



ALCO
HAZMAT
94 JUL 20 PM 12: 25

July 19, 1994

Ms. Eva Chu
Alameda County Health Agency
80 Swan Way, Room 200
Oakland, California 94621

Dear Ms. Chu:


**SUBJECT: MARCH 1994 QUARTERLY GROUND WATER MONITORING AND INTERIM
REMEDATION REPORT FOR THE FORMER ALAMEDA SERVICE STATION
A-528, 7608 AMADOR VALLEY BOULEVARD, DUBLIN, CALIFORNIA**

Enclosed please find the above-captioned report, and a copy of a Bill of Lading for the disposal of ground water generated during purging of the monitoring wells. If you should have any questions, please do not hesitate to call Brad Wright at (510) 748-5697.

Sincerely,

A handwritten signature in cursive script that reads 'Brad Wright'.

Brad Wright
Senior Geoscientist
Project Manager

for: 
David Watts
Environmental Scientist

Enclosures

ALCO
HAZMAT

51 JUL 20 PM 12:35

**MARCH 1994 QUARTERLY GROUND WATER
MONITORING AND INTERIM
REMEDATION REPORT FOR THE
FORMER ALAMEDA
SERVICE STATION A-528
TARGET DUBLIN
7608 AMADOR VALLEY BOULEVARD
DUBLIN, CALIFORNIA**

June 8, 1994

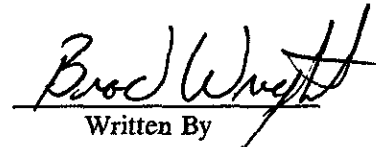
Prepared For:
Target Stores
33 South Sixth Street
Minneapolis, Minnesota 55440-1342

Prepared By:
McLaren/Hart Environmental Engineering
1135 Atlantic Avenue
Alameda, California 94501
(510) 521-5200

Project No: 04.0122629.000

The Information Contained Herein Is Submitted in Partial Fulfillment of Contract No. 465 For the Sole and Exclusive Use of Target Stores and Shall Not Be Disclosed or Furnished to Any Other Entity, Corporation, or Third Party, For Purposes Outside the Specific Scope and Intent of This Contract Without the Express Written Consent of McLaren/Hart.


Reviewed By


Written By



ENVIRONMENTAL ENGINEERING CORPORATION

INTRODUCTION

This report presents the March 1994 quarterly ground water monitoring results for the former Alameda Service Station A-528, located at 7608 Amador Valley Boulevard in Dublin, California ("the site"). This report was prepared in accordance with McLaren/Hart's quarterly ground water sampling and interim remediation measure plan (McLaren/Hart, 1993a) and followed previously presented recommendations (McLaren/Hart, 1993b). These recommendations included extracting ground water from MW-2 as part of quarterly interim remediation and conducting four sampling events between September 1993 and June 1994. This work was approved by Ms. Eva Chu of the Alameda County Health Care Services Agency, Department of Environmental Health, Hazardous Materials Division in a September 27, 1993 letter.

OBJECTIVES AND SCOPE OF WORK

A site location map is presented as Figure 1 and a site map showing monitoring well locations is included as Figure 2. Quarterly monitoring of site wells is being conducted to monitor lateral extent of petroleum hydrocarbons in shallow ground water beneath the site, while ground water removal from MW-2 serves as interim remediation of impacted ground water from the well containing the highest detected concentration of benzene.

The work associated with the March 1994 quarterly monitoring event included: sampling monitoring wells MW-1, MW-2, MW-4, MW-5, and MW-6 for the presence of gasoline-related constituents; collecting water elevations from six monitoring wells (MW-1 through

MW-6); and extracting 1,250 gallons of impacted ground water from monitoring well MW-2. As specified in a letter dated December 18, 1992 from the Alameda County Health Care Services Agency, well MW-3 and not MW-1 is scheduled for annual sampling. MW-3 is therefore scheduled to be sampled during the June 1994 quarterly sampling event.

Ground Water Elevations and Flow Directions

Ground water surface elevations were measured on March 28, 1994, prior to sampling and pumping activities (Table 1). These data were used to construct the March 1994 ground water contour map (Figure 2). The inferred ground water flow direction is generally toward the east and is apparently influenced by the presence of more permeable materials in the excavation area causing a small ground water mound to form. This flow direction is generally consistent with historic ground water flow directions. Based on the observed contour pattern, MW-2 and MW-5 appear to be downgradient, while MW-4 is down-to cross-gradient of the former excavation area.

The static depth to ground water ranges from 4.82 to 6.54 feet below ground surface or 334.69 to 336.01 feet above mean sea level. The average hydraulic gradient is approximately 0.011 feet/foot. The March water level measurements indicate that ground water levels have decreased in all wells except MW-6 since December 1993. These decreases range from 0.02 to 0.18 feet, while the water level at MW-6 increased 0.23 feet. The average decrease was .06 feet. Historic ground water elevation data are presented in Table 2.

Ground Water Sampling Activities

Ground water samples were collected from MW-1, MW-5, and MW-4 on March 28, 1994, and from MW-6 and MW-2 on March 29, 1994. Prior to sampling MW-1, MW-4, MW-5, and MW-6, four casing volumes were purged from each well. A centrifugal pump was used to purge MW-1, MW-4, MW-5, and MW-2. A peristaltic pump was used to purge MW-6. Temperature, pH, electric conductivity, and turbidity were measured after each casing volume was removed. After all parameters had stabilized, with the turbidity at or below 4.0 Nephelometric Turbidity Unit (NTU), sampling was performed using a disposable bailer. At MW-2, in conjunction with the interim remediation, 130 casing volumes were removed prior to sample collection and parameters were collected during the last five casing volumes. Sampling Event Data Sheets are enclosed as Appendix I.

Ground water samples were stored in a container filled with ice and delivered to MBT Environmental Laboratories, a state-certified laboratory located in Rancho Cordova, California. A chain-of-custody record was completed during sampling and accompanied each sample shipment to the laboratory. The samples were submitted for analysis by EPA Method 5030 (LUFT) for total petroleum hydrocarbons as gasoline (TPH/G) and for benzene, toluene, ethyl benzene, and xylenes (BTEX) analyses by EPA Method 8020. Trip blanks were included in the shipments to the laboratory to be analyzed for TPH/G and BTEX.

Ground Water Analytical Results

Table 3 and Figure 3 present the March 1994 sampling event analytical results. Consistent with previous results, water samples collected at monitoring wells MW-1 and MW-5 did not contain concentrations of either TPH/G or BTEX at or above the reporting limit.

Benzene (0.34 ppb) was detected in the sample collected from MW-6, located within the excavation backfill for the former fuel tanks. Although TPH/G was not detected, ethylbenzene (2.2 ppb) and total xylenes (2.2 ppb) were detected in ground water from well MW-6. These levels are generally consistent with recent analytical results.

Benzene (9.2 ppb), toluene (0.47 ppb), ethylbenzene (2.5 ppb), total xylenes (4.40 ppb), and TPH/G (67 ppb) were detected in the sample collected from MW-2. These results represent an increase from the December 1993 sampling results when 0.53 ppb benzene was the only contaminant detected.

At MW-4, located adjacent to the tank excavation, TPH/G (460 ppb), benzene (3.2 ppb), ethylbenzene (45 ppb) and total xylenes (19 ppb) were detected. These represent an increase from the December 1993 sampling results when 1.0 ppb benzene was the only contaminant detected.

The trip blank sample did not contain any contaminants above the reporting limits. The Analytical Data Sheets and Chain-of-Custody Records for the ground water samples are included as Appendix II.

The DHS Maximum Contaminant Levels (MCLs) for BTEX compounds in drinking water include: 1 ppb benzene; 680 ppb ethyl benzene; and 1,750 ppb total xylenes. The Federal MCL for toluene is 1,000 ppb. There is no state action level for TPH/G. Benzene was detected in ground water from monitoring wells MW-2 and MW-4 at concentrations in excess of the MCL. However, ground water beneath the site is reportedly not used for drinking water or other beneficial uses, and the MCL concentrations are presented only for purposes of comparison.

