McLaren Hart

90 NOV 29 PM 12:23

November 28, 1990

Mr. Larry Seto
Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Dear Mr Seto:

QUARTERLY GROUNDWATER MONITORING REPORT, EMERY BAY MARKETPLACE, EMERYVILLE, CALIFORNIA

Attached is the letter report "Quarterly Groundwater Monitoring Report, Emery Bay Marketplace, Emeryville, California," November 28, 1990. This report summarizes the quarterly groundwater monitoring activities performed at the Emery Bay Marketplace property during the months of August, September and October 1990 in accordance with the "Work Plan for Groundwater Monitoring and Free Product Removal at the Marketplace Site, Emeryville, California," July 6, 1990 (Work Plan). The Work Plan was submitted to address recommendations made in the report "Groundwater Characterization, Emery Bay Marketplace, " June 19, 1990.

If you have any questions, please call me.

Sincerely,

Julie S. Menack

Julie S. Menack, RG #4440
Senior Hydrogeologist

cc: Lynn Tolin, Christie Avenue Partners-JS

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1135 Atlantic Avenue, Alameda, CA 94501 (415) 521-5200 FAX (415) 521-1547

QUARTERLY GROUNDWATER MONITORING REPORT EMERY BAY MARKETPLACE EMERYVILLE, CALIFORNIA

NOVEMBER 28, 1990

McLaren Hart

McLaren Hart

November 28, 1990

Ms. Lynn Tolin
Christie Avenue Partners-JS
6475 Christie Avenue, Suite 500
Emeryville, California 94608

Dear Ms. Tolin:

QUARTERLY GROUNDWATER MONITORING REPORT, EMERY BAY MARKETPLACE, EMERYVILLE, CALIFORNIA

This letter report documents the results of the quarterly monitoring activities conducted at the Emery Bay Marketplace property during the months of August, September and October 1990. This is the second quarterly report submitted in accordance with the "Work Plan for Groundwater Monitoring and Free Product Removal at the Marketplace Site, Emeryville, California," July 6, 1990 (Work Plan). The Work Plan was submitted to address recommendations made in the report "Groundwater Characterization, Emery Bay Marketplace," June 19, 1990 (Groundwater Characterization Report).

The following activities were proposed in the Work Plan:

- Obtain groundwater elevation measurements at all monitoring wells on a quarterly basis (July and October 1990; January and April 1991) and prepare groundwater elevation maps;

- Sample groundwater from six downgradient wells (Wells W-7, W-13, W-14, W-19, W-20, and W-24) on a quarterly basis (July and October 1990; January and April 1991) to verify that petroleum hydrocarbons in groundwater are confined to the Marketplace property and have not migrated off-site. Analyze samples for total petroleum hydrocarbons as diesel (TPH/D) and motor oil (TPH/MO) by modified EPA Method 8015;

- Remove free product from Well W-5 on a bi-weekly basis for four months and on a monthly basis for eight months;

1135 Atlantic Avenue, Alameda, CA 94501 (415) 521-5200 FAX (415) 521-1547

- Abandon Well W-10 which cannot be used for sampling because recharge is inadequate.

This letter presents the results of the depth to groundwater measurements and the groundwater quality sampling and analyses performed during the month of October 1990. The activities associated with the free product removal from Well W-5 are summarized. The abandonment of Well W-10 which occurred on October 1, 1990, is also described.

GROUNDWATER ELEVATIONS

Depths to groundwater in all existing wells at the Emery Bay Marketplace property were measured with an electronic sounder on October 3, 1990. A Marine Moisture Control Company oil-water interface probe was used to measure depth to oil and depth to groundwater in wells where free product occurs (Wells W-5 and W-16). Hydrologic data sheets are provided in Attachment A. A summary of historical depth to groundwater measurements, monitoring well surface casing elevations, and calculated groundwater surface elevations is presented in Table 1.

The October 3 groundwater surface elevation contours for the artificial fill are presented in Figure 1. Groundwater elevations from wells completed only in the native material which underlies the artificial fill (Wells W-15, W-16, and W-22), were not used to construct the map because it was determined in the Groundwater Characterization Report that confined or semi-confined conditions may exist in the native material. The groundwater elevations observed in October for wells completed in the native material are consistent with previous measurements and support this conclusion (Table 1).

The groundwater flow map for the artificial fill (Figure 1) is consistent with the groundwater flow maps presented in the Groundwater Characterization Report and the "Quarterly Groundwater Monitoring Report" October 3, 1990 (First Quarterly Report). The groundwater flow map shows that groundwater flow is toward the west-southwest. As suggested in the Groundwater Characterization Report, local variations in groundwater flow near Wells W-4 and W-8 may be caused by a slurry wall installed to a depth of 35 feet on the adjacent upgradient property.

The water level in Well W-7 is significantly higher than in adjacent wells. This elevated water level has consistently been observed at Well W-7 and it was suggested in the Groundwater Characterization Report that perched groundwater conditions may occur at this location. Therefore, the

water level from Well W-7 was not included in the preparation of the groundwater elevation map.

A small amount of free product (0.02 feet) was detected in Well W-16 when it was sounded. This result is similar to the thickness measured when the well was first sounded on September 21, 1989 (0.07 feet) (McLaren, 1989). On many other occasions when Well W-16 was sounded, the product thickness was not measurable, but the presence of a small amount of product was noted. Although product thickness was measurable in Well W-16 on October 3, 1990 it is not believed that an increase in product thickness has actually occurred in this well. Because of the very small amount of product in this well, the ability to measure product thickness is most likely a function of instrument sensitivity.

GROUNDWATER QUALITY SAMPLING AND ANALYTICAL RESULTS

Groundwater samples were collected on October 3 and 4, 1990 from the six wells on the downgradient side of the property (W-7, W-13, W-14, W-19, W-20 and W-24). The purpose of the monitoring program is to confirm that total petroleum hydrocarbons (TPH) are confined to the Marketplace property and have not migrated off-site. TPH/D and TPH/MO have previously been detected in groundwater from Wells W-7 and W-19. TPH has not been detected in groundwater from Wells W-13, W-14, W-20 and W-24 which are located on the downgradient side of the property.

The groundwater samples were analyzed for TPH/D and TPH/MO by Modified EPA Method 8015. Groundwater samples were sent under chain-of-custody to McLaren/Hart Analytical Laboratory (MAL) in Rancho Cordova, California. One travel blank was sent as a Quality Assurance (QA) sample. The analytical laboratory data sheets, QA laboratory results, chain-of-custody records, and sampling data sheets are included in Appendix B. The analytical results are summarized and presented with the historical analytical data in Table 2.

The analyses of the groundwater samples show the following results:

- TPH/D was detected in groundwater from Well W-7 at 5000 parts per billion (ppb) and TPH/MO was detected at 6000 ppb. Both constituents previously have been detected at similar concentrations.

- TPH/D was detected in groundwater from Well W-19 at 300 ppb and TPH/MO was detected at 3000 ppb. Both constituents previously have been detected at similar concentrations.

- TPH/D and TPH/MO were not detected in groundwater samples from downgradient Wells W-13, W-14, W-20 and W-24. These constituents previously have not been detected in groundwater from these four wells.

The results from the October 1990 sampling event confirm that petroleum hydrocarbons do not occur downgradient of Wells W-7 and W-19.

FREE PRODUCT REMOVAL FROM WELL W-5

Free product has been removed from Well W-5 on a biweekly basis from July through October 1990. It was recommended in the Work Plan that free product be removed from Well W-5 on a biweekly basis for a period of four months and on a monthly basis thereafter for a period of eight months. In the future, free product will be removed on a monthly basis.

The free product thickness is measured with a Marine Moisture Control Company oil-water interface probe prior to removal. Product is then removed with a disposable bailer or a peristaltic pump. The product thickness, both before and after product removal, and an estimate of the volume of fluid removed is recorded in Table 3. It should be noted that the volume of fluid removed includes water.

