KARREALIAN ENGINEERING
INCORPORATED

KEI-P88-1203.R15
June 25, 1993

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

Attention: Mr. Tim Howard

RE: Sampling/Disposal of Drill Cutting Soil at
Unocal Service Station #3135
845 - 66th Avenue
Oakland, California

Dear Mr. Howard:

This report summarizes the analytical results of the composite soil sample that was collected from the drill cutting soil at the referenced site. The soil analyses were conducted to comply with the local regulatory agency requirements for proper disposal of potentially contaminated soil.

On April 28, 1993, a soil sample from approximately one cubic yard of stockpiled soil (that had been generated during the installation of one monitoring well - MW7) was collected to determine proper disposal of the soil. One composite soil sample (designated as Comp S1) was collected. The composite sample consisted of four individual grab samples taken at various locations within the stockpile. The individual samples were subsequently composited by the lab. The samples were collected in two-inch diameter, clean brass tubes, which were then sealed with aluminum foil, plastic caps and tape, and placed in a cooled ice chest for subsequent delivery to a certified laboratory for analysis. The sample was analyzed by Sequoia Analytical Laboratory in Concord, California, and was accompanied by properly executed Chain of Custody documentation.

The composite soil sample was analyzed to determine concentrations of total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, benzene, toluene, xylenes, and ethylbenzene (BTX&E) by EPA method 8020, TPH as diesel by EPA method 3550/modified 8015, STLC lead, Reactivity, Corrosivity, and Ignitability. The results of the soil analyses are summarized in Table 1. Copies of the laboratory analyses and the Chain of Custody documentation are attached to this report.

Based on the analytical results of the composite soil sample, approximately one cubic yard of soil, represented by sample Comp S1, was profiled for disposal at the BFI Landfill in Livermore,

2401 Stanwell Drive, Suite 400
Concord, California 94520
Tel: 510.602.5100 Fax: 510.687.0602

California (an approved Class III disposal facility). The soil was subsequently approved for disposal on May 13, 1993 (Approval #CA405/051393/53376). On or about June 22, 1993, Paradiso Construction Company of San Leandro, California, transported and disposed of approximately one cubic yard of soil at the BFI Landfill.

Should you have any questions on this report, please do not hesitate to contact me at (510) 602-5100.

Sincerely,

Kaprealian Engineering, Inc.

Deanna L. Harding
Technical Assistant

/dlh

Attachments: Table 1
Laboratory Analyses
Chain of Custody documentation

KEI-P88-1203.R15
June 25, 1993

TABLE 1

SUMMARY OF LABORATORY ANALYSES

(Collected on April 28, 1993)

Sample	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Xylenes	Ethyl-benzene	STLC Lead	Reactivity	Corrosivity (pH)	Ignitability
Comp S1	2.2	ND	ND	ND	ND	ND	0.19	ND	8.2	>100°C

ND = Non-detectable.

Results in parts per million (ppm), unless otherwise indicated.

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1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Kaprealian Engineering, Inc.	Client Project ID:	Unocal #3135, 845 66th Ave., Oakland	Sampled:	Apr 28, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Soil	Received:	Apr 28, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	May 13, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	304-1236		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 304-1236 Comp S1	Sample I.D. Matrix Blank
Purgeable Hydrocarbons	1.0	N.D.	
Benzene	0.005	N.D.	
Toluene	0.005	N.D.	
Ethyl Benzene	0.005	N.D.	
Total Xylenes	0.005	N.D.	
Chromatogram Pattern:		--	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	4/30/93	4/30/93
Instrument Identification:	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	101	100

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

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Project Manager

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #3135, 845 66th Ave., Oakland	Sampled:	Apr 28, 1993
2401 Stanwell Dr., Ste. 400	Sample Matrix:	Soil	Received:	Apr 28, 1993
Concord, CA 94520	Analysis Method:	EPA 3550/8015	Reported:	May 13, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	304-1236		

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit mg/kg	Sample I.D. 304-1236 Comp S1	Sample I.D. Matrix Blank
Extractable Hydrocarbons	1.0	2.2	
Chromatogram Pattern:		Diesel & Non Diesel Mixture (<C12; >C20)	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Extracted:	5/3/93	5/3/93
Date Analyzed:	5/4/93	5/4/93
Instrument Identification:	HP-3B	HP-3B

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

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #3135, 845 66th Ave., Oakland	Sampled:	Apr 28, 1993
2401 Stanwell Dr., Ste. 400	Sample Descript:	STLC Extract of Soil	Received:	Apr 28, 1993
Concord, CA 94520	Analysis for:	STLC Lead	Extracted:	Apr 30, 1993
Attention: Mardo Kaprealian, P.E.	First Sample #:	304-1236	Analyzed:	May 12, 1993
			Reported:	May 13, 1993

LABORATORY ANALYSIS FOR: STLC Lead

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
304-1236	Comp S1	0.050	0.19

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

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #3135, 845 66th Ave., Oakland	Sampled: Apr 28, 1993
2401 Stanwell Dr., Ste. 400	Sample Descript:	Soil, Comp S1	Received: Apr 28, 1993
Concord, CA 94520			Analyzed: 4/29-5/6/93
Attention: Mardo Kaprealian, P.E.	Lab Number:	304-1236	Reported: May 13, 1993

CORROSIVITY, IGNITABILITY, AND REACTIVITY

Analyte	Detection Limit	Sample Results
Corrosivity:		
pH	N.A.	8.2
Ignitability:		
Flashpoint (Pensky-Martens), °C	N.A.	> 100 °C
Reactivity:		
Sulfide, mg/kg	10	N.D.
Cyanide, mg/kg	0.50	N.D.
Reaction with water	N.A.	Negative

