Paul's
no ref/dep @ this site.

90 JUL 12 PM 2:26

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

July 10, 1990

Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

94609

RE: Unocal Service Station #3538
411 W. MacArthur Blvd.
Oakland, California

610

Gentlemen:

Per the request of Mr. Rick Sisk of Unocal Corporation, enclosed please find our report dated June 4, 1990, for the above referenced site.

Should you have any questions, please feel free to call our office at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Judy A. Dewey

jad\82

Enclosure

cc: Rick Sisk, Unocal Corporation

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581

KEI-P89-0703.QR2
June 4, 1990

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

Attention: Mr. Rick Sisk

RE: Quarterly Report
Unocal Service Station #3538
411 W. MacArthur Blvd.
Oakland, California

Dear Mr. Sisk:

This report presents the results of the second quarter of monitoring and sampling of the monitoring wells at the referenced site by Kaprealian Engineering, Inc. (KEI), per proposal KEI-P89-0703.P2 dated October 23, 1989. The wells are currently monitored monthly and sampled on a quarterly basis. This report covers the work performed by KEI from February through April, 1990.

BACKGROUND

The subject site is presently used as a gasoline station. A Location Map and Site Plan are attached to this report.

KEI's work at the site began in July, 1989 when KEI was asked to collect soil samples following the removal of two underground fuel storage tanks and one waste oil tank at the site. Water was encountered in the fuel tank pit at a depth of 10.5 feet, thus prohibiting sampling directly from beneath the fuel tanks. Sidewall samples were collected at a depth of 10 feet. The sample from beneath the waste oil tank was collected at a depth of 8.5 feet. KEI also collected samples from the piping trenches at depths of 5 to 10 feet. After sampling, the water was pumped from the pit. Since there was no recharge, a water sample was not collected. All samples were analyzed by Sequoia Analytical Laboratory in Redwood City, California, for total petroleum hydrocarbons (TPH) as gasoline, and benzene, toluene, xylenes and ethylbenzene (BTX&E). In addition, the waste oil sample was analyzed for TPH as diesel, total oil and grease (TOG), EPA method 8010 and EPA 8270 compounds.

The analytical results of the soil samples, collected from the sidewalls of the fuel tank pit, showed levels of TPH as gasoline ranging from non-detectable to 11 ppm, except for sample SW1, which had 3,100 ppm of TPH as gasoline. However, after excavation of approximately 4 feet of sidewall where sample SW1 was collected, an additional sample, labeled SW1(4), was collected and the analyses indicated non-detectable levels of TPH as gasoline and BTX&E. The sample from the waste oil pit showed TOG at 36 ppm. Documentation of soil sample collection and sample analytical results from the tank excavation are summarized in KEI's report (KEI-J89-0702.R1) dated July 31, 1989. To comply with the requirements of the regulatory agencies and based on the results of the laboratory analyses, KEI proposed installation of four monitoring wells.

On September 6 and 7, 1989, four two-inch diameter monitoring wells, designated as MW1, MW2, MW3 and MW4 on the attached Site Plan) were installed at the site. Soil sample analyses showed levels of TPH as gasoline ranging from non-detectable to 20 ppm in all samples. TPH as diesel and EPA 8010 were non-detectable in all samples from MW1. All TOG levels in MW1 were <50 ppm. Benzene levels were non-detectable in all samples except MW2 at 19 feet and MW3 at 10 feet, which were 1.5 and 0.29 ppm, respectively. The water sample analyses indicated non-detectable levels of benzene in all wells. MW1 also revealed non-detectable levels of TPH as diesel and <50 ppm of TOG; however, 2.7 ppb of tetrachloroethene was detected. TPH as gasoline was 290 ppb in MW2, 32 ppb in MW3, and non-detectable in wells MW1 and MW4. Based on the analytical results, KEI recommended the implementation of a monthly monitoring and quarterly sampling program.

FIELD ACTIVITIES

The four wells were monitored three times and sampled once during the quarter. During monitoring, the wells were checked for depth to water and presence of free product and sheen. No free product or sheen was noted in any of the wells during the quarter. Monitoring data are summarized in Table 1.

Water samples were collected from the wells on April 19, 1990. Prior to sampling, the wells were purged of between 15 and 55 gallons using a surface pump. Samples were then collected using a clean Teflon bailer. Samples were decanted into clean VOA vials and/or one liter amber bottles as appropriate which were sealed with Teflon-lined screw caps and stored in a cooler on ice until delivery to the state certified laboratory.

HYDROLOGY

Based on the water level data gathered during the quarter, ground water flow direction appeared to be to the northeast on April 19, 1990, changed from the easterly flow direction observed during the previous quarter. Water levels have fluctuated during the quarter, showing a net increase of 0.45 feet in well MW2 and a net decrease in all of the other wells ranging from 0.25 and 0.60 feet since the previous quarter. The measured depth to ground water at the site on April 19, 1990 ranged from 17.30 to 18.25 feet.