The average thickness of the free product prior to removal appears to have decreased somewhat over the period that product has been removed on a biweekly basis. When free product was removed from Well W-5 on July 25, 1990, the product thickness was 2.12 feet prior to removal. During the four subsequent occasions when product was removed, the thickness was 1.16 to 1.24 feet prior to product removal. On the last three occasions when product was removed, the thickness was 1.10, 1.04 and 1.18 feet prior to removal (Table 3).

On the last occasion that product was removed, (October 31, 1990), the depth to water was approximately 0.3 feet lower than it has been on previous occasions. The depth was rechecked and verified prior to product removal to ensure that no measurement error was made. The observed drop in the groundwater level at Well W-5 may be due to a lack of precipitation and might cause the apparent increase in product thickness observed on October 31, 1990.

ABANDONMENT OF WELL W-10

Well W-10 was abandoned on October 1, 1990 because recharge was inadequate for sampling purposes. The well casing and annular material were removed

by overdrilling the well with eight-inch diameter hollow-stem augers to a depth of ten feet. The original borehole was six-inches in diameter and extended to a depth of eight feet. When the well was abandoned, the borehole was drilled with larger diameter augers and extended two feet into the native material to insure that all well materials were removed. Neat cement with 5% bentonite powder was pumped into the borehole through a tremie hose. All cuttings and fluids generated were contained in 55-gallon drums.

CONCLUSIONS

In summary, the results from the August through October 1990 quarterly monitoring activities conducted at the Emery Bay Marketplace property are as follows:

- The October 1990 groundwater flow map for the artificial fill (Figure 1) is consistent with groundwater flow maps presented in the Groundwater Characterization Report and shows that groundwater flow is toward the west-southwest.
- The October 1990 groundwater sampling event confirms the conclusion from the Groundwater Characterization Report that petroleum hydrocarbons do not occur downgradient of Wells W-7 and W-19.
- Free product has been removed from Well W-5 on a biweekly basis from July through October 1990. The average product thickness prior to removal appears to have decreased somewhat over this period.
- Well W-10 was abandoned on October 1, 1990 by overdrilling, and removing the well casing, associated filterpack and seal.

If you have any questions regarding this report, please do not hesitate to call.

Sincerely,

Julie S. Menack

Julie S. Menack, RG #4440
Senior Hydrogeologist

Gary R. Foote

Gary R. Foote
Senior Geologist

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McLaren Hart

REFERENCES

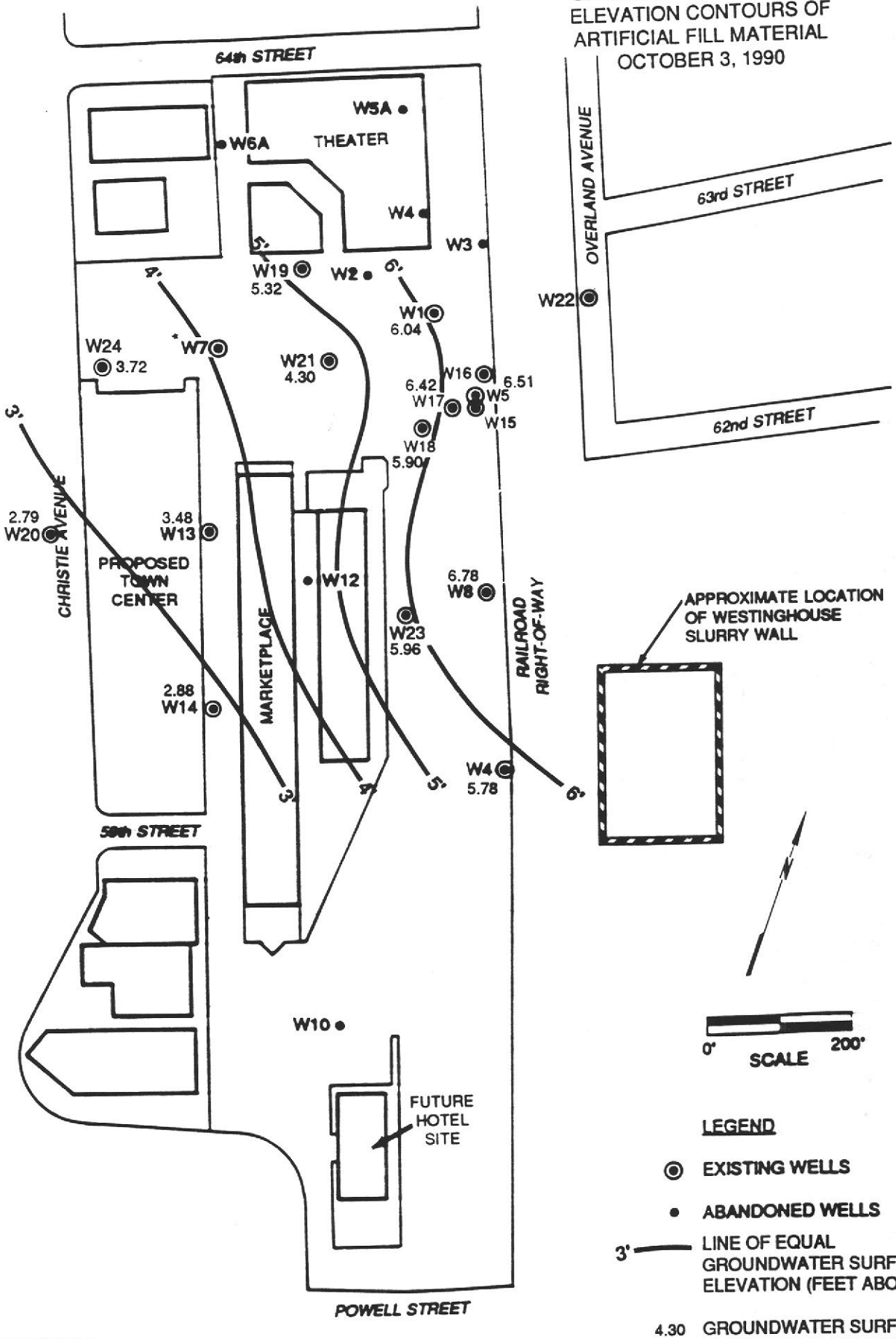
McLaren. (1989) Free Product Subsurface Investigation, Marketplace Site, Emeryville, California, October 19, 1989.

McLaren. (1990a) Groundwater Characterization, Emery Bay Marketplace, June 19,1990.

McLaren. (1990b) Work Plan for Groundwater Monitoring and Free Product Removal at the Marketplace Site, Emeryville, California, July 6, 1990.

McLaren/Hart. (1990) Quarterly Groundwater Monitoring Report, Emery Bay Marketplace, Emeryville, California, October 3, 1990.

