James P. Bowers, PE
R. William Rudolph, Jr., PE

ALCO
HAZMAT

94 APR -8 PM 1:41

LETTER OF TRANSMITTAL

TO:
Ms. Juliet Shin
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, California 94621

DATE: April 6, 1994
PROJECT College of Alameda
SCI JOB NUMBER: 469.009

WE ARE SENDING YOU:
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- [x] of our final report
- [ ] a draft of our report
- [ ] a Service Agreement
- [ ] a proposed scope of services
- [ ] specifications
- [ ] grading/foundation plans
- [ ] soil samples/groundwater samples
- [ ] an executed contract
- [ ] _____

- [x] if you have any questions, please call
- [ ] *for your review and comment*
- [ ] please return an executed copy
- [ ] for geotechnical services
- [ ] with our comments
- [ ] with Chain of Custody documents
- [x] for your use
- [ ] _____
- [ ] _____

REMARKS:

We are submitting this report to you at the request of Ms. Carol Eggert of the Peralta Commjnity College District.

COPIES TO:

BY: Marianne Watada
Marianne Watada

Subsurface Consultants, Inc.

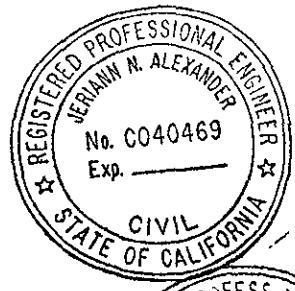
171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 510-268-0461 • FAX 510-268-0137

SUPPLEMENTAL GROUNDWATER INVESTIGATION
COLLEGE OF ALAMEDA
555 ATLANTIC AVENUE
ALAMEDA, CALIFORNIA
SCI 469.009

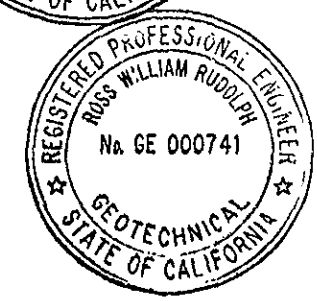
Prepared for:

Mr. Robert Mibach
Director of Physical Plant
Peralta Community College District
333 East 8th Street
Oakland, California 94606

By:



Jeriann N. Alexander
Civil Engineer 40469 (expires 3/31/95)



R. William Rudolph
Geotechnical Engineer 741 (expires 12/31/96)

Subsurface Consultants, Inc.
171 12th Street, Suite 201
Oakland, California 94607
(510) 268-0461

March 8, 1994

I INTRODUCTION

This report presents the results of a supplemental groundwater investigation conducted by Subsurface Consultants, Inc. (SCI) at the College of Alameda in Alameda, California. The College location and study area are shown on Plates 1 and 2.

SCI has previously provided environmental engineering services during the removal of five underground storage tanks, conducted a groundwater investigation, and performed groundwater monitoring at the site. Results of tank removal and the groundwater investigation were presented in reports dated October 31, 1991 and April 3, 1992. Monitoring event letters were dated August 3, 1993, October 21, 1992 and January 22, 1993.

Three monitoring wells were installed in August 1991, as part of the groundwater investigation. Given that the regional hydrology indicated that groundwater flows toward the north, the wells were placed on the north or downgradient side of the tank areas. However, groundwater elevation data generated after the wells were installed, indicated that groundwater flowed to the east, placing the existing monitoring wells cross gradient of the former tank locations. As such, the Alameda County Health Care Services Agency (ACHCSA) requested the installation of two additional groundwater monitoring wells east of the former waste oil and fuel oil tank locations.

As outlined in our work plan dated December 21, 1993, the scope of the current groundwater investigation included:

1. Obtaining a permit to install two wells from the Alameda County Flood Control and Water Conservation District, Zone 7,
2. Drilling and sampling 2 test borings,
3. Installing 2 monitoring wells in the test borings,
4. Developing, purging, and sampling the monitoring wells,
5. Transmitting selected soil and groundwater samples to an analytical laboratory, and
6. Performing a level survey to determine the top of well casing elevations.

II FIELD INVESTIGATION

Groundwater monitoring wells were installed in two test borings drilled at the locations shown on the Study Area Plan, Plate 2. A discussion of procedures followed during drilling, soil sampling, monitoring well installation, well development, purging, and sampling is provided in Appendix A.

A level survey was performed to determine the elevation of the top of the well casings. Originally, the elevations were referenced to the top of the curb adjacent to a fire hydrant near the study area. The elevation of the curb was assumed to be 100.00 feet. In accordance with the ACHCSA letter dated December 27, 1993, the wells were resurveyed using an established benchmark with a known elevation. The new survey was referenced to a City of Alameda survey monument located at the northeast corner of Atlantic

Avenue and Webster Street. The monument has a recorded elevation of 6.11 feet, Mean Sea Level (MSL) datum.

III ANALYTICAL TESTING

Selected soil and groundwater samples were analyzed by Curtis & Tompkins, Ltd., a laboratory certified by the California Department of Health Services (DHS) for hazardous waste and water testing. A soil sample obtained from Boring MW-4 was analyzed for the following:

1. Total volatile hydrocarbons (TVH), EPA 5030/8015 modified,
2. Benzene, toluene, xylene, and ethylbenzene (BTXE), EPA 5030/8020,
3. Total extractable hydrocarbons (TEH), EPA 3550/8015 modified, and
4. Oil and Grease, SMWW 17:5520 EF.

Soil samples from Boring MW-5 were not analyzed, since the boring was drilled in imported backfill placed in the previous tank pit.

Groundwater samples from all five wells were analyzed for the following:

1. Benzene, toluene, xylene, and ethylbenzene (BTXE), EPA 5030/8020,
2. Total extractable hydrocarbons (TEH), EPA 3550/8015 modified, and
3. Oil and Grease, SMWW 17:5520 BF.

The results of the soil and groundwater analyses are presented in Tables 1 and 2, respectively. Analytical test reports and chain-of-custody documents are presented in Appendix B.

IV SITE CONDITIONS

A. Surface Conditions

The College of Alameda encompasses the northwest corner of the intersection of Webster Street and Atlantic Avenue. The study area is at the west end of the campus, as shown on the Site Plan. Wells MW-1 and MW-4 are located in an unpaved area near Building C. Wells MW-2, MW-3, and MW-5 are located in a fenced parking area paved with asphalt concrete. Well and previous tank locations are shown on Plate 2.

B. Subsurface Conditions

Our studies to date indicate that the study area is blanketed by fill which overlies bay and marsh deposits. The fill generally varies from 2 to 5 feet thick and consists of sands, clays and gravel. Boring MW-5, drilled within a former tank excavation, encountered medium dense sandy gravel backfill extending from approximately 3.5 to 10 feet deep.

The fill is underlain by soft bay/marsh deposits, locally known as Bay Mud. Characteristically, the Bay Mud possesses relatively low permeability. Based on soil investigation studies performed at the College site previously by Woodward, Clyde, Sherard & Associates, the Bay Mud varies in thickness from 10 to

over 50 feet. The bay mud is underlain by stiff silty and clayey sands of the Merritt Sand Formation.

C. Groundwater Conditions

Groundwater was encountered at a depth of about 5 feet in Boring MW-5 during drilling. Groundwater was not encountered during drilling of boring MW-4.

Groundwater levels have been periodically measured in all 5 wells. Based on groundwater data obtained using the new wells, groundwater in the area flows toward the north at a gradient of 0.9 percent. This direction is consistent with regional hydrology. Groundwater elevation data from MW-3 was not used to determine the gradient and flow direction, as this well continues to be a poor producer of water and provides inconsistent data.

V CONCLUSIONS AND RECOMMENDATIONS

A. Fuel Oil Tank Area

Relatively low concentrations of total extractable hydrocarbons (TEH) and xylenes were detected in soil samples obtained from near the groundwater surface in test borings MW-1 and MW-4 in the fuel oil tank area. No total volatile hydrocarbons (TVH), oil and grease, benzene, toluene nor ethylbenzene were detected in the soil samples analyzed.

Relatively low concentrations of TEH have been detected in water samples from MW-1, the downgradient well since monitoring began in 1992. BTXE has not been detected during any monitoring

event. The concentrations of TEH in Well MW-1 has decreased considerably in the past year. Neither TEH nor BTXE was detected in the new well, MW-4.

Based on the data generated to date, it does not appear that soil and groundwater have been significantly impacted by previous fuel oil tank releases. As a result, we recommend that the down gradient well, MW-1 be monitored on a quarterly basis for 3 more quarters. If at the completion of the third quarter contaminant concentrations remain to be very low or are nondetectable, the ACHCSA should be petitioned to change the tank site status to No Further Action required or at least reduce the frequency of monitoring.

B. **Gasoline Tank Area**

Neither TVH as gasoline nor BTXE was detected in a soil sample obtained from monitoring well MW-2 at the groundwater surface. Additionally, neither TVH nor BTXE has been detected in groundwater from Well MW-2 for over four quarters of monitoring. As a result, it does not appear that releases from the former gasoline tank have significantly impacted soil and groundwater. We recommend that the ACHCSA consider the tank site closed and that monitoring be discontinued. The well should, however, be maintained for use in determining the groundwater flow direction and gradient.

C. **Waste Oil Tank Area**

Total extractable hydrocarbons (TEH) were detected in groundwater from well MW-5 at a concentration of 5,200 ug/l and at well MW-3 at a concentration of 70 ug/l. The laboratory has

indicated that the chromatogram from MW-5 resembles hydraulic oil. The chromatogram for MW-3 does not resemble any of the laboratory petroleum standards.

Based on a review of the analytical data following tank removal, it appears that soil remediation efforts were successful in removing the significantly contaminated soil. This coupled with the laboratory's finding that the contaminant in the water resembles hydraulic oil leads us to suspect that the previous waste oil tank, and impacted soil left in-place, are not the source(s) of the contamination at well MW-5.

Additional study should be performed to determine the source of the hydraulic oil. In addition, we recommend that quarterly monitoring continue for both wells MW-3 and MW-5. Samples from these wells should be analyzed for TEH and quantified against diesel, kerosene and hydraulic oil standards.

List of Attached Tables:

Table 1	Contaminant Concentrations in Soil
Table 2	Contaminant Concentrations in Groundwater
Table 3	Groundwater Elevations

List of Attached Plates:

Plate 1	Site Plan
Plate 2	Study Area Plan
Plates 3 and 4	Logs of Test Borings MW-4 and MW-5
Plate 5	Unified Soil Classification System

Appendix:

Appendix A	Investigation Protocol
Appendix B	Analytical Test Reports Chain-Of-Custody Documents
Appendix C	Well Permits Well Development Forms Well Sampling Forms

Distribution:

4 copies

Mr. Robert Mibach
Director of Physical Plant
Peralta Community College District
333 East 8th Street
Oakland, California 94606

MFW:JNA:RWR:sld

Table 1.
Contaminant Concentrations In Soil

Sample	TVH (mg/kg)	TEH Kerosene Range (mg/kg)	TEH Diesel Range (mg/kg)	TOG (mg/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl-Benzene (ug/kg)	Total Xylenes (ug/kg)	EPA 8010 Chemicals
Fuel Oil Tank Area									
MW 1 @ 4.5'	--	<1.0	3.8	--	<5.0	<5.0	<5.0	<5.0	--
MW 4 @ 5'	<1.0	<1.0	2	<50	<5.0	<5.0	<5.0	9.0	--
Gasoline Tank Area									
MW 2 @ 5'	<1.0	--	--	--	<5.0	<5.0	<5.0	<5.0	--
Waste Oil Tank Area									
MW 3 @ 5'	<1.0	*	13	190	<5.0	<5.0	<5.0	<5.0	ND

TVH = Total volatile hydrocarbons, as gasoline, EPA Method 5030/8015 modified
TEH = Total extractable hydrocarbons, EPA 3550/8015 modified
TOG = Total oil and grease, EPA 3550 and SMWW 17:5520 E&F
mg/kg = Milligrams per kilogram or parts per million (ppm)
ug/kg = Micrograms per kilogram or parts per billion (ppb)
-- = Test not requested
<1.0 = Less than detection limit shown
* = Quantitated as diesel
ND = None detected, less than detection limits which range from 5 to 20 ug/kg; 2 - chloroethylvinyl ether failed the calibration criteria, therefore there are no results for this compound

Table 2.
Contaminant Concentrations in Groundwater

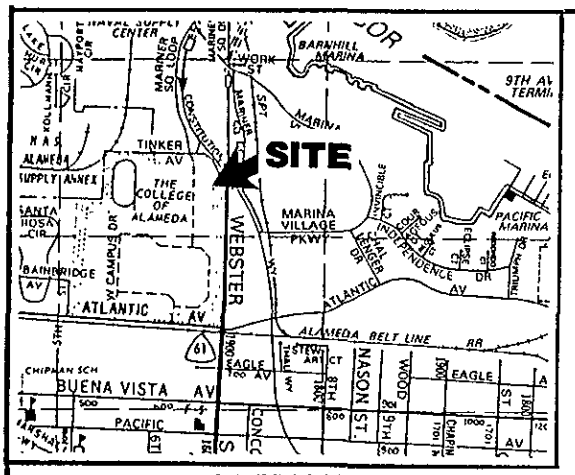
	Sampling Date	TVH (ug/l)	TEH Kerosene Range (ug/l)	TEH Diesel Range (ug/l)	TOG (mg/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Total Xylenes (ug/l)	EPA 8010 Chemicals
Fuel Oil Tank Area										
MW-1	02/19/92	--	<50	94	--	<0.5	<0.5	<0.5	<0.5	--
	06/29/92	--	<50	110	--	<0.5	<0.5	<0.5	<0.5	--
	09/29/92	--	<50	<50	--	<0.5	<0.5	<0.5	<0.5	--
	12/22/92	--	<50	180	--	<0.5	<0.5	<0.5	<0.5	--
	01/26/94	--	60	<50	<5	<0.5	<0.5	<0.5	<0.5	--
MW-4	01/26/94	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
Gasoline Tank Area										
MW-2	02/19/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	06/29/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	09/29/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	12/22/92	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--
	01/25/94	--	<50	<50	<5	<0.5	<0.5	<0.5	<0.5	--
Waste Oil Tank Area										
MW-3	02/19/92	<5000+	680	<50	<5	<50	<50	<50	84	ND
	06/29/92	<50	*	190	<5	<0.5	<0.5	<0.5	<0.5	ND
	09/29/92	<50	*	410	<5	<0.5	<0.5	<0.5	<0.5	ND
	12/21/92	<500	*	400	<5	<5	<5	<5	<5	ND
	01/26/94	--	70	<50	<5	<0.5	<0.5	<0.5	0.8	--
MW-5	01/25/94	--	*	5,200++	<5	<0.5	<0.5	<0.5	<0.5	--

TVH = Total volatile hydrocarbons as gasoline, EPA 8015/5030 modified
TEH = Total extractable hydrocarbons, EPA 3550/8015 modified
TOG = Total oil and grease, EPA 3550 and SMWW 17:5520 B&F
ug/l = Micrograms per liter or parts per billion (ppb)
mg/l = Milligrams per liter or parts per million (ppm)
-- = Test not requested
+ = Sample diluted due to foaming during purge and trap extraction
ND = Not detected at or above reporting limits. Reporting limits vary from 1.0 to 20 ug/l. See test reports for individual reporting limits.
* = Quantitated as diesel range
++ = Laboratory indicates that the sample chromatogram resembles hydraulic oil.

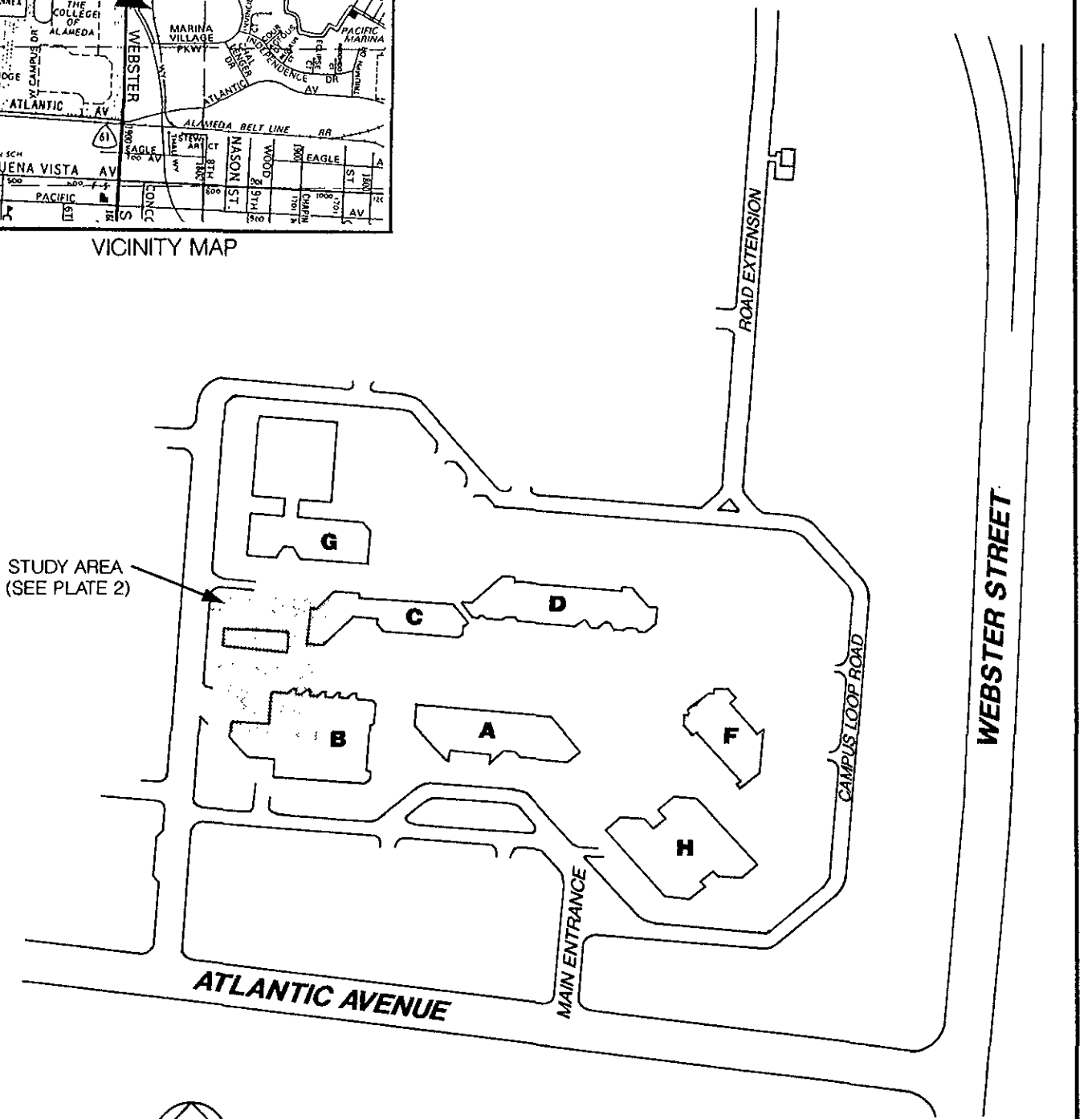
Table 3.
Groundwater Elevations

Well	TOC Elevation	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)
MW-1	12.16	02/24/92	1.64	10.52
		03/09/92	4.28	7.88
		03/24/92	4.33	7.83
		04/28/92	4.54	7.62
		06/29/92	5.92	6.24
		07/27/92	5.74	6.42
		08/27/92	6.04	6.12
		09/24/92	6.16	6.00
		12/16/92	6.19	5.97
		01/21/93	6.83	5.33
		02/07/94	6.01	6.15
MW-2	11.07	02/24/92	4.45	6.62
		03/09/92	3.70	7.37
		01/21/93	6.83	4.24
		03/24/92	3.73	7.34
		04/28/92	4.25	6.82
		06/29/92	4.40	6.67
		07/27/92	4.00	7.07
		08/27/92	4.33	6.74
		09/24/92	4.36	6.71
		12/16/92	4.08	6.99
		01/21/93	4.40	6.67
		02/07/94	3.60	7.47
MW-3	12.65	02/24/92	13.12	-0.47
		03/09/92	8.75	3.90
		03/24/92	6.87	5.78
		04/28/92	6.31	6.34
		06/04/92	7.10	5.55
		06/29/92	10.78	1.87
		07/27/92	6.88	5.77
		08/27/92	6.75	5.90
		09/24/92	7.38	5.27
		12/16/92	6.50	6.15
		01/21/92	10.25	2.40
		02/07/94	11.44	1.21
MW-4	12.22	02/07/94	5.92	6.30
MW-5	12.69	02/07/94	4.89	7.80

TOC = Top of Casing
Groundwater depth measured below TOC
TOC elevation surveyed relative to mean sea level



VICINITY MAP



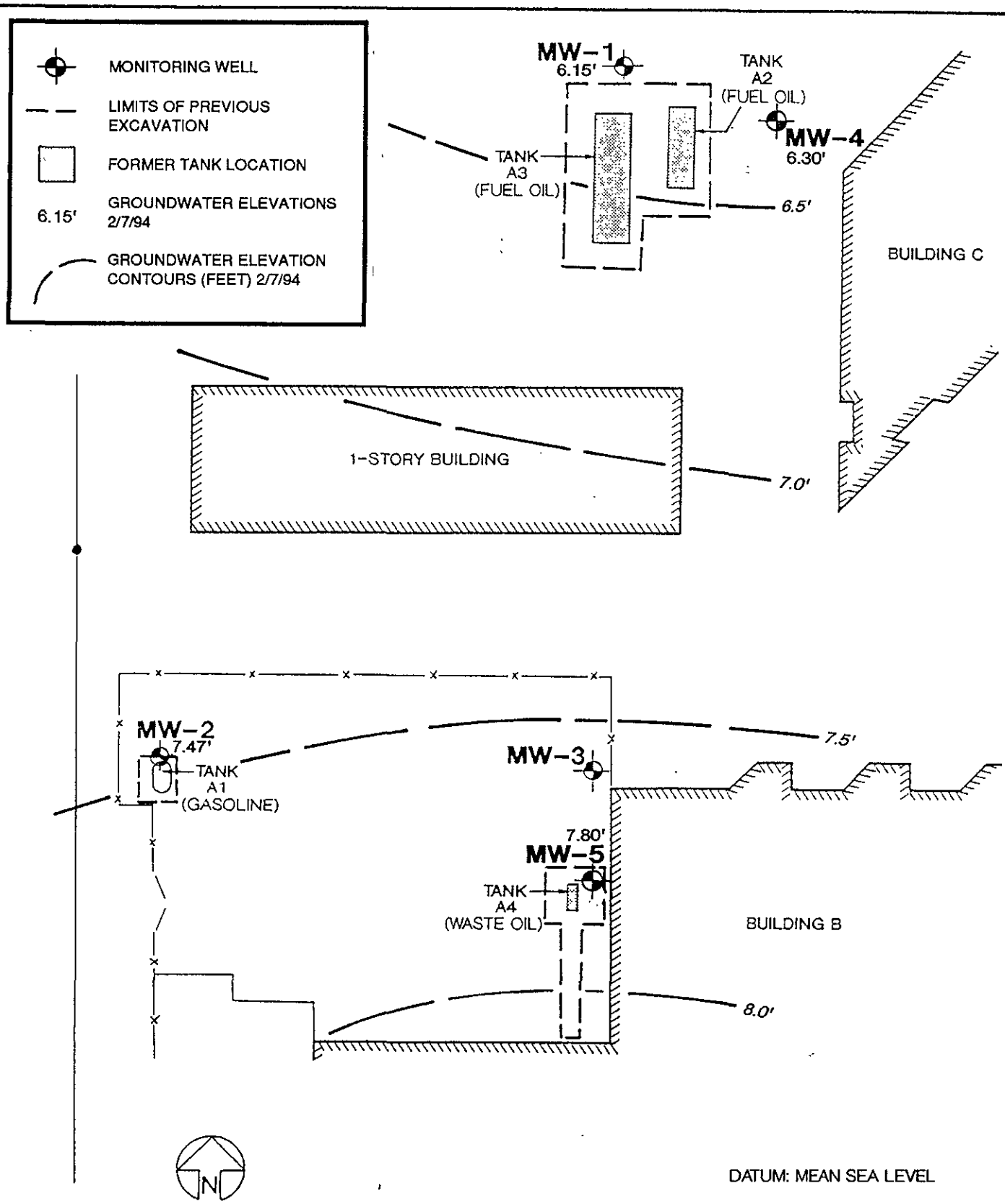
SITE PLAN

Subsurface Consultants

COLLEGE OF ALAMEDA – ALAMEDA, CA

JOB NUMBER	DATE	APPROVED
469.006	3/12/92	MW

PLATE 1



STUDY AREA PLAN

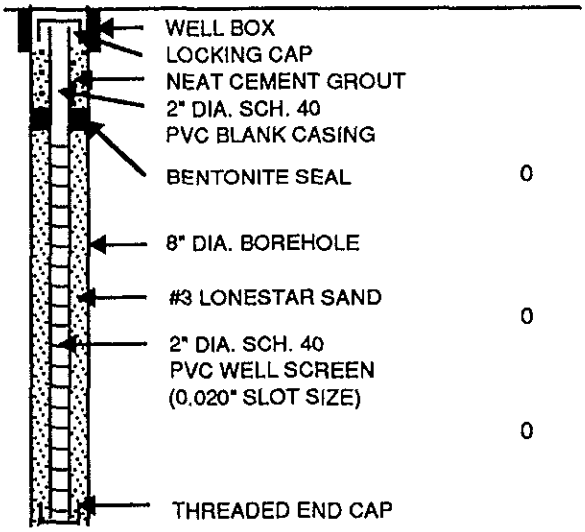
Subsurface Consultants

COLLEGE OF ALAMEDA – ALAMEDA, CA

JOB NUMBER	DATE	APPROVED	PLATE
469.009	2/10/94	MW	2

LOG OF TEST BORING MW-4

EQUIPMENT 7" Hollow Stem Auger
DATE DRILLED 1/10/94
ELEVATION - -



MOISTURE CONTENT %	DRY DENSITY (PCF)	OVM (ppm)	DEPTH (feet)	SAMPLE	BLOWS PER FOOT	
			0			ASPHALTIC CONCRETE - 2" thick
						BROWN SANDY GRAVEL (GM)
						medium dense, dry (fill)
						LIGHT GRAY BROWN SANDY SILTY CLAY (CL)
		0	5		8	medium stiff, moist (fill)
					2*	GROUNDWATER LEVEL 2/7/94
					4	MOTTLED GRAY AND BROWN SILTY CLAY (CL)
		0			0*	medium stiff, moist (fill)
			10			BLUE GRAY CLAYEY SILT (MH)
		0			2	soft, moist, with thin lenses of gray sand and gray clayey sand, and shell fragments, and occasional thin layers of peat (Bay Mud)
					1*	water occurs in thin sand lenses
			15			GROUNDWATER NOT ENCOUNTERED DURING DRILLING
			20			
			25			
			30			
			35			
			40			

SAMPLER TYPES:
MODIFIED CALIFORNIA DRIVE
O.D.: 3 inches
I.D.: 2.5 inches
*CALIFORNIA DRIVE
O.D.: 2.5 inches
I.D.: 2.0 inches

HAMMER WEIGHT: 140 pounds
HAMMER DROP: 30 inches

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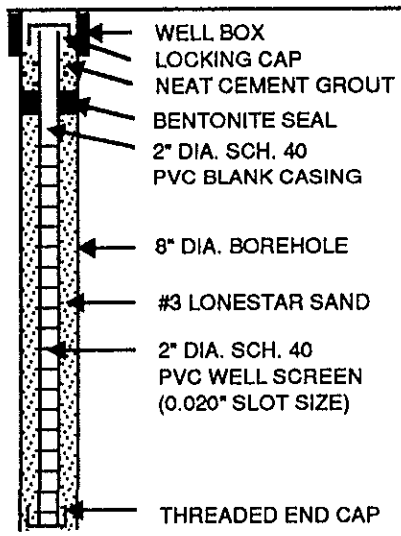
COLLEGE OF ALAMEDA - ALAMEDA, CA

JOB NUMBER	DATE	APPROVED
469.009	1/19/94	

PLATE 3

LOG OF TEST BORING MW-5

EQUIPMENT 7" Hollow Stem Auger
DATE DRILLED 1/10/94
ELEVATION - -



MOISTURE CONTENT %	DRY DENSITY (PCF)	OVM (ppm)	DEPTH (feet)	SAMPLE	BLOWS PER FOOT	
			0			ASPHALTIC CONCRETE - 3" thick
						OLIVE GREEN CLAYEY SAND (SC)
						medium dense, moist (fill)
						GRAY GRAVEL (GP)
						loose, moist (fill)
		0	5		6	GROUNDWATER LEVEL DURING DRILLING
						GREEN, RED AND WHITE SANDY
						GRAVEL (GW)
						medium dense, wet (fill)
		0	10		47	
					18	BLUE GRAY CLAYEY SILT (MH)
						soft, moist, contains thin layer of brown and
						black peat (Bay Mud)
			15		2	
					0*	
			20			
			25			
			30			
			35			
			40			

Subsurface Consultants	COLLEGE OF ALAMEDA - ALAMEDA, CA			PLATE
	JOB NUMBER	DATE	APPROVED	4
	469.009	1/19/94	MW	

GENERAL SOIL CATEGORIES			SYMBOLS	TYPICAL SOIL TYPES
COARSE GRAINED SOILS More than half is larger than No. 200 seive	GRAVEL More than half coarse fraction is larger than No. 4 seive size	Clean Gravel with little or no fines	GW	Well Graded Gravel, Gravel-Sand Mixtures
			GP	Poorly Graded Gravel, Gravel-Sand Mixtures
		Gravel with more than 12% fines	GM	Silty Gravel, Poorly Graded Gravel-Sand-Silt Mixtures
			GC	Clayey Gravel, Poorly Graded Gravel-Sand-Clay Mixtures
	SAND More than half coarse fraction is smaller than No. 4 seive size	Clean Sand with little or no fines	SW	Well Graded Sand, Gravelly Sand
			SP	Poorly Graded Sand, Gravelly Sand
		Sand with more than 12% fines	SM	Silty Sand, Poorly Graded Sand-Silt Mixtures
			SC	Clayey Sand, Poorly Graded Sand-Clay Mixtures
FINE GRAINED SOILS More than half is smaller than No. 200 seive	SILT AND CLAY Liquid Limit Less than 50%		ML	Inorganic Silt and Very Fine Sand, Rock Flour, Silty or Clayey Fine Sand, or Clayey Silt with Slight Plasticity
			CL	Inorganic Clay of Low to Medium Plasticity, Gravelly Clay, Sandy Clay, Silty Clay, Lean Clay
			OL	Organic Clay and Organic Silty Clay of Low Plasticity
	SILT AND CLAY Liquid Limit Greater than 50%		MH	Inorganic Silt, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silt
			CH	Inorganic Clay of High Plasticity, Fat Clay
			OH	Organic Clay of Medium to High Plasticity, Organic Silt
HIGHLY ORGANIC SOILS			PT	Peat and Other Highly Organic Soils

UNIFIED SOIL CLASSIFICATION SYSTEM

Subsurface Consultants

COLLEGE OF ALAMEDA - ALAMEDA, CA

JOB NUMBER	DATE	APPROVED
469.009	1/19/94	

PLATE 5

Appendix A

Investigation Protocol

APPENDIX A
INVESTIGATION PROTOCOL

A. Test Borings

Prior to drilling the test borings, SCI obtained a groundwater protection ordinance permit from the Alameda County Flood Control and Water Conservation District, Zone 7. The project permit number is 94008. A copy of the permit is included in Appendix C.

