BP OIL

BP Oil Company
16400 Southcenter Parkway, Suite 301
Tukwila, Washington 98188
(206) 575-4077

February 19, 1993

Alameda County Health Care Services Agency
Division of Hazardous Materials
Attention Mr. Brian Oliva
80 Swan Way, Room 200
Oakland, CA 94621

California Regional Water Quality Control Board
Attention Mr. Eddie So
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, CA 94612

RE: **BP Oil Site No. 11266**
1541 Park Street
Alameda, CA

Gentlemen:

Attached please find a report describing a recent groundwater monitoring efforts. Based on the results of this investigation, we will continue to obtain quarterly groundwater samples from RW-1, MW-1, and MW-6. Other monitoring wells will be sampled annually. Please give me a call in the event you wish to discuss this matter further. I can be reached at (206) 394-5243.

Sincerely,

Scott T. Hooton
Environmental Resources Management

attachment

cc: site file

GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11266
1541 Park Street
Alameda, California

Project No. 10-050

Prepared for:

BP Oil Company
Environmental Resource Management
16400 Southcenter Parkway, Suite 301
Tukwila, Washington

Prepared by:

Alisto Engineering Group
1000 Burnett Avenue, Suite 420
Concord, California

February 1, 1993

Brady Nagle
Project Manager

Al Sevilla, P.E.
Principal

GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11266
1541 Park Street
Alameda, California

Project No. 10-050

February 1, 1993

INTRODUCTION

This report presents the results and findings of the December 14, 1992 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11266, 1541 Park Street, Alameda, California. A site vicinity map is shown in Figure 1.

FIELD PROCEDURES

Field activities were performed in accordance with the procedures and guidelines of the California Regional Water Quality Control Board, San Francisco Bay Region, and the Alameda County Health Care Services Agency.

Before purging and sampling, the groundwater level in each well was measured from a permanent mark on the top of the casing to the nearest 0.01 foot using an electronic sounder. The depth to groundwater and top of casing elevation data were used to calculate the groundwater elevation in each well in reference to mean sea level. The survey data and groundwater elevation measurements collected to date are presented in Table 1.

Before sample collection, each well was purged of 3 casing volumes, while recording field readings of pH, temperature, and electrical conductivity. Groundwater samples were collected for laboratory analysis by lowering a bottom-fill, disposable bailer to just below the water level in the well. The samples were transferred from the bailer into laboratory-supplied containers. The water sampling field survey forms are presented in Appendix A.

SAMPLING AND ANALYTICAL RESULTS

The results of monitoring and laboratory analysis of the groundwater samples for this and previous quarters are summarized in Table 1. The potentiometric groundwater elevations as interpreted from the results of this quarterly monitoring event are shown in Figure 2. The results of groundwater analysis are shown in Figure 3. The laboratory report and chain of custody record are presented in Appendix B.

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11266
1541 PARK STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-050

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-1	03/04/88	22.63	---	---	95000	2000	5900	1100	10000	---
MW-1	03/29/89	22.63	---	---	25000	930	2600	24	3100	---
MW-1	11/28/89	22.63	---	---	15000	280	880	340	1200	---
MW-1	02/13/91	22.63	---	---	25000	680	2700	1100	3200	---
MW-1	01/08/92	22.63	---	---	10000	260	1100	570	2000	---
MW-1	03/30/92	22.63	8.15	14.48	5800	290	570	500	1100	PACE
MW-1	07/02/92	22.63	9.38	13.25	2500	170	60	310	300	ANA
MW-1	07/22/92	22.63	9.62	13.01	---	---	---	---	---	---
MW-1	10/02/92	22.63	9.98	12.65	4000	86	190	270	350	ANA
QC-1 (c)	10/02/92	---	---	---	3600	89	180	270	340	ANA
MW-1	12/14/92	22.63	9.90	12.73	6800	75	540	200	670	ANA
QC-1 (c)	12/14/92	---	---	---	5900	68	480	190	600	ANA
MW-2	03/04/88	22.75	---	---	ND	ND	ND	ND	ND	---
MW-2	03/29/89	22.75	---	---	ND	1.1	0.78	ND	1.7	---
MW-2	11/28/89	22.75	---	---	170	ND	ND	ND	ND	---
MW-2	02/13/91	22.75	---	---	150	1.4	ND	ND	0.9	---
MW-2	01/08/92	22.75	---	---	ND	1.4	ND	ND	1.1	---
MW-2	03/30/92	22.75	9.03	13.72	91	0.7	ND	ND	ND	PACE
MW-2	07/02/92	22.75	9.96	12.79	150	3.1	0.6	0.6	1.1	ANA
MW-2	07/22/92	22.75	10.12	12.63	---	---	---	---	---	---
MW-2	10/02/92	22.75	10.42	12.33	56	ND<0.5	0.8	0.8	1.2	ANA
MW-2	12/14/92	22.75	10.77	11.98	210	1.5	ND<0.5	0.9	2.7	ANA

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11266
1541 PARK STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-050