FIGURE 1
GROUNDWATER SURFACE
ELEVATION CONTOURS OF
ARTIFICIAL FILL MATERIAL
OCTOBER 3, 1990



McLaren

* GROUNDWATER ELEVATION AT WELL W7 WAS 5.83 FEET

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE

Well Number	Top of Casing (Feet)	Date	Depth to Groundwater (feet)	Groundwater Elevation (Feet)
W-1[a]	11.47	5-6-87	6	6.08[b]
		8-20-89	5.60	5.87
		10-11-89	5.63	5.84
		2-22-90	4.92	6.55
		2-28-90	5.02	6.45
		4-9-90	5.44	6.03
		6-7-90	5.37	6.10
		7-25-90	5.26	6.21
		10-3-90	5.43	6.04
W-4	9.96	1-18-82	2.55	7.95[b]
		3-27/28-85	c	8.65
		8-20-89	3.95	6.01
		10-11-89	3.87	6.09
		2-22-90	2.0	7.96
		2-28-90	2.39	7.57
		4-9-90	3.17	6.79
		6-7-90	2.73	7.23
		7-25-90	3.71	6.25
		10-3-90	4.18	5.78
W-5	11.41	1-18-82	2.50	9.65[b]
		3-27/28-85	c	9.26
		10-11-89	4.43	6.98
		2-22-90	3.80	7.61
		2-28-90	4.43	6.98
		4-9-90	4.73	6.68
		6-7-90	4.30	7.11
		7-25-90	5.10	6.31
		10-3-90	4.90	6.51
W-7[a]	9.05	5-6-87	3	6.88[b]
		8-20-89	3.59	5.46
		10-11-89	3.08	5.97
		2-22-90	1.75	7.30
		2-28-90	1.31	7.74
		4-9-90	2.42	6.63
		6-7-90	1.21	7.84
		7-25-90	2.76	6.29
		10-3-90	3.22	5.83
W-8	10.43	5-6-87	5.5	6.88[b]
		8-20-89	3.59	6.84
		2-22-90	1.5	8.93
		2-28-90	1.78	8.65
		4-9-90	3.12	7.31
		6-7-90	2.90	7.53
		7-27-90[d]	3.33	7.10
		10-3-90	3.65	6.78
W-13	8.15	8-20-89	4.64	3.51
		10-11-89	4.60	3.55
		2-22-90	3.85	4.30
		2-28-90	4.18	3.97
		4-9-90	4.31	3.84
		6-7-90	3.93	4.22
		7-25-90	4.40	3.75
		10-3-90	4.67	3.48

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TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number	Top of Casing (Feet)	Date	Depth to Groundwater (feet)	Groundwater Elevation (Feet)
W-14	7.97	8-20-90	5.02	2.95
		2-22-90	4.19	3.78
		2-28-90	4.46	3.51
		4-9-90	4.36	3.61
		6-7-90	5.29	2.68
		7-25-90	4.83	3.14
		10-3-90	5.09	2.88
W-15	11.53	8-20-89	3.43	8.10
		10-11-89	4.26	7.27
		2-22-90	2.58	8.95
		2-28-90	2.53	9.00
		4-9-90	2.48	9.05
		6-7-90	4.54	6.99
		7-25-90	4.00	7.53
		10-3-90	3.46	8.07
W-16	10.94	10-11-89	4.81	6.13
		2-22-90	3.92	7.02
		2-28-90	3.88	7.06
		4-9-90	7.81	3.13
		6-7-90	6.19	4.75
		7-27-90[e]	4.44	6.50
		10-3-90	4.38	6.56
W-17	12.14	10-11-89	9.12	3.02
		2-22-90	5.42	6.72
		2-28-90	5.35	6.79
		4-9-90	5.72	6.42
		6-7-90	---[f]	---[f]
		7-26-90	5.59	6.55
		10-3-90	5.72	6.42
W-18	11.34	10-11-89	5.52	5.82
		2-22-90	4.42	6.92
		2-28-90	4.77	6.57
		4-9-90	5.24	6.10
		6-7-90	4.28	7.06
		7-25-90	4.98	6.36
		10-3-90	5.44	5.90
W-19	10.27	4-9-90	5.11	5.16
		6-7-90	4.77	5.50
		7-25-90	4.93	5.34
		10-3-90	4.95	5.32
W-20	6.82	4-9-90	4.08	2.74
		6-7-90	3.79	3.03
		7-25-90	4.00	2.82
		10-3-90	4.03	2.79
W-21	9.48	4-9-90	5.21	4.27
		6-7-90	4.84	4.64
		7-25-90	5.05	4.43
		10-3-90	5.18	4.30
W-22	11.67	4-9-90	7.50	4.17
		6-7-90	7.36	4.31
		7-25-90	7.49	4.18
		10-3-90	7.68	3.99

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number	Top of Casing (Feet)	Date	Depth to Groundwater (feet)	Groundwater Elevation (Feet)
W-23	9.16	4-9-90	1.51	7.65
		6-7-90	1.78	7.38
		7-27-90[e]	2.63	6.53
		10-3-90	3.20	5.96
W-24	8.72	6-7-90	4.75	3.97
		7-25-90	5.02	3.70
		10-3-90	5.00	3.72

a Nielson Property
b Groundwater elevation taken from earlier reports; may not agree with calculated elevation using current top of casing.
c Depth to groundwater measurement not available.
d Well W-8 was not accessible on 7-25-90 and 7-26-90. It was sounded on 7-27-90.
e Wells W-16 and W-23 were under pressure when sounded in 7-25-90. The wells were allowed to equilibrate and were resounded on 7-27-90.
f Well W-17 not accessible on 6-7-90.

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TABLE 2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

Well Number	Sample Date	TPH/D Concentration (ppb)	TPH/MO Concentration (ppb)
W-1	4-14-87	<5000[a,b]	---[c]
	2-28-90	<500	---
	4-11-90	<100	570
W-2[d]	4-15-87	<1000[b]	---
W-3[d]		---	---
W-4[d]	4-14-87	<5000[b]	---
W-4	3-01-90	<500	---
	4-10-90	<100	<250
W-5[e]	9-27-89	20,000	---
B-5[d]		---	---
W-5A[d]	4-16-87	<1000[f]	<1000[f]
W-6[d]	4-16-87	<1000[f]	<1000[f]
W-7	9-26-89	1,100	---
	2-28-90	<500[g]	---
	4-11-90	5,600	7,500
	7-30-90	2,600	2,000
	10-4-90	5,000	6,000
W-8	4-17-87	10,000[h]	---
	9-26-89	7,100	---
	3-01-90	4,500	---
	4-18-90	5,300	---
W-13	2-28-90	<500	---
	4-12-90	<500	---
	7-27-90	<500	<1000
	10-4-90	<500	<1000
W-14	2-28-90	<500	---
	4-11-90	<100	<250
	7-30-90	<600	<1000
	10-4-90	<500	<1000
W-15	9-25-89	1,200	---
	4-13-90	1,500	---
W-16	9-27-89	4,700	---
	2-28-90	22,000	---
	4-13-90	9,000	---
W-17	9-25-89	700	---
	4-13-90	1,600	---
W-18	9-26-89	3,100	---
	4-13-90	5,100	---
W-19	4-12-90	1,100	---
	4-16-90	<500[i]	---
	7-27-90	<1000	8,000
	10-3-90	<500[j]	3,000

TABLE 2
(Continued)

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE

Number Well	Sample Date	TPH/D Concentration (ppb)	TPH/MO Concentration (ppb)
W-20	4-12-90	<500	---
	4-16-90	<500	---
	7-30-90	<500	<1000
	10-3-90	<500	<1000
W-21	4-12-90	1,400	---
	4-18-90	1,700	---
W-22	4-12-90	<500	---
	4-18-90	<500	---
W-23	4-12-90	2,000	---
	4-18-90	3,600	---
W-24	6-7-90	<500	---
	7-27-90	<500	<1000
	10-3-90	<500	<1000

a < indicates constituent not detected above this level.
b Oil and grease also not detected above 5000 ppb in Wells W-1, W-2 and W-4 (Nielson)
c --- indicates no analysis made for constituent.
d Abandoned well on Nielson property.
e Free product in Well W-5.
f Indicates total gasoline, diesel, and motor oil also not detected above 1000 ppb in wells W-5A and W-6.
g Review of gas chromatograph indicated TPH/D present at 300 ppb in Well W-7 on 2-28-90.
h Semiquantified results include gasoline, diesel, and some oil and grease in well W-8.
i Review of gas chromatograph indicated TPH/D present at 400 ppb in Well W-19 on 4-16-90.
j Review of gas chromatograph indicated TPH/D present at 300 ppb in Well W-19 on 10-3-90.