Interim Remediation

The most recent interim remediation at the site occurred on March 28 and 29, 1994, when 1,250 gallons were removed from MW-2 at an average pumping rate of 1.4 gpm. Depth to ground water was measured at the six wells during each day of interim remediation, once before pumping started, then again just before pumping stopped for the day (Table 4). Two remedial efforts (September 1993 and December 1993) have previously occurred at MW-2. Approximately 2,240 gallons of water were extracted during those two episodes. Changes in water elevations at site wells associated with extraction at MW-2 are shown on Table 4.

Prior to this remedial effort, ten interim remediation episodes occurred at MW-6 between October 1991 and June 1993. Changes in ground water elevations at the monitoring wells as a result of extracting ground water from MW-6 during this time period are shown in Table 5. A total of approximately 3,300 gallons of ground water were extracted during the ten interim remediation episodes, at an average pumping rate of 0.9 gallons per minute (gpm).

**TARGET DUBLIN
MARCH 1994
QUARTERLY REPORT
June 8, 1994
Page 6**

As shown on Tables 4 and 5, the extraction of ground water from MW-2 and MW-6 typically reduces the water level in each of the six wells. The exception to this was in October and December 1992, when water levels rose during interim remediation pumping as a result of excessive rainfall during the remediation.

The March 1994 change in water level measurements resulting from extraction of ground water from MW-2 (Table 4) reveal that the greatest response during the first day of pumping was at MW-4, MW-5 and MW-6 (decreases of 0.17, 0.26. and 0.17 feet, respectively). Measurements collected after the second day of pumping showed that MW-5 (0.27 feet) and MW-6 (0.21 feet) registered the most response.

CONCLUSIONS

The following conclusions are based on data collected to date:

- Free-floating petroleum product was not observed in any of the wells.
- Consistent with previous sampling results, gasoline-related constituents were not detected in cross-gradient well MW-1 and downgradient well MW-5.
- Concentrations of gasoline-related constituents detected in wells MW-4 and MW-2 increased from those detected during the December 1993 quarterly.
- Based on historical analytical results from downgradient wells MW-2 and MW-5, chemicals of concern do not appear to be migrating towards MW-5. However, low levels of gasoline-related constituents are present in ground water at MW-2.
- As shown on Figure 2, the apparent ground water flow direction at the site is generally to the east, consistent with historic flow directions.

**TARGET DUBLIN
MARCH 1994
QUARTERLY REPORT
June 8, 1994
Page 7**

- Ground water elevations decreased an average of 0.06 feet since December 1993.
- The interim remediation at MW-2 removed approximately 1,250 gallons of ground water at a flow rate of 1.4 gpm and appears to be capable of lowering water levels at other wells on-site.

Future work at the site consists of:

- Ground water sampling as scheduled in June 1994;
- Annual ground water sampling of well MW-3; and
- Extraction of impacted ground water from well MW-2 as part of interim remediation.

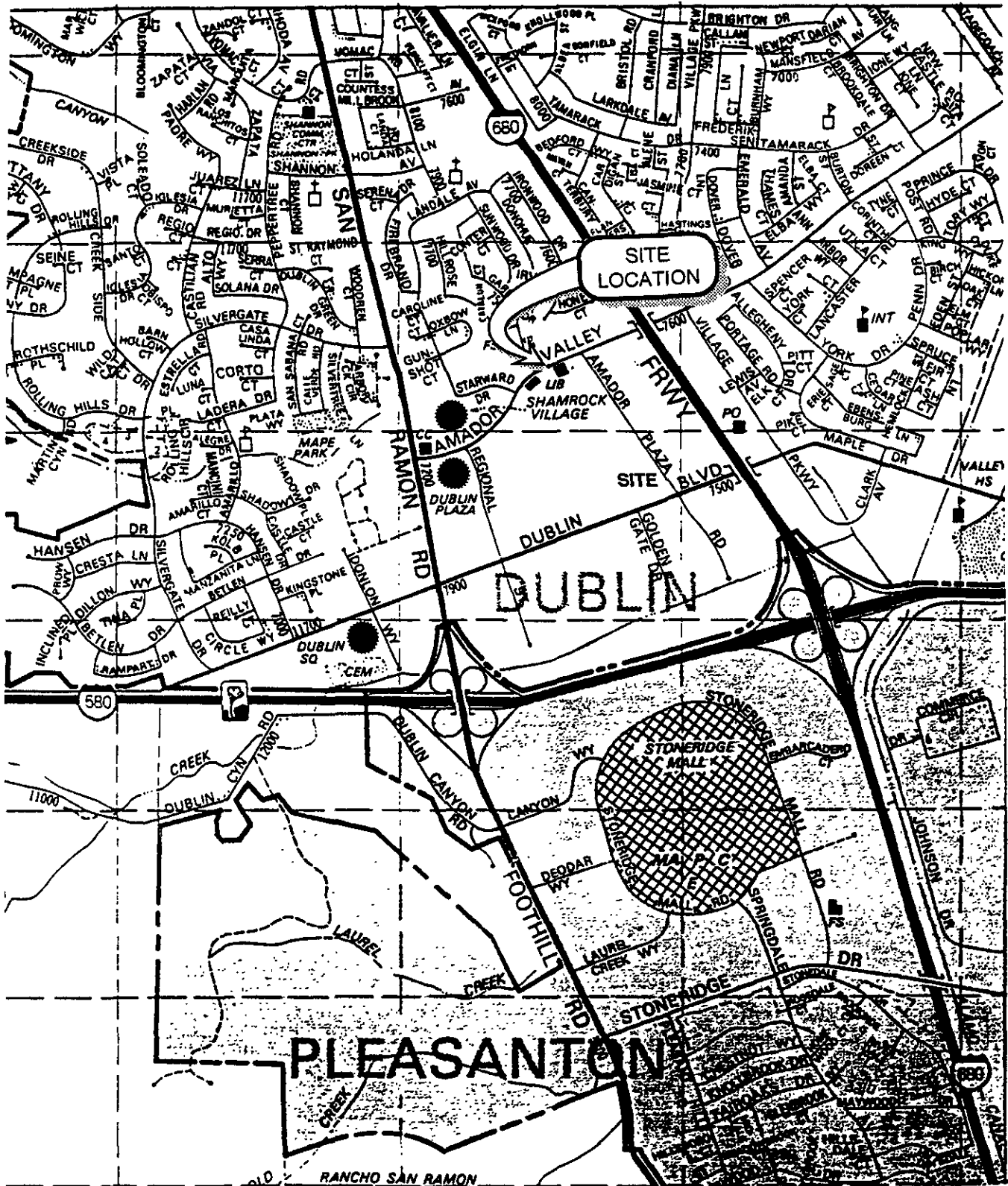
REFERENCES

Alameda County Health Care Service Agency, 1992, "Revision of Quarterly Monitoring Program at the former Alameda Service Station A-558, 7608 Amador Valley Boulevard, Dublin", December 18, 1993

McLaren/Hart, 1993a, "Proposal to Conduct Quarterly Ground Water Sampling and Interim Remediation at the Target Store T-328 Dublin, California", September 13, 1993

McLaren/Hart, 1993b, "December 1993 Quarterly Ground Water Monitoring and Interim Remediation Report for the Former Alameda Service Station A-528", September 13, 1993