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-3	03/04/88	23.45	---	---	ND	ND	ND	ND	ND	---
MW-3	03/29/89	23.45	---	---	ND	ND	ND	ND	ND	---
MW-3	11/28/89	23.45	---	---	ND	ND	ND	ND	ND	---
MW-3	02/13/91	23.45	---	---	ND	ND	ND	ND	ND	---
MW-3	01/08/92	23.45	---	---	ND	ND	ND	ND	ND	---
MW-3	03/30/92	23.45	9.71	13.74	ND	ND	ND	ND	ND	PACE
MW-3	07/02/92	23.45	10.52	12.93	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-3	07/22/92	23.45	10.62	12.83	---	---	---	---	---	---
MW-3	10/02/92	23.45	10.86	12.59	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-3	12/14/92	23.45	10.53	12.92	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-4	03/04/88	23.63	---	---	ND	ND	ND	ND	ND	---
MW-4	03/29/89	23.63	---	---	ND	ND	ND	ND	ND	---
MW-4	11/28/89	23.63	---	---	430	6.2	0.6	12	3.3	---
MW-4	02/13/91	23.63	---	---	ND	ND	ND	ND	ND	---
MW-4	01/08/92	23.63	---	---	ND	ND	ND	ND	ND	---
MW-4	03/30/92	23.63	8.73	14.90	ND	ND	ND	ND	ND	PACE
MW-4	07/02/92	23.63	10.04	13.59	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-4	07/22/92	23.63	10.26	13.37	---	---	---	---	---	---
MW-4	10/02/92	23.63	10.63	13.00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-4	12/14/92	23.63	10.02	13.61	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11266
1541 PARK STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-050

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-5	03/04/88	22.87	---	---	ND	ND	ND	ND	ND	---
MW-5	03/29/89	22.87	---	---	ND	ND	ND	ND	ND	---
MW-5	11/28/89	22.87	---	---	ND	ND	ND	ND	ND	---
MW-5	02/13/91	22.87	---	---	ND	ND	ND	ND	ND	---
MW-5	01/08/92	22.87	---	---	ND	ND	ND	ND	ND	---
MW-5	03/30/92	22.87	7.85	15.02	ND	ND	ND	ND	ND	PACE
MW-5	07/02/92	22.87	9.27	13.60	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-5	07/22/92	22.87	9.55	13.32	---	---	---	---	---	---
MW-5	10/02/92	22.87	9.97	12.90	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-5	12/14/92	22.87	9.14	13.73	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-6	03/04/88	22.85	---	---	ND	ND	ND	ND	ND	---
MW-6	03/29/89	22.85	---	---	ND	ND	ND	ND	ND	---
MW-6	11/28/89	22.85	---	---	ND	ND	ND	ND	ND	---
MW-6	02/13/91	22.85	---	---	ND	ND	ND	ND	ND	---
MW-6	01/08/92	22.85	---	---	ND	ND	ND	ND	ND	---
MW-6	03/30/92	22.85	8.86	13.99	ND	ND	ND	ND	ND	PACE
MW-6	07/02/92	22.85	9.94	12.91	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-6	07/22/92	22.85	10.10	12.75	---	---	---	---	---	---
MW-6	10/02/92	22.85	10.48	12.37	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-6	12/14/92	22.85	10.76	12.09	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11266
1541 PARK STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-050

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
RW-1	07/22/92	---	9.66	---	13000	1000	3400	380	2800	ANA
RW-1	10/02/92	---	10.28	---	---	---	---	---	---	---
RW-1	12/14/92	---	23.28	---	---	---	---	---	---	---
QC-2 (d)	10/02/92	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
QC-2 (d)	12/14/92	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
ND	Not detected above reported detection limits
---	Not analyzed/not available
ANA	Anametrix, Inc.
PACE	Pace, Inc.
ppb	Parts per billion

