centurywest ENGINEERING CORPORATION

ALCO HAZMAT
94 APR 18 PM 1:25

April 15, 1994

STID 537
1) need to determine extent of the plume
work plan by

UST Local Oversight Program
Alameda County Health Agency
Department of Environmental Health
80 Swan Way, Suite 200
Oakland, CA 94621

Attention: Ms. Susan Hugo

Subject: Report of Fourth Quarterly Ground Water Monitoring
Liquid Sugars UST Site
1275 66th Street
Emeryville, California
CWEC: 20516-001-08

Ladies and Gentlemen:

This letter report documents recent fourth quarterly monitoring of two ground water monitoring wells at the subject site in Emeryville, California (see Figures 1 and 2). This letter report summarizes the work performed and the results of this monitoring event.

DESCRIPTION OF SAMPLING ACTIVITIES

On February 15, 1994, Century West Engineering Corporation purged and sampled monitoring wells MW-1 and MW-2. Purging and sampling of each of the wells was conducted in accordance with California LUFT Field Manual guidelines as follows:

- After unlocking and opening both of the monitoring wells, the water level was measured in both wells to the nearest 0.01 foot with an electronic probe.

- Using a disposable PVC bailer, a single bail of ground water was taken from both wells to check for the presence or absence of floating free product.

- The wells were purged of approximately three well volumes. During purging, temperature, pH, conductivity, and turbidity of the well water were periodically monitored and recorded until they stabilized. All purged water was stored onsite in a sealed 55-gallon metal drum. Ground water sampling data sheets for each well are contained in Appendix A.

- After purging the required volume, ground water was poured directly from the bailer into two one-liter amber jars and four 40-ml VOC vials. Each container was then tightly sealed with teflon lined septums, making sure that no air bubbles were present in the containers. Each container was then labeled and placed in cold storage for transport to the analytical laboratory under formal chain-of-custody.

RESULTS OF QUARTERLY MONITORING

Hydrologic Conditions

Shallower water depths measured during this quarterly sampling appear to reflect seasonal raising of the ground water table beneath the project site. Purged water from both monitoring wells exhibited slight to moderate hydrocarbon odors and sheens during sampling.

Analytical Results

Ground water samples from the two wells were analyzed for total petroleum hydrocarbons as gasoline (TPH-gas by EPA Method 8015 Modified); total petroleum hydrocarbons as diesel (TPH-diesel by EPA Method 8015 Modified); and benzene, toluene, xylenes, and ethylbenzene (BTXE by EPA Method 602/8020). Table 1 summarizes these analytical results. Laboratory data reports and chain-of-custody records are contained in Appendix B.

Table 1
SUMMARY OF GROUND WATER ANALYTICAL RESULTS
Liquid Sugars, Inc. 66th Street Site

Well Number	Sample Date	Water Depth	Constituent (ppm) TPH-gas	TPH-diesel	B	T	X	E
MW-1	04/23/93	6.72 ft	0.64	0.99	0.0063	ND(.0005)[1]	0.0025	0.0056
(West)	07/13/93	8.00 ft	0.70	1.5	0.032	0.0012	0.0110	0.0033
	11/02/93	8.95 ft	0.87	1.7	0.019	ND(.0005)	0.0044	0.0066
	02/15/94	7.91 ft	1.20	2.0	0.022	0.0018	0.0064	0.01
MW-2	04/23/93	6.73 ft	1.10	2.10	0.320	0.0065	0.013	0.0082

Table 1
SUMMARY OF GROUND WATER ANALYTICAL RESULTS
Liquid Sugars, Inc. 66th Street Site

Well Number	Sample Date	Water Depth	Constituent (ppm)					
			TPH-gas	TPH-diesel	B	T	X	E
(East)	07/13/93	8.38 ft	0.48	0.21	0.033	0.0025	0.0047	0.0052
	11/02/93	9.05 ft	0.43	1.80	0.016	0.0009	0.0021	0.0019
	02/15/94	6.82 ft	1.40	2.80	0.056	0.0029	0.0071	0.0075

1 - Not detected above the concentration expressed in the parentheses.

