

Ms. Juliett Shin  
Alameda County  
Department of Environmental Health  
1131 Harbor Bay Parkway, 2nd Floor  
Alameda, CA 94502

**Subject: Tank Removal and Remedial Excavation Summary Report for  
Redwood Gasoline Station, 800 San Pablo Avenue, Albany, CA  
Prepared by Geo Plexus, Incorporated dated May 22, 1997**

"I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report is true and correct."

7.24.97  
Date

Mohinder S. Sikand  
Signature of Responsible Party

MOHINDER S SIKAND  
Printed Name of Responsible Party

ALBANY HILL MINI MART  
800 SAN PABLO AVE.  
ALBANY CA 94706

Mr. John Sutfin  
Superior Underground Tank Service  
430 Kevin Court  
San Ramon, California 94583

ENVIRONMENTAL  
PROTECTION  
97 APR 15 AM 9:15

**Subject: Underground Storage Tank Removal Summary Letter Report for  
Redwood Gasoline Station, 800 San Pablo Avenue, Albany, CA**

Dear Mr. Sutfin:

Geo Plexus, Incorporated is pleased to present this Summary Letter Report regarding the removal of four (4) underground storage tanks from the subject property. The tanks reportedly consisted of three gasoline and one diesel fuel tank located as indicated on Figure 1. The tanks were identified as:

- Tank 1 - 10,000 gallon gasoline tank
- Tank 2 - 10,000 gallon gasoline tank
- Tank 3 - 6,000 gallon gasoline tank
- Tank 4 - 2,000 gallon diesel tank

### TANK REMOVAL ACTIVITIES

It is understood that a tank removal permit was filed with Alameda County Department of Environmental Health for general compliance with County/State policies for tank closures. The tanks were excavated and removed from the project site on March 5, 1997 by Superior Underground Tank Services (SUTS) personnel under the oversight of personnel from the Alameda County Department of Environmental Health.

The soil overlying and adjacent to the tanks was removed by a backhoe/excavator to expose the tanks and to facilitate removal of the piping. The riser assemblies and product lines extending from the tanks to the dispenser pumps and the vent lines were removed. The dispensing pumps were disconnected from the product lines prior to proceeding with the tank excavation activities.

The tanks were inerted by placing dry-ice into each tank and the tanks were allowed to vent to the atmosphere until the oxygen content was determined to be below 16% and the Lower Explosive Limit (LEL) was determined to be below 10% of the LEL as measured by a Gastech Tank Tester device and with a Gastech Combustible Gas/LEL/Oxygen Meter. The tanks were transported and disposed of by Erickson, Inc. under contract arrangements with SUTS.

The tanks did not exhibit visual evidence of holes; however, Tank 4 did exhibit some corrosion and pitting at the ends of the tank.

The excavations for the tanks (see Figure 1) extended to depths of 8-9 feet below the ground surface. The soil removed from the excavations above and adjacent to the storage tanks and dispensers exhibited some petroleum odors and some soil discoloration/staining (gray-green color) was observed. These soils were stockpiled on-site for characterization and disposal.

### SOIL SAMPLE ACTIVITIES

Samples of the native soil were obtained from beneath each tank and dispensing pump and along the pipe line. The samples were collected by Geo Plexus, Incorporated personnel under direct supervision of a Certified Engineering Geologist. The samples were obtained through the use of the excavation at the locations directed by Ms. Juliet Shin with the Alameda County Department of Environmental Health (see Figure 1).

The soil samples collected for analytical testing were obtained from the backhoe bucket by advancing pre-cleaned 2 inch I.D. brass liners into the undisturbed soil contained in the backhoe bucket. The soil samples were immediately sealed in the liner using aluminum foil and plastic caps and properly labeled including: the date, time, sample location, and project number. The samples were placed immediately into a chilled cooler and maintained at 4° C for transport to the laboratory under chain-of-custody documentation.

Water seepage was observed entering the excavation following removal of the tanks. A ground water collection point was created in the bottom of the excavation (see Figure 1) by excavating additional soil. A "grab" sample of the water encountered in the excavation was obtained by lowering a sterile teflon bailer into the water column and the water contained in the bailer was decanted into sterile vials/jars with Teflon lined screw caps. The samples were immediately sealed in the vials and properly labeled including: the date, time, sample location, project number, and indication of any preservatives added to the sample. The samples were placed immediately into a chilled cooler and maintained at 4° C for transport to the laboratory under chain-of-custody documentation.