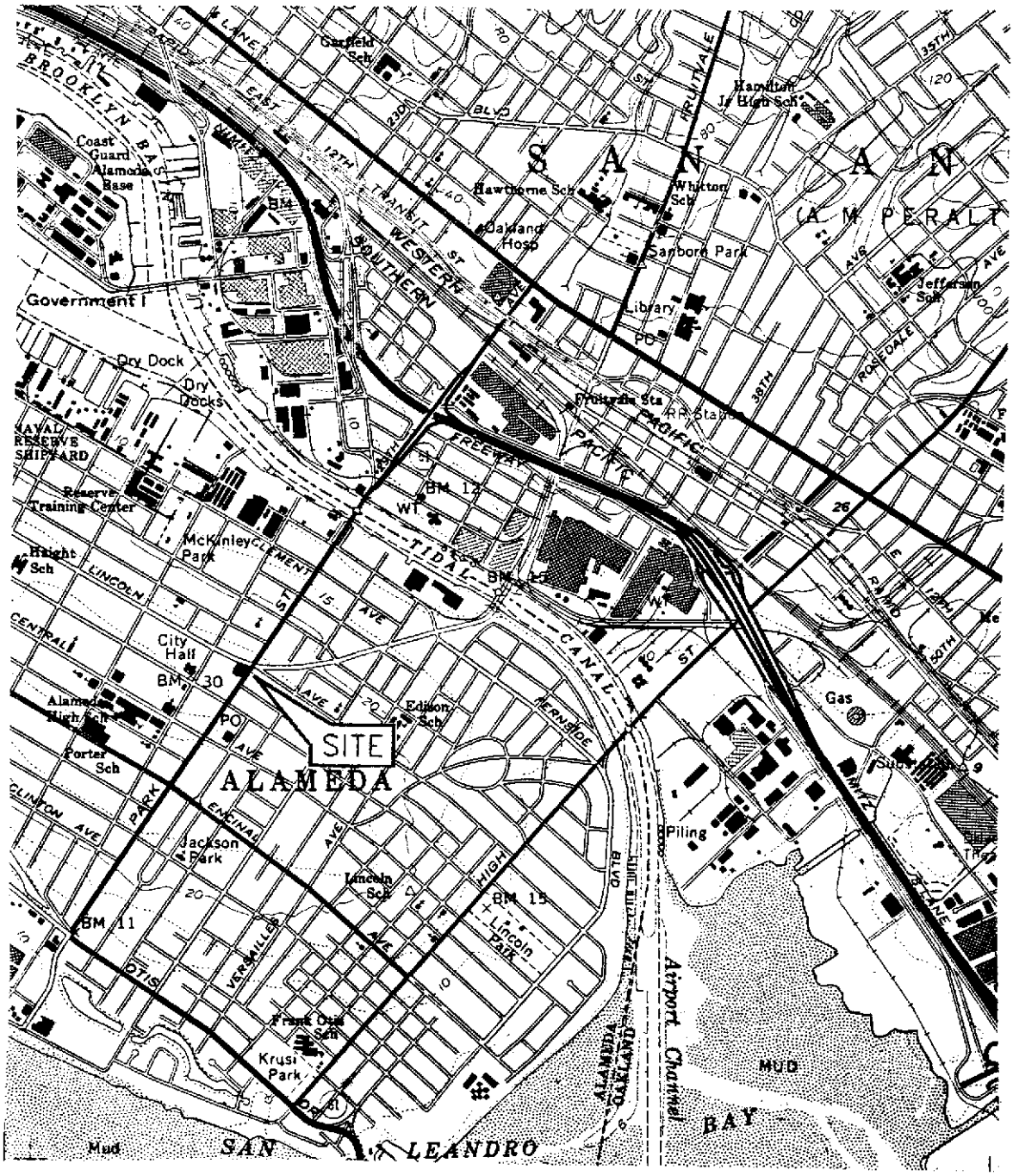
NOTES:

(a) Casing elevations surveyed to nearest 0.01 foot above mean sea level.

(b) Ground water elevation in feet above mean sea level.

(c) Blind duplicate of MW-1.

(d) Travel blank.



N

0 1000' 2000'

SOURCE:
USGS MAP, OAKLAND EAST QUADRANGLE, CALIFORNIA.
7.5 MINUTE SERIES. 1959. PHOTOREVERSED 1980.

