QUARTERLY GROUNDWATER MONITORING REPORT FIRST QUARTER 1993 EMERY BAY MARKETPLACE EMERYVILLE, CALIFORNIA

MARCH 15, 1993

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ENVIRONMENTAL ENGINEERING CORPORATION

McLaren Hart™

March 15, 1993

Ms. Lynn Tolin
Christie Avenue Partners - JS
5800 Shellmound Avenue, Suite 210
Emeryville, California 94608

Dear Ms. Tolin:

QUARTERLY GROUNDWATER MONITORING REPORT FIRST QUARTER 1993, EMERY BAY MARKETPLACE, EMERYVILLE, CALIFORNIA

This letter report documents the results of the quarterly monitoring activities conducted at the Emery Bay Marketplace (Marketplace) property during January 1993. This is the tenth 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) (McLaren, 1990b). The Work Plan was submitted to address recommendations made in the report "Groundwater Characterization, Emery Bay Marketplace," June 19, 1990 (Groundwater Characterization Report) (McLaren, 1990a).

This letter report presents the results of the depth to groundwater measurements and the groundwater quality sampling and analyses performed during the month of January 1993. The data evaluation compares data collected during this quarter to historic data collected at the site.

FIELD METHODS

Depths to groundwater in all existing wells at the Marketplace property were measured with a Solinist electronic water level indicator on January 26, 1993. A Marine Moisture Control Company oil-water interface probe was used to measure depth to oil and depth to groundwater in the well where free product was present (Well W-5). Hydrologic data sheets with original field water level data are provided in Attachment A. A summary of historic depth to groundwater measurements, monitoring well surface casing elevations, and calculated groundwater surface elevations is presented in Table 1.

1135 Atlantic Avenue, Alameda, CA 94501 (510) 521-5200 FAX (510) 521-1547

A peristaltic pump was used to purge groundwater prior to sampling with a disposable bailer on January 26 and 27, 1993. Groundwater was purged until a minimum of three casing volumes of groundwater were removed, turbidity readings were below 50 NTUs and temperature, conductivity and Ph readings were stabilized. Groundwater samples were collected in one-liter amber bottles.

Groundwater samples from wells W-7, W-13, W-14, W-19, W-20, and W-24 were analyzed for TPH/D and TPH/MO by EPA Method 8015 Modified. For this quarter, groundwater samples were also analyzed for gasoline and kerosene by EPA Method 8015 Modified. McLaren/Hart specifically requested lower detection limits of 0.05 ppm for all compounds analyzed. These 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 on each day of sampling. The analytical laboratory data sheets, QA laboratory results, chain-of-custody records, and sampling data sheets are included in Attachment B. The analytical results are summarized and presented with the historic analytical data in Table 2.

DATA EVALUATION

The data which are evaluated consist of: 1) groundwater surface elevations, as determined by the January 26, 1993 depth to groundwater measurements; 2) groundwater flow directions, as determined from the groundwater surface contour map that has been prepared based on the groundwater elevations; and 3) groundwater quality data obtained in January 1993.

Groundwater Elevations

The January 26, 1993 groundwater surface elevation contours for the artificial fill material beneath the site are presented in Figure 1. Elevations from the following wells were omitted from the preparation of groundwater surface elevation contours for the reasons described:

- Elevations from Wells W-15, W-16, and W-22 were not used to construct the map because these wells are completed in the native material below the artificial fill material.

- The groundwater elevation for Well W-5 was not used because the free product which occurs in this well is likely to affect the measured groundwater elevation.

- The elevation from Well W-7 was not used because it is significantly higher than elevations in adjacent wells. The higher elevation at Well W-7 has consistently been observed when water elevations have previously been measured. As discussed in the Groundwater Characterization Report, perched groundwater conditions may occur within the artificial fill material at this location.

Groundwater Flow Direction

The groundwater elevation map for wells completed in the native material is consistent with previous groundwater flow maps and indicates that groundwater flows in a westerly to southwesterly direction, toward Christie Avenue. The January 1993 water levels were generally higher than those measured in October 1992, possibly due to precipitation during the wet season. As discussed in the Groundwater Characterization Report (McLaren, 1990a), local variations in groundwater flow near Wells W-4 and W-8 may be caused by the slurry wall that is installed to a depth of 35 feet on the upgradient property. Well W-8 was not accessible on this date.

Groundwater Quality

Groundwater samples were collected on January 26 and 27, 1993 from six wells within and on the downgradient side of the property (W-7, W-13, W-14, W-19, W-20, and W-24). All groundwater samples collected in January 1993, were analyzed for total petroleum hydrocarbons (TPH) as diesel (TPH/D), motor oil (TPH/MO), kerosene (TPH/K), and as gasoline (TPH/G) by EPA Method 8015 Modified, with a detection limit of 0.05, where possible. The analytical results are summarized in Table 2 and presented in Figure 1. The following discussion focuses on the results of the analyses in the quarterly monitoring program.

The purpose of the quarterly monitoring program is to confirm that total petroleum hydrocarbons (TPH) are confined to within the Marketplace property and have not migrated off-site. The six wells (W-7, W-13, W-14, W-19, W-20 and W-24) that were sampled during this quarter, have been sampled since 1989 (W-7) and since 1990 (W-13, W-14, W-19, W-20, and W-24). The following is a summary of the past as well as present analytical results for each of the six downgradient wells.

- Well W-7 is located in the center of the site. TPH/D has been detected in groundwater at levels ranging from less than 0.5 (non-detect) to 5.6 ppm. The TPH/D result from the January 1993 sampling was <0.5 ppm. Prior to the January 1993 sampling event, TPH/MO had been detected at levels between 2 and 12 ppm. The January 1993 TPH/MO result was 8.0 ppm. Therefore, in the January 1993 sampling, both TPH/D and TPH/MO results were confirmed within the past range of results for groundwater sampled from this well. TPH/G and TPH/K were reported as non-detect.

- Well W-13 is located on the downgradient, central side of the site. TPH had never been detected in groundwater from this well prior to the January 1993 sampling event, when TPH as motor oil was detected at 0.11 ppm. The laboratory data sheet indicated that the gas chromatographic pattern for motor oil in the sample did not exactly match the standard chromatograph. TPH/MO was detected because the detection limits for TPH were reduced from 0.5 to 0.05. Additional quarterly sampling events will confirm whether TPH/MO is present in this well.

- Well W-14 is located on the downgradient, southern side of the site. Similar to well W-13, TPH had never been detected in groundwater from this well prior to the January 1993 sampling event, when TPH as motor oil was detected at 0.13 ppm. The laboratory data sheet indicated that the gas chromatographic pattern for motor oil in the sample did not exactly match the standard chromatograph. TPH as motor oil was detected because the detection limits for TPH were reduced from 0.5 to 0.05. Additional quarterly sampling events will confirm whether TPH as motor oil is present in this well.

- Well W-19 is located within the site upgradient of W-7 on the northwestern side of the site. The TPH/D detected one time, at 1.1 ppm in April 1990, was confirmed by a detection of TPH/D of 0.79 in January 1993. TPH/MO has been detected in the past in groundwater sampled from well W-19 at levels ranging from less than one (the detection limit) to 34 ppm. The January 1993 TPH/MO result was just above this range at 35 ppm. The analytical results indicate that TPH/MO present in this well match the standard chromatograph.

- Well W-20 is located on the far downgradient side of the site. TPH/D has never been detected in groundwater from this well. TPH/MO was detected in groundwater sampled from well W-20 in April 1991 at 2.3 ppm, and in January 1993 at 0.42 ppm. It is likely that TPH/MO has always been present in this well below the detection limits which have ranged from 0.5 to 1 ppm. The laboratory data sheet indicated that the gas chromatographic pattern for motor oil in the sample did not exactly match the standard chromatograph.