### ANALYTICAL TESTING

The soil and water samples were submitted to McCampbell Analytical, a State of California, Department of Health Services certified testing laboratory and were tested in accordance with the State of California, Regional Water Quality Control Board Guidelines and Alameda County protocols. The testing for the tank samples included:

- Total Petroleum Hydrocarbons as gasoline
- Total Petroleum Hydrocarbons as diesel
- Volatile Aromatic Compounds (BTEX and MTBE)
- Total Lead

The testing for the stockpile soils included the above with the addition of:

- LUFT Metals
- Resistivity/Corrosion/Ignitability

The results of the analytical testing are attached as Appendix A. The results of the analytical testing for gasoline and diesel compounds are summarized on Tables 1 and 2.

TABLE 1

SUMMARY OF SOIL ANALYTICAL TEST DATA  
(concentrations in parts per million)

<u>Sample</u>	<u>TPHgas/diesel</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl- Benzene</u>	<u>Total Xylenes</u>	<u>MTBE</u>
T1-S1, 13'	380/----	0.66	2.5	10	45	ND<0.8
T1-S2, 12.5'	160/----	0.18	1.4	2.6	7.8	0.53
T2-S1, 13'	1100/----	3.3	37	24	110	5.0
T2-S2, 12.5'	490/----	1.2	1.8	10	35	ND<2.7
T3-S1, 13'	240/----	1.1	7.6	5.9	31	5.4
T3-S2, 12.5'	97/----	1.4	1.0	2.5	9.4	<b>30</b>
T4-S1, 11'	----/300	0.14	0.16	0.45	0.39	1.0
T4-S2, 11'	----/550	0.046	0.12	0.42	0.35	0.52
D1-S1, 4'	----/2.6	4.5	0.15	0.81	2.3	<b>10</b>
D2-S1, 4'	530/----	11	32	9.1	43	6.7
PL1-S1, 4'	8.5/ND	1.4	0.63	0.36	0.90	5.6

Notes: TPH reported as gasoline/diesel fuel  
N.D. indicates that concentrations below detection limit.  
---- indicates constituent not analyzed.

TABLE 2

SUMMARY OF RECHARGED WATER ANALYTICAL TEST DATA  
(concentrations in parts per billion)

<u>Sample</u>	<u>TPHgas/diesel</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl- Benzene</u>	<u>Total Xylenes</u>	<u>MTBE</u>
TX1-WS1,2	120,000/220,000	11,000	13,000	3,800	21,000	<b>72,000</b>

Notes: TPH reported as gasoline/diesel fuel

FINDINGS

Low to moderate concentrations of Total Petroleum Hydrocarbons as gasoline and Total Petroleum Hydrocarbons as diesel were detected in the soil and the ground water "grab" samples. High concentrations of Benzene and MTBE were detected in the soil and the ground water "grab" samples. Lead concentrations in the soil were not elevated above regional heavy metal concentrations.

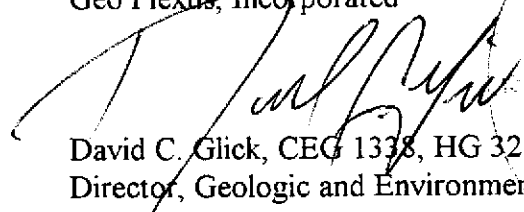
It is recommended that Alameda County be contacted to determine what mandatory soil and/or ground water remediation is required to achieve permitting for installation of the new underground storage tanks.

One copy of this report should be submitted to Ms. Julliet Shin with Alameda County Department of Environmental Health.

It has been a pleasure to be of service to you on this project. Should you have additional questions, please contact our office.