CONCLUSIONS

Lab analysis of ground water samples revealed low levels of gasoline and diesel constituents in both monitoring wells. Over the past year of quarterly monitoring, fuel hydrocarbon levels in MW-2, the well closest to the former USTs, have been highest during shallow ground water conditions. Thus, because a narrow band of hydrocarbon-impacted soil exists in the vicinity of MW-2, as evidenced by elevated levels of TPH-gasoline and TPH-diesel (670 ppm and 940 ppm, respectively) in the soil sample taken at 10.5 feet in the MW-2 well boring, fuel hydrocarbons have been mobilized from this soil into ground water during high ground water table conditions.

Fuel hydrocarbon levels in water samples from MW-1, the well further west (downgradient) from the former USTs, have not responded to seasonal ground water fluctuations, but rather, have increased steadily over the past year of quarterly sampling. Thus, because soil in the vicinity of MW-1 has not been significantly impacted, as evidenced by the low levels of TPH-gasoline and TPH-diesel (23 ppm and 27 ppm, respectively) in the 10.5-foot soil sample from MW-1, seasonal ground water fluctuations have not influenced ground water quality in MW-1.

It is not clear whether fuel hydrocarbon levels in MW-1 will increase or decrease in the future. However, a possible explanation for the steadily increasing fuel hydrocarbons in MW-1 could be that because the UST excavation cavity remained open for approximately one year in 1991, surface water which drained into the pit may have mobilized fuel hydrocarbons in soil, resulting in a downgradient flowing "bubble" of higher TPH concentration ground water. Because the UST excavation cavity was backfilled with clean imported fill material and resurfaced approximately 2-1/2 years

ago, the levels of fuel hydrocarbons would be expected to decrease and stabilize over time as this higher concentration "bubble" degrades and moves past MW-1.

RECOMMENDATIONS

Based on the results of the year of quarterly ground water monitoring, and on previous investigations at the project site and our knowlege of other leaking tank sites in the project vicinity, we recommend the following course of action for the project site: (1) Continue quarterly ground water monitoring of MW-1 and MW-2 in order to provide an adequate baseline of ground water quality (another year of quarterly monitoring is required to verify the trends encountered during the first year of quarterly monitoring); (2) No additional ground water monitoring wells be installed until after an additional year of quarterly monitoring.

With regard to ground water flow gradient, data generated by Aqua Science Engineers, Inc. for the Oliver Rubber UST site, located approximately 200 feet southeast from the Liquid Sugars, Inc. UST site, verifies a west-southwest flow gradient beneath the project site. It is worth noting that soil and ground water data from the Liquid Sugars, Inc. UST site conform to this verified ground water flow direction, with higher soil and ground water TPH concentrations in a west-southwest direction from the former USTs.

We appreciate this opportunity to provide this report for your review. Please contact us you have questions or require additional information.