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

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Kaprealian Engineering, Inc.
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal #3135, 845 66th Ave., Oakland
Matrix: Soil
QC Sample Group 304-1236

Reported: May 13, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Diesel	STLC Lead	Cyanide
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015	EPA 7420	EPA 9010
Analyst:	J.F.	J.F.	J.F.	J.F.	K.Wimer	K.M.A.	A.S.
Conc. Spiked:	0.40	0.40	0.40	1.2	10	1.0	1.4
Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/L	mg/Kg
LCS Batch#:	2LCS043093	2LCS043093	2LCS043093	2LCS043093	BLK050393	BLK043093	LCS050593
Date Prepared:	4/30/93	4/30/93	4/30/93	4/30/93	5/3/93	4/30/93	5/5/93
Date Analyzed:	4/30/93	4/30/93	4/30/93	4/30/93	5/4/93	5/6/93	5/5/93
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B	SpectrAA-20	N/A
LCS % Recovery:	102	102	104	119	108	90	94
Control Limits:	70-130	70-130	70-130	70-130	80-120	75-125	80-120
MS/MSD Batch #:	3041252	3041252	3041252	3041252	3041223	3041126	93050091A
Date Prepared:	4/30/93	4/30/93	4/30/93	4/30/93	5/3/93	4/30/93	5/5/93
Date Analyzed:	4/30/93	4/30/93	4/30/93	4/30/93	5/4/93	5/6/93	5/5/93
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B	SpectrAA-20	N/A
Matrix Spike % Recovery:	105	110	110	125	92	120	90
Matrix Spike *Duplicate* % Recovery:	110	110	110	125	102	120	91
Relative % Difference:	4.6	0.0	0.0	0.0	10	0.0	1.1

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Project Manager

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 LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only *and are not used to accept or reject batch results.*

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Kaprealian Engineering, Inc.	Client Project ID:	Unocal #3135, 845 66th Ave., Oakland
2401 Stanwell Dr., Ste. 400	Matrix:	Soil
Concord, CA 94520		
Attention: Mardo Kaprealian, P.E.	QC Sample Group: 304-1236	Reported: May 13, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Sulfide
Method:	EPA 9030
Analyst:	K.F.
Conc. Spiked:	10
Units:	mg/Kg
LCS Batch#:	LCS050593
Date Prepared:	5/5/93
Date Analyzed:	5/5/93
Instrument I.D.#:	N/A
LCS % Recovery:	110
Control Limits:	80-120

MS/MSD Batch #:	9305009
Date Prepared:	5/5/93
Date Analyzed:	5/5/93
Instrument I.D.#:	N/A
Matrix Spike % Recovery:	100
Matrix Spike Duplicate % Recovery:	100
Relative % Difference:	0.0

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Project Manager

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 LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

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Concord, CA 94520
Attention: Mardo Kaprealian, P.E.

Client Project ID: Unocal #3135, 845 66th Ave., Oakland
QC Sample Group: 304-1236
Reported: May 13, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Ignitability	Cossosivity-pH
Method:	EPA 1010	EPA 9045
Analyst:	S.Phillips	M.Nguyen
Reporting Units:	°C	pH units
Date Analyzed:	May 6, 1993	Apr 29, 1993
QC Sample #:	Xylene;Flashpoint =29°C	304-1236
Sample Conc.:	26	8.2
Spike Conc. Added:	N/A	N/A
Conc. Matrix Spike:	N/A	N/A
Matrix Spike % Recovery:	N/A	N/A
Conc. Matrix Spike Dup.:	28	8.2
Matrix Spike Duplicate % Recovery:	N/A	N/A
Relative % Difference:	7.4	0.0

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Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

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Kaprealian Engineering, Inc. Client Project ID: Unocal #3135, 845 66th Ave., Oakland
2401 Stanwell Dr., Ste. 400
Concord, CA 94520
Attention: Mardo Kaprealian, P.E. QC Sample Group: 304-1236 Reported: May 12, 1993

QUALITY CONTROL DATA REPORT

SURROGATE

Method:	EPA 8015	EPA 8015
Analyst:	K. Wimer	K. Wimer
Reporting Units:	mg/kg	mg/kg
Date Analyzed:	May 4, 1993	May 4, 1993
Sample #:	304-1236	Matrix Blank
Surrogate % Recovery:	90	88

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% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

KAPREALIAN ENGINEERING INCORPORATED

CHAIN OF CUSTODY

SAMPLER: [illegible]

WITNESSING AGENCY:

SITE NAME & ADDRESS: UNOCAL # 3135/OAKLAND 815 60TH AVENUE

SAMPLE ID NO.	DATE	TIME	SOIL	WATER	GRAB	COMP	NO. OF CONT.	SAMPLING LOCATION	TPHg, BTEX	STLC Lead	RCI		*TPH-diesel		
COMP S1	4-28-93		X			X	4	Stockpile/ Drill Cuttings	X	X	X		X		

ANALYSES REQUESTED

TURN AROUND TIME: REGULAR

REMARKS: 3041236AD

*TPH-Diesel - only run (check box) if diesel present.

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature] (KEI)	4/28/93 1640	[signature]
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? Y
2. Will samples remain refrigerated until analyzed? Y
3. Did any samples received for analysis have head space? N
4. Were samples in appropriate containers and properly packaged? Y

EV (Signature) FS (Title) 4/28/93 (Date)

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