ANALYTICAL RESULTS

Ground water samples were analyzed at Sequoia Analytical Laboratory in Redwood City, California, and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for TPH as gasoline using EPA method 5030 in conjunction with modified 8015, and BTX&E using EPA method 8020. In addition, the water sample collected from well MW1 was analyzed for TPH as diesel using EPA method 3510 in conjunction with modified 8015, TOG using EPA method 418.1 with clean up, and halogenated volatile organics using EPA method 8010.

Analytical results of the ground water samples, collected from monitoring wells MW1 and MW4, indicate non-detectable levels of TPH as gasoline and benzene. In wells MW2 and MW3, TPH as gasoline was detected at 3,900 and 3,100 ppb, respectively, and benzene was detected at concentrations of 550 and 600 ppb, respectively, increasing from the previous quarter. In well MW1, TPH as diesel, TOG and all EPA method 8010 compounds were non-detectable, except for 2.2 ppb of tetrachloroethene. Results of the analyses are summarized in Table 2. Copies of the analytical results and Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

In wells MW2 and MW3, TPH as gasoline and benzene levels have increased since the previous quarter. Based on the analytical results collected and evaluated to date and no evidence of free product or sheen in any of the wells, KEI recommends the continuation of the current monitoring and sampling program of the existing wells per KEI's proposal (KEI-P89-0703.P2) dated October 23, 1989. Due to the apparent change of the ground water flow direction, additional monitoring data is necessary to recommend the installation of off-site monitoring wells.

DISTRIBUTION

A copy of this report should be sent to Alameda County Health Care Services, and to the Regional Water Quality Control Board, San Francisco Bay Region.

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.

Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state certified laboratory. We have analyzed this data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, regarding the above, including laboratory analyses, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

If you have any questions regarding this report, please do not hesitate to call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Michael E. Heckathorn
Environmental Engineer

Don R. Braun
Certified Engineering Geologist

License No. 1310
Exp. Date 6/30/90

Mardo Kaprealian
President

jad

Attachments: Tables 1 and 2
Site Location Map
Site Plan
Laboratory Analyses
Chain of Custody documentation

KEI-P89-0703.QR2
June 4, 1990

TABLE 1

SUMMARY OF MONITORING DATA

Date	Well No.	Depth to Water (feet)	Product Thickness	Sheen	Water Bailed (gallons)
4/19/90	MW1	18.10	0	None	15
	MW2	17.30	0	None	35
	MW3	18.20	0	None	55
	MW4	18.25	0	None	15
3/21/90	MW1	17.55	0	None	0
	MW2	18.00	0	None	0
	MW3	17.95	0	None	0
	MW4	17.60	0	None	0
2/21/90	MW1	17.45	0	None	0
	MW2	17.65	0	None	0
	MW3	17.80	0	None	0
	MW4	17.45	0	None	0

KEI-P89-0703.QR2
June 4, 1990

TABLE 2

SUMMARY OF LABORATORY ANALYSES

Sample Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethylbenzene
(Collected on April 19, 1990)						
MW1*	ND	ND	ND	ND	ND	ND
MW2	--	3,900	550	5.1	390	91
MW3	--	3,100	600	27	220	54
MW4	--	ND	ND	0.48	ND	ND
(Collected on January 23, 1990)						
MW1**	ND	ND	1.5	2.3	4.3	ND
MW2	--	400	73	36	40	10
MW3	--	450	110	1.2	11	4.4
MW4	--	ND	ND	0.40	ND	ND
(Collected on September 15, 1989)						
MW1***	ND	ND	ND	0.61	ND	ND
MW2	--	290	ND	12	ND	ND
MW3	--	32	ND	ND	ND	ND
MW4	--	ND	ND	ND	ND	ND
Detection Limits	50	30	0.3	0.3	0.3	0.3

* TOG was non-detectable. EPA method 8010 compounds were non-detectable, except for 2.2 ppb of tetrachloroethene.

** TOG was 1.5 ppm. EPA method 8010 compounds were non-detectable, except for 2.1 ppb of tetrachloroethene.

*** TOG was <50 ppm. EPA method 8010 were non-detectable, except for 2.7 ppb of tetrachloroethene.

-- Indicates analysis not performed.

ND = Non-detectable.

Results in parts per billion (ppb), unless otherwise indicated.