Very truly yours,

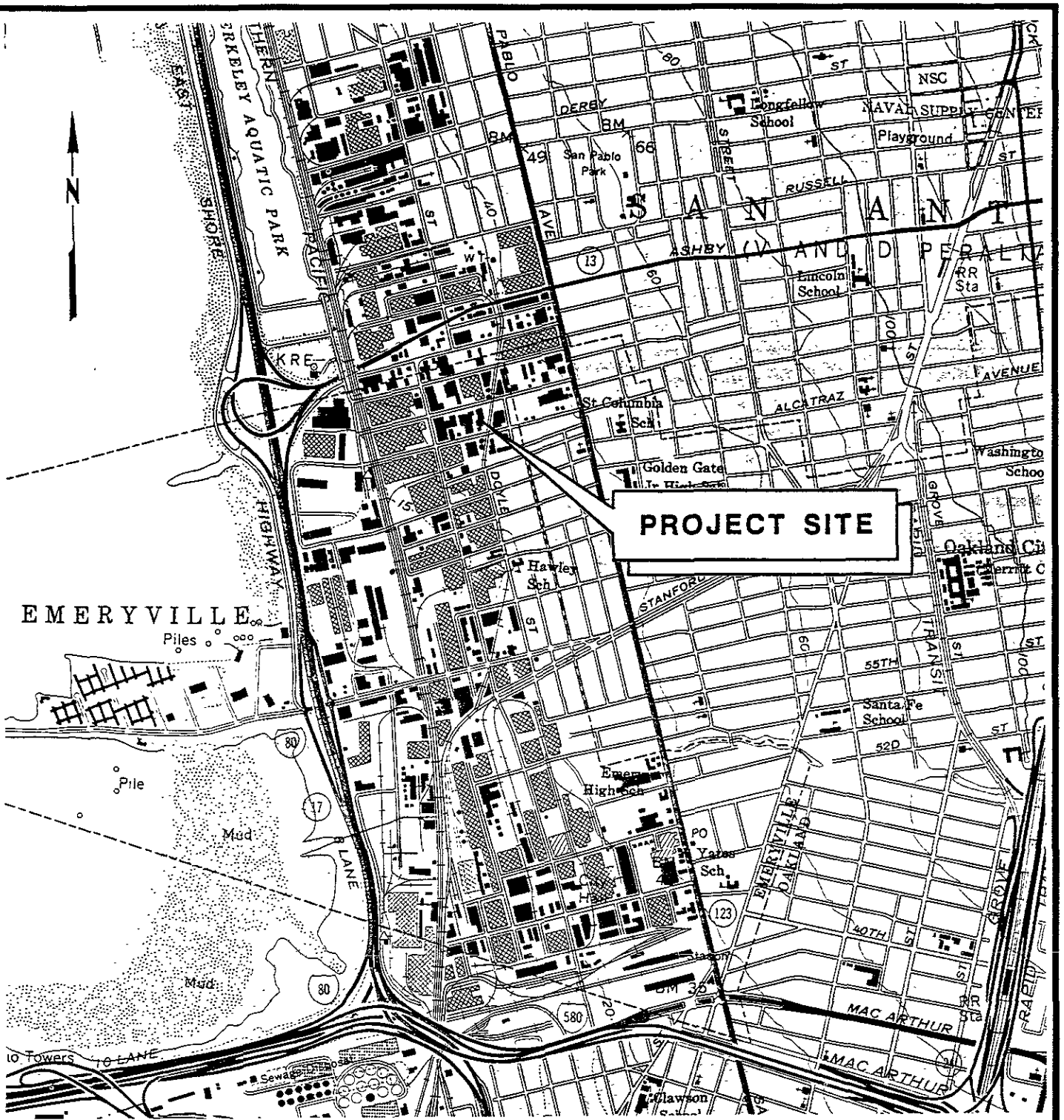
Robert Bogar
Geologist

REGISTERED GEOLOGIST
JAMES E. GRIBI
No. 5843
STATE OF CALIFORNIA

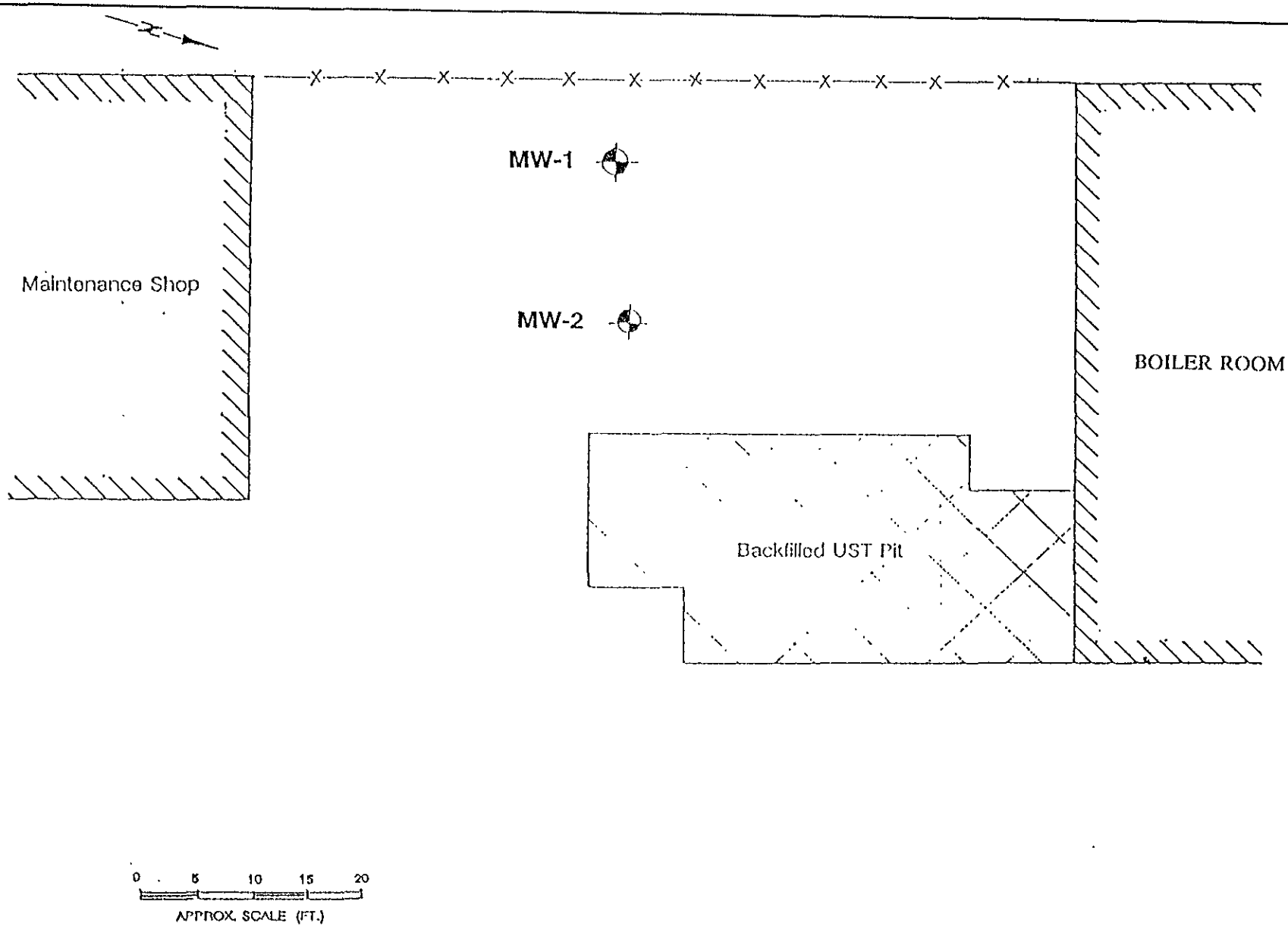
James E. Gribi
Registered Geologist
California No. 5843

RB/JEG:cc
Enclosure

cc: Mr. Alan Mooney, Liquid Sugars, Inc.



DESIGNED BY:	CHECKED BY:	**Figure 1** **SITE VICINITY MAP** CWEC 20516-001-03	DATE:	FIGURE:
DRAWN BY:	SCALE:		CENTURY WEST ENGINEERING	
DWG. NO.:				



DESIGNED BY :	DATE :
DRAWN BY :	SCALE :
CHECKED BY :	SEC. :
DRAWING NO. :	

CENTURY WEST ENGINEERING

FIGURE 2
SITE PLAN

CWEC: 20516-001-07

DRAWING NO.

SHEET NO.

