PORT OF OAKLAND

AUG 02 2002

July 30, 2002

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Subject: **Monitoring Well Installation, Groundwater Monitoring, and Soil Excavation Report, Gray & Reynolds Development Site, Embarcadero Cove, Oakland**

Dear Mr. Chan:

Please find enclosed for your review the report "Monitoring Well Installation, Groundwater Monitoring, and Soil Excavation Report, Gray & Reynolds Development Site, Embarcadero Cove, Oakland," dated July 24, 2002. This report is submitted to fulfill the Port's requirements under the memorandum of understanding (MOU) between the Port, ACHCSA, and the RWQCB dated May 15, 2002. The MOU was ratified by ACHCSA on May 30, 2002 and the RWQCB on June 5, 2002. An excerpt from the MOU is provided below. The tasks that have been completed to date and documented in the enclosed report are shown in *italics*:

1. *The site is now LOP site R00002445*;

2. *The Port will remove MW-1 by excavation with a permit from Alameda County Public Works Agency. The excavation's approximate dimension will be 10 x 10 feet to the depth of the shallow groundwater, which is approximately 5 feet. Monitoring Well MW-1 would be in the center of excavation. Excavated soil will be sampled for off-site disposal. The excavation will be back-filled with clean material after an excess amount of ORC has been introduced into the open excavation. The County will be notified 72 hours prior to the excavation and associated field work.*

3. *A new well, MW-5, will be installed in the presumed down gradient direction from the former tank location to the northeast, in the sidewalk along Embarcadero Road.*

4. *The on-site wells (minus the removed MW-1) and MW-5 will be sampled in April and June 2002.* Thereafter, on-site wells, MW-2 through MW-4, will be abandoned.

5. Monitoring well MW-5 will be sampled additionally in September and December 2002.

6. If the groundwater conditions indicate a stable or diminishing plume, the site will be recommended for closure by the County in approximately December 2002.

7. The SFRWQCB will provide a letter to the Port, as soon as possible, indicating that site development is feasible.

530 Water Street ■ Jack London Square ■ P.O. Box 2064 ■ Oakland, California 94604–2064
Telephone: (510) 627-1100 ■ Facsimile: (510) 627-1826 ■ Web Page: *www.portofoakland.com*

8. No requirement for a deed restriction or risk management plan for the site is foreseen. Construction at the site will have to be undertaken in accordance with an appropriate health and safety plan.

As you can see, the Port of Oakland has completed task 1 through task 3, and a portion of task number 4. Monitoring wells MW-2 through MW-4 will be abandoned as soon as we receive approval from your office.

Please note that the SFRWQCB has not satisfied task number 7 by providing a letter to Gray & Reynolds that development is feasible. Also, we understand that the SFRWQCB contact for this case is now Ms. Betty Graham and no longer Mr. Chuck Headlee.

If you have any questions, please do not hesitate to contact me at (510) 627-1184.

Sincerely,

Douglas P. Herman
Associate Port Environmental Scientist

Encl: Monitoring Well Installation, Groundwater Monitoring, and Soil Excavation Report

Cc w/encl: Dan Gray
Tom Bender
Barbara Szudy
Betty Graham, RWQCB

Cc w/o encl: Chris Alger, Iris Environmental
Robert Marinai, Cambria Environmental
Chuck Headlee, RWQCB

Iris - Cambria
Environmental, JV

AUG 02 2002

MONITORING WELL INSTALLATION, GROUNDWATER MONITORING, AND SOIL EXCAVATION REPORT

Gray & Reynolds Development Site
Embarcadero Cove
1275 Embarcadero
Oakland, California

July 24, 2002

Prepared for:

Port of Oakland
EH&SC Department
530 Water Street
Oakland, California 94607

Prepared by:

Iris-Cambria Environmental, J.V.

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Oakland, California 94602

Robert Marinai, R.G.
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Christopher S. Alger, C.E.G., C.Hg
Principal Engineering Geologist

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INTRODUCTION

Iris–Cambria Environmental, J.V. (Iris–Cambria), has prepared this *Monitoring Well Installation, Groundwater Monitoring, and Soil Excavation Report* for the property located at 1275 Embarcadero, Oakland, California (Site) on behalf of the Port of Oakland (Port) to facilitate redevelopment of the property by Gray & Reynolds Properties, Inc. (Gray & Reynolds) for commercial use. The tasks reported in this document were performed in accordance with an agreement reached between the Alameda County Health Care Agency (ACHCA), the San Francisco Bay Region Water Quality Control Board (SFRWQCB), and the Port, on April 12, 2002. This document describes the recent soil excavation and groundwater monitoring activities and presents results of soil and groundwater sampling that occurred during April, May, and June 2002.

The work performed by Iris-Cambria included the following:

- Installation and development of monitoring well MW-5;
- Completion of two rounds of groundwater sampling;
- Excavation of approximately 60 cubic yards (cu yd) of soil from the former tank area;
- Abandonment of monitoring well MW-1 during excavation activities;
- Introduction of oxygen release compound (ORC) into the former tank excavation pit; and,
- Backfill of the excavation with compacted, imported fill.

SITE DESCRIPTION

The Site is located at 1275 Embarcadero, Oakland, California (Figure 1). Current Site surface features include a parking lot and a vacant former restaurant. The Port owns the Site, and Gray & Reynolds is proposing it for commercial redevelopment.

Past investigations at the Site are described in the following documents: Draft Review of Existing Site Conditions and Environmental Risk Evaluation (Henshaw Associates, Inc., 2001 a), Soil and Groundwater Sampling and Analysis Workplan (Henshaw Associates, Inc., 2001 b), Soil and Groundwater Investigation and Workplan (Baseline Environmental Consulting, August 13, 2001), and Site Investigation and Screening-Level Risk Assessment Report (Iris-Cambria, 2002a).

MONITORING WELL INSTALLATION AND MONITORING

Iris-Cambria installed groundwater monitoring well MW-5 at the Site on April 26, 2002. Description of the installation activities is presented in Appendix A. The well location is illustrated on Figure 2, and the boring log and well completion details are presented in Appendix B. Standard well installation and sampling procedures are presented in Appendix C. The drilling permit is presented in Appendix D.

The monitoring well location was selected based on the April 12, 2002 Agency agreement regarding the Site which specified that a well be installed downgradient (northeastward) from the former underground storage tank (UST) at a location near the eastern Site boundary.

Well sampling forms and survey data are presented in Appendices E and F, respectively. The results of the field investigation are presented below.

Soil Analytical Results

Three soil samples collected from the MW-5 borehole were analyzed for total petroleum hydrocarbons as gasoline (TPHg); total petroleum hydrocarbons as diesel (TPHd) and total petroleum hydrocarbons as motor oil (TPHmo) with silica gel cleanup; benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tertiary-butyl ether (MTBE); and polynuclear aromatic hydrocarbons (PAHs). Soil analytical results are presented in Tables 1, 2, and 3. The laboratory analytical report is presented in Appendix G.

Chemicals detected in soil from MW-5 included TPHd, TPHmo, and PAHs. No TPHg, BTEX, or MTBE was detected in MW-5 soil samples. The maximum total petroleum hydrocarbons were detected in the soil sample collected from the 10.0-10.5 feet below ground surface (ft bgs) interval, with a TPHmo concentration of 14 milligrams per kilogram (mg/kg) and a TPHd concentration of 22 mg/kg; a duplicate sample collected from the 10.5-11.0 ft bgs interval displayed a TPHmo concentration of 12 mg/kg and a TPHd concentration of 26 mg/kg.

Groundwater Analytical Results

Groundwater was sampled from wells MW-1 through MW-5 on May 3, 2002 and wells MW-2 through MW-5 on June 10, 2002. Samples were analyzed for TPHg, TPHd, TPHmo, BTEX, and MTBE. Figures 3 and 4 present groundwater concentrations of TPHg, TPHd, TPHmo, and BTEX detected during the May 3, 2002 and June 10, 2002 sampling events, respectively.

Highest chemical concentrations were found in the north and northeast portion of the Site furthest away from the Bay during both sampling events. MW-1 yielded the most elevated concentrations of TPHg and TPHd; MW-4 yielded the most elevated concentrations of BTEX constituents. TPHg and BTEX were not detected in monitoring wells MW-2 and MW-5. MTBE was not detected in any well.

The analytical results for groundwater testing are summarized in Tables 5 and 6. The laboratory analytical reports are presented in Appendix G.

Site Hydrogeology

During the May 3, 2002 monitoring event, groundwater at the Site was encountered at depths ranging from 5.5 to 7.29 ft bgs. Groundwater elevations measured during the monitoring event reflected an east-northeastern groundwater gradient of 0.025 ft/ft (Figure 5). During the July 2, 2002 gauging, groundwater at the Site was encountered at depths ranging from 5.58 to 7.44 ft bgs, also reflecting an eastern groundwater gradient of 0.025 ft/ft (Figure 6).

Previous monitoring events conducted at the Site prior to the installation of MW-5 reported a more northeastwardly groundwater gradient. Therefore, the groundwater elevations observed in MW-5 are consistent with historical groundwater flow directions, and substantiate the previously reported interpretation that a localized feature is influencing groundwater levels and effecting a groundwater movement away from the Bay.

TANK PIT EXCAVATION, MONITORING WELL DESTRUCTION, AND ORC PLACEMENT

On May 15, 2002 Foss Environmental Services excavated approximately 60 cubic yards of soil from a 10 ft by 10 ft area to 11 ft bgs. The excavation area was centered on monitoring well MW-1, which was removed during the excavation activity. The well abandonment was approved by the ACHCSA and a well destruction permit was obtained from the Alameda County Public Works Agency. A copy of the destruction permit is included in Appendix D. The excavation and well location are illustrated on Figure 2. Field activities are described in Appendix A.

The area was excavated until the MW-1 well box and approximately 7 ft of screen and casing was exposed. A cable was attached to the well casing, and the entire casing and screen were removed intact using the backhoe. The casing and screen was compared against monitoring well records to confirm that the entire structure had been removed. After the well was removed, the excavation

was continued down to a total depth of 11 ft bgs. An estimated total of approximately 60 cubic yards of soil was removed. Excavated soil was stockpiled at the rear of the parking lot where it was placed on and covered with visqueen. Upon completion of the excavation work, no standing water was observed in the hole, though some seepage was observed at the bottom perimeter of the hole.

One hundred and twenty pounds of Regenesis Brand, Oxygen Release Compounds (ORC) was distributed evenly across the floor of the excavation using the bucket of the backhoe. Geotextile fabric was then laid across the floor and sides of the excavation. The excavation was backfilled with low density, coarse aggregate fill, placed in 6-inch lifts, and compacted using a vibraplate attached to the backhoe. The aggregate fill was extended up to within 16 inches of ground surface. Another layer of geotextile was then placed on top of the aggregate fill, and the remainer of the excavation was backfilled with compacted baserock to grade.

A four-point composite soil sample (S1-A,B,C,D) was collected from the soil stockpile for disposal profiling. The soil sample was analyzed for TPHg, TPHd, BTEX, volatile organic compounds (VOCs), and CAM 17 metals. No MTBE was detected in the composite soil sample. The maximum total petroleum hydrocarbon detection was 450 mg/kg TPHg. Analytical results are presented in Table 4.

The soil stockpile was transported by Foss Environmental Services under manifest to Forward Landfill, Inc. for disposal. Copies of the manifests are presented in Appendix H.

CONCLUSIONS AND RECOMMENDATIONS

Monitoring well MW-5 was installed on April 26, 2002, in accordance with the April 12, 2002 agreement between the ACHCSA, SFRWQCB, and the Port. In addition, MW-1 was abandoned by excavation, and approximately 60 cubic yards of hydrocarbon-impacted soil were excavated from the former UST location. The bottom of the excavation pit was treated with ORC to enhance degradation of residual hydrocarbons. Monitoring wells MW-1 through MW-5 were sounded and sampled on May 3, 2002. Subsequent to the destruction of monitoring well MW-1, wells MW-2 through MW-5 were sampled on June 10, 2002 and sounded on July 2, 2002. Based on field observations and the results of laboratory analysis of soil and groundwater, the following conclusions have been made:

- Water levels observed in MW-5 support previous findings of a local northeastern groundwater gradient. Gradient direction appears to be in a more easterly direction than

previously reported, and was interpreted as east-northeasterly to easterly based on well gauging data collected on May 3, 2002 and July 2, 2002. This slight shift in groundwater gradients may be due to the addition of the MW-5 data point and the removal of the MW-1 data point.

- The detection of TPHd at low concentrations in groundwater collected from monitoring well MW-5 during both sampling events indicates that the well is in communication with Site groundwater and therefore provides significant characterization of conditions at the property boundary for the Site.

- Groundwater concentrations of TPHg, TPHd, TPHmo, and BTEX reported in samples from the May 3 and June 10 sampling events were similar to concentrations reported in previous sampling events.

As the results of the 2002 groundwater sampling event are similar to the May 2002 event, we recommend that tasks 4 and 5 of the April 12th Agency agreement be implemented. Specifically:

- Of the 6 wells MW-2, MW-3, and MW-4 are to be abandoned to clear the Site for redevelopment; and

- Well MW-5 is to be sampled two additional times, in September and December 2002.

REFERENCES

Baseline Environmental Consulting. *Soil and Groundwater Investigation and Workplan.*Gray & Reynolds Development Project. Embarcadero Cove, Oakland, California. August 13, 2001.

California Regional Water Quality Control Board, San Francisco Bay Region, Groundwater Committee. *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report.* June 1999.

Henshaw Associates, Inc. *Draft Review of Existing Site Conditions and Environmental Risk Evaluation.* Embarcadero Cove Project, Oakland, California. March 14, 2001 a.

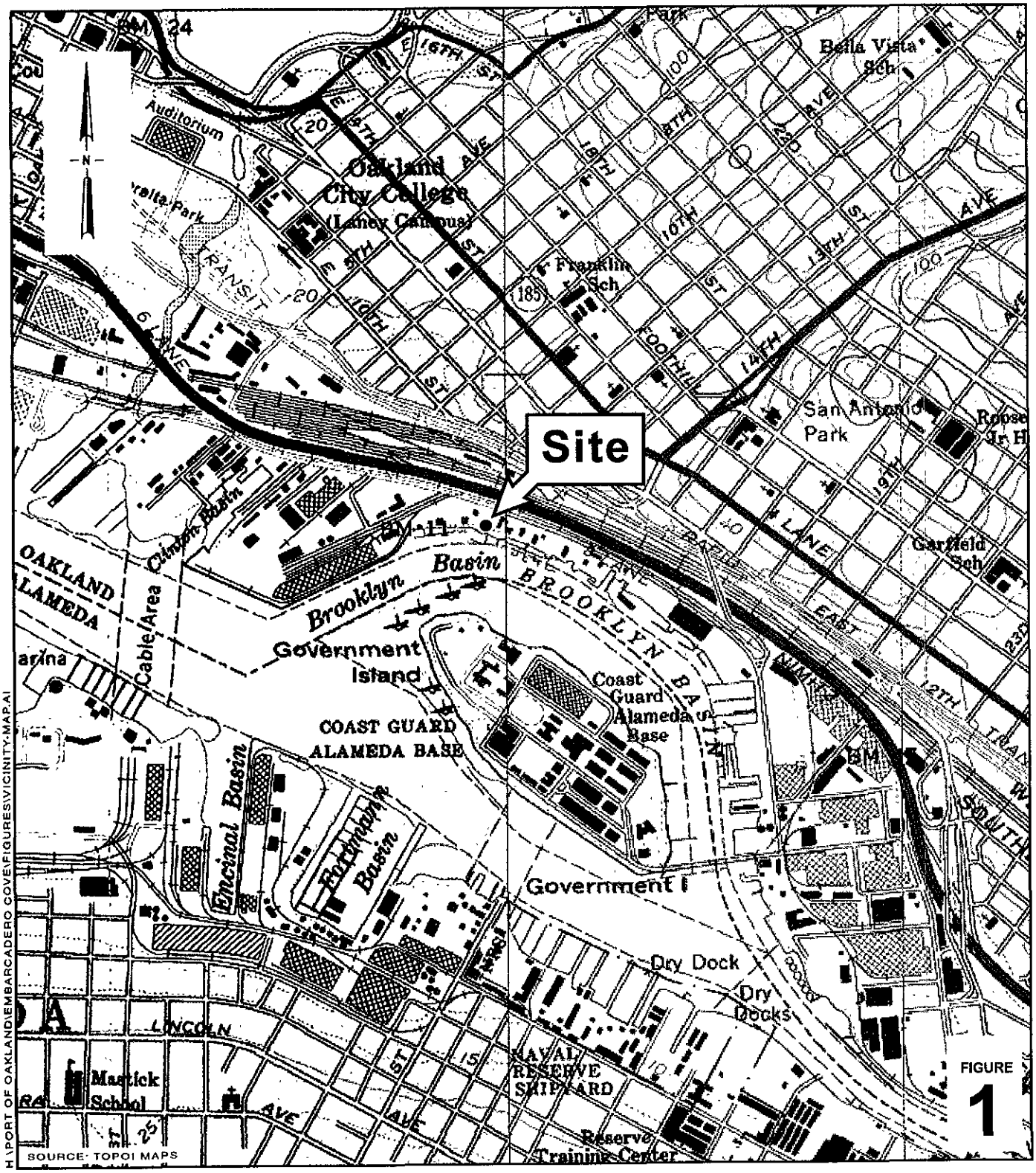
Henshaw Associates, Inc. *Soil and Groundwater Sampling and Analysis Workplan.* Embarcadero Cove Project, Oakland, California. April 23, 2001 b.