FIGURE 1
SITE LOCATION MAP
FORMER ALAMEDA SERVICE STATION
A-578
DUBLIN, CA



PLANTER AREA

FIGURE 2
GROUNDWATER CONTOUR MAP
MARCH 28, 1994
FORMER ALAMEDA SERVICE A-578
AMADOR VALLEY BOULEVARD
DUBLIN, CA

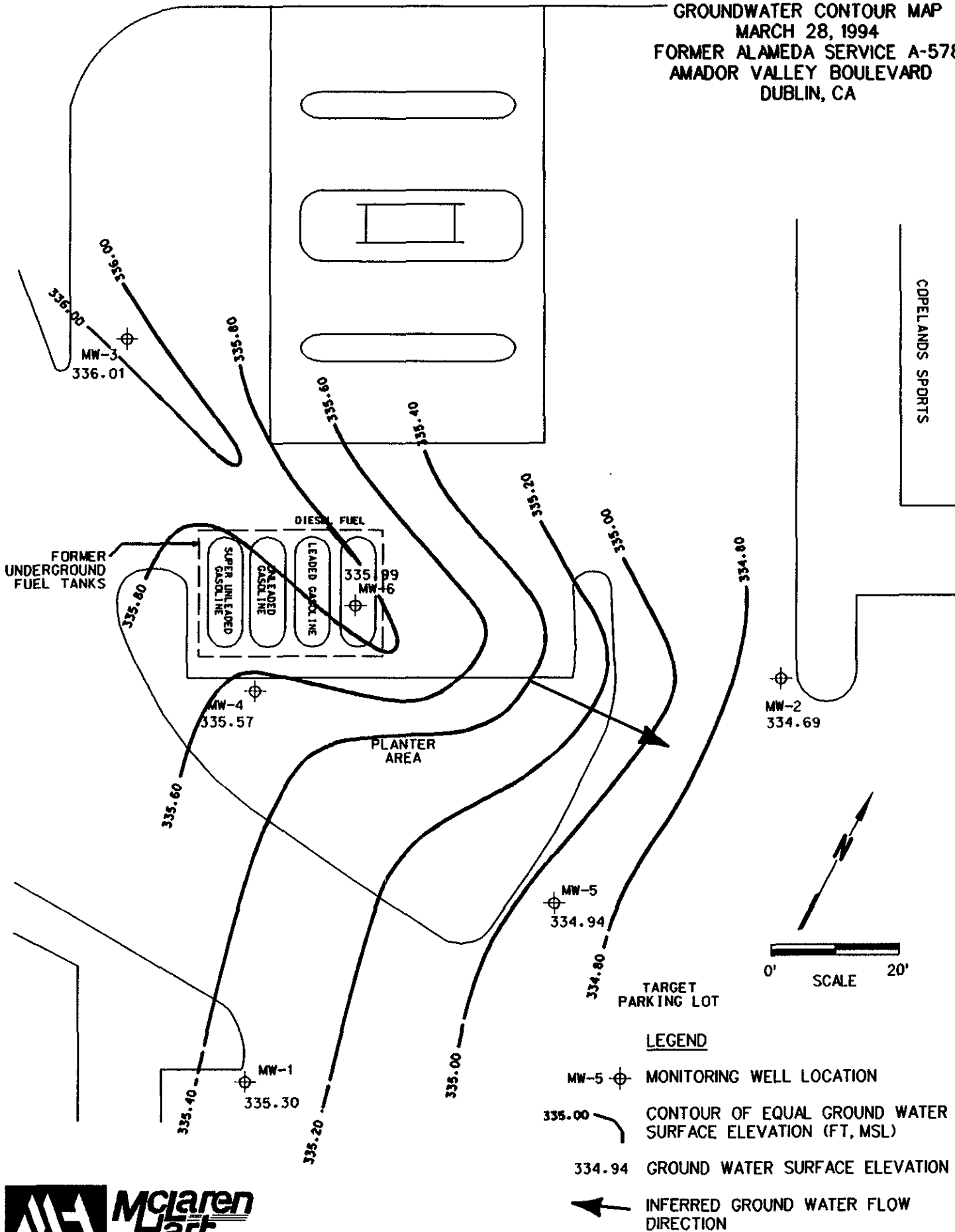


FIGURE 3
GROUNDWATER
MONITORING WELL
CHEMICAL CONCENTRATIONS
MARCH 28, 1994
FORMER ALAMEDA SERVICE A-578
AMADOR VALLEY BOULEVARD
DUBLIN, CA