- Well W-24 is located on the downgradient side of the site. TPH/D has not been detected in the groundwater sampled from well W-24 in either the previous or the most recent sampling events. TPH/MO was detected in April 1991 at 1.1 ppm, and in January 1993 at 0.2 ppm. It is likely that TPH/MO has always been present in this well below the detection limits which have ranged from 0.5 to 1 ppm. The laboratory data sheet indicated that the gas chromatographic pattern for motor oil in the sample did not exactly match the standard chromatograph.

Product thickness has been measured in wells W-5 and W-16 since October 1989. Product thickness in well W-5 has not changed very much since the free product removal program ended in June 1991. Product thickness in the most recent four quarters has ranged between 0.80 and 1.5 feet in well W-5. Prior to the end of monthly product removal for well W-5, product thickness had ranged between 0.71 and 2.12 feet. Prior to October 1991, the product thickness in well W-16 ranged between not detected and 0.07 feet. Product has not been measurable in well W-16 since October 1991.

SUMMARY AND CONCLUSIONS

The results from the ongoing quarterly monitoring activities conducted at the Emery Bay Marketplace property are summarized as follows:

- The January 1993 groundwater flow map for the artificial fill (Figure 1) is consistent with previous groundwater flow maps, and shows that groundwater flow is toward the west-southwest.

- TPH as gasoline and kerosene were not detected in any wells above the detection limit of 0.05 ppm.

- TPH/D and TPH/MO were confirmed in wells W-7 and W-19, where they had been previously detected. The chromatographic patterns for TPH/D and TPH/MO at these locations matched the standard chromatographic range.

- Hydrocarbons quantified as TPH/MO are present at concentrations less than 0.5 ppm in the four wells located on the downgradient side of the site (wells W-13, W-14, W-20, and W-24). Hydrocarbons were detected previously in two of these wells one time in April 1991, but had not been confirmed until January 1993, when the analysis was done with lower detection limits. The chromatographic pattern of the TPH/MO detected at all four of these locations did not match the standard chromatograph, indicating that the source of TPH/MO on the downgradient side of the site is not the same as the source at wells W-7 and W-19.

These results indicate that the TPH/D and TPH/MO detected in wells W-7 and W-19 are from a different source than the TPH/MO detected in wells W-13, W-14, W-20, and W-24, all of which are located on the downgradient side of the site. Based upon the site use history, it is likely that the source of TPH in W-7 and W-19 is the former Nielsen Trucking facility which was in the vicinity of these wells. The site use history for the Marketplace property indicates that an asphalt producing facility was formerly in the vicinity of the Marketplace building and that a tar-like substance is distributed throughout the fill beneath this and adjacent properties.

Because TPH/MO was detected in the four downgradient wells when the EPA Method 8015 analysis was performed with low detection limits (as requested by the Alameda County of Environmental Health), it can be inferred that TPH/MO is present in this area wherever fill is present at these low concentrations.

If you have any questions regarding this report, please call us at (510) 521-5200.

Sincerely,

Julie S Menack

Julie S. Menack, CEG
Supervising Geoscientist

cc: Brian Oliva, Alameda County Department of Environmental Health
Richard Hyatt, Regional Water Quality Control Board

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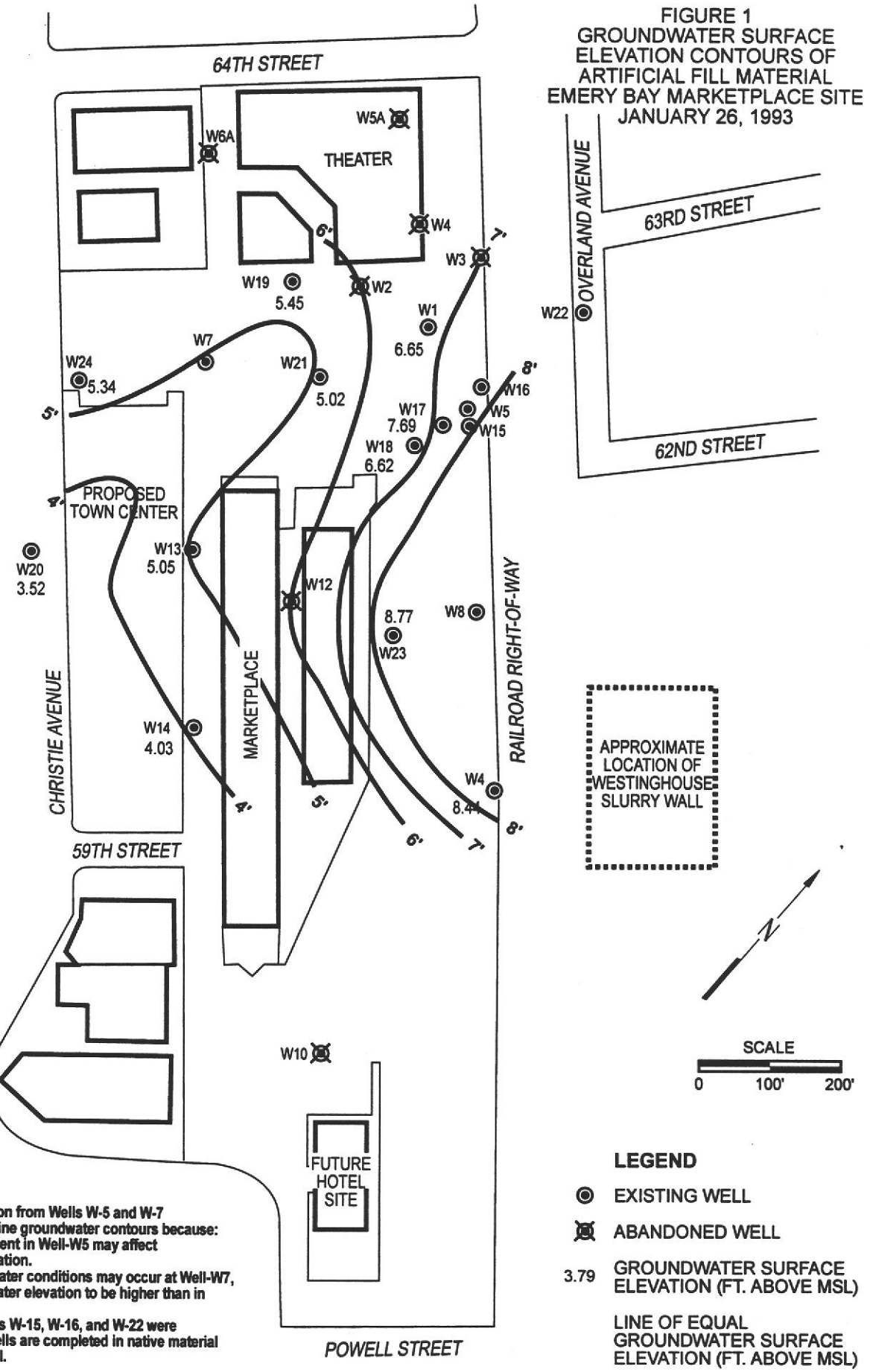
REFERENCES

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.

FIGURE 1
GROUNDWATER SURFACE ELEVATION CONTOURS OF ARTIFICIAL FILL MATERIAL EMERY BAY MARKETPLACE SITE JANUARY 26, 1993



LEGEND

- ◉ EXISTING WELL
- ⊠ ABANDONED WELL
- 3.79 GROUNDWATER SURFACE ELEVATION (FT. ABOVE MSL)
- LINE OF EQUAL GROUNDWATER SURFACE ELEVATION (FT. ABOVE MSL)

* Groundwater elevation from Wells W-5 and W-7 were not used to define groundwater contours because:
- * Free product present in Well-W5 may affect groundwater elevation.
- * Perched groundwater conditions may occur at Well-W7, causing groundwater elevation to be higher than in adjacent wells.

** Elevations from Wells W-15, W-16, and W-22 were not used because wells are completed in native material below the artificial fill.

