

MONITORING
PURGING
DISPOSING
SAMPLING

MPDS

SERVICES, INCORPORATED

ALSO
HAZMAT

94 NOV 18 PM 3:18

November 17, 1994

Alameda County Health Care Services
1131 Harbor Bay Parkway
Alameda, California 94501

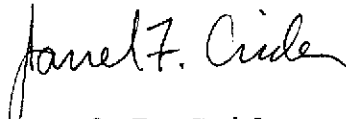
RE: Unocal Service Station #1871
96 MacArthur Boulevard
Oakland, California 94610

Per the request of the Unocal Corporation Project Manager, Mr. Robert A. Boust, enclosed please find our report (MPDS-UN1871-05) dated November 8, 1994 for the above referenced site.

Should you have any questions regarding the reporting of data, please feel free to call our office at (510) 602-5120. Any other questions may be directed to the Project Manager at (510) 277-2334.

Sincerely,

MPDS Services, Inc.



Jarrel F. Crider

/jfc

Enclosure

cc: Mr. Robert A. Boust

ALCO
HAZMAT

94 NOV 18 PM 3:18

MPDS-UN1871-05
November 8, 1994

Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, California 94583

Attention: Mr. Robert A. Boust

RE: Quarterly Data Report
Unocal Service Station #1871
96 MacArthur Boulevard
Oakland, California

Dear Mr. Boust:

This data report presents the results of the most recent quarter of monitoring and sampling of the monitoring wells at the referenced site by MPDS Services, Inc.

RECENT FIELD ACTIVITIES

The monitoring wells that were monitored and sampled during this quarter are indicated in Table 1. Prior to sampling, the wells were checked for depth to water and the presence of free product or sheen. The monitoring data and the ground water elevations are summarized in Table 1. The ground water flow direction during the most recent quarter is shown on the attached Figure 1.

Ground water samples were collected on **October 10, 1994**. Prior to sampling, the wells were each purged of between 16 and 34 gallons of water. During purging operations, the field parameters pH, temperature, and electrical conductivity were recorded and are presented in Table 2. Once the field parameters were observed to stabilize, and where possible, a minimum of approximately four casing volumes had been removed from each well, samples were then collected using a clean Teflon bailer. The samples were decanted into clean VOA vials and/or one-liter amber bottles, as appropriate, which were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to a state-certified laboratory. MPDS Services, Inc. transported the purged ground water to the Unocal Refinery located in Rodeo, California, for treatment and discharge to San Pablo Bay under NPDES permit.

ANALYTICAL RESULTS

The ground water samples were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The analytical results of the ground water samples collected to

date are summarized in Table 3. The concentrations of Total Petroleum Hydrocarbons (TPH) as gasoline and benzene detected in the ground water samples collected this quarter are shown on the attached Figure 2. Copies of the laboratory analytical results and the Chain of Custody documentation are attached to this report.

LIMITATIONS

Environmental changes, either naturally-occurring or artificially-induced, may cause changes in ground water levels and flow paths, thereby changing the extent and concentration of any contaminants.

DISTRIBUTION

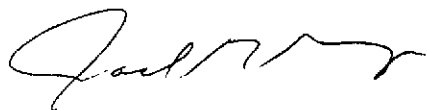
A copy of this report should be sent to the Alameda County Health Care Services Agency.

If you have any questions regarding this report, please do not hesitate to call Mr. Nubar Srabian at (510) 602-5120.

Sincerely,

MPDS Services, Inc.


Sarkis A. Karkarian
Staff Engineer



Joel G. Greger, C.E.G.
Senior Engineering Geologist

License No. EG 1633
Exp. Date 8/31/96

/bp

Attachments: Tables 1, 2 & 3
Location Map
Figures 1 & 2
Laboratory Analyses
Chain of Custody documentation

cc: Mr. Thomas Berkins, Kaprealian Engineering, Inc.