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Consulting Engineers
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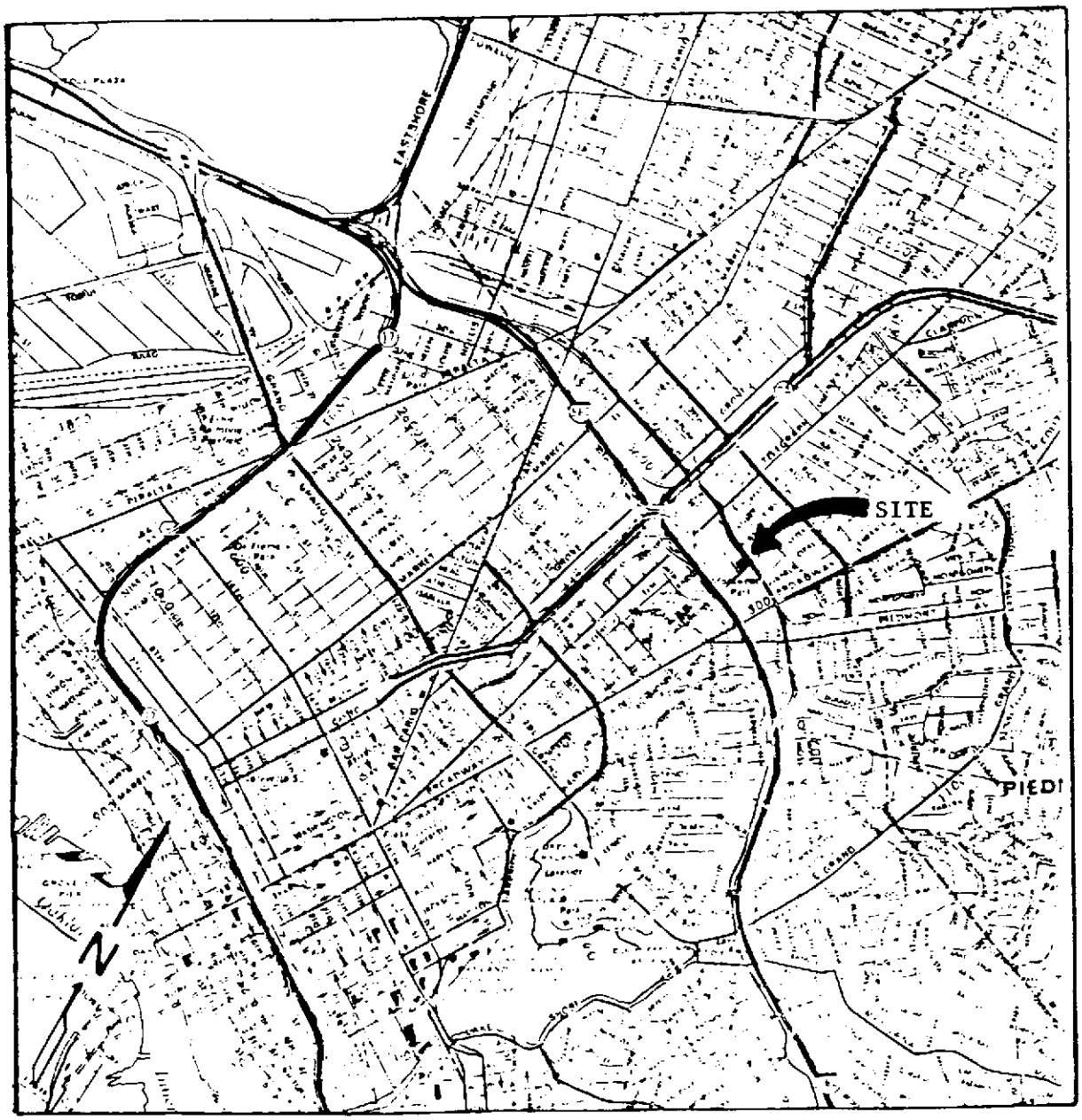
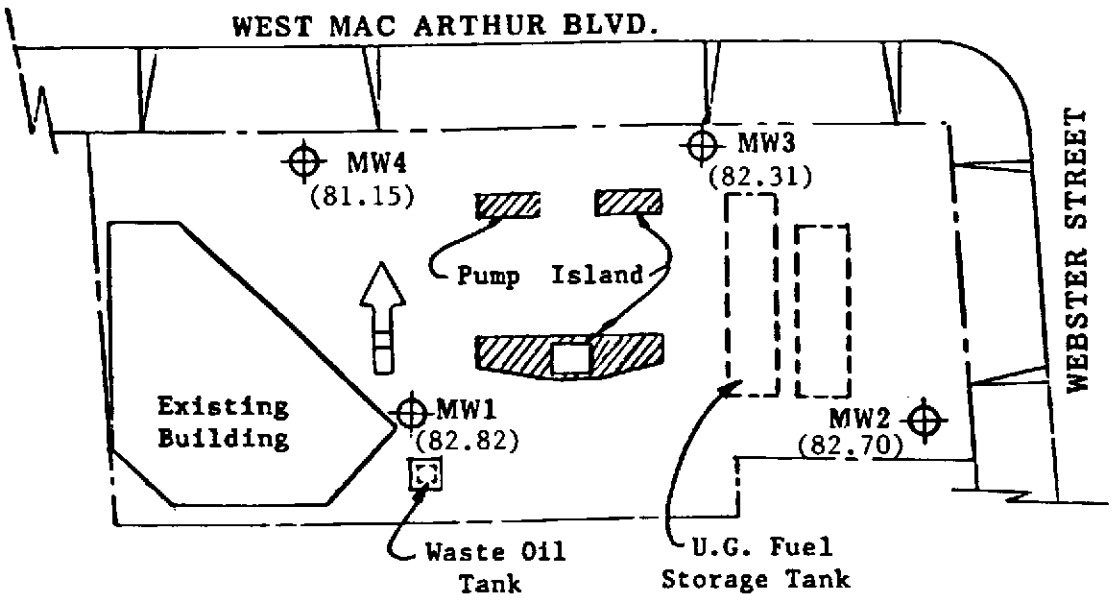