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TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
W-1[a]	11.47	08-07-81	4.30	6.20[b]	
		09-10-81	4.40	6.10[b]	
		05-06-87	6	6.08[b]	
		08-20-89	5.60	5.87	
		10-11-89	5.63	5.84	
		02-22-90	4.92	6.55	
		02-28-90	5.02	6.45	
		04-09-90	5.44	6.03	
		06-07-90	5.37	6.10	
		07-25-90	5.26	6.21	
		10-03-90	5.43	6.04	
		01-03-91	5.69	5.78	
		04-03-91	4.74	6.73	
		10-25-91	5.22	6.25	
		01-15-92	4.88	6.59	
		04-23-92	4.98	6.49	
		07-21-92	5.16	6.31	
		10-22-92	5.79	5.68	
		01-26-93	4.82	6.65	
W-4	9.96	08-07-81	4.30	6.20[b]	
		09-10-81	4.40	6.10[b]	
		01-18-82	2.50	8.00[b]	
		03-27-85	?[c]	8.65	
		08-20-89	3.95	6.01	
		10-11-89	3.87	6.09	
		02-22-90	2.0	7.96	
		02-28-90	2.39	7.57	
		04-09-90	3.17	6.79	
		06-07-90	2.73	7.23	
		07-25-90	3.71	6.25	
		10-03-90	4.18	5.78	
		01-03-91	3.64	6.32	
		04-03-91	1.45	8.51	
		10-25-91	4.29	5.67	
		01-15-92	2.56	7.40	
		04-23-92	2.80	7.16	
		07-21-92	4.03	5.93	
		10-22-92	4.50	5.46	
		01-26-93	1.52	8.44	
W-5	11.41	08-07-81	4.70	7.50[b]	c
		09-10-81	4.90	7.30[b]	c
		01-18-82	2.50	9.60[b]	c
		03-27-85	?[c]	9.28	c
		10-11-89	4.43	6.98	0.71
		02-22-90	3.80	7.61	0.88
		02-28-90	4.43	6.98	1.65
		04-09-90	4.73	6.68	1.82
		06-07-90	4.30	7.11	1.80
		07-25-90	5.10	6.31	2.12
		10-03-90	4.90	6.51	1.11
		01-03-91	4.77	6.64	0.85
		04-03-91	2.42	8.99	0.03
		10-25-91	5.47	5.94	1.18
		01-15-92	3.21	8.2	0.80
		04-23-92	3.13	8.28	1.41
		07-21-92	3.55	7.86	1.50
		10-22-92	4.28	7.13	1.45
		01-26-93	3.28	8.13	1.24

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
W-7[a]	9.05	05-06-87	3	6.88[b]	
		08-20-89	3.59	5.46	
		10-11-89	3.08	5.97	
		02-22-90	1.75	7.30	
		02-28-90	1.31	7.74	
		04-09-90	2.42	6.63	
		06-07-90	1.21	7.84	
		07-25-90	2.76	6.29	
		10-03-90	3.22	5.83	
		01-03-91	3.17	5.88	
		04-03-91	1.18	7.87	
		10-25-91	3.47	5.59	
		01-15-92	3.88	5.17	
		04-23-92	3.20	5.85	
		07-21-92	3.65	5.40	
		10-22-92	4.58	4.77	
		01-26-93	1.12	7.93	
W-8[a]	10.43	05-06-87	5.5	6.88[b]	
		08-20-89	3.59	6.84	
		02-22-90	1.5	8.93	
		02-28-90	1.78	8.65	
		04-09-90	3.12	7.31	
		06-07-90	2.90	7.53	
		07-27-90[d]	3.33	7.10	
		10-03-90	3.65	6.78	
		01-03-91	3.46	6.97	
		04-03-91	1.47	8.96	
		10-25-91	3.54	6.89	
		01-15-92	2.98	7.45	
		04-24-92	3.01	7.42	
		07-21-92	3.41	7.02	
		10-22-92	4.23	6.20	
W-13	8.15	08-20-89	4.64	3.51	
		10-11-89	4.60	3.55	
		02-22-90	3.85	4.30	
		02-28-90	4.18	3.97	
		04-09-90	4.31	3.84	
		06-07-90	3.93	4.22	
		07-25-90	4.40	3.75	
		10-03-90	4.67	3.48	
		01-03-91	4.43	3.72	
		04-03-91	3.64	4.51	
		10-25-91	4.54	3.72	
		01-15-92	3.82	4.33	
		04-23-92	4.12	4.03	
		07-21-92	4.44	3.71	
		10-22-92	4.42	3.73	
		01-26-93	3.10	5.05	
W-14	7.97	08-20-90	5.02	2.95	
		02-22-90	4.19	3.78	
		02-28-90	4.46	3.51	
		04-09-90	4.36	3.61	
		06-07-90	5.29	2.68	
		07-25-90	4.83	3.14	
		10-03-90	5.09	2.88	
		01-03-91	4.32	3.65	
		04-03-91	4.31	3.66	

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
		10-25-91	4.41	3.56	
		01-15-92	4.18	3.79	
		04-23-92	4.93	3.04	
		07-21-92	4.57	3.40	
		10-22-92	5.28	2.69	
		01-26-93	3.94	4.03	
W-15	11.53	08-20-89	3.43	8.10	
		10-11-89	4.26	7.27	
		02-22-90	2.58	8.95	
		02-28-90	2.53	9.00	
		04-09-90	2.48	9.05	
		06-07-90	4.54	6.99	
		07-25-90	4.00	7.53	
		10-03-90	3.46	8.07	
		01-03-91	2.97	8.56	
		04-03-91	3.05	8.48	
		10-25-91	2.88	8.65	
		01-15-92	3.54	7.99	
		04-23-92	2.78	8.75	
		07-21-92	2.67	8.86	
		10-22-92	2.65	8.88	
		01-26-93	2.47	9.06	
W-16[1]	10.94	10-11-89	4.81	6.13	0.07
		02-22-90	3.92	7.02	NM
		02-28-90	3.88	7.06	NM
		04-09-90	7.81	3.13	NM
		06-07-90	6.19	4.75	NM
		07-27-90[1]	4.44	6.50	NM
		10-03-90	4.38	6.56	0.02
		01-03-91	4.67	6.27	0.02
		04-03-91	3.50	7.48	0.02
		10-25-91	4.64	6.30	NM
		01-15-92	4.11	6.83	NM
		04-23-92	3.89	7.05	NM
		07-21-92	4.28	6.66	NM
		10-22-92	NA	NA	NM
		01-26-93	2.47	8.47	NM
W-17	12.14	10-11-89	9.12	3.02	
		02-22-90	5.42	6.72	
		02-28-90	5.35	6.79	
		04-09-90	5.72	6.42	
		06-07-90	---[2]	---[2]	
		07-26-90	5.59	6.55	
		10-03-90	5.72	6.42	
		01-03-91	6.28	5.86	
		04-03-91	4.69	7.45	
		10-25-91	6.00	6.14	
		01-15-92	5.57	6.57	
		04-23-92	5.17	6.97	
		07-21-92	5.54	6.60	
		10-22-92	6.10	6.04	
		01-26-93	4.45	7.69	