TABLE 1

SUMMARY OF MONITORING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)♦	Total Well Depth (feet)♦	Product Thickness (feet)	Sheen	Water Purged (gallons)
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(Monitoring and Sampled on October 10, 1994)

MW-1	65.63 ↓	15.55	24.05	0	No	16
MW-2	65.13 ↓	11.48	24.75	0	No	34
MW-3	64.50 ↓	12.98	23.70	0	No	28

(Monitoring and Sampled on July 13, 1994)

MW-1	66.30	14.88	24.12	0	No	19
MW-2	65.75	10.86	24.71	0	No	32
MW-3	65.02	12.46	23.68	0	No	24

(Monitoring and Sampled on April 13, 1994)

MW-1	66.74	14.44	24.14	0	No	21
MW-2	66.49	10.12	24.75	0	No	40
MW-3	65.46	12.02	23.74	0	No	29

(Monitored and Sampled on January 20, 1994)

MW-1	66.01	15.17	24.12	0	Yes	18
MW-2	65.49	11.12	24.73	0	No	36
MW-3	64.83	12.65	23.70	0	No	29.5

Well #	Well Casing Elevation (feet)*
MW-1	81.18
MW-2	76.61
MW-3	77.48

♦ The depth to water level and total well depth measurements were taken from the top of the well casings.

* The elevations of the top of the well casings have been surveyed relative to Mean Sea Level.

TABLE 2

RECORD OF THE TEMPERATURE, CONDUCTIVITY, AND pH VALUES
 IN THE MONITORING WELLS DURING PURGING AND PRIOR TO SAMPLING

(Measured on October 10, 1994)

Well #	Gallons per Casing Volume	Time	Gallons Purged	Casing Volumes Purged	Temper- ature (°F)	Conductivity ([μmhos/cm] x100)	pH
MW-1	5.53	13:20	0	0	70.3	7.43	7.62
			5	0.90	68.0	8.87	7.19
		13:40	11	1.99	68.5	9.10	6.98
			16	2.89	69.3	8.70	7.02
WELL DEWATERED							
MW-2	8.63	11:50	0	0	70.7	7.43	7.24
			9	1.04	68.4	6.62	7.30
			18	2.09	69.1	6.45	7.22
			26	3.01	67.1	6.86	7.24
		12:25	34	3.94	67.3	6.79	7.19
MW-3	6.97	9:25	0	0	62.4	10.80	6.66
			7	1.00	61.0	9.12	6.75
			14	2.01	64.8	8.87	6.79
			21	3.01	70.3	8.77	6.90
		9:55	28	4.02	69.8	8.70	6.91

TABLE 3

SUMMARY OF LABORATORY ANALYSES
WATER

Date	Well #	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
10/10/94	MW-1	52,000	1,000	810	3,300	12,000
	MW-2	2,300	340	ND	25	ND
	MW-3	4,300	11	ND	12	ND
7/13/94	MW-1	35,000	550	150	1,400	5,700
	MW-2	2,000	490	ND	17	13
	MW-3	1,800**	16	16	ND	21
4/13/94	MW-1	51,000	1,000	2,600	3,200	15,000
	MW-2	550	71	ND	5.1	1.3
	MW-3	4,200	210	ND	36	53
1/20/94	MW-1	92,000	1,200	3,000	3,400	17,000
	MW-2	820	97	ND	12	ND
	MW-3	4,200	11	ND	21	15
10/19/93	MW-1	67,000	1,400	2,600	2,900	5,000
	MW-2	670	24	1.1	7.7	23
	MW-3	3,800	42	ND	50	56
7/16/93	MW-1	29,000	590	560	980	4,200
	MW-2	510*	17	0.6	3.2	2.5
	MW-3	4,000*	1,100	28	52	70
4/29/93	MW-1	100,000	850	2,000	4,300	19,000
	MW-2	1,500	290	ND	33	11
	MW-3	4,500	1,700	ND	200	140
1/25/93	MW-1	120,000	2,100	4,600	4,900	22,000
	MW-2	2,100	56	1.1	90	140
	MW-3	2,300	80	1	55	52
11/03/92	MW-1	260,000	2,300	4,600	3,700	17,000
	MW-2	140	2.2	ND	ND	2
	MW-3	2,100	120	15	38	200

TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

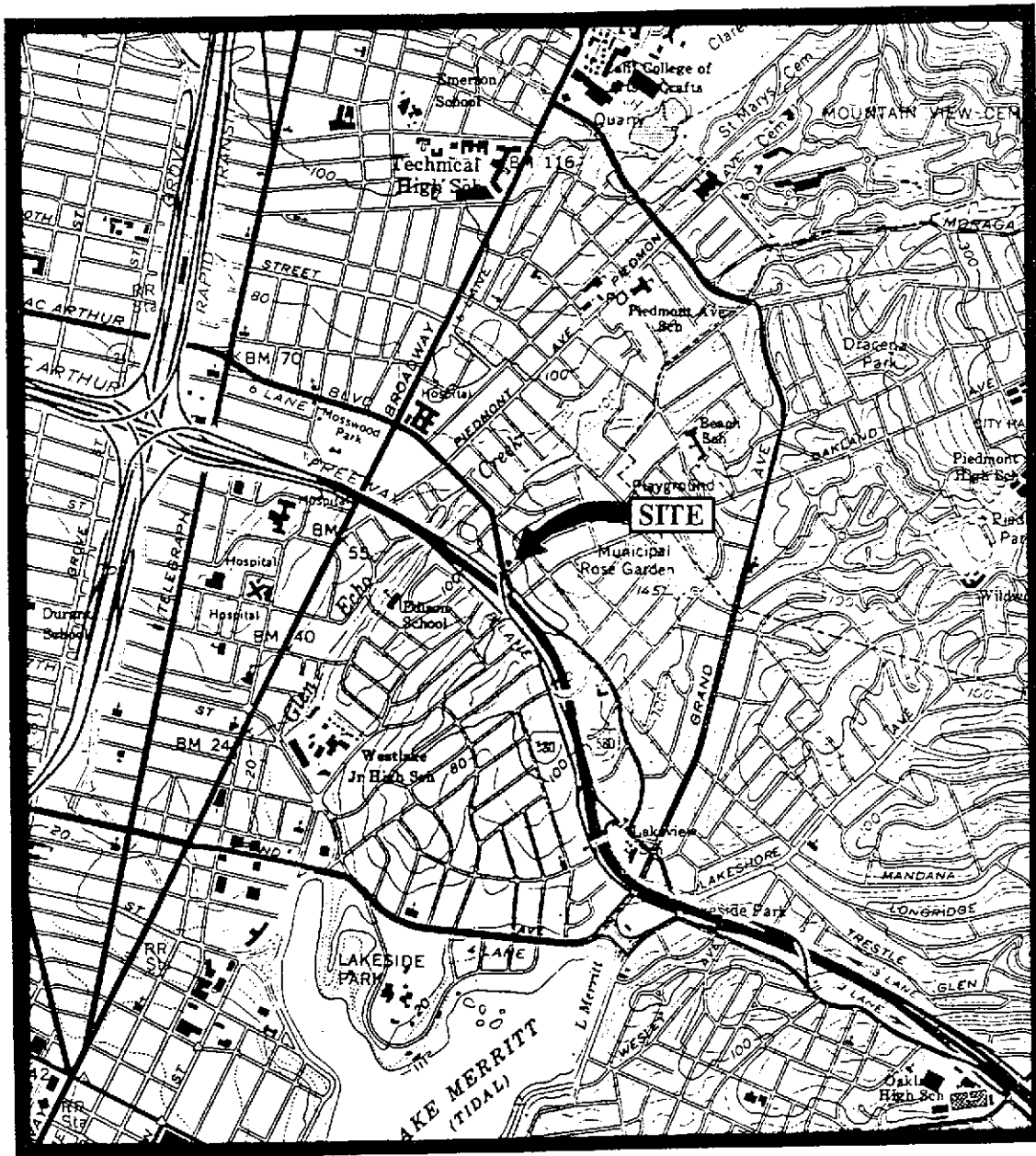
* Primarily due to the presence of discrete peaks not indicative of gasoline.

** Sequoia Analytical Laboratory reported that they hydrocarbons detected appeared to be a gasoline and non-gasoline mixture.

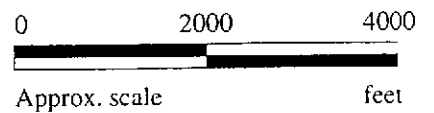
ND = Non-detectable.

Results are in micrograms per liter ($\mu\text{g/L}$), unless otherwise indicated.

Note: Laboratory analyses data prior to October 19, 1993, were provided by GeoStrategies, Inc.



