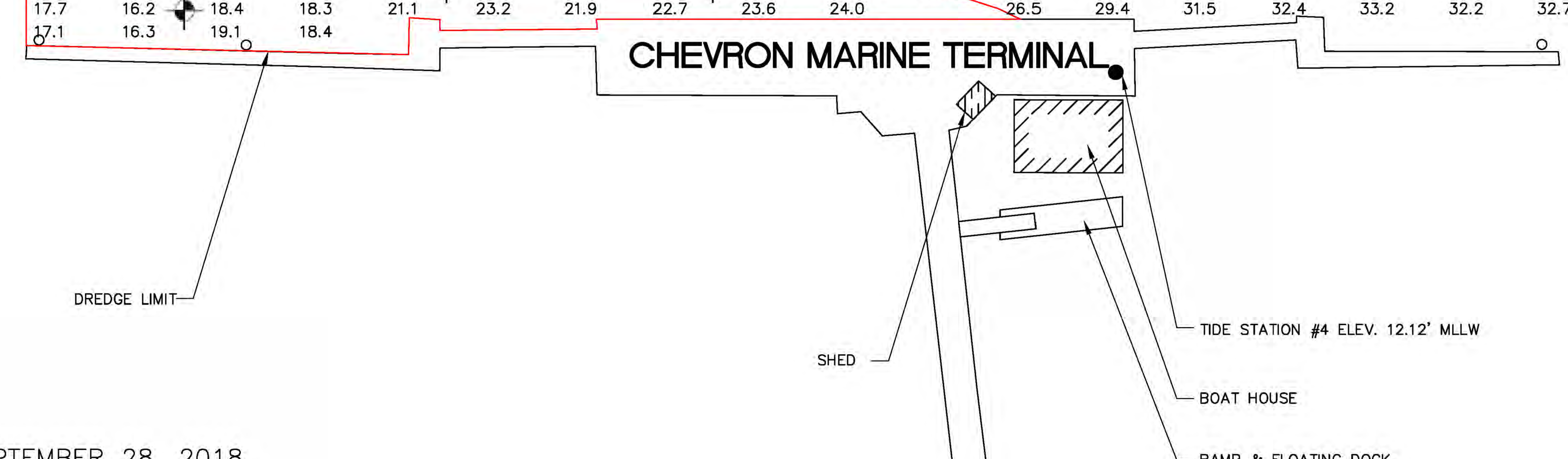
EBB ⟵⟶ FLOOD

SAMPLING NOTES

Sampling Location (crosshair symbol)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
																					35.1	35.1	35.3	35.6	36.0	36.1	36.1	35.8
																				35.2	35.1	35.0	35.2	35.4	35.8	36.0	36.0	35.7
																		35.6	35.4	35.1	35.0	34.9	35.1	35.3	35.6	35.9	35.8	35.6
																	35.5	35.5	35.2	35.1	34.9	34.8	34.9	35.2	35.4	35.8	35.7	35.5
													35.1	35.2	35.4	35.3	35.4	35.4	35.1	35.0	34.8	34.8	34.8	35.1	35.2	35.7	35.6	35.3
							33.6	33.5	34.7	35.4	35.4	35.1	35.0	35.1	35.4	35.3	35.2	35.2	35.0	35.0	34.7	34.7	34.7	34.9	35.0	35.5	35.4	35.2
	32.5	32.7	32.6	33.0	33.4	33.6	33.5	33.5	34.4	35.2	35.3	35.1	34.9	35.0	35.3	35.2	35.1	35.1	34.9	34.9	34.6	34.6	34.6	34.8	34.8	35.4	35.3	35.1
	32.3	32.6	32.6	33.0	33.3	33.5	33.5	33.4	34.2	34.9	35.2	35.0	34.8	34.9	35.2	35.2	34.9	34.9	34.7	34.8	34.5	34.5	34.6	34.7	34.6	35.3	35.1	35.0
	32.1	32.6	32.6	32.9	33.2	33.3	33.4	33.4	34.0	34.7	35.2	35.0	34.7	34.8	35.1	35.1	34.8	34.8	34.6	34.7	34.4	34.4	34.5	34.5	34.5	35.2	35.0	34.9
	31.9	32.5	32.6	32.9	33.1	33.2	33.3	33.4	33.8	34.5	35.1	34.9	34.7	34.7	35.0	35.1	34.7	34.6	34.5	34.6	34.4	34.3	34.5	34.4	34.3	35.1	34.9	34.8
	31.7	32.4	32.5	32.9	33.1	33.1	33.2	33.3	33.6	34.2	35.0	34.8	34.6	34.5	34.9	35.0	34.5	34.5	34.4	34.5	34.3	34.2	34.3	34.2	34.1	34.9	34.7	34.7
	31.5	32.4	32.5	32.8	32.9	32.9	33.1	33.3	33.4	33.9	34.9	34.8	34.5	34.4	34.7	34.8	34.6	34.5	34.2	34.3	34.2	34.0	33.9	33.9	34.0	34.5	34.5	34.5
	31.3	32.2	32.4	32.8	32.9	32.9	33.1	33.3	33.3	33.8	34.7	34.6	34.5	34.2	34.5	34.7	34.6	34.4	34.1	34.1	34.2	33.6	33.7	33.5	33.9	34.0	34.2	34.2
