CET Environmental Services, Inc.

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93 OCT 25 PM 3:53

October 21, 1993

Juliet Shin
Hazardous Materials Specialist
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Subject: **Third Quarter Report, 1993**
Quarterly Groundwater Sampling and Monitoring
1150 Ballena Blvd., Alameda, California
(CET Project No. 3571)

Dear Mr. Anderson:

This report presents the results of quarterly groundwater sampling and monitoring conducted by CET Environmental Services, Inc. (CET) at the subject property during the Third Quarter 1993. Quarterly activities included groundwater elevation measurements, groundwater flow direction and gradient determination, and the collection and analysis of groundwater samples. Activities at the subject property were conducted in accordance with the Alameda County Health Care Services Agency's (ACHCSA) August 4, 1993 letter.

BACKGROUND

During the October 17, 1989 Loma Prieta earthquake, two, single-walled, 12,000-gallon underground storage tanks (USTs) (one containing diesel fuel and the other containing gasoline) rose upward through the backfill in response to the liquefaction of soils which surrounded the tanks at the time of the earthquake. After the earthquake, the USTs were removed from service.

In September 1990, the two tanks were replaced with two, double-walled, 12,000-gallon USTs (one containing diesel fuel and the other containing gasoline) equipped with leak detection systems. These tanks remain in service to date. In December 1992, three groundwater monitoring wells (MW1, MW2, and MW3) were installed near the USTs by Law/Crandell, Inc. of San Rafael. California. These wells are the focus of the groundwater sampling and monitoring activities currently being conducted at the subject property.

In 1991, one single-walled, 250-gallon waste oil underground storage tank (UST) was removed from the subject property. The waste oil tank pit has been vertically excavated to groundwater, and horizontally excavated to the bounds of utility lines and a building. To date, the waste oil tank pit has not been back-filled, but remains open and covered. Groundwater samples were collected from the open pit by CET, as requested by the ACHCSA; the results are presented below.

A site location map is included on Plate 1 (Attachment A). A site plan showing the locations of the two, 12,000 USTs and the former waste oil UST is presented on Plate 2a (Attachment A).

GROUNDWATER MONITORING SUMMARY

Groundwater Elevation Data

Locations of existing site groundwater monitoring wells (MW1, MW2, and MW3) are shown on Plate 2b (Attachment A). On September 2, 1993, the depth to groundwater was measured in all site monitoring wells. From these measurements, groundwater elevations were calculated. A summary of groundwater elevation data is presented in Table 1 (Attachment B).

Groundwater elevation contours, based on water levels recorded on September 2, 1993, are shown on Plate 3 (Attachment A). During the reporting period, the groundwater flow direction was toward the northeast at an average gradient of 0.0214 feet per foot (ft/ft).

Groundwater Sample Collection, Analysis, and Analytical Results

On September 2, 1993, groundwater samples (MW1, MW2 and MW3) were collected from all site monitoring wells. A "grab" groundwater sample (OP1) was also collected from the waste oil tank pit. The samples were submitted according to CET chain-of-custody protocol to a California Department of Health Services (DHS) accredited laboratory.

All samples were analyzed for total petroleum hydrocarbons as gasoline and as diesel (TPH/g and TPH/d, respectively), and for benzene, toluene, ethylbenzene, and total xylenes (BTEX). U.S. Environmental Protection Agency (EPA) Method Nos. 5030/8015, 3510/8015, and 602, were utilized for the TPH/g, TPH/d, and BTEX analyses, respectively.

The sample collected from the waste oil tank pit was additionally analyzed for semi-volatile organic compounds (SVOCs), total oil and grease (TOG), polychlorinated

biphenols (PCBs), and the metals cadmium, chromium, lead, nickel, and zinc. EPA Method Nos. 625, 5520, 608, and 3010/6010, were utilized for the SVOCs, TOG, PCB, and metals analyses, respectively.

Analytical results for groundwater samples are presented in Tables 2 and 3. (Attachment B). Concentrations of TPH/g and BTEX were below the method detection limits in groundwater samples collected from the monitoring wells. Concentrations of TPH/d were below the method detection limit in groundwater samples collected from monitoring wells MW2 and MW3; and were reported at 98 micrograms per liter (ug/L) in the sample collected from well MW1.

Concentrations of benzene, toluene, SVOCs, PCBs, and cadmium were below the method detection limits in the groundwater sample collected from the waste oil tank pit. Concentrations of TPH/motor oil, TPH/d, TPH/g, ethylbenzene, and total xylenes were reported at 20,000 ug/L, 9,100 ug/L, 580 ug/L, 19 ug/L, and 0.5 ug/L, respectively. TOG was reported at a concentration of 43,000 ug/L. Chromium, lead, nickel, and zinc were reported at concentrations of ~~50 ug~~/L, 20 ug/L, 140 ug/L, and 100 ug/L, respectively.

60ppb

Groundwater samples were collected and handled in accordance with the protocol presented in Attachment C. Signed laboratory analytical reports, chain-of-custody documents and sample collection records are provided in Attachment D.

SUMMARY AND CONCLUSIONS

Based on the analytical results presented herein, diesel range hydrocarbons were detected, at relatively low concentrations in only monitoring well MW-1. No gasoline constituents were detected in any of the monitoring wells this quarter. Both monitoring wells MW-2 and MW-3, located the closest to the Bay, contained no detectable petroleum hydrocarbons.

Elevated levels of oil and grease, motor oil, diesel, and gasoline-range hydrocarbons were detected in the groundwater grab sample from the waste oil tank pit, in order of decreasing concentration. No benzene or semivolatile compounds were detected in the grab sample. Total Chromium was detected at a concentration of 50 ug/L. Additionally, lead and nickel were detected at concentrations of 20 ug/L and 140 ug/L, respectively.