Respectfully submitted,

Geo Plexus, Incorporated



David C. Glick, CEG 1338, HG 32  
Director, Geologic and Environmental Services

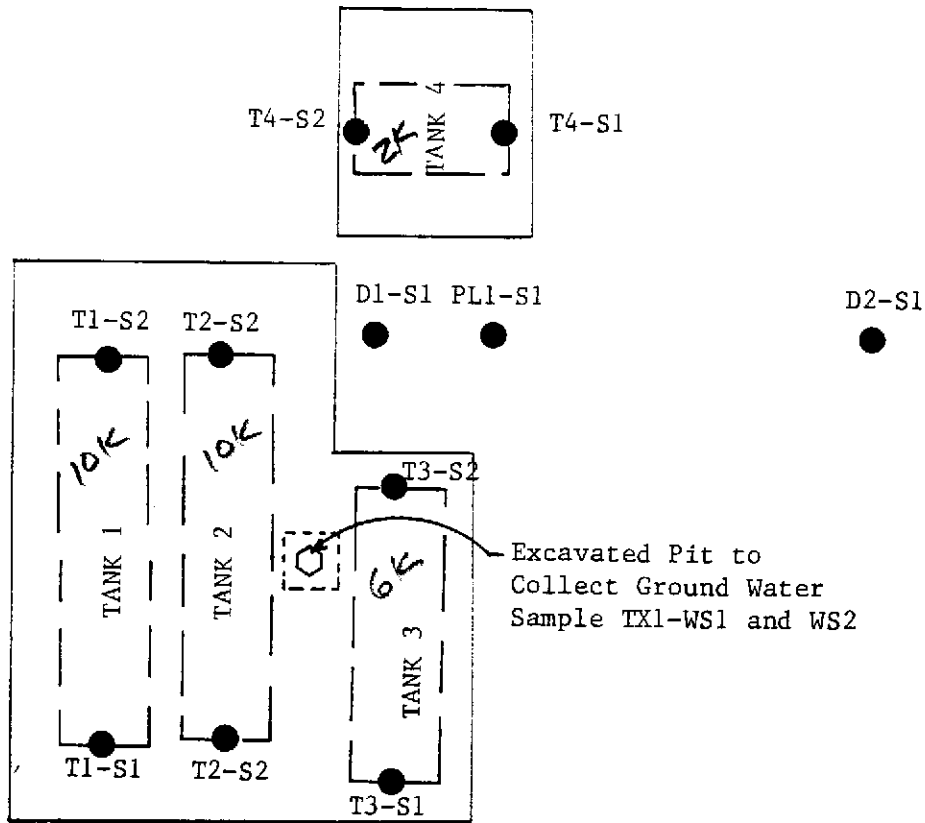


WASHINGTON AVE.

EXISTING BLDG.

SIDEWALK

SAN PABLO AVE.



Excavated Pit to Collect Ground Water Sample TX1-WS1 and WS2

Samples T1-S1,2; T2-S1,2; T3-S1,2; T4-S1,2 and D1-S1; D2-S1, PL1-S1 and TX1-WS1,2 collected 3/5/97



NOTE: Dimensions are approximate by taping from property corners.

SAMPLE LOCATION PLAN		
DATE 3/22/97	SCALE 1"=10'	DRAWN BY dgc
800 SAN PABLO AVE.		
		Figure

APPENDIX A

ANALYTICAL TEST DATA

AGR304

PROJECT NUMBER		PROJECT NAME				Number of Containers	Type of Containers	Type of Analysis				Condition of Samples	Initial
C97-001		REDWOOD GAS						TPH GAS/BTEX/MTBE	TPH d <sub>86</sub>	TOTAL LEAD	BTEX/MTBE		
Send Report Attention of:			Report Due		Verbal Due								
DAVID GLICK			/ /		/ /								
Sample Number	Date	Time	Comp	Grab	Station Location								
T1-S1	3/5/97	11:20	/	/	TANK #1 SOUTH END, 13 FT.	1 EA.	6" BRASS TUBE	X	X			74126	
T1-S2		11:40	/	/	TANK #1 NORTH END, 12.5 FT.			X	X			74127	
T2-S1		11:30	/	/	TANK #2 SOUTH END, 13 FT.			X	X			74128	
T2-S2		11:55	/	/	TANK #2 NORTH END, 12.5 FT.			X	X			74129	
T3-S1		11:35	/	/	TANK #3 SOUTH END, 13 FT.			X	X			74130	
T3-S2		12:00	/	/	TANK #3 NORTH END, 12.5 FT.			X	X			74131	
T4-S1		12:05	/	/	TANK #4 EAST END, 11 FT.				X	X		74132	
T4-S2		12:15	/	/	TANK #4 WEST END, 11 FT.				X	X		74133	
D1-S1		12:35	/	/	DIESEL DISPENSOR 4 FT.				X	X		74134	
D2-S1		12:45	/	/	GASOLINE DISPENSOR 4 FT.			X	X			74135	
PL-S1	↓	12:25	/	/	PRODUCT LINE 4 FT.	↓	↓	X	X	X		74136	
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Date/Time	Remarks: STANDARD TURNAROUND							
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Date/Time								
Relinquished by: (Signature)		Date/Time	Received by: (Signature)		Date/Time								
						ICEPT <input checked="" type="checkbox"/> PRESERVATIVE <input checked="" type="checkbox"/> GOOD CONDITION <input checked="" type="checkbox"/> APPROPRIATE <input checked="" type="checkbox"/> LEAD SPACE ADEQUATE <input checked="" type="checkbox"/> COMMENTS <input checked="" type="checkbox"/>							