Underground Service Alert (USA) was notified in order to contact USA members to clear drilling locations for underground utilities. Additionally, College of Alameda representatives gave their approval on both drilling locations.

The test borings were drilled using a truck-mounted drill rig equipped with 8-inch-diameter hollow stem augers. Our field engineer observed drilling operations, prepared detailed logs of the test borings and obtained undisturbed samples of the materials encountered. Test boring logs are presented on Plates 3 and 4. Soils are classified in accordance with the Unified Soil Classification System described on Plate 5.

A California Drive Sampler (outside diameter: 2.5 inches; inside diameter: 2.0 inches) and Modified California Drive Sampler (outside diameter: 3 inches; inside diameter: 2.5 inches) were used to obtain soil samples. The number of blows required to drive the sampler the final 12 inches of each 18-inch penetration was recorded and is presented on the test boring logs. Drilling and sampling equipment was thoroughly cleaned prior to each use to reduce the likelihood of cross-contamination between samples and/or

borings.

Soil samples were retained in 2.0 inch and 2.5-inch-diameter brass liners. Teflon sheeting was placed over the ends of the soil liners; the liners were subsequently capped and sealed with tape. The shoe sample from each drive was retained in a plastic bag and screened for volatile organics using an Organic Vapor Meter (OVM). OVM measurements are recorded on the test boring logs. The sealed liners were placed in ice-filled coolers and remained iced until delivery to the analytical laboratory. Chain-of-Custody records accompanied the samples to the laboratory.

The test borings were completed as groundwater monitoring wells, as detailed in the following section. Soil cuttings generated during drilling were placed in 55-gallon drums and left on-site for later disposal.

B. Groundwater Monitoring Wells

At the completion of drilling, monitoring wells were installed in the test borings. Well schematics are shown on the respective test boring logs. In general, the wells consist of 2-inch-diameter, Schedule 40 PVC pipe having flush-threaded joints. The pipe was steam-cleaned prior to being placed in the borehole. The lower 10 feet of the wells consists of machine-slotted well screen having 0.02-inch slots. The remaining portion of the wells consist of blank pipe. The wells were provided with bottom caps and locking top caps. The well screen is encased in a filter composed of Lonestar No. 3 washed sand. The filter sand was placed by carefully pouring it through the annulus between the hollow stem of

the auger and the well casing. Periodically, the augers were raised to allow the sand to fill the annulus between the casing and the borehole. The filter extends from just below the bottom of the well to one-half foot above the top of the screened section. A one-half foot thick bentonite pellet seal was placed above the sand filter. The annulus above the bentonite seal was backfilled with cement grout. The grout mixture consists of Portland cement mixed with clean water. It was placed in a manner similar to the sand filter. The monitoring well was completed below grade and is protected by a traffic-rated valve box.

The wells were developed at least 24 hours after the grout seal was placed to allow for proper set up. Initially, the depth to water was measured below the top of the well casing using an electronic sounder. The wells were then developed by removing water with a hand bailer. During the initial sampling event, the wells were allowed to sit for approximately 72 hours after development before sampling. They were then purged of about 2 to 4 well casing volumes of water and sampled with a disposable sampling device. Due to the slow rate of recharge, wells MW-1, MW-3 and MW-4 were allowed to sit for one day after purging before sampling. Well development and purge water was placed in 55 gallon drums which are stored on-site. Well development and sampling forms are presented in Appendix C. Groundwater samples were retained in chilled, pre-cleaned containers supplied by the laboratory.

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Subsurface Consultants
171 12th Street
Suite 201
Oakland, CA 94608

Date: 19-JAN-94
Lab Job Number: 113948
Project ID: 469.002
Location: College of Alameda

Reviewed by: Teresa K Morrison

Reviewed by:

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 113948

Project Name: College of Alameda
Project Number: 469.002

Report Date: 19 January 94

ANALYSIS: Total Oil & Grease (Gravimetric)

METHOD: SMWW 17:5520E

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
113948-001	MW-4@5'	Soil	10-JAN-94	12-JAN-94	14-JAN-94	ND	mg/Kg	50	TR	12353

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

Q C B a t c h R e p o r t

Client: Subsurface Consultants
Project Name: College of Alameda
Project Number: 469.002

Laboratory Login Number: 113948
Report Date: 19 January 94

ANALYSIS: Total Oil & Grease (Gravimetric)

QC Batch Number: 12353

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	50	mg/Kg	SMWW 17:5520E	14-JAN-94

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	97%	SMWW 17:5520E	14-JAN-94
BSD	93%	SMWW 17:5520E	14-JAN-94

		Control Limits
Average Spike Recovery	95%	80% - 120%
Relative Percent Difference	4.2%	< 20%

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 113948
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 469.002
LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 01/10/94
DATE RECEIVED: 01/12/94
DATE EXTRACTED: 01/13/94
DATE ANALYZED: 01/15-16/94
DATE REPORTED: 01/19/94

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
113948-001	MW-4 @5'	ND	2	1
METHOD BLANK		ND	ND	1

ND = Not detected at or above reporting limit.

* Reporting limit applies to all analytes.

QA/QC SUMMARY

LCS RECOVERY, %	94

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 113948
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 469.002
LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 01/10/94
DATE RECEIVED: 01/12/94
DATE ANALYZED: 01/17/94
DATE REPORTED: 01/19/94

Total Volatile Hydrocarbons with BTXE in Soils & Wastes
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (mg/Kg)	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)
113948-001	MW-4 @5'	ND(1)	ND(5)	ND(5)	ND(5)	9
METHOD BLANK		ND(1)	ND(5)	ND(5)	ND(5)	ND(5)

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

LCS RECOVERY, %	95

CHAIN OF CUSTODY FORM

PAGE 1 OF 1

PROJECT NAME: College of Alameda

JOB NUMBER: 469.002 LAB: Curtis & Tompkins

PROJECT CONTACT: John Wolfe TURNAROUND: Normal

SAMPLED BY: John Wolfe REQUESTED BY: John Wolfe

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX						CONTAINERS						METHOD PRESERVED					SAMPLING DATE								NOTES	ANALYSIS REQUESTED										
		WATER	SOIL	WASTE	AIR			VOA	LITER	PINT	TUBE			HCL	H_2SO_4	HNO_3	ICE	NONE	MONTH		DAY		YEAR		TIME				TPH diesel	TOG	BTEX	TVH						
113948 - 1	MW-4 C5'		X								X						X		0	1	1	0	9	4	1	1	0	0	X	X	X	X						

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
[signature]	1-12-94 930		
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
		[signature]	1/12/94 0930

COMMENTS & NOTES:

113948

Subsurface Consultants, Inc.

171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607

(510) 268-0461 • FAX: 510-268-0137

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

MW

ANALYTICAL REPORT

Prepared for:

Subsurface Consultants
171 12th Street
Suite 201
Oakland, CA 94608

Date: 02-FEB-94
Lab Job Number: 114111
Project ID: 469.009
Location: College of Alameda

Reviewed by: Mary Pleasant

Reviewed by:

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 114111
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 469.009
LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 01/25,26/94
DATE RECEIVED: 01/26/94
DATE EXTRACTED: 02/01/94
DATE ANALYZED: 02/01-02/94
DATE REPORTED: 02/02/94

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT (ug/L)
114111-001	MW-1	60	ND	50
114111-002	MW-2	ND	ND	50
114111-003	MW-3	70	ND	50
114111-004	MW-4	ND	ND	50
114111-005	MW-5	**	5,200	50

ND = Not detected at or above reporting limit. Reporting limit applies to all analytes.

QA/QC SUMMARY:

RPD, %	12
RECOVERY, %	86

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 114111
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 469.009
LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 01/25,26/94
DATE RECEIVED: 01/26/94
DATE ANALYZED: 02/01/94
DATE REPORTED: 02/02/94

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT (ug/L)
114111-001	MW-1	ND	ND	ND	ND	0.5
114111-002	MW-2	ND	ND	ND	ND	0.5
114111-003	MW-3	ND	ND	ND	0.8	0.5
114111-004	MW-4	ND	ND	ND	ND	0.5
114111-005	MW-5	ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

Reporting Limit applies to all analytes.

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	105

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 114111

Project Name: College of Alameda
Project Number: 469.009

Report Date: 02 February 94

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD: SMWW 17:5520BF**

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
114111-001	MW-1	Water	26-JAN-94	26-JAN-94	01-FEB-94	ND	mg/L	5	TR	12582
114111-002	MW-2	Water	25-JAN-94	26-JAN-94	01-FEB-94	ND	mg/L	5	TR	12582
114111-003	MW-3	Water	26-JAN-94	26-JAN-94	01-FEB-94	ND	mg/L	5	TR	12582
114111-004	MW-4	Water	26-JAN-94	26-JAN-94	01-FEB-94	ND	mg/L	5	TR	12582
114111-005	MW-5	Water	25-JAN-94	26-JAN-94	01-FEB-94	ND	mg/L	5	TR	12582

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

QC Batch Report

Client: Subsurface Consultants
Project Name: College of Alameda
Project Number: 469.009

Laboratory Login Number: 114111
Report Date: 02 February 94

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 12582**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	01-FEB-94

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	89%	SMWW 17:5520BF	01-FEB-94
BSD	86%	SMWW 17:5520BF	01-FEB-94

		Control Limits
Average Spike Recovery	87%	80% - 120%
Relative Percent Difference	3.6%	< 20%

CHAIN OF CUSTODY FORM

PAGE 1 OF 1

PROJECT NAME: College of Alameda
JOB NUMBER: 469.009 LAB: Curtis + Tompkins
PROJECT CONTACT: Marianne Hatada TURNAROUND: normal
SAMPLED BY: Charles Pearson REQUESTED BY: M. Hatada

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX: WATER	SOIL	WASTE	AIR	CONTAINERS: VOA	LITER	PINT	TUBE	METHOD PRESERVED: HCL	H_2SO_4	HNO_3	ICE	NONE	SAMPLING DATE: MONTH	DAY	YEAR	TIME	NOTES	ANALYSIS REQUESTED: TEH	BTXE	Oil + Grease
11411 -1	MW-1	X				3	2			X			X		01	26	94			X	X	X
-2	MW-2	X				3	2			X			X		01	25	94			X	X	X
-3	MW-3	X				3	2			X			X		01	26	94			X	X	X
-4	MW-4	X				3	2			X			X		01	26	94			X	X	X
-5	MW-5	X				3	2			X			X		01	25	94			X	X	X

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
Charles Pearson	1-26-94 / 1309		
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
		Tina K Morrison	1/26/94 / 1310

COMMENTS & NOTES:

Subsurface Consultants, Inc.
171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607
(510) 268-0461 • FAX: 510-268-0137

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT College of Alameda
555 Atlantic Avenue
Alameda, California

CLIENT
Name Peralta Community College District
Address 333 E 8th Ave Voice 510-466-7260
City Oakland Zip 94606

APPLICANT
Name Marianne Watada
Firm Subsurface Consultants Fax 510-268-0137
Address 171-12th St Ste 201 Voice 510-268-0461
City Oakland Zip 94607

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection		General	
Water Supply		Contamination	
Monitoring	X	Well Destruction	

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. C-57-582696

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 15 ft.
Surface Seal Depth 4 ft. Number 2

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

ESTIMATED STARTING DATE 1/10/94
ESTIMATED COMPLETION DATE 1/10/94

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Marianne Watada Date 1/5/94

FOR OFFICE USE

PERMIT NUMBER 94008
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 6 Jan 94
Wyman Hong

91992

WELL DEVELOPMENT FORM

Project Name: College of Alameda
Well Number: MW-4
Job No.: 469.006
Well Casing Diameter: 2 inches
Developed By: C. Pearson
Date: 1-21-94
TOC Elevation: ____
Weather: Sunny / mild

Depth to Casing Bottom (below TOC) 15' feet
Depth to Groundwater (below TOC) 5.37 feet
Feet of Water in Well 9.63 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.57 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Development Method Bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	6.97	21	malfunction		Smells of Sulfer
3½	6.95	18.2			dry.
	Recharge at 0.1'/3 min - return after 1.2 hrs				
	water level @ 10.80'			boiled	another ½ gallon

Total Gallons Removed 4 gallons
Depth to Groundwater After Development (below TOC) dry feet

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL DEVELOPMENT FORM

Project Name: College of Alameda
Well Number: MW-5
Job No.: 469.006
Well Casing Diameter: 2 inches
Developed By: C. Pearson
Date: 1-21-94
TOC Elevation:
Weather: Sunny / mild

Depth to Casing Bottom (below TOC) 15 feet
Depth to Groundwater (below TOC) 5.01 feet
Feet of Water in Well 9.99 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.63 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Development Method Bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	6.86	20.7	malfunction		clear
7	6.90	16.2			Turbid-gray
10	6.90	16.2			
14	6.90	16.2			clearing

Total Gallons Removed 14 gallons
Depth to Groundwater After Development (below TOC) 5.01 feet

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

SOIL AND GROUNDWATER INVESTIGATION
COLLEGE OF ALAMEDA
555 ATLANTIC AVENUE
ALAMEDA, CALIFORNIA
SCI 469.013

Prepared for:

Mr. Robert Mibach
Director, Physical Plant
Peralta Community College District
333 East 8th Street
Oakland, California 94606

By:

Jerome de Verrier by mail
Jerome de Verrier
Environmental Engineer

REGISTERED PROFESSIONAL ENGINEER
JERIANN N. ALEXANDER
No. C040469
Exp. _____
CIVIL
STATE OF CALIFORNIA

Jeriann N. Alexander by mail
Jeriann N. Alexander
Civil Engineer 40469 (expires 3/31/99)
Registered Environmental Assessor 03130 (expires 6/30/97)

REGISTERED ENVIRONMENTAL ASSESSOR
JERIANN N. ALEXANDER
NO. 03130
Expires. _____
STATE OF CALIFORNIA

Subsurface Consultants, Inc.
171 - 12th Street, Suite 201
Oakland, California 94607
(510) 268-0461

August 21, 1996

SCI **Subsurface Consultants, Inc.**
3736 Mt. Diablo Blvd., Suite 200, Lafayette, CA 94549
Phone: (510) 299-7960 Fax: (510) 299-7970

LETTER OF TRANSMITTAL

TO: Mr. Robert Mibach, Director
Physical Plant
Peralta Community College District
333 East 8th Street
Oakland, CA 94606

DATE: August 21, 1996
PROJECT: College of Alameda
SCI JOB NUMBER: 469.013

WE ARE SENDING YOU:

2 ___ copies

X___ of our final report
_____ a draft of our report
_____ a Service Agreement
_____ a proposed scope of services
_____ specifications
_____ grading/foundation plans
_____ soil samples/groundwater samples
_____ an executed contract

_____ if you have any questions, please call
_____ for your review and comment
_____ please return an executed copy
_____ for geotechnical services
_____ with our comments
_____ with Chain of Custody documents
X___ for your use
_____

REMARKS:

COPIES TO: ✓ (1) Ms. Juliet Shin, Alameda County Health Care Services Agency,
1131 Harbor Bay Parkway, Suite #250, Alameda, CA 94502-6577

BY: Jeriann Alexander
Jeriann N. Alexander (Client)

TABLE OF CONTENTS

I INTRODUCTION

This report presents the results of a soil and groundwater investigation conducted by Subsurface Consultants, Inc. (SCI) to evaluate (1) impacts due to releases from underground hydraulic hoists at the referenced site and (2) whether the site could be considered for closure in accordance with Alameda County Health Care Services Agency (ACHCSA) and Regional Water Quality Control Board (RWQCB) guidelines. SCI has provided environmental engineering services at the site since 1991, as documented in the following reports and letters prepared by SCI.

- Underground Tank Closure and Groundwater Investigation, College of Alameda, 555 Atlantic Avenue, Alameda, California, October 31, 1991.
- Groundwater Investigation, College of Alameda, 555 Atlantic Avenue, Alameda, California, April 3, 1992.
- Supplemental Groundwater Investigation, College of Alameda, 555 Atlantic Avenue, Alameda, California, March 8, 1994.
- Hoist Removal Report, College of Alameda, Building B, 555 Atlantic Avenue, Alameda, California, October 24, 1994.
- Quarterly Groundwater Monitoring, September 1995 Event, College of Alameda, 555 Atlantic Avenue, Alameda, California, October 27, 1995.

The location of the site is shown on the Site Plan, Plate 1.

II BACKGROUND

In 1991, five underground storage tanks (USTs) were removed from the site. SCI installed three monitoring wells at the site in 1991 (MW-1, MW-2 and MW-3) and two additional monitoring wells in 1994 (MW-4 and MW-5) to investigate potential impacts to groundwater from the former USTs. Elevated concentrations of extractable petroleum hydrocarbons were detected in two of the wells located near a former waste oil tank with a maximum detected concentration of 900 micrograms per liter (ug/L) in MW-3 and 5,200 ug/L in MW-5. Based on a review of soil data from the former waste oil tank area, the source of extractable petroleum hydrocarbon does not appear to be due to former releases from the waste oil tank.

In 1994, SCI also observed removal of three underground hydraulic hoists from inside Building B, situated just east of the former waste oil tank area (see Plate 1). Elevated concentrations of extractable petroleum hydrocarbons were detected in grab groundwater samples obtained from beneath two of the former hoists. Review of the chromatographs suggested that the extractable petroleum hydrocarbon observed in samples from monitoring wells MW-3 and MW-5 and in the grab groundwater samples from the former hoist excavations may likely be associated with releases from the same source.

III FIELD INVESTIGATION

A. Purpose and Scope of Services

The purpose of the services described herein is to evaluate potential impacts to soil and groundwater due to the former hoists, and to evaluate whether ACHCSA and RWQCB requirements have been met to obtain site closure. The scope of services included:

- preparing a work plan,
- investigating potential releases of hydraulic oil from hoists by drilling and sampling 6 test borings,
- collecting groundwater samples from 5 existing wells,
- analytical testing soil, groundwater and grab groundwater samples,
- performing an analysis of human health risks in accordance with ASTM procedures E1739-95,
- performing a preliminary evaluation of ecological risks, and
- preparing this report.

B. Soil and Groundwater Sampling

Prior to field exploration, a work plan was prepared, submitted, and subsequently approved by the ACHCSA. In addition, a drilling permit was obtained from the Alameda County Flood Control and Water Conservation District, Zone 7. Underground Service Alert (USA) was contacted to notify their subscribers to perform a utility check at the planned soil boring locations.

Six soil borings were drilled at the locations shown on the Study Area Plan - Hydraulic Hoist Area, Plate 2. Borings H-1, H-2 and H-3 were located to the north and northwest of Building B where the hoists were located. Borings H-4, H-5 and H-6 were located inside Building B. The boring locations were selected to delineate the extent of possible impacts to soil from hoist releases.

The borings were drilled using a hydraulically driven, 2-3/8 inch diameter, cuttingless soil coring system (Enviro-core). Prior to drilling borings H-4, H-5 and H-6, holes were cored through a concrete slab. Our field engineer observed drilling operations, prepared detailed logs of the conditions encountered, and obtained soil samples at frequent intervals. Upon completion of drilling, 1-inch diameter well points, were temporarily installed in the boreholes to facilitate measurement of free product and groundwater levels, and groundwater sampling. Logs of the borings are presented on Plates 4 through 6. Soils are classified in accordance with the Unified Soil Classification System, described on Plate 7.

Soil samples were obtained using a custom Enviro-core sampler having an outside diameter of 1-7/8 inches and inside diameter of 1-11/16 inches. The samplers were driven using a hydraulic vibrating hammer. Drilling and sampling equipment was thoroughly steam-cleaned prior to each drive to reduce the likelihood of cross-contamination between samples and/or borings.

Soil samples were retained in 1-11/16-inch diameter stainless steel liners. Teflon sheeting was placed over the ends of the soil liners prior to capping and sealing with tape. The sealed liners were placed in ice-filled coolers and remained cool until delivery to Curtis & Tompkins, Ltd., a state certified analytical laboratory. Chain-of-Custody records accompanied the soil samples to the laboratory.

Shoe samples collected from each drive were placed in sealable plastic bags and screened for volatile organics using an organic vapor meter (OVM). The OVM did not detect organic vapors in any of the shoe samples screened, except for a minor amount (1 part per million) in boring H-3. OVM measurements are recorded on the logs of test borings.

Following installation of the temporary wells, the presence of free product was checked using a steel tape coated with petroleum product sensitive paste. No free product was detected in any of the temporary wells. The depth to water below the top of casing (TOC) was then measured in the wells using an electric well sounder. Grab groundwater samples were obtained after purging 3 bailer volumes of groundwater from each temporary well. Grab samples were collected using either stainless steel bailers steam cleaned before each use or disposable plastic bailers. The grab groundwater samples were retained in containers pre-cleaned by the supplier in accordance with EPA protocol. The grab groundwater samples were placed in an ice chest chilled with Blue Ice® and remained cool until delivery to the analytical laboratory. Chain-of-Custody records accompanied grab groundwater samples to the laboratory.

After drilling and sampling, the temporary well points were removed and all borings were backfilled with cement grout. The indoor borings (H-4 through H-6) were topped with concrete and were made flush with the existing grade. Boring H-1, located beneath an asphalt parking lot, was topped with cold asphalt patch and also made flush with the existing grade. Soil cuttings, decontamination water and purge water were placed in 55-gallon steel drums and left on-site for later disposal pending the results of the analytical testing program.

C. Groundwater Monitoring Event

Groundwater in existing monitoring wells MW-1 through MW-5 were sampled, coincident with field investigation activities. Initially, the wells were checked for free floating product using a steel tape with petroleum product sensitive paste. No free product was detected in any of the monitoring wells. The depth to water below the top of casing (TOC) was then measured in the wells using an electric well sounder. Current and previous groundwater elevation data are presented in Table 1.

The wells were purged by bailing with disposable bailers until temperature, pH, and conductivity measurements had stabilized. Additionally, dissolved oxygen measurements were obtained. The wells were sampled after they had recharged to within 80% of their initial volume. The samples were retained in glass containers pre-cleaned by the supplier in accordance with EPA protocol. The samples were placed in an ice filled chest and remained cool until transmitted to the analytical laboratory. Chain of Custody records accompanied the samples to the laboratory. Well sampling forms are presented in the Appendix.

D. Analytical Testing

Soil and groundwater samples were analyzed by Curtis & Tompkins, Ltd., an analytical laboratory certified by the California Department of Toxic Substances Control (DTSC) for hazardous waste and water testing. Soil samples from borings H-1 through H-6 were selected at, or just above, the groundwater surface elevation. In general selected soil and groundwater samples were analyzed for the following:

- Total extractable hydrocarbons (TEH), using EPA Methods 3550/8015 modified.
- Oil and grease, (O&G) using SMWW 5520.

In addition, selected groundwater samples were further analyzed for:

- Total dissolved solids (TDS) using EPA Method 160.3
- Polynuclear aromatic hydrocarbons (PNAs) using EPA Method 8270.
- Dissolved oxygen (DO).

Analytical test results are summarized in Tables 2 and 3. Analytical test reports and Chain-of-Custody records are presented in the Appendix.

The grab groundwater sample from boring H-1, which was located in an asphalt parking lot, apparently was contaminated by surface water infiltration. A short rainstorm occurred following drilling and the field engineer observed that boring H-1 was full of water 2 hours after drilling, even though measures had been implemented to prevent surface water from entering the borehole. A grab groundwater sample was not collected immediately following temporary well installation due to slow recharge of the aquifer. Therefore, the grab groundwater analytical test results from this location are considered suspect. The soil samples were unaffected.

IV SITE CONDITIONS

A. Surface Conditions

The College of Alameda campus encompasses the northwest corner of the intersection of Webster Street and Atlantic Avenue in the City of Alameda. The study area is at the west end of the campus as shown on the Site Plan, Plate 1. The study area is relatively level and consists of several school buildings surrounded by asphalt and concrete pavement, lawn areas and landscaping. The specific area for this investigation took place in and around Building B which is currently occupied by an instructional auto and body shop. Boring H-1 was located in an asphalt paved parking lot just northwest of the Building B. Borings H-2 and H-3 were located in a landscaped section just north of Building B. Borings H-4 through H-6 were located within Building B. Soil boring locations are shown on Plate 2. Monitoring Wells MW-2, MW-3, and MW-5 are located in a fenced parking area on the west side of Building B. Wells MW-1 and MW-4 are located in an unpaved area near Building C, just north of Building B. Monitoring well locations are shown on Plate 3.

B. Subsurface Conditions

In general, the study area is blanketed by fill which overlies bay deposits. The fill, which varied from 4 to 6 feet thick, generally consists of medium stiff to stiff, moist, silty and sandy clays, and clayey and sandy silts. The bay deposits which underlie the fill consists of soft, moist clayey silt, occasionally interbedded with thin layers of sand and shells. Locally, the clayey silt is known as Bay Mud. Based on soil investigation studies performed at the site previously by Woodward, Clyde, Sherard & Associates (1961), the Bay Mud varies from 10 to 50 feet thick. The Bay Mud is underlain by stiff, silty and clayey sands of the Merritt Sand Formation.

Groundwater was encountered in the monitoring wells during this phase of study at depths ranging from 4.2 to 5.8 feet below the ground surface (bgs). Groundwater was encountered at the temporary well points at depths ranging from 8.5 to 11.0 feet bgs up to 24 hours after drilling. Based on groundwater elevations obtained from the existing monitoring wells, the current groundwater flow direction beneath the site is westerly at a gradient of approximately 1%. Groundwater elevation contours are presented on Plate 3.

V CONCLUSIONS

A. Soil Contamination

Given the range of TEH concentrations detected in the temporary well locations which surrounded the hoist area (TEH as diesel, 12 milligrams per kilogram (mg/kg) to 110 mg/kg and TEH as motor oil, 73 mg/kg to 290 mg/kg), it appears that the extent of impacts to soil are relatively localized. The laboratory indicated that the corresponding TEH chromatographs resemble hydraulic oil with both lighter and heavier hydrocarbons contributing to the detected chemical concentration. The soil sample TEH chromatographs also appear similar to the chromatographs for the grab groundwater samples obtained from the hoist pits. Hence, the source of impacts to the soil appear to be releases from the former hoist systems.

B. Groundwater Contamination

This investigation indicates that groundwater beneath the site has been impacted by TEH within the diesel range. TEH as diesel concentrations ranged from 190 micrograms per liter (µg/L) to 2,100 µg/L. The laboratory commented that the sample chromatographs do not exhibit a fuel pattern which resembles the diesel standard or any other distinct hydrocarbon standard.

TEH as motor oil, and PNA's were not detected in any groundwater samples except grab groundwater sample H-1 which was contaminated by surface water infiltration. Hence, the data from boring H-1 is judged not to be representative of subsurface conditions.