	31.2	31.9	32.3	32.7	32.9	32.9	33.1	33.3	33.4	33.7	34.5	34.5	34.4	34.0	34.3	34.5	34.6	34.4	34.0	34.0	34.2	33.6	33.4	33.5	33.9	33.7	34.0	34.0
	31.0	31.7	32.1	32.6	32.9	32.8	33.1	33.2	33.5	33.8	34.2	34.3	34.3	33.9	34.3	34.5	34.4	34.4	34.1	34.0	34.2	33.5	33.1	33.4	33.7	33.6	33.8	33.7
	30.8	31.4	31.9	32.6	33.0	32.8	33.1	33.2	33.6	33.8	34.0	34.1	34.3	33.9	34.2	34.4	34.3	34.4	34.2	33.8	34.0	33.2	32.8	33.2	33.5	33.3	33.7	33.3
	30.5	31.2	31.8	32.5	33.0	32.8	33.1	33.2	33.6	33.8	33.9	34.0	34.1	33.8	34.0	34.3	34.1	34.2	34.1	33.5	33.7	32.9	32.6	32.9	33.3	33.1	33.6	32.9
	30.4	31.2	31.9	32.6	33.0	33.0	33.2	33.3	33.7	33.7	33.8	33.9	33.9	33.7	33.7	34.0	33.9	34.0	34.0	33.4	33.5	32.8	32.5	32.8	32.9	32.9	33.5	32.5
	30.2	31.2	32.2	32.9	33.3	33.4	33.4	33.3	33.6	33.7	33.7	33.8	33.6	33.6	33.4	33.7	33.7	33.8	33.8	33.3	33.4	32.8	32.5	32.6	32.6	32.7	33.2	32.2
29.7	30.1	31.2	32.4	33.3	33.7	33.8	33.5	33.4	33.6	33.8	33.6	33.8	33.4	33.4	33.3	33.5	33.5	33.6	33.5	33.2	33.2	32.7	32.4	32.5	32.3	32.6	32.9	32.0
29.6	29.9	31.1	32.5	33.6	34.2	34.2	33.7	33.5	33.6	33.9	33.7	33.9	33.3	33.2	33.1	33.2	33.3	33.4	33.3	33.1	33.0	32.7	32.4	32.4	31.9	32.6	32.6	31.8
29.5	29.8	30.9	32.4	34.0	34.7	34.6	34.0	33.7	33.7	33.9	34.0	34.0	33.2	33.1	33.0	32.9	33.0	33.2	33.1	33.0	32.9	32.7	32.4	32.3	31.6	32.5	32.1	31.5
29.2	29.6	30.6	31.9	33.7	34.7	35.0	34.4	34.0	33.8	34.0	34.3	34.1	33.1	32.9	32.9	32.6	32.8	33.0	32.9	32.9	32.7	32.7	32.3	32.2	31.3	32.5	31.6	31.5
28.8	29.3	30.3	31.4	33.3	34.8	35.4	34.8	34.2	33.9	34.0	34.5	34.2	33.0	32.7	32.7	32.4	32.6	32.8	32.6	32.8	32.5	32.7	32.1	32.0	31.0	32.2	31.6	31.5
28.1	29.1	29.9	30.8	32.9	34.8	35.8	35.2	34.5	34.0	34.1	34.8	34.4	33.0	32.6	32.6	32.2	32.5	32.6	32.5	32.6	32.6	32.6	31.9	31.6	30.8	31.8	31.6	31.5