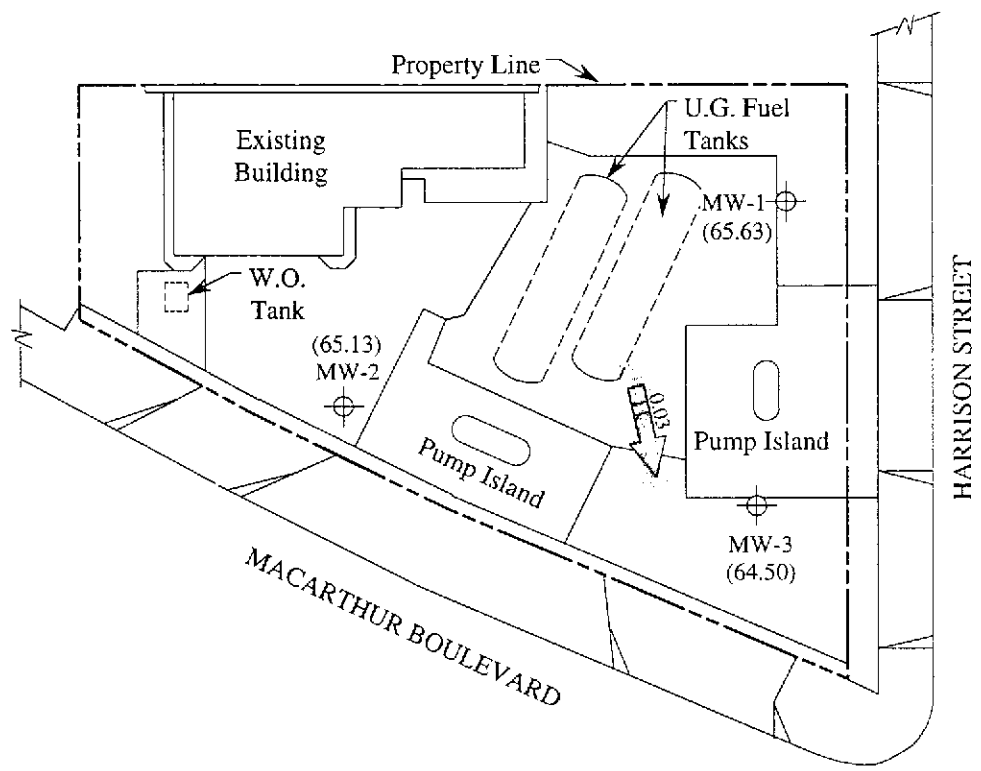
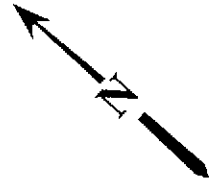
Base modified from 7.5 minute U.S.G.S.
 Oakland East and West Quadrangles
 (both photorevised 1980)






MPDS SERVICES, INCORPORATED

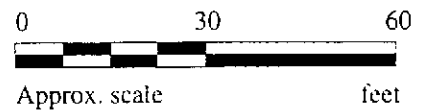
UNOCAL SERVICE STATION # 1871
 96 MACARTHUR BOULEVARD
 OAKLAND, CALIFORNIA

LOCATION
 MAP



LEGEND

-  Monitoring well
-  Ground water elevation in feet above Mean Sea Level
-  Direction of ground water flow with approximate hydraulic gradient