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TABLE 3
PRODUCT THICKNESS DATA FOR WELL W-5
EMERY BAY MARKETPLACE SITE

Date	Before Product Removal			After Product Removal			Volume Removed (Gal.)
	Depth to Oil	Depth to Water	Product Thickness	Depth to Oil	Depth to Water	Product Thickness	
7/25/90	2.98	5.10	2.12	*	*	*	0.72**
8/8/90	3.56	4.72	1.16	4.43	4.47	0.04	0.96**
8/24/90	3.56	4.80	1.24	4.94	4.94	0.00	0.50
9/7/90	3.62	4.83	1.21	4.58	4.79	0.21	0.33**
9/21/90	3.72	4.93	1.21	4.44	4.54	0.10	0.40**
10/4/90	3.84	4.94	1.10	3.24	3.96	0.72	0.33
10/17/90	3.92	4.96	1.04	3.94	3.96	0.02	0.22
10/31/90	4.06	5.24	1.18	4.65	4.72	0.07	0.40

*Product thickness not measured after product was removed on 7/25/90.
**Product removed with a bailer. The estimated volume removed includes an undetermined amount of water.

ATTACHMENT A

HYDROLOGIC DATA SHEETS

McLaren

HYDRODATA

DATE: 10-3-90

PROJECT: Marketplace EVENT: Sounding SAMPLER: CMS

NO.	WELL OR LOCATION	DATE MO DA YR	TIME HR MIN	MEASUREMENT	CODE	COMMENTS
1	W1	10 3 90	9 04	5.43	SWL	
2	W4		8 25	4.18	SWL	
3	W5		8 50	3.79	OIL	4.90 OWI
4	W7		9 31	3.22	SWL	2nd reading 3.22 at 14
5	W8		8 35	3.65	SWL	
6	W10					TAR MAT AT 7'
7	W13		9 25	4.67	SWL	
8	W14		9 20	5.09	SWL	
9	W15		8 45	3.46	SWL	
10	W16		10 35	4.36	OWL	4.38 OWI
11	W17		8 55	5.72	SWL	
12	W18		8 58	5.44	SWL	
13	W19		9 10	4.95	SWL	
14	W20		10 25	4.03	SWL	
15	W21		9 50	5.18	SWL	
16	W22		10 12	7.68	SWL	
17	W23		9 55	3.20	SWL	
18	W24	↓	9 41	5.00	SWL	
19						
20						

CODES:

- *SWL - Static Water Level (Feet)
- *IWL - Instant Water Level; Non-Static (Feet)
- *OIL - Oil Level (Feet)
- *OWI - Oil/Water Interface (Feet)
- *MTD - Measured Total Depth (Feet)
- FLO - Flow Rate (Gallons/Minute)
- CUM - Cumulative (Gallons)
- HRS - Total (Hours)
- PSI - Pressure (psi)²
- pH - 1 to 14
- Ec - Conductivity (µm HOS)
- TMP - Temperature (°C)
- TRB - Turbidity (NTU)
- ___ - _____ (Additional Code)

*All levels are depth from inner casing - describe any other reference points in comments column; when in doubt, describe reference point.

Note in comments column if well is not: properly labeled, locked, or able to be locked. Describe corrective action.

Note flooding of vault box, odor, access problems.

ATTACHMENT B

LABORATORY ANALYTICAL DATA SHEETS,
QA LABORATORY RESULTS,
CHAIN-OF-CUSTODY FORMS, AND
SAMPLING DATA SHEETS

McLaren Hart

Date: October 26, 1990
LP #: 3617

Julie Menack
McLaren/Hart
1135 Atlantic Avenue
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the four sample(s) submitted by you to the McLaren Analytical Laboratory on October 24, 1990, for the project *Marketplace*.

The analyses you requested are:

Modified EPA 8015 (4 - Water)

The report consists of the following sections:

1. A copy of the chain of custody
2. Sample description (chain of custody summary form)
3. Quality Control Report
4. Comments
5. Analytical results
6. Copy of final billing submitted to accounting.

Unless otherwise instructed by you, samples will be disposed of two weeks from the date of this letter.

Thank you for choosing McLaren Analytical Laboratory. We are looking forward to serving you in the future. Should you have any questions concerning this analytical report or the analytical methods employed, please do not hesitate to call.

Sincerely,

Anthony S. Wong, Ph.D.
Laboratory Director

11101 White Rock Road, Rancho Cordova, CA 95670 (916) 638-3696 FAX (916) 638-2842

McLaren CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY
Laboratory Project No.: 3617
Storage Refrigerator ID: 4-2
Storage Freezer ID:
Secured: Yes ✓ No

Project Name: Marketplace Project #: 59804 Sampler: colette shelly (Printed Name) colette shelly (Signature)

Relinquished by: (Signature and Printed Name) colette shelly	Received by: (Signature and Printed Name) FED X	Date:	Time:
Relinquished by: (Signature and Printed Name) FED X	Received by: (Signature and Printed Name) Tiffany E Bamer	Date: 10-4-90	Time: 10:30
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name) Logged by Tiffany E Barnes	Date: 10-4-90	Time: 11:00
Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name)	Date:	Time:

SHIP TO:
McLaren Analytical Laboratory
11101 White Rock Road
Rancho Cordova, CA 95670
(916) 638-3696
FAX (916) 638-2842

Method of Shipment: Fed Ex
Shipment ID:

Circle or Add Analysis(es) Requested

a) Identify specific metals requested under Special Instructions

Sample ID Number	Sample Description: Date	Time	Description	601/8010 (Halogenated Volatiles-GC)	602/8020 (Aromatic Volatiles-GC)	604/8040 (Phenols-GC)	608/8080 (Pesticides/PCB-GC)	610/8100 (PNA-GC)	624/8240 (Volatiles-GC/MS)	625/8270 (BNA-GC/MS)	TPH/G (Gasoline-GC)	TPH/D (Diesel-GC)	418.1 (IR)	8015 Modified (GC)	Metals-Total a	Metals-Soluble a	Fluoride/Perchlorate	Chloride/pH	TDS/Percent Solid	Specific Conductivity (EC)	+ Motor oil	TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	151851-52	10/3/90	11:00	Trip Blank									✓						✓			4	2	A	3617-001
2	151853-54	↓	11:35	W-20									✓						✓			4	2	A	002
3	151855-56		12:40	W-24									✓						✓			4	2	A	003
4	151857-58	✓	13:25	W-19									✓						✓			4	2	A	004
5																									
6																									
7																									
8																									
9																									
10																									

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks
Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other

Special Instructions/Comments:

Sample Archive/Disposal:
☐ Laboratory Standard
☐ Other

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie Menack
☐ Client Name:
Company: McLaren - Hart
Address: 1135 Atlantic Ave, Alameda
Phone: 415 521-5200 Fax:

McLaren Analytical Laboratory
11101 White Rock Road
Rancho Cordova, CA 95670
(916) 638-3696

Client: Julie Menack
McLaren/Hart
Alameda, CA 94501

L.P. #:	3617	Project Name:	Market Place
Date Rec'd:	10/4/90	Project #:	59804
Date Due:	10/11/90	Phone:	415-521-5200

A total of 4 samples were received on 10/4/90 at 11:00 under chain of custody number(s) . The chain of custody form(s) agree(s) with the sample container(s). The analysis(es) requested for the sample(s) received included:

- 5 sample(s) for 8015 modified and motor oil analysis.

Correction(s) made and/or Problem(s): None

McLaren Hart

QUALITY CONTROL REPORT

Method: Mod. EPA 8015
Units: ug/ml (ppm)

Date Analyzed: 10/12/90
Date Extracted: 10/09/90
Batch Number: 901009-0101

METHOD BLANK

Compounds	Reporting Limits	Results of the MB
Gasoline Range	0.5	BRL
Jet Fuel/Kerosene Range	0.5	BRL
Diesel Range	0.5	BRL
Motor Oil Range	1.	BRL

LABORATORY CONTROL SPIKE

Compounds	Concentration Spiked	Concentration Measured	Accuracy % Recovery	Precision RPD	Acceptance Limits[a] % Recovery	Acceptance Limits[a] RPD
Diesel Range	2.5	2.5	100	12	43 - 152	<25

[a] Acceptance limits were obtained statistically from McLaren quality control data.