27.4	28.9	29.6	30.3	32.5	34.8	36.2	35.6	34.7	34.0	34.1	35.1	34.6	33.2	32.7	32.4	32.3	32.4	32.5	32.4	32.4	32.6	32.5	31.6	31.0	30.7	31.4	31.7	31.4
26.7	28.6	29.2	29.8	32.1	34.8	36.3	35.9	34.9	34.2	34.3	35.6	35.0	33.7	32.9	32.2	32.3	32.3	32.4	32.3	32.2	32.7	32.3	31.3	30.4	30.6	31.1	31.6	31.3
26.0	28.3	28.9	29.3	31.4	33.8	35.5	35.8	35.1	34.4	34.5	36.3	35.5	34.1	33.0	32.0	32.4	32.2	32.3	32.3	32.1	32.5	32.2	31.4	30.4	30.6	31.0	31.4	31.0
25.4	27.7	28.2	28.8	30.7	32.8	34.7	35.8	35.3	34.7	34.7	36.8	35.8	34.3	33.2	32.2	32.5	32.3	32.5	32.3	32.1	32.3	32.0	31.5	30.4	30.6	30.8	31.2	30.7
24.8	26.9	27.5	28.4	29.9	31.7	33.8	35.8	35.4	34.8	34.6	36.6	35.8	34.4	33.4	32.4	32.6	32.4	32.6	32.3	32.2	32.0	31.9	31.6	30.5	30.6	30.6	31.0	30.5
24.2	26.0	26.8	27.9	29.1	30.5	32.9	35.1	35.0	34.7	34.4	36.4	35.8	34.5	33.5	32.6	32.7	32.5	32.7	32.3	32.2	31.7	31.7	31.7	30.7	30.5	30.3	30.8	30.3
23.7	25.2	26.1	27.4	28.4	29.5	31.8	34.3	34.6	34.7	34.3	36.3	35.7	34.7	33.7	32.8	32.8	32.6	32.9	32.3	32.2	31.5	31.6	31.8	30.9	30.6	30.1	30.7	30.3
23.1	24.4	25.4	26.6	27.3	28.8	30.8	33.5	34.2	34.4	33.9	35.8	35.6	34.7	34.0	33.2	33.1	33.1	32.9	32.1	31.8	31.1	31.3	31.3	30.9	30.5	29.9	30.6	30.6
22.5	23.7	24.3	25.4	26.2	27.8	29.3	31.7	32.8	33.5	33.0	34.5	34.7	34.4	34.2	33.8	33.4	33.5	32.8	32.0	31.3	30.7	31.0	30.7	30.5	30.3	30.1	30.6	30.6
22.0	22.6	23.0	24.3	24.9	26.1	27.6	29.8	31.4	32.5	32.2	33.3	33.8	33.9	34.1	34.0	33.5	33.7	33.2	32.5	31.7	30.9	31.0	30.8	30.3	30.3	30.1	30.4	30.5
21.4	21.3	21.7	23.2	23.5	24.3	25.9	27.8	29.8	31.0	31.2	32.2	32.8	33.4	34.1	34.0	33.6	33.9	33.6	33.0	32.2	31.2	31.0	30.8	30.2	30.2	30.1	30.3	30.5
20.8	19.7	20.3	21.2	22.0	22.8	24.3	26.1	28.0	29.4	30.2	31.1	31.7	33.0	34.0	34.1	33.7	34.1	33.9	33.6	32.6	31.6	30.9	30.7	30.2	30.2	30.1	30.1	30.4