TDS in groundwater beneath the site ranged from 3,100 mg/L to 35,400 mg/L and averaged more than 20,000 mg/L. The high TDS concentration indicates that the groundwater would not be considered for a source of drinking water. DO ranged from 0 to 3 mg/L in the existing monitoring wells and in Boring H-6, with an average dissolved oxygen content of less than 1 mg/L. These concentrations are considered low and likely indicative of anaerobic conditions.

C. Risk Based Analysis

Impacts to human health and the environment are assessed by comparing detected concentrations in soil and groundwater to risk-based screening levels (RBSLs) established to protect potential human and ecologic receptors. The first step in this process is to determine whether constituents of concern (COC) exist. Once the list of COC is defined then an evaluation of receptor pathways is performed. Conceptual models and guidance documents are then used to evaluate risks to receptors.

1. Human Health Risks

The Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites (ASTM E 1739-95) considers several compounds as potential COC which, based on their toxicities, should be used for assessing human health impacts. Given the historic petroleum hydrocarbon use at the site, the potential COC would be BTEX and PNAs. BTEX and PNA compounds have not been detected in soil samples obtained during SCI's studies at the site. BTEX compounds have not been detected in groundwater samples during the final 4 sampling events for which BTEX was analyzed. In August 1995, the ACHCSA approved dropping BTEX from the sampling program. PNA compounds were not detected in groundwater samples during this investigation. Thus, the site does not appear to be a threat to human health as a result of petroleum hydrocarbon compounds.

This assessment of human health risks applies as long as the use of the property remains the same. The analysis of risk will need to be re-evaluated if property uses change.

2. Ecological Risks

Environmental risks are evaluated by identifying ecological receptors and comparing site values with guidance documents which present risk based screening levels (RBSLs) to protect these receptors. Documents such as the California RWQCB Order No. 95-136, entitled "Revised Site Clean-up Requirements ... for the property at San Francisco International Airport, San Mateo County," establish Tier 1 RBSLs to protect both freshwater and saltwater ecological receptors at the San Francisco Airport site. Although this document does not specifically apply to the Oakland Estuary environment it does provide relatively conservative RBSLs which serve as a

basis of comparison to those found at the College of Alameda site. This document contains RBSLs for the following COC on site: BTEX, PNAs, TEH, TVH and O&G.

The closest ecological receptors are located approximately 3000 feet downgradient from the site in the Oakland Inner Harbor and no known freshwater environments exist within 3000 feet of the site. The impacted plume is not migrating and there is no apparent pathway for the COC to impact freshwater or saltwater environments. Hence, the COC existing at the site do not pose a significant ecological risk.

D. Request for Site Closure

Based on a review of analytical data and the assessment of potential risks, the site does not appear to pose a threat to human health nor the environment for the following reasons:

- Underground storage tanks and hydraulic hoists at the site have been removed.
- The site has been adequately characterized.
- Impacts to soil and groundwater are minimal and localized.
- The groundwater plume is not migrating.
- No water wells, surface waters, or other sensitive receptors are likely to be impacted.
- The site presents no significant risk to human health.

Thus, on behalf of the Peralta Community College District, SCI requests that the site be considered for no further action status.

V LIMITATIONS

This study was intended to provide a preliminary means of evaluating soil and groundwater contamination that exists beneath the site, based on limited subsurface investigation and analytical testing. Contamination may exist in other areas not investigated by SCI. Environmental sampling studies, such as presented herein, are by nature non-comprehensive and subject to limitations including those presented herein.

SCI has performed this environmental assessment in accordance with generally accepted standards of care which exist in northern California at the time of this study. The definition and evaluation of environmental conditions is difficult and inexact. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the subsurface and/or historic conditions applicable to the site. In addition, the conclusions made herein reflect site conditions at the time of the investigation. These conditions may change with time, and as such, the conclusions may also change.

The conclusions and opinions presented herein may also be affected by rapid changes in the field of environmental engineering and the laws governing hazardous waste. The reader is advised to consult with SCI prior to relying upon the information provided.

List of Tables:

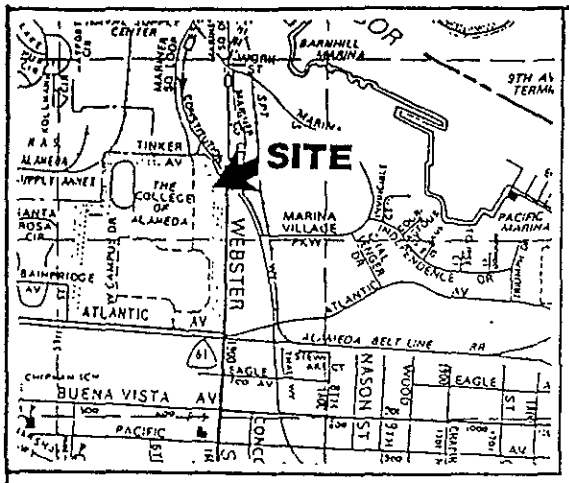
List of Illustrations:

Appendix:

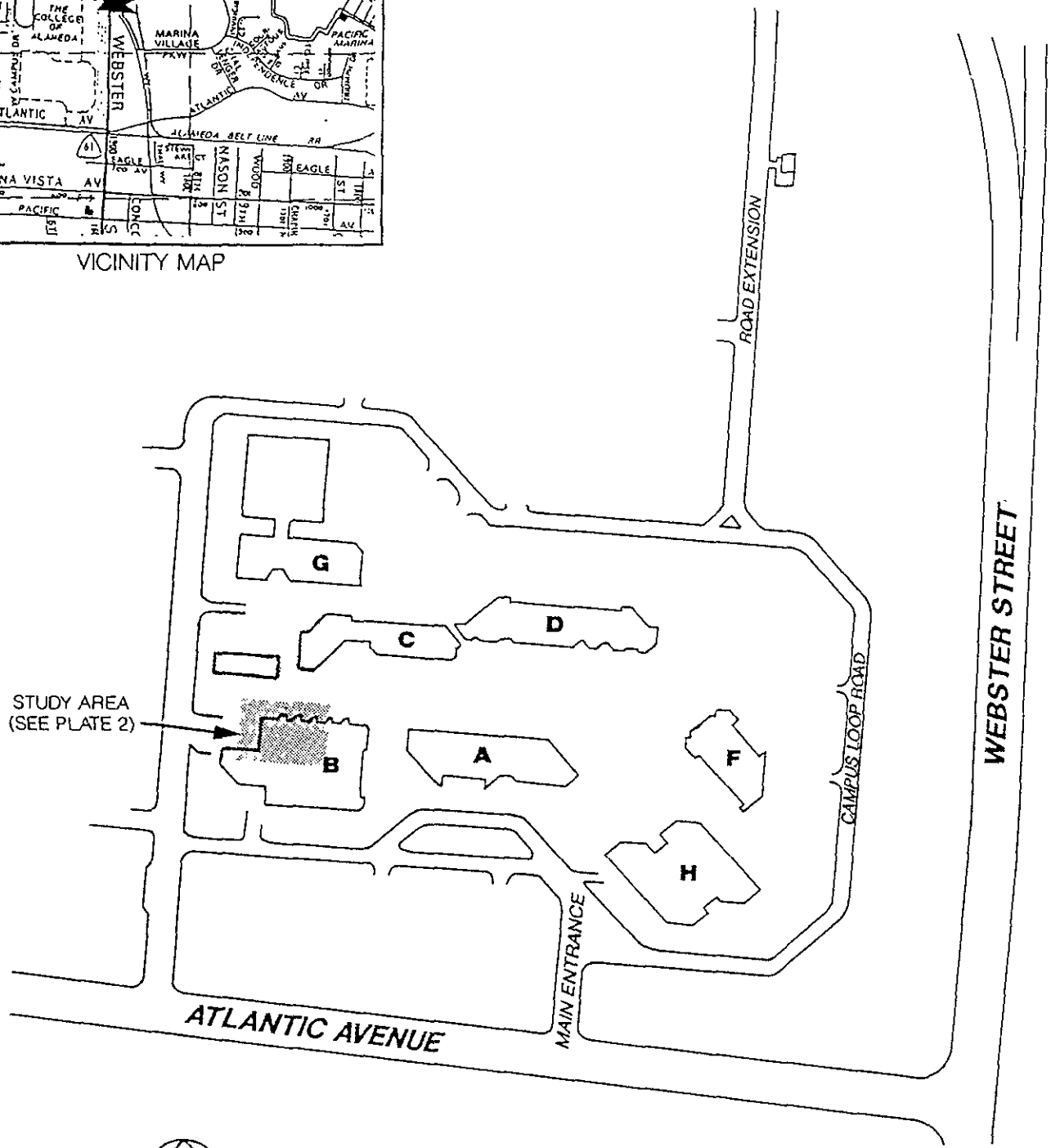
Distribution:

2 copies: Mr. Robert Mibach
Director, Physical Plant
Peralta Community College District
333 East 8th Street
Oakland, California 94606

1 copy: Ms. Juliet Shin
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite #250
Alameda, California 94502-6577



VICINITY MAP



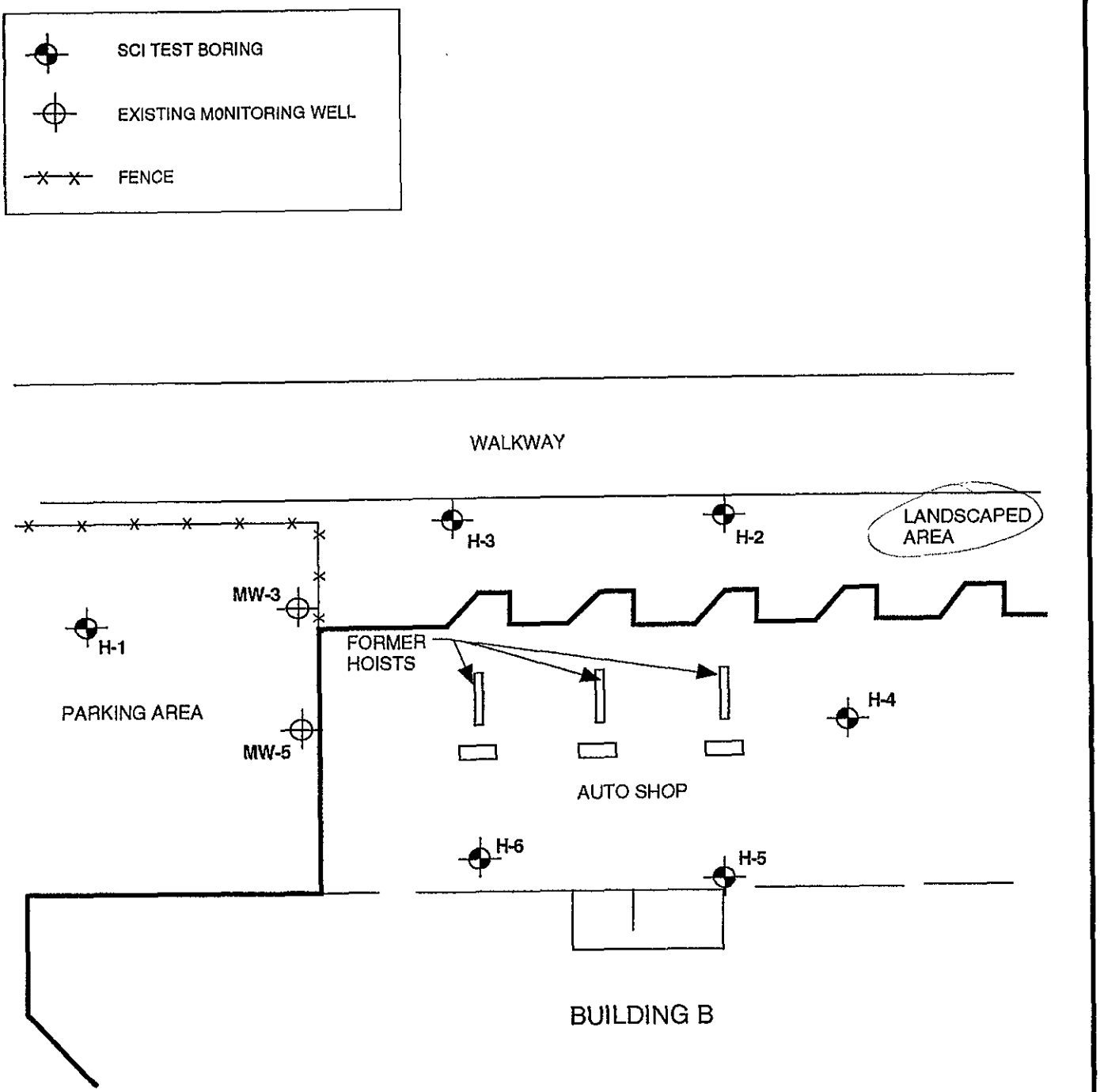
SITE PLAN

Subsurface Consultants

COLLEGE OF ALAMEDA – ALAMEDA, CA

JOB NUMBER	DATE	APPROVED
469.013	7/31/96	UW

PLATE 1



N

APPROXIMATE SCALE IN FEET

0 30 60

HYDRAULIC HOIST STUDY AREA PLAN

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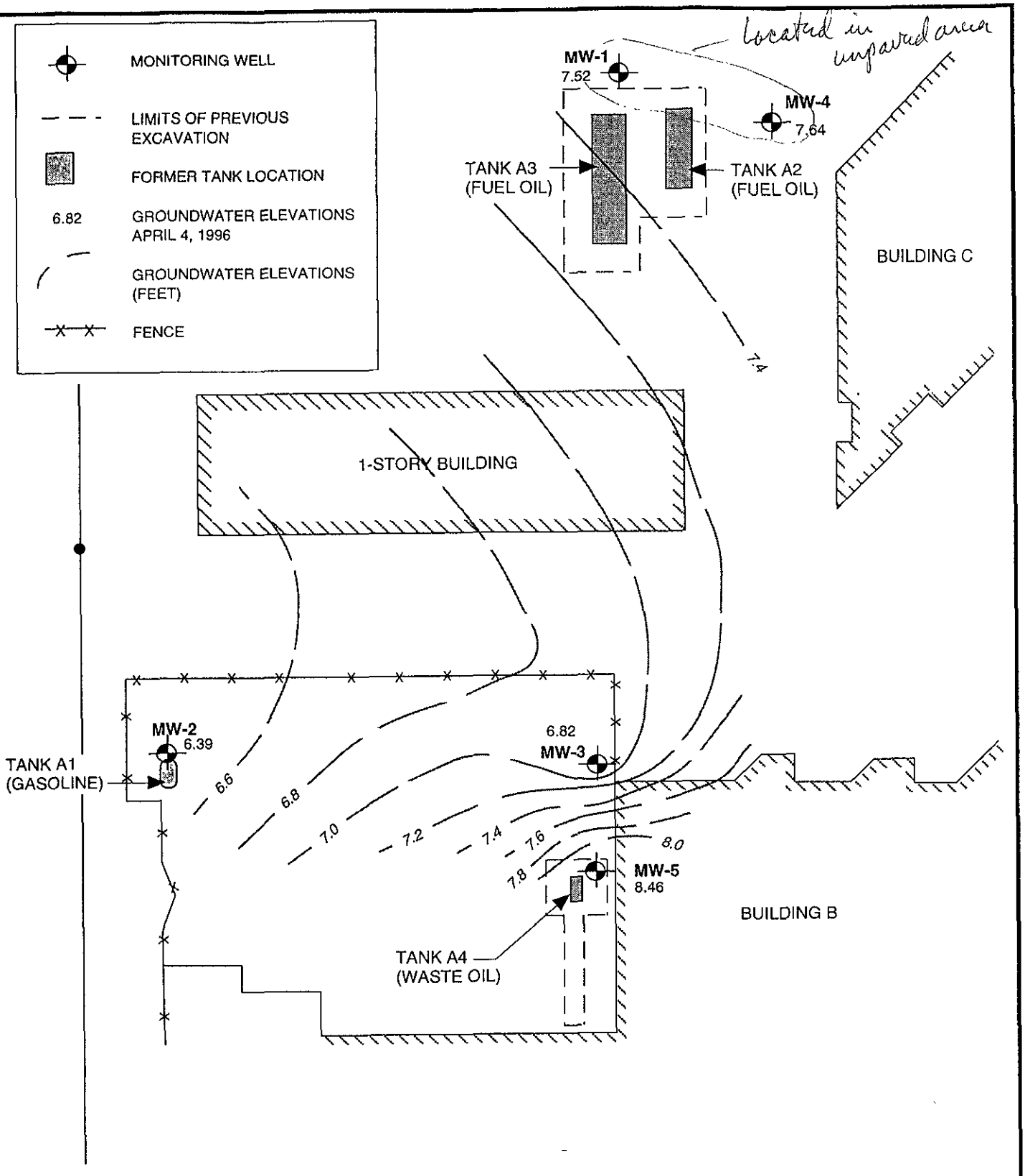
JOB NUMBER	DATE	APPROVED
469.013	7/31/96	MM

PLATE 2



GROUNDWATER ELEVATION CONTOURS

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JOB NUMBER	DATE	APPROVED
469.013	7/31/96	

PLATE 3

LOG OF TEST BORING H-1

EQUIPMENT 2 3/8" Dia. Enviro-core
DATE DRILLED 4/1/96
ELEVATION ----------

LABORATORY TESTS	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	OVM (PPM)	DEPTH (FEET)	SAMPLE	BLOWS PER FOOT	
				0			ASPHALTIC CONCRETE - 4 inches thick BASEROCK BROWN SANDY GRAVEL (GC) medium dense, moist (fill)
			0				GRAY CLAYEY SILT (ML) medium stiff, moist, with rock fragments, sand and shells (fill)
			0	5			GRAY CLAYEY SILT (MH) soft, moist (Bay Mud)
SAMPLER TYPE: ENVIRO-CORE O.D.: 2-3/8 inches I.D.: 1-11/16 inches			0			▽	GROUNDWATER LEVEL AFTER DRILLING
LL = Liquid Limit (%) PI = Plasticity Index (%) -200 = % passing #200 sieve (0.074 mm)				10			
			0	15			Peat layer GRAY CLAYEY SILT (MH) soft, moist (Bay Mud) 1" screened PVC installed in borehole to facilitate grabbing groundwater samples. Upon completion, borehole backfilled with neat cement grout.

LOG OF TEST BORING H-2

EQUIPMENT 2 3/8" Dia. Enviro-core
DATE DRILLED 4/1/96
ELEVATION ----------

LABORATORY TESTS	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	OVM (PPM)	DEPTH (FEET)	SAMPLE	BLOWS PER FOOT	
				0			DARK BROWN SILTY CLAY (CL) medium stiff, moist (fill)
							BROWN SANDY CLAY (CL) medium stiff, moist, with rocks and roots (fill)
				5			GRAY BROWN SILTY CLAY (CL) medium stiff, moist
LL = 63%; PI = 31% -200 = 64%			0				GRAY CLAYEY SILT (MH) soft, moist (Bay Mud)
			0				
			0	10		▽	GROUNDWATER LEVEL AFTER DRILLING
			0				1" screened PVC installed in borehole to facilitate grabbing groundwater samples. Upon completion, borehole backfilled with neat cement grout.
				15			

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COLLEGE OF ALAMEDA
ALAMEDA, CALIFORNIA

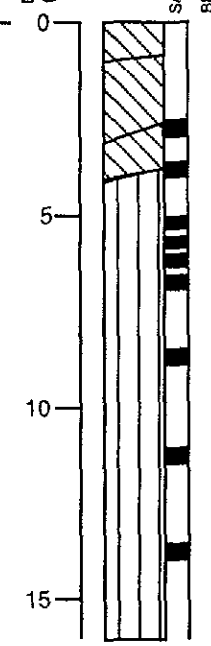
JOB NUMBER	DATE	APPROVED
469.013	4/15/96	

PLATE 4

LOG OF TEST BORING H-3

EQUIPMENT 2 3/8" Dia. Enviro-core
DATE DRILLED 4/1/96
ELEVATION ----------

LABORATORY TESTS	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	OVM (PPM)	DEPTH (FEET)	SAMPLE	BLOWS PER FOOT
				0		
			0	5		
			0			
			0	10		
			1	15		



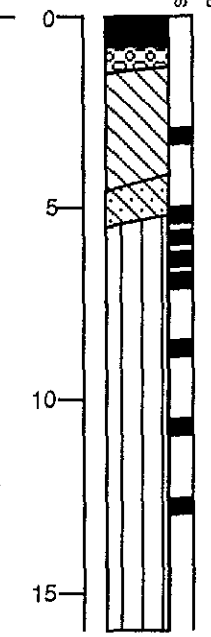
DARK BROWN SILTY CLAY (CL)
medium stiff, moist (fill)
BROWN SILTY CLAY (CL)
medium stiff, moist, with sand and gravel (fill)
GRAY-BROWN SILTY CLAY (CL)
medium stiff, moist, with fine-grained sand (fill)
GRAY CLAYEY SILT (ML)
soft, moist (Bay Mud)
GROUNDWATER LEVEL AFTER DRILLING

1" screened PVC installed in borehole to facilitate grabbing groundwater samples. Upon completion, borehole backfilled with neat cement grout.

LOG OF TEST BORING H-4

EQUIPMENT 2 3/8" Dia. Enviro-core
DATE DRILLED 4/1/96
ELEVATION ----------

LABORATORY TESTS	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	OVM (PPM)	DEPTH (FEET)	SAMPLE	BLOWS PER FOOT
				0		
				5		
				10		
				15		



CEMENT CONCRETE - 8-inches thick
BASEROCK
GRAY-BROWN SILTY CLAY (CL)
stiff, moist, with fine-grained sand (fill)
GRAY BROWN CLAYEY SAND (SC)
medium dense, moist (fill)
GRAY CLAYEY SILT (MH)
soft, moist (Bay Mud)

GROUNDWATER LEVEL AFTER DRILLING

1" screened PVC installed in borehole to facilitate grabbing groundwater samples. Upon completion, borehole backfilled with neat cement grout.

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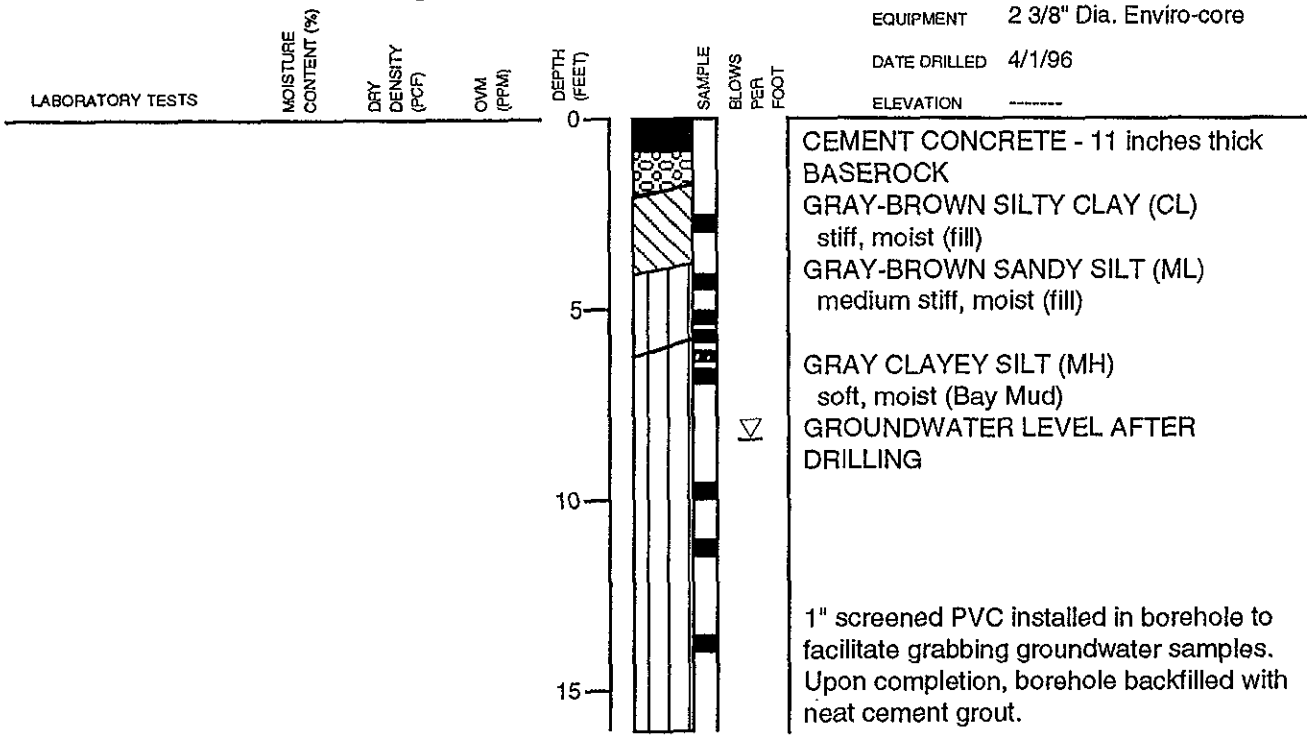
COLLEGE OF ALAMEDA
ALAMEDA, CALIFORNIA

JOB NUMBER	DATE	APPROVED
469.013	4/15/96	

PLATE 5

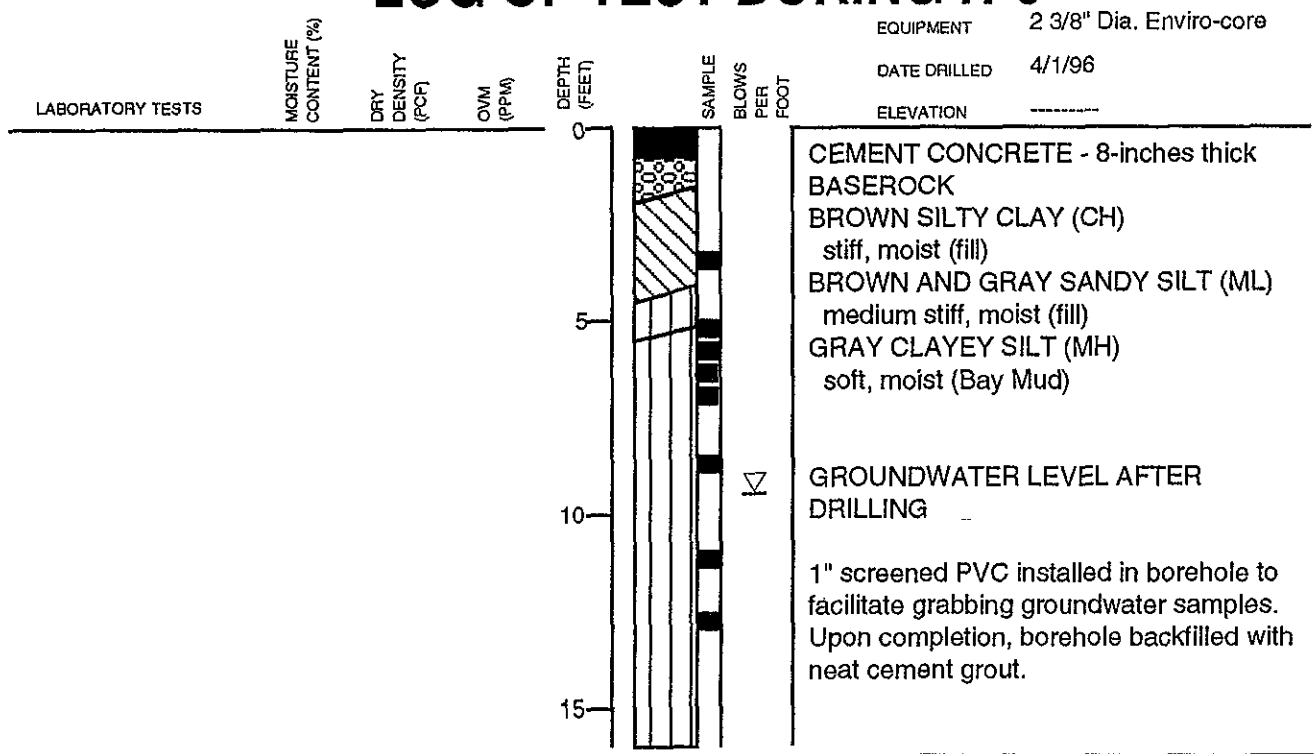
LOG OF TEST BORING H-5

EQUIPMENT 2 3/8" Dia. Enviro-core
DATE DRILLED 4/1/96
ELEVATION --------



LOG OF TEST BORING H-6

EQUIPMENT 2 3/8" Dia. Enviro-core
DATE DRILLED 4/1/96
ELEVATION ---------



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COLLEGE OF ALAMEDA
ALAMEDA, CALIFORNIA