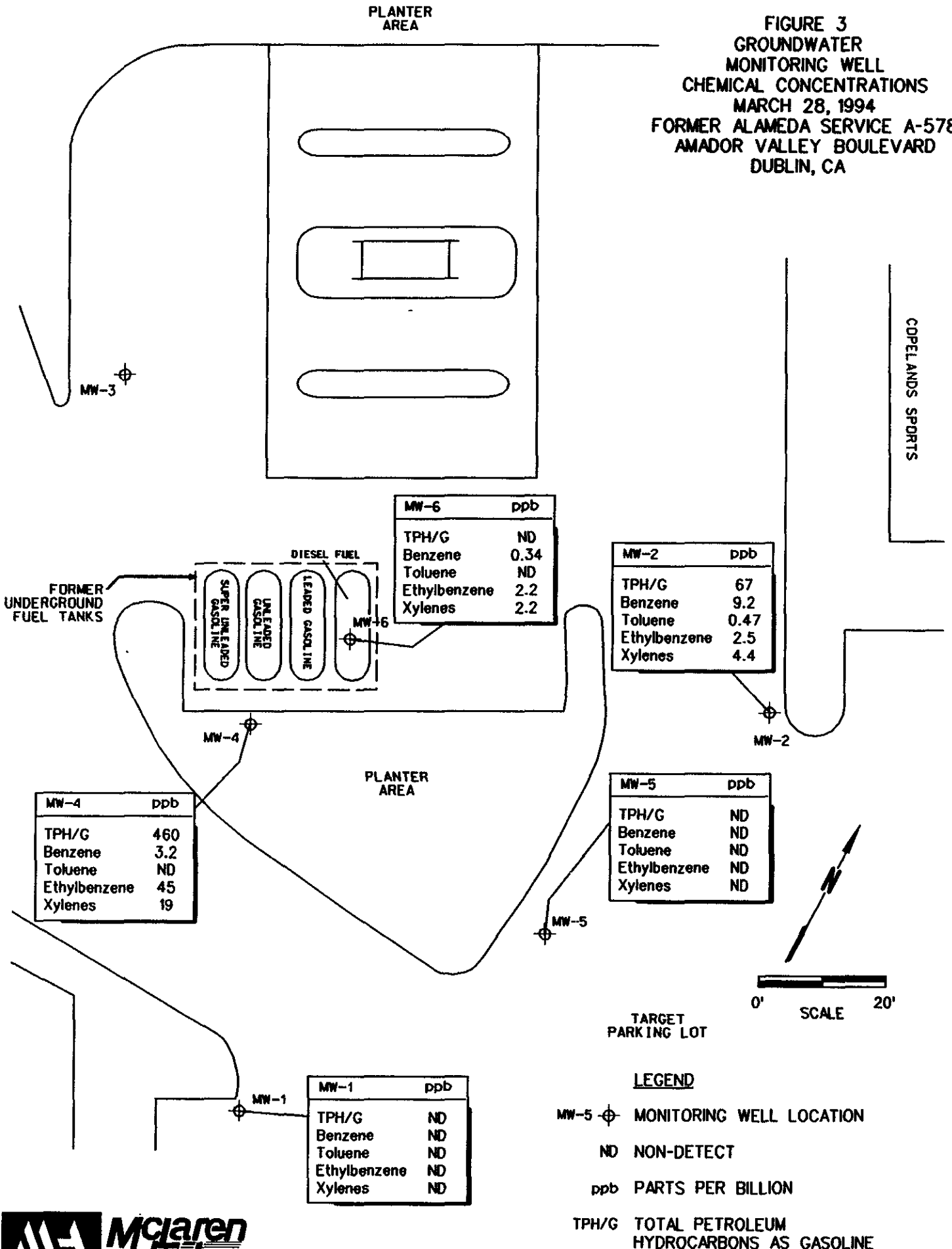


TABLE 1

WELL CONSTRUCTION DETAILS AND GROUND WATER SURFACE ELEVATIONS
 FORMER ALAMEDA SERVICE STATION, A-578
 DUBLIN, CALIFORNIA

WELL DESIGNATION	SCREENED INTERVAL (feet below grade)	GROUND SURFACE ELEVATION (MSL)*	SCREENED INTERVAL (MSL)	TOP OF CASING ELEVATION (MSL)	STATIC WATER LEVEL 03/28/94 (feet below TOC)	GROUND WATER ELEVATION 03/28/94 (MSL)
MW-1	5-20	340.30	335.30 - 320.30	340.20	4.90	335.30
MW-2	5-20	340.52	335.52 - 320.52	340.27	5.58	334.69
MW-3	5-20	341.67	336.67 - 321.67	341.00	4.99	336.01
MW-4	5-20	342.31	337.31 - 322.31	342.11	6.54	335.57
MW-5	5-20	340.52	335.52 - 320.52	340.09	5.15	335.94
MW-6	4.5 - 14.5	341.13	336.63 - 326.63	340.81	4.82	335.99

*Feet above mean sea level

TABLE 2

**SUMMARY OF GROUND WATER ELEVATION DATA
FORMER ALAMEDA SERVICE STATION A-578
DUBLIN, CALIFORNIA**

WELL I.D.	TOP OF CASING ELEVATION (MSL)*	DATE MEASURED	DEPTH TO WATER (ft)	WATER ELEVATIONS (MSL)	CHANGE SINCE LAST READING (ft)
MW-1	340.20	02/28/91	5.00	335.20	
		06/14/91	5.53	334.67	-0.59
		09/26/91	5.97	334.23	-0.38
		12/30/91	5.50	334.70	0.47
		03/26/92	4.65	335.55	0.85
		06/23/92	4.92	335.28	-0.27
		09/24/92	5.10	335.10	-0.18
		12/29/92	4.89	335.31	0.21
		03/24/93	3.57	336.63	1.32
		06/28/93	3.79	336.41	-0.22
		09/28/93	4.24	335.96	-0.45
		12/16/93	4.72	335.48	-0.48
		03/28/94	4.90	335.30	-0.18
		MW-2	340.27	02/28/91	5.46
06/14/91	5.90			334.37	-0.44
09/26/91	6.54			333.73	-0.64
12/30/91	5.83			334.44	0.71
03/27/92	5.35			334.92	0.48
06/23/92	5.69			334.58	-0.34
09/24/92	5.70			334.57	-0.01
12/29/92	5.52			334.75	0.18
03/24/93	4.48			335.79	1.04
06/28/93	4.67			335.60	-0.19
09/28/93	5.01			335.26	-0.34
12/16/93	5.40			334.87	-0.39
03/28/94	5.58			334.69	-0.18
MW-3	341.00			02/28/91	5.61
		06/14/91	5.40	335.60	0.21
		09/26/91	6.29	334.71	-0.89
		12/30/91	5.75	335.25	0.54
		03/26/92	4.58	336.42	1.17
		06/23/92	5.27	335.73	-0.69
		09/24/92	5.47	335.53	-0.20
		12/29/92	5.08	335.92	0.39
		03/24/93	3.83	337.17	1.25
		06/28/93	4.02	336.98	-0.19
		09/28/93	4.42	336.58	-0.40
		12/16/93	4.97	336.03	-0.55
		03/28/94	4.99	336.01	-0.02

TABLE 2
SUMMARY OF GROUND WATER ELEVATION DATA
FORMER ALAMEDA SERVICE STATION A-578
DUBLIN, CALIFORNIA
 (continued)

WELL I.D.	TOP OF CASING ELEVATION (MSL)*	DATE MEASURED	DEPTH TO WATER (ft)	WATER ELEVATIONS (MSL)	CHANGE SINCE LAST READING (ft)
MW-4	342.11	02/28/91	7.01	335.10	
		06/14/91	7.01	335.10	0.00
		09/26/91	7.81	334.30	-0.80
		12/30/91	7.17	334.94	0.64
		03/27/92	6.44	335.67	0.73
		06/23/92	6.70	335.41	-0.26
		09/24/92	6.84	335.27	-0.14
		12/29/92	6.59	335.52	0.25
		03/24/93	5.38	336.73	1.21
		06/28/93	5.52	336.59	-0.14
		09/28/93	5.89	336.22	-0.37
		12/16/93	6.51	335.60	-0.62
		03/28/94	6.54	335.57	-0.03
MW-5	340.09	06/14/91	5.81	334.28	
		09/26/91	5.92	334.17	-0.11
		12/30/91	5.52	334.57	0.40
		03/26/92	4.80	335.29	0.72
		06/23/92	5.23	334.86	-0.43
		09/24/92	5.07	335.02	0.16
		12/29/92	5.04	335.05	0.03
		03/24/93	3.99	336.10	1.05
		06/28/93	4.11	335.98	-0.12
		09/28/93	4.50	335.59	-0.39
		12/16/93	4.99	335.10	-0.49
03/28/94	5.15	334.94	-0.16		
MW-6	340.81	09/26/91	6.45	334.36	
		12/30/91	5.71	335.10	0.74
		03/27/92	5.03	335.78	0.68
		06/23/92	5.38	335.43	-0.35
		09/24/92	5.57	335.24	-0.19
		12/29/92	5.22	335.59	0.35
		03/24/93	3.86	336.95	1.36
		06/28/93	3.95	336.86	-0.09
		09/28/93	4.30	336.51	-0.35
		12/16/93	5.05	335.76	-0.75
03/28/94	4.82	335.99	0.23		

* MSL = Mean Sea Level

TABLE 3
ANALYTICAL RESULTS OF GROUND WATER SAMPLES (ppb)
FORMER ALAMEDA SERVICE STATION, A-578
DUBLIN, CALIFORNIA

<u>WELL DESIGNATION</u>	<u>DATE</u>	<u>TPH/G</u>	<u>TPH/D</u>	<u>BENZENE</u>	<u>TOLUENE</u>	<u>ETHYL BENZENE</u>	<u>XYLENES</u>	<u>TOTAL</u>
MW-1	2/91	<50	<500	<0.5	<0.5	<0.5	<0.5	
	6/91	<50	—	<0.5	<0.5	<0.5	<0.5	
	9/91	<50	—	<0.5	<0.5	<0.5	<0.5	
	12/91	<50	—	<0.5	<0.5	<0.5	<0.5	
	3/92	<50	—	<0.3	<0.3	<0.3	<0.3	
	6/92	<50	—	<0.3	<0.3	<0.3	<0.3	
	9/92	<50	—	<0.3	<0.3	<0.3	<0.3	
	3/94	<50	—	<0.3	<0.3	<0.3	<0.3	
	MW-2	2/91	50	<500	2.0	0.8	1.1	5.8
6/91		51	—	6.6	<0.5	1.1	1.33	
9/91		<50	—	5.0	<0.5	0.64	<0.5	
12/91		<50	—	6.1	<0.5	<0.5	<0.5	
3/92		<50	—	3.6	<0.5	<0.5	<0.5	
6/92		<50	—	9.5	<0.3	<0.3	<0.3	
9/92		<50	—	1.3	<0.3	<0.3	<0.3	
12/92		150	—	35 ^b	0.81	4.0	3.2	
3/93		<50	—	3.2	<0.3	<0.3	0.86	
6/93		<50	—	17.0 ^b	<0.3	0.93	0.41	
9/93		81	—	5.0 ^b	<0.3	3.8	4.06	
12/93		<50	—	0.53	<0.3	<0.3	<0.3	
3/94		67	—	9.2	0.47	2.5	4.40	
MW-3		2/91	<50	<500	<0.5	<0.5	<0.5	<0.5
	6/91	<50	—	<0.5	<0.5	<0.5	<0.5	
	9/91	<50	—	<0.5	<0.5	<0.5	<0.5	
	12/91	<50	—	<0.5	<0.5	<0.5	<0.5	
	3/92	<50	—	<0.3	<0.3	<0.3	<0.3	
	6/92	<50	—	<0.3	<0.3	<0.3	<0.3	
	9/92	<50	—	<0.3	<0.3	<0.3	<0.3	
	MW-4	2/91	6,000	<500	680	<20	160	250
6/91		6,100	—	680	<25	150	<25	
9/91		<50	—	100	<0.5	45	8.1	
12/91		180	—	6.4	<1.0	16	25.8	
3/92		560	—	120	6.0	5.0	<0.5	
6/92		<50	—	<0.3	<0.3	<0.3	<0.3	
9/92		<50	—	<0.3	<0.3	<0.3	<0.3	
12/92		<50	—	0.92	<0.3	<0.3	<0.3	
3/93		<50	—	4.3	<0.3	0.98	<0.3	
6/93		<50	—	2.1	<0.3	<0.3	0.31	
9/93		<50	—	2.8	<0.3	<0.3	<0.3	
12/93		<50	—	1.0	<0.3	<0.3	<0.3	
3/94		460 ^b	—	3.2 ^b	<3.0	45 ^b	19 ^b	