20.3	18.1	19.1	19.7	20.6	21.6	22.7	24.4	26.3	27.6	29.1	30.0	30.7	32.6	33.9	34.2	33.7	34.2	34.3	34.1	33.1	31.9	30.9	30.7	30.2	30.2	30.1	29.9	30.4
19.7	16.8	17.9	18.3	19.2	20.3	21.1	22.7	24.5	25.8	28.0	28.9	29.5	31.5	32.9	33.8	33.6	34.2	34.6	34.4	33.6	32.3	30.9	30.7	30.2	30.2	30.1	29.8	30.3
19.1	15.4	16.6	16.9	17.8	19.0	19.5	21.0	22.7	23.9	25.9	26.9	27.5	29.0	30.4	31.9	32.6	33.6	34.2	34.3	34.0	33.1	31.6	30.9	30.2	30.3	30.1	29.6	30.2
18.6	14.4	15.6	15.5	16.4	17.6	18.2	19.5	20.7	22.1	23.6	24.9	25.6	26.5	28.0	30.0	31.8	32.9	33.8	34.2	34.4	33.9	32.4	31.3	30.5	30.8	30.3	29.9	30.0
18.0	14.3	14.5	14.2	15.1	16.3	17.4	18.2	19.7	21.2	22.5	23.6	24.1	24.9	26.5	28.0	29.6	31.6	32.9	33.9	34.0	34.0	32.7	31.4	30.5	31.1	30.6	30.0	30.1
17.5	14.6	14.4	14.4	14.2	15.3	17.0	16.9	18.9	20.2	21.5	22.4	22.8	23.4	24.9	26.1	27.3	29.9	31.8	33.5	33.5	34.1	32.9	31.6	30.6	30.9	30.5	30.0	30.2
16.7	15.1	14.7	14.7	12.6	14.3	16.9	16.0	18.3	18.8	20.8	22.4	21.8	22.3	23.0	24.2	25.2	27.9	30.5	32.2	32.8	33.5	32.6	32.4	30.7	30.9	30.1	29.9	30.1
15.9	15.0	14.8	14.8	13.6	13.9	17.7	16.2	18.4	18.3	21.1	23.2	21.9	22.7	23.6	24.0		26.5	29.4	31.5	32.4	33.2	32.2	32.7	30.7	30.6	29.5	29.8	29.9
15.1	15.0	15.0	14.8	14.7	14.6	17.1	16.3	19.1	18.4																30.2	29.3	29.6	29.7
14.3	14.6	14.9	15.1	15.2	16.1																					29.2	29.5	29.5
13.6	14.1	14.8	15.3	15.2	16.7																							
13.3	13.8	14.5	15.0	14.9	16.5																							
13.2	13.7	14.1	14.7	14.7	15.5																							
12.9	13.5	13.8	14.3	14.5																								
12.6	13.3	13.5	13.9																									
12.4	12.7	13.1	13.5																									
	12.4	12.8																										