LOCATION MAP

Unocal Service Station #3538
411 W. MacArthur Blvd.
Oakland, California

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P.O. BOX 996 • BENICIA, CA 94510
(707) 746-6915 • (707) 746-6916 • FAX: (707) 746-5581



30 0 30
feet
Approx. Scale

SITE PLAN

LEGEND

⊕ Monitoring Well

( ) Water Table elevation in feet on 4/19/90. Top of MW2 wellcover assumed 100.00 feet as datum

⇨ Ground water flow direction

Unocal S/S #3538
411 W. MacArthur Blvd.
Oakland, California

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 411 W. MacArthur	Sampled:	Apr 19, 1990
P.O. Box 996	Matrix Descript:	Water	Received:	Apr 19, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Apr 19, 1990
Attention: Mardo Kaprealian, P.E.	First Sample #:	004-2830 A-B	Reported:	Apr 27, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
0042830 A-B	MW1	N.D.	N.D.	N.D.	N.D.	N.D.
0042831 A-B	MW2	3,900	550	5.1	91	390
0042832 A-B	MW3	3,100	600	27	54	220
0042833 A-B	MW4	N.D.	N.D.	0.48	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

42830.KEI <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 411 W. MacArthur	Sampled:	Apr 19, 1990
P.O. Box 996	Matrix Descript:	Water	Received:	Apr 19, 1990
Benicia, CA 94510	Analysis Method:	EPA 3510/8015	Extracted:	Apr 25, 1990
Attention: Mardo Kaprealian, P.E.	First Sample #:	004-2830 C	Analyzed:	Apr 26, 1990
			Reported:	Apr 27, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons µg/L (ppb)
0042830 C	MW1	N.D.

Detection Limits:	50

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 411 W. MacArthur	Sampled:	Apr 19, 1990
P.O. Box 996	Matrix Descript:	Water	Received:	Apr 19, 1990
Benicia, CA 94510	Analysis Method:	EPA 418.1 (I.R. with clean-up)	Extracted:	Apr 24, 1990
Attention: Mardo Kaprealian, P.E.	First Sample #:	004-2830 D	Analyzed:	Apr 24, 1990
			Reported:	Apr 27, 1990

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

Sample Number	Sample Description	Petroleum Oil mg/L (ppm)
0042830 D	MW1	N.D.

Detection Limits:	1.0

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

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Kaprealian Engineering, Inc.	Client Project ID:	Unocal, Oakland, 411 W. MacArthur	Sampled:	Apr 19, 1990
P.O. Box 996	Sample Descript:	Water, MW1	Received:	Apr 19, 1990
Benicia, CA 94510	Analysis Method:	EPA 5030/8010	Analyzed:	Apr 24, 1990
Attention: Mardo Kaprealian, P.E.	Lab Number:	004-2830 E-G	Reported:	Apr 27, 1990

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	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	2.2
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	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.

SEQUOIA ANALYTICAL

Belinda C. Vega
Project Manager

42830.KEI <4>

KAPREALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: JOE

WITNESSING AGENCY:

SITE NAME & ADDRESS: Unocal/Oakland
411 W. MacArthur

TURN AROUND TIME: 5 days

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHG, BTXE	601	TOG	TPHD	REMARKS
MW 1	4/19/90	1:00 PM		✓	✓		7	MW	✓	✓	✓	✓	VOA's preserved in the field with HCl
" 2	"	"		✓	✓		2	"	✓				
" 3	"	4:45 PM		✓	✓		2	"	✓				
" 4	"	9:20 AM		✓	✓		2	"	✓				

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Joe Lewis	4/19/90 15:00	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? ✓
2. Will samples remain refrigerated until analyzed? ✓
3. Did any samples received for analysis have head space? NO
4. Were samples in appropriate containers and properly packaged?

Signature	Title	Date
	SR	4/19