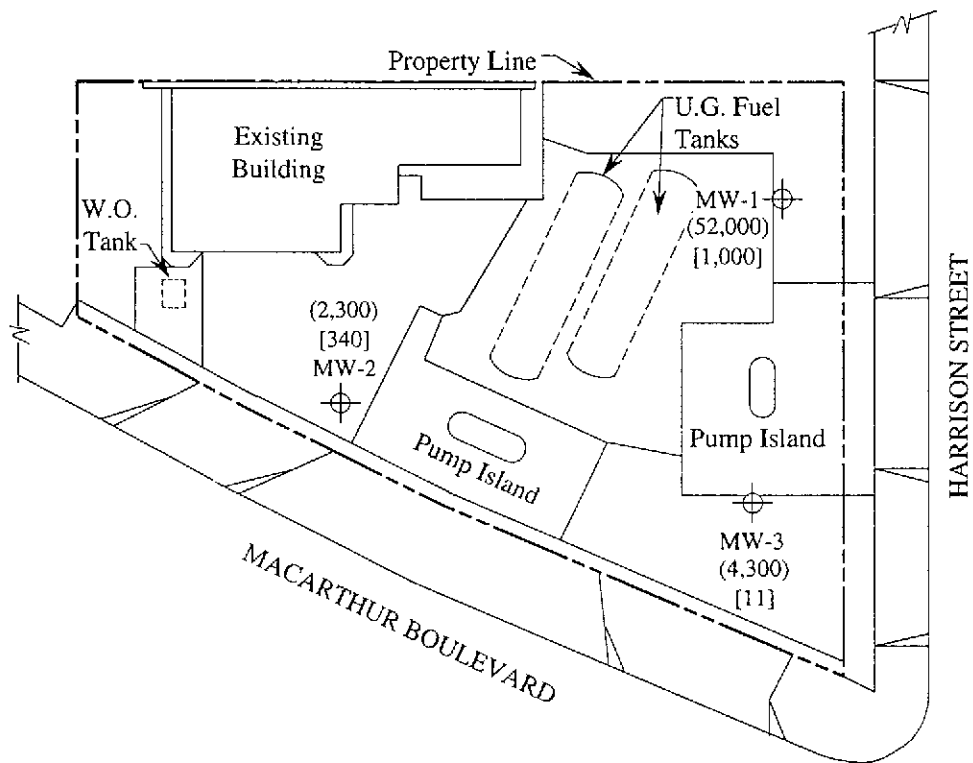
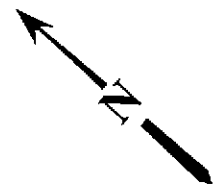


GROUND WATER FLOW DIRECTION MAP FOR THE OCTOBER 10, 1994 MONITORING EVENT



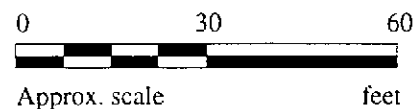
UNOCAL SERVICE STATION # 1871
96 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

FIGURE
1



LEGEND

- ⊕ Monitoring well
- () Concentration of TPH as gasoline in $\mu\text{g/L}$
- [] Concentration of benzene in $\mu\text{g/L}$



PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON OCTOBER 10, 1994



**UNOCAL SERVICE STATION # 1871
96 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA**

**FIGURE
2**



MPDS Services 2401 Stanwell Dr., Ste. 400 Concord, CA 94520 Attention: Avo Avedessian	Client Project ID: Unocal #1871, 96 MacArthur, Oakland Matrix Descript: Water Analysis Method: EPA 5030/8015/8020 First Sample #: 410-0601	Sampled: Oct 10, 1994 Received: Oct 10, 1994 Reported: Oct 24, 1994
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TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Sample Number	Sample Description	Purgeable Hydrocarbons μg/L	Benzene μg/L	Toluene μg/L	Ethyl Benzene μg/L	Total Xylenes μg/L
410-0601	MW-1	52,000 ✓	1,000 ✓	810	3,300	12,000
410-0602	MW-2	2,300 ✓	340 ✓	ND	25	ND
410-0603	MW-3	4,300 ✓	11 ✓	ND	12	ND

Detection Limits:	50	0.50	0.50	0.50	0.50
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Total Purgeable Petroleum Hydrocarbons are quantitated against a fresh gasoline standard.
 Analytes reported as ND were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
 Project Manager





Sequoia Analytical

680 Chesapeake Drive Redwood City, CA 94063 (415) 364-9600 FAX (415) 364-9233
1900 Bates Avenue, Suite L Concord, CA 94520 (510) 686-9600 FAX (510) 686-9689
819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

MPDS Services	Client Project ID: Unocal #1871, 96 MacArthur, Oakland	Sampled: Oct 10, 1994
2401 Stanwell Dr., Ste. 400	Matrix Descript: Water	Received: Oct 10, 1994
Concord, CA 94520	Analysis Method: EPA 5030/8015/8020	Reported: Oct 24, 1994
Attention: Avo Avedessian	First Sample #: 410-0601	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Sample Number	Sample Description	Chromatogram Pattern	DL Mult. Factor	Date Analyzed	Instrument ID	Surrogate Recovery, % QC Limits: 70-130
410-0601	MW-1	Gasoline	400	10/17/94	HP-5	98
410-0602	MW-2	Gasoline	20	10/18/94	HP-2	102
410-0603	MW-3	Gasoline	20	10/18/94	HP-4	86