TABLE 3

ANALYTICAL RESULTS OF GROUND WATER SAMPLES (ppb)
FORMER ALAMEDA SERVICE STATION, A-578
DUBLIN, CALIFORNIA
(Continued)

<u>WELL DESIGNATION</u>	<u>DATE</u>	<u>TPH/G</u>	<u>TPH/D</u>	<u>BENZENE</u>	<u>TOLUENE</u>	<u>ETHYL BENZENE</u>	<u>XYLENES</u>	<u>TOTAL</u>	
MW-5	6/91	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	
	9/91	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	
	12/91	<50	---	<0.5	<0.5	<0.5	<0.5	<0.5	
	3/92	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	6/92	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	9/92	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	12/92	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	3/93	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	6/93	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	9/93	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	12/93	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	3/94	<50	---	<0.3	<0.3	<0.3	<0.3	<0.3	
	MW-6	9/91	2,300	---	760	11	360	236	
		10/91	1,900	---	230	<5	140	12.1	
12/91		2,500	<500	360	<50 ^a	260	<50 ^a		
3/92		2,600	<500	400	<50 ^a	280	<50 ^a		
6/92		1,500	---	220	<3 ^b	190	<3 ^b		
9/92		<480 ^b	---	28	<3 ^b	120	<3 ^b		
12/92		250	---	16 ^b	<0.3	33 ^b	16.4		
3/93		<50	<500	<0.3	<0.3	0.37	0.88		
6/93		<50	---	<0.3	<0.3	0.72	1.48		
9/93		230	---	0.46	<0.3	6.4	12.6		
12/93		<50	---	2.5	<0.3	2.6	3.5		
3/94		45	---	0.34	<0.3	2.2	2.2		

a = The analysis was run at a 1:100 dilution to bring target analytes within linear working range of the GC.

b = The analysis was run at a 1:10 dilution to bring target analytes within linear working range of the GC.

--- = Not analyzed.

TABLE 4

CHANGE IN GROUND WATER ELEVATION AT MONITORING WELLS
DURING INTERIM REMEDIATION AT MW-2
FORMER ALAMEDA SERVICE STATION A-578
DUBLIN, CALIFORNIA

DATE	TIME	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6	
		Depth	Change [*]	Depth	Change [*]	Depth	Change [*]	Depth	Change [*]	Depth	Change [*]	Depth	Change [*]
09-28-93	0959	4.24	—	5.01	—	4.42	—	5.89	—	4.50	—	4.30	—
	1809	4.37	-0.13	12.85	-7.84	4.55	-0.13	6.09	-0.20	4.79	-0.29	4.42	-0.12
09-29-93	0809	4.30	-0.06	5.09	-0.08	4.48	-0.06	5.97	-0.08	4.61	-0.11	4.35	-0.05
	1321	4.40	-0.16	19.51	-14.50	4.57	-0.15	6.14	-0.25	4.86	-0.36	4.47	-0.17
12-16-93	0826	4.72	—	5.40	—	4.97	—	6.51	—	4.99	—	5.05	—
	1605	4.88	-0.16	16.90	-11.5	5.11	-0.14	6.71	-0.20	5.27	-0.28	5.22	-0.17
12-17-93	0750	4.86	-0.14	5.52	-0.12	5.10	-0.13	6.65	-0.14	5.11	-0.12	5.18	-0.13
	1326	4.94	-0.22	17.03	-11.63	5.18	-0.21	6.78	-0.27	5.34	-0.35	5.30	-0.25
03-28-94	0910	4.90	—	5.58	—	4.99	—	6.54	—	5.15	—	4.82	—
	1500	5.00	-0.10	14.44	-8.86	5.11	-0.12	6.71	-0.17	5.41	-0.26	4.99	-0.17
03-29-94	0756	4.93	-0.03	5.63	-0.05	5.02	-0.03	6.57	-0.03	5.17	-0.02	4.86	-0.04
	1502	5.01	-0.11	18.18	-12.60	5.12	-0.13	6.71	-0.17	5.42	-0.27	5.03	-0.21

*NOTE: Changes in water elevation are measured from the initial depth to ground water on 9/28/93, 12/16/93 and 3/28/94. Ground water was pumped from MW-2 at approximately 1.4 gpm during March 1994.

TABLE 5

CHANGE IN GROUND WATER ELEVATION AT MONITORING WELLS
DURING INTERIM REMEDIATION AT MW-6
FORMER ALAMEDA SERVICE STATION A-578
DUBLIN, CALIFORNIA

DATE	TIME	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6	
		Depth	Change	Depth	Change	Depth	Change	Depth	Change	Depth	Change	Depth	Change
10-17-91	1000	6.19	—	6.74	—	6.40	—	7.96	—	6.28	—	6.65	—
	1600	6.24	-0.05	6.80	-0.06	6.59	-0.19	8.10	-0.14	6.45	-0.17	11.26	-4.61
10-18-91	0900	6.24	-0.05	6.82	-0.08	6.55	-0.15	8.04	-0.08	6.40	-0.12	6.72	-0.07
	1600	6.28	-0.09	6.84	-0.10	6.64	-0.24	8.13	-0.17	6.48	-0.20	12.80	-6.15
12-30-91	0800	5.50	—	5.83	—	5.75	—	7.17	—	5.52	—	5.72	—
12-31-91	1500	5.69	-0.19	6.00	-0.17	5.83	-0.08	7.29	-0.12	5.68	-0.16	7.36	-1.65
3/26/92	1000	4.65	—	5.35	—	4.58	—	6.44	—	4.80	—	5.03	—
	1500	4.82	-0.17	5.43	-0.08	5.01	-0.43	6.70	-0.26	5.15	-0.35	12.72	-7.69
3/27/92	0845	4.74	-0.09	5.41	-0.06	4.95	-0.37	6.52	-0.08	5.01	-0.21	5.10	-0.07
	1400	4.80	-0.15	5.48	-0.13	5.04	-0.46	6.72	-0.28	6.11	-1.31	13.12	-8.07
6/23/92	0930	4.92	—	5.69	—	5.27	—	6.70	—	5.23	—	5.38	—
	1830	5.04	-0.12	5.82	-0.13	5.38	-0.11	6.95	-0.25	5.39	-0.16	13.70	-8.32
6/24/92	0900	5.04	-0.12	5.76	-0.07	5.33	-0.06	6.84	-0.14	5.34	-0.11	5.48	-0.10
	1130	5.09	-0.17	5.79	-0.10	5.38	-0.11	6.95	-0.25	5.39	-0.16	9.77	-4.39
9/24/92	0845	5.10	—	5.70	—	5.47	—	6.84	—	5.07	—	5.57	—
	1530	5.33	-0.23	5.91	-0.21	5.68	-0.21	7.16	-0.32	5.50	-0.43	13.50	-7.93