1-C 1-B 1-A



SURVEY NOTES

SURVEYED BY PACIFIC AFFILIATES CONSULTING ENGINEERS SEPTEMBER 28, 2018.

TIDE STATION FOR SURVEYS, MONUMENT #406, SET BY TOWILL INC. 1996, ELEV. 12.12 MLLW. MONUMENT IS LOCATED NEAR THE NORTHWEST CORNER OF THE CHEVRON BOAT HOUSE.

SOUNDINGS ARE SHOWN TO THE NEAREST FOOT AND TENTHS OF A FOOT. VERTICAL DATUM UTILIZED – MEAN LOWER LOW WATER (MLLW).

HORIZONTAL CONTROL REFERENCED TO NAD83, CALIF. ZONE 1, LAMBERT CONFORMAL PROJECTION.

SURVEY REPRESENTS THE CONDITIONS ON THE DATE SURVEYED (SEPTEMBER 28, 2018).

REVISIONS | BY

PACIFIC AFFILIATES
CONSULTING ENGINEERS
990 W. WATERFRONT DRIVE, EUREKA, CA 95501
TEL (707) 445-3001 • FAX (707) 445-3003

REGISTERED PROFESSIONAL ENGINEER ★ TRAVIS L. SCHNEIDER 67393 EXP. 12-31-2018 CIVIL ★ STATE OF CALIFORNIA

BATHYMETRIC SURVEY

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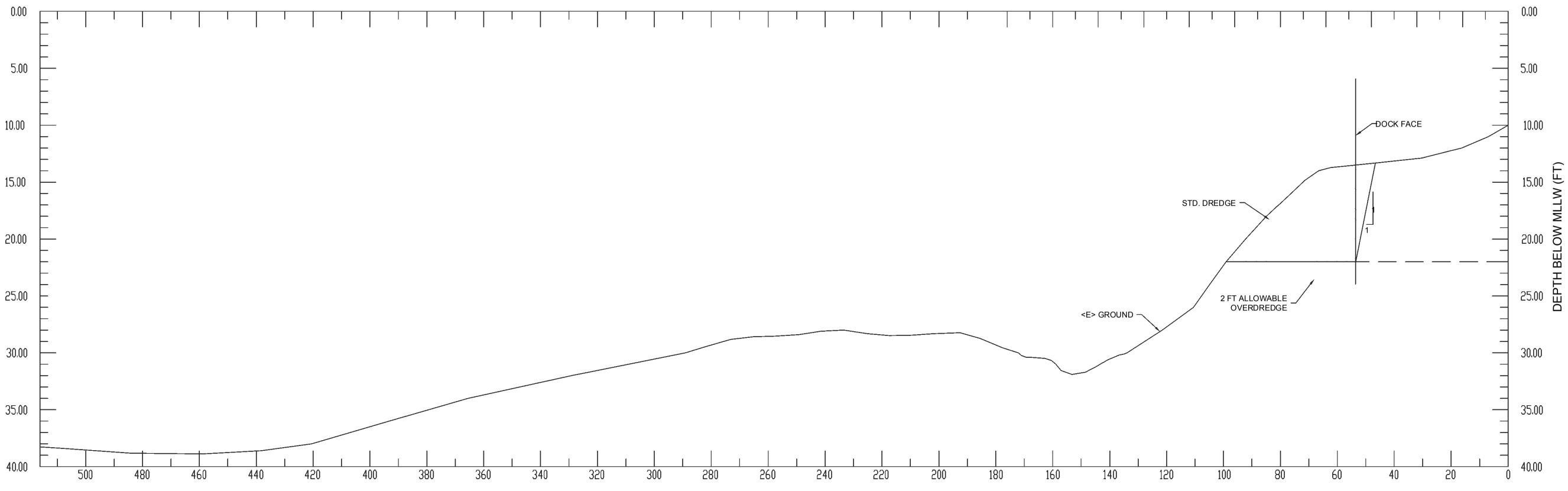
CHEVRON MARINE TERMINAL
EUREKA, CA 95501
APN 007-071-013

Date: OCTOBER 01, 2018
Scale: 1"=30'
Drawn by: BA

SHEET NUMBER C-1

JOB NUMBER 1518



SECTION A-A

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'

FOR PLAN REVIEW ONLY - NOT FOR CONSTRUCTION

REVISIONS	BY

PACIFIC AFFILIATES
CONSULTING ENGINEERS
890 W. WATERFRONT DRIVE, EUREKA, CA 95501
TEL (707) 445-3001 • FAX (707) 445-3003

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER J. ZINEMAN
No. 82613
CIVIL
STATE OF CALIFORNIA
EXP. DATE: 12-31-2020

Dredge Section

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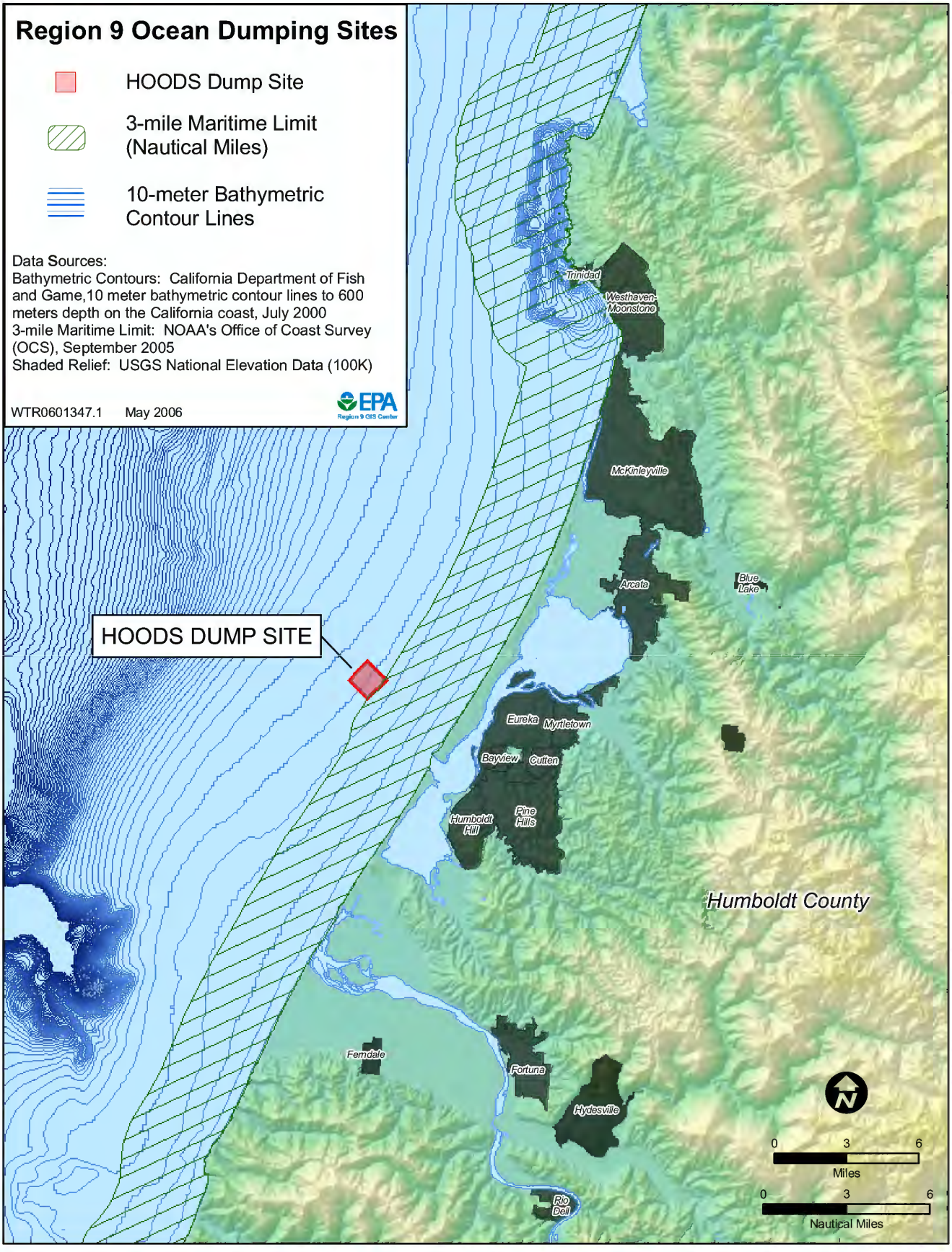
CHEVRON MARINE TERMINAL
EUREKA, CA 95501
APN 007-071-013