APPENDIX A

GROUND WATER SAMPLING DATA SHEETS

CENTURY WEST ENGINEERING

GROUNDWATER SAMPLING RECORD

****

SAMPLE NO. MW-1 WELL NO. MW-1

PROJECT NAME LSI/LG PROJECT NO. _____

DATE 2/15 TIME _____ ELEV. TOP OF CASING _____

WELL DIAMETER _____ WELL DEPTH _____ SCREEN INTERVAL _____

H20 LEVEL INIT. 8.79 / 7.91 FIN. _____

CALC. PURGE H20 COL. _____ FT. (X) ** = _____ (X) 3 = _____ GALS.

LAB ANALYSIS _____

LABORATORY _____ PURGE/SAMPLE METHOD _____

WEATHER CONDITIONS _____

****

TIME	VOLUME PUMPED (GALS.)	PUMP RATE (GPM)	TEMP. (C)	COND.	pH	REMARKS (TURBIDITY)
0			56.1	1.80	7.28	SL MURKY / NO SH, MOD HC ODOR
1		-	58.0	1.28	6.91	SAME (MOD HC OD.)
2			59.0	1.27	6.84	SAME (" / SL SHEEN
3			59.6	1.36	6.83	" (")
4			60.0	1.40	6.89	murky, (")
5			56.6	1.34	6.85	" (")

SAMPLE CREW _____

REMARKS WATER LEVEL REHECKED @ 9:47 AM = 0.88 ft drop in water level.

** (2" = 0.163 GAL/FT) (4" = 0.653 GAL/FT)

Century West Engineering Corporation / Engineers and Scientists
East 429 Third Avenue / Spokane, Washington 99202 / (509) 838-3810 / Fax: (509) 624-0355

CENTURY WEST ENGINEERING

GROUNDWATER SAMPLING RECORD

****

SAMPLE NO. MW-2 WELL NO. MW-2 (4" well)

PROJECT NAME LSI/66th PROJECT NO.

DATE 2/15 TIME ELEV. TOP OF CASING

WELL DIAMETER WELL DEPTH SCREEN INTERVAL

H20 LEVEL INIT. 6.82 FIN.

CALC. PURGE H20 COL. ____ FT. (X) ** = ____ (X) 3 = ____ GALS.

LAB ANALYSIS

LABORATORY PURGE/SAMPLE METHOD

WEATHER CONDITIONS cloudy.

****

TIME	VOLUME PUMPED (GALS.)	PUMP RATE (GPM)	TEMP. (C)	COND.	pH	REMARKS (TURBIDITY)
0	0	–	57.3	1.79	6.30	clear/SLIGHT HC ODOR (no mod) SHEEN 6'
	4	–	58.4	1.82	6.22	SAME
	8		57.8	1.84	6.00	SL. MURKY/ SL. ODOR/ SHEEN
	12		59.3	1.89	6.31	SAME
	16		60.0	1.96	6.46	"
	26		58.3	2.02	6.74	"

SAMPLE CREW

REMARKS

** (2" = 0.163 GAL/FT) (4" = 0.653 GAL/FT)

Century West Engineering Corporation / Engineers and Scientists
East 429 Third Avenue / Spokane, Washington 99202 / (509) 838-3810 / Fax: (509) 624-0355

APPENDIX B

LABORATORY DATA REPORT AND CHAIN-OF-CUSTODY RECORDS

NATIONAL ENVIRONMENTAL TESTING, INC.

Santa Rosa Division
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Jim Gribi
Century West Engineering
7950 Dublin Blvd., Ste 210
Dublin, CA 94568

Date: 03/01/1994
NET Client Acct. No: 75300
NET Pacific Job No: 94.00626
Received: 02/16/1994

Client Reference Information

LSI/66th, Project: 20516-001-02

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Linda DeMartino
Project Coordinator

Jim Hoch
Operations Manager

Enclosure(s)

Ref: LSI/66th, Project: 20516-001-02

SAMPLE DESCRIPTION: MW-1
Date Taken: 02/15/1994
Time Taken:
NET Sample No: 185014