Iris-Cambria Environmental, JV. *Site Investigation and Screening-Level Risk Assessment Report.* Gray and Reynolds Development Site. Embarcadero Cove, 1275 Embarcadero, Oakland, California. January 17, 2002 a.

Iris-Cambria Environmental, JV. *Proposal to Perform Soil Excavation, Well Installation, and Monitoring.* Gray and Reynolds Development Site. Embarcadero Cove, 1275 Embarcadero, Oakland, California. April 17, 2002 b.

Figures

01/07/02



H:\PORT OF OAKLAND\EMBARCADERO COVE\FIGURES\VICINITY-MAP.AI

FIGURE 1

Port of Oakland
1275 Embarcadero
Embarcadero Cove Project
Oakland, California

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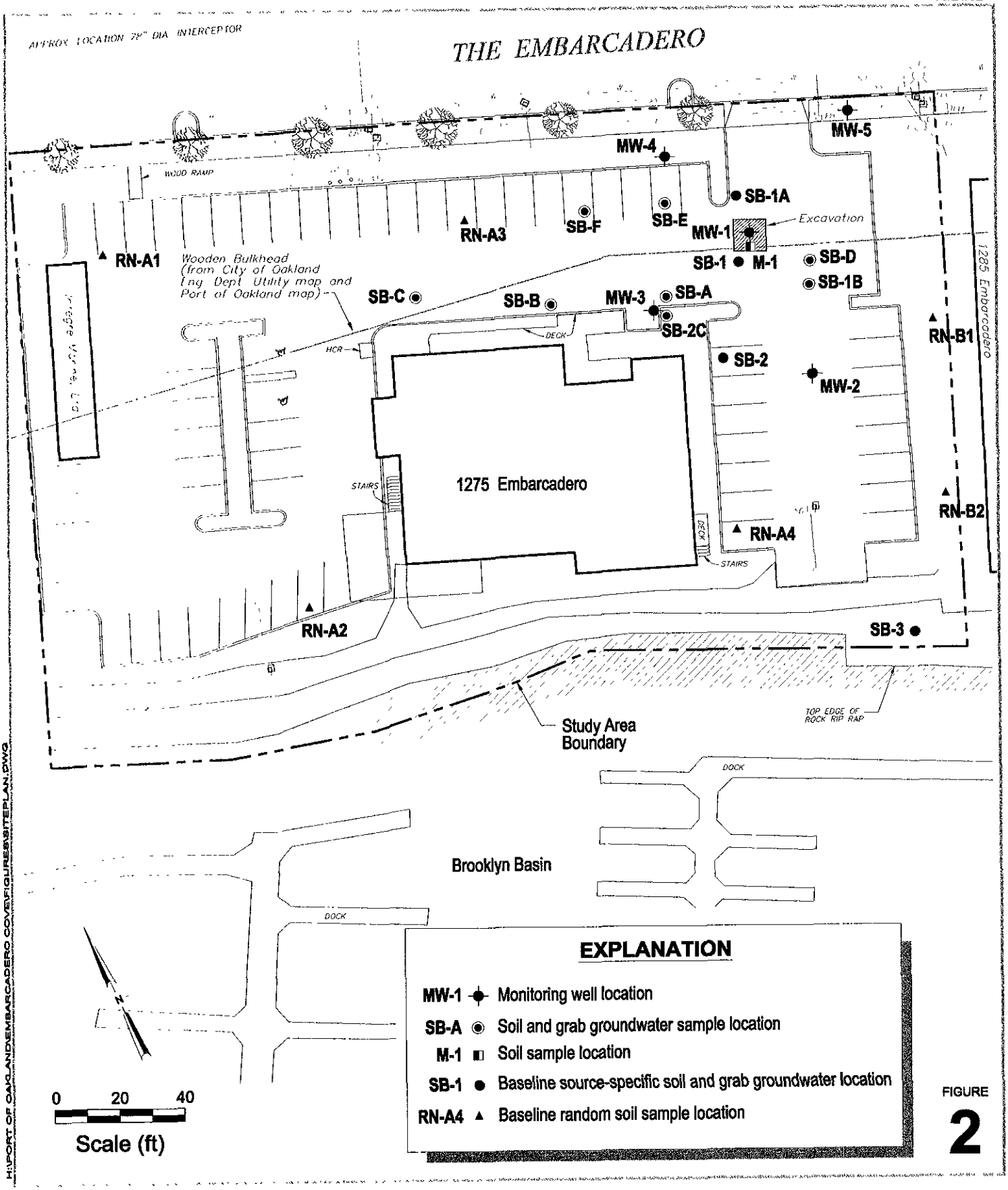
Vicinity Map



Port of Oakland
1275 Embarcadero
Embarcadero Cove Project
Oakland, California

CAMBRIA

Site Plan

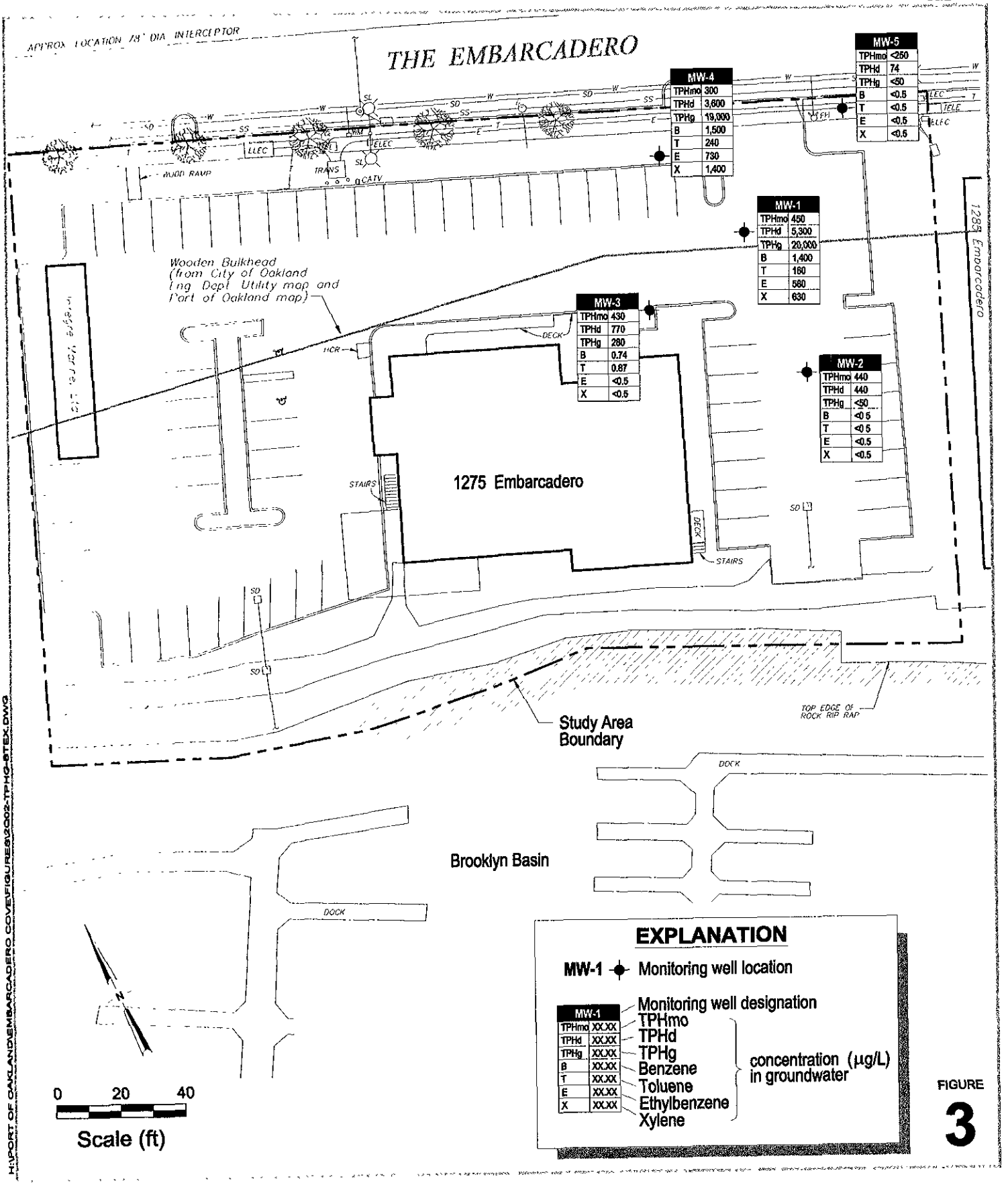


FIGURE 3

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Port of Oakland
1275 Embarcadero
Embarcadero Cove Project
Oakland, California