JOB NUMBER	DATE	APPROVED
469.013	4/15/96	

PLATE 6

GENERAL SOIL CATEGORIES			SYMBOLS		TYPICAL SOIL TYPES
COARSE GRAINED SOILS More than half is larger than No. 200 sieve	GRAVEL More than half coarse fraction is larger than No. 4 sieve size	Clean Gravel with little or no fines	GW		Well Graded Gravel, Gravel-Sand Mixtures
			GP		Poorly Graded Gravel, Gravel-Sand Mixtures
		Gravel with more than 12% fines	GM		Silty Gravel, Poorly Graded Gravel-Sand-Silt Mixtures
			GC		Clayey Gravel, Poorly Graded Gravel-Sand-Clay Mixtures
	SAND More than half coarse fraction is smaller than No. 4 sieve size	Clean Sand with little or no fines	SW		Well Graded Sand, Gravelly Sand
			SP		Poorly Graded Sand, Gravelly Sand
		Sand with more than 12% fines	SM		Silty Sand, Poorly Graded Sand-Silt Mixtures
			SC		Clayey Sand, Poorly Graded Sand-Clay Mixtures
FINE GRAINED SOILS More than half is smaller than No. 200 sieve	SILT AND CLAY Liquid Limit Less than 50%		ML		Inorganic Silt and Very Fine Sand, Rock Flour, Silty or Clayey Fine Sand, or Clayey Silt with Slight Plasticity
			CL		Inorganic Clay of Low to Medium Plasticity, Gravelly Clay, Sandy Clay, Silty Clay, Lean Clay
			OL		Organic Clay and Organic Silty Clay of Low Plasticity
	SILT AND CLAY Liquid Limit Greater than 50%		MH		Inorganic Silt, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silt
			CH		Inorganic Clay of High Plasticity, Fat Clay
			OH		Organic Clay of Medium to High Plasticity, Organic Silt
HIGHLY ORGANIC SOILS			PT		Peat and Other Highly Organic Soils

UNIFIED SOIL CLASSIFICATION SYSTEM

Subsurface Consultants

COLLEGE OF ALAMEDA
ALAMEDA , CALIFORNIA

JOB NUMBER	DATE	APPROVED
469.013	8/8/96	

PLATE 7

Table 1.
Groundwater Elevations

Well	TOC Elevation	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)
MW-1	12.16	02/24/92	1.64	10.52
		03/09/92	4.28	7.88
		03/24/92	4.33	7.83
		04/28/92	4.54	7.62
		06/29/92	5.92	6.24
		07/27/92	5.74	6.42
		08/27/92	6.04	6.12
		09/24/92	6.16	6.00
		12/16/92	6.19	5.97
		01/21/93	6.83	5.33
		02/07/94	6.01	6.15
		05/03/94	5.03	7.13
		06/02/94	5.14	7.02
		08/23/94	5.20	6.96
		11/03/94	5.51	6.65
		02/13/95	5.30	6.86
		05/22/95	5.05	7.11
		09/06/95	6.52	5.64
		04/01/96	4.64	7.52
MW-2	11.07	02/24/92	4.45	6.62
		01/21/93	6.83	4.24
		03/24/92	3.73	7.34
		04/28/92	4.25	6.82
		06/29/92	4.40	6.67
		07/27/92	4.00	7.07
		08/27/92	4.33	6.74
		09/24/92	4.36	6.71
		12/16/92	4.08	6.99
		01/21/93	4.40	6.67
		02/07/94	3.60	7.47
		05/03/94	4.04	7.03
		06/02/94	4.17	6.90
		08/23/94	4.28	6.79
		11/03/94	4.33	6.74
		02/13/95	5.95	5.12
		05/22/95	4.10	6.97
		09/06/95	4.54	6.53
		04/01/96	4.68	6.39
MW-3	12.65	02/24/92	13.12	-0.47
		03/09/92	8.75	3.90
		03/24/92	6.87	5.78
		04/28/92	6.31	6.34
		06/04/92	7.10	5.55
		06/29/92	10.78	1.87

Table 1.
Groundwater Elevations

Well	TOC Elevation	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)
		07/27/92	6.88	5.77
		09/24/92	7.38	5.27
		12/16/92	6.50	6.15
		01/21/93	10.25	2.40
		02/07/94	11.44	1.21
		05/03/94	7.02	5.63
		06/02/94	9.15	3.50
		08/23/94	7.13	5.52
		11/03/94	7.54	5.11
		02/13/95	5.80	6.85
		05/22/95	7.87	4.78
		09/06/95	6.47	6.18
		04/01/96	5.83	6.82
MW-4	12.22	02/07/94	5.92	6.30
		05/03/94	5.50	6.72
		06/02/94	5.17	7.05
		08/23/94	5.73	6.49
		11/03/94	6.41	5.81
		02/13/95	4.65	7.57
		05/22/95	4.77	7.45
		09/06/95	5.43	6.79
		04/01/96	4.58	7.64
MW-5	12.69	02/07/94	4.89	7.80
		05/03/94	4.50	8.19
		06/02/94	4.49	8.20
		08/23/94	4.83	7.86
		11/03/94	5.14	7.55
		02/13/95	4.19	8.50
		05/22/95	4.25	8.44
		09/06/95	4.68	8.01
		04/01/96	4.23	8.46

TOC = Top of Casing
Groundwater depth mesured below TOC
TOC elevation surveyed relative to mean sea level

Table 2.
Contaminant Concentrations in Soil

Sample	Date	TVH (mg/kg)	TEH Kerosene Range (mg/kg)	TEH Diesel Range (mg/kg)	TEH Motor Oil Range (mg/kg)	TOG (mg/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl-Benzene (ug/kg)	Total Xylenes (ug/kg)	EPA 8010 Compounds
Fuel Oil Tank Area											
MW-1 @ 4.5'	2/6/92	--	<1.0	3.8	--	--	<5.0	<5.0	<5.0	<5.0	--
MW-4 @ 5'	1/10/94	<1.0	<1.0	2	--	<50	<5.0	<5.0	<5.0	9.0	--
Gasoline Tank Area											
MW-2 @ 5'	2/6/92	<1.0	--	--	--	--	<5.0	<5.0	<5.0	<5.0	--
Waste Oil Tank Area											
MW-3 @ 5'	2/6/92	<1.0	*	13	--	190	<5.0	<5.0	<5.0	<5.0	ND
Hydraulic Hoist Area											
H-1 @ 5.0	4/1/96	--	--	110†	290†	<50	--	--	--	--	--
H-2 @ 5.0	4/1/96	--	--	12†	73†	<50	--	--	--	--	--
H-3 @ 5.5	4/1/96	--	--	160†	380†	<50	--	--	--	--	--
H-4 @ 6.0	4/1/96	--	--	20†	82†	<50	--	--	--	--	--
H-5 @ 4.5	4/1/96	--	--	22†	100†	<50	--	--	--	--	--
H-6 @ 5.0	4/1/96	--	--	56†	190†	<50	--	--	--	--	--

TVH = Total volatile hydrocarbons
TEH = Total extractable hydrocarbons
TOG = Total oil and grease
mg/kg = Milligrams per kilogram or parts per million (ppm)
ug/kg = Micrograms per kilogram or parts per billion (ppb)
-- = Test not requested
<1.0 = Compound not detected at or above reporting limit shown
* = Quantitated as diesel range
ND = Not detected
† = Sample exhibits fuel pattern which does not resemble standard

Table 3

Contaminant Concentrations in Groundwater

	Sampling Date	TVH (ug/l)	TEH Kerosene (ug/l)	TEH Diesel (ug/l)	TEH Motor Oil (ug/l)	TOG (mg/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Total Xylenes (ug/l)	EPA 8270 Compounds	EPA 8010 Compounds	TDS (mg/l)
Fuel Oil Tank Area													
MW-1	2/19/92	--	<50	**94**	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	6/29/92	--	<50	**110**	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	9/29/92	--	<50	<50	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	12/22/92	--	<50	**180**	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	1/26/94	--	**60**	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	5/4/94	--	<50	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	8/25/94	--	*	**480†**	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	11/7/94	--	<50	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	2/13/95	--	<50	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	5/24/95	--	--	<50	--	**9.7**	<0.5	<0.5	<0.5	<0.5	--	--	--
	9/7/95	--	--	**140†**	<1300	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	4/4/96	--	--	**240†**	--	<5	--	--	--	--	ND	--	14,200
MW-4	1/26/94	--	<50	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	8/25/94	--	*	**530†**	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	5/27/95	--	--	**240†**	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	4/4/96	--	--	**190†**	--	<5	--	--	--	--	ND	--	17,600
Gasoline Tank Area													
Tank Excavation	8/15/91	**800**	--	--	--	--	**78**	**99**	**10**	**52**	--	--	--
MW-2	2/19/92	<50	--	--	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	6/29/92	<50	--	--	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	9/29/92	<50	--	--	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	12/22/92	<50	--	--	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	1/25/94	--	<50	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	5/4/94	--	*	**50†**	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	11/4/94	--	<50	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	2/13/95	--	<50	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--

Table 3

Contaminant Concentrations in Groundwater

	Sampling Date	TVH (ug/l)	TEH Kerosene (ug/l)	TEH Diesel (ug/l)	TEH Motor Oil (ug/l)	TOG (mg/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Total Xylenes (ug/l)	EPA 8270 Compounds	EPA 8010 Compounds	TDS (mg/l)
Fuel Oil Tank Area													
H-5	4/1/96	--	--	370†	<300	<11	--	--	--	--	--	--	35,400
H-6	4/1/96	--	--	680†	<300	<10	--	--	--	--	ND	--	28,900

TVH = Total volatile hydrocarbons as gasoline
TEH = Total extractable hydrocarbons
TOG = Total oil and grease,
PNAs = Polynuclear Aromatic Hydrocarbons
TDS = Total Dissolved Solids
ug/L = Micrograms per liter or parts per billion (ppb)
mg/L = Milligrams per liter or parts per million (ppm)
-- = Test not requested
<50 = Compound not detected at or above reporting limit shown
ND = Not detected at or above reporting limits
† = Samples exhibits pattern which does not resemble standard
* = Quantitated as diesel range
[h] = Laboratory indicates that the sample chromatogram closely resembles hydraulic fluid.
** = Laboratory indicates value is estimated since surrogate recovery fell outside of proper QC limits

Note:

1. Analytical results for the grab groundwater sample collected from Boring H-1 are not presented due to sample contamination.

Table 3
Contaminant Concentrations in Groundwater

	Sampling Date	TVH (ug/l)	TEH Kerosene (ug/l)	TEH Diesel (ug/l)	TEH Motor Oil (ug/l)	TOG (mg/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Total Xylenes (ug/l)	EPA 8270 Compounds	EPA 8010 Compounds	TDS (mg/l)
Fuel Oil Tank Area													
	9/7/95	--	--	140†	<1300	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	4/4/96	--	--	190†	--	<5	--	--	--	--	ND	--	3,100
Waste Oil Tank Area													
MW-3	2/19/92	<5000	680	<50	--	<5	<50	<50	<50	84	--	ND	--
	6/29/92	<50	*	190	--	<5	<0.5	<0.5	<0.5	<0.5	--	ND	--
	9/29/92	<50	*	410	--	<5	<0.5	<0.5	<0.5	<0.5	--	ND	--
	12/21/92	<500	*	400	--	<5	<5	<5	<5	<5	--	ND	--
	1/26/94	--	70	<50	--	<5	<0.5	<0.5	<0.5	0.8	--	--	--
	5/5/94	--	<50	140†	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	8/25/94	--	*	900†	--	<5	14.5	5.1	<0.5	<0.5	--	--	--
	11/7/94	--	<50	<50	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	2/13/95	--	*	310†	--	5.9	<0.5	<0.5	<0.5	<0.5	--	--	--
	5/24/95	--	--	390†	--	14	<0.5	<0.5	<0.5	<0.5	--	--	--
	9/7/95	--	--	440†	<1300	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	4/4/96	--	--	400†	--	<5	--	--	--	--	ND	--	31,600
MW-5	1/25/94	--	*	5,200[h]	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	5/4/94	--	*	3,500[h]	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	8/25/94	--	*	5,000[h]	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	11/4/94	--	*	4,600[h]	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	2/13/95	--	*	3000[h]	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	5/22/95	--	--	3,100[h]	--	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	9/7/95	--	--	5,000[h]	4900[h]	<5	<0.5	<0.5	<0.5	<0.5	--	--	--
	4/4/96	--	--	2,100[h]	--	<5	--	--	--	--	ND	--	9,020
Hydraulic Hoist Area													
H-2	4/1/96	--	--	1100†	<300	--	--	--	--	--	ND	--	--
H-3	4/1/96	--	--	1300†	<300	<9	--	--	--	--	--	--	9,730
H-4	4/1/96	--	--	320†	<300	<11	--	--	--	--	--	--	33,100

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Subsurface Consultants
171 12th Street
Suite 201
Oakland, CA 94608

Date: 16-APR-96
Lab Job Number: 125098
Project ID: 469.009
Location: College of Alameda

Reviewed by: _____

Reviewed by: _____

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 125098
CLIENT: SUBSURFACE CONSULTANTS
PROJECT#: 469.009
LOCATION: COLLEGE OF ALAMEDA

DATE SAMPLED: 04/04/96
DATE RECEIVED: 04/05/96
DATE ANALYZED: 04/10/96
DATE REPORTED: 04/16/96

ANALYSIS: TOTAL DISOLVED SOLIDS
ANALYSIS METHOD: EPA 160.1

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
125098-001	MW-1	14,200	mg/L	50
125098-002	MW-2	3,100	mg/L	50
125098-003	MW-3	31,600	mg/L	50
125098-004	MW-4	17,600	mg/L	50
125098-005	MW-5	9,020	mg/L	50
METHOD BLANK	N/A	ND	mg/L	50

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: MS/SAMPLE DUPLICATE OF 125102-009

RPD, %	16
RECOVERY, %	101

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 125098

Project Name: College of Alameda
Project Number: 469.009

Report Date: 16 April 96

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD:** SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
125098-001	MW-1	Water	04-APR-96	05-APR-96	10-APR-96	ND	mg/L	5	DLP	26922
125098-002	MW-2	Water	04-APR-96	05-APR-96	10-APR-96	ND	mg/L	5	DLP	26922
125098-003	MW-3	Water	04-APR-96	05-APR-96	10-APR-96	ND	mg/L	5	DLP	26922
125098-004	MW-4	Water	04-APR-96	05-APR-96	10-APR-96	ND	mg/L	5	DLP	26922
125098-005	MW-5	Water	04-APR-96	05-APR-96	10-APR-96	ND	mg/L	5	DLP	26922

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

Q C B a t c h R e p o r t

Client: Subsurface Consultants
Project Name: College of Alameda
Project Number: 469.009

Laboratory Login Number: 125098
Report Date: 16 April 96

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 26922**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
MB	ND	5	mg/L	SMWW 17:5520BF	10-APR-96

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	84%	SMWW 17:5520BF	10-APR-96
BSD	81%	SMWW 17:5520BF	10-APR-96

		Control Limits
Average Spike Recovery	82%	80% - 120%
Relative Percent Difference	%	< 20%

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
125098-001	MW-1	26934	04/04/96	04/10/96	04/12/96	
125098-002	MW-2	26934	04/04/96	04/10/96	04/12/96	
125098-003	MW-3	26934	04/04/96	04/10/96	04/12/96	
125098-004	MW-4	26934	04/04/96	04/10/96	04/12/96	

Analyte Diln Fac:	Units	125098-001 1	125098-002 1	125098-003 1	125098-004 1
Diesel Range	ug/L	240 YH	190 YH	400 YH	190 YH
Surrogate					
Hexacosane	%REC	97	102	95	131

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
125098-005	MW-5	26934	04/04/96	04/10/96	04/12/96	

Analyte	Units	125098-005
Diln Fac:		1
Diesel Range	ug/L	2100 YH
Surrogate		
Hexacosane	%REC	106

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard

Curtis & Tompkins, Ltd.

Lab #: 125098

BATCH QC REPORT

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

METHOD BLANK

Matrix: Water
Batch#: 26934
Units: ug/L
Diln Fac: 1

Prep Date: 04/10/96
Analysis Date: 04/11/96

MB Lab ID: QC19049

Analyte	Result	
Diesel Range	<50	
Surrogate	%Rec	Recovery Limits
Hexacosane	87	60-140

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 26934
Units: ug/L
Diln Fac: 1

Prep Date: 04/10/96
Analysis Date: 04/12/96

BS Lab ID: QC19050

Analyte	Spike Added	BS	%Rec #	Limits
Diesel Range	2475	1575	64	60-140
Surrogate	%Rec	Limits		
Hexacosane	88	60-140		

BSD Lab ID: QC19051

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Diesel Range	2475	1576	64	60-140	0	<35
Surrogate	%Rec	Limits				
Hexacosane	87	60-140				

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

Polynuclear Aromatic Hydrocarbons by GC/MS

Client:	Subsurface Consultants	Analysis Method:	EPA 8270
Project#:	469.009	Prep Method:	EPA 3520
Location:	College of Alameda		

Field ID:	MW-1	Sampled:	04/04/96
Lab ID:	125098-001	Received:	04/05/96
Matrix:	Water	Extracted:	04/08/96
Batch#:	26877	Analyzed:	04/12/96
Units:	ug/L		
Diln Fac:	1		

Analyte	Result	Reporting Limit
Naphthalene	ND	9.4
Acenaphthylene	ND	9.4
Acenaphthene	ND	9.4
Fluorene	ND	9.4
Phenanthrene	ND	9.4
Anthracene	ND	9.4
Fluoranthene	ND	9.4
Pyrene	ND	9.4
Benzo(a)anthracene	ND	9.4
Chrysene	ND	9.4
Benzo(b)fluoranthene	ND	9.4
Benzo(k)fluoranthene	ND	9.4
Benzo(a)pyrene	ND	9.4
Indeno(1,2,3-cd)pyrene	ND	9.4
Dibenz(a,h)anthracene	ND	9.4
Benzo(g,h,i)perylene	ND	9.4

Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	91	35-114
2-Fluorobiphenyl	53	43-116
Terphenyl-d14	33	33-141

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: EPA 8270
Prep Method: EPA 3520

Field ID: MW-2
Lab ID: 125098-002
Matrix: Water
Batch#: 26877
Units: ug/L
Diln Fac: 1

Sampled: 04/04/96
Received: 04/05/96
Extracted: 04/08/96
Analyzed: 04/12/96

Analyte	Result	Reporting Limit
Naphthalene	ND	9.4
Acenaphthylene	ND	9.4
Acenaphthene	ND	9.4
Fluorene	ND	9.4
Phenanthrene	ND	9.4
Anthracene	ND	9.4
Fluoranthene	ND	9.4
Pyrene	ND	9.4
Benzo(a)anthracene	ND	9.4
Chrysene	ND	9.4
Benzo(b)fluoranthene	ND	9.4
Benzo(k)fluoranthene	ND	9.4
Benzo(a)pyrene	ND	9.4
Indeno(1,2,3-cd)pyrene	ND	9.4
Dibenz(a,h)anthracene	ND	9.4
Benzo(g,h,i)perylene	ND	9.4

Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	98	35-114
2-Fluorobiphenyl	90	43-116
Terphenyl-d14	76	33-141

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: EPA 8270
Prep Method: EPA 3520

Field ID: MW-3
Lab ID: 125098-003
Matrix: Water
Batch#: 26877
Units: ug/L
Diln Fac: 1

Sampled: 04/04/96
Received: 04/05/96
Extracted: 04/08/96
Analyzed: 04/12/96

Analyte	Result	Reporting Limit
Naphthalene	ND	9.4
Acenaphthylene	ND	9.4
Acenaphthene	ND	9.4
Fluorene	ND	9.4
Phenanthrene	ND	9.4
Anthracene	ND	9.4
Fluoranthene	ND	9.4
Pyrene	ND	9.4
Benzo(a)anthracene	ND	9.4
Chrysene	ND	9.4
Benzo(b)fluoranthene	ND	9.4
Benzo(k)fluoranthene	ND	9.4
Benzo(a)pyrene	ND	9.4
Indeno(1,2,3-cd)pyrene	ND	9.4
Dibenz(a,h)anthracene	ND	9.4
Benzo(g,h,i)perylene	ND	9.4

Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	100	35-114
2-Fluorobiphenyl	87	43-116
Terphenyl-d14	47	33-141

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: EPA 8270
Prep Method: EPA 3520

Field ID: MW-4
Lab ID: 125098-004
Matrix: Water
Batch#: 26877
Units: ug/L
Diln Fac: 1

Sampled: 04/04/96
Received: 04/05/96
Extracted: 04/08/96
Analyzed: 04/12/96

Analyte	Result	Reporting Limit
Naphthalene	ND	9.4
Acenaphthylene	ND	9.4
Acenaphthene	ND	9.4
Fluorene	ND	9.4
Phenanthrene	ND	9.4
Anthracene	ND	9.4
Fluoranthene	ND	9.4
Pyrene	ND	9.4
Benzo(a)anthracene	ND	9.4
Chrysene	ND	9.4
Benzo(b)fluoranthene	ND	9.4
Benzo(k)fluoranthene	ND	9.4
Benzo(a)pyrene	ND	9.4
Indeno(1,2,3-cd)pyrene	ND	9.4
Dibenz(a,h)anthracene	ND	9.4
Benzo(g,h,i)perylene	ND	9.4

Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	87	35-114
2-Fluorobiphenyl	71	43-116
Terphenyl-d14	40	33-141

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: EPA 8270
Prep Method: EPA 3520

Field ID: MW-5
Lab ID: 125098-005
Matrix: Water
Batch#: 26877
Units: ug/L
Diln Fac: 1

Sampled: 04/04/96
Received: 04/05/96
Extracted: 04/08/96
Analyzed: 04/12/96

Analyte	Result	Reporting Limit
Naphthalene	ND	9.4
Acenaphthylene	ND	9.4
Acenaphthene	ND	9.4
Fluorene	ND	9.4
Phenanthrene	ND	9.4
Anthracene	ND	9.4
Fluoranthene	ND	9.4
Pyrene	ND	9.4
Benzo(a)anthracene	ND	9.4
Chrysene	ND	9.4
Benzo(b)fluoranthene	ND	9.4
Benzo(k)fluoranthene	ND	9.4
Benzo(a)pyrene	ND	9.4
Indeno(1,2,3-cd)pyrene	ND	9.4
Dibenz(a,h)anthracene	ND	9.4
Benzo(g,h,i)perylene	ND	9.4

Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	96	35-114
2-Fluorobiphenyl	88	43-116
Terphenyl-d14	50	33-141

Curtis & Tompkins, Ltd.

Lab #: 125098 BATCH QC REPORT

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: EPA 8270
Prep Method: EPA 3520

METHOD BLANK

Matrix: Water
Batch#: 26877
Units: ug/L
Diln Fac: 1

Prep Date: 04/08/96
Analysis Date: 04/11/96

MB Lab ID: QC18833

Analyte	Result	Reporting Limit
Naphthalene	ND	10
Acenaphthylene	ND	10
Acenaphthene	ND	10
Fluorene	ND	10
Phenanthrene	ND	10
Anthracene	ND	10
Fluoranthene	ND	10
Pyrene	ND	10
Benzo(a)anthracene	ND	10
Chrysene	ND	10
Benzo(b)fluoranthene	ND	10
Benzo(k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenz(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

Surrogate	%Rec	Recovery Limits
Nitrobenzene-d5	67	35-114
2-Fluorobiphenyl	77	43-116
Terphenyl-d14	107	33-141

Curtis & Tompkins, Ltd.

Lab #: 125098 BATCH QC REPORT

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.009
Location: College of Alameda

Analysis Method: EPA 8270
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 26877
Units: ug/L
Diln Fac: 1

Prep Date: 04/08/96
Analysis Date: 04/11/96

BS Lab ID: QC18834

Analyte	Spike Added	BS	%Rec #	Limits
Acenaphthene	25	21.91	88	46-118
Pyrene	25	19.06	76	26-127

Surrogate	%Rec	Limits
Nitrobenzene-d5	88	35-114
2-Fluorobiphenyl	88	43-116
Terphenyl-d14	110	33-141

BSD Lab ID: QC18835

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Acenaphthene	25	21.34	85	46-118	3	<31
Pyrene	25	18.23	73	26-127	4	<31

Surrogate	%Rec	Limits
Nitrobenzene-d5	80	35-114
2-Fluorobiphenyl	82	43-116
Terphenyl-d14	103	33-141

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

125098

CHAIN OF CUSTODY FORM

PAGE OF

PROJECT NAME: College of Alameda
JOB NUMBER: 464.009 LAB: Curtis & Tompkins
PROJECT CONTACT: Jerome de Verrier TURNAROUND: normal
SAMPLED BY: Chris O'Dea REQUESTED BY: Jerome de Verrier

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX: WATER	SOIL	WASTE	AIR	CONTAINERS: VOA	LITER	PINT	TUBE	BRASS	METHOD PRESERVED: HCL	H_2SO_4	HNO_3	ICE	NONE	SAMPLING DATE: MONTH	DAY	YEAR	TIME	NOTES	ANALYSIS REQUESTED: TEH	O&G	TDS	[redacted]	PNA/8100
-1	MW-1	X					3			1	1			X	3	04	04	96	0930		X	X	X		X
-2	MW-2	↓					3			↓	1			X	3	↓	↓	↓	↓		↓	↓	↓		↓
-3	MW-3						3				1			X	3										
-4	MW-4						3				1			X	3										
-5	MW-5						3				1			X	3										

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
Dean Alexander	4/5/96 11:30 a.m.	[signature]	4.5.96 11:30
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME

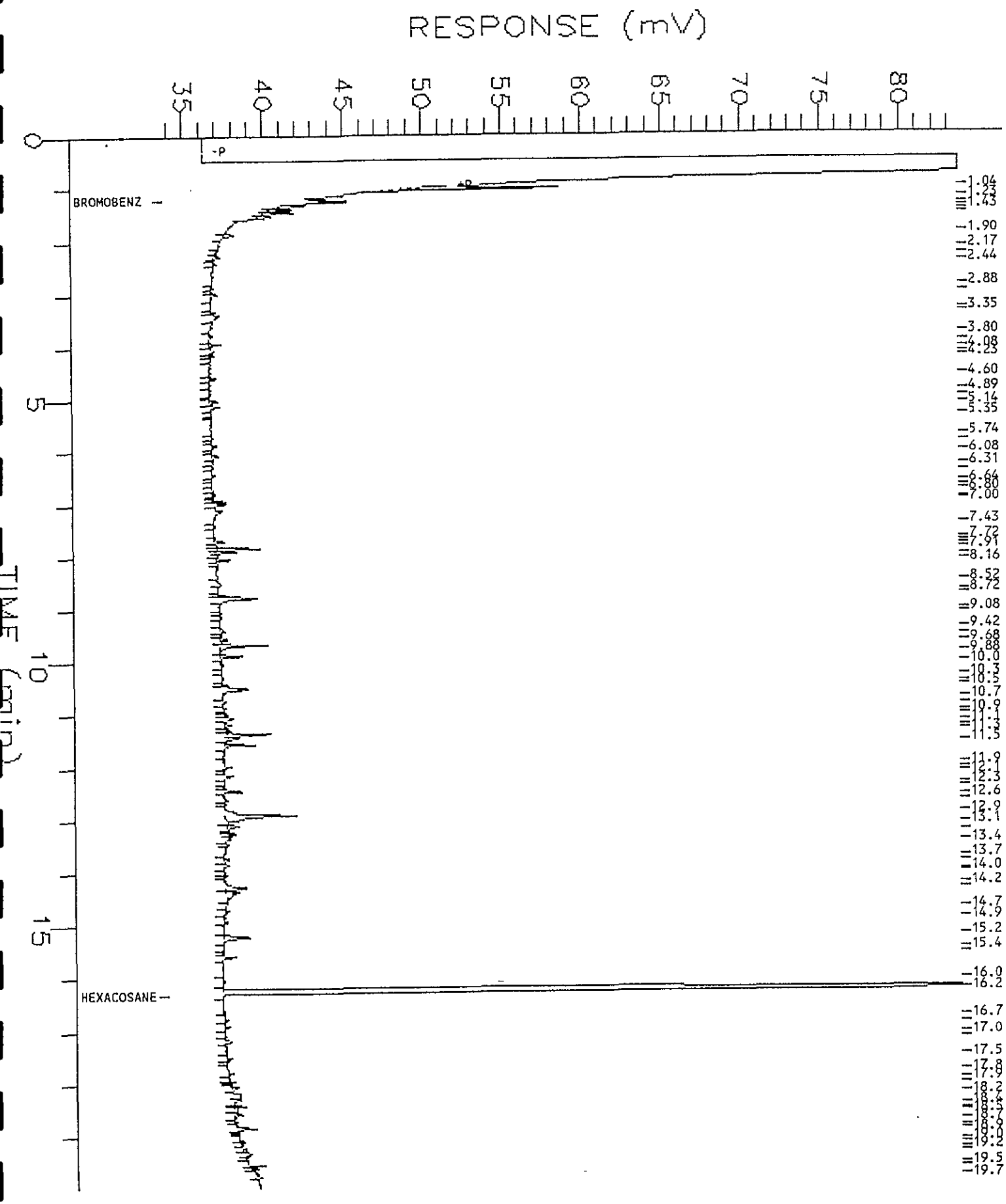
COMMENTS & NOTES:

Subsurface Consultants, Inc.
171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607
(510) 268-0461 • FAX: 510-268-0137