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
W-18	11.34	10-11-89	5.52	5.82	
		02-22-90	4.42	6.92	
		02-28-90	4.77	6.57	
		04-09-90	5.24	6.10	
		06-07-90	4.28	7.06	
		07-25-90	4.98	6.36	
		10-03-90	5.44	5.90	
		01-03-91	5.84	5.50	
		04-03-91	4.94	6.40	
		10-25-91	5.55	5.79	
		01-15-92	5.24	6.10	
		04-23-92	4.81	6.53	
		07-21-92	5.01	6.33	
		10-22-92	5.55	5.79	
		01-26-93	4.72	6.62	
W-19	10.27	04-09-90	5.11	5.16	
		06-07-90	4.77	5.50	
		07-25-90	4.93	5.34	
		10-03-90	4.95	5.32	
		01-03-91	5.95	4.32	
		04-03-91	5.39	4.88	
		10-25-91	5.47	4.80	
		01-15-92	5.18	5.09	
		04-23-92	5.34	4.93	
		07-21-92	5.08	5.19	
		10-22-92	5.31	4.96	
		01-26-93	4.82	5.45	
W-20	6.82	04-09-90	4.08	2.74	
		06-07-90	3.79	3.03	
		07-25-90	4.00	2.82	
		10-03-90	4.03	2.79	
		01-03-91	4.12	2.70	
		04-03-91	3.84	2.98	
		10-25-91	4.07	2.75	
		01-15-92	3.75	3.07	
		04-23-92	4.08	2.74	
		07-21-92	4.02	2.80	
		10-22-92	4.07	2.75	
		01-26-93	3.30	3.52	
W-21	9.48	04-09-90	5.21	4.27	
		06-07-90	4.84	4.64	
		07-25-90	5.05	4.43	
		10-03-90	5.18	4.30	
		01-03-91	5.47	4.01	
		04-03-91	4.80	4.68	
		10-25-91	5.04	4.44	
		01-15-92	4.95	4.53	
		04-23-92	5.17	4.31	
		07-21-90	5.07	4.41	
		10-22-92	5.28	4.20	
		01-26-93	4.46	5.02	

TABLE 1

GROUNDWATER DEPTHS AND ELEVATIONS
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number (Feet)	Top of Casing (Feet)	Date	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)	Product Thickness
W-22	11.67	04-09-90	7.50	4.17	
		06-07-90	7.36	4.31	
		07-25-90	7.49	4.18	
		10-03-90	7.68	3.99	
		01-03-91	7.88	3.79	
		04-03-91	7.64	4.03	
		10-25-91	6.69	4.98	
		01-15-92	7.61	4.06	
		04-23-92	7.21	4.46	
		07-21-92	7.69	3.98	
		10-22-92	7.82	3.85	
		01-26-93	7.40	4.27	
W-23	9.16	04-09-90	1.51	7.65	
		06-07-90	1.78	7.38	
		07-27-90[f]	2.63	6.53	
		10-03-90	3.20	5.96	
		01-03-91	2.36	6.80	
		04-03-91	0.60[h]	8.56	
		10-25-91	2.36	6.80	
		01-15-92	1.62	7.54	
		04-23-92	1.18	7.98	
		07-21-92	2.17	6.99	
		10-22-92	2.76	6.40	
		01-26-93	0.39	8.77	
W-24	8.72	06-07-90	4.75	3.97	
		07-25-90	5.02	3.70	
		10-03-90	5.00	3.72	
		01-03-91	5.25	3.47	
		04-03-91	4.56	4.16	
		10-25-91	5.09	3.63	
		01-15-92	4.82	3.90	
		04-23-92	4.94	3.78	
		07-21-92	5.00	3.72	
		10-22-92	5.13	3.59	
		01-26-93	3.38	5.34	

a Nielson Property
b Groundwater elevation taken from earlier reports; may not agree with calculated elevation using current top of casing elevation.
c Data 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 NM indicates product thickness not measurable.
f 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.
g Well W-17 not accessible on 6-7-90.
h Depth to groundwater measured with tape measure because water level was too shallow to measure with oil-water interface probe.
i Well W-16 not accessible on 10-22-92.
j Well W-8 not accessible on 01-26-93

TABLE 2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number	Sample Date	TPH/D Concentration (ppm)	TPH/MO Concentration (ppm)
W-1	04-14-87	---[a]	<5[b,c]
	02-28-90	<0.5	---
	04-11-90	<0.1	0.57
W-2[d]	04-15-87	<1	---
W-3[d]		---	---
W-4[d]	04-14-87	---	<5[c]
W-4	03-01-90	<0.5	---
	04-10-90	<0.1	<0.25
W-5[e]	09-27-89	20	---
B-5[d]		---	---
W-5A[d]	04-16-87	<1[f]	<1[f]
W-5[n]	10-25-91	HFA: Crude Oil or Waste Oil	
W-6[d]	04-16-87	<1[f]	<1[f]
W-7	09-26-89	1.1	---
	02-28-90	<0.5[g]	---
	04-11-90	5.6	7.5
	07-30-90	2.6	2
	10-04-90	5	6
	01-04-91	4	12
	04-03-91	<1.0[h]	3.2
	10-25-91	1.4	2.3
	10-25-91[n]	HFA: Biogenic or highly degraded material	
	01-16-92	1.6	3.6
	04-24-92	3.3	4.9
	07-23-92	2.6	4.0
	10-23-92[i,o]	3.8	4.2
	01-27-93	<0.5	8.0[i]
W-8	04-17-87	10[i]	---
	09-26-89	7.1	---
	03-01-90	4.5	---
	04-18-90	5.3	---
W-13	02-28-90	<0.5	---
	04-12-90	<0.5	---
	07-27-90	<0.5	<1
	10-04-90	<0.5	<1
	01-03-91	<0.5	<1
	04-04-91	<0.5	<1
	10-25-91	<0.5	<1
	01-16-92	<0.5	<0.5
	04-24-92	<0.5	<0.5
	07-22-92	<0.5	<0.5
	10-23-92	<0.5	<0.5
	01-27-93	<0.05	0.11[i]

TABLE 2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number	Sample Date	TPH/D Concentration (ppm)	TPH/MO Concentration (ppm)
W-14	02-28-90	<0.5	---
	04-11-90	<0.1	<0.25
	07-30-90	<0.6	<1
	10-04-90	<0.5	<1
	01-04-91	<0.5	<1
	04-04-91	<0.5	<1
	10-25-91	<0.5	<1
	01-16-92	<0.5	<0.5
	04-24-92	<0.5	<0.5
	07-22-92	<0.5	<0.5
	10-23-92	<0.5	<0.5
	01-27-93	<0.05	0.13[1]
W-15	09-25-89	1.2	---
	04-13-90	1.5	---
W-16	09-27-89	4.7	---
	02-28-90	22	---
	04-13-90	9	---
W-17	09-25-89	0.7	---
	04-13-90	1.6	---
W-18	09-26-89	3.1	---
	04-13-90	5.1	---
W-19	04-12-90	1.1	---
	04-16-90	<0.5[j]	---
	07-27-90	<1	8
	10-03-90	<0.5[k]	3
	01-03-91	<0.5	<1
	04-03-91	<2.5[h]	8.4
	10-25-91[n]	<0.5	34
	10-25-91	HFA: Motor Oil	---
	01-17-92	<10.0	29
	04-23-92	<2.0	7.1
	07-23-92	<0.1	7.3
	10-22-92[l]	<10	28
	01-26-93	0.79	35
W-20	04-12-90	<0.5	---
	04-16-90	<0.5	---
	07-30-90	<0.5	<1
	10-03-90	<0.5	<1
	01-04-91	<0.5	<1
	04-04-91	<0.5	2.3[l]
	10-25-91[n]	<0.5	<1
	10-25-91[n]	HFA: Volatiles and Semi-Volatiles not detected	---
	01-17-92	<0.5	<0.5
	04-24-92	<0.5	<0.5
	07-22-92	<0.5	<0.5
	10-22-92	<0.5	<0.5
	01-27-93	<0.10	0.42[l]
W-21	04-12-90	1.4	---
	04-18-90	1.7	---

TABLE 2

HYDROCARBONS IN GROUNDWATER
EMERY BAY MARKETPLACE SITE
(Continued)

Well Number	Sample Date	TPH/D Concentration (ppm)	TPH/MO Concentration (ppm)
W-22	04-12-90	<0.5	---
	04-18-90	<0.5	---
W-23	04-12-90	2.9	---
	04-18-90	3.6	---
W-24	06-07-90	<0.5	---
	07-27-90	<0.5	<1
	10-03-90	<0.5	<1
	01-03-91	<0.5	<1
	04-03-91	<0.5	1.1[l]
	10-25-91[m]	<0.5	<1
	10-25-91[n]	HFA: Volatiles and Semi-Volaties not detected	---
	01-17-92	<0.5	<0.5
	04-24-92	<0.5	<0.5
	07-23-92	<0.5	<0.5
	10-22-92	<0.5	<0.5
	01-26-93	<0.05	0.20[l]