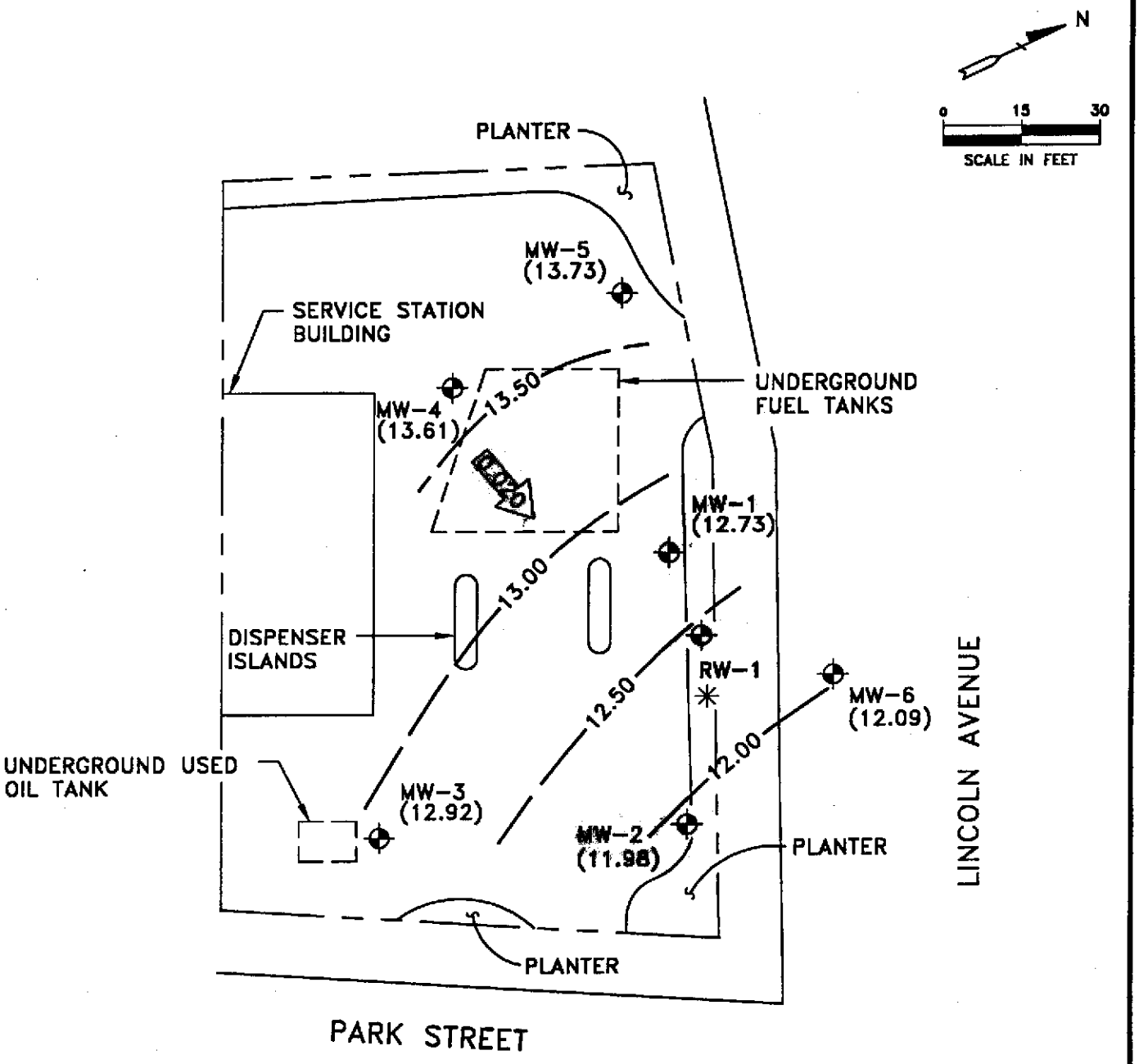
FIGURE 1

SITE VICINITY MAP

BP OIL SERVICE STATION NO. 11266
1541 PARK STREET
ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-050

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA



LEGEND:

- ⊕ GROUNDWATER MONITORING WELL
- ✳ INACCESSIBLE
- (13.73) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 13.50 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL – 0.50 FOOT)
- 0.020 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2

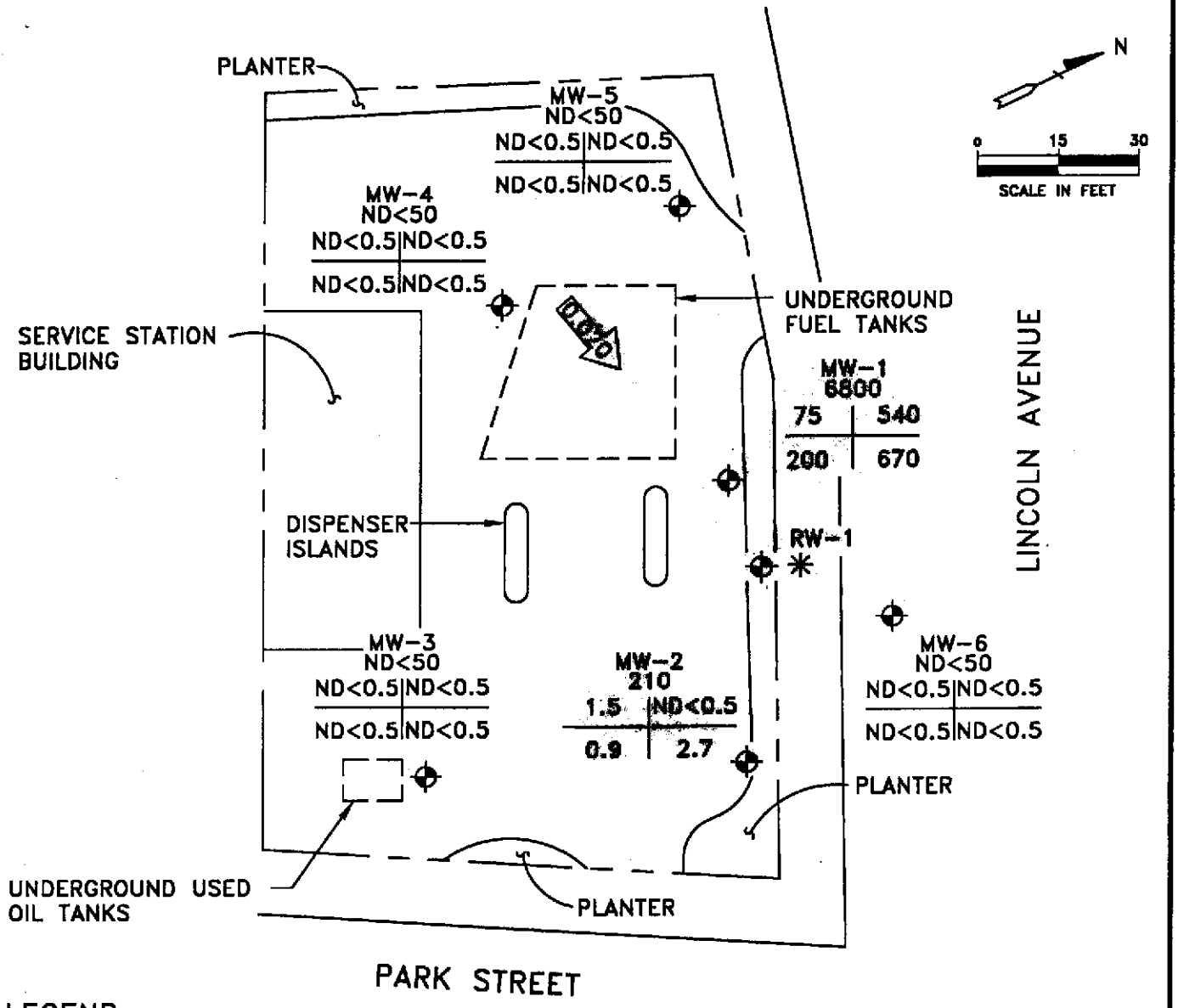
POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP (DECEMBER 14, 1992)