(DC1-CN3624)

McLaren Hart

QUALITY CONTROL REPORT

METHOD BLANK RESULTS: A method blank (MB) is a laboratory generated sample free of any contamination. The method blank assesses the degree to which the laboratory operations and procedures cause false-positive analytical results for your samples. The method blank results associated with your samples are attached.

LABORATORY CONTROL SPIKES

The LCS Program:

The laboratory control spike is a well characterized matrix (organic pure type II water for water samples and contamination free sand for soil samples) which is spiked with certain target parameters and analyzed in duplicate at approximately 10% of the sample load in order to assure the accuracy and precision of the analytical method. The results of the laboratory control spike associated with your samples are attached.

Accuracy is measured using percent recovery, i.e.:

$$\text{Percent Recovery} = \frac{\text{(measured concentration)}}{\text{(actual concentration)}} \times 100$$

Precision is measured using the relative percent difference (RPD) from duplicate tests, i.e.:

$$\text{RPD} = \frac{\%\ \text{Recovery of Spike}_{(1)} - \%\ \text{Recovery of Spike}_{(2)}}{(\%\ \text{Recovery of Spike}_{(1)} + \%\ \text{Recovery of Spike}_{(2)})/2} \times 100$$

Control limits for accuracy and precision are different for different methods. They may also vary with the different sample matrices. They are based on laboratory average historical data and EPA limits which are approved by the Quality Assurance Department. McLaren Analytical Laboratory reanalyzes samples if the precision or accuracy is out of acceptance control limits.

McLaren Hart

COMMENTS

The samples in this project were analyzed by the methods requested on the chain of custody with no deviations in procedure.

Values for total petroleum hydrocarbons were calculated based only on detected peaks.

Gasoline and diesel standard obtained from local Chevron station. Gasoline is sold commercial as unleaded gasoline and diesel as diesel fuel #2.

Kerosene standard obtained from Post Jeff Chevron/Mobil Products. It is sold commercially as jet fuel and kerosene. Other jet fuel sources may produce different instrument responses and contain different hydrocarbon chains. The kerosene standard contains the same hydrocarbon chain as commercial jet fuel.

Motor oil standard obtained from local automotive store. Manufacturer and motor oil type are Pennzoil SAE 10W-40.

ANALYTICAL RESULTS

Test methods may include minor modifications of published EPA methods (e.g., reporting limits or parameter lists). Reporting limits are adjusted to reflect dilution of the sample when appropriate. Solids and waste are analyzed with no correction made for moisture content. Results are corrected for concentrations of analytes which may be found in the blanks.

ABBREVIATIONS USED IN THIS REPORT:

BRL	Below Reporting Limit
MB	Method Blank
MS	Matrix Spike
MSD	Matrix Spike Duplicate
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
RPD	Relative Percent Difference

Results are on the attached data sheets.

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Marketplace

Project Number: 59804

Sample Description: Trip Blank

Lab Project-ID Number: 3617-001

Sample Number: 151851

Date Sampled: 10/03/90

Date Received: 10/04/90

Date Extracted: 10/10/90

Date Analyzed: 10/12/90

Batch Number: 901009-0101

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil Range	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.0

Dilution: None

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

Approved By: C. Fong Date: 10/26/90

The cover letter and attachments are integral parts of this report.

McLaren Hart

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Marketplace

Project Number: 59804

Sample Description: W-20

Lab Project-ID Number: 3617-002

Sample Number: 151853

Date Sampled: 10/03/90

Date Received: 10/04/90

Date Extracted: 10/10/90

Date Analyzed: 10/12/90

Batch Number: 901009-0101

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil Range	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.0

Dilution: None

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

Approved By: _____ Date: 10/26/90.
C. Fong

The cover letter and attachments are integral parts of this report.

McLaren Hart

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Marketplace

Project Number: 59804

Sample Description: W-24

Lab Project-ID Number: 3617-003

Sample Number: 151855

Date Sampled: 10/03/90

Date Received: 10/04/90

Date Extracted: 10/10/90

Date Analyzed: 10/12/90

Batch Number: 901009-0101

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil Range	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.0

Dilution: None

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

Approved By: C. Fong Date: 10/26/90

The cover letter and attachments are integral parts of this report.

McLaren Hart

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 {a}
Preparation Method: EPA 3510

Project Name: Marketplace

Project Number: 59804

Sample Description: W-19

Lab Project-ID Number: 3617-004

Sample Number: 151857

Date Sampled: 10/03/90

Date Received: 10/04/90

Date Extracted: 10/10/90

Date Analyzed: 10/12/90

Batch Number: 901009-0101

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil Range	3.	1.
Total Petroleum Hydrocarbons	3.	1.0

Dilution: None

Comments: {a} Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

Sample contains 0.3 ppm of diesel which is below reporting limit. {b}

{b} Revised 11/12/90.

Approved By: C. Fong Date: 11/12/90

The cover letter and attachments are integral parts of this report.

McLaren Hart

McLaren Hart

Date: October 25, 1990
LP #: 3627

Julie Menack
McLaren/Hart
1135 Atlantic Avenue
Alameda, CA 94501

Dear Ms. Menack:

Enclosed are the laboratory results for the three sample(s) submitted by you to the McLaren Analytical Laboratory on October 5, 1990, for the project *Marketplace*.

The analyses you requested are:

Mod. EPA 8015 (3 - Water)

The report consists of the following sections:

1. A copy of the chain of custody
2. Sample description (chain of custody summary form)
3. Quality Control Report
4. Comments
5. Analytical results
6. Copy of final billing submitted to accounting.

Unless otherwise instructed by you, samples will be disposed of two weeks from the date of this letter.

Thank you for choosing McLaren Analytical Laboratory. We are looking forward to serving you in the future. Should you have any questions concerning this analytical report or the analytical methods employed, please do not hesitate to call.

Sincerely,

Anthony S. Wong, Ph.D
Laboratory Director

11101 White Rock Road, Rancho Cordova, CA 95670 (916) 638-3696 FAX (916) 638-2842

McLaren

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY		
Laboratory Project No.: 3627		Secured: ✓
Storage Refrigerator ID: 4-2		Yes ✓
Storage Freezer ID:		No

Project Name: Marketplace Project #: 59804 Sampler: colette shelly (Printed Name) colette shelly (Signature)

Relinquished by: (Signature and Printed Name)	Received by: (Signature and Printed Name)	Date:	Time:
Colette Shelly colette shelly	FED EX	10-5-90	10:00
FED EX	Offiye E. Bonus	10-5-90	11:15
	Logged by Offiye E. Bonus		

SHIP TO:
McLaren Analytical Laboratory
11101 White Rock Road
Rancho Cordova, CA 95670
(916) 638-3696
FAX (916) 638-2842

Method of Shipment: Fed Ex

Shipment ID:

Circle or Add Analysis(es) Requested

a) Identify specific metals requested under Special Instructions

	Sample ID Number	Date	Time	Description	601/8010 (Halogenated Volatiles-GC)	602/8020 (Aromatic Volatiles-GC)	604/8040 (Phenols-GC)	608/8080 (Pesticides/PCB-GC)	610/8100 (PNA-GC)	624/8240 (Volatiles-GC/MS)	625/8270 (BNA-GC/MS)	TPH/G (Gasoline-GC)	TPH/D (Diesel-GC)	418.1 (IR)	8015 Modified (GC)	Metals-Total a	Metals-Soluble a	Fluoride/Perchlorate	Chloride/pH	TDS/Percent Solid	Specific Conductivity (EC)	+ Motor oil		TAT	Container(s) #	Container(s) Type	FOR LABORATORY USE ONLY Lab ID
1	151859-60	10/4/90	1355	W-7											✓							✓		4	2	A	3627-001
2	151861-62	↓	1435	W-13											✓							✓		4	2	A	002
3	151863-64	↓	1315	W-14											✓							✓		4	2	A	003
4																											
5																											
6																											
7																											
8																											
9																											
10															A							B					