Footnotes:

a --- indicates no analysis made for constituent.
b < indicates constituent not detected above this level.
c Grease also not detected above 5 ppm in Wells W-1 and W-4 (Nielson)
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 1 ppm in wells W-5A and W-6.
g Review of gas chromatograph indicated TPH/D present at 0.3 ppm in Well W-7 on 2-28-90.
h Reporting limits increased from 0.5 ppm to 1.0 ppm (W-7) and 2.5 ppm (W-19) TPH/D on 4-3-91 because samples were diluted due to presence of motor oil.
i Semiquantified results include gasoline, diesel, and some oil and grease in well W-8.
j Review of gas chromatograph indicated TPH/D present at 0.4 ppm in Well W-19 on 4-16-90.
k Review of gas chromatograph indicated TPH/D present at 0.3 ppm in Well W-19 on 10-3-90.
l The chromatographic pattern in the sample does not exactly match the motor oil standard chromatograph.
m BTEX analyzed 10/25/91, not detected.
n Hydrocarbon Fingerprinting Analysis (HFA)
o The chromatographic pattern in the sample does not exactly match the diesel standard chromatograph.

ATTACHMENT A

HYDROLOGIC DATA SHEETS

Mitchell Hart

HYDRODATA

DATE: 1/26/93

PROJECT: MARKET PLACE EVENT: QUARTERLY SAMPLER: C.G/S.A

NO.	WELL OR LOCATION	DATE MO	DA	YR	TIME HR	MIN	MEASUREMENT	CODE	COMMENTS
1	W5	1	26	93	10	15	2.04/3.28	0.2/OWI	VBF
2	W15				10	24	2.47	SWL	
3	W17				10	27	4.45		VAULT BOX FILLED WITH SLURRY
4	W16				10	32	4.72		VBF
5	W8								
6	W4				2	50	1.52		
7	W23				10	44	0.39		
8	W14				10	55	3.94		
9	W13				10	59	3.10		
10	W7				11	02	1.12		VBF
11	W24				11	04	3.38		
12	W20				3	05	3.30		VBF
13	W21				11	13	4.46		
14	W19				11	16	4.82		VBF
15	W1				11	20	4.42		
16	W22				11	25	7.40		
17									
18									
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)
- VBF - VAULT BOX FLOODED (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.

²Negative pressure (Vacuum) psi = approx -(1/2 x mmHg)

McLaren Hart — SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-7

PROJECT MARKET PLACE EVENT QUARTERLY SAMPLER S. Allison DATE 1/27/93

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)

diameter 2"

equals .16 gal/ft. casing

SWL 1.38 (if above screen)

packer intake bailer depth ____ ft. (circle one)

SWL (if in screen)

9.5 TOP

12.5 BOP

measured T.D. 12.2

12.5 T.D. (as built)

Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	9:27		1.38
	9:35		4.25
	9:42		8.98
9:53	~~9:53~~		7.82
Stop 9:53	~~9:53~~		
Sampled	10:05		3.36
(Final IWL)			1.38

Purge calculation

.16 gal/ft. * 11.15 ft. = 1.78 gals x 3 = 5.34 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 / D-BAILER

100% Recovery

0.0/0.0

Actual gallons purged 6

Actual volumes purged 3+

Well yield ⊕ (see below) M

COC # 35084

Sample I.D.	Analysis	Lab
239354	8015m	MAL
239355	"	"

Additional comments:

WATER HAS GREENISH BLACK TINT

SMELLS LIKE SEWAGE

LOTS OF FOAM

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 2	52°	1620	5.89	27.8		
2. 4	51.9°	1547	5.86	32.5		
3. 6	52.3	1835	5.75	46.2		
4. Sample				39.6		

* 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.

McLaren Hart

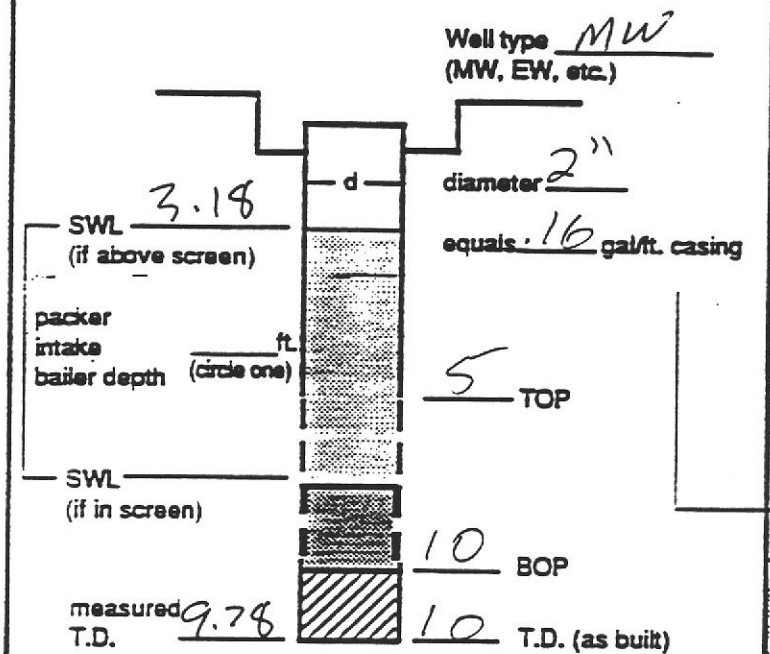
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-13

PROJECT MARKETPLACE EVENT QUARTERLY SAMPLER SAM/SOW DATE 1/27/93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	11:05	0.22 GPM	3.18
	11:10		4.68
	11:16		5.38
	11:22		8.86
Stop	11:22		8.86
Sampled	11:30		
(Final IWL)			4.32

Purge calculation

.16 gal/ft. * 6.82 ft. = 1.09 gals x 3 = 3.27 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:

PERI / D-BAILER

5/82

0.0/0.0

Actual gallons purged 3.75

Actual volumes purged 3+

Well yield ⊕ (see below) MY

COC # 35084

Sample I.D.	Analysis	Lab
239356	8015 m	MAL
239357	"	"

Additional comments:

GOOD RECHARGE

Gallons purged *	TEMP °C (°F) (circle one)	EC (x10²) (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.25	59.6	8.51	7.15	13.48		
2. 2.5	60.2	9.61	7.13	16.52		
3. 3.75	60.1	8.96	7.16	15.42		
4. Sample				12.36		

* 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.

McLaren Hart

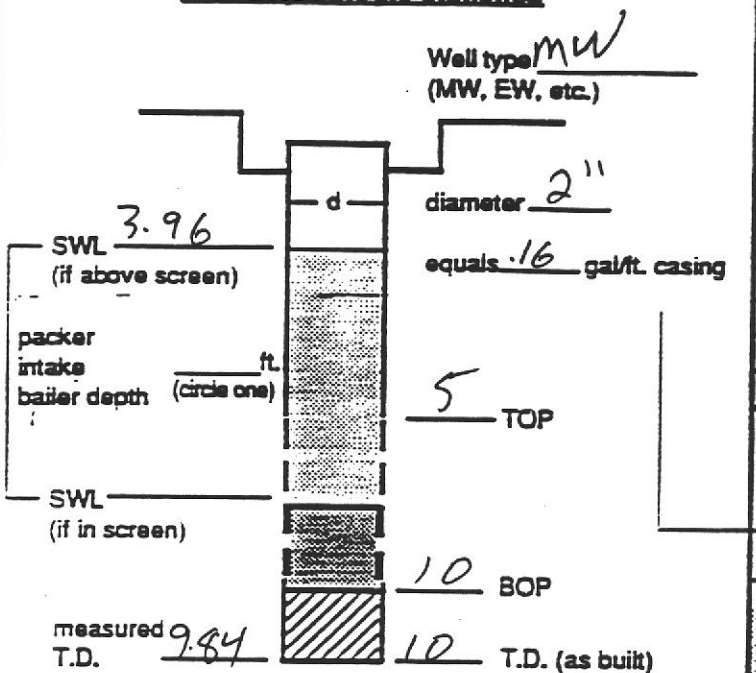
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-14

PROJECT MARKET PLACE EVENT QUARTERLY SAMPLER S. ANDERSON DATE 1/22/93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	11:59	0.11GPM	3.96
	12:05		7.24
	12:10		8.84
	12:16		9.84
	12:26		7.16
Stop	12:26		
Sampled	12:40		9.36
(Final IWL)			

Purge calculation

.16 gal/ft. * 6.04 ft. = .96 gals x 3 = 2.89 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:

PERI / D-BAILER

93% RECOVERY

5 / 182

0.0 / 0.0

Actual gallons purged 3

Actual volumes purged 3+

Well yield ⊕ VLY
(see below)

COC # 35084

Sample I.D.	Analysis	Lab
239358	8015m	MAL
239359	1	1

Additional comments:

DRY AFTER 2+ VOLUMES
WAITED 10 MINUTES PURGED
REMAINING WATER

12:26

Gallons purged *	TEMP °C (°F) (circle one)	EC (X10²) (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	67.4	15.83	7.19	>200		
2. 2	68.00	14.87	7.21	>200		
3. 3	68.3	14.86	7.17	>200		
4. Sample				17.68		

* 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.

McLaren Hart

SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-19

PROJECT MARKETPLACE EVENT QUARTERLY SAMPLER [illegible] DATE 1/26/93

Well / Hydrologic statistics

Well type MW (MW, EW, etc.)

diameter 2" equals .16 gal/ft. casing

SWL (if above screen)

packer / intake / bailer depth ____ ft. (circle one)

2.5 TOP

SWL 4.42 (if in screen)

14 BOP

measured T.D. 13.325 — 14 T.D. (as built)

Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	12:41	0.24 GPM	4.82
	12:47		4.92
	12:53		4.92
	1:00		4.92
Stop	1:00		
Sampled	1:05		
(Final IWL)			4.82

Purge calculation

.16 gal/ft. × 8.50 ft. = 1.36 gals x 3 = 4.08 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:

PERI / D-BAILER

Actual gallons purged 4.5

Actual volumes purged 3+

Well yield (see below) ⊕ HY

COC # 35084

Sample I.D.	Analysis	Lab
240048	8015m	MAL
240049		
239352-53	8015M(TB)	MAL

Additional comments: (APPROX. 1/4" PRODUCT – THICK/BLACK)

SOME FREE PRODUCT

S/BZ

0.0/0.0

Gallons purged *	TEMP °C / (F) (circle one)	EC (X10²) (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.5	63.4	12.90	6.22	74.5		
2. 3.0	63.9	14.62	6.07	75.3		
3. 4.5	63.9	14.59	6.05	74.7		
4.				74.6		

* 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.

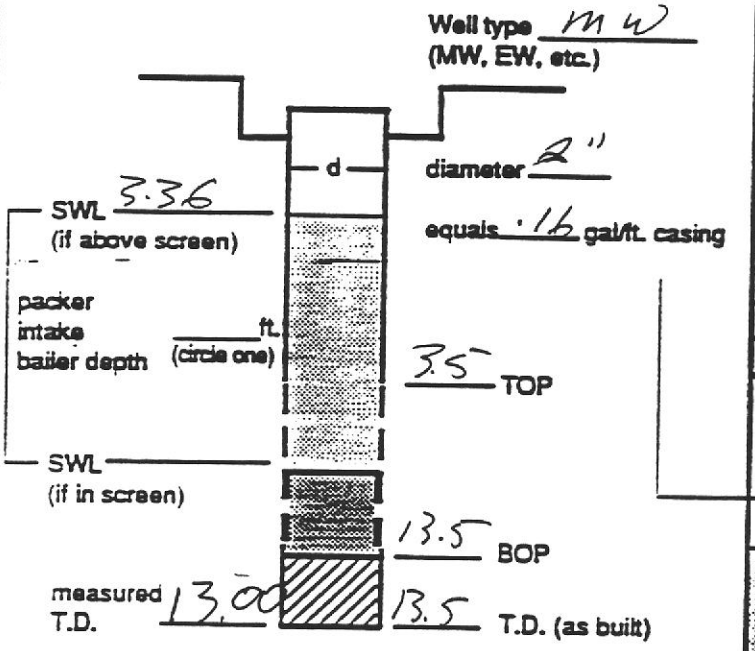
McLaren Hart — SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-24

PROJECT MARKETPLACE EVENT QUARTERLY SAMPLER S. ALLISON DATE 1/26/93

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	1:34	0.2 GPM	3.36
	1:40		3.48
	1:47		3.52
	1:55		3.56
	1:58		3.56
Stop	1:58		3.56
Sampled	2:10		
(Final IWL)			

Purge calculation

.16 gal/ft. * 9.64 ft. = 1.54 gals x 3 = 4.62 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:

PERI/D. BAILER

5/BZ

0.0/0.0

Actual gallons purged 5.0

Actual volumes purged 3+

Well yield ⊕ (see below) HY

COC # 35084

Sample I.D.	Analysis	Lab
22925	8015	MHC
240050	1	1

Additional comments:

Gallons purged *	TEMP °C / °F (circle one)	EC (x10²) (µs / cm)	PH	TURBIDITY (NTU)		
1. 1.5	64.8	9.42	6.34	14.58		
2. 3.0	64.9	9.38	6.39	16.25		
3. 4.5	63.9	9.41	6.31	16.25		
4. 5.0	64.1	9.47	6.31	15.22		

* 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.

1 of 1

McLaren Hart

DIRECT READING REPORT

Sheet ___ of ___

Client Name and Site:	Project Manager:	Task Number:	Date:
MARKETPLACE	JULIE MENACK	04.00598005.000	1/26-1/27/93

Employee:	Title:	Weather Conditions/ Observations:	Wind Speed:	Wind Direction:	Temperature:
C GIUNTOLI/S. ALLISON	ASSOC. ENV. SCI.	SUNNY	—	—	—

Direct Reading Data

Location:	Task Description (Drilling, Sampling, etc.)	Time	Instrument Type (& lamp size if applicable)	Substance/ Agent	Concentration	Source: S Breathing Zone: B
MW-7	SAMPLING	927 (1/27/93)	OVM 580B	VOC	0.0/0.0	S/B
MW-13	"	1105	"	"	0.0/0.0	S/B
MW-14	"	1159	"	"	0.0/0.0	S/B
MW-19	"	1241 (1/26/93)	"	"	0.0/0.0	S/B
MW-20	"	1315 (1/27/93)	"	"	0.0/0.0	S/B
MW-24	"	1334 (1/26/93)	"	"	0.0/0.0	S/B

Comments:

NOTE: Return to REHSC Upon Completion of Site Work. Use Additional Forms if Necessary.

McLaren Hart

DIRECT READING REPORT

Sheet ___ of ___

Client Name and Site:	Project Manager:	Task Number:	Date:
MARKETPLACE	J. MENACK	04, 00 59805.000	1/26/93

Employee:	Title:	Weather Conditions/ Observations:	
SCN NELSON / C. GIUNTI	ASSIST. TECH.	SUNNY	
		Wind Speed: TRACE	Wind Direction: — Temperature: 60

Direct Reading Data

Location:	Task Description (Drilling, Sampling, etc.)	Time	Instrument Type (& lamp size if applicable)	Substance/ Agent	Concentration	Source: S Breathing Zone: B
W-5	SOUNDING	1012	OVM 580B	VOC	0.0/0.0	S/B
W-15		1024			0.0/0.0	
W-17		1027			0.0/0.0	
W-18		1032			0.0/0.0	
W-6		1037			36.8/0.0	
W-4		10:49			0.0/0.0	
W-23		10:44			15.2/0.0	
W-14		10:55			0.0/0.0	
W-13		10:56			0.0/0.0	
W-7		11:02			0.0/0.0	
W-24		11:04			0.0/0.0	
W-20		11:07			0.0/0.0	
W-21		11:12			0.0/0.0	
W-19		11:16			0.0/0.0	
W-1		11:20			0.0/0.0	
W-22		11:23			0.0/0.0	

Comments:

NOTE: Return to REHSC Upon Completion of Site Work. Use Additional Forms if Necessary.

McLaren Hart

INSTRUMENT CALIBRATION LOG

Page____of____

Client Name and Site:	Project Manager:	Task Number:
MARKETPLACE	J. MENACK	04. 0059805.000

Calibration Event:

Person Calibrating:		Date:	1/26/93
Instrument Type:	OVM	Calibration Gas:	ISOBUTYLENE/AIR
Model:	M-202	Calibration Gas Concentration (ppm):	100
Serial #:	—	Reading (ppm):	110
Calibrator Model:		Adjusted Reading (If Necessary)	—
Comments:			

Person Calibrating:	Sow Allison	Date:	1/27/93
Instrument Type:	OVM	Calibration Gas:	isobutylene / Air
Model:	M-200	Calibration Gas Concentration (ppm):	100
Serial #:	—	Reading (ppm):	99.9
Calibrator Model:		Adjusted Reading (If Necessary)	—
Comments:			

Person Calibrating:		Date:	
Instrument Type:		Calibration Gas:	
Model:		Calibration Gas Concentration (ppm):	
Serial #:		Reading (ppm):	
Calibrator Model:		Adjusted Reading (If Necessary)	
Comments:			

Person Calibrating:		Date:	
Instrument Type:		Calibration Gas:	
Model:		Calibration Gas Concentration (ppm):	
Serial #:		Reading (ppm):	
Calibrator Model:		Adjusted Reading (If Necessary)	
Comments:			

Person Calibrating:		Date:	
Instrument Type:		Calibration Gas:	
Model:		Calibration Gas Concentration (ppm):	
Serial #:		Reading (ppm):	
Calibrator Model:		Adjusted Reading (If Necessary)	
Comments:			

Comments:

NOTE: Return to **REHSC** Upon Completion of Site Work.

ATTACHMENT B

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

McLaren Hart sm

ENVIRONMENTAL ENGINEERING CORPORATION

Date: February 9, 1993
LP #: 7071

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

Dear Ms. Menack:

Enclosed are the laboratory results for the seven samples submitted by you to the McLaren Analytical Laboratory on January 29, 1993, for the project *Marketplace Emeryville*.

The analyses you requested are:

EPA 8015 Modified (7 - Water)

The report consists of the following sections:

1. A copy of the Chain-of-Custody
2. Quality Control Definitions and Report
3. Abbreviations and Comments
4. Analytical results

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,

Carleen Fong for:

Shakoora Azimi
Laboratory Director, Principal Scientist

3083 Gold Canal Drive, Rancho Cordova, CA 95670 (916) 852-6600 FAX (916) 852-7292

McLaren Hart — CHAIN OF CUSTODY RECORD

SEE SIDE 2 FOR COMPLETE INSTRUCTIONS

Ship To: MAL
Address:

Project Name: MARKETPLACE Emeryville
Project Number: 04.0059805.000
Project Location: (State) CA.

FOR LABORATORY USE ONLY
Laboratory Project #: 7071
Storage Refrigerator ID: 4-27
Storage Freezer ID:

Sampler Name	Signature	PPE Worn in Field
SACHEM Allison	Sachem Allison	D

Relinquished By: Sachem Allison	Date/Time 1/26/93 700	Received By or Method of Shipment/Shipment I.D.	Date/Time 1/26/93 700
Relinquished By:	Date/Time 1/26/93 900	Received By or Method of Shipment/Shipment I.D. EXPRESS-IT	Date/Time 1/26/93 900
Relinquished By: Express IT	Date/Time	Received By or Method of Shipment/Shipment I.D.	Date/Time 1-27-93 0830

Sample Disposal (check one): ☒ Laboratory Standard ☐ Other

Level of QC (see Side 2): ☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

Write in Analysis Method →

SAMPLE INFORMATION

FOR LABORATORY USE ONLY Lab ID	Sample ID Number	Date	Time	Description: Locator	Description: Depth	Container(s): #	Container(s): Type	Matrix Type	Pres. Type	TAT	8015 mod									
1	7071-001	239352-53	1/26/93		TRIP		2	A	H_2O	HP	3	X								
2	-002	240048-49	1/26/93	1:05	W19		1					X								
3	-003	240050-	1/26/93	2:10	W24		1					X								
4	MS/MSD	239351	1/26/93	2:10	W24		1					X								
5	-004	239354-55	1/26/93	10:05	W-7		2					X								
6	-005	239356-57	1/27/93	11:30	W-13		2					X								
7	-006	239358-59	1/27/93	12:40	W-14		2					X								
8	-007	239360-61	1/27/93	1:50	W-20		2					X								
9																				
10																				

Special Instructions/Comments: PLEASE USE LOW LEVEL DETECTION LIMITS FOR 8015M

Container Types: B=Brass Tube, G=Glass Jar, O=Other ____, A=1 Liter Amber, C=Cassette, P=Polyethylene, V=Voa Vial

TAT (Analytical Turn Around Time): 1 = 24 hours, 2 = 48 hours, 3 = 1 week, 4 = 2 weeks, 0 = Other ____

FOR LABORATORY USE ONLY Sample Condition Upon Receipt: Satisfactory
Tinfoil

SEND DOCUMENTATION AND RESULTS TO (Check one):
☒ Project Manager/Office: Julie MENACK
☒ Client Name: MCLAREN/HART
Company: 1135 ATLANTIC AVE
Address: ALAMEDA Ca 94501
Phone: 510 521-5200 FAX:

Common Analytical Methods

- 413.1
- 413.2
- 418.1
- 418.1 Short Method
- 420.1
- 502.2
- 503E
- 524.2
- 601
- 602
- 604
- 608
- 610
- 624
- 625
- 8010
- 8015
- 8015 Mod.
- 8020
- 8021
- 8040
- 8080
- 8100
- 8240
- 8270
- 8310
- Alkalinity
- BTEX
- Chloride
- CLP (see Side 2)
- COD
- Color
- Conductivity
- Cyanide
- Flashpoint
- Fluoride
- General Mineral
- Hex. Chromium
- Ion Balance
- Metals (write specific metal & method #)*
- Metals 6010*
- Metals PP*
- Metals Title 22:
  - TTLC Level
  - STLC Level
  - (see Side 2)
- Nitrate
- Nitrite
- Org. Lead
- Org. Mercury
- Percent Moisture
- Percent Solid
- Perchlorate
- pH
- Phosphates
- Phosphorus
- Sulfate
- Sulfides
- TCLP:
  - VOA
  - Semivoa
  - Metals
  - Pesticide
- TDS
- Total Hardness
- Total Solids
- TPH/D
- TPH/G
- TSS
- Turbidity

* Specify Total or Dissolved

QUALITY CONTROL DEFINITIONS

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.

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 5% of the sample load, in order to assure the accuracy and precision of the analytical method.

Control limits for accuracy and precision are different for different methods and may 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.

QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8015
Units: mg/L (ppm)

Date Analyzed: 02/04/93
Date Extracted: 02/01/93
Batch Number: 930201-1901

Petroleum Fraction	Carbon Range	Reporting Limit	Concentration
Gasoline Range	C7 - C14	0.050	BRL
Jet Fuel/Kerosene Range	C12 - C18	0.050	BRL
Diesel Range	C12 - C22	0.050	BRL
Motor Oil Range	C22 - C32	0.050	BRL
Total Petroleum Hydrocarbons		0.050	BRL

(DC3-CN7071)

Laboratory Control Sample/Laboratory Control Sample Duplicate
Method 8015 - Modified

LP#: 7071

Analyst: EB

Batch #: 930126-0303

Date Of Analysis: 01/30/93

Spike Sample ID: LCSW/LCSDW #49

Column: DB-1

Spike ID Code: W2-1413 W2-1326

Instrument #: PGC #6

Surrogate ID Code: NA

Matrix: Water Units: mg/L

COMPOUNDS	(a) SAMPLE CONC.	(b) SPIKE CONC.	(c) SAMPLE + SPIKE CONC.	(d) SPIKE REC. %	(e) SAMPLE DUP. + SPIKE CONC.	(f) SPIKE DUP. REC. %	(g) RPD %	ACCEPTANCE LIMITS % REC	ACCEPTANCE LIMITS RPD
Gasoline	0	2.5	2.0	80	2.1	84	5	26 - 90	≤ 25
Diesel	0	2.5	2.2	88	2.6	104	17	43 - 152	≤ 25

Spike Recovery = d = ((c-a)/b) x 100
Spike Duplicate Recovery = f = ((e-a)/b) x 100
Relative Percent Difference = g = (|c-e|)/((c+e) x .5) x 100

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
NS	Not Specified
NA	Not Applicable

COMMENTS

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.

A reporting limit of 0.050 ppm was requested by the client, which is lower than the established reporting limit of 0.50 ppm. As a result, the MDL was used and 1000 mLs of sample were extracted and concentrated to a final volume of 1 mL, causing the established reporting limit to be lowered by a factor of 10.

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

The gasoline standard was obtained from a local BP station. Gasoline is sold commercially as unleaded gasoline.

The diesel standard was obtained from a local Chevron station. Diesel is sold commercially as Diesel Fuel #2.

The kerosene standard was obtained from Post Jeff Chevron/Mobil Products. Kerosene 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.

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

The laboratory reported result for Total Petroleum Hydrocarbons is a summation result of the individual analytes.

Regenerated 05/25/93.

(DC3-CN7071)

TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace Emeryville

Project Number: 04.0059805.000

Sample Description: Trip

Lab Project-ID Number: 7071-001

Sample Number: 239352

Date Sampled: 01/26/93

Date Received: 01/29/93

Date Extracted: 02/01/93

Date Analyzed: 02/05/93

Batch Number: 930201-1901

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Jet Fuel/Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	BRL	0.050
Total Petroleum Hydrocarbons		BRL	0.050

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.

Regenerated 05/25/93.

Approved By: NM Date: 5.26.93

Nancy McDonald, Quality Control Chemist

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

0611928015M

McLaren Hart sm

ENVIRONMENTAL ENGINEERING CORPORATION

recycled paper

TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace Emeryville

Project Number: 04.0059805.000

Sample Description: W19

Lab Project-ID Number: 7071-002

Sample Number: 240048

Date Sampled: 01/26/93

Date Received: 01/29/93

Date Extracted: 02/01/93

Date Analyzed: 02/05/93

Batch Number: 930201-1901

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.25
Jet Fuel/Kerosene Range	C12 - C18	BRL	0.25
Diesel Range	C12 - C22	0.79	0.25
Motor Oil Range	C22 - C32	35 (b)	5.0
Total Petroleum Hydrocarbons		36	0.25

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.

(b) The data was reported from a different analytical run on 02/08/93 at a 100 fold dilution to obtain a result within linear range.

The sample was diluted 5 fold to bring target analyte within linear working range.

Regenerated 05/25/93.

Approved By: NM Date: 5.26.93

Nancy McDonald, Quality Control Chemist

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

0611928015M

McLaren Hart sm

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TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace Emeryville

Project Number: 04.0059805.000

Sample Description: W24

Lab Project-ID Number: 7071-003

Sample Number: 240050

Date Sampled: 01/26/93

Date Received: 01/29/93

Date Extracted: 02/01/93

Date Analyzed: 02/05/93

Batch Number: 930201-1901

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Jet Fuel/Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	0.20 (b)	0.050
Total Petroleum Hydrocarbons		0.20	0.050

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.

(b) The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

Regenerated 05/25/93.

Approved By: NM Date: 5-26-93

Nancy McDonald, Quality Control Chemist

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

0611928015M

McLaren Hart sm

ENVIRONMENTAL ENGINEERING CORPORATION

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TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace Emeryville

Project Number: 04.0059805.000

Sample Description: W-7

Lab Project-ID Number: 7071-004

Sample Number: 239354

Date Sampled: 01/27/93

Date Received: 01/29/93

Date Extracted: 02/01/93

Date Analyzed: 02/05/93

Batch Number: 930201-1901

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.50
Jet Fuel/Kerosene Range	C12 - C18	BRL	0.50
Diesel Range	C12 - C22	BRL	0.50
Motor Oil Range	C22 - C32	8.0 (b)	0.50
Total Petroleum Hydrocarbons		8.0	0.50

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.

(b) The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

The sample was diluted 10 fold to bring target analyte within linear working range.

Regenerated 05/25/93.

Approved By: UM Date: 5-26-93

Nancy McDonald, Quality Control Chemist

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

0611928015M

McLaren Hart sm

ENVIRONMENTAL ENGINEERING CORPORATION

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TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace Emeryville

Project Number: 04.0059805.000

Sample Description: W-13

Lab Project-ID Number: 7071-005

Sample Number: 239356

Date Sampled: 01/27/93

Date Received: 01/29/93

Date Extracted: 02/01/93

Date Analyzed: 02/05/93

Batch Number: 930201-1901

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Jet Fuel/Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	0.11 (b)	0.050
Total Petroleum Hydrocarbons		0.11	0.050

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.

(b) The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

Regenerated 05/25/93.

Approved By: NM Date: 5.26.93

Nancy McDonald, Quality Control Chemist

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

0611928015M

McLaren Hart sm

ENVIRONMENTAL ENGINEERING CORPORATION

TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace Emeryville

Project Number: 04.0059805.000

Sample Description: W-14

Lab Project-ID Number: 7071-006

Sample Number: 239358

Date Sampled: 01/27/93

Date Received: 01/29/93

Date Extracted: 02/01/93

Date Analyzed: 02/05/93

Batch Number: 930201-1901

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.050
Jet Fuel/Kerosene Range	C12 - C18	BRL	0.050
Diesel Range	C12 - C22	BRL	0.050
Motor Oil Range	C22 - C32	0.13 (b)	0.050
Total Petroleum Hydrocarbons		0.13	0.050

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.

(b) The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

Regenerated 05/25/93.

Approved By: NM Date: 5-26-93

Nancy McDonald, Quality Control Chemist

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

0611928015M

McLaren Hart sm

ENVIRONMENTAL ENGINEERING CORPORATION

TOTAL PETROLEUM HYDROCARBONS

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

Project Name: Marketplace Emeryville

Project Number: 04.0059805.000

Sample Description: W-20

Lab Project-ID Number: 7071-007

Sample Number: 239360

Date Sampled: 01/27/93

Date Received: 01/29/93

Date Extracted: 02/01/93

Date Analyzed: 02/05/93

Batch Number: 930201-1901

PETROLEUM FRACTION	CARBON RANGE	CONCENTRATION mg/L (ppm)	REPORTING LIMIT mg/L (ppm)
Gasoline Range	C7 - C14	BRL	0.10
Jet Fuel/Kerosene Range	C12 - C18	BRL	0.10
Diesel Range	C12 - C22	BRL	0.10
Motor Oil Range	C22 - C32	0.42 (b)	0.10
Total Petroleum Hydrocarbons		0.42	0.10

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.

(b) The chromatographic pattern of motor oil in the sample does not exactly match the standard chromatograph.

The sample was diluted 2 fold to bring target analyte linear working range.

Regenerated 05/25/93.

Approved By: UM Date: 5-26-93
Nancy McDonald, Quality Control Chemist

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

0611928015M