Groundwater was encountered at depths ranging form 4.50 to 5.90 below the top of the well casings. The groundwater flow direction was determined to be northeasterly at the time of the sampling event. Due to the close proximity of the site to the Bay, a shift in groundwater flow direction could be expected due to potential tidal influences.

PLANNED ACTIVITIES

CET will collect groundwater elevation measurements, will determine groundwater flow direction and gradient, and will collect groundwater samples for chemical analysis on a quarterly basis. Quarterly groundwater samples will be submitted to a California DHS accredited laboratory for analysis of TPH/d, TPH/g, and BTEX.

Quarterly reports summarizing activities conducted by CET at the subject property will be submitted to the ACHCSA. Activities at the subject property will be conducted in accordance with the ACHCSA's August 4, 1993 letter.

Limitations and uncertainty to this report are in Attachment E.

Please contact us if you have any questions or comments.

Sincerely,

CET EVIRONMENTAL SERVICES, INC.

Kimberly S. Lagomarsino
Environmental Scientist

Mark R. Lafferty, R.G.
Project Manager
Senior Hydrogeologist
California Registered Geologist #4701
(Expires 6-30-94)

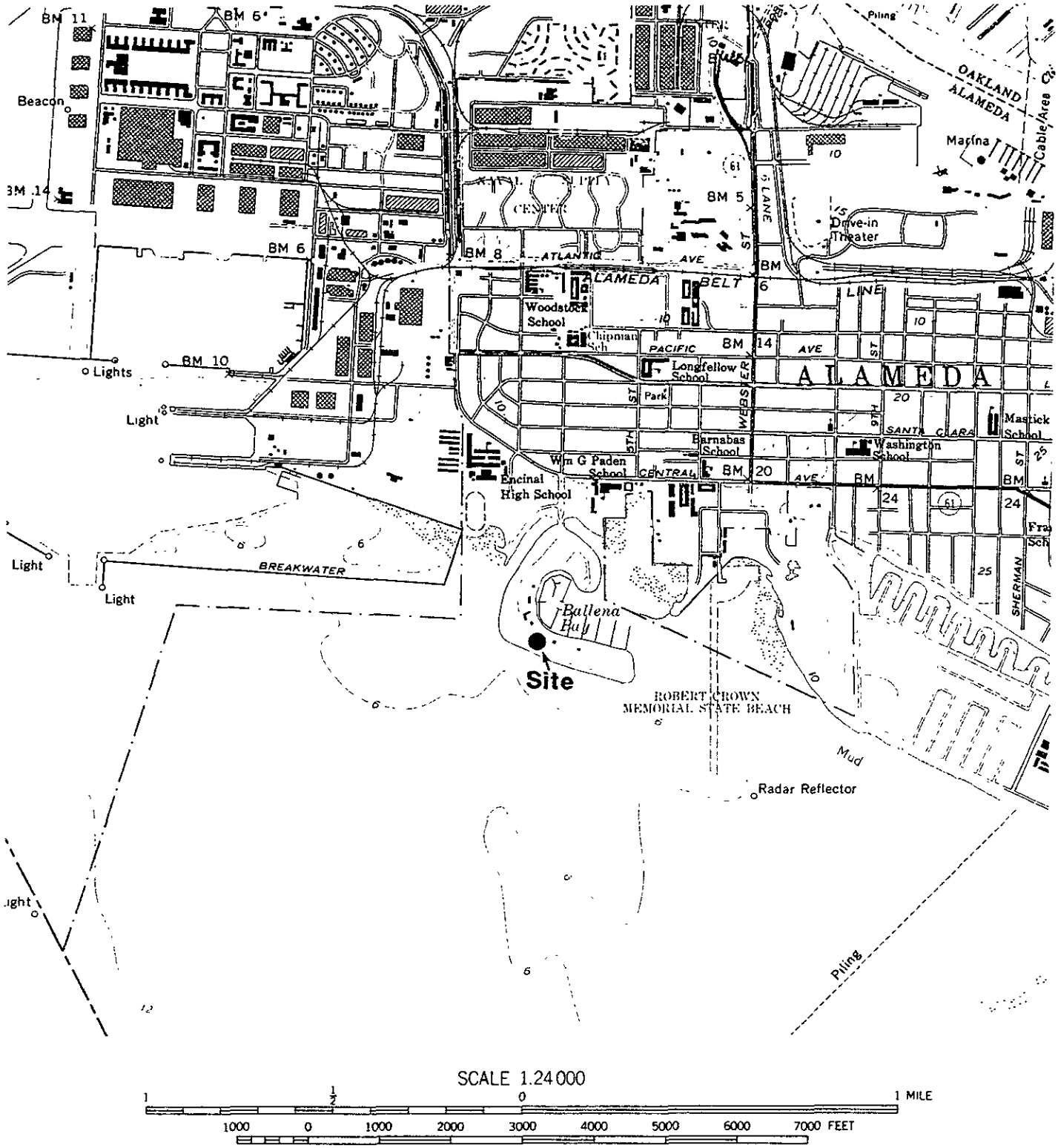
KSL/MRL:pd

Attachments

cc: Don Anderson, Ballena Isle Marina

ATTACHMENT A

Plates



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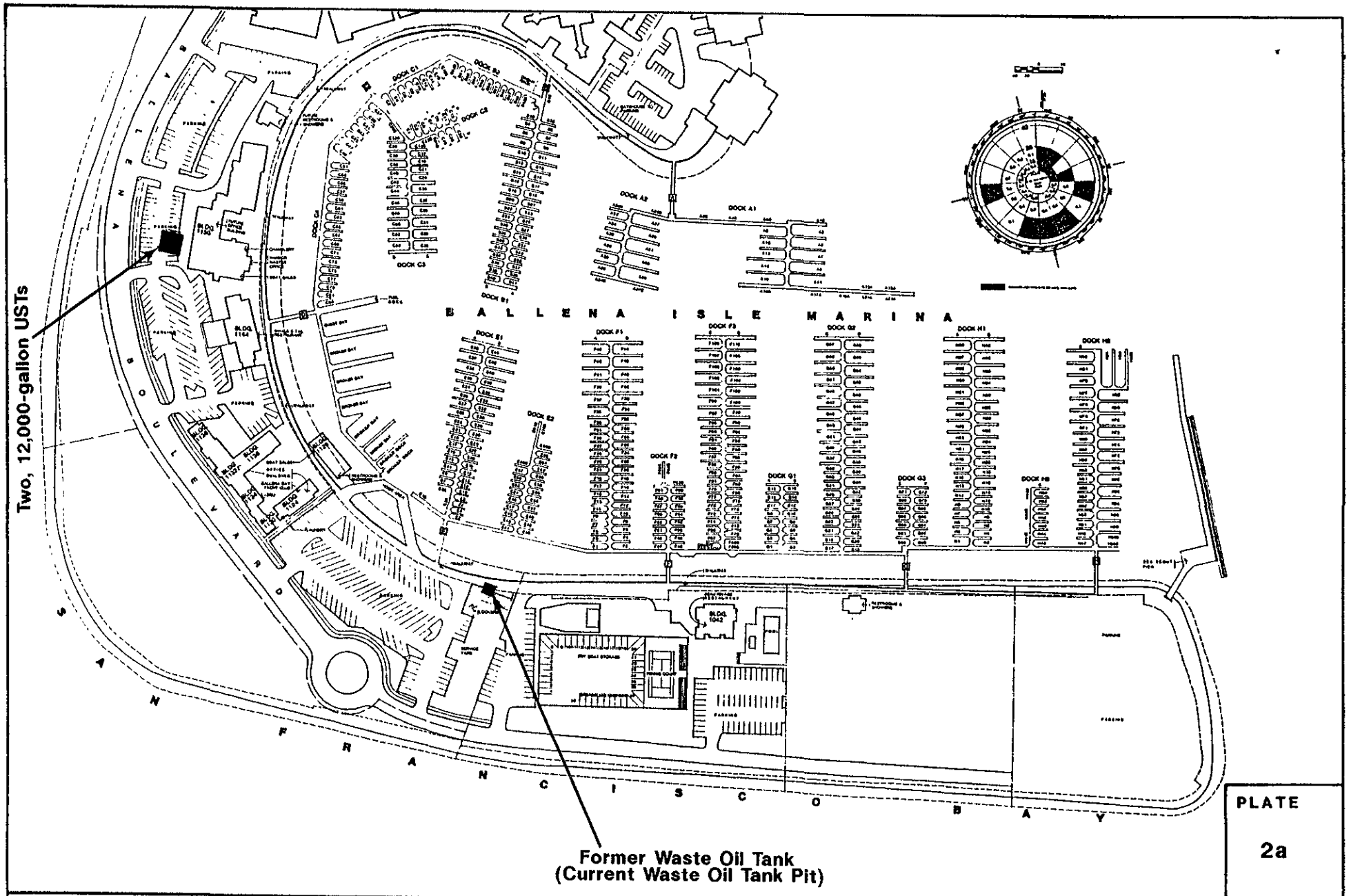
Site Location Map

Ballena Bay Yacht Harbor
1150 Ballena Blvd., Alameda, CA

CET Environmental Services, Inc.

Ballena Bay Marina

JOB NUMBER	DATE	PLATE
3571	10/93	1



PLATE

2a

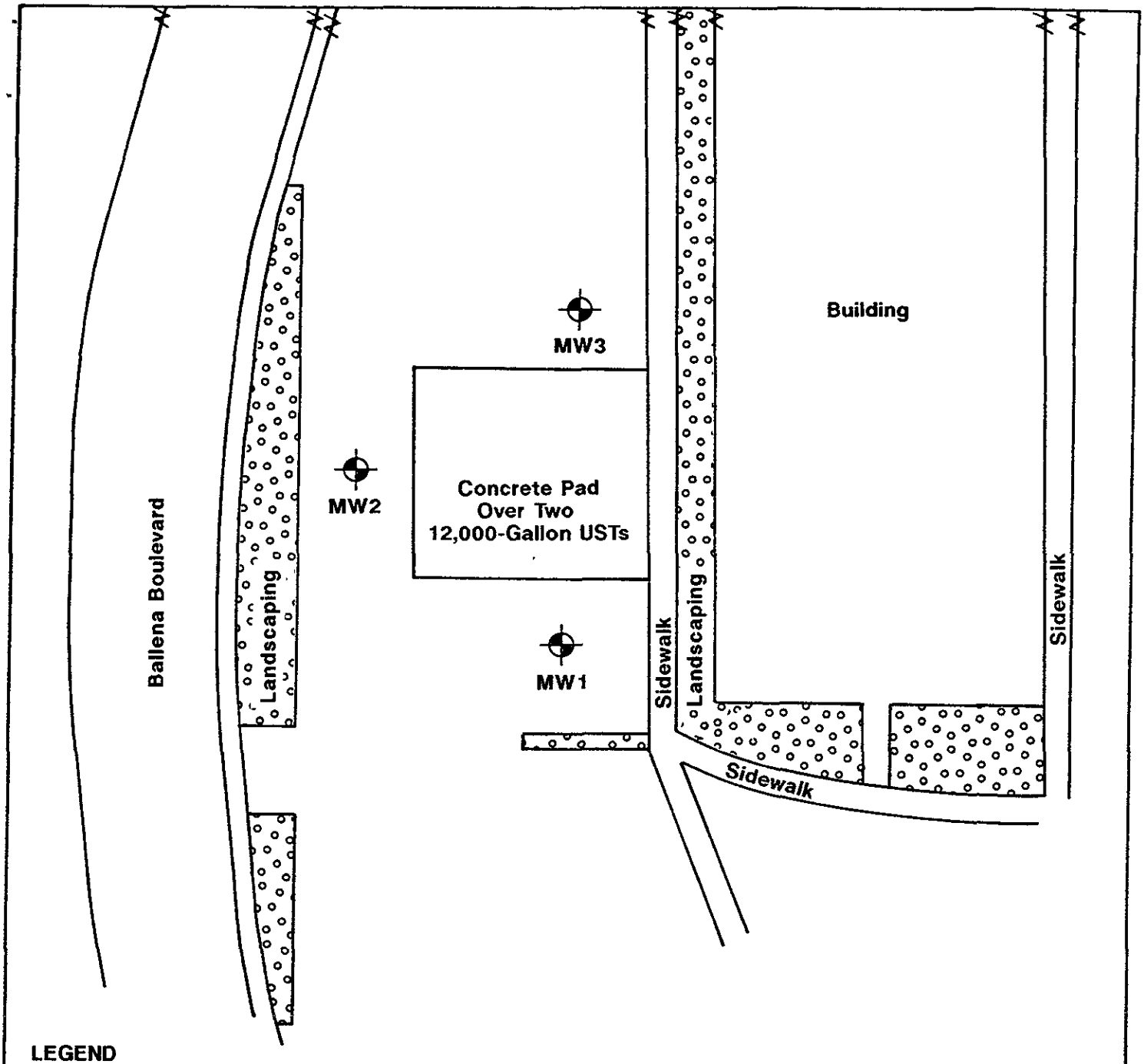
CET Environmental Services, Inc.