BP OIL SERVICE STATION NO. 11266
1541 PARK STREET
ALAMEDA, CALIFORNIA

PROJECT NO. 10-050

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

10050038.DWG 1-4-93 JWB 1=350



LEGEND:

- ⌖ GROUNDWATER MONITORING WELL
- ✳ INACCESSIBLE
- TPH-G / B | T / E | X — CONCENTRATION OF CONSTITUENTS IN PARTS PER BILLION (PPB)
- TPH-G — TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- B — BENZENE
- T — TOLUENE
- E — ETHYLBENZENE
- X — TOTAL XYLENES
- ND — NOT DETECTED ABOVE REPORTED DETECTION LIMIT
- 0.020 ▷ CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3

CONCENTRATION OF PETROLEUM HYDROCARBONS IN GROUNDWATER (DECEMBER 14, 1992)

BP OIL SERVICE STATION NO. 11266
1541 PARK STREET
ALAMEDA, CALIFORNIA

PROJECT NO. 10-050

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

10000307.DWG 1-4-93 JWB 1=360

APPENDIX A

WATER SAMPLING FIELD SURVEY FORMS

Field Report / Data Sheet

Birch Technical Services

116 Liberty st
Santa Cruz, Ca 95060
(408) 459-0718

X Groundwater Sampling O Groundwater Monitoring O Well Development O Drill Support O Stockpile Sampling

Firm: ALISTO	Date: 12/14/92	Station #: BP11266	Day: (M) Tu W Th F	
Project Number: 10-050	Field Technician: Dan Bird	Address: 1541 Park St., Alameda	Weather: Clear cool	Milage: ____ mi

Equipment List:

- X Water Guage (1) day
- X Parameter Kit (1) day
- X Disposable Bailers (6)
- X Plug(s) (___) (___ in)
- X Honda Pump (1) day
- X Poly Tubing (122 ft)
- X Dolphin Lock(s) (2)
- O Nitrile Gloves (___ pair)
- O ____ (___)
- O ____ (___)

Travel Time: 2 hrs
Time at Site: 4 hrs
Total Time: 6 hrs

DTWorder	Well ID	Diam	Lock	Exp Cap	Total Depth (feet)	1st Depth to Water (feet)	2nd Depth to Water (feet)	Depth to Product (feet)	Product Thickness	Comments
7	RW-1	6	ok	ok	NM	23.28	23.28			Measured through port hole in PVC cap. System on.
6	MW-1	2	ok	ok	21.88	9.90	9.90			
5	MW-2	2	ok	ok	23.01	10.77	10.77			Traffic box full of water.
1	MW-3	2	ok	ok	19.59	10.53	10.53			Traffic box full of water.
2	MW-4	2	ok	ok	19.92	10.02	10.02			
3	MW-5	2	ok	ok	24.24	9.14	9.14			
4	MW-6	2	ok	ok	16.95	10.76	10.76			Street well.

Notes: Arrive @ 11:00. Measure DTW after opening wells. Sampled as shown on "Groundwater sampling forms." Left site at 3:00

Page ___ of ___ Inv#: ____

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-1

Project Number: 10-050
Station Number: BP11266
Date: 12-14-92

Sample Type: ⊗ Groundwater OTrip Blank ODuplicate of _____

Sampled by: DAN BIRCH

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

⊗2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	____

Total Depth of Well 21.88 Initial Water Level: 9.90

Total Volume Purged: 6 Time Elapsed: 6

PURGE METHOD:
⊗ Honda Pump
⊗ Disposable PolyTubing(23 ft)
O Disposable PVC Bailer(s)(____)
O Other _____

Calculated Purge Volume:

21.88 (Total Depth) - 9.90 (Water Level) = 11.98 x .16 (Well Vol. Fac.) = 1.9 x 3 (#of vol. to Purge) = 5.7 (gallons) (Calculated Purge Volume)

Subjective Analysis Prior to Purging

SHEEN ⊗ OYes ⊗ ONo Depth to Product None (ft) Product Thickness None (ft)

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 1207
Solution pH 7.00 7 at 62 °F
Solution pH 4.00 4 at 62 °F
Solution pH 10.00 10 at 62 °F
Water Level Meter#: 10

COMMENTS: Duplicate QC-1 was collected from this well. Water was black. Well purged dry @ 6 gallons.

SAMPLING METHOD

OPVC Disposable Bailer
OTeflon Bailer
OOther: _____

Time Sampled (24 hour clock): 1415

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
2	1410	64.1	6.51	0.89
4	1413	63.7	6.53	0.84
6	1415	63.1	6.52	0.84

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-2

Project Number: 10-050
Station Number: BP11266
Date: 12-14-92

Sample Type: ☒ Groundwater OTrip Blank ODuplicate of _____

Sampled by: Dan Birch

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

☒ 2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well 23.01 Initial Water Level: 10.77

Total Volume Purged: 6 Time Elapsed: 5

PURGE METHOD:
☒ Honda Pump
☒ Disposable PolyTubing (26 ft)
O Disposable PVC Bailer(s) (____)
O Other _____

Calculated Purge Volume:

23.01 (Total Depth) - 10.77 (Water Level) = 12.24 x .16 (Well Vol. Fac.) = 1.96 x 3 (#of vol. to Purge) = 5.8 (gallons) Calculated Purge Volume

Subjective Analysis Prior to Purging

SHEEN ☒ No O Yes Depth to Product: None (ft) Product Thickness: None (ft)

COMMENTS: Purged dry @ 6 gallons.