CAMBRIA

Hydrocarbon Concentrations in Groundwater

May 3, 2002

07/08/02

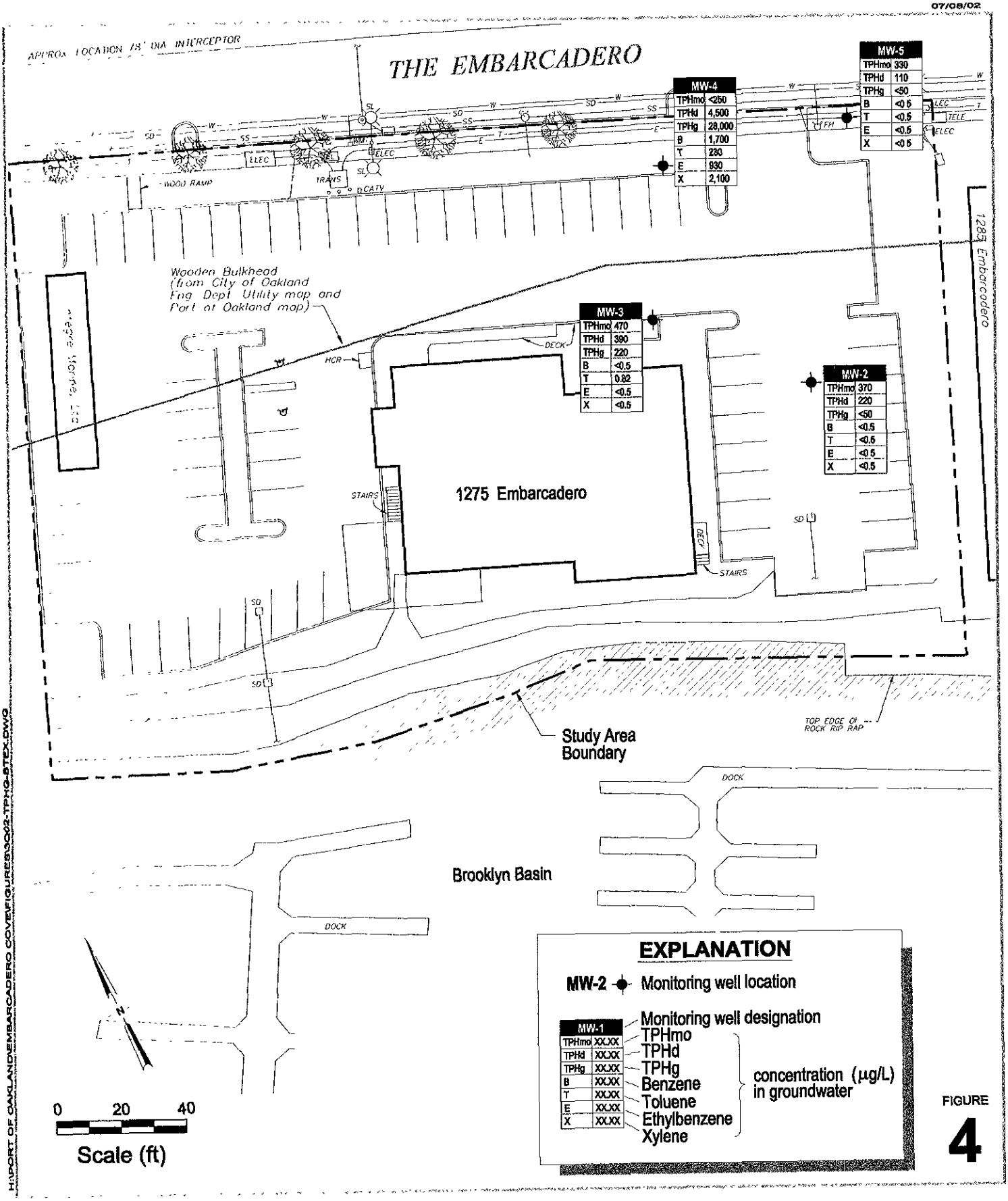

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FIGURE 4

Port of Oakland
1275 Embarcadero
Embarcadero Cove Project
Oakland, California

CAMBRIA

Hydrocarbon Concentrations in Groundwater

June 10, 2002

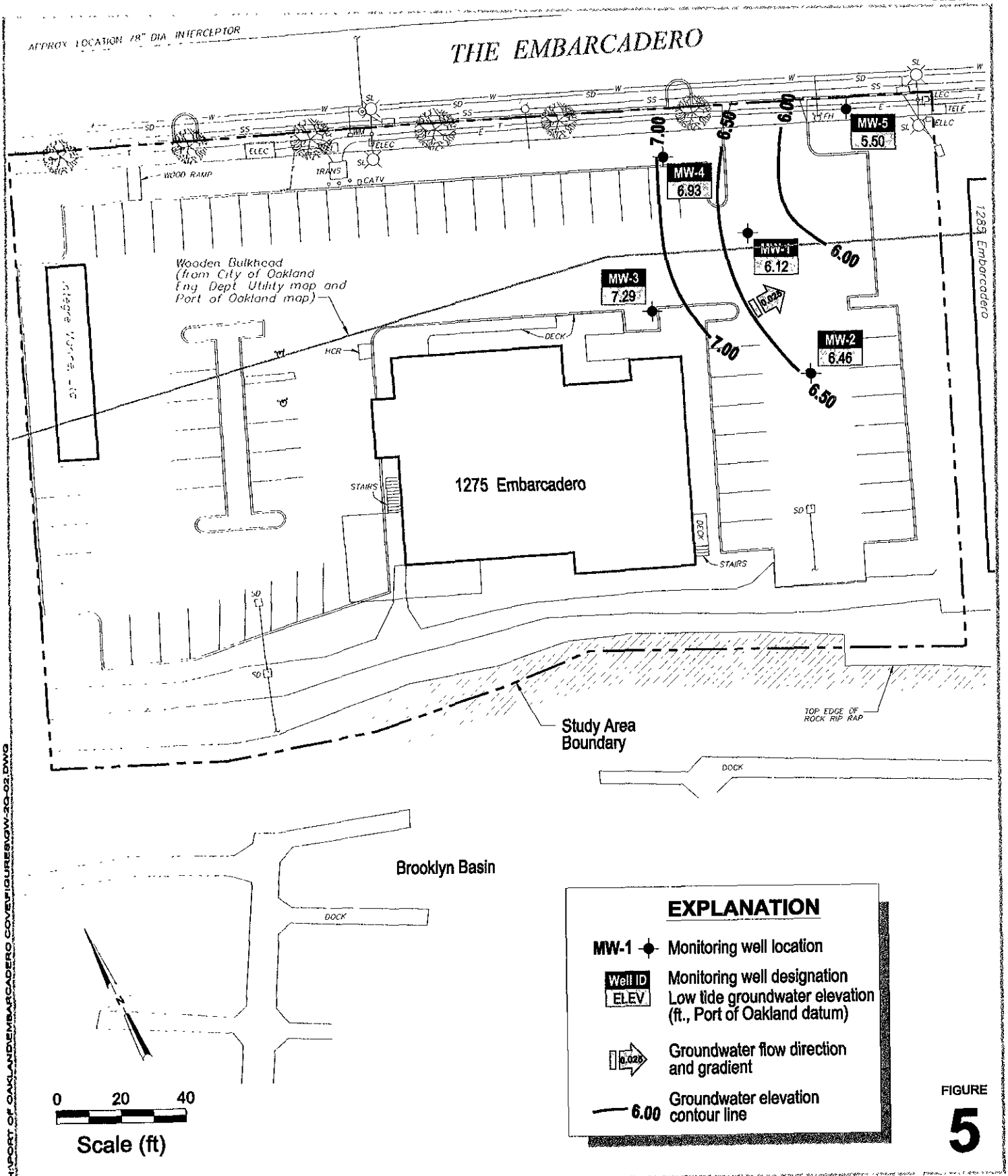

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FIGURE
5

Port of Oakland
1275 Embarcadero
Embarcadero Cove Project
Oakland, California

CAMBRIA

Groundwater Elevation Contours

May 3, 2002

07/08/02

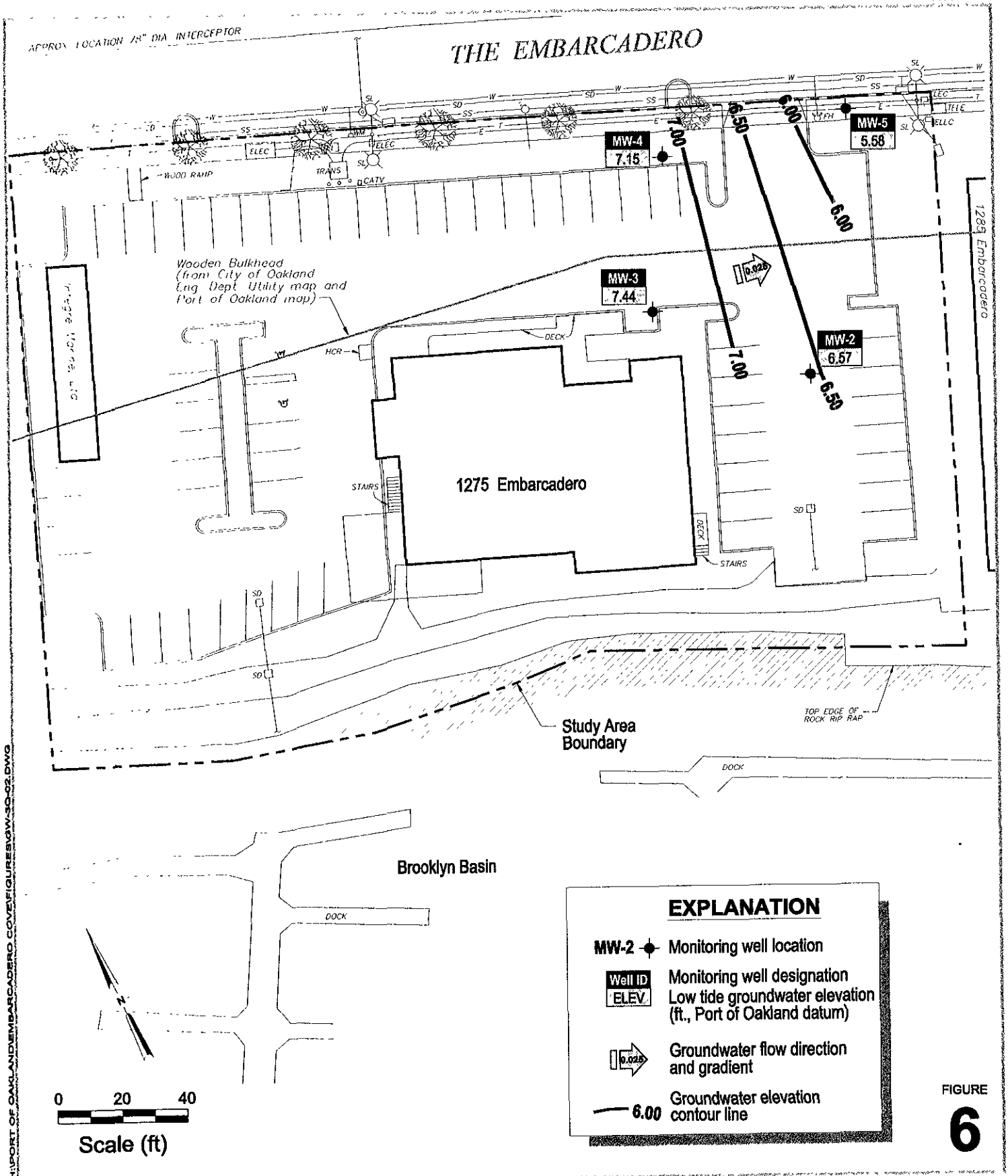

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FIGURE
6

Port of Oakland
1275 Embarcadero
Embarcadero Cove Project
Oakland, California

CAMBRIA

Groundwater Elevation Contours

July 2, 2002

Tables

CAMBRIA

Table 1: Soil Analytical Data - Light-Range Petroleum Hydrocarbons and MTBE - 1275 Embarcadero, Oakland, CA

Sample ID	Date Sampled	Sample Depth (ft)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
			← mg/kg →					
Baseline Samples								
RN-A1;1 5-2	05/01/01	1.5	--	< 0 005	< 0 005	< 0 005	< 0 005	< 1 0
RN-A2;1-1.5	05/01/01	1 0	--	< 0 005	< 0 005	< 0 005	< 0 005	< 1 0
RN-A3,0.5-1	05/01/01	0.5	--	< 0.005	< 0 005	< 0 005	< 0 005	< 1 0
RN-A4,1.0-1.5	05/01/01	1 0	--	< 0.005	< 0 005	< 0 005	< 0 005	< 1 0
RN-B1,1-1 5	05/01/01	1 0	--	< 0 005	< 0.005	< 0 005	< 0 005	< 1 0
RN-B2;1-1 5	05/01/01	1.0	--	< 0 005	< 0.005	< 0 005	< 0 005	< 1 0
SB-1;0 75-1 25	05/01/01	0 75	< 1.1	< 0.0056	< 0.0056	< 0 0056	< 0 0056	--
SB-1;3-3.5	05/01/01	3 0	< 1 0	0.013	< 0 0052	< 0 0052	< 0 0052	--
SB-1A,0-0 5	05/02/01	0.0	< 1.1	< 0 0054	< 0.0054	< 0 0054	< 0 0054	--
SB-1A;5-5.5	05/02/01	5.0	**500**	< 0 130	1 1	5 0	**16.1**	--
SB-1B,1-1 5	05/02/01	1 0	< 1.0	< 0 005	< 0 005	< 0.005	0 0074	--
SB-2,1-1.5	05/01/01	1.0	< .98	< 0 0049	< 0 0049	< 0.0049	< 0 0049	--
SB-2,4-4 5	05/01/01	4 0	< 1.1	< 0 0054	< 0 0054	< 0.0054	< 0 0054	--
SB-2C;0-0.5	05/02/01	0.0	< 0.96	< 0 0048	< 0.0048	< 0 0048	< 0 0048	--
SB-2C;3-3.5	05/02/01	3 0	< 1 0	< 0.0052	< 0 0052	< 0 0052	< 0 0052	--
Cambria Samples								
SB-A-3 5	08/30/01	3 5	< 1.0	< 0 005	< 0 005	< 0.005	< 0.005	< 0 05
SB-B-3.5	08/30/01	3.5	< 1 0	< 0 005	< 0 005	< 0 005	< 0 005	< 0.05
SB-D-3.5	08/30/01	3.5	< 1.0	< 0 005	< 0.005	< 0 005	< 0 005	< 0 05
SB-E-3.5	08/30/01	3.5	1.4	0.014	0 0080	< 0.005	0.026	< 0 05
SB-F-3.5	08/30/01	3.5	2.5	0.021	0.010	< 0.005	0 005	< 0 05
M-1-5	09/17/01	5.0	**2,300**	**1.8**	3.7	**48**	**7.2**	**5.1**
MW-1-8.3	10/09/01	8.3	30	**0.48**	0.067	0 70	0 52	<0 05
MW-2-5.0	10/09/01	5 0	7.5	0.027	0 051	0.041	0 087	<0 05
MW-3-5 0	10/09/01	5 0	1 6	< 0 005	< 0.005	< 0 005	< 0 005	<0 05
MW-4-5 3	10/09/01	5.3	34	**0.70**	0.068	0.41	0 97	<0.05

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Table 1: Soil Analytical Data - Light-Range Petroleum Hydrocarbons and MTBE - 1275 Embarcadero, Oakland, CA

Sample ID	Date Sampled	Sample Depth (ft)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
			mg/kg					
Current Cambria Investigation								
MW-5-7.0	04/26/02	7.0	<1	< 0.005	< 0.005	< 0.005	< 0.005	<0.05
MW-5-10.0	04/26/02	10.0	<1	< 0.005	< 0.005	< 0.005	< 0.005	<0.05
MW-5-10.5D*	04/26/02	10.5	<1	< 0.005	< 0.005	< 0.005	< 0.005	<0.05
Soil Screening Values								
Surface Soil (<3 m) Commercial Worker [non-drinking water source][1]								
Human Health Risk-Based			11,000	0.39	89	220	210 sat	69
Soil Leaching-Based for Protection of Aquatic Life			400	2.1	8.4	24	1	1
Urban Area Ecotoxicity-Based			--	25	150	--	--	--
Construction Worker[2]								
Human Health Risk-Based			16,000	16	520 sat	230 sat	210 sat	4900

Abbreviations and Methods:

ft = feet

mg/kg = milligrams per kilogram

-- = not available, not analyzed, or does not apply

MTBE = methyl tert-butyl ether by EPA Method 8020

Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020 or 8021B

TPHg = total petroleum hydrocarbons as gasoline by EPA Methods modified 8015, 5030, and 8020 or 602

sat = saturation limit

Notes:

*Duplicate Sample.

[1] Soil screening values from RWQCB's (2000) Table B-2.

[2] Soil screening values from RWQCB's (2000) Table K-3

Bolded values indicate exceedance of soil screening values.

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Table 2: Soil Analytical Data - Heavy-Range Petroleum Hydrocarbons and SVOCs - 1275 Embarcadero, Oakland, CA

Sample ID	Date Sampled	Sample Depth (ft)	TPHd	TPHmo	bis(2-ethylhexyl) phthalate	Fluoranthene	2 - methyl naphthalene	Naphthalene	Pyrene
			←			mg/kg			→
Baseline Samples[1]									
RN-A1,1.5-2	05/01/01	1 5	--	--	--	--	--	< 0 0046	--
RN-A2;1-1.5	05/01/01	1 0	--	--	--	--	--	< 0 005	--
RN-A3;0.5-1	05/01/01	0 5	--	--	--	--	--	< 0 005	--
RN-A4;1 0-1.5	05/01/01	1 0	--	--	--	--	--	< 0 0046	--
RN-B1,1-1 5	05/01/01	1.0	--	--	--	--	--	< 0 0049	--
RN-B2,1-1.5	05/01/01	1.0	--	--	--	--	--	< 0 0047	--
SB-1;0.75-1.25	05/01/01	0.75	62[2]	--	< 0 33	< 0 33	< 0.33	< 0.33	< 0 33
SB-1,3-3 5	05/01/01	3 0	13[2]	--	0.61	< 0 33	< 0.33	< 0 33	< 0 33
SB-1A;0-0.5	05/02/01	0.0	240[2]	--	< 6.60	< 6 60	< 6 60	< 6 60	< 6 60
SB-1A,5-5 5	05/02/01	5 0	40[2]	--	< 0 33	< 0 33	2.2	2 2	< 0 33
SB-1B;1-1.5	05/02/01	1.0	60[2]	--	--	--	--	--	--
SB-2;1-1.5	05/01/01	1.0	43[2]	--	< 0 33	< 0.33	< 0 33	< 0 33	< 0 33
SB-2,4-4.5	05/01/01	4.0	43[2]	--	< 0.33	< 0 33	< 0.33	< 0 33	< 0 33
SB-2C;0-0.5	05/02/01	0.0	25[2]	--	--	--	--	--	--
SB-2C;3-3.5	05/02/01	3.0	37[2]	--	--	--	--	--	--
Cambria Samples									
SB-A-3.5	08/30/01	3.5	1.4	5 2	--	< 0 25	--	< 0 25	< 0 25
SB-B-3.5	08/30/01	3.5	< 1 0	< 5.0	--	< 0.062	--	< 0 062	< 0 062
SB-D-3.5	08/30/01	3 5	< 1.0	< 5 0	--	< 0 062	--	< 0.062	< 0 062
SB-E-3.5	08/30/01	3.5	2.4	6.1	--	< 0.062	--	< 0 062	< 0.062
SB-F-3 5	08/30/01	3.5	4 6	16	--	< 0.25	--	< 0.25	< 0 25
M-1-5	09/17/01	5.0	850	97	--	--	--	--	--
MW-1-8.3	10/09/01	8.3	5.7	< 5.0	< 0.33	< 0.33	< 0.33	< 0 33 / 0 58[3]	< 0 33
MW-2-5.0	10/09/01	5.0	74	300	< 1.0	< 1 0	< 1 0	< 1.0 / < 0 005[3]	< 1 0
MW-3-5 0	10/09/01	5.0	17	160	< 0.33	< 0 33	< 0 33	< 0.33 / < 0.005[3]	< 0 33
MW-4-5.3	10/09/01	5 3	8.3	10	< 0.33	< 0 33	< 0.33	0 62 / 0 62[3]	< 0 33

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Table 2: Soil Analytical Data - Heavy-Range Petroleum Hydrocarbons and SVOCs - 1275 Embarcadero, Oakland, CA

Sample ID	Date Sampled	Sample Depth (ft)	TPHd	TPHmo	bis(2-ethylhexyl) phthalate	Fluoranthene	2 - methyl naphthalene	Naphthalene	Pyrene
			← mg/kg →						
Current Cambria Investigation									
MW-5-7 0	04/26/02	7 0	8 6	15	--	--	--	--	--
MW-5-10.0	04/26/02	10 0	14	22	--	--	--	--	--
MW-5-10 5D*	04/26/02	10 5	12	26	--	--	--	--	--
Soil Screening Values									
Surface Soil (<3 m) Commercial Worker [non-drinking water source] [4]									
Human Health Risk-Based			11,000	11,000	180	6,000	280	5 7	11,000
Soil Leaching-Based for Protection of Aquatic Life			500	1,000	530	60	0 25	4 9	55
Urban Area Ecotoxicity-Based			--	--	--	40	--	40	--
Construction Worker [5]									
Human Health Risk-Based			16,000	16,000	1,200	12,000	18,000	450	16,000

Abbreviations and Methods:

ft = feet

mg/kg = milligrams per kilogram

-- = not available, not analyzed, or does not apply

TPHd = total petroleum hydrocarbons as diesel by EPA method 8015

TPHd analyses with silica gel clean-up prior to extraction unless otherwise noted

TPHmo = total petroleum hydrocarbons as motor oil by EPA method 8015

SVOC = semi-volatile organic compounds by EPA Method 8270 (modified 8100) and 3550 or 625 and 3510 unless otherwise noted

Notes:

Only those compounds above laboratory reporting limits are shown

*Duplicate sample

[1] Baseline samples analyzed for SVOCs by EPA Method 8260 or 8270

[2] No silica gel cleanup performed, prepared by shaker table

[3] Analyzed by EPA Method 8270 and additionally by EPA Method 8260

[4] Soil screening values from RWQCB's (2000) Table B-2

[5] Soil screening values from RWQCB's (2000) Table K-3.