Parameter	Results	Flags	Reporting Limit	Units	Method	Date Extracted	Date Analyzed
TPH (Gas/BTXE,Liquid)							
METHOD 5030/M8015	--						02/25/1994
DILUTION FACTOR*	1						02/25/1994
as Gasoline	1.2		0.05	mg/L	5030		02/25/1994
METHOD 8020 (GC,Liquid)	--						02/25/1994
Benzene	22		0.5	ug/L	8020		02/25/1994
Toluene	1.8		0.5	ug/L	8020		02/25/1994
Ethylbenzene	10		0.5	ug/L	8020		02/25/1994
Xylenes (Total)	6.4		0.5	ug/L	8020		02/25/1994
SURROGATE RESULTS	--						02/25/1994
Bromofluorobenzene (SURR)	192	MI		% Rec.	5030		02/25/1994
METHOD 3510/M8015						02/18/1994	
DILUTION FACTOR*	1						02/21/1994
as Diesel	2.0	DL+	0.05	mg/L	3510		02/21/1994

DL+: The positive result appears to be a lighter hydrocarbon than Diesel and Diesel.
MI : Matrix Interference Suspected

Ref: LSI/66th, Project: 20516-001-02

SAMPLE DESCRIPTION: MW-2
Date Taken: 02/15/1994
Time Taken:
NET Sample No: 185015

Parameter	Results	Flags	Reporting Limit	Units	Method	Date Extracted	Date Analyzed
TPH (Gas/BTXE,Liquid)							
METHOD 5030/M8015	--						02/25/1994
DILUTION FACTOR*	1						02/25/1994
as Gasoline	1.4		0.05	mg/L	5030		02/25/1994
METHOD 8020 (GC,Liquid)	--						02/25/1994
Benzene	56		0.5	ug/L	8020		02/25/1994
Toluene	2.9		0.5	ug/L	8020		02/25/1994
Ethylbenzene	7.5		0.5	ug/L	8020		02/25/1994
Xylenes (Total)	7.1		0.5	ug/L	8020		02/25/1994
SURROGATE RESULTS	--						02/25/1994
Bromofluorobenzene (SURR)	135	MI		% Rec.	5030		02/25/1994
METHOD 3510/M8015						02/18/1994	
DILUTION FACTOR*	1						02/21/1994
as Diesel	2.8	DL+	0.05	mg/L	3510		02/21/1994

DL+: The positive result appears to be a lighter hydrocarbon than Diesel and Diesel.
MI : Matrix Interference Suspected

Ref: LSI/66th, Project: 20516-001-02

CONTINUING CALIBRATION VERIFICATION STANDARD REPORT

Parameter	CCV Standard % Recovery	CCV Standard Amount Found	CCV Standard Amount Expected	Units	Date Analyzed	Analyst Initials
TPH (Gas/BTXE,Liquid)						
as Gasoline	89.0	0.89	1.00	mg/L	02/25/1994	aal
Benzene	96.6	4.83	5.00	ug/L	02/25/1994	aal
Toluene	100.0	5.00	5.00	ug/L	02/25/1994	aal
Ethylbenzene	100.0	5.00	5.00	ug/L	02/25/1994	aal
Xylenes (Total)	95.8	14.37	15.0	ug/L	02/25/1994	aal
Bromofluorobenzene (SURR)	93.0	93	100	% Rec.	02/25/1994	aal
METHOD 3510/M8015						
as Diesel	85.6	856	1000	mg/L	02/21/1994	dkb

Ref: LSI/66th, Project: 20516-001-02

METHOD BLANK REPORT

Parameter	Method Blank Amount Found	Reporting Limit	Units	Date Analyzed	Analyst Initials
TPH (Gas/BTXE,Liquid)					
as Gasoline	ND	0.05	mg/L	02/25/1994	aal
Benzene	ND	0.5	ug/L	02/25/1994	aal
Toluene	ND	0.5	ug/L	02/25/1994	aal
Ethylbenzene	ND	0.5	ug/L	02/25/1994	aal
Xylenes (Total)	ND	0.5	ug/L	02/25/1994	aal
Bromofluorobenzene (SURR)	96		% Rec.	02/25/1994	aal
METHOD 3510/M8015					
as Diesel	ND	0.05	mg/L	02/21/1994	dkb