TEH Chromatogram GC13 CHA

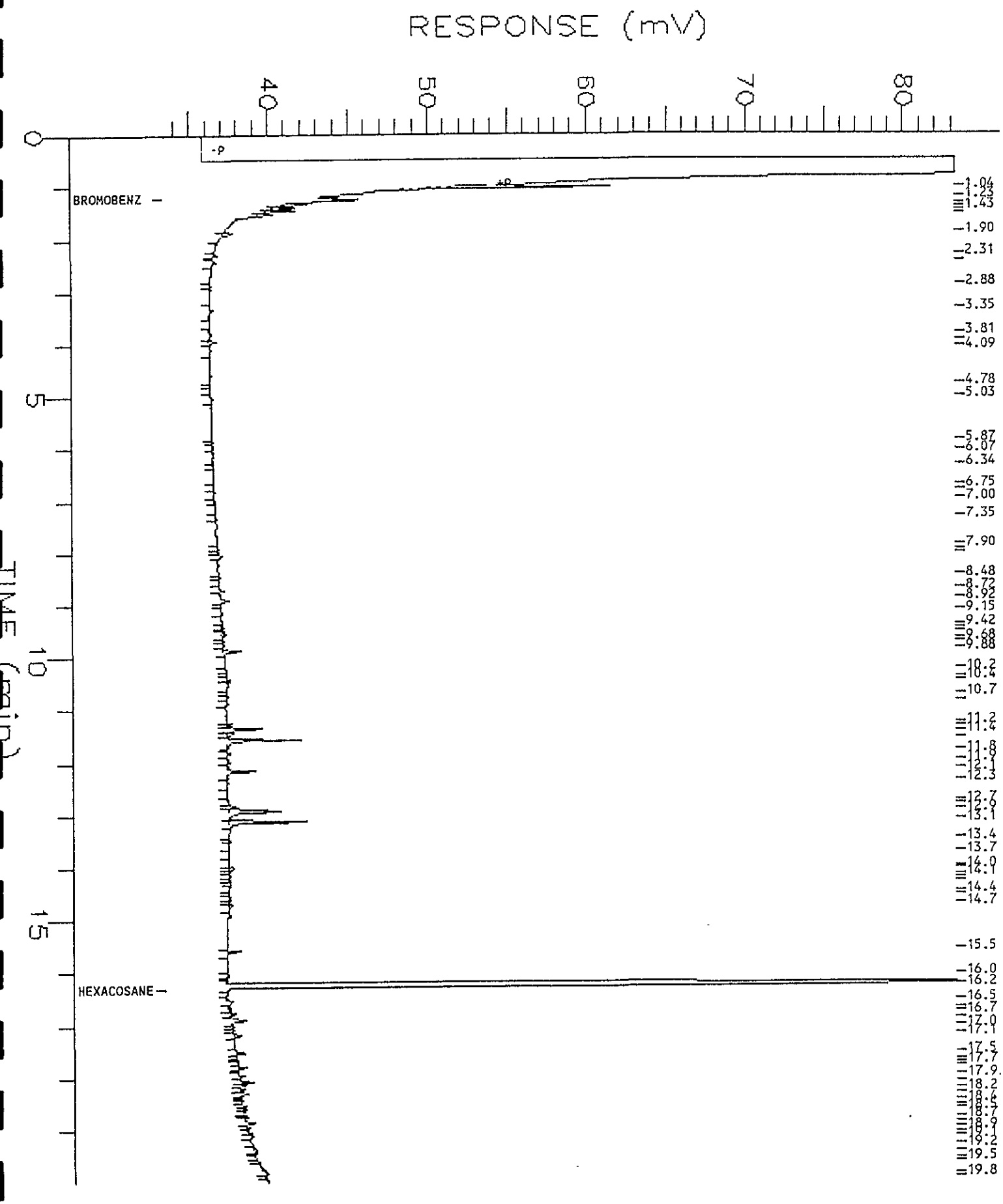
Sample Name : 125098-001,500:2.5
FileName : g:\gc13\cha\099A143.raw
Method : 13A20.ins
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: -1 Plot Offset: 34 mV

Sample #: 26934
Date : 4/12/96 03:53 AM
Time of Injection: 4/12/96 03:31 AM
Low Point : 33.69 mV High Point : 83.69 mV
Plot Scale: 50 mV



Sample Name : 125098-002,500:2.5
FileName : g:\gc13\cha\099A144.raw
Method : 13A20.ins
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: -1 Plot Offset: 33 mV

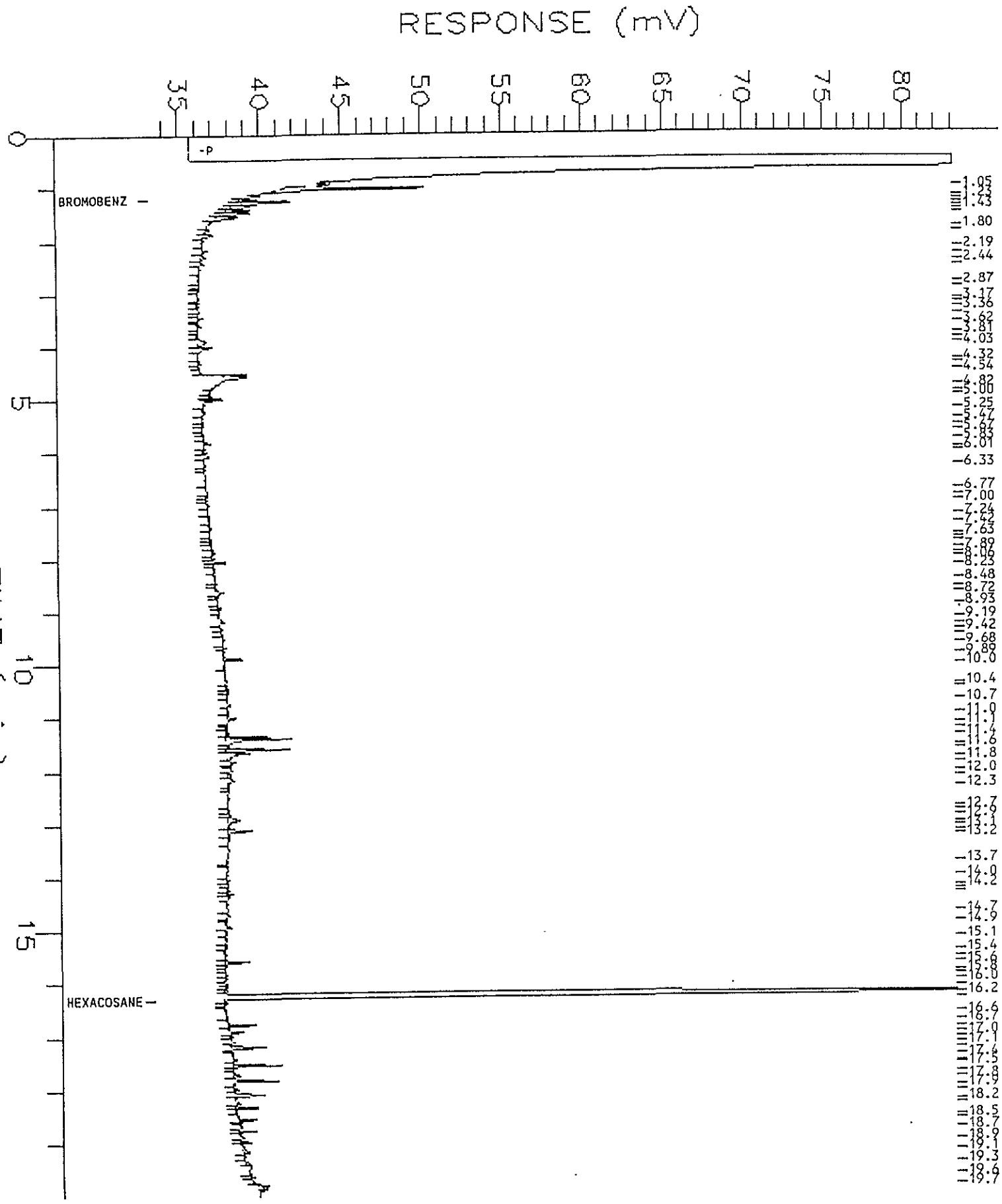
Sample #: 26934 Page 1 of 1
Date : 4/12/96 04:22 AM
Time of Injection: 4/12/96 04:02 AM
Low Point : 33.29 mV High Point : 83.29 mV
Plot Scale: 50 mV



TEH Chromatogram 8015 Ch A

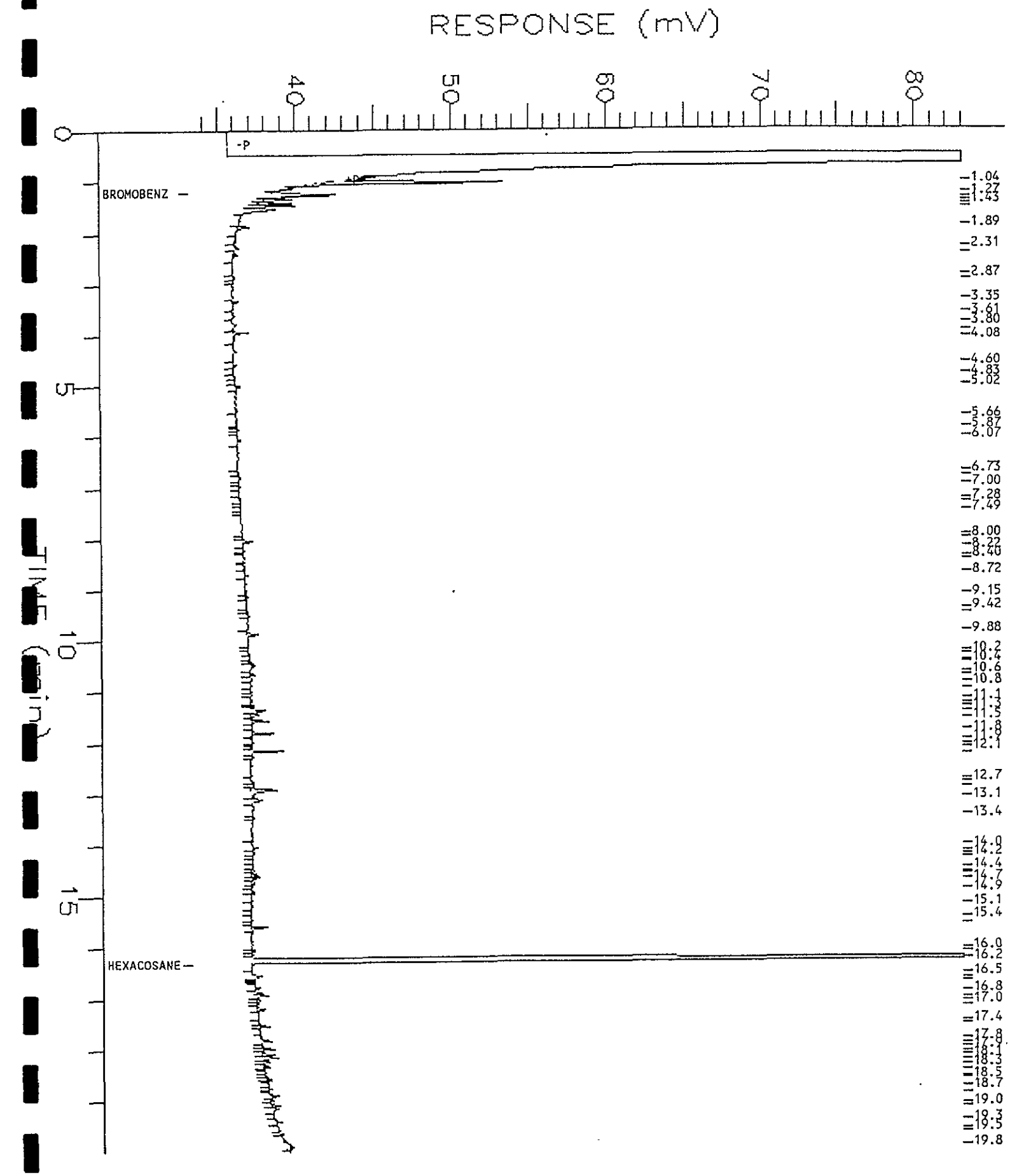
Sample Name : 125098-003,500:2.5
FileName : g:\gc13\cha\099A145.raw
Method : 13A20.ins
Start Time : 0.00 min End Time : 20.00 min
Sample Factor: -1 Plot Offset: 33 mV

Sample #: 26934
Date : 4/12/96 04:53 AM
Time of Injection: 4/12/96 04:32 AM
Low Point : 33.16 mV High Point : 83.16 mV
Plot Scale: 50 mV



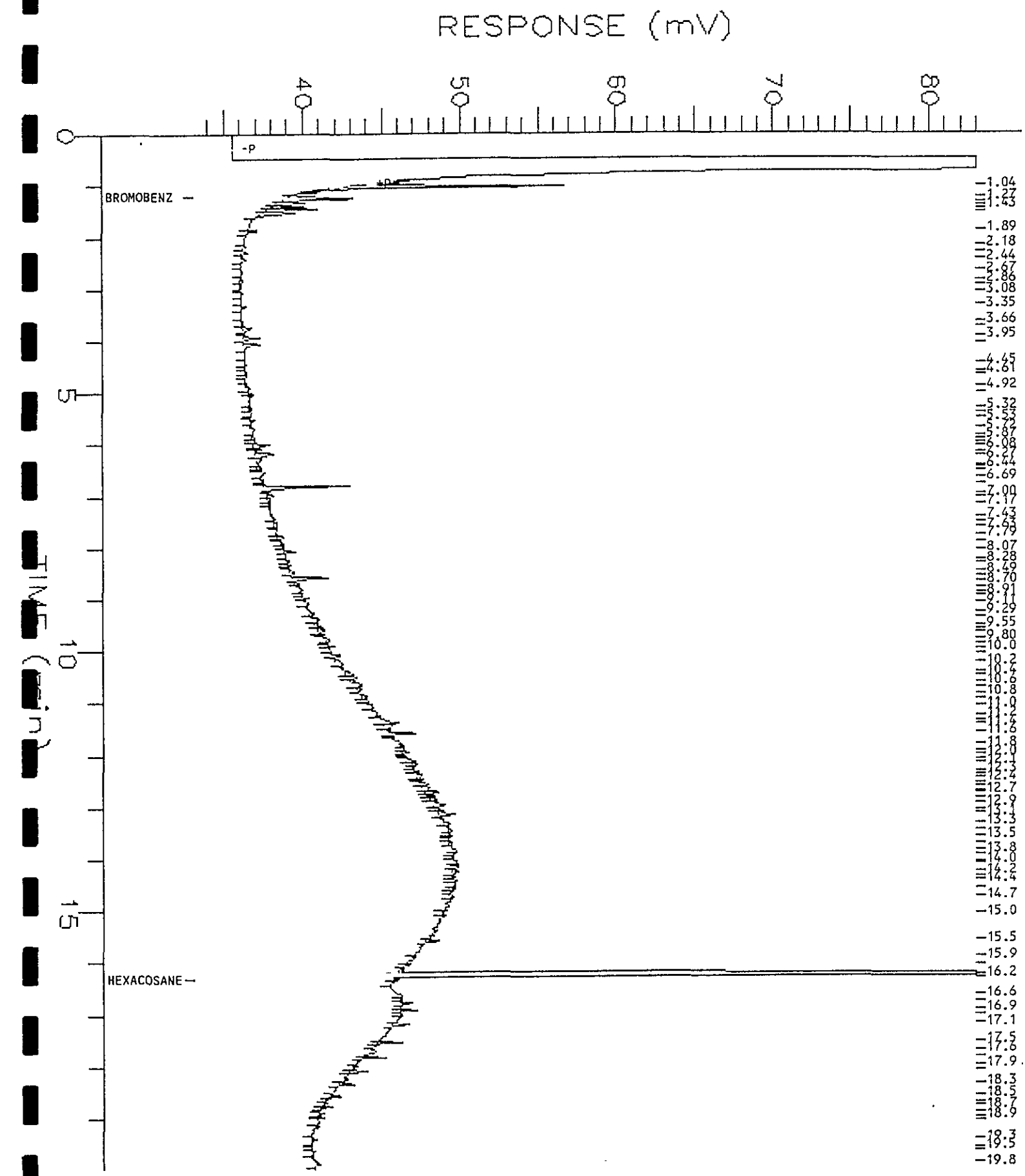
Sample Name : 125098-004,500:2.5
FileName : g:\gc13\cha\099A146.raw
Method : 13A20.ins
Start Time : 0.00 min End Time : 20.00 min
Sample Factor: -1 Plot Offset: 33 mV

Sample #: 26934 Page 1 of 1
Date : 4/12/96 05:23 AM
Time of Injection: 4/12/96 05:02 AM
Low Point : 33.09 mV High Point : 83.09 mV
Plot Scale: 50 mV



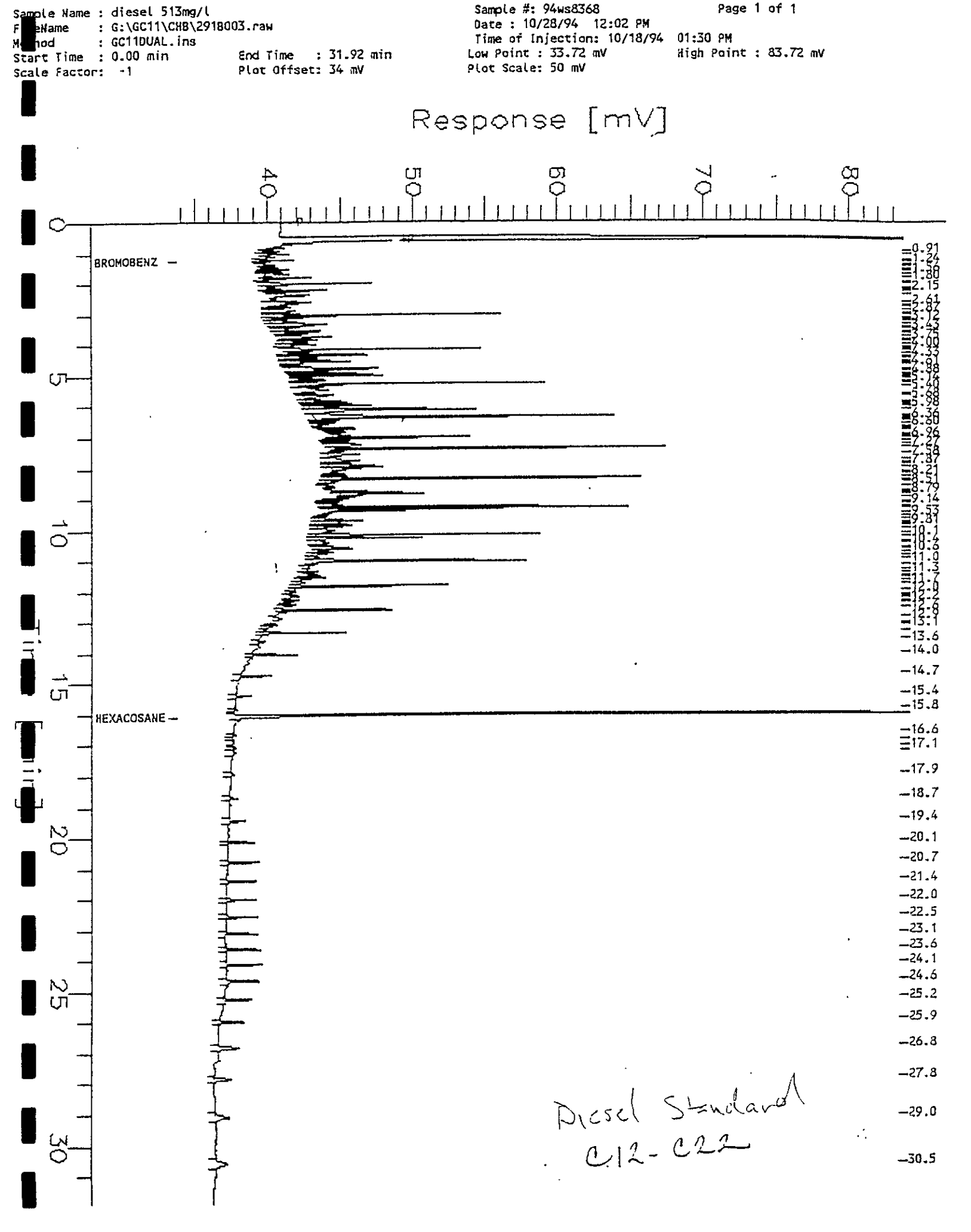
Sample Name : 125098-005,500:2.5
FileName : g:\gc13\cha\099A147.raw
Method : 13A20.ins
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: -1 Plot Offset: 33 mV

Sample #: 26934
Date : 4/12/96 05:54 AM
Time of Injection: 4/12/96 05:32 AM
Low Point : 33.01 mV High Point : 83.01 mV
Plot Scale: 50 mV



Sample Name : diesel 513mg/l
FileName : G:\GC11\CHB\2918003.raw
Method : GC11DUAL.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 34 mV

Sample #: 94ws8368 Page 1 of 1
Date : 10/28/94 12:02 PM
Time of Injection: 10/18/94 01:30 PM
Low Point : 33.72 mV High Point : 83.72 mV
Plot Scale: 50 mV

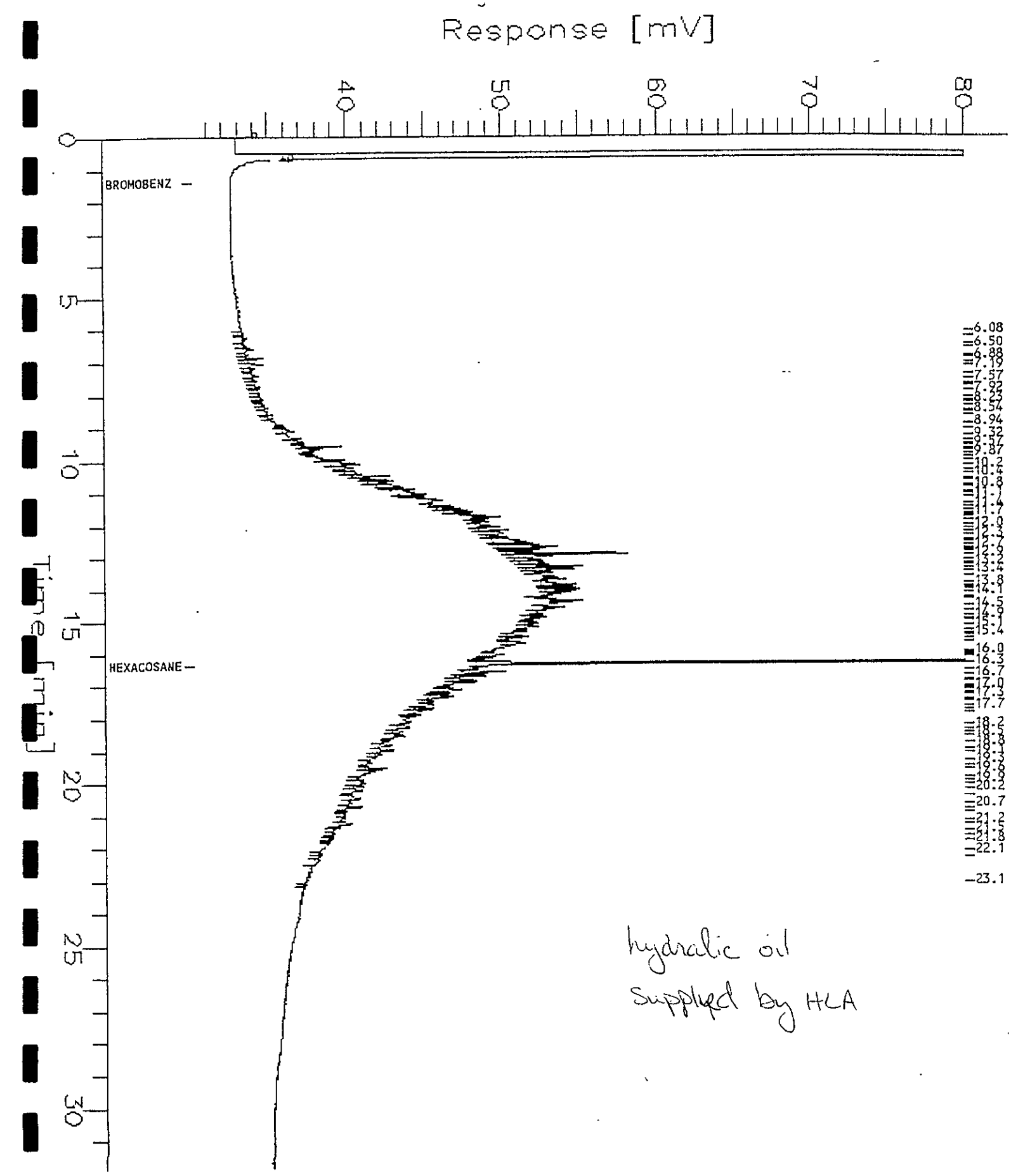


Diesel Standard
C12-C22

TEH Chromatogram GC11 CH A

Sample Name : Hyraulic oil 909mg/L
FileName : G:\GC11\CHA\026a027.raw
Method : GC11CHA.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 30 mV

Sample #: 94ws6652 Page 1 of 1
Date : 1/27/94 02:37 PM
Time of Injection: 1/27/94 09:06 AM
Low Point : 30.07 mV High Point : 80.07 mV
Plot Scale: 50 mV

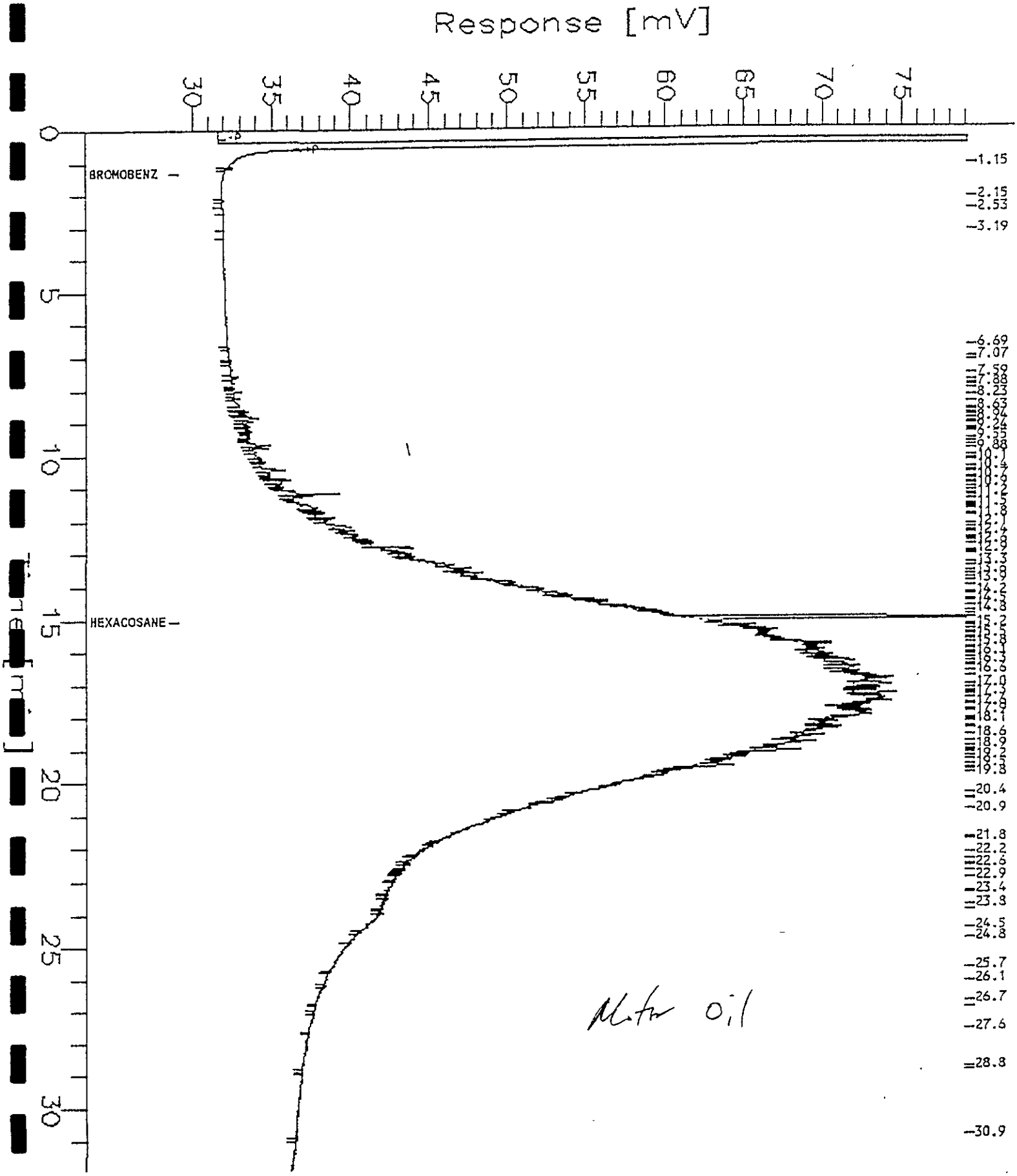


hydraulic oil
supplied by HLA

TEH Chromatogram GC15 CH A

Sample Name : MOTOR OIL 1250MG/L
FileName : g:\gc15\cha\139A036.raw
Method : TEH.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 29 mV

Sample #: 95WS0143 Page 1 of 1
Date : 5/21/95 3:46 PM
Time of Injection: 5/20/95 5:40 PM
Low Point : 29.10 mV High Point : 79.10 mV
Plot Scale: 50 mV



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Subsurface Consultants
171 12th Street
Suite 201
Oakland, CA 94608

Date: 17-APR-96
Lab Job Number: 125099
Project ID: 469.013
Location: College of Alameda/Hoist

Reviewed by: _____

Reviewed by: _____

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: LUFT

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
125099-001	H-1 @ 5.0	26907	04/01/96	04/09/96	04/11/96	
125099-002	H-2 @ 5.0	26907	04/01/96	04/09/96	04/11/96	
125099-003	H-3 @ 5.5	26907	04/01/96	04/09/96	04/11/96	
125099-004	H-4 @ 6.0	26907	04/01/96	04/09/96	04/11/96	

Analyte	Units	125099-001	125099-002	125099-003	125099-004
Diln Fac:		1	1	1	1
Diesel Range	mg/Kg	110 YH	12 YH	160 YH	20 YH
Motor Oil C22-C50	mg/Kg	290 Y	73 Y	380 Y	82 Y
Surrogate					
Hexacosane	%REC	87	85	107	80

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: LUFT

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
125099-005	H-5 @ 4.5	26907	04/01/96	04/09/96	04/11/96	
125099-006	H-6 @ 5.0	26907	04/01/96	04/09/96	04/11/96	

Analyte	Units	125099-005	125099-006
Diln Fac:		1	1
Diesel Range	mg/Kg	22 YH	56 YH
Motor Oil C22-C50	mg/Kg	100 Y	190 Y
Surrogate			
Hexacosane	%REC	89	82

Y: Sample exhibits fuel pattern which does not resemble standard
H: Heavier hydrocarbons than indicated standard

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
125099-007	H-1	26903	04/01/96	04/09/96	04/12/96	
125099-008	H-2	26903	04/01/96	04/09/96	04/12/96	
125099-009	H-3	26903	04/01/96	04/09/96	04/12/96	
125099-010	H-4	26903	04/01/96	04/09/96	04/12/96	

Analyte Diln Fac:	Units	125099-007 1	125099-008 1	125099-009 1	125099-010 1
Diesel Range	ug/L	1700 YZ	1100 YZ	1300 YZ	320 YZ
Motor Oil C22-C50	ug/L	5900 YH	<300	<300	<300
Surrogate					
Hexacosane	%REC	115	129	128	118

Y: Sample exhibits fuel pattern which does not resemble standard
Z: Sample exhibits unknown single peak or peaks
H: Heavier hydrocarbons than indicated standard

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
125099-011	H-5	26903	04/01/96	04/09/96	04/12/96	
125099-012	H-6	26903	04/01/96	04/09/96	04/12/96	

Analyte	Units	125099-011	125099-012
Diln Fac:		1	1
Diesel Range	ug/L	370 YZ	680 YZ
Motor Oil C22-C50	ug/L	<300	<300
Surrogate			
Hexacosane	%REC	121	124

Y: Sample exhibits fuel pattern which does not resemble standard
Z: Sample exhibits unknown single peak or peaks
H: Heavier hydrocarbons than indicated standard

Curtis & Tompkins, Ltd.