Bolded values indicate exceedance of soil screening values.

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Table 3: Soil Analytical Data - PAHs - 1275 Embarcadero, Oakland, CA

Sample ID	Date Sampled	Sample Depth (ft)	Benzo(a)anthracene	Benzo(b)Fluoranthene	Benzo(k)Fluoranthene	Benzo(g,h,i)perlyene	Benzo(a)pyrene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
			~~mg~~ µg/kg										
Current Cambria Investigation													
MW-5-7.0	04/26/02	7.0	8.5	16	11	23	33	<5.0	25	23	28	<5.0	86
MW-5-10.0	04/26/02	10.0	54	50	34	45	110	23	71	200	120	17	540
MW-5-10.5D	04/26/02	10.5	73	67	45	43	140	25	86	220	91	17	570
Limit within Table K-3 ppb			5000	12000	12000	12(10^6)	1200	120000	3500	12(10^6)	12000	18(10^6)	16(10^6)

Abbreviations and Methods:

mg/kg = milligrams per kilogram

PAH = polynuclear aromatic hydrocarbons by EPA Methods 8310 and 3510

Notes:

Only those compounds above laboratory reporting limits are shown

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Table 4: Soil Analytical Data - Stockpile Analysis - 1275 Embarcadero, Oakland, CA

Sample ID	Date Sampled	TPHd	TPHg	Benzene	n-Butyl benzene	tert-Butyl benzene	Isopropyl benzene	Naphthalene	Toluene	1,2,4-Trimethyl benzene	Xylenes	sec-Butyl benzene	Ethylbenzene	2-Hexanone	4-Isopropyl toluene	4-Methyl-2-pentanone	Methyl-tert-butyl ether	n-Propyl benzene	1,3,5-Trimethyl benzene
		mg/kg																	
S1-A,B,C,D	05/15/02	150	450	(0.63)	3.2	1.1	0 84	6.1	(2 6) 2	11	(15) 12	0 64	(5 1) 5	0.68	0 54	2.1	(<5.0) <0 5	4.4	3 4

Sample ID	Date Sampled	Arsenic	Barium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Vanadium	Zinc
		mg/kg									
S1-A,B,C,D	05/15/02	4.2	120	29	8.4	24	48.00	0.17	34	28	110

Abbreviations and Methods:

mg/kg = milligrams per kilogram

TPHd by EPA Method 8015C

TPHg by modified EPA Method 8015Cm

Parentheses indicate analysis by EPA Method 8021B

VOCs by EPA Method 8260B

Metals by EPA Method 6010C/200.7

Notes:

Only those compounds above laboratory reporting limits are shown

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Table 5: Groundwater Analytical and Elevation Data - Light-Range Petroleum Hydrocarbons and MTBE - 1275 Embarcadero, Oakland, CA

Sample ID *TOC* (ft)	Date Sampled	Groundwater Elevation (ft [1])	Depth to Water (ft)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				µg/L					
Baseline Grab Samples									
SB-1	05/01/01	--	--	80,000	8,600	8,200	3,900	14,600	--
SB-1A	05/02/01	--	--	25,000	260	170	760	2,290	--
SB-2	05/01/01	--	--	< 50	< 0.5	< 0 5	< 0 5	< 0 5	--
Cambria Grab Samples									
SB-A	08/30/01	--	--	< 50	< 0.5	< 0 5	< 0 5	< 0 5	< 5 0
SB-B	08/30/01	--	--	< 50	< 0.5	< 0 5	< 0 5	< 0 5	< 5 0
SB-D	08/30/01	--	--	< 50	< 0 5	< 0 5	< 0 5	< 0 5	< 5 0
SB-E	08/30/01	--	--	39,000	3,200	750	1,200	3,600	< 200
SB-F	08/30/01	--	--	< 50	< 0.5	< 0 5	< 0 5	< 0 5	< 5 0
Cambria Monitoring Well Samples									
MW-1	10/12/01	4 88	7.15	--	--	--	--	--	--
12 03	10/19/01	4 81	7 22	11,000	900	300	470	1,000	--
	12/05/01 [2]	5 33	6.70	13,000	1,300	180	1,200	860	< 20
	12/05/01 [3]	4 74	7 29	3,100	270	12	150	74	< 5 0
	12/19/01 [4]	4.95	7 08	--	--	--	--	--	--
	05/03/02	6.12	5.91	20,000	1,400	160	580	630	<500
MW-2	10/12/01	5.71	5.75	--	--	--	--	--	--
11 46	10/19/01	5.52	5.94	< 50	< 0.5	< 0.5	< 0 5	< 0 5	--
	12/05/01 [2]	6 11	5.35	< 50	< 0.5	< 0 5	< 0 5	< 0 5	< 5 0
	12/05/01 [3]	5.66	5 80	< 50	< 0 5	< 0.5	< 0.5	< 0 5	< 5.0
	12/19/01 [4]	5 65	5.81	--	--	--	--	--	--
	05/03/02	6.46	5.00	< 50	< 0 5	< 0 5	< 0.5	< 0.5	< 5 0
	6/10/2002 [7]	6 57	4.89	< 50	< 0 5	< 0 5	< 0 5	< 0 5	< 5 0
MW-3	10/12/01	5.89	6.60	--	--	--	--	--	--
12 49	10/19/01 [5]	5.84	6.65	290	2.0	6 6	0.54	1 2	--
	12/05/01 [2,5]	6.69	5.8	310	0.72	2.2	< 0.5	< 0 5	< 5 0
	12/05/01 [3,5]	5.54	6 95	320	0.84	2 6	< 0.5	0.76	< 5 0
	12/19/01 [4]	6 10	6.39	--	--	--	--	--	--
	05/03/02	7 29	5.20	280	0.74	0 87	< 0.5	0 76	< 5 0
	6/10/2002 [7]	7.44	5.05	220	< 0.5	1	< 0 5	< 0 5	< 5 0

Table 5: Groundwater Analytical and Elevation Data - Light-Range Petroleum Hydrocarbons and MTBE - 1275 Embarcadero, Oakland, CA

Sample ID *TOC* (ft)	Date Sampled	Groundwater Elevation (ft [1])	Depth to Water (ft)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				µg/L					
MW-4	10/12/01	4.98	8.15	--	--	--	--	--	--
13.13	10/19/01	4.91	8.22	44,000	1,900	270	1,500	3,300	--
	12/05/01 [2]	5.61	7.52	13,000	120	28	170	380	< 10
	12/05/01 [3]	5.08	8.05	20,000	420	78	390	870	< 20
	12/19/01 [4]	5.09	8.04	--	--	--	--	--	--
	05/03/02	6.93	6.20	19,000	1,500	240	730	1,400	<1,000
	6/10/2002 [7]	7.15	5.98	28,000	1,700	230	930	2,100	<500
MW-5	05/03/02	5.50	4.69	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
10.19	6/10/2002 [7]	5.58	4.61	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
Trip Blank				--	--	--	--	--	--
TB	12/05/01	--	--	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0
				--	--	--	--	--	--
Groundwater Screening Values [6]									
Indoor Air Impacts				--	84	76,000	170,000 sol	150,000	290000
Aquatic Life Protection				3,700 [a]	700 [b]	5,000 [b]	430 [c]	13 [d]	8,000 [c]

Abbreviations and Methods:

ft = feet

µg/L = micrograms per liter

-- = not available, not analyzed, or does not apply

msl = mean sea level

Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8020

MTBE = methyl tert-butyl ether by EPA Method 8020

TPHg = total petroleum hydrocarbons as gasoline by EPA Methods modified 8015, 5030, and 8020 or 602

TOC Elev. (ft) = top of casing elevation in feet (Port of Oakland datum)

Depth to water in monitoring wells is ft below TOC.

sol = solubility threshold

Notes:

[1] Elevation in feet, Port of Oakland datum

[2] Wells gauged between 6.00 am and 6:30 am on 12/5 near lower high tide.

[3] Wells gauged between 11 40 am and 12:00 pm on 12/5 near higher high tide

[4] Wells gauged between 9.00 pm and 9:15 pm on 12/19 at lower low tide.

[5] Sample was collected pre-purge.

[6] Goundwater screening values from RWQCB's (2000) Table F-2, F-4a, b, and c

[7] Depth to water measurement collected on July 2, 2002

Bolded values indicate exceedance of groundwater screening values

[a] California Toxic Rule, Saltwater Criteria for Continuous Concentration

[b] USEPA Saltwater Chronic Lowest Observable Effect Level

[c] USEPA Saltwater Acute Lowest Observable Effect Level

[d] USDOE Freshwater Chronic Preliminary Remedial Goal

[e] RWQCB Saltwater Criteria for Continuous Concentration (interim)

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Table 6: Groundwater Analytical and Elevation Data - Heavy-Range Petroleum Hydrocarbons, SVOCs and PAHs
1275 Embarcadero, Oakland, CA

Sample ID *TOC* *(ft)*	Date Sampled	Groundwater Elevation (ft [1])	Depth to Water (ft)	TPHd	TPHmo	Acenaphthalene	bis(2-ethylhexyl) phthalate	Fluoranthene	1 - methyl-naphthalene	2 - methyl naphthalene	Naphthalene	Phenanthrene	Pyrene
				µg/L									
Baseline Grab Samples													
SB-1	05/01/01	--	--	**2,900**	--	< 94	< 94	< 94	--	**260**	610	< 94	< 94
SB-1A	05/02/01	--	--	**800**	--	<9 6	<9.6	<9.6	--	**130**	170	<9 6	<9 6
SB-2	05/01/01	--	--	180	--	< 9 7	< 9 7	< 9 7	--	< 9 7	< 9 7	< 9 7	< 9 7
Cambria Grab Samples													
SB-A	08/30/01	--	--	**1,500**	**7,200**	< 10	--	< 10	--	--	< 10	< 10	< 10
SB-B	08/30/01	--	--	63	550	< 10	--	< 10	--	--	< 10	< 10	< 10
SB-D	08/30/01	--	--	**1,100**	**3,400**	< 10	--	11	--	--	< 10	< 10	11
SB-E	08/30/01	--	--	**5,800**	350	< 50	--	< 50	--	--	370	< 50	< 50
SB-F	08/30/01	--	--	480	**1,400**	< 10	--	< 10	--	--	< 10	< 10	< 10
Cambria Monitoring Well Samples													
MW-1	10/12/01	4.88	7.15	--	--	--	--	--	--	--	--	--	--
12.03	10/19/01	4.81	7.22	**3,300**	< 250	< 10	< 10	< 10	--	**54**	66	< 10	< 10
	12/05/01 [2]	5.33	6.70	**3,800**	< 250	72	--	< 10	**150**	**220**	360	< 10	< 10
	12/05/01 [3,4]	4.74	7.29	**680**	< 250	9 6	--	< 1.0	**18**	**14**	22	1.3	< 1 0
	12/19/01 [5]	4 95	7.08	--	--	--	--	--	--	--	--	--	--
	5/3/2002 [8]	6 12	5 91	**5,300**	450	--	--	--	--	--	--	--	--
MW-2	10/12/01	5.71	5.75	--	--	--	--	--	--	--	--	--	--
11.46	10/19/01	5.52	5.94	210	460	< 10	< 10	< 10	--	< 10	< 10	< 10	< 10
	12/5/01 [2]	6.11	5.35	150	560	< 0.5	--	< 0 25	< 1 0	< 1.0	< 0 25	< 0 25	< 0 25
	12/05/01 [3,4]	5 66	5.80	75	270	< 0 5	--	< 0 25	< 1 0	< 1.0	< 0 25	< 0 25	< 0 25
	12/19/01 [5]	5.65	5.81	--	--	--	--	--	--	--	--	--	--
	5/3/2002 [8]	6.46	5.00	440	440	--	--	--	--	--	--	--	--
	6/10/2002 [9]	6.57	4.89	220	370	<10*	--	<10*	--	--	<10*	<50*	<10*

Table 6: Groundwater Analytical and Elevation Data - Heavy-Range Petroleum Hydrocarbons, SVOCs and PAHs
1275 Embarcadero, Oakland, CA

Sample ID	Date Sampled	Groundwater Elevation	Depth to Water	TPHd	TPHmo	Acenaphthalene	bis(2-ethylhexyl) phthalate	Fluoranthene	1 - methyl-naphthalene	2 - methyl naphthalene	Naphthalene	Phenanthrene	Pyrene
TOC				µg/L									
(ft)		(ft [1])	(ft)										
MW-3	10/12/01	5.89	6.60	--	--	--	--	--	--	--	--	--	--
12 49	10/19/01 [6]	5.84	6 65	1,600	1,300	< 25	< 25	< 25	--	670	420	< 25	< 25
	12/05/01 [2, 6]	6.69	5.80	480	480	< 0 5	--	< 0 25	< 1 0	< 1 0	< 0 25	< 0 25	< 0.25
	12/05/01 [3, 6]	5 54	6.95	530	550	< 0 5	--	< 0 25	< 1 0	< 1 0	< 0 25	< 0 25	0 31
	12/19/01 [5]	6 10	6 39	--	--	--	--	--	--	--	--	--	--
	5/3/2002 [8]	7.29	5.2	770	430	--	--	--	--	--	--	--	--
	6/10/2002 [9]	7.44	5.05	390	470	<10*	--	<10*	--	--	<10*	<50*	<10*
MW-4	10/12/01	4.98	8.15	--	--	--	--	--	--	--	--	--	--
13.13	10/19/01	4.91	8.22	33,000	900	< 50	< 50	< 50	--	< 50	< 50	< 50	< 50
	12/05/01 [2]	5.61	7.52	6,400	430	24	--	< 10	99	190	60	18	< 10
	12/05/01 [3]	5.08	8.05	5,400	450	21	--	< 10	100	180	96	12	< 10
	12/19/01 [5]	5.09	8.04	--	--	--	--	--	--	--	--	--	--
	5/3/2002 [8]	6.93	6.20	3,600	300	--	--	--	--	--	--	--	--
	6/10/2002 [9]	7.15	5.98	4,500	<250	<50*	--	<50*	--	--	250*	<250*	<50*
MW-5	5/3/2002 [8]	5.50	4.69	74	<250	--	--	--	--	--	--	--	--
10 19	6/10/2002 [9]	5 58	4 61	110	330	<10*	--	<10*	--	--	<10*	<50*	<10*
Groundwater Screening Values [7]													
Indoor Air Impacts				--	--	--	--	--	26,000 sol	26,000 sol	9,200	--	135 sol
Aquatic Life Protection				640 [a]	640 [a]	310 [g]	32 [b]	11 [c]	2 1 [d]	2.1 [d]	2,350 [e]	4 6 [f]	300 [c]

Table 6: Groundwater Analytical and Elevation Data - Heavy-Range Petroleum Hydrocarbons, SVOCs and PAHs
1275 Embarcadero, Oakland, CA

Sample ID	Date Sampled	Groundwater Elevation	Depth to Water	TPHd	TPHmo	Acenaphthalene	bis(2-ethylhexyl) phthalate	Fluoranthene	1 - methyl-naphthalene	2 - methyl naphthalene	Naphthalene	Phenanthrene	Pyrene
TOC (ft)		(ft [1])	(ft)	µg/L									

Abbreviations and Methods:

ft = feet

µg/L = micrograms per liter

-- = not available, not analyzed, or does not apply

msl = mean sea level

TOC Elev (ft) = top of casing elevation in feet (Port of Oakland datum)

TPHd analyses with silica gel clean-up prior to extraction unless otherwise noted

TPHmo = total petroleum hydrocarbons as motor oil by EPA method 8015

SVOC = semi-volatile organic compound analyses performed by EPA Method 8270 (modified 8100) and 3550 unless otherwise noted

PAH = polynuclear aromatic hydrocarbon analyses performed by EPA Method 8270D

TPHd = total petroleum hydrocarbons as diesel by EPA method 8015, and 3550 or 3510

Only those compounds above laboratory reporting limits are shown

Depth to water in monitoring wells is ft below TOC.

sol = solubility threshold

Notes:

[1] Elevation in feet, Port of Oakland datum

[2] Wells gauged between 6 00 am and 6.30 am on 12/5 near lower high tide.