PROJECT NUMBER		PROJECT NAME				Number of Cntrs	Type of Containers	Type of Analysis				Condition of Samples	Initial
C97-001		REDWOOD GAS						TPH GAS/BTEX/MTBE	TPH d	BTEX/MTBE			
Send Report Attention of:			Report Due		Verbal Due								
DAVID GLICK			/ /		/ /								
Sample Number	Date	Time	Comp	Grab	Station Location								
#2 TXI-WS1A	3/5/97	14:15		/	TANK EXCAVATION PIT, ~13 FT.	1 EA.	ACIDIFIED 40ML VOA	X				74139	
#2 TXI-WS1B	↓	14:40		/	↓	↓	↓	X				74140	
#2 TXI-WS2	↓	15:00		/	↓	↓	1 LITER BOTTLE	X	DN			74141	

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 3/5/97 19:55	Received by: (Signature) <i>[Signature]</i>	Date/Time 3/5/97 19:55	Remarks: STANDARD TURN AROUND  ICE/T* <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> GOOD CONDITION <input checked="" type="checkbox"/> HEAD SPACE ABSENT <input checked="" type="checkbox"/>  VOAS <input checked="" type="checkbox"/> O&G <input checked="" type="checkbox"/> METALS <input checked="" type="checkbox"/> OTHER <input checked="" type="checkbox"/> PRESERVATIVE <input checked="" type="checkbox"/> APPROPRIATE CONTAINERS <input checked="" type="checkbox"/>
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 3/6/97 1705	Received by: (Signature) <i>[Signature]</i>	Date/Time 3/6/97 1705	
Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 3/6/97 1915	Received by: (Signature) <i>[Signature]</i>	Date/Time 3/6/97 1918	

020  
A6P304

PROJECT NUMBER		PROJECT NAME				Number of Cntrs	Type of Containers	Type of Analysis					Condition of Samples	Initial						
C 97-001		REDWOOD GAS						TPH gas/STEX	ATSC	TPHD	WFT, 20Z	YS 7/13/97			STC					
Send Report Attention of:		Report Due		Verbal Due																
DAVID GLICK		/ /		/ /																
Sample Number	Date	Time	Comp	Grab	Station Location															
STK1-S1	3/5/97	13:20		/	STOCKPILE	1 EA.	6" BRASS TUBE													
STK1-S2		13:25		/	↓	↓	COMPOSITE	✓	✓	X		74137								
STK1-S3		13:35		/																
STK1-S4		13:40		/																
STK1-S5		13:45		/																
STK1-S6		13:55		/																
STK1-S7		14:00		/																
STK1-S8	Y	14:05		/																
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Date/Time		Remarks: STANDARD TURNDOWN					VOAS   O&G   METALS   OTHER							
J. Grogan		3/5/97 19:55		[Signature]		3/5/97 19:55							ICEP ✓				GOOD CONDITION ✓			
[Signature]		3/6/97 1705		[Signature]		3/6/97 1705							ICEP ✓				GOOD CONDITION ✓			
Relinquished by: (Signature)		Date/Time		Received by: (Signature)		Date/Time		HEAD SPACE ✓					HEAD SPACE ABSENT ✓							
[Signature]		3/6/97 19:18		[Signature]		3/6/97 19:18		PRESERVATIVE ✓					APPROPRIATE CONTAINERS ✓							

Geo Plexus, Inc. 1900 Wyatt Drive, Suite 1 Santa Clara, CA 95054	Client Project ID:# C97-001; Redwood Gas	Date Sampled: 03/05/97
		Date Received: 03/06/97
	Client Contact: David Glick	Date Extracted: 03/06-03/10/97
	Client P.O.:	Date Analyzed: 03/06-03/10/97