TAT (Analytical Turn-Around Times) 1 = 24 hours 2 = 48 hours 3 = 1 week 4 = 2 weeks

Container Types: B=Brass Tube, V=VOA Vial, A=1-Liter Amber, G=Glass Jar, C=Cassette, O = Other

Special Instructions/Comments:

Sample Archive/Disposal:
- ☐ Laboratory Standard
- ☐ Other

SEND DOCUMENTATION AND RESULTS TO (Check one):
- ☒ Project Manager/Office: Julie Menack
- ☐ Client Name:

Company: McLaren - Hart
Address: 1135 Atlantic Ave, Alameda
Phone: (415) 521-5200 Fax:

FOR LABORATORY USE ONLY. Sample Condition Upon Receipt:

SAMPLES RECEIVED IN GOOD CONDITION

McLaren Analytical Laboratory
11101 White Rock Road
Rancho Cordova, CA 95670
(916) 638-3696

Client: Julie Menack
McLaren/Hart
Alameda, CA 94501

L.P. #:	3627	Project Name:	Marketplace
Date Rec'd:	10/5/90	Project #:	59804
Date Due:	10/19/90	Phone:	415-521-5200

A total of 3 samples were received on 10/5/90 at 11:15 under chain of custody number(s) . The chain of custody form(s) agree(s) with the sample container(s). The analysis(es) requested for the sample(s) received included:

- 3 sample(s) for 8015 modified analysis.

Correction(s) made and/or Problem(s): None

McLaren Hart

METHOD BLANK RESULTS: A method blank (MB) is a laboratory generated sample free of any contamination. The method blank assesses the degree to which the laboratory operations and procedures cause false-positive analytical results for your samples. The method blank results associated with your samples are attached.

LABORATORY CONTROL SPIKES

The LCS Program:

The laboratory control spike is a well characterized matrix (organic pure type II water for water samples and contamination free sand for soil samples) which is spiked with certain target parameters and analyzed in duplicate at approximately 10% of the sample load in order to assure the accuracy and precision of the analytical method. The results of the laboratory control spike associated with your samples are attached.

Accuracy is measured using percent recovery, i.e.:

$$\text{Percent Recovery} = \frac{\text{(measured concentration)}}{\text{(actual concentration)}} \times 100$$

Precision is measured using the relative percent difference (RPD) from duplicate tests, i.e.:

$$\text{RPD} = \frac{\%\ \text{Recovery of Spike}_{(1)} - \%\ \text{Recovery of Spike}_{(2)}}{(\%\ \text{Recovery of Spike}_{(1)} + \%\ \text{Recovery of Spike}_{(2)})/2} \times 100$$

Control limits for accuracy and precision are different for different methods. They may also vary with the different sample matrices. They are based on laboratory average historical data and EPA limits which are approved by the Quality Assurance Department. McLaren Analytical Laboratory reanalyzes samples if the precision or accuracy is out of acceptance control limits.

McLaren Hart

QUALITY CONTROL REPORT

Method: Mod. EPA 8015
Units: ug/ml (ppm)

Date Analyzed: 10/12/90
Date Extracted: 10/05/90
Batch Number: 901005-1301

METHOD BLANK

Compounds	Reporting Limits	Results of the MB
Gasoline Range	0.5	BRL
Jet Fuel/Kerosene Range	0.5	BRL
Diesel Range	0.5	BRL
Motor Oil Range	1.	BRL

LABORATORY CONTROL SPIKE

Compounds	Concentration Spiked	Concentration Measured	Accuracy % Recovery	Precision RPD	Acceptance Limits[a] % Recovery	Acceptance Limits[a] RPD
Diesel Range	2.5	2.6	104	1	43 - 152	<25

[a] Acceptance limits were obtained statistically from McLaren quality control data.

(DC3-CN3627)

McLaren Hart

COMMENTS

The samples in this project were analyzed by the methods requested on the chain of custody with no deviations in procedure.

Values for total petroleum hydrocarbons were calculated based only on detected peaks.

Gasoline and diesel standard obtained from local Chevron station. Gasoline is sold commercially as unleaded gasoline and diesel as diesel fuel #2.

Kerosene standard obtained from Post Jeff Chevron/Mobil Products. It is sold commercially as jet fuel and kerosene. Other jet fuel sources may produce different instrument responses and contain different hydrocarbon chains. The kerosene standard contains the same hydrocarbon chain as commercial jet fuel.

Motor oil standard obtained from local automotive store. Manufacturer and motor oil type are Pennzoil SAE 10W-40.

ANALYTICAL RESULTS

Test methods may include minor modifications of published EPA methods (e.g., reporting limits or parameter lists). Reporting limits are adjusted to reflect dilution of the sample when appropriate. Solids and waste are analyzed with no correction made for moisture content. Results are corrected for concentrations of analytes which may be found in the blanks.

ABBREVIATIONS USED IN THIS REPORT:

BRL	Below Reporting Limit
MB	Method Blank
MS	Matrix Spike
MSD	Matrix Spike Duplicate
LCS	Laboratory Control Spike
LCSD	Laboratory Control Spike Duplicate
RPD	Relative Percent Difference

Results are on the attached data sheets.

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Marketplace

Project Number: 59804

Sample Description: W-7

Lab Project-ID Number: 3627-001

Sample Number: 151860

Date Sampled: 10/04/90

Date Received: 10/05/90

Date Extracted: 10/09/90

Date Analyzed: 10/12/90

Batch Number: 901009-0101

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	1.
Jet Fuel/Kerosene Range	BRL	1.
Diesel Range	5.	1.
Motor Oil Range	6.	2.
Total Petroleum Hydrocarbons	11.	2.

Dilution: None

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

Approved By: C. Fong Date: 10/26/90

The cover letter and attachments are integral parts of this report.

McLaren Hart

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Marketplace

Project Number: 59804

Sample Description: W-13

Lab Project-ID Number: 3627-002

Sample Number: 151862

Date Sampled: 10/04/90

Date Received: 10/05/90

Date Extracted: 10/05/90

Date Analyzed: 10/12/90

Batch Number: 901005-1301

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil Range	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.0

Dilution: None

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

Approved By: C. Fong Date: 10/26/90

The cover letter and attachments are integral parts of this report.

McLaren Hart

TOTAL PETROLEUM HYDROCARBONS

Analytical Method: Modified EPA 8015 (a)
Preparation Method: EPA 3510

Project Name: Marketplace

Project Number: 59804

Sample Description: W-14

Lab Project-ID Number: 3627-003

Sample Number: 151864

Date Sampled: 10/04/90

Date Received: 10/05/90

Date Extracted: 10/05/90

Date Analyzed: 10/13/90

Batch Number: 901005-1301

PETROLEUM HYDROCARBONS	CONCENTRATION ug/ml (ppm)	REPORTING LIMIT ug/ml (ppm)
Gasoline Range	BRL	0.5
Jet Fuel/Kerosene Range	BRL	0.5
Diesel Range	BRL	0.5
Motor Oil Range	BRL	1.
Total Petroleum Hydrocarbons	BRL	1.0

Dilution: None

Comments: (a) Derived from EPA 8015. Gas Chromatograph with flame ionization detector is used to perform the analysis. Modification is due to the quantitation of petroleum fraction instead of non-halogenated volatile compounds.

Approved By: C. Fong Date: 10/26/90

The cover letter and attachments are integral parts of this report.