[3] Wells gauged between 11·40 am and 12·00 pm on 12/5 near higher high tide

[4] SVOC extraction performed past standard 7day hold time per SW-846 Table 2-36 Revision 3,

[5] Wells gauged between 9.00 pm and 9 15 pm on 12/19 at lower low tide

[6] Sample was collected pre-purge

[7] Goundwater screening values from RWQCB's (2000) Table F-2, F-4a, b, and c

[8] Sample was analyzed without silica gel clean-up

[9] Depth to water measurement collected on July 2, 2002.

* PAH analysis

Bolded values indicate exceedance of groundwater screening values.

[a] RWQCB Saltwater and Freshest Water Criteria

[b] USEPA Freshwater Chronic Ecotoxicity Criteria

[c] USEPA Saltwater Chronic Ecotoxicity Criteria

[d] USDOE Freshwater Chronic Preliminary Remedial Goal

[e] USEPA Saltwater Acute Lowest Observable Effect Level

[f] USEPA Saltwater Crierion for Continuous Concentration

[g] Ontario Ministry of Environment and Energy Drinking Water Screening Level

Appendices

APPENDIX A

Field Activity Descriptions

APPENDIX A

FIELD ACTIVITY DESCRIPTIONS

April 2002 Monitoring Well Installation

Field activities completed during the installation of monitoring well MW-5 are presented below. The discussion is organized according to the nature of the individual activity.

Field Date:	April 26, 2002.
Scope of Work:	Iris-Cambria advanced one (1) boring and completed it as a monitoring well. Three soil samples were collected from the boring. The well was developed and sampled per Tri-Regional procedural guidelines.
Personnel Present:	Ian Young, Cambria Senior Staff Geologist; and Robert Marinai, R.G., Cambria Project Geologist.
Drilling Company:	Gregg Drilling of Martinez, California (C-57 License No. 485165).
Drilling Methods:	Hollow-stem auger drill rig. The boring was hand-augered to 5 ft bgs as a safeguard to prevent damage to subsurface utilities.
Boring Depths:	Prior to well installation, the boring was drilled to depths of 12 ft bgs.
Soil Sampling:	Soil samples were collected continuously from all borings during drilling and logged in accordance with the Unified Soil Classification System.
Well Development:	On April 29, 2002, Iris-Cambria developed monitoring well MW-5. Well depth measurements are included in Appendix E.
Groundwater Gauging:	Groundwater was gauged during sampling in Site wells May 3, 2002. Well caps were removed and water levels allowed to equilibrate for at least 15 minutes and until stable. During each gauging event, all four wells were gauged within a 30-minute time period. Field forms are included in Appendix D.
Groundwater Sampling:	All five (5) site wells were sampled on May 5, 2002. The samples collected for volatile analyses were placed in 40-ml VOAs while samples collected for petroleum hydrocarbons were placed in 1 liter unpreserved ambers. The sample bottles were labeled and placed in

a cooled container for transport to McCampbell Analytical in Pacheco, California. Cambria's standard sampling procedures are presented in Appendix C. Well sampling forms are included in Appendix F

Chemical Analysis: Soil and groundwater samples were sent under chain of custody control to McCampbell Analytical, Inc., of Pacheco, California, and analyzed for: TPHg by EPA Method 8015; TPHd and TPHmo by EPA Method 8015 with silica-gel cleanup; and BTEX by EPA Method 8020. Soil samples were also analyzed for PAHs by EPA Methods 8310 and 3510. Laboratory analytical results are included in Appendix G.

Well Survey: Virgil Chavez Land Surveying of Vallejo, California, (State of California Licensed Land Surveyor No. 6323) surveyed the well top of casing (TOC) elevations of all wells relative to Port datum TP184 on June 4, 2002. Survey data is presented in Appendix F.

Waste Disposal: All soil cuttings and well development and purge water were left onsite in DOT-approved, 55-gallon drums pending disposal by the Port.

May 2002 Soil Excavation and ORC Placement

Field activities completed during the excavation of the former tank location are presented below. The discussion is organized according to the nature of the individual activity.

Field Date: May 15, 2002.

Scope of Work: Iris-Cambria excavated approximately 45 cubic yards of soil from an area 10 ft by 10 ft wide and 11 ft deep, centered on monitoring well MW-1. Well MW-1 was abandoned in the process and removed in its entirety. One hundred and twenty (120) lbs of oxygen releasing compound was distributed across the floor of the excavation, and the excavation backfilled with clean, imported fill.

Personnel Present: Ian Young, Cambria Senior Staff Geologist; Mary Hollad-Ford, Cambria Project Geologist; and Robert Marinai, R.G., Cambria Project Geologist.

Excavation Company: Foss Environmental Services of Alameda, California.

Excavation Methods: CAT 416Cit backhoe excavator.

Soil Stockpile Sampling: A four-point soil sample was collected from stockpiled soil.

Chemical Analysis: Soil samples were sent under chain of custody control to McCampbell Analytical, Inc., of Pacheco, California, and analyzed for: TPHg by EPA Method 8015; TPHd by EPA Method 8015 with silica-gel cleanup; BTEX by EPA Method 8020; VOCs by EPA Method 8260B; and metals by EPA Method 6010. Laboratory analytical results are included in Appendix G.

Waste Disposal: All excavated soil was stockpiled onsite on visqueen pending disposal by the Port.

APPENDIX B

Soil Boring Log / Well Construction Diagram

Cambria Environmental Technology, Inc.
1144 - 65th St.
Oakland, CA 94608
Telephone: (510) 420-0700
Fax: (510) 420-9170

BORING/WELL LOG

CLIENT NAME	Port of Oakland	**BORING/WELL NAME**	MW-5
JOB/SITE NAME	Embarcadero Cove	**DRILLING STARTED**	26-Apr-02
LOCATION	1275 Embarcadero, Oakland, CA	**DRILLING COMPLETED**	26-Apr-02
PROJECT NUMBER	458-1705	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	8"	**SCREENED INTERVAL**	4 to 12 ft bgs
LOGGED BY	I. Young	**DEPTH TO WATER (First Encountered)**	7.5 ft (26-Apr-02) ▽
REVIEWED BY	R. Marinai, RG# 5479	**DEPTH TO WATER (Static)**	NA ▼
REMARKS	Hand augered to 5 ft bgs, located in sidewalk approximately 9 ft south of driveway.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
							CONCRETE	0.3	Portland Type I/II Cement
0.0							**FILL**. Baserock/gravelly fill; high estimated permeability. @ 0.5 ft: **Sandy Gravelly FILL**: Brown; dry; 15% silt, 65% medium to coarse grained sand, 20% coarse gravel; brick fragments present.	2.5	Bentonite Seal
					CL		**Silty CLAY** (CL): Mottled light and dark brown; stiff; dry, 50% clay, 40% silt, 10% fine grained sand; low plasticity; low estimated permeability.	3.5	Monterey Sand #2/12
							Silty Sandy FILL: Dark brown; dry; 10% clay, 40% silt, 50% fine to medium grained sand; moderate estimated permeability.	4.0	
					CL		**CLAY** (CL): Interbedded grey and black; stiff; dry; 80% clay, 20% silt; high plasticity; low estimated permeability.		
				5				5.5	
0.0		MW-5-7.0			ML		**Clayey SILT** (ML): Grey; very loose; wet; 30% clay, 70% silt; slight plasticity, moderate estimated permeability. ▽		2"-diameter, 0.010" Slotted Schedule 40 PVC
								9.5	
0.0		MW-5-10.0		10	CL		**Silty CLAY** (CL): Greenish grey; loose; wet; 70% clay, 30% silt; low plasticity; low estimated permeability; occasional thin sand lenses and shell fragments present.	12.0	Bottom of Boring @ 12 ft

WELL LOG (PID) H:\PORTOF~1\EMBARC~1\GINTECOVEMW.GPJ DEFAULT GDT 7/10/02

APPENDIX C

Standard Field Procedures for Soil Borings and Monitoring Wells

CAMBRIA

STANDARD FIELD PROCEDURES FOR SOIL BORINGS AND MONITORING WELLS

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Analysis

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4° C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. The groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 ft below and 5 ft above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three ft thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two ft thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

F:\TEMPLATE\SOPs\Wells-borings-gw.wpd

APPENDIX D

Permits

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-5554
FAX (510)782-1939

APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Sidewalk between The Embarcadero & 275 Embarcadero in Oakland

CLIENT
Name Port of Oakland Doug Herman
Address 530 Water St. Phone 510.627.1184
City Oakland, CA Zip 94607

APPLICANT
Name R. Elena Ramirez
Fax 510.834.4199
Address 1615 Broadway, Ste 1003 Phone 510.834.4747
City Oakland, CA Zip 94612

FOR OFFICE USE
PERMIT NUMBER WO2-0469
WELL NUMBER
APN

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☐
Monitoring	☒	Well Destruction	☐

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	☒
Cable	☐	Other	☐		

DRILLER'S NAME Gregg Drilling

DRILLER'S LICENSE NO. 485165

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum Depth 15 ft.
Casing Diameter 2 in. Owner's Well Number MW-5
Surface Seal Depth 3 ft.

GEOTECHNICAL PROJECTS
Number of Borings Maximum
Hole Diameter in. Depth ft.

ESTIMATED STARTING DATE 4/26/02
ESTIMATED COMPLETION DATE 5/26/02

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE R. Elena Ramirez DATE 4/23/02

PLEASE PRINT NAME R. Elena Ramirez

Rev.9-21-01

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL

1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources-Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date

B. WATER SUPPLY WELLS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL

Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC

Fill hole anode zone with concrete placed by tremie.

D. WELL DESTRUCTION

Attached or Specified on permit application.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED DATE 4-25-02

JAMES YOO
(510) 670 6633

ALAMEDA COUNTY PUBLIC WORKS AGENCY

WATER RESOURCES SECTION
399 ELMHURST ST. HAYWARD CA. 94544-1395
PHONE (510) 670-5564
FAX (510)782-1939

APPLICANTS: PLEASE ATTACH A SITE MAP FOR ALL DRILLING PERMIT APPLICATIONS
DESTRUCTION OF WELLS OVER 45 FEET REQUIRES A SEPARATE PERMIT APPLICATION

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 1275 Embarcadero Oakland

CLIENT
Name Port of Oakland - Doug Herman
Address 530 Water St Phone 510-627-1184
City Oakland CA Zip 94607

APPLICANT
Name R. Elena Ramirez
Iris Environmental Fax 510 834-4189
Address 1615 Broadway Phone 510.834-4747
City Oakland Zip 94612

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	☐	General	☐
Water Supply	☐	Contamination	☐
Monitoring	☐	Well Destruction	X

PROPOSED WATER SUPPLY WELL USE

New Domestic	☐	Replacement Domestic	☐
Municipal	☐	Irrigation	☐
Industrial	☐	Other ____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Auger	X
Cable	☐	Other	☐		

DRILLER'S NAME V & W Drilling

DRILLER'S LICENSE NO. C57-D904

WELL PROJECTS
Drill Hole Diameter 8" in. Maximum
Casing Diameter ____ in. Depth 15 ft.
Surface Seal Depth ____ ft. Owner's Well Number MW-1

GEOTECHNICAL PROJECTS
Number of Borings ____ Maximum
Hole Diameter ____ in. Depth ____ ft.

ESTIMATED STARTING DATE May 15, 2002
ESTIMATED COMPLETION DATE June 15, 2002

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE R. Elena Ramirez DATE 5/14/02

PLEASE PRINT NAME R. Elena Ramirez

Rev.9-21-01

FOR OFFICE USE

PERMIT NUMBER WO2-0513
WELL NUMBER ____
APN ____

PERMIT CONDITIONS
Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the ACPWA office five days prior to proposed starting date.
2. Submit to ACPWA within 60 days after completion of permitted original Department of Water Resources Well Completion Report.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER SUPPLY WELLS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

D. GEOTECHNICAL
Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings.

E. CATHODIC
Fill hole inside zone with concrete placed by tremie.

D. WELL DESTRUCTION Attached

Attached or Specified on permit application.

G. SPECIAL CONDITIONS

NOTE: One application must be submitted for each well or well destruction. Multiple borings on one application are acceptable for geotechnical and contamination investigations.

APPROVED [signature] DATE 5-14-02

JAMES YOO
(510) 670-6633

APPENDIX E

Well Sampling Forms

CAMBRIA

WELL DEPTH MEASUREMENTS

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments
MW-1	3:35		5.91		14.80	
MW-2	3:30		5.00		14.80	
MW-3	3:25		5.20		12.60	
MW-4	3:20		6.20		14.25	
MW-5	3:15		4.69		12.00	

Project Name: Embarcadero Cove

Project Number: 458-1774

Measured By: L. Hill

Date: 5-3-02

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CAMBRIA

WELL SAMPLING FORM

Project Name: Embarcadero Cove	Cambria Mgr: **IY**	Well ID: MW-1
Project Number: 458-1774	Date:05/ 03 /02	Well Yield:
Site Address: 1275 Embarcadero Oakland, Ca	Sampling Method: **Disposable bailer**	Well Diameter: **2" pvc** Technician(s): SG
Initial Depth to Water: 5.91	Total Well Depth: 14.80	Water Column Height: 8.89
Volume/ft: 0.16	1 Casing Volume: 1.53	3 Casing Volumes: 4.61
Purging Device: **disposable bailer**	Did Well Dewater?: NO	Total Gallons Purged: 5
Start Purge Time: 6:10	Stop Purge Time: 6:24	Total Time: 14mins

1 Casing Volume = Water column height x Volume/ ft

Well Diam.	Volume/ft (gallons)
2"	0 16
4"	0 65
6"	1 47

Time	Casing Volume	Temp.	pH	Cond.	Comments
6:15	1.5	16.1	7.41	3999	
6:20	3	15.9	7.29	3999	
6:25	5	15.9	7.25	3995	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-1	**05/03/02**	6:30	**4VOAs**	**HCL**	**TPHg BTEX MTBE**	**8020/8260**
			Amber		**TPHd**	**8015**

CAMBRIA

WELL SAMPLING FORM

Project Name: Embarcadero Cove	Cambria Mgr: **IY**	Well ID: MW-2
Project Number: 458-1774	Date:05/ 03 /02	Well Yield:
Site Address: 1275 Embarcadero Oakland, Ca	Sampling Method: **Disposable bailer**	Well Diameter: **2" pvc** Technician(s): SG
Initial Depth to Water: 5.00	Total Well Depth: 14.80	Water Column Height: 9.80
Volume/ft: 0.16	1 Casing Volume: 1.56	3 Casing Volumes: 4.70
Purging Device: **disposable bailer**	Did Well Dewater?: no	Total Gallons Purged: 5
Start Purge Time: 5:25	Stop Purge Time: 5.39	Total Time: 14 mins

1 Casing Volume = Water column height x Volume/ ft

Well Diam.	Volume/ft (gallons)
2"	0 16
4"	0.65
6"	1 47

Time	Casing Volume	Temp.	pH	Cond.	Comments
5:30	1.5	15.9	7.14	3999	
5:35	3	15.9	7.19	3999	
5:40	5	15.9	7.21	3999	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-2	**05/03/02**	5:45	**4VOAs**	**HCL**	**TPHg BTEX MTBE**	**8020/8260**
			Amber		**TPHd**	**8015**

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NSM 5/31/94

CAMBRIA

WELL SAMPLING FORM

Project Name: Embarcadero Cove	Cambria Mgr: **IY**	Well ID: MW-3
Project Number: 458-1774	Date:05/ 03 /02	Well Yield:
Site Address: 1275 Embarcadero Oakland, Ca	Sampling Method: **Disposable bailer**	Well Diameter: **2" pvc** Technician(s): SG
Initial Depth to Water: 5.20	Total Well Depth: 12.60	Water Column Height: 7.40
Volume/ft: 0.16	1 Casing Volume: 1.18	3 Casing Volumes: 3.55
Purging Device: **disposable bailer**	Did Well Dewater?: no	Total Gallons Purged: 3.5
Start Purge Time: 4:48	Stop Purge Time: 4:54	Total Time: 14mins