Lab #: 125099

BATCH QC REPORT

TEH-Tot Ext Hydrocarbons	
Client: Subsurface Consultants	Analysis Method: CA LUFT (EPA 8015M)
Project#: 469.013	Prep Method: LUFT
Location: College of Alameda/Hoist	

METHOD BLANK

Matrix: Soil	Prep Date: 04/09/96
Batch#: 26907	Analysis Date: 04/10/96
Units: mg/Kg	
Diln Fac: 1	

MB Lab ID: QC18948

Analyte	Result	
Diesel Range	<1.0	
Motor Oil C22-C50	<25	
Surrogate	**%Rec**	**Recovery Limits**
Hexacosane	101	60-140

Curtis & Tompkins, Ltd.

Lab #: 125099 BATCH QC REPORT

TEH-Tot Ext Hydrocarbons	
Client: Subsurface Consultants	Analysis Method: CA LUFT (EPA 8015M)
Project#: 469.013	Prep Method: EPA 3520
Location: College of Alameda/Hoist	

METHOD BLANK	
Matrix: Water	Prep Date: 04/09/96
Batch#: 26903	Analysis Date: 04/12/96
Units: ug/L	
Diln Fac: 1	

MB Lab ID: QC18930

Analyte	Result	
Diesel Range	<50	
Motor Oil C22-C50	<300	
Surrogate	**%Rec**	**Recovery Limits**
Hexacosane	120	60-140

Curtis & Tompkins, Ltd

Lab #: 125099

BATCH QC REPORT

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 26903
Units: ug/L
Diln Fac: 1

Prep Date: 04/09/96
Analysis Date: 04/12/96

BS Lab ID: QC18931

Analyte	Spike Added	BS	%Rec #	Limits
Diesel Range	2475	2847	115	60-140
Surrogate	%Rec	Limits		
Hexacosane	120	60-140		

BSD Lab ID: QC18932

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Diesel Range	2475	2968	120	60-140	4	<35
Surrogate	%Rec	Limits				
Hexacosane	118	60-140				

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: LUFT

LABORATORY CONTROL SAMPLE

Matrix: Soil
Batch#: 26907
Units: mg/Kg
Diln Fac: 1

Prep Date: 04/09/96
Analysis Date: 04/10/96

LCS Lab ID: QC18949

Analyte	Result	Spike Added	%Rec #	Limits
Diesel Range	45.5	49.5	91	60-140
Surrogate	%Rec	Limits		
Hexacosane	91	60-140		

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

Curtis & Tompkins, Ltd.

Lab #: 125099 BATCH QC REPORT

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: CA LUFT (EPA 8015M)
Prep Method: LUFT

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: ZZZZZZ
Lab ID: 125065-007
Matrix: Soil
Batch#: 26907
Units: mg/Kg dry weight
Diln Fac: 1

Sample Date: 04/02/96
Received Date: 04/03/96
Prep Date: 04/09/96
Analysis Date: 04/11/96
Moisture: 20%

MS Lab ID: QC18950

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Diesel Range	61.88	<1.250	61	99	60-140
Surrogate	%Rec	Limits			
Hexacosane	90	60-140			

MSD Lab ID: QC18951

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Diesel Range	61.88	60.13	90	60-140	1	<30
Surrogate	%Rec	Limits				
Hexacosane	90	60-140				

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 125099

Project Name: College of Alameda/Hoist
Project Number: 469.013

Report Date: 16 April 96

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD: SMWW 17:5520BF**

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
125099-009	H-3	Water	01-APR-96	05-APR-96	10-APR-96	ND	mg/L	9	DLP	26922
125099-010	H-4	Water	01-APR-96	05-APR-96	10-APR-96	ND	mg/L	11	DLP	26922
125099-011	H-5	Water	01-APR-96	05-APR-96	10-APR-96	ND	mg/L	11	DLP	26922
125099-012	H-6	Water	01-APR-96	05-APR-96	10-APR-96	ND	mg/L	10	DLP	26922

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

Q C B a t c h R e p o r t

Client: Subsurface Consultants
Project Name: College of Alameda/Hoist
Project Number: 469.013

Laboratory Login Number: 125099
Report Date: 17 April 96

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 26922

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
MB	ND	5	mg/L	SMWW 17:5520BF	10-APR-96

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	84%	SMWW 17:5520BF	10-APR-96
BSD	81%	SMWW 17:5520BF	10-APR-96

		Control Limits
Average Spike Recovery	82%	80% - 120%
Relative Percent Difference	%	< 20%

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 125099

Project Name: College of Alameda/Hoist
Project Number: 469.013

Report Date: 16 April 96

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD: SMWW 17:5520EF**

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
125099-001	H-1 @ 5.0	Soil	01-APR-96	05-APR-96	11-APR-96	ND	mg/Kg	50	DLP	26954
125099-002	H-2 @ 5.0	Soil	01-APR-96	05-APR-96	11-APR-96	ND	mg/Kg	50	DLP	26954
125099-003	H-3 @ 5.5	Soil	01-APR-96	05-APR-96	11-APR-96	ND	mg/Kg	50	DLP	26954
125099-004	H-4 @ 6.0	Soil	01-APR-96	05-APR-96	11-APR-96	ND	mg/Kg	50	DLP	26954
125099-005	H-5 @ 4.5	Soil	01-APR-96	05-APR-96	11-APR-96	ND	mg/Kg	50	DLP	26954
125099-006	H-6 @ 5.0	Soil	01-APR-96	05-APR-96	11-APR-96	ND	mg/Kg	50	DLP	26954

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

Q C B a t c h R e p o r t

Client: Subsurface Consultants
Project Name: College of Alameda/Hoist
Project Number: 469.013

Laboratory Login Number: 125099
Report Date: 16 April 96

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 26954**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
MB	ND	50	mg/Kg	SMWW 17:5520EF	11-APR-96

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	88%	SMWW 17:5520EF	11-APR-96
BSD	97%	SMWW 17:5520EF	11-APR-96

		Control Limits
Average Spike Recovery	92%	80% - 120%
Relative Percent Difference	9.9%	< 20%

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: EPA 8270
Prep Method: EPA 3520

Field ID: H-1
Lab ID: 125099-007
Matrix: Water
Batch#: 26843
Units: ug/L
Diln Fac: 1

Sampled: 04/01/96
Received: 04/05/96
Extracted: 04/05/96
Analyzed: 04/13/96

Analyte	Result	Reporting Limit
Naphthalene	ND	9.4
Acenaphthylene	ND	9.4
Acenaphthene	ND	9.4
Fluorene	ND	9.4
Phenanthrene	ND	9.4
Anthracene	ND	9.4
Fluoranthene	ND	9.4
Pyrene	4.8 J	9.4
Benzo(a)anthracene	ND	9.4
Chrysene	ND	9.4
Benzo(b)fluoranthene	ND	9.4
Benzo(k)fluoranthene	ND	9.4
Benzo(a)pyrene	ND	9.4
Indeno(1,2,3-cd)pyrene	ND	9.4
Dibenz(a,h)anthracene	ND	9.4
Benzo(g,h,i)perylene	ND	9.4

Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	22*	35-114
2-Fluorobiphenyl	8*	43-116
Terphenyl-d14	4*	33-141

J: Estimated Value
* Values outside of QC limits

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: EPA 8270
Prep Method: EPA 3520

Field ID: H-2
Lab ID: 125099-008
Matrix: Water
Batch#: 26843
Units: ug/L
Diln Fac: 1

Sampled: 04/01/96
Received: 04/05/96
Extracted: 04/05/96
Analyzed: 04/15/96

Analyte	Result	Reporting Limit
Naphthalene	ND	10
Acenaphthylene	ND	10
Acenaphthene	ND	10
Fluorene	ND	10
Phenanthrene	ND	10
Anthracene	ND	10
Fluoranthene	ND	10
Pyrene	ND	10
Benzo(a)anthracene	ND	10
Chrysene	ND	10
Benzo(b)fluoranthene	ND	10
Benzo(k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenz(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	85	35-114
2-Fluorobiphenyl	38*	43-116
Terphenyl-d14	12*	33-141

* Values outside of QC limits

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants	Analysis Method: EPA 8270
Project#: 469.013	Prep Method: EPA 3520
Location: College of Alameda/Hoist	

Field ID: H-6	Sampled: 04/01/96
Lab ID: 125099-012	Received: 04/05/96
Matrix: Water	Extracted: 04/05/96
Batch#: 26843	Analyzed: 04/15/96
Units: ug/L	
Diln Fac: 1	

Analyte	Result	Reporting Limit
Naphthalene	ND	10
Acenaphthylene	ND	10
Acenaphthene	ND	10
Fluorene	ND	10
Phenanthrene	ND	10
Anthracene	ND	10
Fluoranthene	ND	10
Pyrene	ND	10
Benzo(a)anthracene	ND	10
Chrysene	ND	10
Benzo(b)fluoranthene	ND	10
Benzo(k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenz(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

Surrogate	%Recovery	Recovery Limits
Nitrobenzene-d5	89	35-114
2-Fluorobiphenyl	64	43-116
Terphenyl-d14	25*	33-141

* Values outside of QC limits

Curtis & Tompkins, Ltd.

Lab #: 125099 BATCH QC REPORT

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: EPA 8270
Prep Method: EPA 3520

METHOD BLANK

Matrix: Water
Batch#: 26843
Units: ug/L
Diln Fac: 1

Prep Date: 04/05/96
Analysis Date: 04/08/96

MB Lab ID: QC18695

Analyte	Result	Reporting Limit
Naphthalene	ND	10
Acenaphthylene	ND	10
Acenaphthene	ND	10
Fluorene	ND	10
Phenanthrene	ND	10
Anthracene	ND	10
Fluoranthene	ND	10
Pyrene	ND	10
Benzo(a)anthracene	ND	10
Chrysene	ND	10
Benzo(b)fluoranthene	ND	10
Benzo(k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenz(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

Surrogate	%Rec	Recovery Limits
Nitrobenzene-d5	79	35-114
2-Fluorobiphenyl	81	43-116
Terphenyl-d14	86	33-141

Curtis & Tompkins, Ltd.

Lab #: 125099 BATCH QC REPORT

Polynuclear Aromatic Hydrocarbons by GC/MS

Client: Subsurface Consultants
Project#: 469.013
Location: College of Alameda/Hoist

Analysis Method: EPA 8270
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 26843
Units: ug/L
Diln Fac: 1

Prep Date: 04/05/96
Analysis Date: 04/08/96

BS Lab ID: QC18696

Analyte	Spike Added	BS	%Rec #	Limits
Acenaphthene	50	22.84	91	46-118
Pyrene	50	16.66	67	26-127
Surrogate	**%Rec**	**Limits**		
Nitrobenzene-d5	97	35-114		
2-Fluorobiphenyl	93	43-116		
Terphenyl-d14	97	33-141		

BSD Lab ID: QC18697

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Acenaphthene	50	23.61	94	46-118	3	<31
Pyrene	50	17.08	68	26-127	1	<31
Surrogate	**%Rec**	**Limits**				
Nitrobenzene-d5	98	35-114				
2-Fluorobiphenyl	93	43-116				
Terphenyl-d14	97	33-141				

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 125099
CLIENT: SUBSURFACE CONSULTANTS
PROJECT#: 469.013
LOCATION: COLLEGE OF ALAMEDA/HOIST

DATE SAMPLED: 04/01/96
DATE RECEIVED: 04/05/96
DATE ANALYZED: 04/08/96
DATE REPORTED: 04/16/96

ANALYSIS: TOTAL DISSOVED SOLIDS
ANALYSIS METHOD: EPA 160.1

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
125099-009	H-3	9,730	mg/L	50
125099-010	H-4	33,100	mg/L	50
125099-011	H-5	35,400	mg/L	50
125099-012	H-6	28,900	mg/L	50
METHOD BLANK	N/A	ND	mg/L	50

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: MS/SAMPLE DUPLICATE OF SAMPLE 125099-012

RPD, %	2
RECOVERY, %	99

CURTIS & TOMPKINS, LTD. BERKELEY LOGIN CHANGE FORM

Reason for change: _____ Client Request: By:_____ Date/Time:_____ Initials:_____
_____ Login Review _____ Data Review

Current Lab ID	Previous Lab ID	Client ID	Matrix	Add/Cancel	Analysis	Duedate
1250 99 -007				cancel	TDS	
-008				cancel	TDS	

← can't do no sample

Curtis & Tompkins, Ltd.

CHAIN OF CUSTODY FORM

12509

PAGE 1 OF 2

PROJECT NAME: College of Alameda / Hoist Area
469.013

JOB NUMBER:

LAB: Curtis & Tompkins

PROJECT CONTACT: Jerome de Verrier

TURNAROUND: normal

SAMPLED BY: Chris O'Dea

REQUESTED BY: Jerome de Verrier

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX: WATER	SOIL	WASTE	AIR			CONTAINERS: VOA	LITER	PINT	TUBE	1/8 brass	METHOD PRESERVED: HCL	H_2SO_4	HNO_3	ICE	NONE	SAMPLING DATE: MONTH	DAY	YEAR	TIME	NOTES	ANALYSIS REQUESTED: TEH / incl. Motor Oil Range	O & G	TDS		PNA / 8100
-1	H-1 @ 5.0		X								X					X		04	01	96	1000		X	X			
-2	H-2 @ 5.0		↓								↓					↓		04	01	96	1100		X	X			
-3	H-3 @ 5.5																	04	01	96	1200		X	X			
-4	H-4 @ 6.0																	04	01	96	0100		X	X			
-5	H-5 @ 4.5																	04	01	96	0200		X	X			
-6	H-6 @ 5.0																	04	01	96	0300		X	X			
-7	H-1	X						2				0	1				1	04	01	96	0300	6	X		X[1]		X
-8	H-2	↓						↓				↓	↓				↓	04	01	96	0315		X		X[2]		X
-9	H-3																	04	01	96	0330		X	X	X		
-10	H-4																	04	01	96	0345		X	X	X		
-11	H-5											↓						04	01	96	0400		X	X	X		
-12	H-6	↓						3				1	↓				2	04	01	96	0415		X	X	X		X

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
Dean Alexander	4/5/96 11:30 a.m.		4.5.96 11:30
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME

COMMENTS & NOTES:

please use limited quantity

NOTE HOLDING TIME

*unable to do TDS Not sufficient S

Subsurface Consultants, Inc.

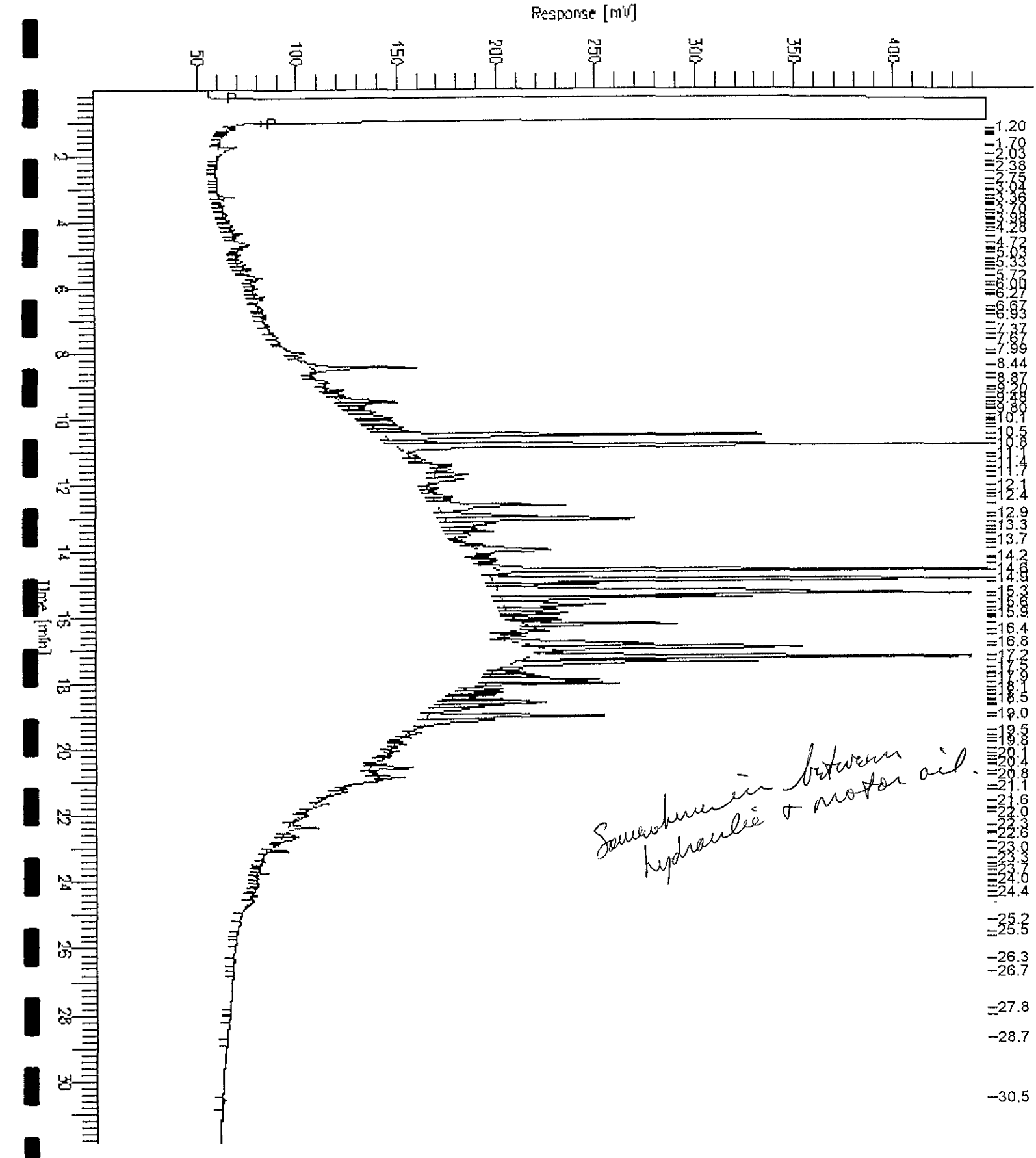
171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607

(510) 268-0461 • FAX: 510-268-0137

GC15 Channel A TEH

Sample Name : S,125099-001,26907
FileName : C:\GC15\CHB\1018044.RAW
Method : BTEHJ.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 43 mV

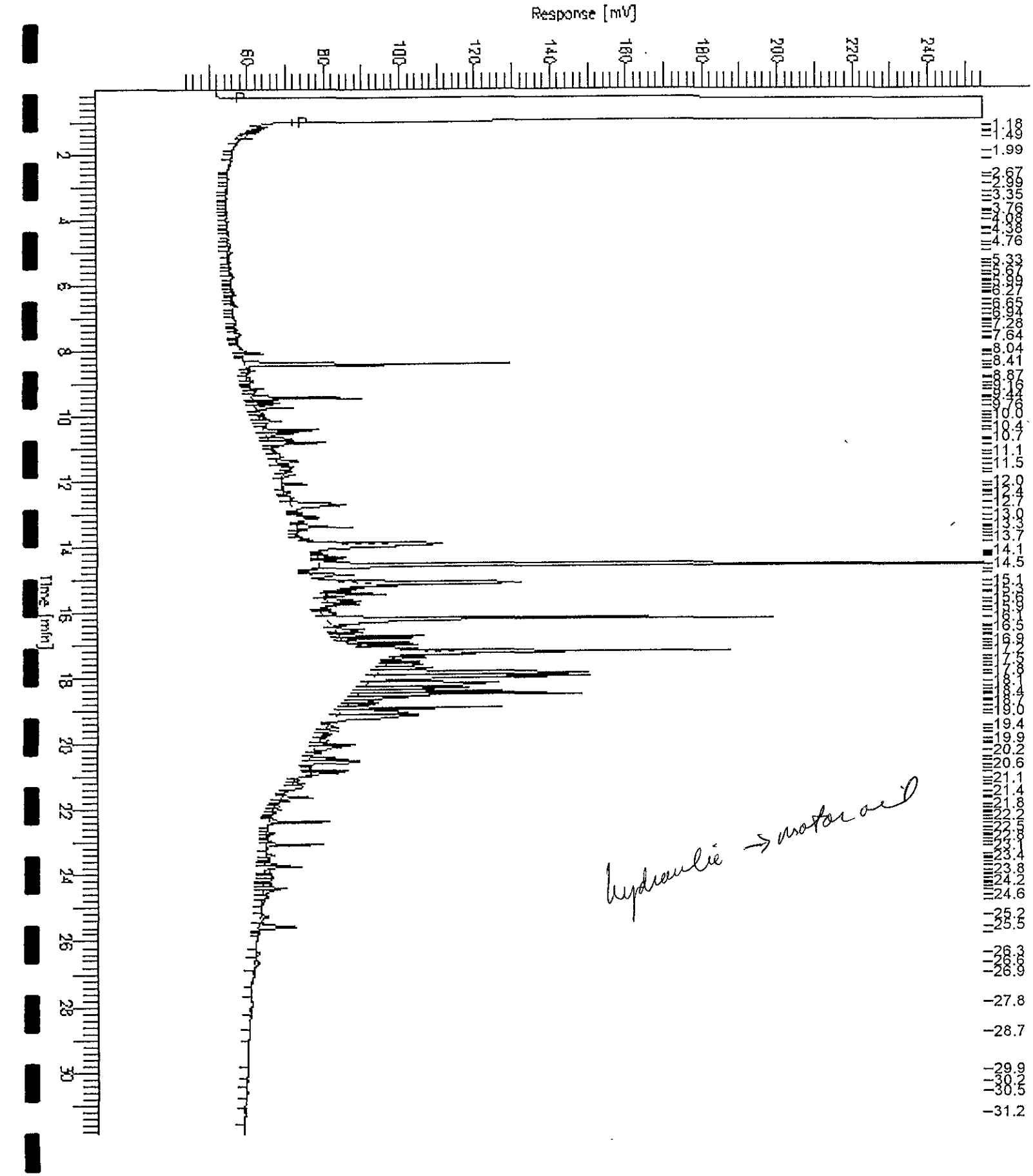
Sample #: 50:5 Page 1 of 1
Date : 4/12/96 11:06 AM
Time of Injection: 4/11/96 07:25 PM
Low Point : 43.11 mV High Point : 446.86 mV
Plot Scale: 403.8 mV



Somewhere between hydraulic + motor oil.