McLaren Hart

SAMPLING EVENT DATA SHEET

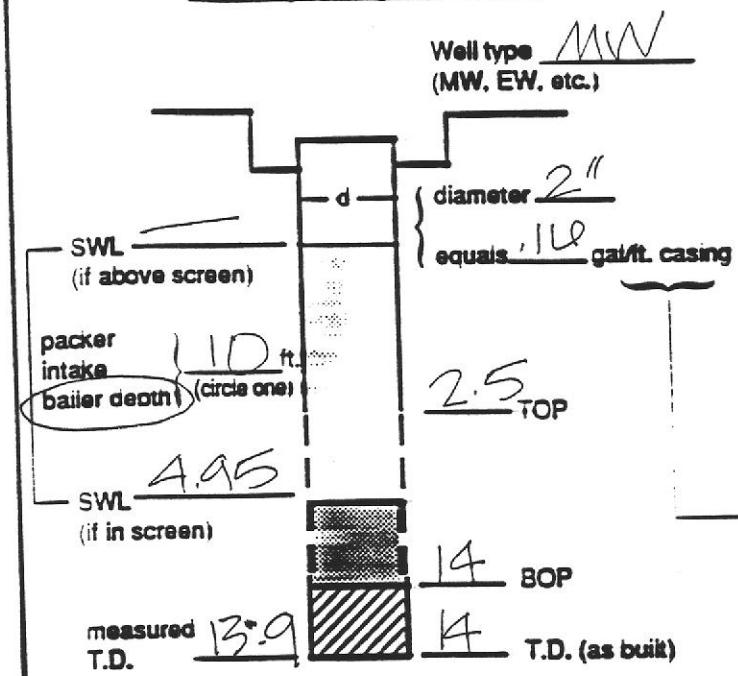
(fill out completely)

McLaren

WELL OR LOCATION MW-19

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 10-3-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	13:10		
Stop	13:20		
Sampled	13:25		
(Final IWL)			

Purge calculation

.16 gal/ft. * 9 ft. = 1.4 gals x 3 = 4.5 gals.

SWL to BOP or packer to BOP · one volume · purge volume-3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

centrifugal used to purge 3 casing volumes. Disposable bailer used to sample.

Actual gallons purged 6

Actual volumes purged 4

Well yield ⊕ (see below) HY

COC # 220403

Sample I.D.	Analysis	Lab
151857	8015+	MAL
151858	Motoroil	↓

Additional comments:

lots of brown globs of product on bailer when withdrawn from well.

Gallons purged *	TEMP °C / (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)
1. 1.5	83.4	960	7.17	43.7
2. 3	81.7	700	6.90	14.2
3. 4.5	80.7	1010	6.98	11.1
4.		sample turbidity →		18.9
5. 6	80.5	910	6.95	12.6

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

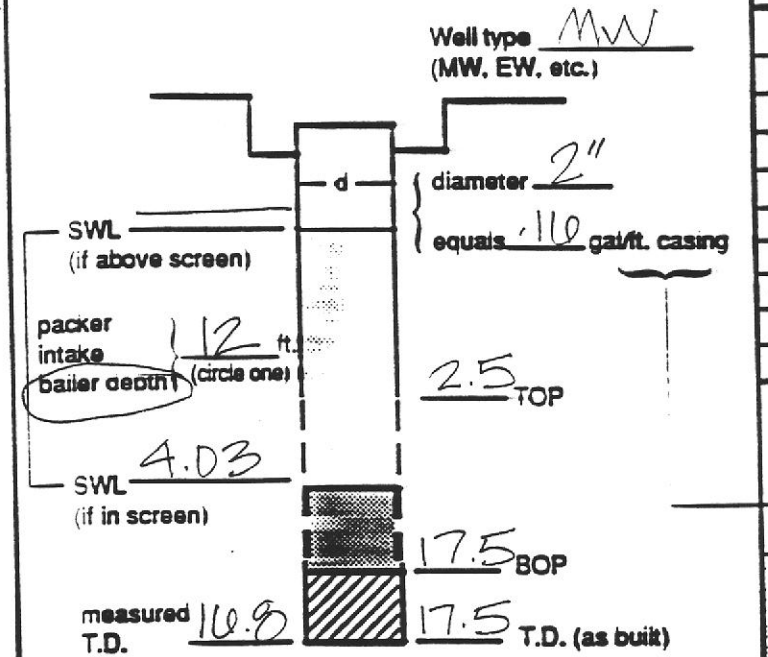
(fill out completely)

McLaren

WELL OR LOCATION MW-20

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 10-3-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	11:23		
Stop	11:28		
Sampled	11:35	→	5.12
(Final IWL)			

Purge calculation

.16 gal/ft. * 13 ft. = 2 gals x 3 = 6 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

centrifugal pump used to purge 3 casing volumes. Disposable bailer used to sample.

pump used on lowest setting and 1/2 discharge

Actual gallons purged 8.8

Actual volumes purged 4

Well yield ⊕ (see below) HY

COC # 220403

Sample I.D.	Analysis	Lab
151853	8015+ Motoroil	MAL
151854		↓
Trip Blank:		
151851	8015+ Motoroil	MAL
151852		↓

Additional comments:

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2	74.7	1630	7.74	124.5		
2. 4	75.1	1660	7.67	123.1		
3. 6	74.6	1400	7.23	70.3		
4.		sample	turbidity	→ 45.6		
5. 8	73.2	1330	7.22	43.7		

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop | MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. | LY - Able to purge 3 volumes by returning later or next day. | VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

(fill out completely)

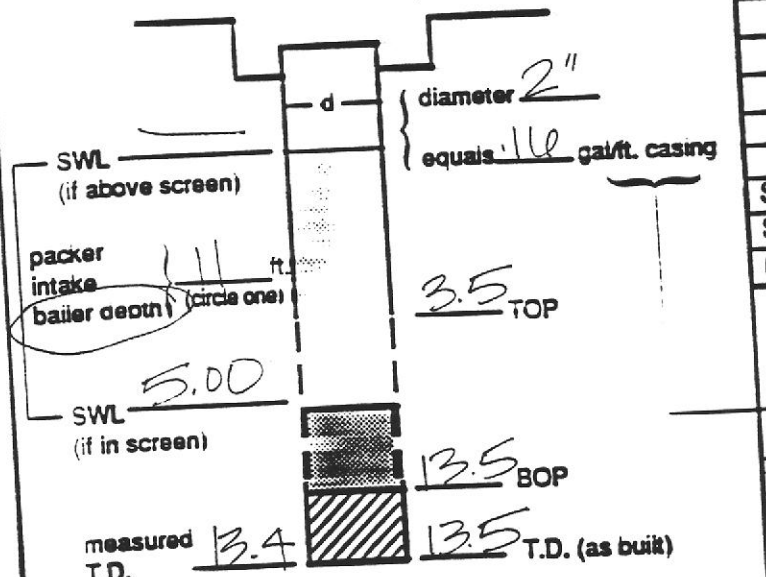
McLaren

WELL OR LOCATION MW-24

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 10-3-90

Well / Hydrologic statistics

Well type (MW, EW, etc.) MW



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	12:25		
Stop	12:35		
Sampled	12:40	→	5.83
(Final IWL)			

Purge calculation

.16 gal/ft. * 8.5 ft. = 1.4 gals x 3 = 4.5 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

centrifugal used to purge 3 casing volumes. Disp. bailer used to sample pump used at lowest setting and at 1/2 discharge.