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 1207
Solution pH 7.00 7 at 62 °F
Solution pH 4.00 4 at 62 °F
Solution pH 10.00 10 at 62 °F
Water Level Meter#: 10337

SAMPLING METHOD

☒ PVC Disposable Bailer
O Teflon Bailer
O Other: _____

Time Sampled (24 hour clock): 1335

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
1	1330	68.5	7.03	3.19
4		67.1	7.11	3.00
6	1335	66.1	7.12	2.77

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-3

Project Number: 10-050
Station Number: BP11266
Date: 12-14-92

Sample Type: ⊗ Groundwater OTrip Blank ODuplicate of _____

Sampled by: Dan Birch

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) ⊗2" O3" O4" O4.5" O6" O____
Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 ____

Total Depth of Well 19.59 Initial Water Level: 10.53

Total Volume Purged: 5 Time Elapsed: 10

PURGE METHOD:
⊗ Honda Pump
⊗ Disposable PolyTubing(23 ft)
O Disposable PVC Bailer(s)(____)
O Other _____

Calculated Purge Volume:

19.59 (Total Depth) - 10.53 (Water Level) = 9.06 x .16 (Well Vol. Fac.) = 1.44 x 3 (#of vol. to Purge) = 4.32 ~~2.10~~ (gallons) (Calculated Purge Volume)

Subjective Analysis Prior to Purging

SHEEN OYes ⊗No Depth to Product None (ft) Product Thickness None (ft)

COMMENTS:

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 1207
Solution pH 7.00 7 at 62 °F
Solution pH 4.00 4 at 62 °F
Solution pH 10.00 10 at 62 °F
Water Level Meter#: 10337

SAMPLING METHOD

⊗ PVC Disposable Bailer
O Teflon Bailer
O Other: _____

Time Sampled (24 hour clock): 1320

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
1	1310	69.1	8.00	3.91
3	1305	68.7	8.12	3.81
5	1320	67.9	8.17	3.84

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Project Number: 10-050
Station Number: BP11266
Date: 12-14-92

Well Number: MW-4
Sample Type: ☒ Groundwater ○Trip Blank ○Duplicate of _____
Sampled by: DAN BIRCH

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

☒ 2"	○3"	○4"	○4.5"	○6"	○_____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well 19.92 Initial Water Level: 10.02

Total Volume Purged: 5 Time Elapsed: 5

PURGE METHOD:
☒ Honda Pump
☒ Disposable PolyTubing (22 ft)
○ Disposable PVC Bailer(s) (____)
○ Other _____

Calculated Purge Volume:

19.92 (Total Depth) − 10.02 (Water Level) = 9.90 × .16 (Well Vol. Fac.) = 1.58 ~~5.94~~ × 3 (#of vol. to Purge) = 4.7 (gallons) (Calculated Purge Volume)

Subjective Analysis Prior to Purging

SHEEN ○Yes ☒No Depth to Product None (ft) Product Thickness None (ft)

COMMENTS:

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9/12 Time: 1207
Solution pH 7.00 7 at 62 °F
Solution pH 4.00 4 at 62 °F
Solution pH 10.00 10 at 62 °F
Water Level Meter#: 10337

SAMPLING METHOD

☒ PVC Disposable Bailer
○ Teflon Bailer
○ Other: _____

Time Sampled (24 hour clock): 1256

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
1	1252	69.9	6.63	0.90
3	1254	68.8	6.55	0.89
5	1256	68.3	6.56	0.88

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Project Number: 10-050
Station Number: BD11266
Date: 12-14-92

Well Number: MW-5
Sample Type: ⊗ Groundwater OTrip Blank ODuplicate of _____
Sampled by: DAN BIRCH

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

⊗2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well 24.24 Initial Water Level: 9.14

Total Volume Purged: 8 Time Elapsed: 6

PURGE METHOD:
⊗ Honda Pump
⊗ Disposable PolyTubing (26 ft)
O Disposable PVC Bailer(s)(____)
O Other _____

Calculated Purge Volume:

24.24 (Total Depth) - 9.14 (Water Level) = 15.1 x .16 (Well Vol. Fac.) = 2.41 x 3 (#of vol. to Purge) = 7.3 (gallons) Calculated Purge Volume

Subjective Analysis Prior to Purging

SHEEN ⊗ OYes ⊗ ONo
Depth to Product: None (ft)
Product Thickness: None (ft)

COMMENTS:

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 1207
Solution pH 7.00 7 at 62 °F
Solution pH 4.00 4 at 62 °F
Solution pH 10.00 10 at 62 °F
Water Level Meter#: 10337

SAMPLING METHOD

⊗ PVC Disposable Bailer
O Teflon Bailer
O Other: _____

Time Sampled (24 hour clock): 1235

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
2	1229	61.3	7.33	⊗ 1.75
4	1231	65.2	7.15	1.56
5	1233	66.5	7.09	1.31
8	1235	67.5	7.01	1.27

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-6

Project Number: 10-050
Station Number: BP11266
Date: 12-14-92

Sample Type: ☒ Groundwater OTrip Blank ODuplicate of _____

Sampled by: DAN BIRCH

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) / Volume Factors:

☒ 2"	O3"	O4"	O4.5"	O6"	O____
0.1632	0.3672	0.6528	0.826	1.469	_____

Total Depth of Well 16.95 Initial Water Level: 10.76

Total Volume Purged: 3 Time Elapsed: 3

PURGE METHOD:
☒ Honda Pump
☒ Disposable PolyTubing(20 ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Calculated Purge Volume:

16.95 (Total Depth) - 10.76 (Water Level) = 6.19 x .16 (Well Vol. Fac.) = .99 x 3 (#of vol. to Purge) = 2.97 (gallons) Calculated Purge Volume

Subjective Analysis Prior to Purging

SHEEN ☒ OYes ☒ ONo Depth to Product None (ft) Product Thickness None (ft)

COMMENTS:

PARAMETER EQUIPMENT CALIBRATION

pH Meter #: 9112 Time: 1207
Solution pH 7.00 7 at 62 °F
Solution pH 4.00 4 at 62 °F
Solution pH 10.00 10 at 62 °F
Water Level Meter#: 10337

SAMPLING METHOD

☒ PVC Disposable Bailer
OTeflon Bailer
OOther:_____

Time Sampled (24 hour clock): 1400

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)
1	1357	65.7	6.91	0.91
2	1358	64.7	6.70	0.97
3	1400	63.8	6.65	0.97

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: RW-1

Project Number: 10-050
Station Number: BP11266
Date: 12-14-92

Sample Type: ⊗Groundwater OTrip Blank ODuplicate of _____

Sampled by: DAN BIRCH

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) O 2" O3" O4" O4.5" ~~O6"~~ O____
Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 _____

Total Depth of Well _____ Initial Water Level:_____

Total Volume Purged:_____ Time Elapsed:_____

PURGE METHOD:
O Honda Pump
ODisposable PolyTubing(____ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Calculated Purge Volume:

_____ (Total Depth) - _____ (Water Level) = _____ x _____ (Well Vol. Fac.) = _____ x _____ (#of vol. to Purge) = _____(gallons) (Calculated Purge Volume)

Subjective Analysis Prior to Purging

SHEEN OYes ONo
Depth to Product _____(ft)
Product Thickness _____ (ft)

PARAMETER EQUIPMENT CALIBRATION

pH Meter #:_____ Time:_____
Solution pH 7.00 _____at _____°F
Solution pH 4.00_____at _____°F
Solution pH 10.00 _____ at _____°F
Water Level Meter#:_____

COMMENTS:

Pumping system downhole prevented sampling. System was operational.

SAMPLING METHOD

OPVC Disposable Bailer
OTeflon Bailer
OOther:_____

Time Sampled (24 hour clock)
NOT

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)

Analysis Required	No. of	Container Type	Preservatives
EPA 601		VOA's	
TPH-G/BTEX		VOA's	HCl
TPH- Diesel		Amber Liter	
TOG 5520 BF		Amber Liter	H_2SO_4

Birch Technical Services

116 Liberty Street
Santa Cruz, Ca 95060
(408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: QC-1

Project Number:
Station Number:
Date:

Sample Type: Groundwater OTrip Blank XDuplicate of MW-1

Sampled by: _____

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) O 2" O3" O4" O4.5" O6" O____
Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 _____

Total Depth of Well _____ Initial Water Level:_____

Total Volume Purged:_____ Time Elapsed:_____

PURGE METHOD:
O Honda Pump
ODisposable PolyTubing(____ft)
ODisposable PVC Bailer(s)(____)
OOther_____

Calculated Purge Volume:

_____ - _____ = _____ x _____ = _____ x _____ = _____(gallons)
Total Depth | Water Level | Well Vol. Fac. | #of vol. to Purge | Calculated Purge Volume

Subjective Analysis Prior to Purging

SHEEN OYes ONo
Depth to Product _____(ft)
Product Thickness _____ (ft)

PARAMETER EQUIPMENT CALIBRATION

pH Meter #:_____ Time:_____
Solution pH 7.00 _____at _____°F
Solution pH 4.00_____at _____°F
Solution pH 10.00 _____ at _____°F
Water Level Meter#:_____

COMMENTS: Duplicate of MW-1.

SAMPLING METHOD

OPVC Disposable Bailer
OTeflon Bailer
OOther:_____

Time Sampled (24 hour clock) 1420

WELL SAMPLING PARAMETERS

Gallons Removed	Time	Temp °F	pH	Cond. (umhos/cm)

	Analysis Required	No. of	Container Type	Preservatives
	EPA 601		VOA's	
X	TPH-G/BTEX	3	VOA's	HCl
	TPH- Diesel		Amber Liter	
	TOG 5520 BF		Amber Liter	H_2SO_4

APPENDIX B

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD

ANAMETRIX INC
Environmental & Analytical Chemistry

Part of INCHCAPE ENVIRONMENTAL

REPORT

MR. BRADY NAGLE
ALISTO ENGINEERING GROUP
1000 BURNETT AVENUE, SUITE 150
CONCORD, CA 94520

Workorder # : 9212213
Date Received : 12/14/92
Project ID : 10-050
Purchase Order: N/A

The following samples were received at Anametrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9212213- 1	MW-1
9212213- 2	MW-2
9212213- 3	MW-3
9212213- 4	MW-4
9212213- 5	MW-5
9212213- 6	MW-6
9212213- 7	QC-1
9212213- 8	QC-2

This report consists of 6 pages not including the cover letter, and is organized in sections according to the specific Anametrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anametrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anametrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anametrix.

