GeoStrategies Inc.

SITE UPDATE

UNOCAL Service Station No. 5325
3220 Lakeshore Avenue
Oakland, California

781401-7

July 23, 1991

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545

July 23, 1991

Gettler-Ryan Inc.
2150 West Winton Avenue
Hayward, California 94545

Attn: Mr. Keith Bullock

Re: SITE UPDATE
UNOCAL Service Station No. 5325
3220 Lakeshore Avenue
Oakland, California

Gentlemen:

This Site Update by GeoStrategies Inc. (GSI) presents results of the 1991 second quarter ground-water sampling performed by Gettler-Ryan Inc. (G-R) for the above-referenced site (Plate 1). The scope of work presented in the document was performed at the request of UNOCAL. Field work and laboratory analysis methods were performed to comply with current State of California Water Resources Control Board (SWRCB) guidelines. Ground-water sampling procedures are presented in a GSI Well Installation report dated December 19, 1990.

SITE BACKGROUND

There are currently three monitoring wells at the site, (U-1 through U-3) (Plate 2). These wells were installed by GSI on September 24, 1990. These wells have been installed to evaluate the vertical and horizontal extent of petroleum hydrocarbons in soils and shallow groundwater beneath the site. The underground storage tanks were replaced in June 1990.

Quarterly sampling of wells began in October, 1990. Ground-water samples have been analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene, and Toluene (BTEX) according to EPA Method 8020.

CURRENT QUARTERLY SAMPLING RESULTS

Potentiometric Data

Prior to ground-water sampling, water-levels were measured in each monitoring well using an electronic oil-water interface probe. Static ground-water levels were measured from the surveyed top of well box and recorded to the nearest ±0.01 foot. Elevations corresponding to Mean Sea Level (MSL) are presented in Table 1. Water-level data were used to construct a potentiometric map presented on Plate 3. Shallow groundwater flows generally to the southeast at a calculated hydraulic gradient of 0.009.

The shallow ground-water flow direction has continued to change over the historical period of monitoring this site (approximately 6 months). Continued monitoring will be needed before an accurate assessment of long-term ground-water flow direction can be performed.

Floating Product Measurements

Each monitoring well was checked for the presence of floating product with an electronic oil-water interface probe. A clear acrylic bailer was used to confirm interface probe results. Floating product was not detected in the wells this quarter.

Ground-water Analytical Data

Prior to collecting samples, monitoring wells were pumped until ground-water parameters stabilized. Purge volumes and physical parameter values were presented in Table 1. Ground-water samples were collected on April 1, 1991. The samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Chemical analyses were performed by International Technology (IT) Analytical Services, a State-certified environmental laboratory located in San Jose, California.

TPH-Gasoline was detected in Wells U-1 and U-2 at concentrations of 160. and 1700. parts per billion (ppb), respectively. Benzene was detected in Wells U-1, U-2 and U-3 at concentrations of 13., 250. and 1.0 ppb, respectively. Well U-3 was reported as None Detected (ND) for TPH-Gasoline. A TPH-Gasoline/benzene concentration map was prepared from this data (Plate 4). Ground-water analyses data are presented in Table 2. Historical analytical data for the site are presented in Table 3. The IT laboratory report and Chain-of-Custody form are presented in Appendix A.

Quality Control

The Quality Control (QC) sample for the quarter's ground-water sampling was a trip blank. The trip blank was prepared in the IT laboratory using organic-free water to evaluate field and laboratory handling and analytical procedures. The results of the QC sample analyses were reported as ND and are presented in Table 1.

If you have any questions, please call.

GeoStrategies Inc. by,

Cliff M. Garratt
Hydrogeologist

David H. Peterson
Senior Geologist
C.E.G. 1186

REGISTERED GEOLOGIST
DAVID H. PETERSON
No. 1186
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

CMG/DHP/mlg

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric Map
Plate 4. TPH-G/Benzene Concentration Map

Appendix A: Ground-water Chemical Analytical Report and Chain-of-Custody Form

QC Review:

781401-7

TABLE 1

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (u MHOS/CM)
U-1	01-Apr-91	3	20.2	5.75	9.25	----	-3.50	4	7.25	66.0	2550
U-2	01-Apr-91	3	20.0	4.94	8.15	----	-3.21	4	6.33	68.8	10500
U-3	01-Apr-91	3	20.0	8.14	11.80	----	-3.66	5	7.22	64.7	979

Notes: 1. Water level elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.
3. pH values reported in pH units.
4. Static water-levels corrected for floating product (conversion factor = 0.80).

TABLE 2

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
U-1	01-Apr-91	05-Apr-91	160.	13.	8.6	1.0	15.
U-2	01-Apr-91	08-Apr-91	1700.	250.	89.	34.	190.
U-3	01-Apr-91	08-Apr-91	<50.	1.0	2.9	0.53	5.4
TB	----	06-Apr-91	<50.	<0.5	<0.5	<0.5	<0.5

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion TB = Trip Blank

Note: 1. All data shown as <x are reported as ND (none detected).

TABLE 3

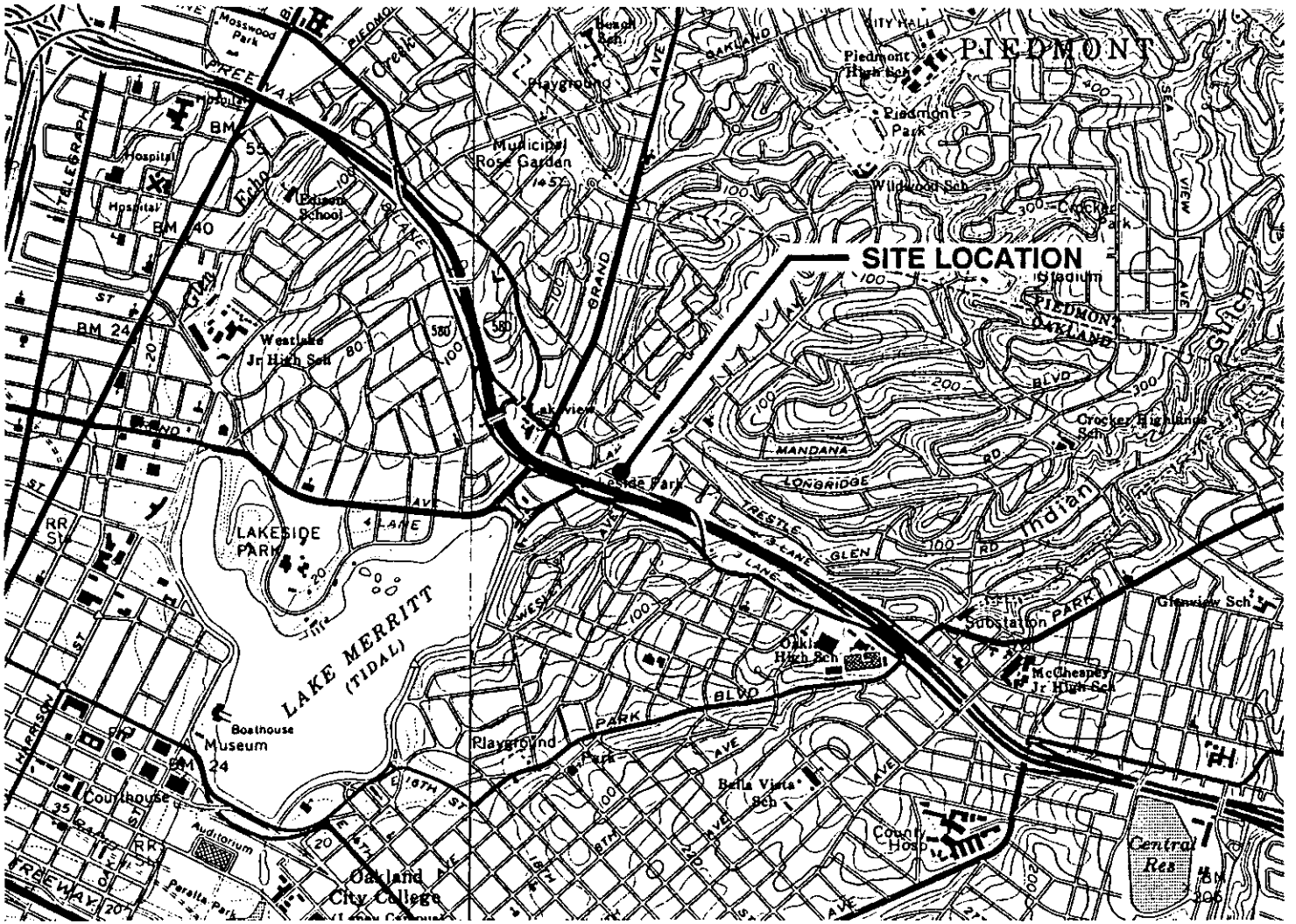
HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
08-Oct-90	U-1	690.	38.	75.	8.6	130.
07-Jan-91	U-1	250.	22.	16.	4.2	17.
01-Apr-91	U-1	160.	13.	8.6	1.0	15.
08-Oct-90	U-2	780.	27.	46.	15.	130.
07-Jan-91	U-2	1900.	67.	5.8	58.	69.
01-Apr-91	U-2	1700.	250.	89.	34.	190.
08-Oct-90	U-3	<50.	<0.5	<0.5	<0.5	<0.5
07-Jan-91	U-3	<50.	<0.5	<0.5	<0.5	1.8
01-Apr-91	U-3	<50.	1.0	2.9	0.53	5.4

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion

All data shown as <X are reported as ND (none detected).

ILLUSTRATIONS



N

Base Map: USGS Topographic Map

Approximate Scale: 1" = 2000'

GeoStrategies Inc.

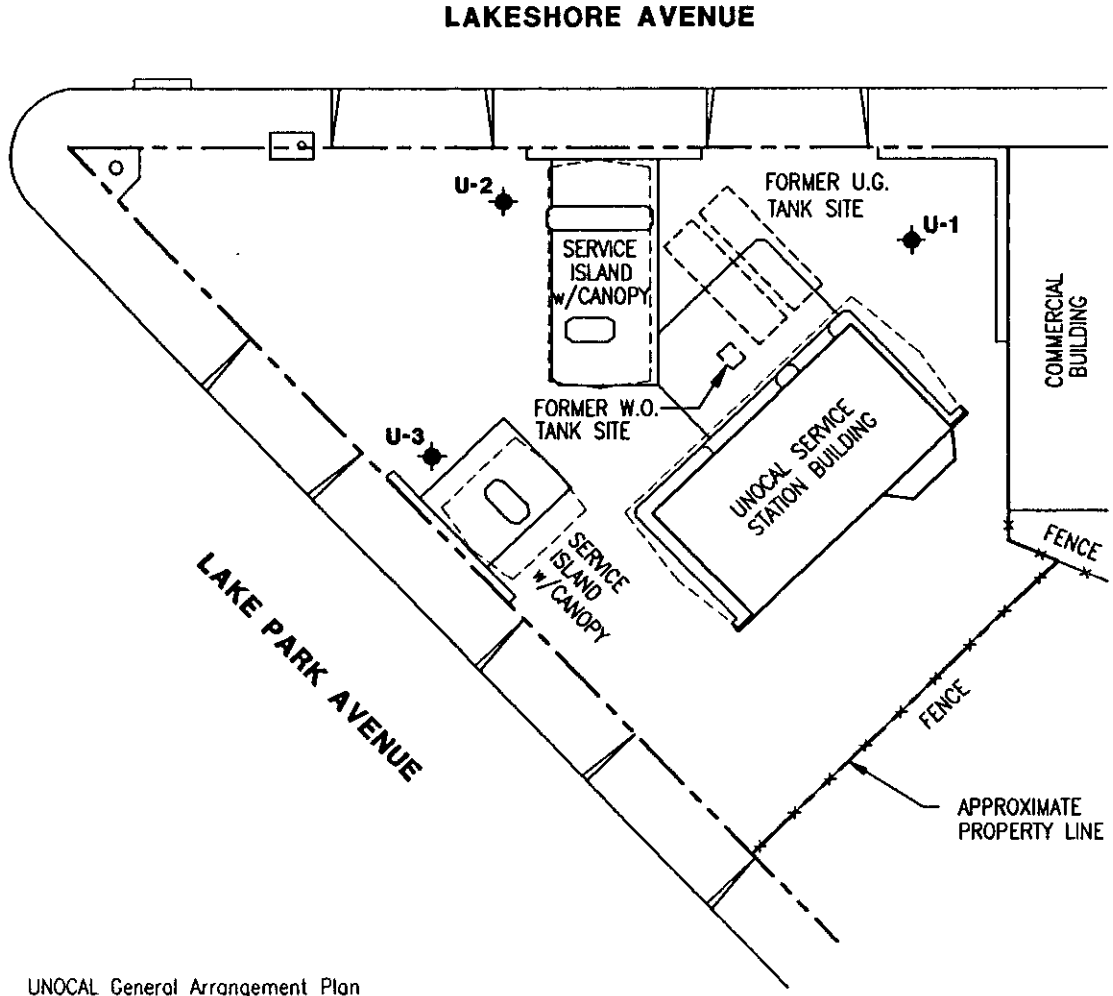
Vicinity Map
UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

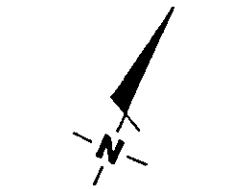
PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7814	RG/CEG	6/90	

EXPLANATION

✦ Ground-water monitoring well





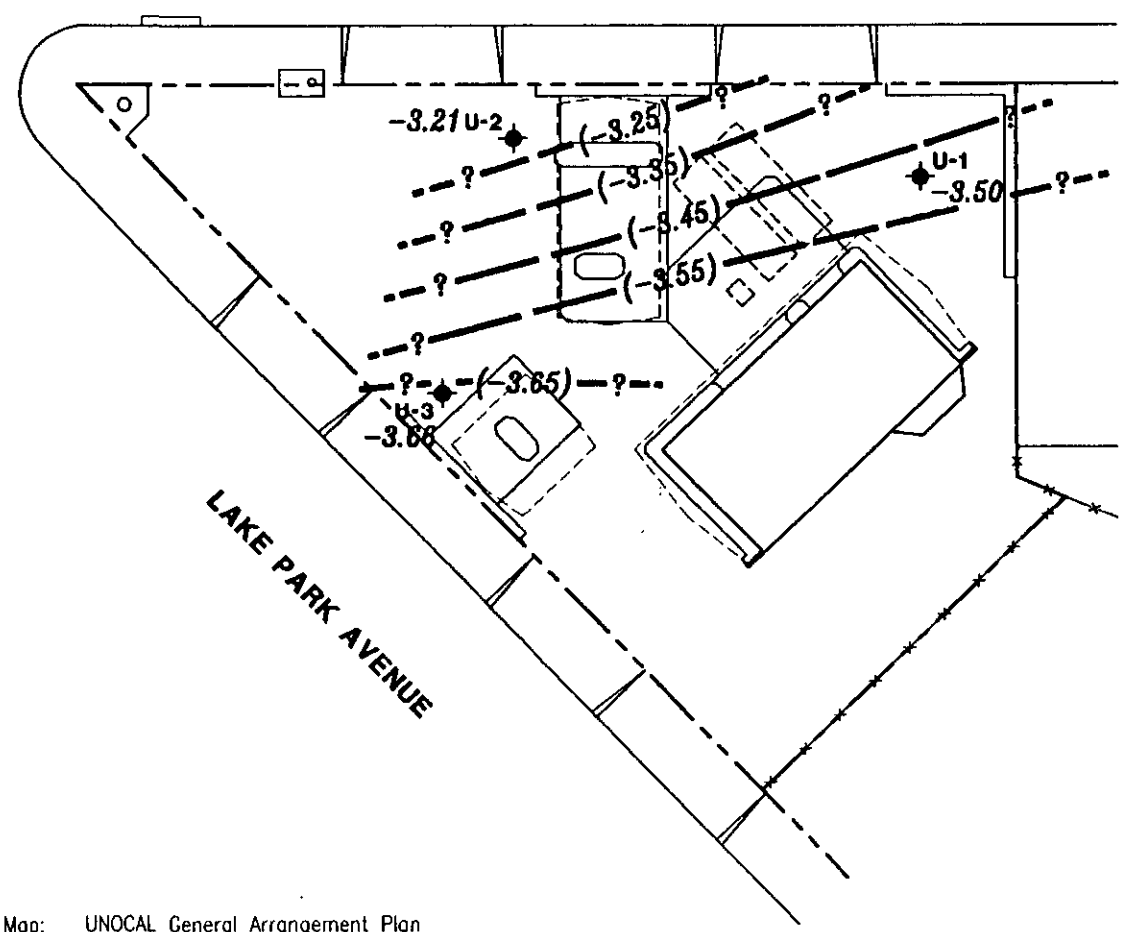
Base Map: UNOCAL General Arrangement Plan dated 7-8-66 (Rev, 12-4-84) and field observations

GeoStrategies Inc.

SITE PLAN
UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
781401-7	DHP	5/91	



EXPLANATION

- Ground–water monitoring well
- 99.99 — Ground–water elevation contour Approximate Gradient = 0.009
- *99.99* — Ground–water elevation in feet referenced to Mean Sea Level (MSL) measured on April 1, 1991

Note: Contours may be influenced by irrigation practices and/or site construction activities.

Approximate Ground–water Flow Direction

N

0 40

Scale in Feet

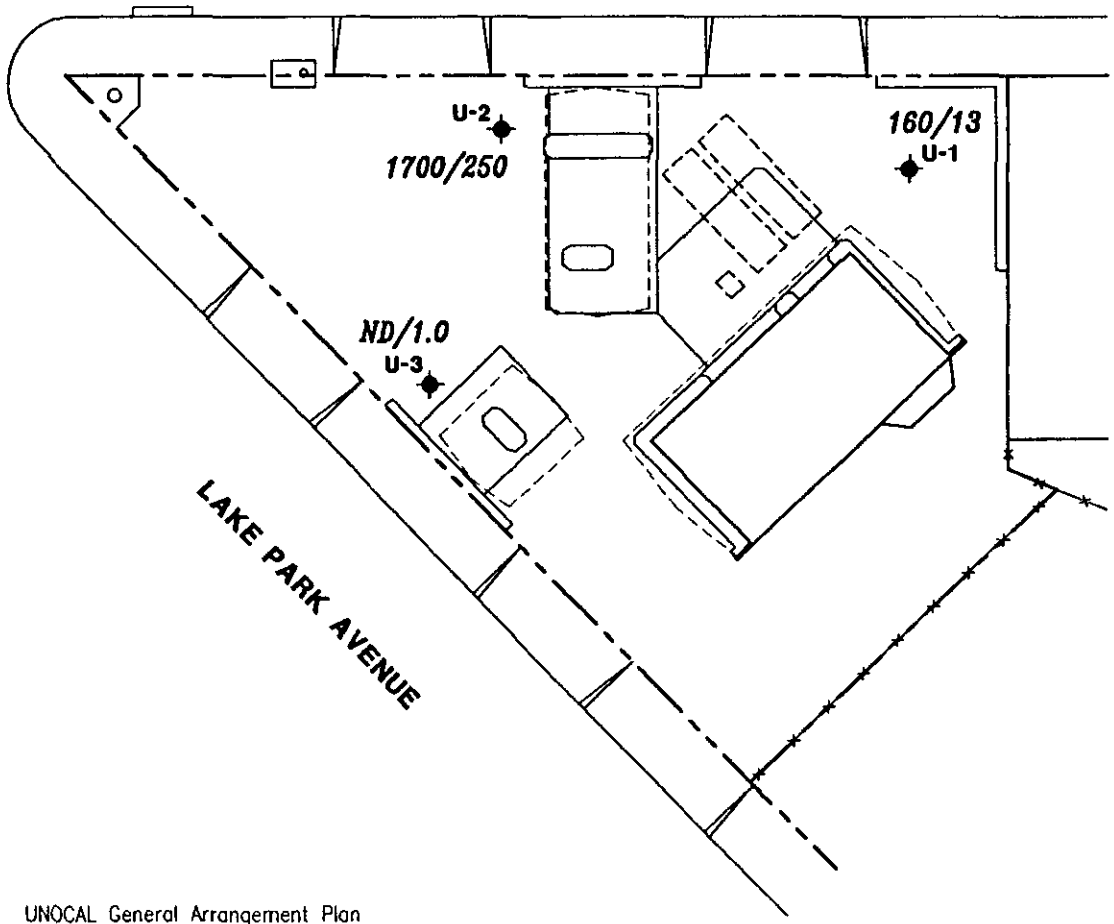
Base Map: UNOCAL General Arrangement Plan dated 7–8–66 (Rev, 12–4–84) and field observations

GeoStrategies Inc.

POTENTIOMETRIC MAP
UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

PLATE **3**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
781401–7	DHP	5/91	



EXPLANATION

- Ground-water monitoring well
- *99/9.9* TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppb sampled on April 1, 1991
- *ND* Not Detected (See laboratory reports for detection limits)

N

0 40

Scale in Feet

Base Map: UNOCAL General Arrangement Plan dated 7-8-66 (Rev, 12-4-84) and field observations

GeoStrategies Inc.

TPH-G/BENZENE CONCENTRATION MAP
UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

PLATE 4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
781401-7	DHP	5/91	

APPENDIX A
GROUND-WATER CHEMICAL ANALYTICAL REPORT AND CHAIN-OF-CUSTODY FORM

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED
APR 19 1991
GETTLER-RYAN INC.
GENERAL CONTRACTORS

CERTIFICATE OF ANALYSIS

Date: 04/18/91

Gettler-Ryan
2150 West Winton
Hayward, CA 94545
Tom Paulson

(CORRECTED REPORT)

Work Order: T1-04-019 P.O. Number: 3814.01

This is the Certificate of Analysis for the following samples:

Client Work ID: 3220 Lakeshore, Unocal
Date Received: 04/02/91
Number of Samples: 5
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Gettler-Ryan
Date: 04/18/91
Client Work ID: 3220 Lakeshore, Unocal

Work Order: T1-04-019

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: U-1
SAMPLE DATE: 04/01/91
LAB SAMPLE ID: T104019-01
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Micrograms per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		04/05/91
Low Boiling Hydrocarbons	Mod.8015		04/05/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	50.	160.
BTEX		
Benzene	0.5	13.
Toluene	0.5	8.6
Ethylbenzene	0.5	1.0
Xylenes (total)	0.5	15.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Gettler-Ryan
Date: 04/18/91
Client Work ID: 3220 Lakeshore, Unocal

Work Order: T1-04-019

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: U-2
SAMPLE DATE: 04/01/91
LAB SAMPLE ID: T104019-02
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Micrograms per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		04/08/91
Low Boiling Hydrocarbons	Mod.8015		04/08/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	250.	1700.
BTEX		
Benzene	2.5	250.
Toluene	2.5	89.
Ethylbenzene	2.5	34.
Xylenes (total)	2.5	190.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Gettler-Ryan
Date: 04/18/91
Client Work ID: 3220 Lakeshore, Unocal

Work Order: T1-04-019

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: U-3
SAMPLE DATE: 04/01/91
LAB SAMPLE ID: T104019-03
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Micrograms per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		04/08/91
Low Boiling Hydrocarbons	Mod.8015		04/08/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	50.	None
BTEX		
Benzene	0.5	1.0
Toluene	0.5	2.9
Ethylbenzene	0.5	0.53
Xylenes (total)	0.5	5.4

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Gettler-Ryan
Date: 04/18/91
Client Work ID: 3220 Lakeshore, Unocal

Work Order: T1-04-019

TEST NAME: Petroleum Hydrocarbons

SAMPLE ID: TRIP BLANK
SAMPLE DATE: not spec
LAB SAMPLE ID: T104019-04
SAMPLE MATRIX: aqueous
RECEIPT CONDITION: Cool pH < 2

RESULTS in Micrograms per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		04/06/91
Low Boiling Hydrocarbons	Mod.8015		04/06/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	50.	None
BTEX		
Benzene	0.5	None
Toluene	0.5	None
Ethylbenzene	0.5	None
Xylenes (total)	0.5	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Gettler-Ryan
Date: 04/18/91
Client Work ID: 3220 Lakeshore, Unocal

Work Order: T1-04-019

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T104019-05A
EXTRACTION DATE:
ANALYSIS DATE: 04/05/91
ANALYSIS METHOD: 8020

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Benzene	ND<0.5	20.0	20.0	20.8	100.	104.	4.
Toluene	ND<0.5	20.0	19.5	20.2	98.	101.	3.
Ethyl benzene	ND<0.5	20.0	18.6	19.6	93.	98.	5.
Xylenes	ND<0.5	60.0	47.7	50.2	80.	84.	5.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	104.	104.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Gettler-Ryan
Date: 04/18/91
Client Work ID: 3220 Lakeshore, Unocal

Work Order: T1-04-019

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T104019-05B
EXTRACTION DATE:
ANALYSIS DATE: 04/06/91
ANALYSIS METHOD: Mod.8015

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	500.	390.	406.	78.	81.	4.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	77.	78.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Gettler-Ryan
Date: 04/18/91
Client Work ID: 3220 Lakeshore, Unocal

Work Order: T1-04-019

TEST CODE TPHVB TEST NAME TPH Gas,BTEX by 8015/8020

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

COMPANY Unocal 5325 JOB NO.

JOB LOCATION 3220 La[illegible]shore

CITY Oakland PHONE NO. 783-7500

AUTHORIZED Tom Paulson DATE 4-1-90 P.O. NO. 3814.01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
U-1	3	liquid	4-1-91/1117	TPH(gas) BTXE	Cool / OK
U-2	↓	↓	/1039	↓	1 w/bubble
U-3	↓	↓	/1001	↓	OK
Trip Blank	1	↓	—	↓	OK

RELINQUISHED BY: [signature] 4-1-91 1530 RECEIVED BY: Refrig #1 4-1-91 1530

RELINQUISHED BY: Refrig #1 4-2-91 08:00 RECEIVED BY: [signature] 4-2-91 08:00

RELINQUISHED BY: [signature] 4-2-91 14:55 RECEIVED BY LAB: [signature] 4/2/91 1459

DESIGNATED LABORATORY: 1 T(SCV) DHS #: 137

REMARKS: Normal TAT

DATE COMPLETED 4-1-91 FOREMAN [signature]

ORIGINAL