TABLE 5

CHANGE IN GROUND WATER ELEVATION AT MONITORING WELLS
DURING INTERIM REMEDIATION AT MW-6
FORMER ALAMEDA SERVICE STATION A-578
DUBLIN, CALIFORNIA
(continued)

DATE	TIME	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6	
		Depth	Change	Depth	Change	Depth	Change	Depth	Change	Depth	Change	Depth	Change
9/25/92	0705	5.35	-0.25	5.98	-0.28	5.69	-0.22	7.14	-0.30	5.53	-0.46	5.79	-0.22
	1005	5.42	-0.32	6.07	-0.37	5.76	-0.29	7.64	-0.80	5.66	-0.59	13.50	-7.93
10/29/92	1030	5.95	—	6.77	—	6.46	—	8.00	—	6.34	—	6.65	—
	1556	6.03	-0.08	6.64	0.13	6.47	-0.01	7.94	-0.06	6.21	0.13	13.16	-6.51
11/20/92	0820	6.06	—	6.85	—	6.47	—	8.04	—	6.42	—	6.73	—
	1325	6.22	-0.16	6.88	-0.03	6.67	-0.20	8.12	-0.08	6.48	-0.06	13.85	-7.12
12/29/92	1150	4.89	—	5.52	—	5.08	—	6.59	—	5.04	—	5.22	—
	1605	4.89	0.00	5.57	-0.05	5.08	0.00	6.71	-0.12	5.09	-0.05	12.25	-7.03
12/30/92	0935	4.66	0.23	5.26	0.26	4.82	0.26	6.33	0.26	4.83	0.21	4.81	0.41
	1420	4.72	0.17	5.31	0.21	4.92	0.16	6.54	0.05	4.93	0.11	13.90	-8.68
3/24/93	0912	3.57	—	4.48	—	3.83	—	5.38	—	3.99	—	3.86	—
	1340	3.64	-0.07	4.63	-0.15	3.97	-0.14	5.63	-0.25	4.13	-0.14	9.98	-6.12
3/25/93	0918	3.53	0.04	4.46	0.02	3.77	0.06	5.35	0.03	3.97	0.02	3.79	0.07
	1130	3.62	-0.05	4.53	-0.05	3.93	-0.10	5.60	-0.22	4.10	-0.11	10.36	-6.50

TABLE 5

**CHANGE IN GROUND WATER ELEVATION AT MONITORING WELLS
DURING INTERIM REMEDIATION AT MW-6
FORMER ALAMEDA SERVICE STATION A-578
DUBLIN, CALIFORNIA
(continued)**

DATE	TIME	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6	
		Depth	Change	Depth	Change	Depth	Change	Depth	Change	Depth	Change	Depth	Change
06-28-93	1120	3.79	—	4.67	—	4.02	—	5.52	—	4.11	—	3.95	—
	1541	3.90	-0.11	4.82	-0.15	4.18	-0.16	5.77	-0.25	4.29	-0.18	8.05	-4.10
06-29-93	1032	3.77	0.02	4.59	0.08	3.99	0.03	5.50	0.02	4.04	0.07	3.87	0.08
	1347	3.85	-0.06	4.70	-0.03	4.14	-0.12	5.76	-0.24	4.19	-0.08	11.26	-7.31

*NOTE: Changes in water elevation are measured from the initial depth to ground water on 10/17/91, 12/30/91, 3/26/92, 6/23/92, 9/24/92, 10/29/92, 11/20/92, 12/29/92, 3/24/93 and 6/28/93.
Ground water was pumped from MW-6 at approximately 0.96 gpm during June 1993.

APPENDIX I
SAMPLING EVENT DATA SHEETS



HYDRODATA

DATE: 3/28/94

PROJECT: TARGET DUBLIN EVENT: SAMPLING SAMPLER: D. WATTS

NO.	WELL OR LOCATION	DATE			TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YR	HR	MIN			
1	MW-1	3	28	94	09	10	4.90	SWL	
2	MW-3				09	11	4.99		D.O.: 2.10
3	MW-5				09	13	5.15		
4	MW-2				09	16	5.58		
5	MW-4				09	17	6.54		
6	MW-6	↓	↓	↓	09	18	4.82	↓	
7									
8	MW-1	3	28	94	15	00	5.00	SWL	
9	MW-3				15	01	5.11		D.O.: 1.40
10	MW-5				15	02	5.41		
11	MW-2				15	03	14.44		(Purging)
12	MW-4				15	04	6.71		
13	MW-6	↓	↓	↓	15	05	4.99	↓	
14									
15									
16									
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)
- _____ (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.
 †Negative pressure (Vacuum) not _____



HYDRODATA

DATE: 3/29/94

PROJECT: Target Dublin EVENT: Sampling SAMPLER: D. WATTS

NO.	WELL OR LOCATION	DATE			TIME		MEASUREMENT	CODE	COMMENTS
		MO	DA	YR	HR	MIN			
1	MW-1	3	29	94	07	56	4.93	SWL	
2	MW-3				07	57	5.02		
3	MW-5				07	58	5.17		
4	MW-2				08	00	5.63		
5	MW-4				08	01	6.57		
6	MW-6	↓	↓	↓	08	02	4.86	↓	
7									
8	MW-1	3	29	94	15	02	5.01	SWL	
9	MW-3				15	03	5.12		
10	MW-5				15	04	5.42		
11	MW-2				15	06	18.18		(Purging)
12	MW-4				15	07	6.71		
13	MW-6	↓	↓	↓	15	08	5.03	↓	
14									
15									
16									
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)
- _____ (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.
 (Marking procedure (Vertical) ...)

SAMPLING EVENT DATA SHEET

(fill out completely)



McLaren

WELL OR LOCATION MW-1

PROJECT TARGET Dublin EVENT Quarterly SAMPLER D. Wright DATE 3/28/94

Well / Hydrologic statistics

Well type MW
(MW, EW, etc.)

diameter 4"
equals .65 gal/ft. casing

5 TOP

20 BOP

measured T.D. 19.78 T.D. (as built) 20

Action	Time	Pump rate	IWL (low vick)
Start pump / Begin	1038	1 GPM	
	1048	1 GPM	9.38
	1059	1 GPM	9.81
	1109	1 GPM	10.44
	1118	1 GPM	10.77
Stop	1120		10.77
Sampled	1132		7.55
(Final IWL)	1144		6.09

Purge calculation

.65 gal/ft. * 15.10 ft. = 10 gals * $\frac{4}{4}$ = 40 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.
Disposable Bailer used to Sample.

Actual gallons purged	<u>40</u>
Actual volumes purged	<u>4</u>
Well yield (see below)	<u>MY</u>
COC #	<u>4723</u>
Sample I.D.	Analysis Lab
<u>243757-62</u>	<u>TTH-6 (Luv)</u> (TB) <u>MST</u>
<u>243763-66</u>	<u>TTH-6 (Luv)</u> ↓

Additional comments:
USED DESIGN T.D for Purge Calculation
20% recovery: 12.45
80% recovery: 7.92 Sample Turbidity: 3.27

Gallons purged *	TEMP °C (°F) (circle one)	EC (us / cm)	PH	TURBIDITY (NTU)	L.O.
1. <u>10</u>	<u>64.6</u>	<u>1940</u>	<u>6.74</u>	<u>11.27</u>	<u>1.96 (ini)</u>
2. <u>20</u>	<u>67.2</u>	<u>1980</u>	<u>6.54</u>	<u>4.96</u>	
3. <u>30</u>	<u>67.8</u>	<u>1960</u>	<u>6.57</u>	<u>3.98</u>	
4. <u>40</u>	<u>67.0</u>	<u>1900</u>	<u>6.70</u>	<u>3.04</u>	<u>0.45 (Final)</u>
5. <u> </u>					

* 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.



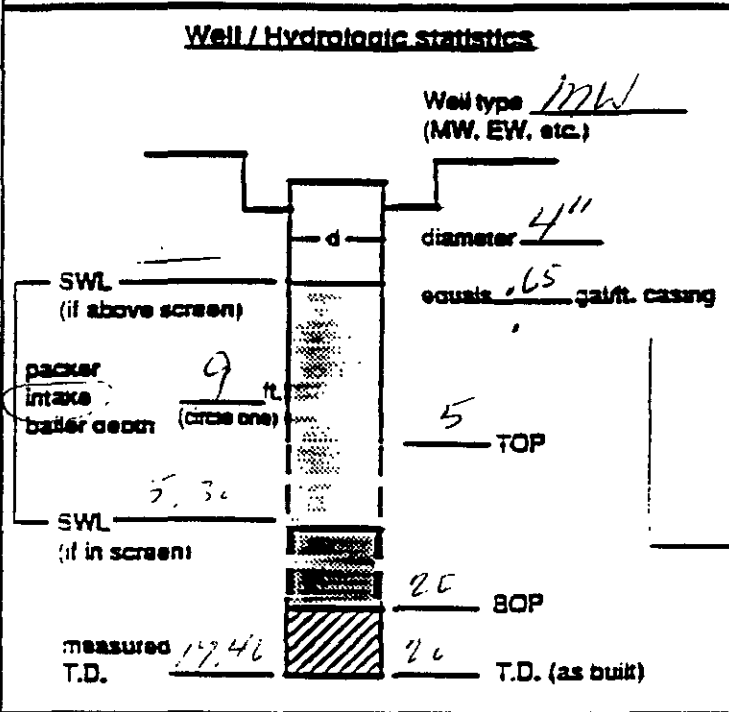
McLaren

SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION 17W-5

PROJECT LURGET Dublin EVENT Quarterly SAMPLER D. WITTS DATE 3/28/94



Action	Time	Pump rate	IWL (low vick)
Start pump / Begin	1217	1 GPM	
	1227	1 GPM	8.12
	1236	1 GPM	8.40
	1245	1 GPM	8.59
	1254	1 GPM	8.63
Stop	1254		8.63
Sampled	1258		6.36
(Final IWL)	1306		5.57
Purge calculation			
$.65 \text{ gal/ft.} \cdot 14.76 \text{ ft.} = 10 \text{ gals} \times 3 = 40 \text{ gals.}$			
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.
PORTABLE TAPLER USED TO SAMPLE.

Actual gallons purged	<u>40</u>
Actual volumes purged	<u>4</u>
Well yield (see below)	<u>MY</u>
COC #	<u>41163</u>
Sample I.D.	<u>245161-70</u>
Analysis	<u>149.6 (Total T)</u> <u>15762 (3024)</u>
Lab	<u>11281</u>

Additional comments:
USED DESIGN T.D. FOR Purge Calculation.
SWL TO BOP = 12.65
10% Recovery: 7.24 Sample Turbidity: 1.45

Gallons purged *	TEMP °C/F (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)	D.O.
1. 10	71.0	1510	6.74	6.01	1.20 (min)
2. 20	71.3	1550	6.72	2.67	
3. 30	71.3	1540	6.77	1.23	
4. 40	71.5	1580	6.80	2.01	0.65 (FINAL)
5.					

* Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop MY - WL drop - sole 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.



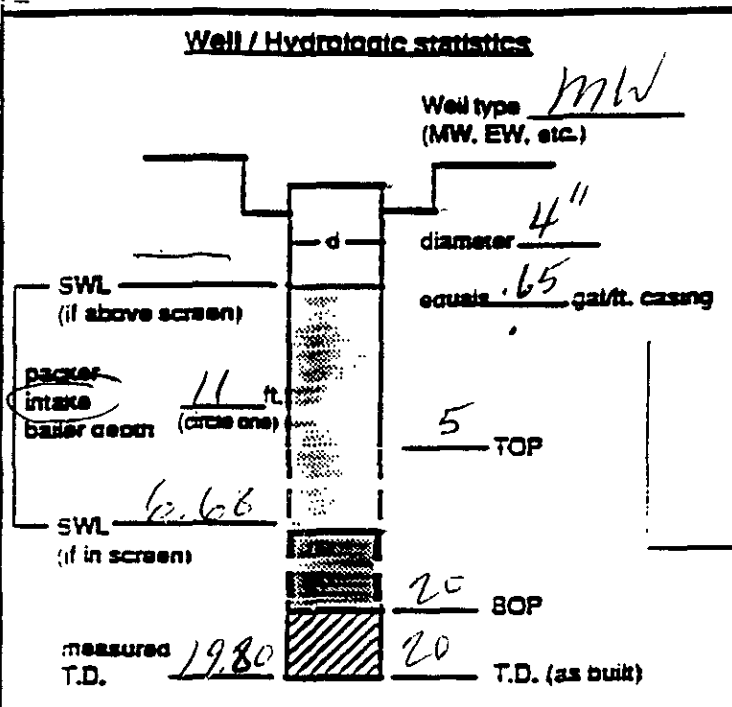
McLaren

SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-4

PROJECT TARGET Dublin EVENT Quarterly SAMPLER D. WATTS DATE 5/28/94



Action	Time	Pump rate	IWL (low vick)
Start pump / Begin	1342	1 GPM	
	1351	1 GPM	10.12
	1400	1 GPM	10.39
	1409	1 GPM	10.55
	1418	1 GPM	10.64
Stop	1418		10.64
Sampled	1420		8.98
(Final IWL)	1429		7.09

Purge calculation

.65 gal/ft. * 13.32 ft. = 9 gals x 3 = 36 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.
DISPOSABLE BAILER USED TO SAMPLE.

Actual gallons purged	<u>36</u>
Actual volumes purged	<u>4</u>
Well yield (see below)	<u>MY</u>
COC #	<u>4/05</u>
Sample I.D.	<u>243771-74</u>
Analysis	<u>LT52 / 10020</u>
Lab	<u>178T</u>

Additional comments:
USLD DESIGN T.D. FOR PURGE CALCULATION.
50% RECOVERY: 13.34
10% RECOVERY: 9.34 SAMPLE TURBIDITY: 1.21

Gallons purged *	TEMP °C / (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)	D.O.
1. <u>9</u>	<u>69.4</u>	<u>1270</u>	<u>6.73</u>	<u>2.25</u>	<u>0.75 (IN.T.)</u>
2. <u>18</u>	<u>68.5</u>	<u>1020</u>	<u>6.85</u>	<u>1.43</u>	
3. <u>27</u>	<u>68.3</u>	<u>950</u>	<u>6.85</u>	<u>1.05</u>	
4. <u>36</u>	<u>68.8</u>	<u>920</u>	<u>6.96</u>	<u>1.13</u>	<u>0.55 (FINAL)</u>
5.					

* 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.