Sample Name : S,125099-002,26907
FileName : C:\GC15\CHB\101B028.RAW
Method : BTEHJ.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 44 mV

Sample #: 50:5 Page 1 of 1
Date : 4/12/96 01:33 PM
Time of Injection: 4/11/96 08:39 AM
Low Point : 43.56 mV High Point : 254.57 mV
Plot Scale: 211.0 mV

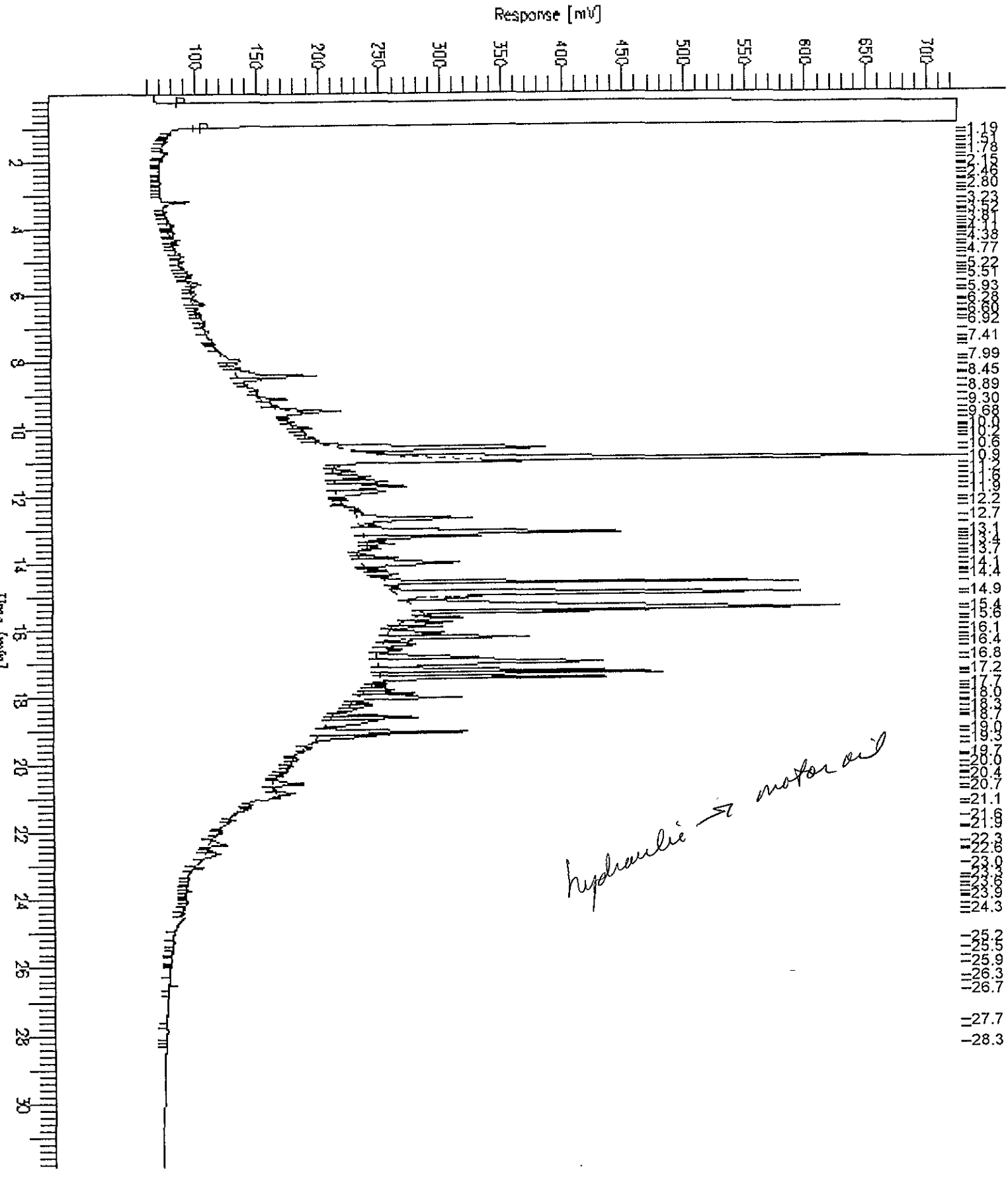


hydraulic → motor oil

GC15 Channel A TEH

Sample Name : S,125099-003,26907
FileName : C:\GC15\CHB\101B043.RAW
Method : BTEHJ.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 55 mV

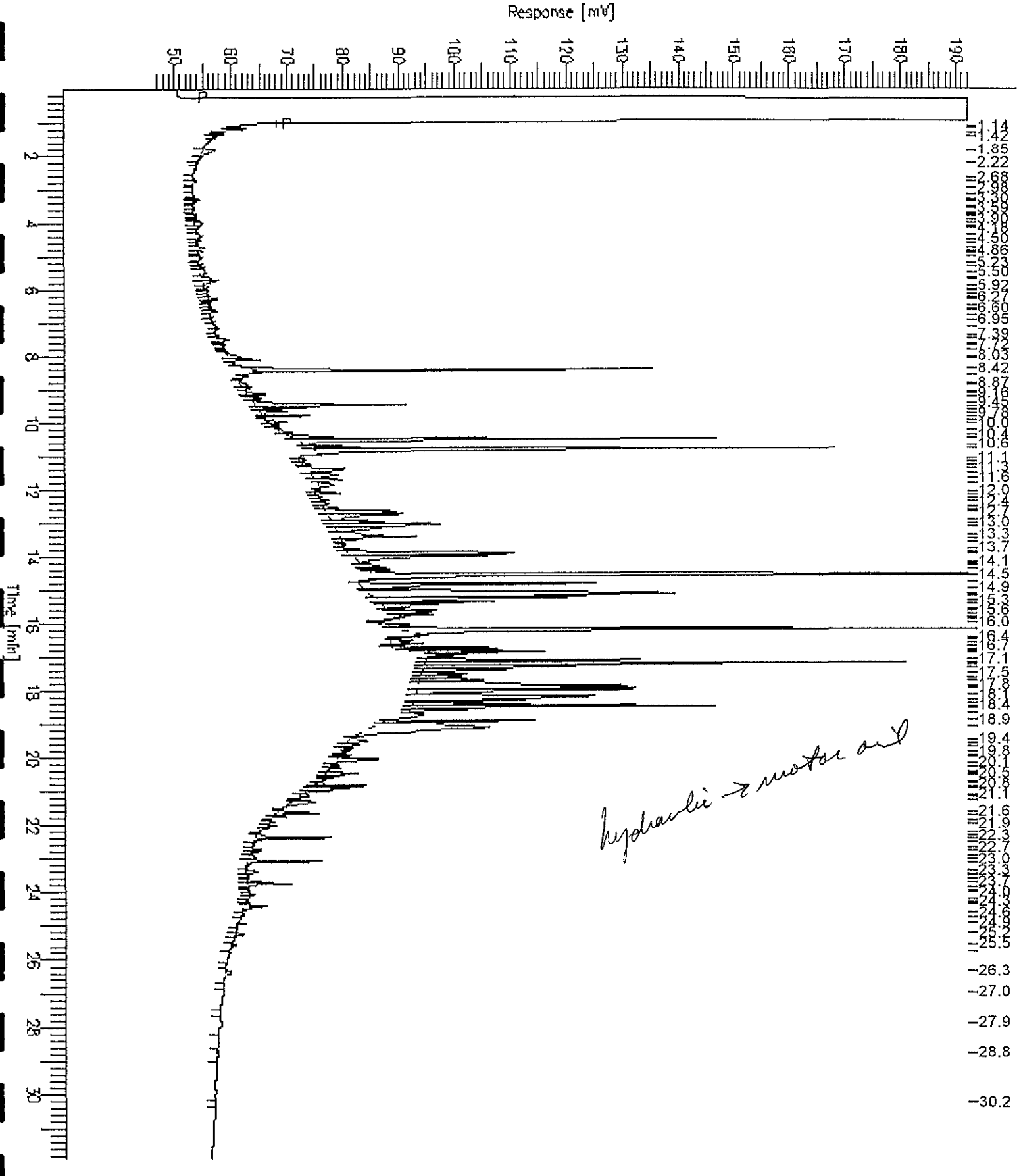
Sample #: 50:5
Date : 4/12/96 10:46 AM
Time of Injection: 4/11/96 06:40 PM
Low Point : 54.75 mV High Point : 725.41 mV
Plot Scale: 670.7 mV



GC15 Channel A TEH

Sample Name : S,125099-004,26907
FileName : C:\GC15\CHB\101B029.RAW
Method : BTEHJ.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 47 mV

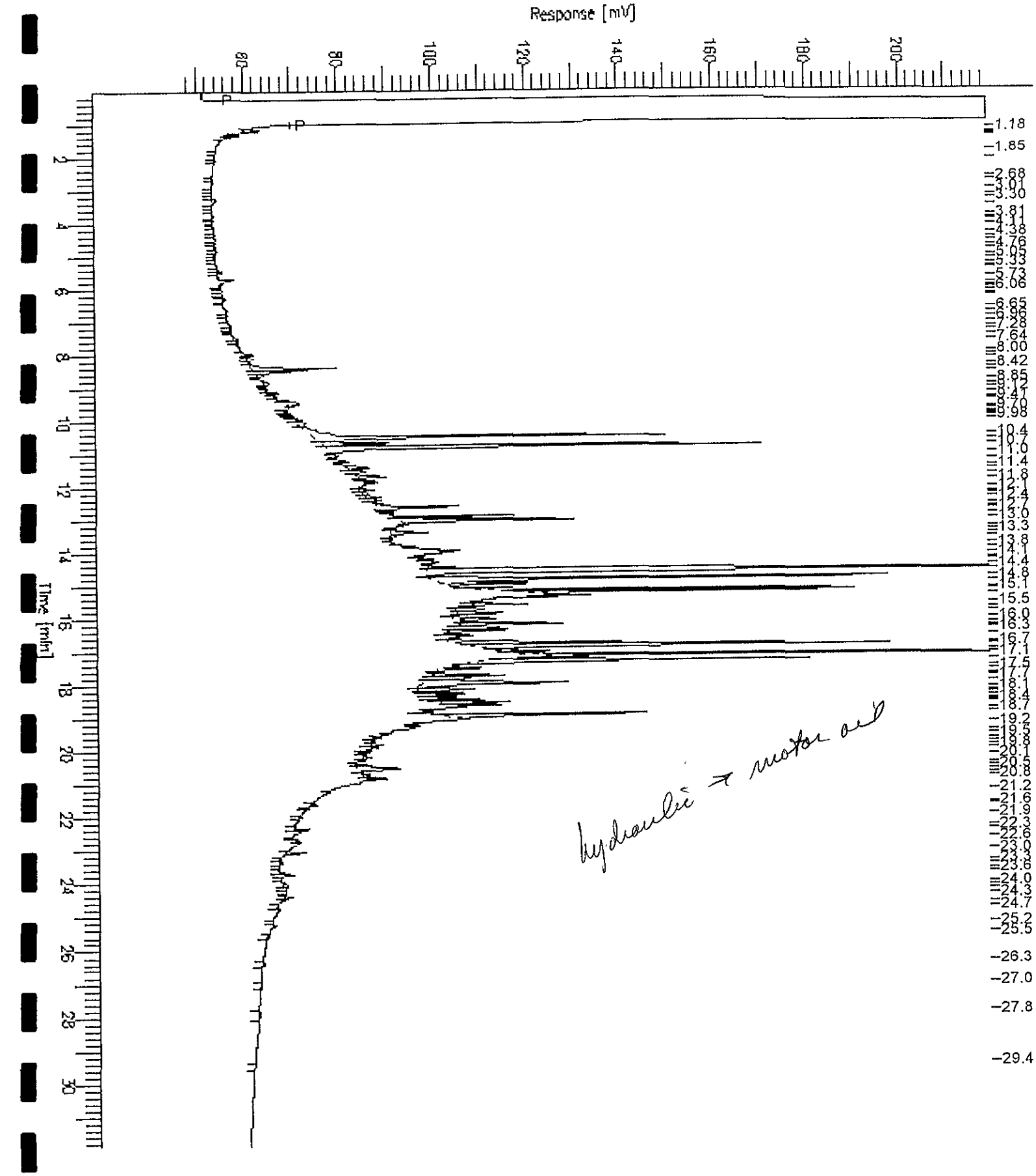
Sample #: 50:5 Page 1 of 1
Date : 4/12/96 01:37 PM
Time of Injection: 4/11/96 09:23 AM
Low Point : 46.56 mV High Point : 192.10 mV
Plot Scale: 145.5 mV



GC15 Channel A TEH

Sample Name : S,125099-005,26907
FileName : C:\GC15\CHB\101B027.RAW
Method : BTEHJ.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 47 mV

Sample #: 50:5 Page 1 of 1
Date : 4/12/96 01:38 PM
Time of Injection: 4/11/96 07:54 AM
Low Point : 47.18 mV High Point : 219.20 mV
Plot Scale: 172.0 mV



GC15 Channel A TEH

Sample #: 50.5 Page 1 of 1
Date : 4/11/96 10:53 AM
Time of Injection: 4/11/96 [illegible] AM
Low Point : 44.17 mV High Point : 305.06 mV
Plot Scale: 264.9 mV

End Time : 31.91 min
Plot Offset: 14 mV

Response [mV]

60 80 100 120 140 160 180 200 220 240 260 280 300

Time [min]

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

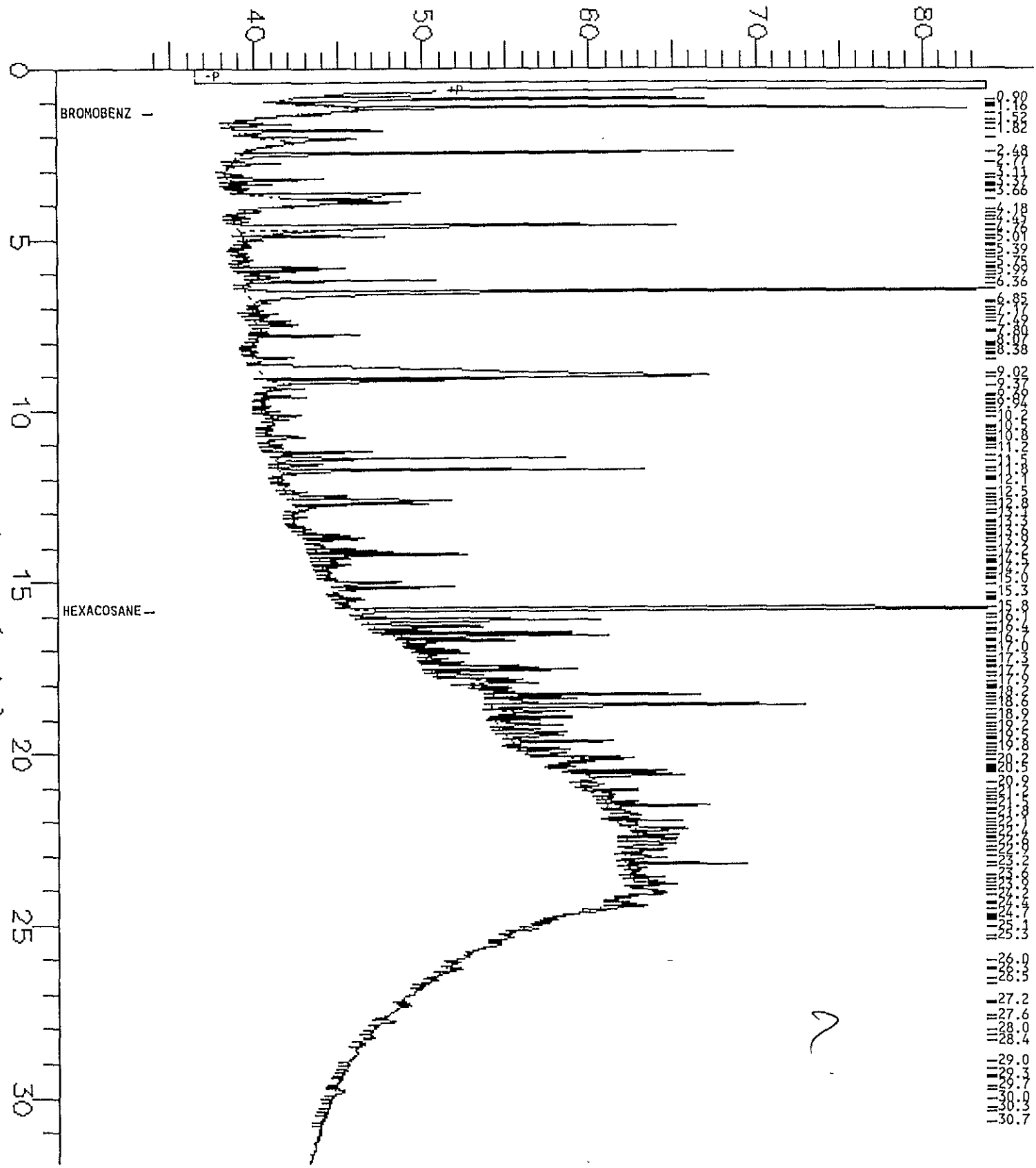
1.19
1.52
1.98
2.68
3.09
3.52
4.11
4.39
4.77
5.05
5.33
5.67
5.89
6.27
6.66
6.95
7.28
7.65
8.00
8.43
8.86
9.18
9.54
9.92
10.2
10.6
11.0
11.4
11.7
12.1
12.4
12.7
13.0
13.3
13.7
14.2
14.6
14.9
15.2
15.6
16.0
16.4
16.8
17.1
17.5
17.8
18.1
18.5
18.8
19.4
19.7
20.0
20.2
20.8
21.2
21.6
22.0
22.2
22.6
23.0
23.3
23.6
23.9
24.3
24.6
25.2
25.5
26.3
27.6
29.1

hydraulic → motor act

mple Name : 125099-007,500:2.5
leName : g:\gc11\chb\1018065.raw
Method : 11832.ins
Start Time : 0.00 min End Time : 31.92 min
cale Factor: -1 Plot Offset: 34 mV

Sample #: 26903 Page 1 of 1
Date : 4/12/96 08:54 AM
Time of Injection: 4/12/96 08:20 AM
Low Point : 33.89 mV High Point : 83.89 mV
Plot Scale: 50 mV

Sample H-1 water



TEH Chromatogram - GC-11 GH

Sample Name : 125099-008,500:2.5
FileName : g:\gc11\chb\101B063.raw
Method : 11B32.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 34 mV

Sample #: 26903
Date : 4/12/96 07:27 AM
Time of Injection: 4/12/96 06:54 AM
Low Point : 33.97 mV High Point : 83.97 mV
Plot Scale: 50 mV

Sample H-2 water

Response (mV)

BROMOBENZ

HEXACOSANE

Time (Min)

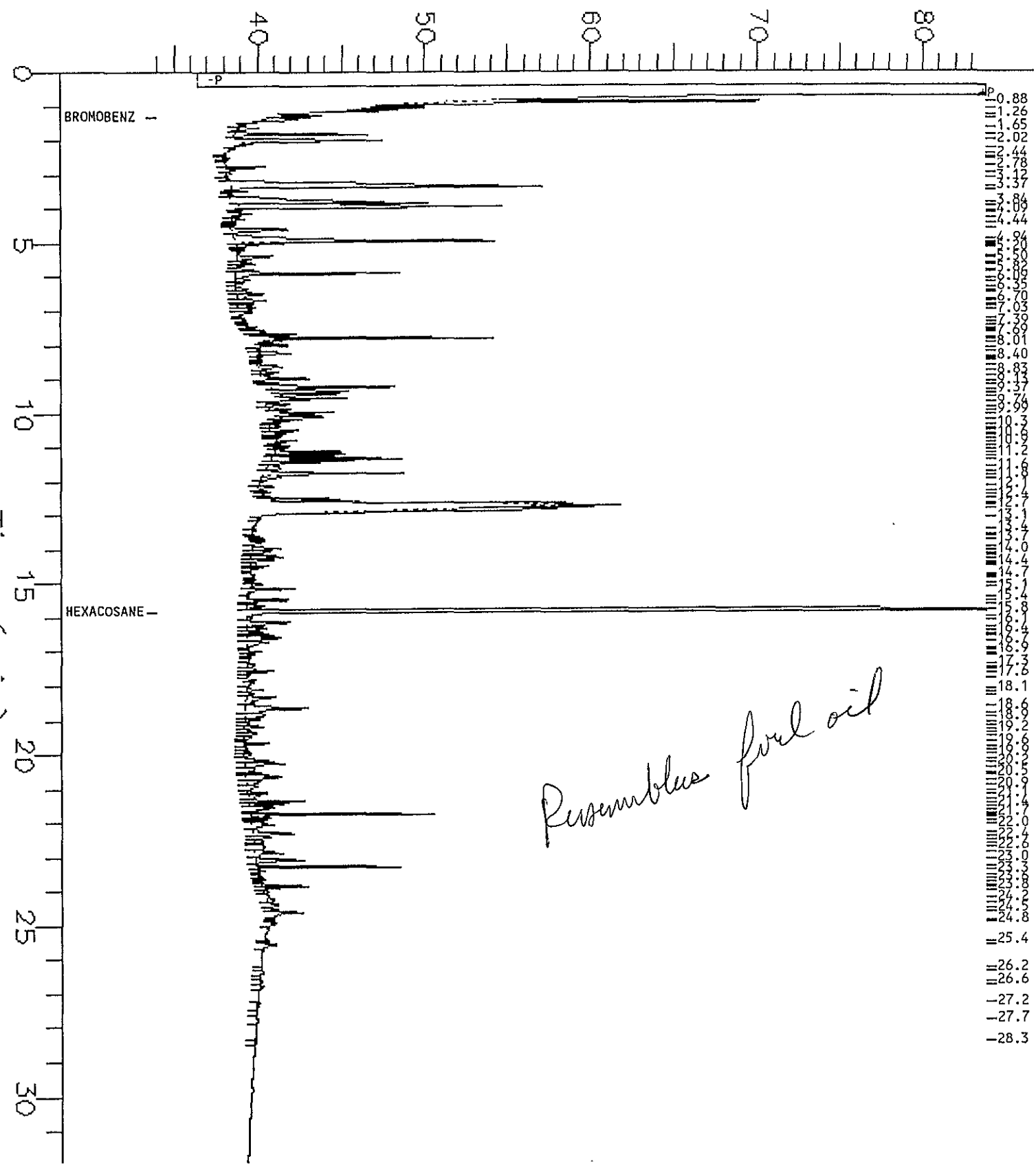
Resumbles fuel oil

mple Name : 125099-009,500:2.5
leName : g:\gc11\chb\1018064.raw
Method : 11832.ins
Start Time : 0.00 min End Time : 31.92 min
ale Factor: -1 Plot Offset: 34 mV

Sample #: 26903 Page 1 of 1
Date : 4/12/96 08:11 AM
Time of Injection: 4/12/96 07:37 AM
Low Point : 33.87 mV High Point : 83.87 mV
Plot Scale: 50 mV

Sample H-3
water

Response (mV)



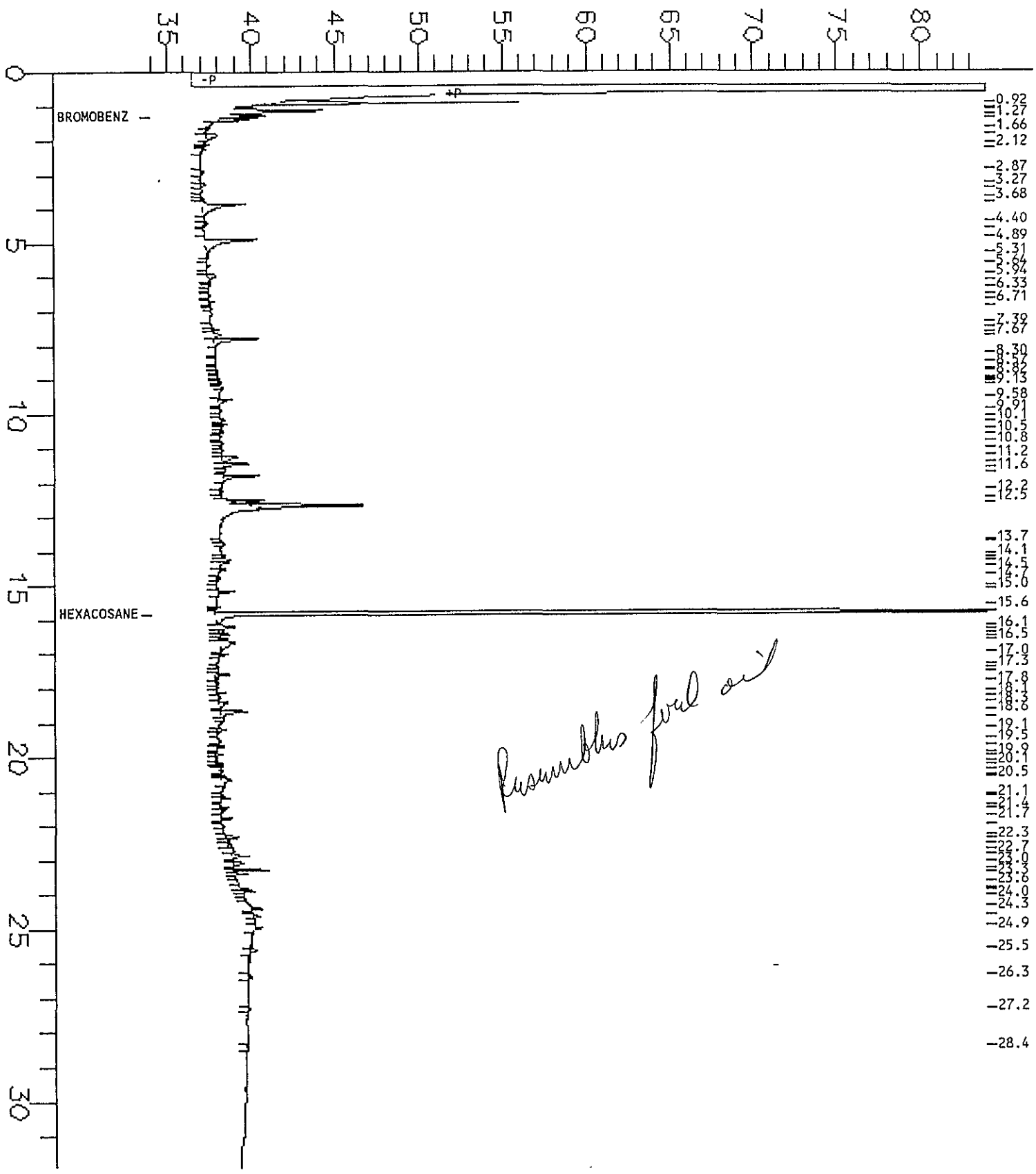
Resembles fuel oil

mple Name : 125099-010,500:2.5
leName : g:\gc11\chb\101B062.raw
Method : 11B32.ins
Start Time : 0.00 min End Time : 31.92 min
ale Factor: -1 Plot Offset: 34 mV

Sample #: 26903 Page 1 of 1
Date : 4/12/96 06:43 AM
Time of Injection: 4/12/96 06:10 AM
Low Point : 33.95 mV High Point : 83.95 mV
Plot Scale: 50 mV

Sample 11-4 water

Response (mV)



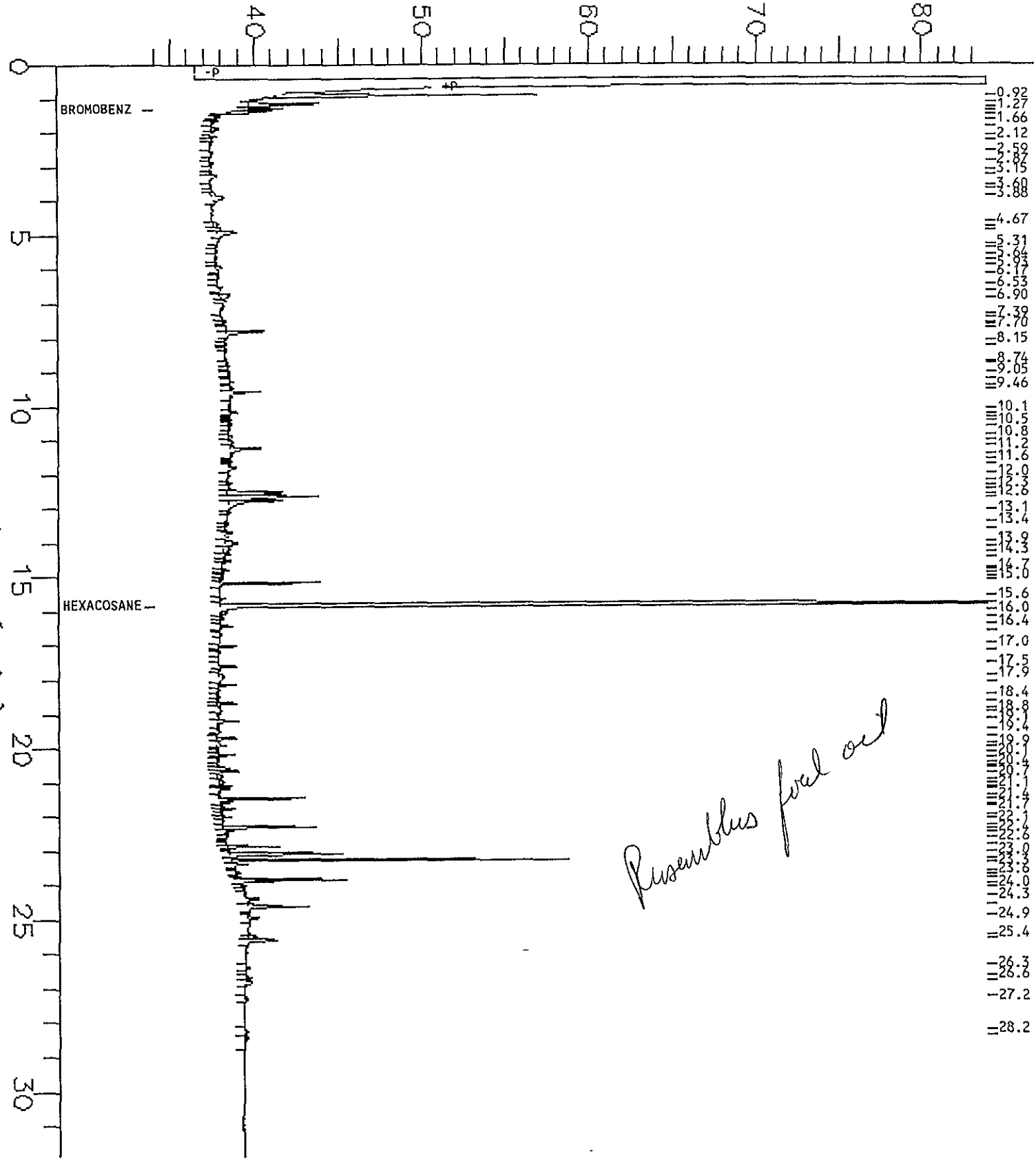
Resembles fuel oil

TEH Chromatogram - GC 11 Ch B

Sample Name : 125099-011,500:2.5
FileName : g:\gc11\chb\101B061.raw
Method : 11832.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 34 mV

Sample #: 26903
Date : 4/12/96 06:01 AM
Time of Injection: 4/12/96 05:27 AM
Low Point : 33.93 mV High Point : 83.93 mV
Plot Scale: 50 mV