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline\*, with Methyl tert-Butyl Ether\* & BTEX\***

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) <sup>+</sup>	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Rec. Surrogate
74126	T1-S1	S	380,b,d	ND< 0.8	0.66	2.5	10	45	98
74127	T1-S2	S	160,b,d	0.53	0.18	1.4	2.6	7.8	99
74128	T2-S1	S	1100,b,d	5.0	3.3	37	24	110	99
74129	T2-S2	S	490,b,d	ND< 2.7	1.2	1.8	10	35	99
74130	T3-S1	S	240,b,d	5.4	1.1	7.6	5.9	31	97
74131	T3-S2	S	97,a	30	1.4	1.0	2.5	9.4	96
74132	T4-S1	S	---	1.0	0.14	0.16	0.45	0.39	98
74133	T4-S2	S	---	0.52	0.046	0.12	0.42	0.35	97
74134	D1-S1	S	---	10	4.5	0.15	0.81	2.3	93
74135	D2-S1	S	530,a	6.7	11	32	9.1	43	105
74136	PL-S1	S	8.5,a	5.6	1.4	0.63	0.36	0.90	95
74137	STKP-S1-S4	S	120,b,d	ND< 0.5	0.10	1.2	0.84	6.3	97
74138	STKP-S5-S8	S	320,b,d	ND< 1.3	0.22	1.9	3.2	25	96
74139	TX1-WS1A	W	120,000,a,h	52,000	11,000	13,000	3800	21,000	104
74140	TX1-WS1B	W	110,000,a,h	72,000	15,000	12,000	3500	19,000	99
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	50 ug/L	5.0	0.5	0.5	0.5	0.5	0.5	
	S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	0.005	

\* water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, and all TCLP extracts in mg/L

# cluttered chromatogram; sample peak coelutes with surrogate peak

<sup>+</sup> The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant (aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~ 5 vol. % sediment; j) no recognizable pattern.

Geo Plexus, Inc. 1900 Wyatt Drive, Suite 1 Santa Clara, CA 95054	Client Project ID: # C97-001; Redwood Gas	Date Sampled: 03/05/97
		Date Received: 03/06/97
	Client Contact: David Glick	Date Extracted: 03/06-03/07/97
	Client P.O:	Date Analyzed: 03/06-03/07/97

**Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel \***

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d) <sup>+</sup>	% Recovery Surrogate
74132	T4-S1	S	300,a	104
74133	T4-S2	S	550,a	105
74134	D1-S1	S	2.6,d	104
74136	PL-S1	S	ND	104
74137	STKP-S1-S4	S	110,d	105
74138	STKP-S5-S8	S	390,d,b	105
74141	TX1-WS2	W	220,000,d	99
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	
		S	1.0 mg/kg	

\* water samples are reported in ug/L, soil and sludge samples in mg/kg, and all TCLP and STLC extracts in mg/L

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~ 5 vol. % sediment.

Geo Plexus, Inc. 1900 Wyatt Drive, Suite 1 Santa Clara, CA 95054	Client Project ID:# C97-001; Redwood Gas	Date Sampled: 03/05/97
		Date Received: 03/06/97
	Client Contact: David Glick/John Sutfin	Date Extracted: 03/13/97
	Client P.O:	Date Analyzed: 03/14/97

**LUFT Metals\***

EPA analytical methods 6010/200.7, 239.2\*

Lab ID	Client ID	Matrix	Extraction <sup>o</sup>	Cadmium	Chromium	Lead	Nickel	Zinc	% Rec. Surrogate
74137-38	STK1 (S1-S8)	S	TTLC	ND	30	7.3	29	32	107
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	S	TTLC	0.5 mg/kg	0.5	3.0	2.0	1.0		
	W	TTLC	0.005 mg/L	0.005	0.005	0.05	0.05		
	---	STLC,TCLP	0.01 mg/L	0.05	0.2	0.05	0.05		

\* soil samples and sludge are reported in mg/kg, and water samples and all STLC & TCLP extracts in mg/L  
 + Lead is analysed using EPA method 6010 (ICP) for soils, STLC & TCLP extracts and method 239.2 (AA Furnace) for water samples  
<sup>o</sup> EPA extraction methods 1311(TCLP), 3010/3020(water,TTLC), 3040(organic matrices,TTLC), 3050(solids,TTLC); STLC from CA Title 22  
 # surrogate diluted out of range; N/A means surrogate not applicable to this analysis  
 & reporting limit raised due matrix interference  
 i) liquid sample that contains greater than ~ 2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations.

McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553

Tele: 510-798-1620 Fax: 510-798-1622

Geo Plexus, Inc. 1900 Wyatt Drive, Suite 1 Santa Clara, CA 95054	Client Project ID:# C97-001; Redwood Gas	Date Sampled: 03/05/97
		Date Received: 03/06/97
	Client Contact: David Glick	Date Extracted: 03/07/97
	Client P.O:	Date Analyzed: 03/10/97

## Lead\*

EPA analytical methods 6010/200.7, 239.2<sup>+</sup>

Lab ID	Client ID	Matrix	Extraction <sup>o</sup>	Lead*	% Recovery Surrogate
74126	T1-S1	S	TTLC	10	99
74127	T1-S2	S	TTLC	8.4	96
74128	T2-S1	S	TTLC	8.3	100
74129	T2-S2	S	TTLC	7.3	99
74130	T3-S1	S	TTLC	9.4	99
74131	T3-S2	S	TTLC	10	101
74135	D2-S1	S	TTLC	8.4	101
74136	PL-S1	S	TTLC	7.2	102
Reporting Limit unless otherwise stated; ND means not detected above the re- porting limit	S	TTLC	3.0 mg/kg		
	W	TTLC	0.005 mg/L		
	—	STLC,TCLP	0.2 mg/L		

\* soil and sludge samples are reported in mg/kg, and water samples and all STLC &amp; TCLP extracts in mg/L

<sup>+</sup> Lead is analysed using EPA method 6010 (ICP) for soils, sludges, STLC & TCLP extracts and method 239.2 (AA Furnace) for water samples<sup>o</sup> EPA extraction methods 1311(TCLP), 3010/3020(water,TTLC), 3040(organic matrices,TTLC), 3050(solids,TTLC); STLC from CA Title 22<sup>#</sup> surrogate diluted out of range; N/A means surrogate not applicable to this analysis<sup>&</sup> reporting limit raised due matrix interference<sup>i)</sup> liquid sample that contains greater than ~ 2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations.

**McCAMPBELL ANALYTICAL INC.**

110 2nd Avenue South, #D7, Pacheco, CA 94553  
Tele: 510-798-1620 Fax: 510-798-1622

Geo Plexus, Inc. 1900 Wyatt Drive, Suite 1 Santa Clara, CA 95054	Client Project ID:# C97-001; Redwood Gas	Date Sampled: 03/05/97
		Date Received: 03/06/97
	Client Contact: David Glick/John Sutfin	Date Extracted: 03/13/97
	Client P.O:	Date Analyzed: 03/13/97

**RCI (Reactivity, Corrosivity & Ignitability)**

CA Title 22, Section 66261.21-66261.23

Lab ID	Client ID	Matrix	Reactivity <sup>+</sup>	Corrosivity (pH)	Ignitability <sup>o</sup>
74137-38	STK1 (S1-S8)	S	negative	8.17 @ 25.6°C	negative

<sup>+</sup> negative means no obvious reaction with water, no evolution of gas upon contact with water, appears to contain no reactive cyanide or sulfide (< ~ 5 mg/kg cyanide and 50 mg/kg sulfide by EPA SW-846, chapter 7, modified), and shows no indication of explosivity.

<sup>o</sup> negative for a soil means the absence of spontaneous combustion and the absence of flammability upon exposure to a naked flame.