Sarah Schoen, Ph.D.
Laboratory Director

12-22-92
Date

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. BRADY NAGLE
ALISTO ENGINEERING GROUP
1000 BURNETT AVENUE, SUITE 150
CONCORD, CA 94520

Workorder # : 9212213
Date Received : 12/14/92
Project ID : 10-050
Purchase Order: N/A
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9212213- 1	MW-1	WATER	12/14/92	TPHg/BTEX
9212213- 2	MW-2	WATER	12/14/92	TPHg/BTEX
9212213- 3	MW-3	WATER	12/14/92	TPHg/BTEX
9212213- 4	MW-4	WATER	12/14/92	TPHg/BTEX
9212213- 5	MW-5	WATER	12/14/92	TPHg/BTEX
9212213- 6	MW-6	WATER	12/14/92	TPHg/BTEX
9212213- 7	QC-1	WATER	12/14/92	TPHg/BTEX
9212213- 8	QC-2	WATER	12/08/92	TPHg/BTEX

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. BRADY NAGLE
ALISTO ENGINEERING GROUP
1000 BURNETT AVENUE, SUITE 150
CONCORD, CA 94520

Workorder # : 9212213
Date Received : 12/14/92
Project ID : 10-050
Purchase Order: N/A
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Cheryl Berlman 12/22/92
Department Supervisor Date

Anna Shor 12/22/92
Chemist Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9212213
Matrix : WATER
Date Sampled : 12/14/92

Project Number : 10-050
Date Released : 12/22/92

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# MW-1 -01	Sample I.D.# MW-2 -02	Sample I.D.# MW-3 -03	Sample I.D.# MW-4 -04	Sample I.D.# MW-5 -05
Benzene	0.5	75	1.5	ND	ND	ND
Toluene	0.5	540	ND	ND	ND	ND
Ethylbenzene	0.5	200	0.9	ND	ND	ND
Total Xylenes	0.5	670	2.7	ND	ND	ND
TPH as Gasoline	50	6800	210	ND	ND	ND
% Surrogate Recovery		98%	121%	119%	114%	108%
Instrument I.D.		HP4	HP4	HP4	HP4	HP4
Date Analyzed		12/17/92	12/17/92	12/17/92	12/17/92	12/17/92
RLMF		50	1	1	1	1

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anametrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Luna Shor 12/22/92
Analyst Date

Cheryl Balmer 12/22/92
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9212213
Matrix : WATER
Date Sampled : 12/08 & 14/92

Project Number : 10-050
Date Released : 12/22/92

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# MW-6 -06	Sample I.D.# QC-1 -07	Sample I.D.# QC-2 -08	Sample I.D.# BD1704E2 BLANK
Benzene	0.5	ND	68	ND	ND
Toluene	0.5	ND	480	ND	ND
Ethylbenzene	0.5	ND	190	ND	ND
Total Xylenes	0.5	ND	600	ND	ND
TPH as Gasoline	50	ND	5900	ND	ND
% Surrogate Recovery		112%	97%	99%	96%
Instrument I.D.		HP4	HP4	HP4	HP4
Date Analyzed		12/17/92	12/17/92	12/17/92	12/17/92
RLMF		1	50	1	1

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anametrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Lucia Shor 12/22/92
Analyst Date

Cheryl Balmer 12/22/92
Supervisor Date

TOTAL VOLATILE HYDROCARBON MATRIX SPIKE REPORT
EPA METHOD 5030 WITH GC/FID
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 10-050 MW-6	Anametrix I.D.	: 9212213-06
Matrix	: WATER	Analyst	: [illegible]
Date Sampled	: 12/14/92	Supervisor	: [illegible]
Date Analyzed	: 12/17/92	Date Released	: 12/22/92
		Instrument ID	: HP4

COMPOUND	SPIKE AMT (ug/L)	SAMPLE AMT (ug/L)	REC MS (ug/L)	% REC MS	REC MD (ug/L)	% REC MD	RPD	% REC LIMITS
GASOLINE	500	0	510	102%	540	108%	6%	48-145
P-BFB				88%		111%		53-147

* Limits established by Anametrix, Inc.

Environmental & Analytical Chemistry
1961 Concourse Drive, Suite E, San Jose, CA 95131
(408) 432-8192 • Fax (408) 432-8198

9212213 (18)

CHAIN-OF-CUSTODY RECORD

PROJECT NUMBER	PROJECT NAME
10-050	BP 11266

Send Report Attention of:	Report Due	Verbal Due
BRADY NAGLE	12/29/92	/ /

	Sample Number	Date	Time	Comp	Matrix	Station Location	Number of Cntnrs	Type of Containers	Type of Analysis: TPH/BTEX	Condition of Samples	Initial
1	MW-1	12/14/92	1415		W	ALAMEDA	3	VOA's	X		
2	MW-2		1335						X		
3	MW-3		1320						X		
4	MW-4		1256						X		
5	MW-5		1235						X		
6	MW-6		1400						X		
7	QC-1		1420						X		
8	QC-2	↓			↓	↓	↓	↓	X		

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by Lab:	Date/Time
A. J. Bird	12-14-92 1512	Michele D. Aguilera	12-14-92 1512

Remarks:

COMPANY: ALISTO ENGINEERING
ADDRESS:
PHONE : 5107864070 FAX : 5107864089