1 Casing Volume = Water column height x Volume/ ft

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp.	pH	Cond.	Comments
4:50	1.5	15.8	7.27	3999	
4:52	3	15.9	7.21	3999	
4:55	4	15.8	7.20	3999	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-3	**05/03/02**	5:00	**4VOAs**	**HCL**	**TPHg BTEX MTBE**	**8020/8260**
			Amber		**TPHd**	**8015**

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CAMBRIA

WELL SAMPLING FORM

Project Name: Embarcadero Cove	Cambria Mgr: **IY**	Well ID: MW-4
Project Number: 458-1774	Date:05/ 03 /02	Well Yield:
Site Address: *1275 Embarcadero* Oakland, Ca	Sampling Method: **Disposable bailer**	Well Diameter: **2" pvc** Technician(s): SG
Initial Depth to Water: 6.20	Total Well Depth: 14.25	Water Column Height: 8.05
Volume/ft: 0.16	1 Casing Volume: 1.28	3 Casing Volumes: 3.86
Purging Device: **disposable bailer**	Did Well Dewater?: no	Total Gallons Purged: 4
Start Purge Time: 4:25	Stop Purge Time: 4.39	Total Time: 14 mins

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0 16
4"	0 65
6"	1 47

Time	Casing Volume	Temp.	pH	Cond.	Comments
4:30	1.5	15.9	7.20	3999	
~~4:35~~ 4:35	3	15.8	7.20	3999	
4:40	4	15.7	7.24	3999	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-4	**05/03/02**	4:45	**4VOAs**	**HCL**	**TPHg BTEX MTBE**	**8020/8260**
			Amber		**TPHd**	**8015**

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CAMBRIA

WELL SAMPLING FORM

Project Name: Embarcadero Cove	Cambria Mgr: **IY**	Well ID: MW-5
Project Number: 458-1774	Date:05/ 03 /02	Well Yield:
Site Address: 1275 Embarcadero Oakland, Ca	Sampling Method: **Disposable bailer**	Well Diameter: **2" pvc** Technician(s): SG
Initial Depth to Water: 4.69	Total Well Depth: 12.00	Water Column Height: 7.31
Volume/ft: 0.16	1 Casing Volume: 1.16	3 Casing Volumes: 3.50
Purging Device: **disposable bailer**	Did Well Dewater?: no	Total Gallons Purged: 3.5
Start Purge Time: 3:40	Stop Purge Time: 3.54	Total Time: 14mins

1 Casing Volume = Water column height x Volume/ ft

Well Diam.	Volume/ft (gallons)
2"	0 16
4"	0.65
6"	1 47

Time	Casing Volume	Temp.	pH	Cond.	Comments
3:45	1.5	15.9	7.25	3999	
3:50	2	15.9	7.27	3999	
3:55	3	15.9	7.23	3999	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW-5	**05/03/02**	4:00	**4VOAs**	**HCL**	**TPHg BTEX MTBE**	**8020/8260**
			Amber		**TPHd**	**8015**

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CAMBRIA

Groundwater Monitoring Field Sheet

Well ID	Time	DTP	DTW	Product Thickness	Amount of Product Removed	Casing Diam.	Comment
MW-2	2:40		4.89				
MW-3	2:35		5.05				
MW-4	2:30		5.98				
MW-5	2:45		~~41.67~~ 4.69				

Project Name: Embarcadero Cove

Project Number/Task: 458-1774-002

Measured By: L. Gill

Date: 7-2-02

APPENDIX F

Survey Data

Virgil Chavez Land Surveying
312 Georgia Street, Suite 225
Vallejo, California 94590-5907
(707) 553-2476 • Fax (707) 553-8698

June 5, 2002
Project No.: 2003-37

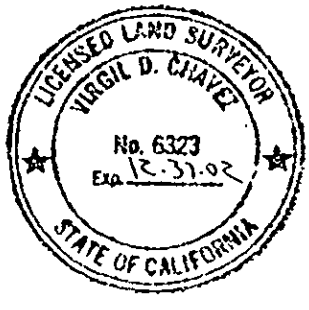
Rob Marinai
Cambria Environmental
1144-65th Street, Suite C
Oakland, CA 94608

Subject: Monitoring Well Survey
Port of Oakland
1275 Embarcadero
Oakland, CA

Dear Rob:

This is to confirm that we have proceeded at your request to survey the ground water monitoring wells located at the above referenced location. The survey was completed on June 4, 2002. The benchmark for this survey was a Port of Oakland benchmark "TP184". The latitude, longitude and coordinates are for top of casings and are based on the California State Coordinate System, Zone III (NAD83) as per the Port of Oakland Record of Survey map recorded in Book 18 of Surveys, Page 50.
Benchmark Elevation 13.42 feet (Port of Oakland Datum).

Latitude	Longitude	Northing	Easting	Elev.	Desc.
				11.72	RIM MW-2
37.7876824	-122.2508440	2114007.51	6055751.15	11.46	TOC MW-2
				12.79	RIM MW-3
37.7877898	-122.2509711	2114047.29	6055715.16	12.49	TOC MW-3
				13.28	RIM MW-4
37.7879037	-122.2508868	2114088.29	6055740.30	13.13	TOC MW-4
				10.44	RIM MW-5
37.7878807	-122.2506888	2114078.83	6055797.35	10.19	TOC MW-5



Sincerely,

Virgil D. Chavez, PLS 6323

APPENDIX G

Laboratory Analytical Reports

McCampbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone 925-798-1620 Fax 925-798-1622
http://www.mccampbell.com E-mail main@mccampbell.com

Cambria Env Technology	Client Project ID: #458-1789; Embarcadero Cove	Date Sampled: 04/26/02
1144 65th Street, Suite C		Date Received. 04/30/02
Oakland, CA 94608	Client Contact: Rob Marinai	Date Extracted: 04/30/02
	Client P O :	Date Analyzed. 05/01/02-05/02/02

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

Extraction method. SW5030B | Analytical methods. SW8021B/8015Cm | Work Order 0204481

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-5-7.0	S	ND	ND	ND	ND	ND	ND	1	106
002A	MW-5-10 0	S	ND	ND	ND	ND	ND	ND	1	112
003A	MW-5-10.5D	S	ND	ND	ND	ND	ND	ND	1	109
Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5	0.5	0.5	0.5	0.5	ug/L		
	S	1	0.05	0.005	0.005	0.005	0.005	mg/Kg		

*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L.

DF = dilution factor.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCampbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone 925-798-1620 Fax 925-798-1622
http://www.mccampbell.com E-mail main@mccampbell.com

Cambria Env. Technology	Client Project ID. #458-1789; Embarcadero Cove	Date Sampled. 04/26/02
1144 65th Street, Suite C		Date Received. 04/30/02
Oakland, CA 94608	Client Contact: Rob Marinai	Date Extracted: 04/30/02
	Client P.O.:	Date Analyzed. 05/01/02

Diesel (C10-23) and Oil (C18+) Range Extractable Hydrocarbons as Diesel and Motor Oil with Silica Gel Clean-Up*

Extraction method. SW3550C | Analytical methods: SW8015C | Work Order: 0204481

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	DF	% SS
001A	MW-5-7 0	S	8.6,g,b	15	1	99 3
002A	MW-5-10 0	S	14,g,b	22	1	98.3
003A	MW-5-10.5D	S	12,g,b	26	1	104

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	NA	NA	ug/L
	S	1	5	mg/Kg

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
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Telephone : 925-798-1620 Fax . 925-798-1622
http //www mccampbell.com E-mail: main@mccampbell com

Cambria Environmental Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: #458-1789; Embarcadero Cove	Date Sampled: 04/26/02
		Date Received: 04/30/02
	Client Contact: Rob Marinai	Date Extracted: 04/30/02
	Client P.O:	Date Analyzed: 05/01-05/02/02

Polynuclear Aromatic Hydrocarbons (PAH / PNA) by Liquid Chromatography

EPA methods 8310 and 3510

Lab ID	0204481-001A	0204481-002A	0204481-003A	Reporting Limit	
Client ID	MW-5-7.0	MW-5-10 0	MW-5-10 5D	S	W, STLC TCLP
Matrix	S	S	S		
Compound	Concentration*			ug/kg	ug/L
Acenaphthene	ND	ND<10	ND<10	5 0	N/A
Acenaphthylne	ND	ND<10	ND<10	5 0	N/A
Anthracene	ND	ND<10	ND<10	5 0	N/A
Benzo(a)anthracene	8.5	54	73	5 0	N/A
Benzo(b)fluoranthene	16	50	67	5 0	N/A
Benzo(k)fluoranthene	11	34	45	5.0	N/A
Benzo(g,h,i)perylene	23	45	43	5 0	N/A
Benzo(a)pyrene	33	110	140	5 0	N/A
Chrysene	ND	23	25	5.0	N/A
Dibenzo(a,h)anthracene	25	71	86	5.0	N/A
Fluoranthene	23	200	220	5.0	N/A
Fluorene	ND	ND<10	ND<10	5 0	N/A
Indeno(1,2,3-cd)pyrene	28	120	91	5.0	N/A
Naphthalene	ND	ND<10	ND<10	5 0	N/A
Phenanthrene	ND	17	17	5 0	N/A
Pyrene	86	540	570	5.0	N/A
% Recovery Surrogate 1	100	103	104		
% Recovery Surrogate 2	108	102	103		
Comments					

* water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipes in ug/wipe and all TCLP / STLC / SPLP extracts in ug/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

surrogate diluted out of range or surrogate coelutes with another peak

(h) a lighter than water immiscible sheen is present; (i) liquid sample that contains >~5 vol % sediment; (j) sample diluted due to high organic content.

DHS Certification No. 1644

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QC SUMMARY REPORT FOR SW8021B/8015Cm

BatchID: 1597 Matrix: S WorkOrder: 0204481

EPA Method: SW8021B/8015Cm Extraction: SW5030B Ext. Date: 4/30/02 Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	N/A	0.60	N/A	N/A	N/A	89.4	109	20	80	120
MTBE	N/A	0.10	N/A	N/A	N/A	82.3	90.4	9.4	80	120
Benzene	N/A	0.10	N/A	N/A	N/A	85.6	104	20	80	120
Toluene	N/A	0.10	N/A	N/A	N/A	89.3	111	22	80	120
Ethylbenzene	N/A	0.10	N/A	N/A	N/A	90.4	107	16	80	120
Xylenes	N/A	0.30	N/A	N/A	N/A	89.7	107	17	80	120
%SS	N/A	0.10	N/A	N/A	N/A	105	108	3.1	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample, LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or their RPDs near 0% if: a) the sample is inhomogeneous AND contains significant concentrations of analyze relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

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QC SUMMARY REPORT FOR SW8015C

BatchID: 1600 Matrix: S WorkOrder: 0204481

EPA Method: SW8015C Extraction: SW3550C Ext. Date: 4/30/02 Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(d)	N/A	150	N/A	N/A	N/A	91.4	89.9	1.7	70	130
%SS1	N/A	50	N/A	N/A	N/A	94 7	94 6	0 032	70	130
%SS2	N/A	50	N/A	N/A	N/A	97 8	96 6	1.3	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike, MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount

% Recovery = 100 * (MS-Sample)/(Amount Spiked); RPD = 100 * (MS - MSD)/(MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

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QC REPORT

SVOCs (EPA 8270/625/525)

Date: 05/01/02 Extraction: N/A Matrix: Soil

Compound	Concentration: mg/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 50102					Instrument	GC-8	
Surrogate1	ND	980.0	980.0	1000.00	98	98	0.0
Pyrene	ND	770.0	780.0	1000.00	77	78	1.3
Pentachlorophenol	ND	1320.0	1320.0	2000.00	66	66	0.0
2,4-Dinitrotoluene	ND	760.0	740.0	1000.00	76	74	2 7
4-Nitrophenol	ND	1220.0	1220.0	2000.00	61	61	0.0
Acenaphtene	ND	790.0	780.0	1000.00	79	78	1.3
4-Chloro-3-metylphenol	ND	1460.0	1480.0	2000.00	73	74	1.4
1,2,4-trichlorobenzene	ND	900.0	840.0	1000.00	90	84	6.9
N-nitroso-di-n-propyl	ND	850.0	870.0	1000 00	85	87	2.3
1,4-Dichlorobenzene	ND	870.0	860.0	1000.00	87	86	1.2
2-Chlorophenol	ND	1640.0	1680.0	2000.00	82	84	2.4
Phenol	ND	1460.0	1460.0	2000.00	73	73	0.0

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation

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CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☑ 5 DAY

Report To: Rob Marinai Bill To: Ports Oakland - Doug Herman

Company: Cambria Environmental Technology
1144 65th Street, Suite C
Oakland, CA 94608
Tele: (510) 420-0700 Fax: (510) 420-9170
Project #: 4558-1789 Project Name: Embarcadero Cove
Project Location: 1275 Embarcadero Cove
Sampler Signature:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO_3	Other
MW-5-7.0		4/26/02	9:35a	1	Brass		X				X			
MW-5-10.0		"	9:35a	1	↓		X				X			
MW-5-10.5D		"	9:35a	1	↓		X				X			

Analysis Request

BTEX & TPH as Gas (602/8020 + 8015) MTBE	TPH as Diesel (8015) and Motor Oil	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270C (8310)	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other	Comments
X	X									X						
X	X									X						
X	X									X						

Relinquished By:	Date:	Time:	Received By:
	4-30-02	1010	X233
X233	4-30-02	1410	OR P285
OR P285	4/30	1525	

Remarks: Silica gel cleanup for TPH_d and TPH_{mo}

McCampbell Analytical Inc.
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Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0204481

Client:
Cambria Env. Technology
1144 65th Street, Suite C
Oakland, CA 94608

TEL: (510) 420-0700
FAX: (510) 420-9170
ProjectNo: #458-1789; Emb
PO:

30-Apr-02

Sample ID	ClientSampID	Matrix	Collection Date	Bottle	Requested Tests		
					SW8015C	8021B/8015	SW8310
0204481-001	MW-5-7 0	Soil	4/26/02 9:25:00 AM		A	A	A
0204481-002	MW-5-10.0	Soil	4/26/02 9:35:00 AM		A	A	A
0204481-003	MW-5-10.5D	Soil	4/26/02 9:35:00 AM		A	A	A

Comments:

	Date/Time		Date/Time
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Relinquished by:		Received by:	

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

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

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Telephone 925-798-1620 Fax 925-798-1622
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Cambria Env. Technology	Client Project ID: #458-1774-002; Embaradero Cove	Date Sampled: 05/03/02
1144 65th Street, Suite C		Date Received: 05/08/02
Oakland, CA 94608	Client Contact: Ian Young	Date Extracted: 05/09/02-05/14/02
	Client P.O.:	Date Analyzed: 05/09/02-05/14/02

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

Extraction method: SW5030B | Analytical methods: SW8021B/8015Cm | Work Order: 0205105

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-1	W	20,000,a,+	ND<500	1400	160	580	630	100	113
002A	MW-2	W	ND	ND	ND	ND	ND	ND	1	113
003A	MW-3	W	280,a	ND	0.74	0.87	ND	ND	1	97.4
004A	MW-4	W	19,000,a	ND<1000	1500	240	730	1400	200	105
005A	MW-5	W	ND	ND	ND	ND	ND	ND	1	99.8
Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	ug/L		
	S	1.0	0.05	0.005	0.005	0.005	0.005	mg/Kg		

*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L.

DF = dilution factor

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol % sediment, j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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Cambria Env. Technology	Client Project ID: #458-1774-002; *Embaradero Cove*	Date Sampled: 05/03/02
1144 65th Street, Suite C		Date Received: 05/08/02
Oakland, CA 94608	Client Contact: Ian Young	Date Extracted: 05/08/02
	Client P.O.:	Date Analyzed: 05/08/02-05/09/02

Diesel (C10-23) and Oil (C18+) Range Extractable Hydrocarbons as Diesel and Motor Oil*

Extraction method SW3510C | Analytical methods: SW8015C | Work Order 0205105

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	DF	% SS
0205105-001B	MW-1	W	5300,d,b	450	1	88.7
0205105-002B	MW-2	W	440,c/m	440	1	86 2
0205105-003B	MW-3	W	770,d,b g,f	430	1	89.0
0205105-004B	MW-4	W	3600,d	300	1	93 9
0205105-005B	MW-5	W	74,b,g	ND	1	98.2
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	250	µg/L	
		S	NA	NA	mg/Kg	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil, n) stoddard solvent.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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QC SUMMARY REPORT FOR SW8021B/8015Cm

BatchID: 1738 *Matrix* W WorkOrder: 0205105

EPA Method: SW8021B/8015Cm Extraction SW5030B Ext Date 5/08/02 Spiked Sample ID 0205101-001A

Compound	Sample µg/L	Spiked µg/L	MS* % Rec	MSD* % Rec	MS-MSD* % RPD	LCS % Rec	LCSD % Rec	LCS-LCSD % RPD	Acceptance Criteria (%) Low	High
TPH(gas)	ND	60	105	102	3.10	108	104	3.8	80	120
MTBE	ND	10	107	99.7	6.63	93.5	91.5	2.2	80	120
Benzene	ND	10	106	109	2.42	108	111	2.1	80	120
Toluene	ND	10	107	109	1.61	109	111	2.0	80	120
Ethylbenzene	ND	10	108	109	0.877	110	109	0.75	80	120
Xylenes	ND	30	110	107	3.08	113	110	3.0	80	120
%SS	105	10	103	106	2.28	103	105	2.5	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions

NONE

MS = Matrix Spike, MSD = Matrix Spike Duplicate, LCS = Laboratory Control Sample, LCSD = Laboratory Control Sample Duplicate, RPD = Relative Percent Deviation

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount

% Recovery = 100 * (MS-Sample) / (Amount Spiked), RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or their RPDs near 0% if: a) the sample is inhomogeneous AND contains significant concentrations of analyze relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery

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QC REPORT

EPA 8015m + 8020

Date: 05/08/02 **Extraction:** EPA 5030 **Matrix:** Water

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID 50802					Instrument GC-2 A		
Surrogate1	ND	101 0	99.7	100.00	101	100	1.3
TPH (diesel)	ND	7500 0	7500 0	7500.00	100	100	0.0

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \ 100$$

$$\text{RPD} = \frac{(MS - MSD)}{(MS + MSD)} \ 2\,100$$

RPD means Relative Percent Deviation

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(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0205105

Client:
Cambria Env. Technology
1144 65th Street, Suite C
Oakland, CA 94608

TEL: (510) 420-0700
FAX: (510) 420-9170
ProjectNo: #458-1774-002;
PO:

08-May-02

Sample ID	ClientSampID	Matrix	Collection Date	Bottle	Requested Tests					
					SW8015C	8021B/8015				
0205105-001	MW-1	Water	5/3/02 6:30:00 AM		B	A				
0205105-002	MW-2	Water	5/3/02 5:45:00 AM		B	A				
0205105-003	MW-3	Water	5/3/02 5:00:00 AM		B	A				
0205105-004	MW-4	Water	5/3/02 4:45:00 AM		B	A				
0205105-005	MW-5	Water	5/3/02 4:00:00 AM		B	A				

Comments:

	Date/Time		Date/Time
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Relinquished by:		Received by:	

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made Hazardous samples will be returned to client or disposed of at client expense

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

0205105

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110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY

Report To: Ian Young Bill To: Cambria Env. Tech

Company: ~~Cambria Environmental Technology~~ Cambria Env. Tech

~~6262 Hollis Street~~ 1144 65th. St.

~~Emeryville, CA 94608~~ Oakland, Ca

Tele: (510) 420-0700 Fax: (510) ~~450-8295~~ 420-9170

Project #: 458-1774-002 Project Name: Embarcadero Cove

Project Location: 1275 Embarcadero, Oakland, Ca

Sampler Signature: [signature]

SAMPLE ID	LOCATION	Sampling Date	Sampling Time	# Containers	Type Containers	Matrix: Water	Soil	Air	Sludge	Other	Method Preserved: Ice	HCl	HNO_3	Other	BTEX & TPH as Gas (602/8020 + 8015)/ MTBE	TPH as Diesel (8015) [illegible]	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other: Confirm MTBE by 8260	Comments
MW-1		5-3-02	6:30	5	VOA Amber	X					X	X			X	X														X	
MW-2		5-3-02	5:45	5	VOA Amber	X					X	X			X	X														X	
MW-3		5-3-02	5:00	5	VOA Amber	X					X	X			X	X														X	
MW-4		5-3-02	4:45	5	VOA Amber	X					X	X			X	X														X	
MW-5		5-3-02	4:00	5	VOA Amber	X					X	X			X	X														X	

Relinquished By:	Date:	Time:	Received By:
[signature]	5-3-02	8:30	secure location
Relinquished By:	Date:	Time: 2:00	Received By: [signature] 5/8/02
Relinquished By:	Date:	Time:	Received By:

Remarks: Report results in EDF format

ICE/t° ✓ GOOD CONDITION ✓ PRESERVATION APPROPRIATE ✓ VOAS | O&G | METALS | OTHER

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http://www mccampbell com E-mail main@mccampbell com

Cambria Env Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: 458-1789, Embarcadero Cove	Date Sampled: 05/15/02
		Date Received: 05/16/02
	Client Contact: Rob Marinai	Date Extracted: 05/16/02
	Client P.O.:	Date Analyzed: 05/17/02

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

Extraction method SW5030B Analytical methods SW8021B/8015Cm Work Order 0205244

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	S1-A,B,C,D	S	450,a	ND<5.0	0 63	2 6	5 1	15	100	117

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5	0 5	0.5	0 5	0.5		ug/L
	S	1	0.05	0.005	0.005	0.005	0 005		mg/Kg

*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L

DF = dilution factor

cluttered chromatogram, sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant, b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant, h) lighter than water immiscible sheen/product is present, i) liquid sample that contains greater than ~2 vol % sediment, j) no recognizable pattern

DHS Certification No. 1644

Edward Hamilton, Lab Director

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http://www.mccampbell.com E-mail main@mccampbell.com

Cambria Env Technology 1144 65th Street, Suite C Oakland, CA 94608	Client Project ID: 458-1789; Embarcadero Cove	Date Sampled: 05/15/02
		Date Received 05/16/02
	Client Contact: Rob Marinai	Date Extracted 05/16/02
	Client P O :	Date Analyzed 05/17/02

Diesel Range (C10-23) Extractable Hydrocarbons as Diesel*

Extraction method SW3550C | Analytical methods SW8015C | Work Order 0205244

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
001A	S1-A,B,C,D	S	150,d,g	10	104
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	NA		NA
		S	1		mg/Kg

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation. a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant), d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel, f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; k) kerosene/kerosene range, l) bunker oil, m) fuel oil; n) stoddard solvent.

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http://www.mccampbell.com E-mail: main@mccampbell.com

Cambria Env. Technology	Client Project ID: 458-1789; Embarcadero Cove	Date Sampled: 05/15/02
1144 65th Street, Suite C		Date Received: 05/16/02
Oakland, CA 94608	Client Contact: Rob Marinai	Date Extracted: 05/16/02
	Client P.O:	Date Analyzed: 05/19/02-05/24/02

Volatiles Organics by GC/MS (Basic Target List)*

Extraction Method SW5030B | Analytical Method SW8260B | Work Order 0205244

Lab ID	0205244-001A
Client ID	S1-A,B,C,D
Matrix	Soil

Compound	Concentration *	DF	Reporting Limit	Compound	Concentration *	DF	Reporting Limit
Acetone	ND<5000	100	50	Benzene	ND<500	100	5
Bromobenzene	ND<500	100	5	Bromochloromethane	ND<500	100	5
Bromodichloromethane	ND<500	100	5	Bromoform	ND<500	100	5
Bromomethane	ND<500	100	5	2-Butanone (MEK)	ND<1000	100	10
n-Butyl benzene	3200	100	5	sec-Butyl benzene	640	100	5
tert-Butyl benzene	1100	100	5	Carbon Disulfide	ND<500	100	5
Carbon Tetrachloride	ND<500	100	5	Chlorobenzene	ND<500	100	5
Chloroethane	ND<500	100	5	2-Chloroethyl Vinyl Ether	ND<1000	100	10
Chloroform	ND<500	100	5	Chloromethane	ND<500	100	5
2-Chlorotoluene	ND<500	100	5	4-Chlorotoluene	ND<500	100	5
Dibromochloromethane	ND<500	100	5	1,2-Dibromo-3-chloropropane	ND<500	100	5
1,2-Dibromoethane (EDB)	ND<500	100	5	Dibromomethane	ND<500	100	5
1,2-Dichlorobenzene	ND<500	100	5	1,3-Dichlorobenzene	ND<500	100	5
1,4-Dichlorobenzene	ND<500	100	5	Dichlorodifluoromethane	ND<500	100	5
1,1-Dichloroethane	ND<500	100	5	1,2-Dichloroethane (1,2-DCA)	ND<500	100	5
1,1-Dichloroethene	ND<500	100	5	cis-1,2-Dichloroethene	ND<500	100	5
trans-1,2-Dichloroethene	ND<500	100	5	1,2-Dichloropropane	ND<500	100	5
1,3-Dichloropropane	ND<500	100	5	2,2-Dichloropropane	ND<500	100	5
1,1-Dichloropropene	ND<500	100	5	cis-1,3-Dichloropropene	ND<500	100	5
trans-1,3-Dichloropropene	ND<500	100	5	Ethyl benzene	5000	100	5
Hexachlorobutadiene	ND<500	100	5	2-Hexanone	680	100	5
Iodomethane (Methyl iodide)	ND<1000	100	10	4-Isopropyl toluene	540	100	5
Isopropylbenzene	840	100	5	4-Methyl-2-pentanone (MIBK)	2100	100	5
Methylene chloride	ND<2500	100	5	Methyl-t-butyl ether (MTBE)	ND<500	100	5
Naphthalene	6100	100	5	n-Propyl benzene	4400	100	5
Styrene	ND<500	100	5	1,1,1,2-Tetrachloroethane	ND<500	100	5
1,1,2,2-Tetrachloroethane	ND<500	100	5	Tetrachloroethene	ND<500	100	5
Toluene	2000	100	5	1,2,3-Trichlorobenzene	ND<500	100	5
1,2,4-Trichlorobenzene	ND<500	100	5	1,1,1-Trichloroethane	ND<500	100	5
1,1,2-Trichloroethane	ND<500	100	5	Trichloroethene	ND<500	100	5
Trichlorofluoromethane	ND<500	100	5	1,2,3-Trichloropropane	ND<500	100	5
1,2,4-Trimethylbenzene	11,000	100	5	1,3,5-Trimethylbenzene	3400	100	5
Vinyl Acetate	ND<5000	100	50	Vinyl Chloride	ND<500	100	5
Xylenes	12,000	100	5				

Surrogate Recoveries (%)

%SS1:	97.7	%SS2:	94.2
%SS3	94 0		

Comments

*water and vapor samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / SPLP extracts in ug/L

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis

(h) lighter than water immiscible sheen/product is present; (i) liquid sample that contains greater than ~2 vol. % sediment, (j) sample diluted due to high organic content.

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Cambria Env. Technology	Client Project ID: 458-1789; Embarcadero Cove	Date Sampled: 05/15/02
1144 65th Street, Suite C		Date Received: 05/16/02
Oakland, CA 94608	Client Contact: Rob Marinai	Date Extracted: 05/16/02
	Client P.O.:	Date Analyzed: 05/16/02-05/17/02

CAM 17 Metals

					Reporting Limit for DF =1; ND means not detected above the reporting limit	
Lab ID	0205244-001A				S	W
Client ID	S1-A,B,C,D					
Matrix	S				TTLC(mg/Kg)	mg/L
Extraction Type	TTLC					

ICP Metals, Concentration*

Analytical Method: 6010C Extraction Method: SW3050B

Dilution Factor	1				1	1
Antimony	ND				2.5	NA
Barium	120				2.5	NA
Beryllium	ND				0.5	NA
Cadmium	ND				0.5	NA
Chromium	29				0.5	NA
Cobalt	8.4				2	NA
Copper	24				2	NA
Lead	48				3	NA
Molybdenum	ND				2.5	NA
Nickel	34				2	NA
Silver	ND				1	NA
Vanadium	28				2	NA
Zinc	110				1	NA
% SS	96.1					

GFAA Metals, Concentration*

Analytical Method: SW7010 Extraction Method: SW3050B

Dilution Factor	1				1	1
Arsenic	4.2				2.5	NA
Selenium	ND				2.5	NA
Thallium	ND				2.5	NA

Cold Vapor Metals, Concentration*

Analytical Method: SW7471B Extraction Method: SW7471B

Dilution Factor	1				1	1
Mercury	0.17				0.06	NA
Comments						

* water samples are reported in mg/L, soil/sludge/solids/ samples in mg/kg, wipes in ug/wipe and all TCLP / STLC / DISTLC / SPLP extracts in mg/L

ND means not detected above the reporting limit; NA means not applicable to this sample or instrument

Analytical Methods. EPA 6010C/200.7 for all elements except: 200.9 (water- Sb, As, Pb, Se, Tl); 245.1 (Hg); 7010 (sludge/soil/solids/oil/ wipes - As, Se, Tl); 7471B (Hg)

DISTLC extractions are performed using STLC methodology except that deionized water is substituted for citric acid buffer as the extraction fluid. DISTLC results are not applicable to STLC regulatory limits.

1) liquid sample that contains greater than ~2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations.

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QC SUMMARY REPORT FOR SW8021B/8015Cm

BatchID: 1895 Matrix S WorkOrder 0205244

EPA Method SW8021B/8015Cm Extraction SW5030B Ext Date: 5/16/02 Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	N/A	0.60	N/A	N/A	N/A	98.6	99 6	1 0	80	120
MTBE	N/A	0 10	N/A	N/A	N/A	83 8	87 8	4 7	80	120
Benzene	N/A	0.10	N/A	N/A	N/A	99 3	104	4 5	80	120
Toluene	N/A	0.10	N/A	N/A	N/A	104	110	5 6	80	120
Ethylbenzene	N/A	0.10	N/A	N/A	N/A	103	109	5 2	80	120
Xylenes	N/A	0.30	N/A	N/A	N/A	107	110	3 1	80	120
%SS	N/A	0 10	N/A	N/A	N/A	101	104	3.8	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate, RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount.