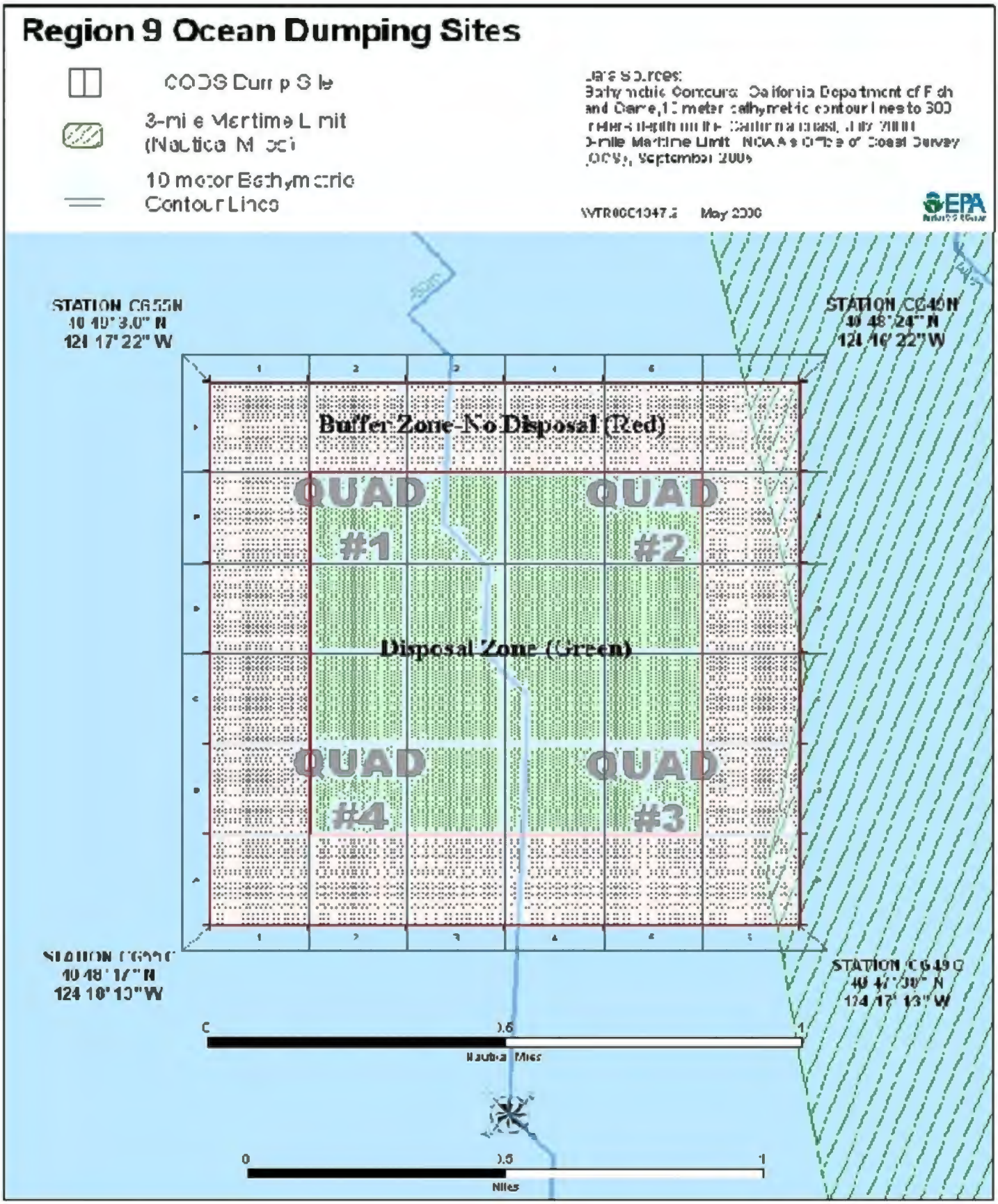
Date: 3-14-2019
Scale: AS NOTED
Drawn by: AZ

SHEET NUMBER C-3

JOB NUMBER 1518



CEMT 3400 CHRISTIE STREET Eureka, California	HOODS –Area Map Figure C–4	PACIFIC AFFILIATES CONSULTING ENGINEERS 990 W. WATERFRONT DRIVE, EUREKA, CA 95501 TEL (707) 445-3001 FAX(707)445-3003



CEMT 3400 CHRISTIE STREET EUREKA, CA	Humboldt Open Ocean Disposal Site Quadrants Figure C-5	PACIFIC AFFILIATES CONSULTING ENGINEERS 990 W. WATERFRONT DRIVE, EUREKA, CA 95501 TEL (707) 445-3001 FAX(707)445-3003