Site Plan

Ballena Bay Yacht Harbor
1150 Ballena Blvd., Alameda, CA

Ballena Bay Marina

JOB NUMBER	DATE
3571	10/93



LEGEND

Groundwater Monitoring Well

0 25

Scale in Feet

N

Base Map Source: LAW/CRANDALL, INC.
Job # 2123-20559-1, Figure 3.

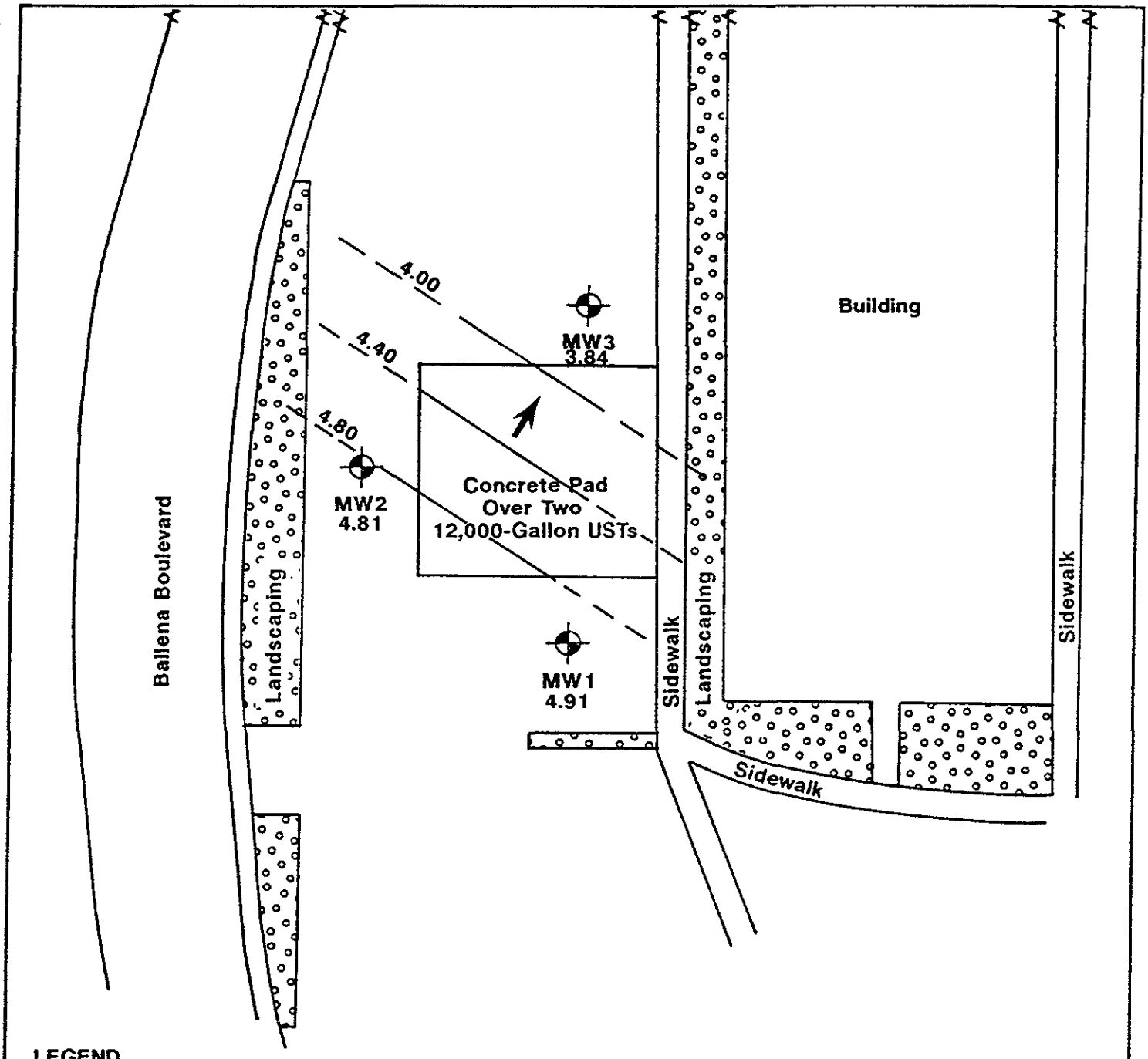
Site Plan

Ballena Bay Yacht Harbor
1150 Ballena Blvd., Alameda, CA

CET Environmental Services, Inc.