% Recovery = 100 * (MS-Sample) / (Amount Spiked), RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or their RPDs near 0% if: a) the sample is inhomogeneous AND contains significant concentrations of analyze relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

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QC REPORT

EPA 8015m + 8020

Date: 05/17/02 **Extraction:** EPA 5030 **Matrix:** Soil

Compound	Concentration: mg/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 51602					Instrument	GC-2 B	
Surrogate1	ND	106.000	104.000	100.00	106	104	1.9
TPH (diesel)	ND	149.000	150.000	150.00	99	100	0.7

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{Amount Spiked} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 200$$

RPD means Relative Percent Deviation

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QC SUMMARY REPORT FOR SW8260B

BatchID: 1905 Matrix: S WorkOrder: 0205244

EPA Method: SW8260B Extraction: SW5030B Ext Date: 5/16/02 Spiked Sample ID: 0205243-001A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/Kg	µg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec	% RPD	Low	High
Benzene	ND	50	114	111	1.98	109	112	2 1	70	130
Chlorobenzene	ND	50	102	103	0 768	102	103	0 50	70	130
1,1-Dichloroethene	ND	50	124	125	1 11	118	114	2 9	70	130
Methyl-t-butyl ether (MTBE)	ND	50	100	96 9	3.41	101	99 9	0 92	70	130
Toluene	ND	50	104	105	0 223	102	102	0 54	70	130
Trichloroethene	ND	50	94 2	93 1	1 14	87 2	86.7	0 48	70	130
%SS1	101	50	101	99.4	1 63	102	98 6	2 9	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate, LCS = Laboratory Control Sample, LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if, a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels

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QC REPORT

CAM 17

Date: 05/17/02 **Extraction:** TTLC **Matrix:** Soil

Compound	Concentration: mg/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 51702					Instrument	P-1 | AA	
Beryllium	ND	5.3	5.4	5 00	105	109	3.6
Selenium	ND	9.7	8.3	10.00	97	83	16.1
Molybdenum	ND	5.4	5.2	5.00	107	104	2.7
Silver	ND	0.43	0.43	0.50	85	85	0 0
Thallium	ND	9.3	8.5	10.00	93	85	8.5
Barium	ND	4.5	4 6	5.00	90	92	1 6
Nickel	ND	5.0	5 0	5.00	101	101	0.0
Arsenic	ND	9.2	9.3	10.00	92	93	1.0
Vanadium	ND	4.9	5.0	5.00	98	100	2 1
Surrogate1	ND	98.6	99.3	100.00	99	99	0.7
Zinc	ND	4.9	5.1	5.00	98	102	4 2
Copper	ND	4.8	4.8	5.00	97	96	1.1
Antimony	ND	4.8	5.0	5.00	96	100	3.9
Lead	ND	5.0	5 2	5.00	100	105	4.9
Cadmium	ND	5.4	5.3	5.00	108	106	1.2
Cobalt	ND	5.0	5.4	5.00	100	108	8.3
Mercury	ND	0.23	0.20	0.25	93	81	13.2
Chromium	ND	5.1	5.2	5.00	101	103	2.0

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation

020524+c631a0c

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CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☑ 5 DAY

Report To: Rob Marinzi Bill To:
Company: Cambria Environmental Technology
1144 65th Street, Suite C
Oakland, CA 94608
Tele: (510) 420-0700 Fax: (510) 420-9170
Project #: 458-1789 Project Name: Embarcadero Cove
Project Location: 1275 Embarcadero Cove, Oakland
Sampler Signature:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	BTEX & TPH as Gas (602/8020 + 8015) MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other	Comments
S1-A,B,C,D		5/15/02	2:00p	4	Brass		X				X				X	X							X			X					4-pt Composite

Relinquished By:	Date:	Time:	Received By:
	5/16/2	1040	ER — P 285
ER — P 285	5/16/02	1315	
Relinquished By:	Date:	Time:	Received By:

Remarks:

PRESERVATION APPROPRIATE CONTAINERS ✓ VOAS ✓ O&G METALS OTHER

GOOD CONDITION ✓
HEAD SPACE ABSENT

+B. W

McCampbell Analytical Inc.
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CHAIN-OF-CUSTODY RECORD

WorkOrder: 0205244

Client:
Cambria Env. Technology
1144 65th Street, Suite C
Oakland, CA 94608

TEL: (510) 420-0700
FAX: (510) 420-9170
ProjectNo: #458-1789; Emb
PO:

16-May-02

Sample ID	ClientSampID	Matrix	Collection Date	Bottle	Requested Tests					
					6010C	SW7010	SW7471B	SW8015C	8021B/8015	SW8260B
0205244-001	S1-A,B,C,D	Soil	5/15/02 2:00:00 PM		A	A	A	A	A	A

Comments:

	Date/Time		Date/Time
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Relinquished by:		Received by:	

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

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

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Cambria Env. Technology	Client Project ID: 458-1774-002; Embarcadero Cove	Date Sampled: 06/10/02
1144 65th Street, Suite C		Date Received: 06/10/02
Oakland, CA 94608	Client Contact: Ian Young	Date Extracted: 06/11/02-06/13/02
	Client P.O.:	Date Analyzed: 06/11/02-06/13/02

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

Extraction method SW5030B *Analytical methods* SW8021B/8015Cm Work Order: 0206131

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-2	W	ND	ND	ND	ND	ND	ND	1	110
002A	MW-3	W	220,b	ND	ND	0 82	ND	ND	1	109
003A	MW-4	W	28,000,a	ND<500	1700	230	930	2100	100	111
004A	MW-5	W	ND	ND	ND	ND	ND	ND	1	112
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	5.0	0.5	0.5	0.5	0.5	ug/L	
		S	1.0	0.05	0.005	0.005	0.005	0.005	mg/Kg	

*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L.

DF = dilution factor.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment, j) no recognizable pattern; k) TPH pattern that does not appear to be derived from gasoline (aviation gas).

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Cambria Env. Technology	Client Project ID: 458-1774-002; Embarcadero Cove	Date Sampled. 06/10/02
1144 65th Street, Suite C		Date Received: 06/10/02
Oakland, CA 94608	Client Contact: Ian Young	Date Extracted: 06/07/02
	Client P.O :	Date Analyzed: 06/10/02-06/11/02

Diesel (C10-23) & Oil (C18+) Range, Extractable Hydrocarbons as Diesel & Motor Oil with Silica Gel Clean-Up*

Extraction method: SW3510C Analytical methods: SW8015C Work Order 0206131

Lab ID	Client ID	Matrix	TPH(d)	TPH(mo)	DF	% SS
0206131-001B	MW-2	W	220,b,g	370	1	92.7
0206131-002B	MW-3	W	390,d,b,g	470	1	95 2
0206131-003B	MW-4	W	4500,d	ND	1	102
0206131-004B	MW-5	W	110,b,g	330	1	93 6
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	250	µg/L	
		S	NA	NA	mg/Kg	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; k) kerosene/kerosene range, l) bunker oil; m) fuel oil, n) stoddard solvent.

DHS Certification No. 1644

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Cambria Env Technology	Client Project ID 458-1774-002; Embarcadero Cove	Date Sampled: 06/10/02
1144 65th Street, Suite C		Date Received: 06/10/02
Oakland, CA 94608	Client Contact: Ian Young	Date Extracted: 06/10/02
	Client P.O.:	Date Analyzed: 06/11/02-06/12/02

Polynuclear Aromatic Hydrocarbons (PAHs / PNAs) by GC/MS*

Extraction Method SW3550C | Analytical Method SW8270D | Work Order 0206131

Lab ID	0206131-001C	0206131-002C	0206131-003C	0206131-004C	Reporting Limit for DF =1	
Client ID	MW-2	MW-3	MW-4	MW-5		
Matrix	W	W	W	W		
DF	1	1	5	1	S	W
Compound	**Concentration**				ug/kg	µg/L
Acenaphthene	ND	ND	ND<50	ND	NA	10
Acenaphthylene	ND	ND	ND<50	ND	NA	10
Anthracene	ND	ND	ND<50	ND	NA	10
Benz(a)anthracene	ND	ND	ND<50	ND	NA	10
Benzo(b)fluoranthene	ND	ND	ND<50	ND	NA	10
Benzo(k)fluoranthene	ND	ND	ND<50	ND	NA	10
Benzo(g,h,i)perylene	ND	ND	ND<50	ND	NA	10
Benzo(a)pyrene	ND	ND	ND<50	ND	NA	10
Chrysene	ND	ND	ND<50	ND	NA	10
Dibenzo(a,h)anthracene	ND	ND	ND<50	ND	NA	10
Fluoranthene	ND	ND	ND<50	ND	NA	10
Fluorene	ND	ND	ND<50	ND	NA	10
Indeno (1,2,3-cd) pyrene	ND	ND	ND<50	ND	NA	10
Naphthalene	ND	ND	250	ND	NA	10
Phenanthrene	ND	ND	ND<250	ND	NA	50
Pyrene	ND	ND	ND<50	ND	NA	10
Surrogate Recoveries (%)						
%SS1	110	109	118	111		
%SS2	116	114	119	116		
Comments						

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit, N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCampbell Analytical Inc.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone 925-798-1620 Fax 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8021B/8015Cm

BatchID: 2358 Matrix: W WorkOrder: 0206131

EPA Method: SW8021B/8015Cm Extraction: SW5030B Ext. Date: 6/07/02 Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	N/A	60	N/A	N/A	N/A	95 8	94 8	1.1	80	120
MTBE	N/A	10	N/A	N/A	N/A	96.9	103	6 6	80	120
Benzene	N/A	10	N/A	N/A	N/A	106	114	6 9	80	120
Toluene	N/A	10	N/A	N/A	N/A	109	117	7 4	80	120
Ethylbenzene	N/A	10	N/A	N/A	N/A	108	116	7 3	80	120
Xylenes	N/A	30	N/A	N/A	N/A	107	113	6.1	80	120
%SS	N/A	10	N/A	N/A	N/A	106	109	2.5	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or their RPDs near 0% if a) the sample is inhomogeneous AND contains significant concentrations of analyze relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

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QC SUMMARY REPORT FOR SW8015C

BatchID: 2353 Matrix: W WorkOrder: 0206131

EPA Method: SW8015C Extraction: SW3510C Ext. Date: 6/07/02 Spiked Sample ID: N/A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(d)	N/A	7500	N/A	N/A	N/A	101	104	2.9	70	130
%SSI	N/A	2500	N/A	N/A	N/A	95.8	98.4	2.7	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions.

NONE

MS = Matrix Spike, MSD = Matrix Spike Duplicate, LCS = Laboratory Control Sample, LCSD = Laboratory Control Sample Duplicate, RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike, or analyte concentration in sample exceeds spike amount.

% Recovery = 100 * (MS-Sample)/(Amount Spiked); RPD = 100 * (MS - MSD)/(MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if, a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

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QC REPORT

PAHs (EPA 8270)

Date: 06/11/02 **Extraction:** N/A **Matrix:** Water

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 53102					Instrument		GC-8
Surrogate1	ND	590.0	590.0	1000.00	59	59	0.0
Pyrene	ND	500.0	500.0	1000.00	50	50	0.0
Acenaphtene	ND	520.0	510.0	1000.00	52	51	1.9

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$\text{RPD} = \frac{(MS - MSD)}{(MS + MSD)} \cdot 200$$

RPD means Relative Percent Deviation

McCampbell Analytical Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0206131

Client:

Cambria Env. Technology
1144 65th Street, Suite C
Oakland, CA 94608

TEL: (510) 420-0700
FAX: (510) 420-9170
ProjectNo: 458-1774-002; E
PO:

10-Jun-02

Sample ID	ClientSampID	Matrix	Collection Date	Bottle	Requested Tests		
					SW8015C	8021B/8015	SW8270D
0206131-001	MW-2	Water	6/10/02 4:00:00 PM	B	A	C	
0206131-002	MW-3	Water	6/10/02 3:20:00 PM	B	A	C	
0206131-003	MW-4	Water	6/10/02 2:55:00 PM	B	A	C	
0206131-004	MW-5	Water	6/10/02 1:25:00 PM	B	A	C	

Comments: REPORT IN EDF

	Date/Time		Date/Time
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Relinquished by:		Received by:	

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

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

020613

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY

Report To: Ian Young Bill To: Cambria Env. Tech

Company: Cambria Environmental Technology

~~6262 Hollis Street~~ 1144 65th St.

~~Emeryville, CA 94608~~ Oakland, Ca 94608

Tele: (510)-420-0700 Fax: ~~(510) 450-8295~~ 510-420-9170

Project #: 458-1774-002 Project Name: Embarcadero Cove

Project Location: 1275 Embarcadero Oakland, Ca

Sampler Signature:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO3	Other
MW-2		6-10-02	4:00	6	VOA Amb	X					X	X		
MW-3		6-10-02	3:20	6	VOA Amb	X					X	X		
MW-4		6-10-02	2:55	6	VOA Amb	X					X	X		
MW-5		6-10-02	1:25	6	VOA Amb	X					X	X		

Analysis Request

BTEX & TPH as Gas (602/8020 + 8015) MTBE	TPH as Diesel (8015) with silica gel cleanup	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI
X	X									X				
X	X									X				
X	X									X				
X	X									X				

Other: MTBE if detected then by 8260

Comments:

Relinquished By:	Date:	Time:	Received By:
	6/10/02	12:46	
Relinquished By	Date:	Time:	Received By
Relinquished By:	Date:	Time:	Received By:

Remarks: Report results in EDF format

VOAS | O&G | METALS | OTHER | ICE/t° | PRESERVATION | APPROPRIATE | CONTAINERS

APPENDIX H

Soil Disposal Manifests

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: CAL000232155
Manifest Doc. No.: 00002
2. Page 1 of 1
7/11/2002

GENERATOR

3. Generator's Name and Mailing Address
PORT OF OAKLAND
530 WATER ST.
OAKLAND, CA 94607

4. Generator's Phone (510) 627-1100

5. Transporter 1 Company Name: Vorthow [illegible] EQ
6. US EPA ID Number:
A. Transporter's Phone: (510) 889-7328

7. Transporter 2 Company Name:
8. US EPA ID Number:
B. Transporter's Phone: (510) 651 2822

9. Designated Facility Name and Site Address
ALLIED WASTE/FORWARD
9999 S. AUSTIN RD.
MANTECA, CA 95336

10. US EPA ID Number: CAD990794133
C. Facility's Phone: (209)466-4482

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-HAZARDOUS WASTE, SOLID (SOIL)	001	DT	00020	Y
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
A) 1578

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
WEAR PROPER PPE WHEN HANDLING
POSS ENVIRONMENTAL SERVICES: -- 24 HOUR EMERGENCY SERVICE -- (510)-749-1390
JOB # A2672 PO # A2672-01 TO # 02-CRE-06 WO # 104058

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: [illegible]
Signature: [signature]
Month Day Year: 07 11 02

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Month Day Year:

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature: [signature]
Month Day Year: 7 16 02

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name:
Signature:
Month Day Year:

Printed by J. J. Keller & Associates, Inc., Neenah, WI 54957-0368

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. CAL000232155	Manifest Doc. No. 00001	2. Page 1 of 1	7/11/2002

GENERATOR

3. Generator's Name and Mailing Address
PORT OF OAKLAND
530 WATER ST.
OAKLAND, CA 94607

4. Generator's Phone (510) 627-1100

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
[illegible handwriting]		[illegible]
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone
9. Designated Facility Name and Site Address	10. US EPA ID Number	C. Facility's Phone
ALLIED WASTE/FORWARD 9999 S. AUSTIN RD. MANTECA, CA 95336	CAD990794133	(209)466-4482

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-HAZARDOUS WASTE, SOLID (SOIL)	001	DT	00020	Y
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above
A) 1576

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
WEAR PROPER PPE WHEN HANDLING
FOSS ENVIRONMENTAL SERVICES. -- 24 HOUR EMERGENCY SERVICE -- (510)-749-1390
JOB # A2672 PO # A2672-01 TO # 02-CRE-06 WO # 104058

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
[illegible handwriting]	[signature]	[illegible]	[illegible]	[illegible]

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
[illegible handwriting]	[signature]	[illegible]	[illegible]	[illegible]

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

Please print or type (Form designed for use on elite (12-pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. CAL000232155	Manifest Doc. No. 00003	2. Page 1 of 1	7/11/2002

GENERATOR

3. Generator's Name and Mailing Address
PORT OF OAKLAND
530 WATER ST.
OAKLAND, CA 94607

4. Generator's Phone (510) 627-1100

5. Transporter 1 Company Name	6. US EPA ID Number	A. Transporter's Phone
7. Transporter 2 Company Name	**8. US EPA ID Number**	**B. Transporter's Phone**
9. Designated Facility Name and Site Address	**10. US EPA ID Number**	**C. Facility's Phone**
ALLIED WASTE/FORWARD 9999 S. AUSTIN RD. MANTECA, CA 95336	CAD990794133	(209)466-4482

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-HAZARDOUS WASTE, SOLID (SOIL)	001	DT	00020	Y
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above	E. Handling Codes for Wastes Listed Above
A) 1576	

15. Special Handling Instructions and Additional Information
WEAR PROPER PPE WHEN HANDLING
FOSS ENVIRONMENTAL SERVICES. -- 24 HOUR EMERGENCY SERVICE -- (510)-749-1390
JOB # A2672 PO # A2672-01 TO # 02-CRE-06 WO # 104058

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
		07	1[illegible]	[illegible]

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
[illegible] PAUL [illegible]		07	1[illegible]	[illegible]

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year