Ref: LSI/66th, Project: 20516-001-02

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

Parameter	Matrix Spike % Rec.	Matrix Spike Dup % Rec.	RPD	Spike Amount	Sample Conc.	Matrix Spike Conc.	Matrix Spike Dup. Conc.	Units	Date Analyzed	Analyst Initials
TPH (Gas/BTXE,Liquid)										
as Gasoline	92.6	87.3	5.9	1.00	ND	0.926	0.873	mg/L	02/25/1994	aal
Benzene	100.5	96.0	4.5	37.3	ND	37.5	35.8	ug/L	02/25/1994	aal
Toluene	101.0	96.4	4.6	92.6	ND	93.5	89.3	ug/L	02/25/1994	aal
METHOD 3510/M8015										
as Diesel	91	89	2.2		ND			mg/L	02/21/1994	dkb

Ref: LSI/66th, Project: 20516-001-02

LABORATORY CONTROL SAMPLE REPORT

Parameter	LCS % Recovery	RPD	LCS Amount Found	LCS Amount Expected	Units	Date Analyzed	Analyst Initials
METHOD 3510/M8015 as Diesel	73.0		0.73	1.00	mg/L	02/21/1994	dkb
METHOD 3510/M8015 as Diesel	83.0		0.83	1.00	mg/L	02/21/1994	dkb

NET®

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
*	:	Reporting Limits are a function of the dilution factor for any given sample. Actual reporting limits and results have been multiplied by the listed dilution factor. Do not multiply the reporting limits or reported values by the dilution factor.
dw	:	Result expressed as dry weight.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than the applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, Rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, Rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986., Rev. 1, December 1987.

SM: see "Standard Methods for the Examination of Water & Wastewater, 17th Edition, APHA, 1989.

Revised September, 1993
abb.93

NET NATIONAL ENVIRONMENTAL TESTING, INC.

CHAIN OF CUSTODY RECORD

7955

COMPANY: CENTURY WEST ENGINEERING
ADDRESS: 7950 DUBLIN BLVD
PHONE: (510) 551-7774 FAX
PROJECT NAME/LOCATION: LSI / 66th
PROJECT NUMBER: 20516-001-02
PROJECT MANAGER: J GRIBI

REPORT TO:
INVOICE TO:
P.O. NO.
NET QUOTE NO.

SAMPLED BY: Bob Bogar (PRINT NAME) SIGNATURE: Bob Bogar
(PRINT NAME) SIGNATURE

ANALYSES: BTEX/TPH-G; DIESEL

DATE	TIME	SAMPLE ID/DESCRIPTION	GRAB	COMP	# OF CONTAINERS TYPE	MATRIX	PRESERVED Y/N		BTEX/TPH-G	DIESEL	COMMENTS
2/15		MW-1			6	WATER	Y		X	X	
2/15		MW-2			6	"	"		X	X	

2/15/94 [signature] seal intact

CONDITION OF SAMPLE: BOTTLES INTACT? (YES) / NO
FIELD FILTERED? YES / (NO)
COC SEALS PRESENT AND INTACT? (YES) / NO
VOLATILES FREE OF HEADSPACE? (YES) / NO
TEMPERATURE UPON RECEIPT: 5.5°C

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA
I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS DATE

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	RELINQUISHED BY:	DATE/TIME	RECEIVED FOR NET BY:
Bob Bogar	2/15/94 14:13	[signature]	[signature]	2/15/94 17:30*	[signature] 2/16/94 0800

METHOD OF SHIPMENT: * via NCS

REMARKS:

PT 1 - ORIGINAL - WHITE PT 2 - NET PROJECT MANAGER - YELLOW PT 3 - CUSTOMER COPY - PINK