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 03/06/97

Matrix: Water

Analyte	Concentration (mg/L) Sample (#74060)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
TPH (gas)	0.0	98.4	97.3	100.0	98.4	97.3	1.2
Benzene	0.0	9.6	9.4	10.0	96.0	94.0	2.1
Toluene	0.0	10.0	9.6	10.0	100.0	96.0	4.1
Ethyl Benzene	0.0	10.4	10.0	10.0	104.0	100.0	3.9
Xylenes	0.0	30.9	30.0	30.0	103.0	100.0	3.0
TPH (diesel)	0	135	129	150	90	86	4.5
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\* Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100



## QC REPORT FOR HYDROCARBON ANALYSES

Date: 03/07/97

Matrix: Water

Analyte	Concentration (mg/L) Sample (#74177)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
TPH (gas)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethyl Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPH (diesel)	0	135	119	150	90	79	12.8
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 03/10/97

Matrix: Water

Analyte	Concentration (mg/L) Sample (#74177)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
TPH (gas)	0.0	99.0	91.4	100.0	99.0	91.4	8.0
Benzene	0.0	9.6	9.0	10.0	96.0	90.0	6.5
Toluene	0.0	10.0	9.3	10.0	100.0	93.0	7.3
Ethyl Benzene	0.0	10.3	9.6	10.0	103.0	96.0	7.0
Xylenes	0.0	30.7	28.7	30.0	102.3	95.7	6.7
TPH (diesel)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 03/07/97-03/10/97

Matrix: Soil

Analyte	Concentration (mg/kg)			Amount Spiked	% Recovery		RPD
	Sample (#68840)	MS	MSD		MS	MSD	
TPH (gas)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethylbenzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPH (diesel)	0	314	294	300	105	98	6.4
TRPH (oil and grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 03/06/97

Matrix: Soil

Analyte	Concentration (mg/kg)			Amount Spiked	% Recovery		RPD
	Sample (#68848)	MS	MSD		MS	MSD	
TPH (gas)	0.000	1.788	1.802	2.03	88	89	0.8
Benzene	0.000	0.186	0.192	0.2	93	96	3.2
Toluene	0.000	0.190	0.198	0.2	95	99	4.1
Ethylbenzene	0.000	0.184	0.192	0.2	92	96	4.3
Xylenes	0.000	0.550	0.566	0.6	92	94	2.9
TPH (diesel)	0	318	321	300	106	107	0.8
TRPH (oil and grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\* Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 03/10/97

Matrix: Soil

Analyte	Concentration (mg/kg) Sample (#68848)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
TPH (gas)	0.000	1.858	1.882	2.03	92	93	1.3
Benzene	0.000	0.180	0.180	0.2	90	90	0.0
Toluene	0.000	0.186	0.188	0.2	93	94	1.1
Ethylbenzene	0.000	0.180	0.180	0.2	90	90	0.0
Xylenes	0.000	0.536	0.532	0.6	89	89	0.7
TPH (diesel)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TRPH (oil and grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

## QC REPORT FOR METALS

Date: 03/14/97

Matrix: Soil

Extraction: TTLC

Analyte	Concentration (mg/kg, mg/L)			Amount Spiked	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
Arsenic	0.0	5.2	5.0	5.0	105	99	5.4
Selenium	0.0	4.8	4.6	5.0	95	92	4.0
Molybdenum	0.0	5.3	5.2	5.0	106	104	1.9
Silver	0.0	0.4	0.4	0.5	85	82	2.7
Thallium	0.0	4.1	4.0	5.0	82	80	1.5
Barium	0.0	4.1	4.0	5.0	82	80	2.3
Nickel	0.0	4.7	4.6	5.0	94	93	1.1
Chromium	0.0	5.1	4.9	5.0	101	99	2.1
Vanadium	0.0	5.0	4.9	5.0	100	98	2.5
Beryllium	0.0	5.3	5.1	5.0	106	102	3.3
Zinc	0.0	5.0	4.9	5.0	100	98	2.7
Copper	0.0	4.5	4.4	5.0	89	88	2.0
Antimony	0.0	4.3	4.1	5.0	85	82	3.4
Lead	0.0	4.6	4.5	5.0	92	90	1.8
Cadmium	0.0	5.1	4.9	5.0	101	98	3.7
Cobalt	0.0	4.7	4.6	5.0	94	91	3.6
Mercury	0.000	0.254	0.265	0.25	102	106	4.2

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

## QC REPORT FOR ICP and/or AA METALS

Date: 03/09/97-03/10/97

Matrix: Soil

Extraction: TTLC

Analyte	Concentration (mg/kg, mg/L, ug/wip)			Amount Spiked	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
Total Lead	0.0	4.64	4.63	5.0	93	93	0.2
Total Cadmium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Chromium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Nickel	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Zinc	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Copper	N/A	N/A	N/A	N/A	N/A	N/A	N/A
STLC Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$