Sample H-5 water



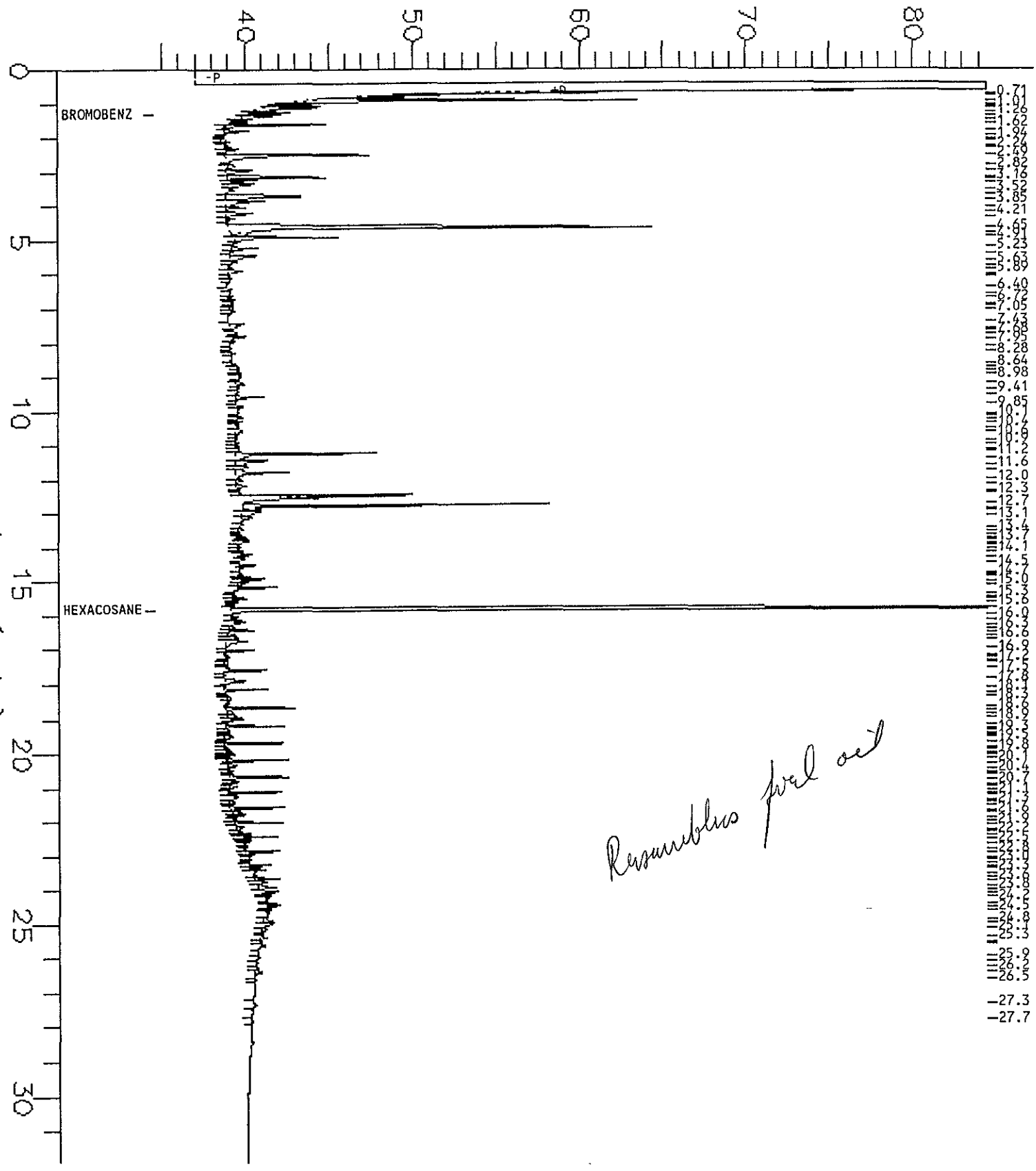
Resembles fuel oil

mple Name : 125099-012,500:2.5
leName : g:\gc11\chb\1018067.raw
Method : 11832.ins
Start Time : 0.00 min End Time : 31.92 min
ale Factor: -1 Plot Offset: 35 mV

Sample #: 26903
Date : 4/12/96 10:21 AM
Time of Injection: 4/12/96 09:47 AM
Low Point : 34.49 mV High Point : 84.49 mV
Plot Scale: 50 mV

Sample 11-6 water

Response (mV)



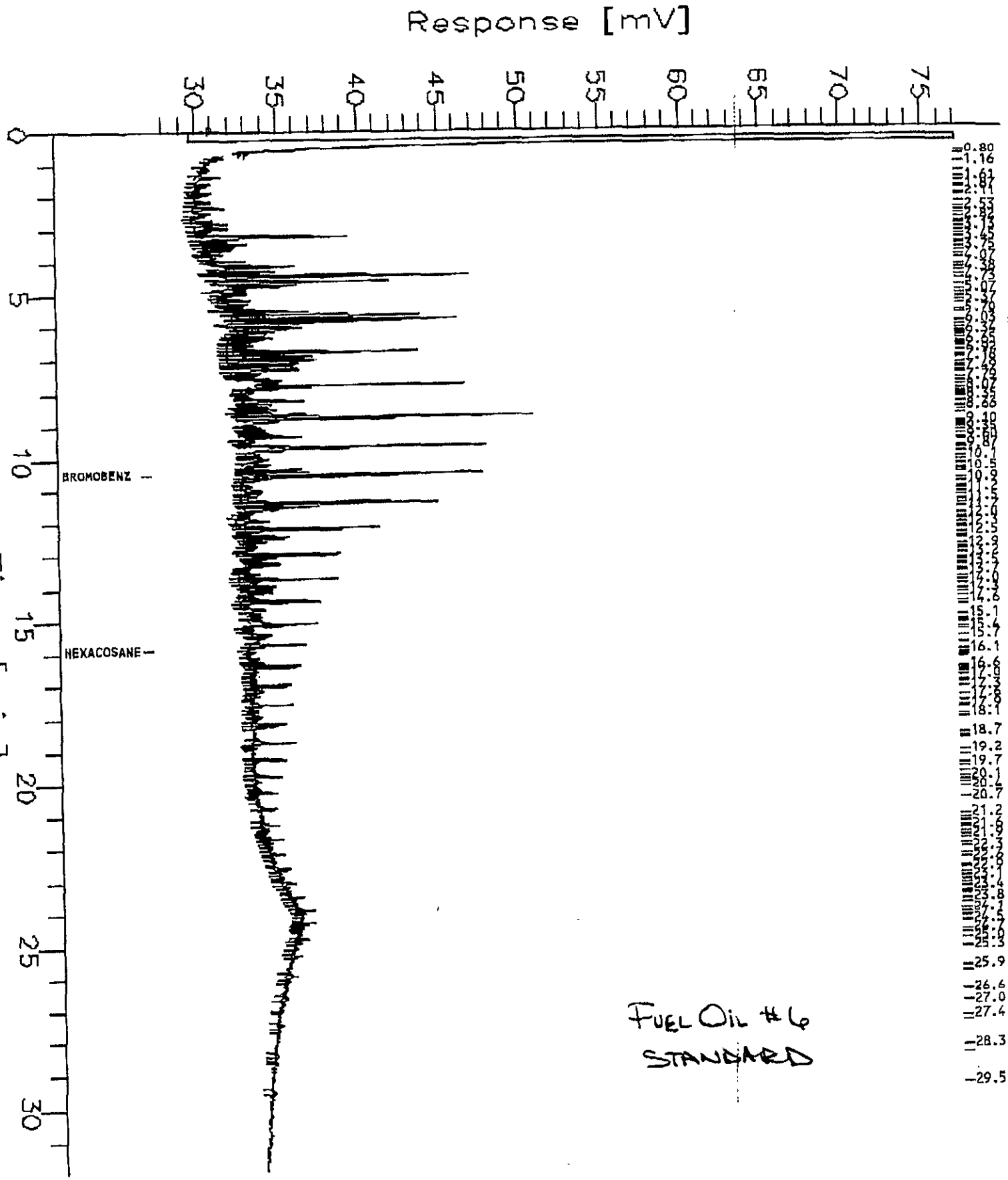
Resembles fuel oil

JUN 10 '93 16:09 TO SUBCONTRACT CONSULT FROM CURTIS & TOMPKINS

TEH Chromatogram GC11 CH A

Sample Name : fuel oil #6 1000 mg/L
FileName : g:\gc11\ch\140a027.raw
Method : GC11DB5.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 27 mV

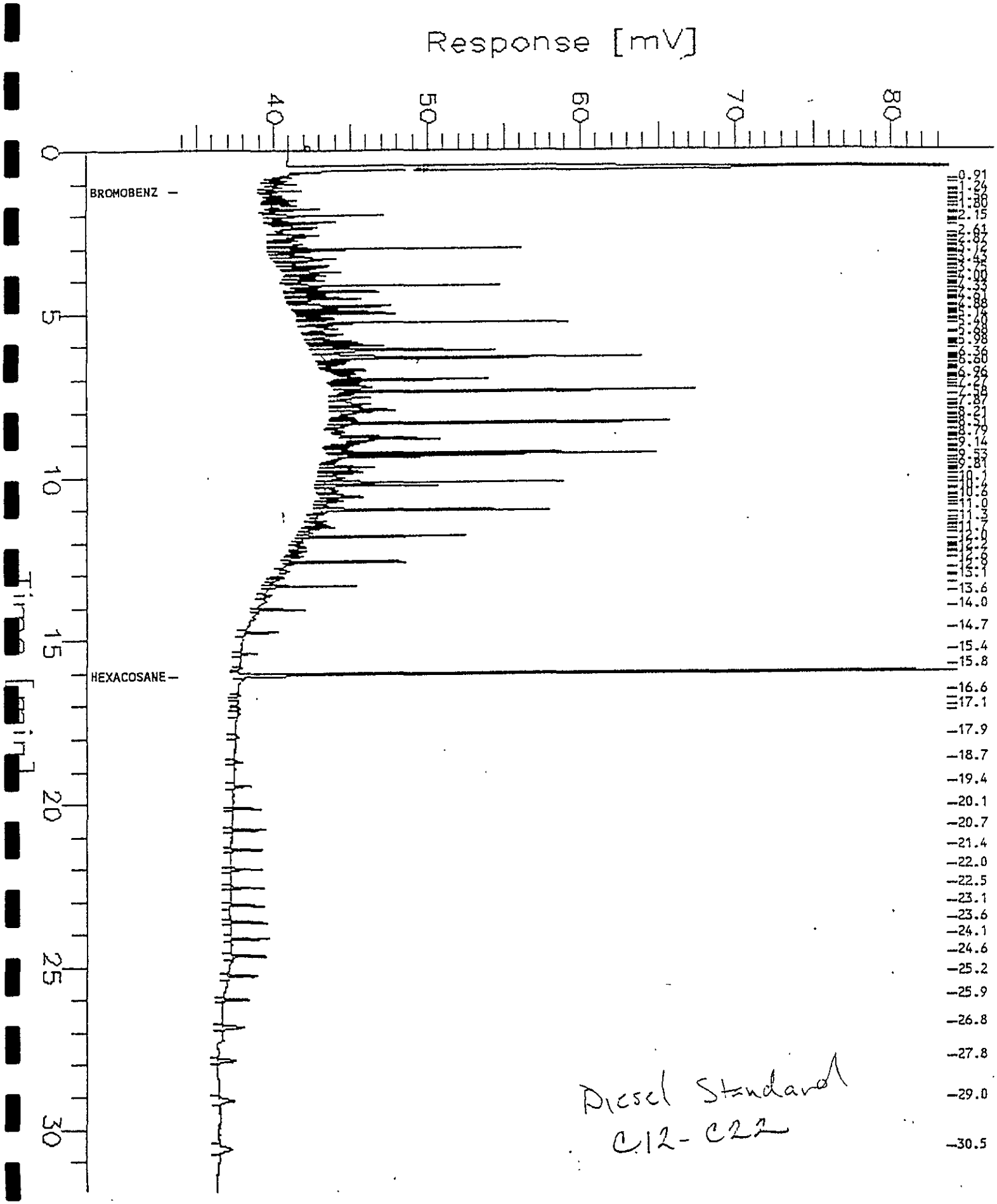
Sample #:
Date : 5/21/93 3:35 PM
Time of Injection: 5/21/93 3:01 PM
Low Point : 27.14 mV High Point : 77.14 mV
Plot Scale: 50 mV



FUEL OIL #6
STANDARD

Sample Name : diesel 513mg/l
FileName : G:\GC11\CHB\291B003.raw
Method : GC11DUAL.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 34 mV

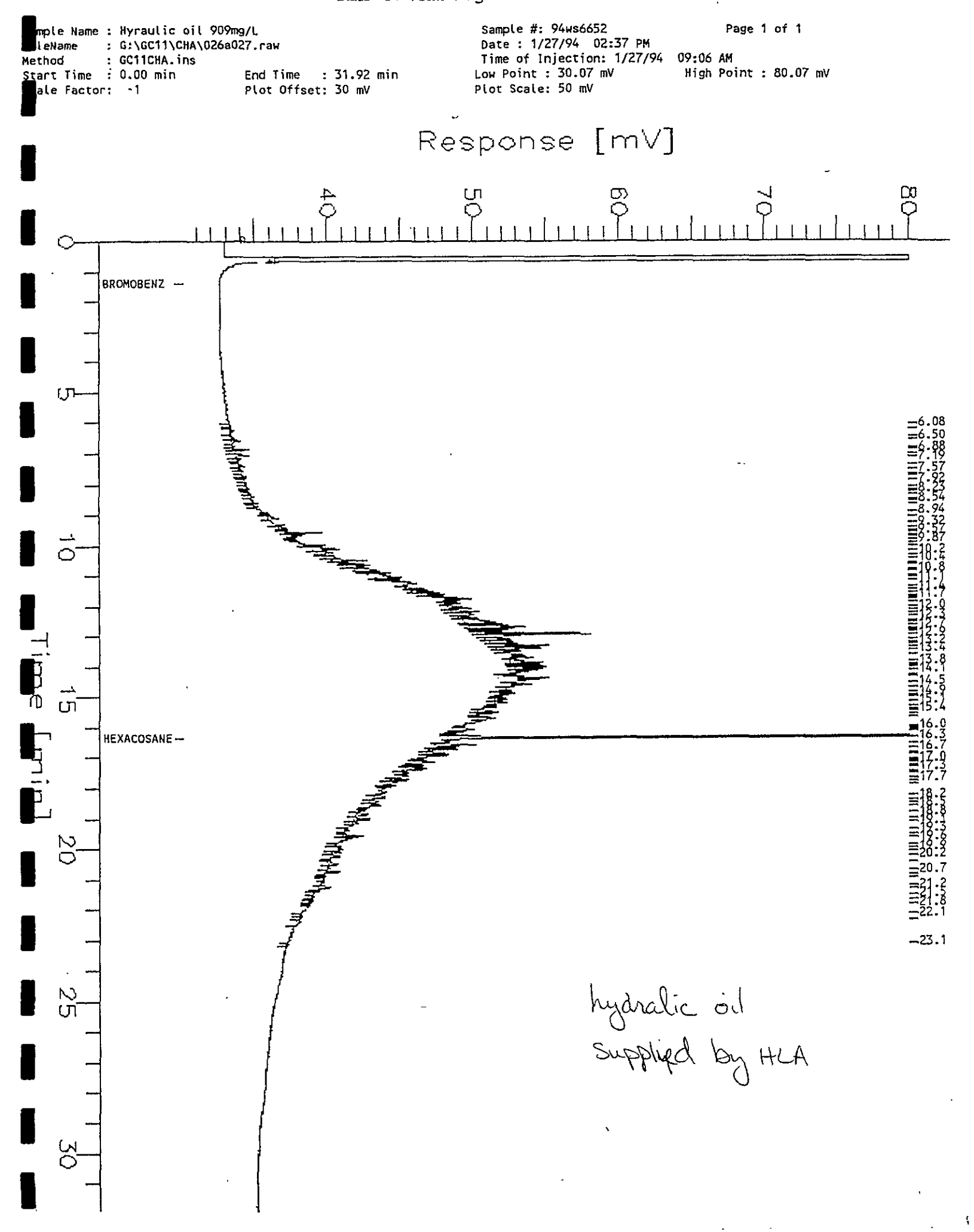
Sample #: 94ws8368 Page 1 of 1
Date : 10/28/94 12:02 PM
Time of Injection: 10/18/94 01:30 PM
Low Point : 33.72 mV High Point : 83.72 mV
Plot Scale: 50 mV



Diesel Standard
C12-C22

mple Name : Hyraulic oil 909mg/L
leName : G:\GC11\CHA\026a027.raw
Method : GC11CHA.ins
Start Time : 0.00 min End Time : 31.92 min
ale Factor: -1 Plot Offset: 30 mV

Sample #: 94ws6652 Page 1 of 1
Date : 1/27/94 02:37 PM
Time of Injection: 1/27/94 09:06 AM
Low Point : 30.07 mV High Point : 80.07 mV
Plot Scale: 50 mV

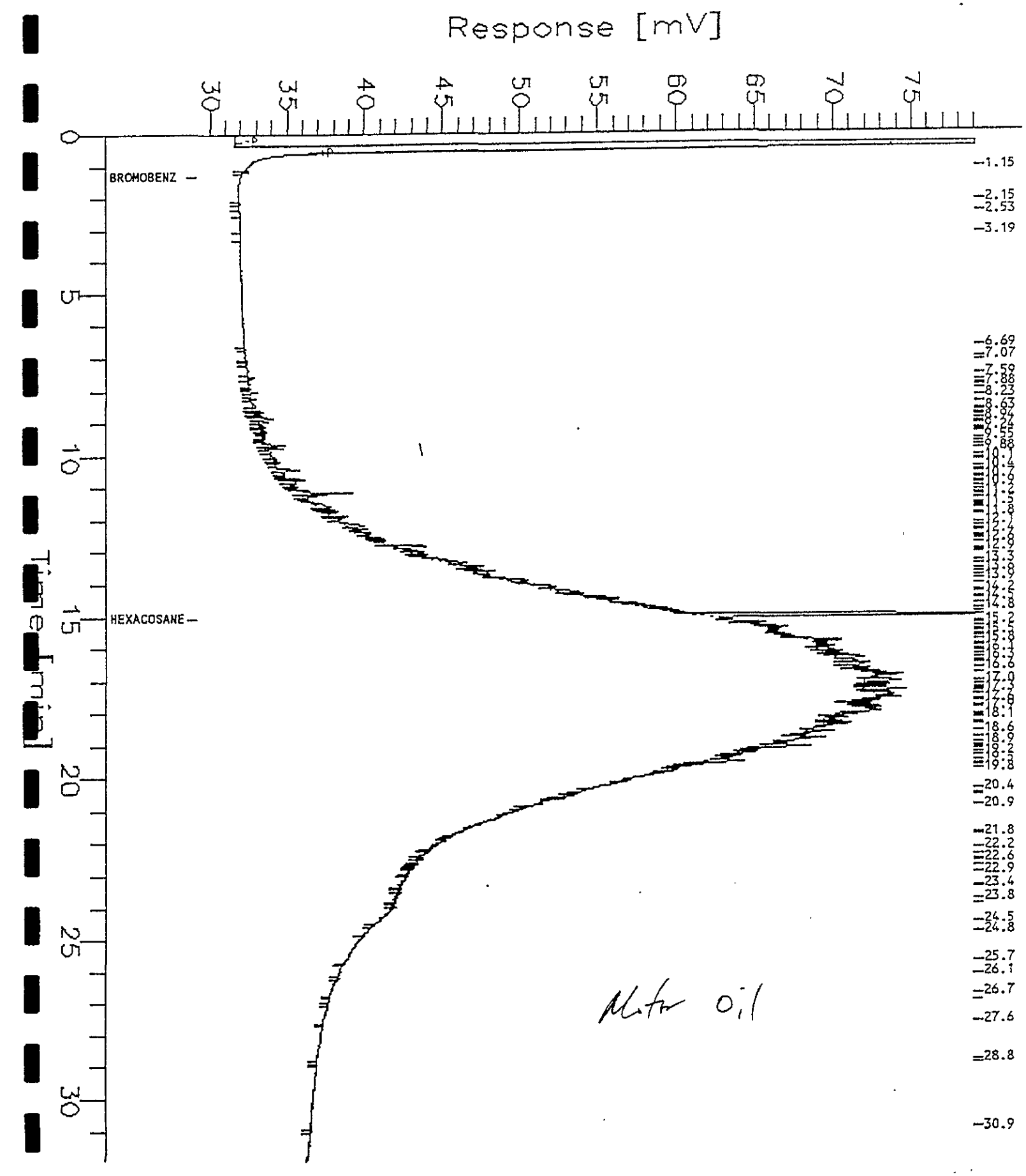


hydraulic oil
supplied by HLA

TEH Chromatogram GC15 CH A

Sample Name : MOTOR OIL 1250MG/L
FileName : g:\gc15\cha\139A036.raw
Method : TEH.ins
Start Time : 0.00 min End Time : 31.92 min
Scale Factor: -1 Plot Offset: 29 mV

Sample #: 95WS0143 Page 1 of 1
Date : 5/21/95 3:46 PM
Time of Injection: 5/20/95 5:40 PM
Low Point : 29.10 mV High Point : 79.10 mV
Plot Scale: 50 mV



WELL SAMPLING FORM

Project Name: College of Alameda Well Number: MW-1

Job No.: 469.009 Well Casing Diameter: 2 inch

Sampled By: CO Dea Date: 4/1/96

TOC Elevation: _____ Weather: Rain

Depth to Casing Bottom (below TOC) 12.00 feet

Depth to Groundwater (below TOC) 4.64 feet

Feet of Water in Well 5.36 ← INCORRECT BY COD 7.36 feet

Depth to Groundwater When 80% Recovered 6.11 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) .87 1.2 gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product rare

Purge Method bottom bailer

very slow recharge

FIELD MEASUREMENTS

D.O. = Opti

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	7.24	62.6	3540		
2	6.95	10.4	3780		
3					

Total Gallons Purged 0.3 gallons

Depth to Groundwater Before Sampling (below TOC) 7.5' on 4/5/96 @ 0730 feet

Sampling Method disposable bailer

Containers Used 1 ~~40~~ ml (100 ml poly) 3 liter _____ pint

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: MW-2

Job No.: 423.009 Well Casing Diameter: 2 inch

Sampled By: D. Drew Date: 4/1/96

TOC Elevation: _____ Weather: rain

Depth to Casing Bottom (below TOC) 10.00 feet

Depth to Groundwater (below TOC) 4.68 feet

Feet of Water in Well 5.32 feet

Depth to Groundwater When 80% Recovered 5.74 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) .87 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product none

Purge Method teflon bailer

FIELD MEASUREMENTS

D.O. = 1.4 ppm immediate pressure

Gallons Removed	pH ✓	Temp (°F) ✓	Conductivity (micromhos/cm)	Salinity S%	Comments
1	8.28	71.9	2600		semi clear/no odor
2	7.86	73.6	2300		↓
3	7.67	72.0	1800		

Total Gallons Purged 3 gallons

Depth to Groundwater Before Sampling (below TOC) 4.68 feet

Sampling Method disposable bailer

Containers Used 1 (~~40 ml~~ 100ml poly) | 3 liter | _____ pint

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: MW-3

Job No.: 469.009 Well Casing Diameter: 2 inch

Sampled By: [illegible] Date: 4/1/96

TOC Elevation: _____ Weather: Rain

Depth to Casing Bottom (below TOC) 15.00 feet

Depth to Groundwater (below TOC) 5.83 feet

Feet of Water in Well 9.17 feet

Depth to Groundwater When 80% Recovered 7.66 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.5 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product none

Purge Method teflon bailer

very slow recharge

FIELD MEASUREMENTS

D.O.: 0 ppm

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	6.34	65.8	4790		
2	6.39	64.3	5000 ✓		
3	6.43	64.1	5400		

Total Gallons Purged 3-4 gallons

Depth to Groundwater Before Sampling (below TOC) [illegible] @ 1:20 feet

Sampling Method teflon bailer

Containers Used 1 (~~40 ml~~ 100 ml) 3 liter _____ pint

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: City of Alameda Well Number: MW-4

Job No.: 7207.009 Well Casing Diameter: 2 inch

Sampled By: [illegible] Date: 4/5/96

TOC Elevation: _____ Weather: [illegible]

Depth to Casing Bottom (below TOC) 13.50 feet

Depth to Groundwater (below TOC) 4.58 feet

Feet of Water in Well 1.92 feet

Depth to Groundwater When 80% Recovered 6.36 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.5 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product none

Purge Method [illegible]

FIELD MEASUREMENTS

D.O.= 0?" slow recharge

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	7.2	58.2	3130		[illegible]
2	7.23	58.2	3130		[illegible]
3	[illegible]	[illegible]	[illegible]	✓	[illegible]
4	7.24	59.2	[illegible]		4.5 gals ?
5					

Total Gallons Purged 4.5 gallons

Depth to Groundwater Before Sampling (below TOC) 6.5' feet

Sampling Method disposable bailer

Containers Used 1 (~~40 ml~~ 1 liter) 3 liter _____ pint

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: Collins of Alameda Well Number: MW-5

Job No.: 469.009 Well Casing Diameter: 2 inch

Sampled By: CDiaz Date: 4/1/96

TOC Elevation: _____ Weather: Rain

Depth to Casing Bottom (below TOC) 13.50 feet

Depth to Groundwater (below TOC) 4.23 feet

Feet of Water in Well 9.27 feet

Depth to Groundwater When 80% Recovered 6.08 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.51 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product NSRA

Purge Method bailer

immediate recharge

FIELD MEASUREMENTS

D.O. = 3.0 ppm

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	7.53	68.5	3500		semi-clear/no odor
2	7.03	67.3	2740		
3	6.87	67.0	3440		
4	6.88	65.6	3300		
5	6.77	64.4	3270		

Total Gallons Purged 5 gallons

Depth to Groundwater Before Sampling (below TOC) 4.23 feet

Sampling Method disposable bailer

Containers Used 1 (~~40 ml~~ 100 ml) / 3 liter / _____ pint

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: H-1

Job No.: 469.013 Well Casing Diameter: 1 inch

Sampled By: CDM Date: 4/1/96

TOC Elevation: _____ Weather: Rain

Depth to Casing Bottom (below TOC) 16 feet

Depth to Groundwater (below TOC) measured 4/2 9.15 feet

Feet of Water in Well 6.85 feet

Depth to Groundwater When 80% Recovered _____ feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) .28 gallons

Depth Measurement Method (Tape & Paste) (Electronic Sounder) Other

Free Product none

Purge Method Stainless steel bailer (grab sample)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments

Total Gallons Purged .65 gallons

Depth to Groundwater Before Sampling (below TOC) _____ feet

Sampling Method Stainless steel bailer (after steam clean)

Containers Used _____ 40 ml 2 liter _____ pint

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: H-2

Job No.: 469.013 Well Casing Diameter: 1 inch

Sampled By: CO'Dea Date: 4/1-2/96

TOC Elevation: _____ Weather: (1) Rain, cloudy (2)

Depth to Casing Bottom (below TOC) 16 feet

Depth to Groundwater (below TOC) 10.92 feet

Feet of Water in Well 5.08 feet

Depth to Groundwater When 80% Recovered _____ feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) .21 gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product none

Purge Method teflon bailer (grab sample)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
Sampled dry 4/1					
Collected remaining sample 4/2					

Total Gallons Purged 2 liters gallons

Depth to Groundwater Before Sampling (below TOC) 10.92 feet

Sampling Method teflon bailer

Containers Used _____ (40 ml) 2 (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: H-3

Job No.: 469.013 Well Casing Diameter: 1 inch

Sampled By: CO'Dea Date: 4/1-2/96

TOC Elevation: _____ Weather: (1) Rain, clear (2)

Depth to Casing Bottom (below TOC) 16 feet

Depth to Groundwater (below TOC) 8.85 feet

Feet of Water in Well 7.15 feet

Depth to Groundwater When 80% Recovered _____ feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.29 gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product none

Purge Method teflon bailer (Grab sample)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
Sampled dry 4/1					
Collected remaining sample 4/2					

Total Gallons Purged 2 liters gallons

Depth to Groundwater Before Sampling (below TOC) 8.85 feet

Sampling Method teflon bailer

Containers Used _____ (40 ml) 2 (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: H-4

Job No.: 469.013 Well Casing Diameter: 1 inch

Sampled By: COD Date: 4/2/96

TOC Elevation: _____ Weather: Clear

Depth to Casing Bottom (below TOC) 16 feet

Depth to Groundwater (below TOC) 9.63 feet

Feet of Water in Well 6.37 feet

Depth to Groundwater When 80% Recovered _____ feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) .26 gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product none

Purge Method teflon bailer (grab sample)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments

Total Gallons Purged 2 liters gallons

Depth to Groundwater Before Sampling (below TOC) 9.63 feet

Sampling Method teflon bailer

Containers Used _____ 40 ml 2 liter _____ pint

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: H-5

Job No.: 469.013 Well Casing Diameter: 1 inch

Sampled By: COD Date: 4/2/96

TOC Elevation: _____ Weather: Clear

Depth to Casing Bottom (below TOC) 16 feet

Depth to Groundwater (below TOC) 8.55 feet

Feet of Water in Well 7.45 feet

Depth to Groundwater When 80% Recovered _____ feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) .30 gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product none

Purge Method teflon bailer (Grab Sample)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments

Total Gallons Purged 2 liters gallons

Depth to Groundwater Before Sampling (below TOC) 8.55 feet

Sampling Method teflon bailer

Containers Used _____ 40 ml 2 liter _____ pint

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: College of Alameda Well Number: H-6

Job No.: 469.013 Well Casing Diameter: 1 inch

Sampled By: COD / DA Date: 4/2/96

TOC Elevation: _____ Weather: Clear

Depth to Casing Bottom (below TOC) 16 feet

Depth to Groundwater (below TOC) 10.15 feet

Feet of Water in Well 5.85 feet

Depth to Groundwater When 80% Recovered _____ feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) .24 gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product none

Purge Method teflon bailer (grab sample)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
bailed & sampled			dry 4/2	no	significant
recharge.					
DA finished sampling 4/3					

Total Gallons Purged 2 liters gallons

Depth to Groundwater Before Sampling (below TOC) _____ feet

Sampling Method teflon bailer

Containers Used _____ (40 ml) 2 (liter) _____ (pint)

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE