

MONITORING
PURGING
DISPOSING
SAMPLING

MPDS

SERVICES, INCORPORATED

ENVIRONMENTAL
PROTECTION

96 DEC 17 AM 9:59

December 13, 1996

Alameda County Health Care Services
1131 Harbor Bay Parkway
Alameda, California 94502


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

Per the request of the Unocal Corporation Project Manager, Ms. Tina R. Berry, enclosed please find our report (MPDS-UN1871-13) dated December 2, 1996 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) 277-2321.

Sincerely,

MPDS Services, Inc.



Jarrel F. Crider

/jfc

Enclosure

cc: Ms. Tina R. Berry

MPDS-UN1871-13
December 2, 1996

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 24, 1996. Prior to sampling, the wells were each purged of between 4.5 and 27.5 gallons of water. During purging operations, the field parameters pH, temperature, and electrical conductivity were recorded on the purging/sampling data sheets which are attached to this report. Once the field parameters were observed to stabilize, and where possible, a minimum of approximately three 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. Field blank and Trip blank samples (denoted as ES1 and ES2, respectively) were also collected for quality assurance and control. 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 2. The concentrations of Total Petroleum Hydrocarbons (TPH) as gasoline and benzene detected in the ground water samples collected this

MPDS-UN1871-13

December 2, 1996

Page 2

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. Joel G. Greger at (510) 602-5120.

Sincerely,

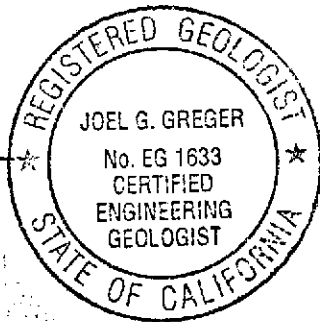
MPDS Services, Inc.



Haig (Gary) Tejirian
Senior Staff Geologist



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



License No. EG 1633
Exp. Date 8/31/98

Attachments: Tables 1 & 2
Location Map
Figures 1 & 2
Laboratory Analyses
Chain of Custody documentation
Purging/Sampling Data Sheets

cc: Mr. Thomas J. 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)	Seen	Water Purged (gallons)
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(Monitored and Sampled on October 24, 1996)

MW-1	71.39	14.85	24.18	0	Yes	18.5
MW-2	70.88	10.78	24.74	0	No	27.5
MW-3	69.90	12.65	23.70	0	No	22
MW-4	70.90	11.14	19.57	0	No	6
MW-5	70.40	11.40	20.00	0	No	4.5

(Monitored and Sampled on July 24, 1996)

MW-1	72.09	14.15	24.10	0	No	26
MW-2	71.64	10.02	24.70	0	No	25
MW-3	70.38	12.17	23.68	0	No	30
MW-4	71.57	10.47	19.56	0	No	6.5
MW-5	71.00	10.80	20.00	0	No	6.5

(Monitored and Sampled on April 18, 1996)

MW-1	72.84	13.40	24.20	0	No	23
MW-2	72.39	9.27	24.80	0	No	41
MW-3	71.25	11.30	23.77	0	No	33
MW-4	72.21	9.83	19.61	0	No	7.5
MW-5	72.15	9.65	20.05	0	No	7.5

(Monitored and Sampled on January 18, 1996)

MW-1	66.97	14.21	24.13	0	No	17
MW-2	66.50	10.11	24.74	0	No	38
MW-3	65.69	11.79	23.71	0	No	31

Well #	Well Casing Elevation (feet)**	Well Casing Elevation (feet)*
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MW-1	81.18	86.24
MW-2	76.61	81.66
MW-3	77.48	82.55
MW-4	N/A	82.04
MW-5	N/A	81.80

Table 1
Summary of Monitoring Data

- ◆ The depth to water level and total well depth measurements were taken from the top of the well casings.
- * The top of casing elevations were re-surveyed by Kier & Wright in May, 1996, per City of Oakland Benchmark No. 2310, a cut square in concrete curb at mid point of return at the northeast corner of El Dorado and Fairmont Streets (elevation = 77.53 feet MSL). These well casing elevations are used beginning with the April 18, 1996 monitoring event.
- ** The elevations of the top of the well casings, used prior to April 18, 1996, were surveyed by Roux Associates relative to Mean Sea Level (benchmark unknown).

Table 2
 Summary of Laboratory Analyses
 Water

Well #	Date	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylenes	MTBE
MW-1	11/3/92	--	260,000	2,300	4,600	3,700	17,000	--
	1/25/93	--	120,000	2,100	4,600	4,900	22,000	--
	4/29/93	--	100,000	850	2,000	4,300	19,000	--
	7/16/93	--	29,000	590	560	980	4,200	--
	10/19/93	--	67,000	1,400	2,600	2,900	5,000	--
	1/20/94	--	92,000	1,200	3,000	3,400	17,000	--
	4/13/94	--	51,000	1,000	2,600	3,200	15,000	--
	7/13/94	--	35,000	550	150	1,400	5,700	--
	10/10/94	--	52,000	1,000	810	3,300	12,000	--
	1/10/95	--	810	16	18	59	250	--
	4/17/95	--	48,000	880	530	2,500	11,000	--
	7/24/95	--	48,000	1,500	420	2,700	9,700	--
	10/23/95	--	47,000	780	210	2,100	11,000	270
	1/18/96	--	30,000	1,500	500	3,500	13,000	2,400
	4/18/96	--	66,000	2,700	2,200	3,100	13,000	57,000
	7/24/96	--	5,600	2,100	ND	160	160	24,000
10/24/96	--	110,000	7,500	8,000	3,300	14,000	58,000	
MW-2	11/3/92	--	140	2.2	ND	ND	2.0	--
	1/25/93	--	2,100	56	1.1	90	140	--
	4/29/93	--	1,500	290	ND	33	11	--
	7/16/93	--	510*	17	0.60	3.2	2.5	--
	10/19/93	--	670	24	1.1	7.7	23	--
	1/20/94	--	820	97	ND	12	ND	--
	4/13/94	--	550	71	ND	5.1	1.3	--
	7/13/94	--	2,000	490	ND	17	13	--
	10/10/94	--	2,300	340	ND	25	ND	--
	1/10/95	--	850	3.8	ND	8.5	1.3	--
	4/17/95	--	1,300	4.7	ND	8.3	1.2	--
	7/24/95	--	960	20	ND	4.2	6.2	--
	10/23/95	--	ND	ND	ND	ND	ND	19
	1/18/96	--	900	300	86	7.6	18	4,300
4/18/96	--	18,000	3,600	680	890	4,100	19,000	
7/24/96	--	100,000	13,000	21,000	2,700	16,000	120,000	
10/24/96	--	800	110	17	11	20	20,000	
MW-3	11/3/92	--	2,100	120	15	38	200	--
	1/25/93	--	2,300	80	1	55	52	--
	4/29/93	--	4,500	1,700	ND	200	140	--
	7/16/93	--	4,000*	1,100	28	52	70	--
	10/19/93	--	3,800	42	ND	50	56	--
	1/20/94	--	4,200	11	ND	21	15	--
	4/13/94	--	4,200	210	ND	36	53	--

Table 2
 Summary of Laboratory Analyses
 Water

Well #	Date	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylenes	MTBE
MW-3	7/13/94	--	1,800**	16	16	ND	21	--
(Cont.)	10/10/94	--	4,300	11	ND	12	ND	--
	1/10/95	--	310	4.6	ND	3.5	2.1	--
	4/17/95	--	7,800	ND	4.6	300	450	--
	7/24/95	--	3,200	170	ND	22	16	--
	10/23/95	--	3,900	55	ND	19	11	4,500
	1/18/96	--	2,200	270	33	26	18	5,500
	4/18/96	--	6,000	1,800	ND	100	230	48,000
	7/24/96	--	ND	2,500	ND	ND	ND	71,000
	10/24/96	--	3,800	660	ND	15	ND	65,000
MW-4	4/18/96♦	110†	ND	630	ND	ND	ND	18,000
	7/24/96♦♦	ND	ND	ND	ND	ND	5.2	3,900
	10/24/96★	ND	ND	ND	ND	ND	ND	6,300
MW-5	4/18/96	--	31,000	5,500	1,400	1,700	8,100	66,000
	7/24/96	--	32,000	6,400	ND	1,600	6,100	120,000
	10/24/96	--	17,000	6,900	ND	970	130	84,000

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

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

† Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to contain diesel.

♦ Total Oil & Grease and all EPA Method 8010 constituents were non-detectable.

♦♦ Total Oil & Grease and all EPA Method 8010 and 8270 constituents were non-detectable.

★ Total Oil and Grease and all EPA Method 8010 constituents were non-detectable. All EPA Method 8270 constituents were non-detectable, except for Bis (2-ethylhexyl) phthalate which was detected at a concentration of 14 µg/L.

-- Indicates analysis was not performed.

ND = Non-detectable.

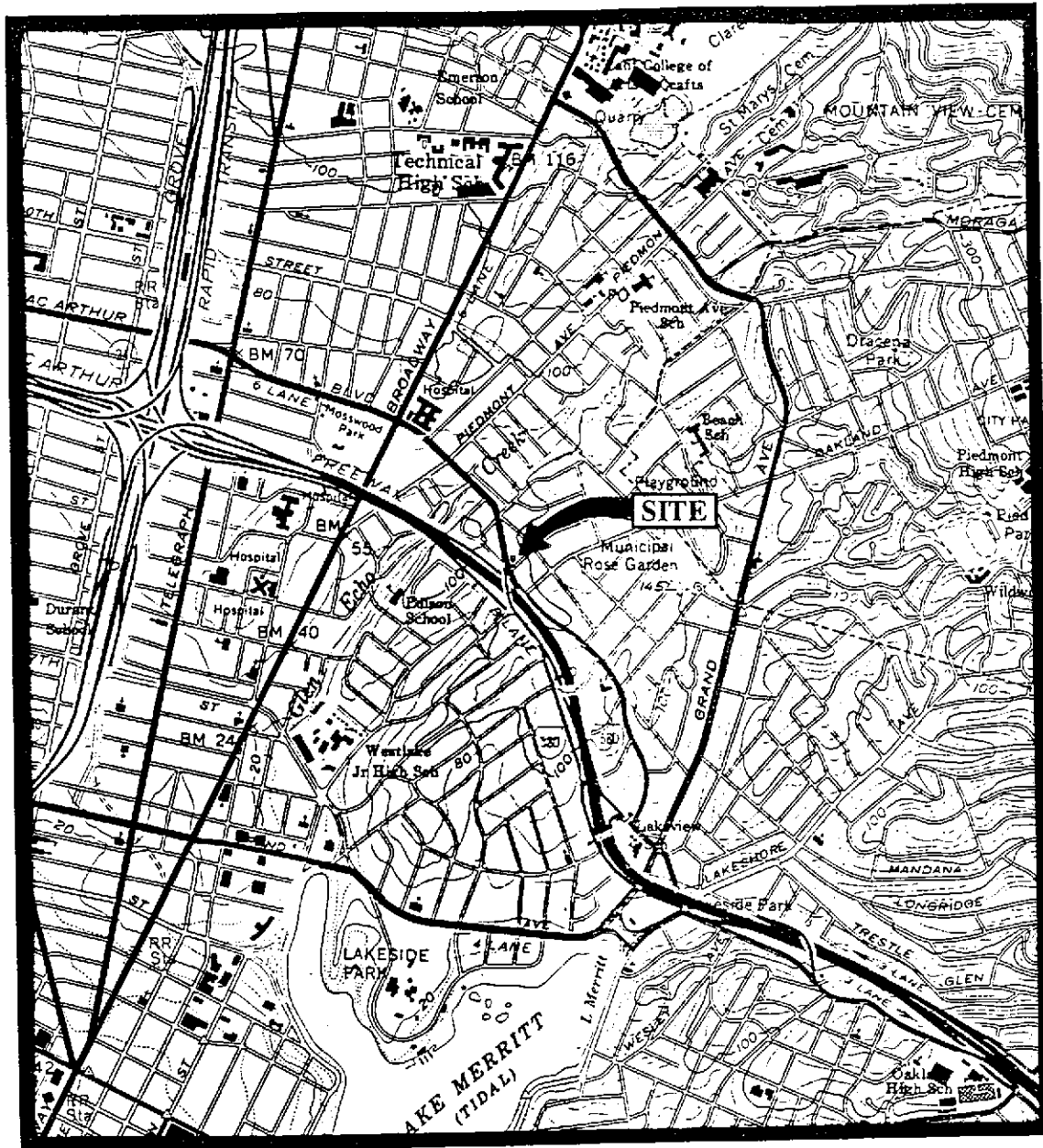
Results are in micrograms per liter (µg/L), unless otherwise indicated.

Table 2
Summary of Laboratory Analyses
Water

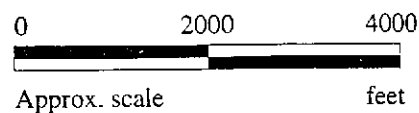
Note: The detection limit for results reported as ND by Sequoia Analytical Laboratory is equal to the stated detection limit times the dilution factor indicated on the laboratory analytical sheets.

Prior to August 1, 1995, the total purgeable petroleum hydrocarbon (TPH as gasoline) quantification range used by Sequoia Analytical Laboratory was C4 - C12. Since August 1, 1995, the quantification range used by Sequoia Analytical Laboratory is C6 - C12.

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



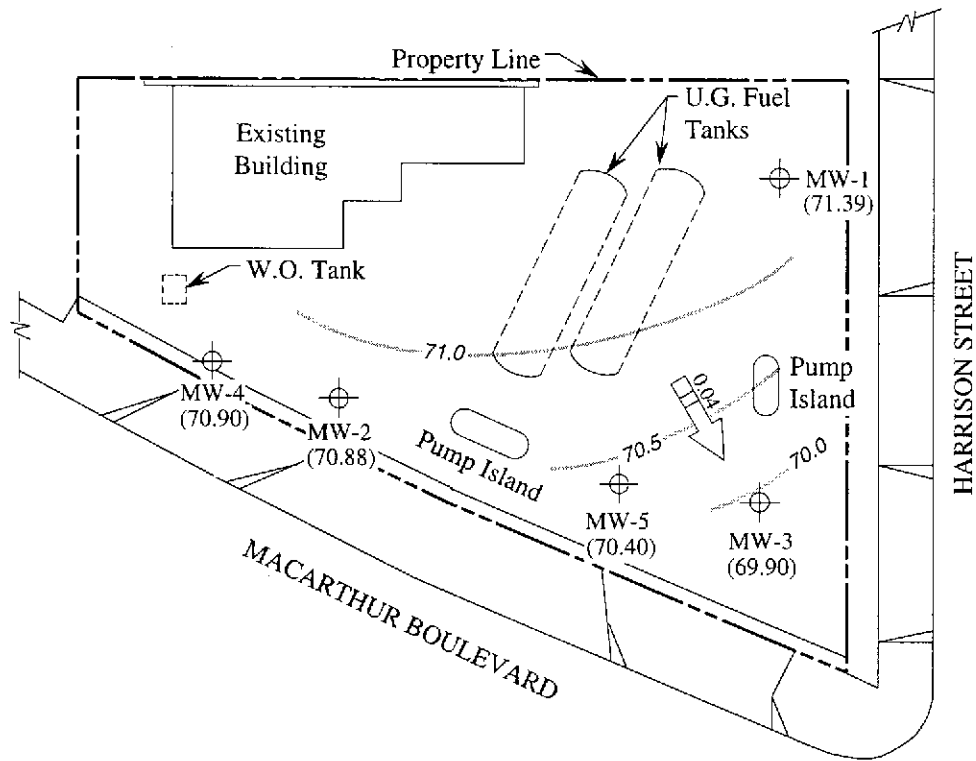
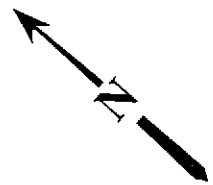
Base modified from 7.5 minute U.S.G.S.
 Oakland East and West Quadrangles
 (both photorevised 1980)







MPDS SERVICES, INCORPORATED

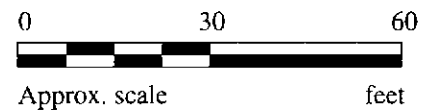
UNOCAL SERVICE STATION # 1871
 96 MACARTHUR BOULEVARD
 OAKLAND, CALIFORNIA

LOCATION
 MAP

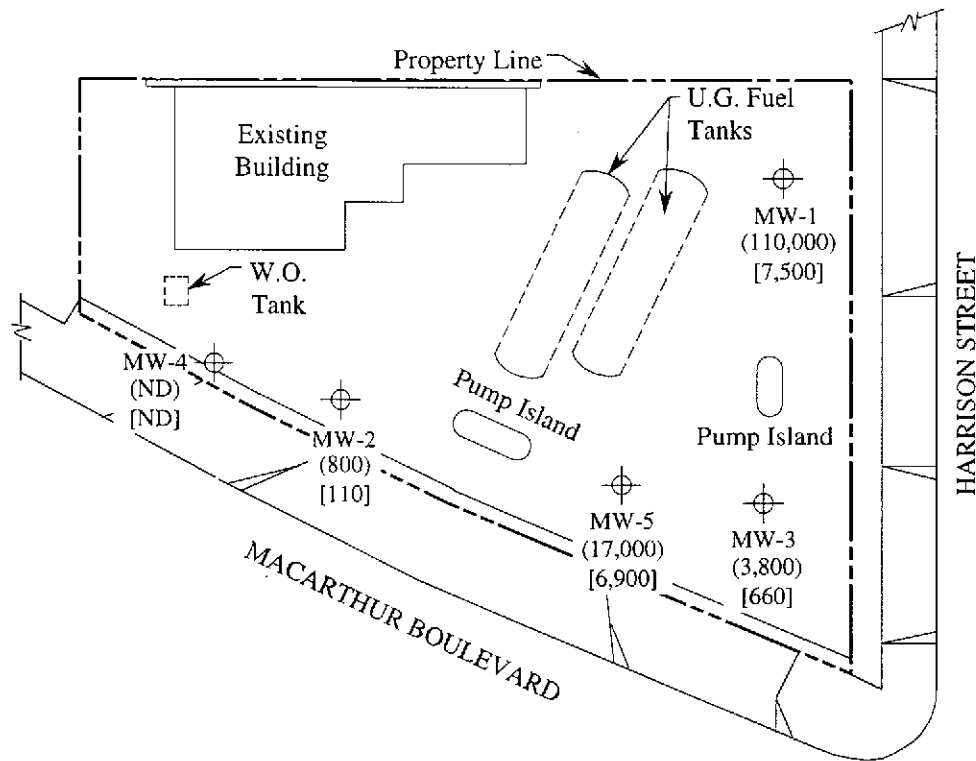
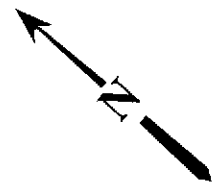


LEGEND

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

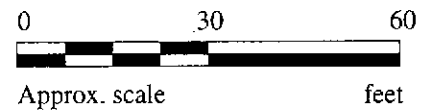


GROUND WATER FLOW DIRECTION MAP FOR THE OCTOBER 24, 1996 MONITORING EVENT



LEGEND

- ⊕ Monitoring well
- () Concentration of TPH as gasoline in µg/L
- [] Concentration of benzene in µg/L
- ND Non-detectable



PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON OCTOBER 24, 1996



MPDS Services 2401 Stanwell Dr., Ste. 300 Concord, CA 94520 Attention: Jarrel Crider	Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland Matrix Descript: Water Analysis Method: EPA 5030/8015 Mod./8020 First Sample #: 610-1411	Sampled: Oct 24, 1996 Received: Oct 24, 1996 Reported: Nov 4, 1996
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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
610-1411	MW-1	110,000	7,500	8,000	3,300	14,000
610-1412	MW-2	800	110	17	11	20
610-1413	MW-3	3,800	660	ND	15	ND
610-1414	MW-4	ND	ND	ND	ND	ND
610-1415	MW-5	17,000	6,900	ND	970	130
610-1416	ES-1	ND	ND	ND	ND	ND
610-1417	ES-2	ND	ND	ND	ND	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





MPDS Services	Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland	Sampled: Oct 24, 1996
2401 Stanwell Dr., Ste. 300	Matrix Descript: Water	Received: Oct 24, 1996
Concord, CA 94520	Analysis Method: EPA 5030/8015 Mod./8020	Reported: Nov 4, 1996
Attention: Jarrel Crider	First Sample #: 610-1411	

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
610-1411	MW-1	Gasoline	400	10/31/96	HP-4	94
610-1412	MW-2	Gasoline	10	10/31/96	HP-4	92
610-1413	MW-3	Gasoline	10	10/31/96	HP-4	78
610-1414	MW-4	--	1.0	10/31/96	HP-4	96
610-1415	MW-5	Gasoline	100	11/2/96	HP-4	91
610-1416	ES-1	--	1.0	10/31/96	HP-4	97
610-1417	ES-2	--	1.0	10/31/96	HP-4	94

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager





MPDS Services 2401 Stanwell Dr., Ste. 300 Concord, CA 94520 Attention: Jarrel Crider	Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland Sample Descript: Water Analysis for: MTBE (Modified EPA 8020) First Sample #: 610-1411	Sampled: Oct 24, 1996 Received: Oct 24, 1996 Analyzed: Oct 31-Nov 2, 96 Reported: Nov 4, 1996
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LABORATORY ANALYSIS FOR: MTBE (Modified EPA 8020)

Sample Number	Sample Description	Detection Limit µg/L	Sample Result µg/L
610-1411	MW-1	2,000	58,000
610-1412	MW-2	50	20,000
610-1413	MW-3	50	65,000
610-1414	MW-4	5.0	6,300
610-1415	MW-5	500	84,000

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager





MPDS Services	Client Project ID:	Unocal #1871, 96 Mac Arthur Blvd. Oakland	Sampled:	Oct 24, 1996
2401 Stanwell Dr., Ste. 300	Sample Matrix:	Water	Received:	Oct 24, 1996
Concord, CA 94520	Analysis Method:	EPA 3510/8015 Mod.	Reported:	Nov 4, 1996
Attention: Jarrel Crider	First Sample #:	610-1414		

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit $\mu\text{g/L}$	Sample I.D. 610-1414 MW-4
Extractable Hydrocarbons	50	N.D.

Chromatogram Pattern: --

Quality Control Data

Report Limit Multiplication Factor:	1.0
Date Extracted:	10/29/96
Date Analyzed:	10/30/96
Instrument Identification:	HP-3B

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

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
404 N. Wiget Lane Walnut Creek, CA 94598 (510) 988-9600 FAX (510) 988-9673
819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100

MPDS Services	Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland	Sampled: Oct 24, 1996
2401 Stanwell Dr., Ste. 300	Matrix Descript: Water	Received: Oct 24, 1996
Concord, CA 94520	Analysis Method: SM 5520 B&F (Gravimetric)	Extracted: Oct 24, 1996
Attention: Jarrel Crider	First Sample #: 610-1414	Analyzed: Oct 25, 1996
		Reported: Nov 4, 1996

TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)	Detection Limit Multiplication Factor
610-1414	MW-4	N.D.	1.0

Detection Limits: 5.0

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager

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MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland
Sample Descript: Water, MW-4
Analysis Method: EPA 5030/8010
Lab Number: 610-1414

Sampled: Oct 24, 1996
Received: Oct 24, 1996
Analyzed: Oct 29, 1996
Reported: Nov 4, 1996

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	1.0	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	2.0	N.D.
Carbon tetrachloride.....	1.0	N.D.
Chlorobenzene.....	1.0	N.D.
Chloroethane.....	2.0	N.D.
2-Chloroethylvinyl ether.....	2.0	N.D.
Chloroform.....	1.0	N.D.
Chloromethane.....	2.0	N.D.
Dibromochloromethane.....	1.0	N.D.
1,3-Dichlorobenzene.....	1.0	N.D.
1,4-Dichlorobenzene.....	1.0	N.D.
1,2-Dichlorobenzene.....	1.0	N.D.
1,1-Dichloroethane.....	1.0	N.D.
1,2-Dichloroethane.....	1.0	N.D.
1,1-Dichloroethene.....	1.0	N.D.
cis-1,2-Dichloroethene.....	1.0	N.D.
trans-1,2-Dichloroethene.....	1.0	N.D.
1,2-Dichloropropane.....	1.0	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	10	N.D.
1,1,2,2-Tetrachloroethane.....	1.0	N.D.
Tetrachloroethene.....	1.0	N.D.
1,1,1-Trichloroethane.....	1.0	N.D.
1,1,2-Trichloroethane.....	1.0	N.D.
Trichloroethene.....	1.0	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager





MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland
Sample Descript: Water, MW-4
Analysis Method: EPA 8270
Lab Number: 610-1414

Sampled: Oct 24, 1996
Received: Oct 24, 1996
Extracted: Oct 29, 1996
Analyzed: Nov 11, 1996
Reported: Nov 18, 1996

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit µg/L	Sample Results µg/L
Acenaphthene.....	2.0	N.D.
Acenaphthylene.....	2.0	N.D.
Aniline.....	2.0	N.D.
Anthracene.....	2.0	N.D.
Benzidine.....	50	N.D.
Benzoic Acid.....	10	N.D.
Benzo(a)anthracene.....	2.0	N.D.
Benzo(b)fluoranthene.....	2.0	N.D.
Benzo(k)fluoranthene.....	2.0	N.D.
Benzo(g,h,i)perylene.....	2.0	N.D.
Benzo(a)pyrene.....	2.0	N.D.
Benzyl alcohol.....	2.0	N.D.
Bis(2-chloroethoxy)methane.....	2.0	N.D.
Bis(2-chloroethyl)ether.....	2.0	N.D.
Bis(2-chloroisopropyl)ether.....	2.0	N.D.
Bis(2-ethylhexyl)phthalate.....	10	14
4-Bromophenyl phenyl ether.....	2.0	N.D.
Butyl benzyl phthalate.....	2.0	N.D.
4-Chloroaniline.....	2.0	N.D.
2-Chloronaphthalene.....	2.0	N.D.
4-Chloro-3-methylphenol.....	2.0	N.D.
2-Chlorophenol.....	2.0	N.D.
4-Chlorophenyl phenyl ether.....	2.0	N.D.
Chrysene.....	2.0	N.D.
Dibenz(a,h)anthracene.....	2.0	N.D.
Dibenzofuran.....	2.0	N.D.
Di-N-butyl phthalate.....	10	N.D.
1,3-Dichlorobenzene.....	2.0	N.D.
1,4-Dichlorobenzene.....	2.0	N.D.
1,2-Dichlorobenzene.....	2.0	N.D.
3,3-Dichlorobenzidine.....	10	N.D.
2,4-Dichlorophenol.....	2.0	N.D.
Diethyl phthalate.....	2.0	N.D.
2,4-Dimethylphenol.....	2.0	N.D.
Dimethyl phthalate.....	2.0	N.D.
4,6-Dinitro-2-methylphenol.....	10	N.D.
2,4-Dinitrophenol.....	10	N.D.
2,4-Dinitrotoluene.....	2.0	N.D.
2,6-Dinitrotoluene.....	2.0	N.D.
Di-N-octyl phthalate.....	2.0	N.D.





MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland
Sample Descript: Water, MW-4
Analysis Method: EPA 8270
Lab Number: 610-1414

Sampled: Oct 24, 1996
Received: Oct 24, 1996
Extracted: Oct 29, 1996
Analyzed: Nov 11, 1996
Reported: Nov 18, 1996

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit µg/L	Sample Results µg/L
Fluoranthene.....	2.0	N.D.
Fluorene.....	2.0	N.D.
Hexachlorobenzene.....	2.0	N.D.
Hexachlorobutadiene.....	2.0	N.D.
Hexachlorocyclopentadiene.....	2.0	N.D.
Hexachloroethane.....	2.0	N.D.
Indeno(1,2,3-cd)pyrene.....	2.0	N.D.
Isophorone.....	2.0	N.D.
2-Methylnaphthalene.....	2.0	N.D.
2-Methylphenol.....	2.0	N.D.
4-Methylphenol.....	2.0	N.D.
Naphthalene.....	2.0	N.D.
2-Nitroaniline.....	10	N.D.
3-Nitroaniline.....	10	N.D.
4-Nitroaniline.....	10	N.D.
Nitrobenzene.....	2.0	N.D.
2-Nitrophenol.....	2.0	N.D.
4-Nitrophenol.....	10	N.D.
N-Nitrosodimethylamine.....	2.0	N.D.
N-Nitrosodiphenylamine.....	2.0	N.D.
N-Nitroso-di-N-propylamine.....	2.0	N.D.
Pentachlorophenol.....	10	N.D.
Phenanthrene.....	2.0	N.D.
Phenol.....	2.0	N.D.
Pyrene.....	2.0	N.D.
1,2,4-Trichlorobenzene.....	2.0	N.D.
2,4,5-Trichlorophenol.....	10	N.D.
2,4,6-Trichlorophenol.....	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Signature on File

Alan B. Kemp
Project Manager





MPDS Services
2401 Stanwell Dr., Ste. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland
Matrix: Liquid

QC Sample Group: 6101411-417

Reported: Nov 18, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel	Oil & Grease
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015	SM 5520
Analyst:	D. Newcomb	D. Newcomb	D. Newcomb	D. Newcomb	D. Sharma	D. Newcomb

MS/MSD Batch#:	6101133	6101133	6101133	6101133	BLK102996	BLK102496
Date Prepared:	10/31/96	10/31/96	10/31/96	10/31/96	10/29/96	10/24/96
Date Analyzed:	10/31/96	10/31/96	10/31/96	10/31/96	10/30/96	10/25/96
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B	Manual
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L	100 mg/L
Matrix Spike % Recovery:	100	80	80	83	93	84
Matrix Spike Duplicate % Recovery:	100	85	85	85	93	94
Relative % Difference:	0.0	6.1	6.1	2.0	0.0	11

LCS Batch#:	4LCS103196	4LCS103196	4LCS103196	4LCS103196	LCS102996	BLK102496
Date Prepared:	10/31/96	10/31/96	10/31/96	10/31/96	10/29/96	10/24/96
Date Analyzed:	10/31/96	10/31/96	10/31/96	10/31/96	10/30/96	10/25/96
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B	Manual
LCS % Recovery:	90	95	100	103	97	84

% Recovery Control Limits:	60-140	60-140	60-140	60-140	60-140	60-140
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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. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland
Matrix: Liquid

QC Sample Group: 6101411-417

Reported: Nov 18, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	D. Newcomb	D. Newcomb	D. Newcomb	D. Newcomb

MS/MSD Batch#:	6110196	6110196	6110196	6110196
Date Prepared:	11/1/96	11/1/96	11/1/96	11/1/96
Date Analyzed:	11/1/96	11/1/96	11/1/96	11/1/96
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:	125	95	90	93
Matrix Spike Duplicate % Recovery:	125	95	90	92
Relative % Difference:	0.0	0.0	0.0	1.8

LCS Batch#:	4LCS110196	4LCS110196	4LCS110196	4LCS110196
Date Prepared:	11/1/96	11/1/96	11/1/96	11/1/96
Date Analyzed:	11/1/96	11/1/96	11/1/96	11/1/96
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4
LCS % Recovery:	125	95	90	93

% Recovery Control Limits:	60-140	60-140	60-140	60-140
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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. 300
Concord, CA 94520
Attention: Jarrel Crider

Client Project ID: Unocal #1871, 96 Mac Arthur Blvd. Oakland
Matrix: Liquid

QC Sample Group: 6101411-417

Reported: Nov 18, 1996

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-Dichloro-ethene	Trichloro-ethene	Chloro-benzene
Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	P. Horton	P. Horton	P. Horton

MS/MSD			
Batch#:	6101463	6101463	6101463
Date Prepared:	10/28/96	10/28/96	10/28/96
Date Analyzed:	10/28/96	10/28/96	10/28/96
Instrument I.D.#:	HP-7	HP-7	HP-7
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L
Matrix Spike % Recovery:	65	97	85
Matrix Spike Duplicate % Recovery:	74	94	91
Relative % Difference:	13	3.1	6.8

LCS Batch#:	LCS102896	LCS102896	LCS102896
Date Prepared:	10/28/96	10/28/96	10/28/96
Date Analyzed:	10/28/96	10/28/96	10/28/96
Instrument I.D.#:	HP-7	HP-7	HP-7
LCS % Recovery:	83	122	90

% Recovery Control Limits:	60-140	60-140	60-140
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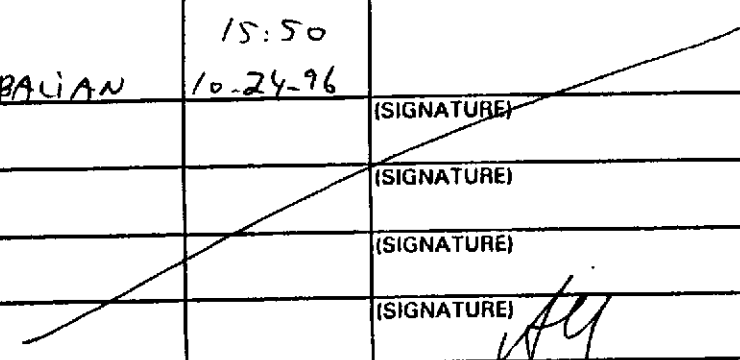

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire 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



CHAIN OF CUSTODY

SAMPLER STEVE BALIAN			UNOCAL SIS # <u>1871</u> CITY: <u>DAKLAND</u>					ANALYSES REQUESTED							TURN AROUND TIME: 5-DAYS	
WITNESSING AGENCY			ADDRESS: <u>96 MAC ARTHUR BLVD.</u>					TPH-GAS BTEX	TPH-DIESEL	TOG	8010	MTBE	8270			REMARKS
SAMPLE ID NO.	DATE	TIME	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPH-GAS BTEX	TPH-DIESEL	TOG	8010	MTBE	8270			
MW-1	10-24-96	13:40	X	X		2	WELL	X				X		6101411A-B	T.OG TPH-D 8270 8010 } REGULAR TURN AROUND TIME	
MW-2	"	13:55	X	X		2	"	X				X		6101412		
MW-3	"	13:25	X	X		2	"	X				X		6101413		
MW-4	"	10:20	X	X		7	"	X	X	X	X	X	X	6101414 A-G		
MW-5	"	14:10	X	X		2	"	X				X		6101415 A,B		
RELINQUISHED BY:		DATE/TIME	RECEIVED BY:		DATE/TIME	THE FOLLOWING <u>MUST BE</u> COMPLETED BY THE LABORATORY ACCEPTING SAMPLES FOR ANALYSES:										
STEVE BALIAN		15:50			10/24/96	1. HAVE ALL SAMPLES RECEIVED FOR ANALYSIS BEEN STORED ON ICE? <input checked="" type="checkbox"/>										
(SIGNATURE)						2. WILL SAMPLES REMAIN REFRIGERATED UNTIL ANALYZED? <input checked="" type="checkbox"/>										
(SIGNATURE)						3. DID ANY SAMPLES RECEIVED FOR ANALYSIS HAVE HEAD SPACE? <input checked="" type="checkbox"/>										
(SIGNATURE)						4. WERE SAMPLES IN APPROPRIATE CONTAINERS AND PROPERLY PACKAGED? <input checked="" type="checkbox"/>										
(SIGNATURE)						(SIGNATURE)		10/24/96	SIGNATURE: 		TITLE: <u>ANALYST</u>		DATE: <u>10/24/96</u>			

Note: All water containers to be sampled for TPHG/BTEX, 8010 & 8240 are preserved with HCL. All water containers to be sampled for Lead or Metals are preserved with HNO3. All other containers are unpreserved.

PURGING/SAMPLING DATA SHEET

SAMPLING LOCATION: #1871 OAKLAND DATE & TIME SAMPLED 10-24-96 13:40 A.M.
P.M.

96 MAC ARTHUR BLVD FIELD TECHNICIAN STEVE BALIAN

PURGE METHOD pump DATE(S) PURGED 10-24-96

WELL NUMBER MW-1

WATER LEVEL-INITIAL 14.85 SAMPLING METHOD BAIL

WATER LEVEL-FINAL 16.01 CONTAINERS 4

WELL DEPTH 24.18 PRESERVATIVES Hcl

WELL CASING VOLUME 6.06 †CASING DIAMETER 4'

TIME	GALLONS PURGED	TEMPERATURE (°F) (± 1°F)	ELECTRICAL CONDUCTIVITY ([μmhos/cm]x100) (± 10% of TOTAL)	pH (± 0.2)
11:00	0	76.6	565 US	6.64
↓	6	76.1	533 US	6.55
↓	12	76.0	537 US	6.53
↓	18.5 DEWATERED			
12:05	18.5	75.8	544 US	6.57

† Correction Factors:

Well Diameter	Factor
2"	0.17
3"	0.37
4"	0.65
4.5"	0.82
6"	1.46
8"	2.6
12"	5.87

PURGING/SAMPLING DATA SHEET

SAMPLING LOCATION: #1871 OAKLAND DATE & TIME SAMPLED 10-24-96 13:55 A.M.
P.M.

96 MAR ARTHUR BLVD FIELD TECHNICIAN STEVE BALIAN

PURGE METHOD pump DATE(S) PURGED 10-24-96

WELL NUMBER MW-2

WATER LEVEL-INITIAL 10.78 SAMPLING METHOD BAIL

WATER LEVEL-FINAL 11.69 CONTAINERS 4

WELL DEPTH 24.74 PRESERVATIVES Hcl

WELL CASING VOLUME 9.07 TCASING DIAMETER 4"

TIME	GALLONS PURGED	TEMPERATURE (°F) (± 1°F)	ELECTRICAL CONDUCTIVITY ([μmhos/cm]x100) (± 10% of TOTAL)	pH (± 0.2)
12:15	0	73.4	437 us	6.72
↓	9	74.1	407 us	6.79
	18	73.6	407 us	6.77
	DEWATERED			
12:45	27.5	73.9	401 us	6.73

† Correction Factors:

Well Diameter	Factor
2"	0.17
3"	0.37
4"	0.65
4.5"	0.82
6"	1.46
8"	2.6
12"	5.87

PURGING/SAMPLING DATA SHEET

SAMPLING LOCATION: # 1871 OAKLAND DATE & TIME SAMPLED 10-24-96 13:25 A.M.
P.M.

96 MCARTHUR BLVD. FIELD TECHNICIAN STEVE BALIAN

PURGE METHOD PUMP DATE(S) PURGED 10-24-96

WELL NUMBER MW-3

WATER LEVEL-INITIAL 12.65 SAMPLING METHOD BAIL

WATER LEVEL-FINAL 14.71 CONTAINERS 4

WELL DEPTH 23.70 PRESERVATIVES Hcl

WELL CASING VOLUME 7.18 †CASING DIAMETER 4"

TIME	GALLONS PURGED	TEMPERATURE (°F) (± 1°F)	ELECTRICAL CONDUCTIVITY (µmhos/cm)x100 (± 10% of TOTAL)	pH (± 0.2)
10:30	0	72.9	525 us	6.56
↓	7.5	75.2	563 us	6.56
↓	15	75.6	538 us	6.58
10:50	22	75.8	531 us	6.55

† Correction Factors:

Well Diameter	Factor
2"	0.17
3"	0.37
4"	0.65
4.5"	0.82
6"	1.46
8"	2.6
12"	5.87

PURGING/SAMPLING DATA SHEET

SAMPLING LOCATION: #1871 OAKLAND DATE & TIME SAMPLED: 10-24-96 10:20 A.M. P.M.

96 MAC ARTHUR BLVD FIELD TECHNICIAN STEVE BALIAN

PURGE METHOD PUMP DATE(S) PURGED 10-24-96

WELL NUMBER MW-4

WATER LEVEL-INITIAL 11.14 SAMPLING METHOD BAIL

WATER LEVEL-FINAL 11.23 CONTAINERS 9

WELL DEPTH 19.57 PRESERVATIVES Hcl

WELL CASING VOLUME 1.43 †CASING DIAMETER 2"

TIME	GALLONS PURGED	TEMPERATURE (°F) (± 1°F)	ELECTRICAL CONDUCTIVITY ([μmhos/cm]x100) (± 10% of TOTAL)	pH (± 0.2)
9:55	0	66.3	588 u.s	7.88
↓	1.5	68.0	452 u.s	7.50
↓	3	69.8	420 u.s	7.23
↓	4.5	70.2	399 u.s	7.00
10:05	6	70.3	408 u.s	6.95

† Correction Factors:

Well Diameter	Factor
2"	0.17
3"	0.37
4"	0.65
4.5"	0.82
6"	1.46
8"	2.6
12"	5.87

PURGING/SAMPLING DATA SHEET

SAMPLING LOCATION: #1871 OAKLAND DATE & TIME SAMPLED 10-24-96 14:10 A.M.
P.M.

96 MAC ARTHUR BLVD. FIELD TECHNICIAN STEVE BALIAN

PURGE METHOD PUMP DATE(S) PURGED 10-24-96

WELL NUMBER MW-5

WATER LEVEL-INITIAL 11.40 SAMPLING METHOD BAIL

WATER LEVEL-FINAL ~~13.07~~ 13.07 CONTAINERS 4

WELL DEPTH 20.00 PRESERVATIVES Hcl

WELL CASING VOLUME 1.46 †CASING DIAMETER 2"

TIME	GALLONS PURGED	TEMPERATURE (°F) (± 1°F)	ELECTRICAL CONDUCTIVITY ((µmhos/cm)x100) (± 10% of TOTAL)	pH (± 0.2)
13:00	0	75.2	484 US	6.79
↓	1.5	75.8	465 US	6.79
↓	3	75.3	493 US	6.75
13:05	4.5	75.1	499 US	6.74

† Correction Factors:

Well Diameter	Factor
2"	0.17
3"	0.37
4"	0.65
4.5"	0.82
6"	1.46
8"	2.6
12"	5.87