Ballena Bay Marina

JOB NUMBER	DATE	PLATE
3571	10/93	2b



LEGEND

- Groundwater Monitoring Well
- Line of Equal Groundwater Elevation
- Direction of Groundwater Flow

0 25

Scale in Feet

N

Base Map Source: LAW/CRANDALL, INC.
Job # 2123-20559-1, Figure 3.

Groundwater Elevations and Contours
09/02/93
Ballena Bay Yacht Harbor
1150 Ballena Blvd., Alameda, CA

CET Environmental Services, Inc.

Ballena Bay Marina

JOB NUMBER	DATE	PLATE
3571	10/93	3

ATTACHMENT B

Tables

Table 1

Groundwater Elevation Summary
1150 Ballena Blvd., Alameda, California

Well No.	TOC Elevation[a]	Date Measured	Depth to Groundwater[b]	Groundwater Elevation[c]
MW1	9.41	09/02/93	4.50	4.91
MW2	9.81	09/02/93	5.00	4.81
MW3	9.74	09/02/93	5.90	3.84

a. TOC Elevation = top of well casing elevation; measured in feet above a benchmark with an assumed elevation of 10.00 feet. (Data provided by Law/Crandell, Inc.)
b. Depth to Groundwater = measured in feet below top of well casing.
c. Groundwater Elevation = depth to groundwater subtracted from TOC elevation.

Table 2

Groundwater Analytical Data Summary-Petroleum Hydrocarbon Constituents
1150 Ballena Blvd., Alameda, California

Well No.	Date Sampled	TPH/d[a] (µg/L)[g]	TPH/g[b] (µg/L)[g]	B[c] (µg/L)[g]	T[c] (µg/L)[g]	E[c] (µg/L)[g]	X[c] (µg/L)[g]	SVOCs[d] (µg/L)[g]	TOG[e] (µg/L)[g]	PCBs[f] (µg/L)[g]
MW1	09/02/93	98	<50[h]	<0.5	<0.5	<0.5	<0.5	NA[i]	NA	NA
MW2	09/02/93	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
MW3	09/02/93	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
OP1	09/02/93	9,100	580	<0.5	<0.5	19	0.5	ND[j]	43,000	<0.5

a. TPH/d = total petroleum hydrocarbons as diesel
b. TPH/g = total petroleum hydrocarbons as gasoline
c. B = benzene; T = toluene; E = ethylbenzene; x = total xylenes
d. SVOCs = semi volatile organic compounds
e. TOG = total oil and grease
f. PCBs = polychlorinated biphenols
g. µg/L = micrograms per liter, equal to parts per billion (ppb)
h. <50 = less than method detection limit of 50 µg/L
i. NA = analysis not requested
j. ND = no analytes detected above respective method detection limits (see analytical test reports for individual analyte detection limits)

Table 3

Groundwater Analytical Data Summary-Metals
1150 Ballena Blvd., Alameda, California

Well No.	Cadmium (μg/L)[a]	Chromium (μg/L)[a]	Lead (μg/L)[a]	Nickel (μg/L)[a]	Zinc (μg/L)[a]
MW1	NA[b]	NA	NA	NA	NA
MW2	NA	NA	NA	NA	NA
MW3	NA	NA	NA	NA	NA
OP1	<1[c]	~~50~~ 60	20	140	100

a. μg/L = micrograms per liter, equal to parts per billion (ppb)
b. NA = analysis not requested
c. <1 = less than the method detection limit of 1 μg/L.

ATTACHMENT C

Soil & Groundwater Sample Collection & Handling Protocol

SOIL & GROUNDWATER SAMPLE COLLECTION & HANDLING PROTOCOL

INTRODUCTION & PURPOSE

Because reliable and representative test results must be generated from soil and groundwater samples, it is essential to establish a sampling procedure which assures that all samples are:

- Collected by approved and repeatable methods
- Representative of the materials(s) at the desired location and depth
- Uncontaminated by container and sampling equipment

The following sampling protocol was designed to be a guide to the sampling and handling procedures for soil and groundwater samples. Based on conditions which may be encountered in the field, some modifications to this protocol may be required to fit the needs of an individual site.

SAMPLING PROCEDURES

Groundwater Sampling

Prior to collecting groundwater samples, monitoring wells were purged by bailing until pH, conductivity, and temperature levels stabilize. A minimum of four well casing volumes was purged from each well. Wells were purged and groundwater samples were obtained using a teflon bailer, or disposable polyethelene bailer, and nylon rope. New nylon rope is used for each well.

The appropriate number of sample containers and type were used for each sample collected, in accordance with the analytical laboratory requirements and EPA protocol. The bottles were filled using the bailer. All sample bottles were pre-cleaned by the supplier according to EPA protocols.

To prevent cross contamination of groundwater samples by the sampling equipment, all reusable equipment used in sampling was washed with a trisodium phosphate solution (TSP), triple rinsed with purified water, and allowed to air dry prior to each use. A sample of the purified water was retained for analysis as part of sample quality assurance.

Soil Sampling

After the soil sampler was driven to the desired depth and the samples were retrieved, each end of the tube containing the soil sample retained for laboratory analysis was sealed with teflon sheeting, covered with plastic end caps, and sealed with PVC tape. All sample containers (tubes) were steamed cleaned (or washed with TSP, as above) and air dried prior to use. The soil sample recovered in the tube just above the sample retained for chemical analysis was examined in the field for visual and olfactory indications of chemical contamination and used for lithologic description.

The Unified Soil Classification System (USCS) was used to log and describe the soil by the onsite geologist. These logs also include details of the sampling process such as depth, apparent odors, discoloration, and any other factors which may be required to evaluate the presence of contamination at the site.

POST SAMPLING PROCEDURES

One field/travel blank consisting of one sample bottle filled with purified water accompanied soil and groundwater sample containers at all times, including during transport to and from the site. Purified water field/travel blanks were analyzed according to the appropriate EPA Methods corresponding to the soil/groundwater sample analyses.

Sample containers were labeled with sample number, project number, date, and the initials of the person collecting the sample. A separate sample collection record was maintained for each groundwater sample collected.

Soil and groundwater samples collected were analyzed by an analytical laboratory certified by the California Department of Health Services (DHS). Quality assurance documentation accompanied all analytical reports generated by the laboratory.

The samples were placed in a cooler with dry ice (for soil samples) or bagged ice (for water samples) immediately following collection, and remained in the cooler until refrigerated at the analytical laboratory. The samples were delivered to the laboratory direct by courier or overnight freight within 48 hours of time of collection. Appropriate chain of custody forms were used for all samples.

ATTACHMENT D

Chain-of-Custody Records
Sample Collection Records
Laboratory Analytical Reports

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

September 16, 1993 ChromaLab File No.: 9309066

CET ENVIRONMENTAL SERVICES,INC

Attn: Kimberly Lagomarsino

RE: Four water samples for Diesel analysis

Project Name: BALLENA BAY MARINA
Project Number: 3571-209
Date Sampled: September 2, 1993 Date Submitted: September 3, 1993
Date Extracted: September 15, 1993 Date Analyzed: September 15, 1993

RESULTS:

Sample I.D.	Diesel (µg/L)
MW1	98
MW2	N.D.
MW3	N.D.
OP1	9100*
BLANK	N.D.
SPIKE RECOVERY	88%
DUP SPIKE RECOVERY	84%
DETECTION LIMIT	50
METHOD OF ANALYSIS	3510/8015

* 20 mg/l of motor oil found in sample.

ChromaLab, Inc.

Alex Tam
Analytical Chemist

Eric Tam
Laboratory Director

jm

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

September 20, 1993 ChromaLab File No.: 9309066

CET ENVIRONMENTAL SERVICES,INC

Attn: Kimberly Lagomarsino

RE: Four water samples for Gasoline and BTEX analysis

Project Name: BALLENA BAY MARINA
Project Number: 3571-209
Date Sampled: Sept. 2, 1993 Date Submitted: Sept. 3, 1993
Date Analyzed: Sept. 16, 1993

RESULTS:

Sample I.D.	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	Total Xylenes (µg/L)
MW1	N.D.	N.D.	N.D.	N.D.	N.D.
MW2	N.D.	N.D.	N.D.	N.D.	N.D.
MW3	N.D.	N.D.	N.D.	N.D.	N.D.
OP-1	580	N.D.	N.D.	19	0.5
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	97%	99%	100%	103%	100%
DUP SPIKE RECOVERY	----	102%	103%	104%	104%
DETECTION LIMIT	50	0.5	0.5	0.5	0.5
METHOD OF ANALYSIS	5030/8015	602	602	602	602

ChromaLab, Inc.

Billy Thach
Analytical Chemist

Eric Tam
Laboratory Director

cc

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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

September 17, 1993

ChromaLab File # 9309066
Submission #: 9309000066

CET ENVIRONMENTAL SERVICES,INC

Attn: Kimberly Lagomarsino

Project Name: BALLENA BAY MARINA
Date Sampled: September 2, 1993
Date Submitted: September 3, 1993
Date Analyzed: September 15, 1993
Sample I.D.: OP-1

Project No: 3571-209
Method of Analysis: EPA 625
Matrix: Water
Reporting Limit: see below
Dilution Factor: None

COMPOUND NAME	Sample mg/l	MDL mg/l	Spike Recovery
PHENOL	N.D.	0.02	90% 84%
BIS(2-CHLOROETHYL) ETHER	N.D.	0.02	-----
2-CHLOROPHENOL	N.D.	0.02	103% 95%
1,3-DICHLOROBENZENE	N.D.	0.02	-----
1,4-DICHLOROBENZENE	N.D.	0.02	-----
BENZYL ALCOHOL	N.D.	0.04	-----
1,2-DICHLOROBENZENE	N.D.	0.02	-----
2-METHYLPHENOL	N.D.	0.02	-----
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.02	-----
4-METHYLPHENOL	N.D.	0.02	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.02	88% 93%
HEXACHLOROETHANE	N.D.	0.02	-----
NITROBENZENE	N.D.	0.02	-----
ISOPHORONE	N.D.	0.02	-----
2-NITROPHENOL	N.D.	0.02	-----
2,4-DIMETHYLPHENOL	N.D.	0.02	-----
BENZOIC ACID	N.D.	0.10	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.02	-----
2,4-DICHLOROPHENOL	N.D.	0.02	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.02	96% 81%
NAPHTHALENE	N.D.	0.02	-----
4-CHLOROANILINE	N.D.	0.04	-----
HEXACHLOROBUTADIENE	N.D.	0.02	-----
4-CHLORO-3-METHYLPHENOL	N.D.	0.04	82% 84%
2-METHYLNAPHTHALENE	N.D.	0.02	-----
HEXACHLOROCYCLOPENTADIENE	N.D.	0.2	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.02	-----
2,4,5-TRICHLOROPHENOL	N.D.	0.02	-----
2-CHLORONAPHTHALENE	N.D.	0.02	-----
2-NITROANILINE	N.D.	0.10	-----
DIMETHYL PHTHALATE	N.D.	0.02	-----
ACENAPHTHYLENE	N.D.	0.02	-----
3-NITROANILINE	N.D.	0.10	-----
ACENAPHTHENE	N.D.	0.02	80% 76%
2,4-DINITROPHENOL	N.D.	0.10	-----
4-NITROPHENOL	N.D.	0.10	-----
DIBENZOFURAN	N.D.	0.02	-----

(continued on next page)

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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

ChromaLab File # 9309066

Project Name: BALLENA BAY MARINA
Project No: 3571-209
Sample I.D.: OP-1
Method of Analysis: EPA 625 Matrix: water

COMPOUND NAME	Sample mg/l	MDL mg/l	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.02	-----
2,6-DINITROTOLUENE	N.D.	0.02	83% 80%
DIETHYL PHTHALATE	N.D.	0.02	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.02	-----
FLUORENE	N.D.	0.02	-----
4-NITROANILINE	N.D.	0.10	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.10	-----
N-NITROSODIPHENYLAMINE	N.D.	0.02	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.02	-----
HEXACHLOROBENZENE	N.D.	0.02	-----
PENTACHLOROPHENOL	N.D.	0.10	67% 70%
PHENANTHRENE	N.D.	0.02	-----
ANTHRACENE	N.D.	0.02	-----
DI-N-BUTYL PHTHALATE	N.D.	0.02	-----
FLUORANTHENE	N.D.	0.02	-----
PYRENE	N.D.	0.02	83% 87%
BUTYLBENZYLPHTHALATE	N.D.	0.02	-----
3,3'-DICHLOROBENZIDINE	N.D.	0.04	-----
BENZO(A)ANTHRACENE	N.D.	0.02	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.02	-----
CHRYSENE	N.D.	0.02	-----
DI-N-OCTYLPHTHALATE	N.D.	0.02	-----
BENZO(B)FLUORANTHENE	N.D.	0.02	-----
BENZO(K)FLUORANTHENE	N.D.	0.02	-----
BENZO(A)PYRENE	N.D.	0.02	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.02	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.02	-----
BENZO(G,H,I)PERYLENE	N.D.	0.02	-----

ChromaLab, Inc.

Alex Tam
Analytical Chemist

Eric Tam
Lab Director

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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

September 15, 1993 ChromaLab File No.: 9309066

CET ENVIRONMENTAL SERVICES,INC

Attn: Kimberly Lagomarsino

RE: One water sample for Oil & Grease analysis

Project Name: BALLENA BAY MARINA
Project Number: 3571-209
Date Sampled: Sept. 2, 1993 Date Submitted: Sept. 3, 1993
Date Analyzed: Sept. 14, 1993

RESULTS:

Sample I.D.	Oil & Grease (mg/L)
OP1	43
BLANK	N.D.
DETECTION LIMIT	1.0
METHOD OF ANALYSIS	STD METHOD 5520 B & F

ChromaLab, Inc.

Carolyn M. House
Analyst

Eric Tam
Laboratory Director

cc

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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

September 20, 1993 ChromaLab File No.: 9309066

CET ENVIRONMENTAL SERVICES,INC

Attn: Kimberly Lagomarsino

RE: One water sample for PCB analysis

Project Name: BALLENA BAY MARINA
Project Number: 3571-209
Date Sampled: September 2, 1993 Date Submitted: September 3, 1993
Date Extracted: September 15, 1993 Date Analyzed: September 15, 1993

RESULTS:

Sample I.D.	PCB (µg/L)
OP-1	N.D.
BLANK	N.D.
DETECTION LIMIT	0.5
METHOD OF ANALYSIS	608

ChromaLab, Inc.

Alex Tam
Analytical Chemist

Eric Tam
Laboratory Director

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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

September 14, 1993 ChromaLab File No.: 9309066

CET ENVIRONMENTAL SERVICES,INC

Attn: Kimberly Lagomarsino

RE: One water sample for LUFT (5) Metals analysis

Project Name: BALLENA BAY MARINA
Project Number: 3571-209
Date Sampled: Sept. 2, 1993 Date Submitted: Sept. 3, 1993
Date Analyzed: Sept. 14, 1993

RESULTS:

Sample I.D.	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Nickel (mg/L)	Zinc (mg/L)
OP1	N.D.	0.06	0.02	0.14	0.10
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
DETECTION LIMIT	0.001	0.01	0.01	0.02	0.005
METHOD OF ANALYSIS	3010/ 6010	3010/ 6010	3010/ 6010	3010/ 6010	3010/ 6010

ChromaLab, Inc.

Refaat Mankarious
Inorganic Supervisor

Eric Tam
Laboratory Director

cc

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Federal ID #68-0140157

CHAIN OF CUSTODY RECORD P.O. #70855

order # 13160

Log Number _______

Client name	Job number or Purchase Order number
Ballena Bay Marina	3571-209
Project name: Tank / G.W. monitoring	
Project manager: MRL	Sampler(s): [signature]

Analyses required: TPH-D, TPH-G, BTEX, TOG, Metals Cr, Pb, Cd, Zn, Ni, 8270, PCB 8080, Hazardous sample Special handling required

Sample number	Date sampled	Time sampled	Matrix type	Sample description	Number of containers	TPH-D	TPH-G	BTEX	TOG	Metals Cr, Pb, Cd, Zn, Ni	8270	PCB 8080	Hazardous sample Special handling required	Remarks
MW1	9/2/93	1410	H_2O	2x40ml / 2x1L	4	X	X	X						
MW2	↓	1255	↓	"	4	X	X	X						
MW3	↓	1445	↓	"	4	X	X	X						
OP1	↓	1130	↓	2x40ml / 2x1L / 1x1L H_2SO_4 1x.5L HNO_3	6	(X)	X	X	X	X	(X)	(X)		Limited sample volumes submitted.

* 10 day TAT

SUBM #: 9309066
CLIENT: CET
DUE: 09/20/93
REF: 13160

	Signature	Company	Date	Time
Relinquished by	[signature]	CET	9/3/93	5:00
Received by	[signature]	Chromalab	9.3.93	5:00
Relinquished by				
Received by				
Relinquished by				
Received by				

CET ENVIRONMENTAL SERVICES, INC.

Note: Samples are discarded 30 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

SAMPLE COLLECTION RECORD - MONITOR WELL

Date: 9-2-93 Sample I.D.: ~~MW3~~ MW1 Job No.: 3571-209

Site Location: Ballena Bay

No. of Containers: 4 /(check one): X Well Samples;

___Duplicates from well_____; ___Travel Blanks;

___Field Blanks; ___Other (explain)/_____

W.L.(1/100'): 4.50 Time: 1217 B.O.W.(1/2'): 13.3'

Method: ___Electric Well Sounder; ___Other/_____

Meters calibrated: Y / N Well Loc. Map: Y / N

Calculated Purge Volume (4 casing volumes): 5.8 gallons

Purging Method: X Disposable Bailer; ___Teflon Bailer;

___Other/_____

Time Start Purging (24 hr): 1354, Product: Y / (N)
Sheen: Y / (N), Odor: Y / (N), Vapor:___ ppm / %LEL
Turbidity:_____, Color: Gray

Time Stop Purging (24 hr):_____, Product: Y / (N)
Sheen: Y / (N), Odor: Y / (N), Vapor:___ ppm / %LEL
Turbidity:_____, Color: DK. Gray

Time (24 hr)	Temp. (C)	pH	Cond. (uS)	H2O (Gal)	Turbid. (NTU)
13:59	24.0	7.99	610	2.0	
14:04	24.0	8.03	590	4.0	
14:09	24.0	8.06	590	6.0	
:					
:					

Sample Collection Time (24 hr): 1410

Notes:_____

Collected By (signature): [signature]

SAMPLE COLLECTION RECORD - MONITOR WELL

Date: 9-2-93 Sample I.D.: MW2 Job No.: 5571-209

Site Location: Ballena Bay

No. of Containers: 4 / (check one): X Well Samples;

___Duplicates from well_____; ___Travel Blanks;

___Field Blanks; ___Other (explain)/_____

W.L.(1/100'): 5.00 Time: 1225 B.O.W.(1/2'): 14.8'

Method: X Electric Well Sounder; ___Other/_____

Meters calibrated: Y / N Well Loc. Map: Y / N

Calculated Purge Volume (4 casing volumes): 6.4 gallons

Purging Method: X Disposable Bailer; ___Teflon Bailer;

___Other/_____

Time Start Purging (24 hr): 1239, Product: Y / (N)
Sheen: Y / (N), Odor: Y / (N), Vapor:___ ppm / %LEL
Turbidity:_____, Color: Gray

Time Stop Purging (24 hr): 1254, Product: Y / (N)
Sheen: Y / (N), Odor: Y / (N), Vapor:___ ppm / %LEL
Turbidity:_____, Color: DK. Gray

Time (24 hr)	Temp. (C)	pH	Cond. (uS)	H2O (Gal)	Turbid. (NTU)
12:44	26.0	7.44	540	2.0	
12:48	26.0	7.59 pH 63	540	4.0	
12:54	26.0	7.72	560	6.5	
:					
:					

Sample Collection Time (24 hr): 1255

Notes:_____

Collected By (signature): David Lowe

SAMPLE COLLECTION RECORD - MONITOR WELL

Date: 9-2-93 Sample I.D.: ~~MW4~~ MW3 Job No.: 3571-209

Site Location: Ballena Bay

No. of Containers : 4 /(check one): X Well Samples;

___Duplicates from well_____; ___Travel Blanks;

___Field Blanks; ___Other (explain)/_____

W.L.(1/100'): 5.90 Time : 1220 B.O.W.(1/2'): 14.3'

Method: ___Electric Well Sounder; ___Other/_____

Meters calibrated: Y / N Well Loc. Map: Y / N

Calculated Purge Volume (4 casing volumes): 55 gallons

Purging Method: X Disposable Bailer; ___Teflon Bailer;

___Other/_____

Time Start Purging (24 hr): 1433, Product: Y / (N)
Sheen: Y / (N), Odor: Y / (N), Vapor:___ ppm / %LEL
Turbidity:_____, Color: Gray

Time Stop Purging (24 hr): 1444, Product: Y / (N)
Sheen: Y / (N), Odor: Y / (N), Vapor:___ ppm / %LEL
Turbidity:_____, Color: Dk. gray

Time (24 hr)	Temp. (C)	pH	Cond. (uS)	H2O (Gal)	Turbid. (NTU)
14:37	23.0	7.78	940	2.0	
14:41	23.0	7.79	960	4.0	
14:44	23.0	7.81	980	6.0	
:					
:					

Sample Collection Time (24 hr): 1445

Notes:_____

Collected By (signature): [signature]

ATTACHMENT E

Limitations and Uncertainty

LIMITATIONS AND UNCERTAINTY

This report was prepared in general accordance with the accepted standard of practice which exists in northern California at the time the investigation was conducted and within the scope of services outlined in our proposal. It should be recognized that the definition and evaluation of surface and subsurface environmental conditions is a difficult and inexact science. Judgements leading to conclusions is a difficult and inexact science. Judgements leading to conclusions and recommendations generally are made with an incomplete knowledge of the conditions present. It is possible that variations in the soil and/or groundwater conditions could exist beyond the points explored for this investigation. Also changes in groundwater conditions could occur sometime in the future due to variations in tides, rainfall, temperature, local or regional water use or other factors. If the client wishes to reduce the uncertainty beyond the level associated with this study, CET Environmental Services, Inc. should be notified for additional consultation.

The discussion and recommendations presented in this report are based on: 1) information and data provided by third party consultants, 2) the exploratory test borings drilled at the site, 3) the observations of field personnel, 4) the results of laboratory analysis by a California Department of Health Services (DHS) accredited laboratory, and 5) interpretations of federal, state, and local regulations and/or ordinances.

Chemical analytical data included in this report have been obtained from state certified laboratories. The analytical methods employed by the laboratories were in accordance with procedures suggested by the U.S. Environmental Protection Agency and the State of California. CET Environmental Services, Inc. is not responsible for laboratory errors in procedures or reporting.

CET has conducted this investigation in a manner consistent with the level of care and skill ordinarily exercised by members of the environmental consulting profession currently practicing under similar conditions in northern California. CET has prepared this report for the client's (and assigned parties) exclusive use for this particular project. No other warranties, expressed or implied, as to the professional advice provided are made.