Actual gallons purged 6

Actual volumes purged 4

Well yield ⊕ (see below) HY

COC # 220403

Sample I.D.	Analysis	Lab
151855	BTEX	MAL
151856	Motor oil	↓

Additional comments:

Gallons purged *	TEMP °C/°F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.5	81.4	410	7.36	115.8		
2. 3	78.6	480	7.21	174.3		
3. 4.5	78.1	220	7.15	83.8		
4.		sample turbidity →		121.6		
5. 6	77.8	200	7.05	59.7		

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

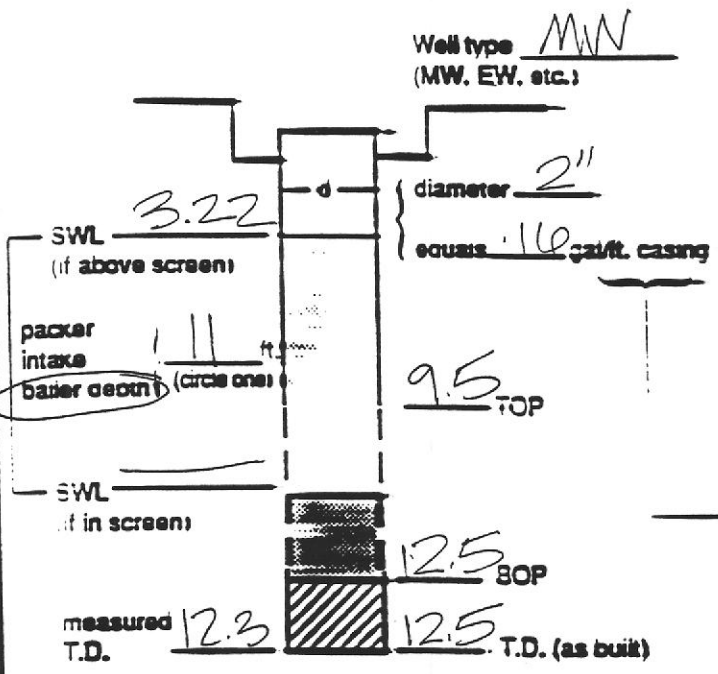
(fill out completely)

McLaren

WELL OR LOCATION MW-7

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 10-4-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	11:50	3 gpm	
	11:55		
peri	13:40		
Stop	13:50		
Sampled	13:55		4.43
(Final IWL)			

Purge calculation

.16 gal/ft. • 9 ft. = 1.5 gals x 3 = 4.5 gals.

SWL to BOP or packer to BOP | one volume | purge volume - 3 casings

Head purge calculation (Airlift only)

gal/ft. ___ ft. ___ gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

centrifugal used to purge 2 casing volumes. Disp. bailer used to sample. peristaltic used to purge 3rd casing volume.

Actual gallons purged 4.5

Actual volumes purged 3

Well yield ⊕ HY

(see below)

COC # 220267

Sample I.D.	Analysis	Lab
151859	8015+	MAL
151860	Motordil	↓

Additional comments:

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)	
1. 1.5	73.6	1310	6.82	off scale	foamy discharge
2. 3	74.1	3260	6.66	160.5	
3. 4.5	73.6	3340	6.46	8.7	
4.					
5.					

* Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one outing by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

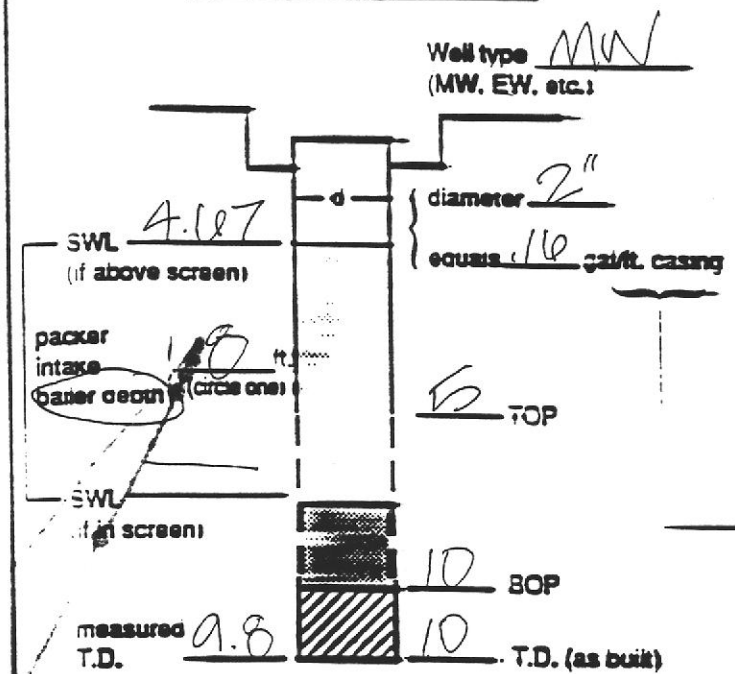
(fill out completely)

McLaren

WELL OR LOCATION W-13

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 10-4-90

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	14:05		
Stop	14:30		
Sampled	14:35		5.51
(Final IWL)			

Purge calculation

.16 gal/ft. • 5.3 ft. = .85 gals x 3 = 2.5 gals.

SWL to BOP or packer to BOP | one volume | purge volume-3 casings

Head purge calculation (Airlift only)

gal/ft. • ft. = gals

packer to SWL

Equipment Used / Sampling Method / Description of Event:

peristaltic used to purge 3 casing volumes. Disp. bailer used to sample.

Actual gallons purged 2.5

Actual volumes purged 3

Well yield ⊕ (see below) MY

COC # 220207

Sample I.D.	Analysis	Lab
151801	8015+	MAL
151802	Motoroil	↓

Additional comments:

Gallons purged *	TEMP °C / °F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	70.0	240	8.09	10.8		
2. 2	70.10	200	7.94	3.6		
3. 3	71.0	200	7.80	2.4		
4.						
5.		sample turbidity →				

* Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one outing by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

SAMPLING EVENT DATA SHEET

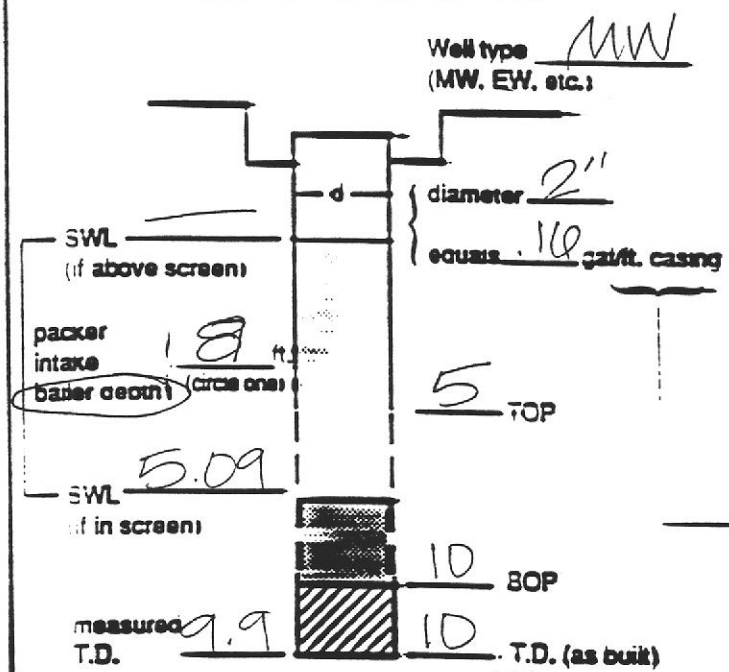
(fill out completely)

McLaren

WELL OR LOCATION W-4

PROJECT Marketplace EVENT Quarterly SAMPLER CMS DATE 10-4-90

Well / Hydrologic statistics



Action	Time	Pump rate	WL (low yield)
Start pump / Begin	11:30		
Stop	13.10		
Sampled	13.15		5.91
(Final WL)			

Purge calculation

.16 gal/ft. • 5 ft. = .8 gals x 3 = 2.4 gals.

SWL to BOP or packer to BOP | one volume | purge volume- 3 casings

Head purge calculation (Airlift only)

gal/ft. ___ ft. ___ gals.

packer to SWL ___

Equipment Used / Sampling Method / Description of Event:

peristaltic pump used to purge 3 casing volumes disp. bailer used to sample. collection of 2 liter ambers resulted in near evacuation of well.

Actual gallons purged 2.5

Actual volumes purged 3

Well yield ⊕ MV
(see below)

Additional comments:

6.00 WL = 80% recharge.

COC # 220267

Sample I.D.	Analysis	Lab
151863	8015 +	MAL
151864	Motor oil	↓

Gallons purged *	TEMP °C / (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	78.4	3650	7.48	4.0		
2. 2	72.1	3780	7.89	3.1		
3. 3	70.0	2540	7.57	4.0		
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY- Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one outing by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.