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager

4100601.MPD <2>





MPDS Services
 2401 Stanwell Dr., Ste. 400
 Concord, CA 94520
 Attention: Avo Avedessian

Client Project ID: Unocal #1871, 96 MacArthur, Oakland
 Matrix: Liquid

QC Sample Group: 4100601-603

Reported: Oct 25, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon

MS/MSD Batch#:	4100558	4100558	4100558	4100558
Date Prepared:	10/17/94	10/17/94	10/17/94	10/17/94
Date Analyzed:	10/17/94	10/17/94	10/17/94	10/17/94
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	110	110	110	108
Matrix Spike Duplicate % Recovery:	115	110	110	108
Relative % Difference:	4.4	0.0	0.0	0.0

LCS Batch#:	3LCS101794	3LCS101794	3LCS101794	3LCS101794
Date Prepared:	10/17/94	10/17/94	10/17/94	10/17/94
Date Analyzed:	10/17/94	10/17/94	10/17/94	10/17/94
Instrument I.D.#:	HP-5	HP-5	HP-5	HP-5
LCS % Recovery:	106	114	108	106

% Recovery Control Limits:	71-133	72-128	72-130	71-120
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Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
 Project Manager





MPDS Services
 2401 Stanwell Dr., Ste. 400
 Concord, CA 94520
 Attention: Avo Avedessian

Client Project ID: Unocal #1871, 96 MacArthur, Oakland
 Matrix: Liquid

QC Sample Group: 4100601-603

Reported: Oct 25, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon

MS/MSD				
Batch#:	4100600	4100600	4100600	4100600
Date Prepared:	10/18/94	10/18/94	10/18/94	10/18/94
Date Analyzed:	10/18/94	10/18/94	10/18/94	10/18/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike				
% Recovery:	85	105	110	108
Matrix Spike				
Duplicate %				
Recovery:	85	100	100	102
Relative %				
Difference:	0.0	4.9	9.5	5.7

LCS Batch#:	2LCS101894	2LCS101894	2LCS101894	2LCS101894
Date Prepared:	10/18/94	10/18/94	10/18/94	10/18/94
Date Analyzed:	10/18/94	10/18/94	10/18/94	10/18/94
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
LCS %				
Recovery:	81	92	95	97

% Recovery				
Control Limits:	71-133	72-128	72-130	71-120

Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
 Project Manager





Sequoia Analytical

680 Chesapeake Drive Redwood City, CA 94063 (415) 364-9600 FAX (415) 364-9233
 1900 Bates Avenue, Suite L Concord, CA 94520 (510) 686-9600 FAX (510) 686-9689
 819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

MPDS Services
 2401 Stanwell Dr., Ste. 400
 Concord, CA 94520
 Attention: Avo Avedessian

Client Project ID: Unocal #1871, 96 MacArthur, Oakland
 Matrix: Liquid

QC Sample Group: 4100601-603

Reported: Oct 25, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Tuzon	A. Tuzon	A. Tuzon	A. Tuzon

MS/MSD				
Batch#:	4100735	4100735	4100735	4100735
Date Prepared:	10/18/94	10/18/94	10/18/94	10/18/94
Date Analyzed:	10/18/94	10/18/94	10/18/94	10/18/94
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Matrix Spike % Recovery:	105	105	105	108
Matrix Spike Duplicate % Recovery:	110	110	120	115
Relative % Difference:	4.6	4.6	13	6.3

LCS Batch#:	1LCS101894	1LCS101894	1LCS101894	1LCS101894
Date Prepared:	10/18/94	10/18/94	10/18/94	10/18/94
Date Analyzed:	10/18/94	10/18/94	10/18/94	10/18/94
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
LCS % Recovery:	101	103	106	113

% Recovery Control Limits:	71-133	72-128	72-130	71-120
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Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
 Project Manager