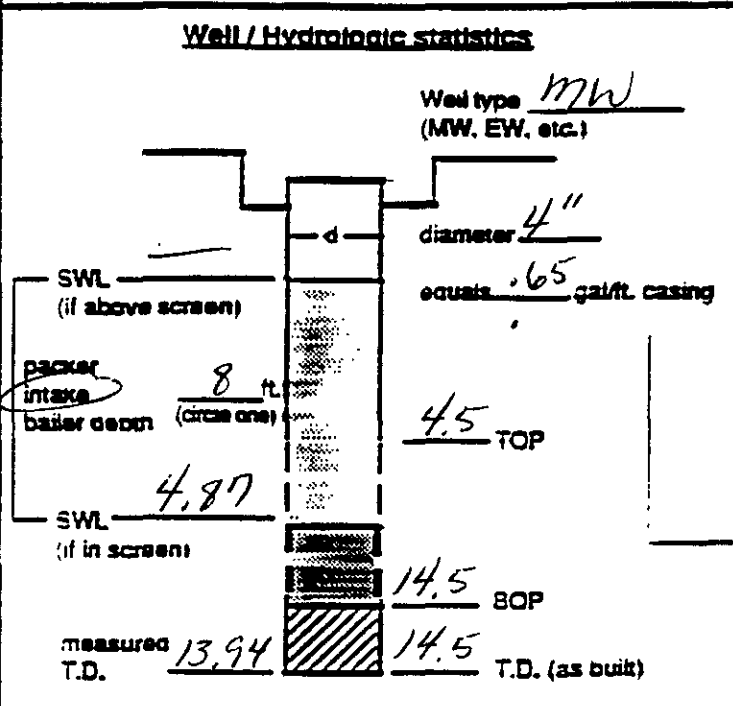
SAMPLING EVENT DATA SHEET

(fill out completely)



WELL OR LOCATION MW-6

PROJECT TARGET DUBLIN EVENT Quarterly SAMPLER D. WATTS DATE 3/29/94



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	0839	.2 GPM	
	0913	.2 GPM	6.71
	0953	.17 GPM	6.90
	1032	.17 GPM	7.03
<u>N</u> <u>1114</u>	1114	.21 GPM	7.01
Stop	1114		7.01
Sampled	1130		5.92
(Final IWL)	1138		5.42

Purge calculation

.65 gal/ft. * 9.63 ft. = 6.5 gal * 4 = 26 gal.

SWL to BOP or one volume
 packer to BOP volume

Head purge calculation (Airlift only)...

gal/ft. * ft. = gal.
 packer to SWL...

Equipment Used / Sampling Method / Description of Event:
PERISTALTIC PUMP USED TO PURGE.
DISPOSABLE BAIER USED TO SAMPLE.

Actual gallons purged	<u>26</u>
Actual volumes purged	<u>4</u>
Well yield (see below)	<u>MY</u>
COC #	<u>4703</u>
Sample I.D.	<u>243775-78</u>
Analysis	<u>Fe, Mn, Cu, Pb, Zn, Cd</u>
Lab	<u>MBS</u>

Additional comments:
USED DESIGN T.D. FOR PURGE CALCULATION.

50% RECOVERY: 9.68

80% RECOVERY: 6.79 SAMPLE TURBIDITY: 11.41

Gallons purged *	TEMP °C (°F) (circle one)	EC (us / cm)	PH	TURBIDITY (NTU)	D. D.
<u>6.50</u>	<u>62.3</u>	<u>640</u>	<u>7.58</u>	<u>14.94</u>	<u>0.70 (INIT.)</u>
<u>13.00</u>	<u>62.4</u>	<u>610</u>	<u>7.11</u>	<u>11.01</u>	
<u>20.00</u>	<u>63.1</u>	<u>610</u>	<u>7.09</u>	<u>5.53</u>	
<u>26.00</u>	<u>62.3</u>	<u>640</u>	<u>7.08</u>	<u>3.54</u>	<u>5.40 (FINAL)</u>
<u>5.</u>					

* 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.



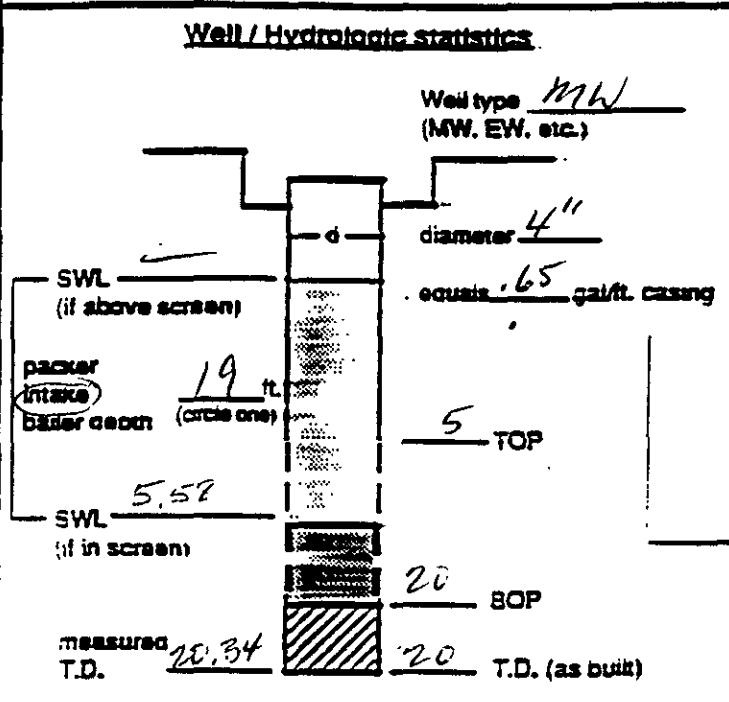
McLaren

SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION MW-2

PROJECT TARGET DUBUQUE EVENT Quarterly SAMPLER D. W. JTT DATE 3/28/94



Action	Time	Pump rate	IWL (low vick)
Start pump / Begin	0959		
550 GAL	1629	1.41 GPM	14.09
3/29/94 Restart	0820	1.46 GPM	
700 GAL			
Stop	1620		18.20
Sampled	1640		6.37
(Final IWL)	1650		6.29
Purge calculation			
<u>.65</u> gal/ft. * <u>14.76</u> ft. = <u>9.60</u> gals x <u>3</u> = <u>38.40</u> 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.
DISPOSABLE BAILER USED to SAMPLE.

Actual gallons purged	<u>1250</u>
Actual volumes purged	<u>130</u>
Well yield (see below)	<u>MY</u>
COC #	<u>4703</u>
Sample I.D.	<u>243779-82</u>
Analysis	<u>TRT-6 (LIFT) BY 18030</u>
Lab	<u>MGT</u>

Additional comments:
USED MEASURED T.D. FOR Purge Calculation.
50% RECOVERY: 12.96
80% RECOVERY: 8.53 SAMPLE TURBIDITY: 2.01

Gallons purged *	TEMP °C (°F) (circle one)	EC (us / cm)	PH	TURBIDITY (NTU)	D.O.
1. 1050	67.3	1690	6.86	1.84	1.15 (INIT.)
2. 1100	66.9	1700	6.86	1.42	
3. 1150	66.8	1710	6.86	1.17	
4. 1200	66.5	1700	6.86	1.07	3.30 (Final)
5. 1250	66.90	1690	6.87	1.83	

* Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop

MY - WL drop - sole 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.

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.

The reporting limits for BTEX meet those specified in the California LUFT Manual.

(CN8984)

MBT Environmental
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Master Builders Technologies





MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292

CHAIN OF CUSTODY RECORD

SEE SIDE 2 FOR
COMPLETE
INSTRUCTIONS

Ship To: 17701 2nd Lanes Project Name: Trinity Dublin FOR LABORATORY USE ONLY
 Address: 3083 Gold Canal Dr. Project Number: 04 0122629.000 Laboratory Project #: 8984
Rancho Cordova, CA 95670 Project Location: (State) CA Storage Refrigerator ID: 1
 Storage Freezer ID: _____

Sampler Name: D. Winters Signature: [Signature] PPE Worn in Field: D
 Relinquished By: [Signature] Date/Time: 3/30/94 1100 Received By or Method of Shipment/shipment I.D.: Express IT Date/Time: 3/30/94 1100
 Relinquished By: Express IT Date/Time: _____ Received By or Method of Shipment/shipment I.D.: [Signature] Date/Time: 3-31-94 0915
 Relinquished By: _____ Date/Time: _____ Received By or Method of Shipment/shipment I.D.: _____ Date/Time: _____

Sample Disposal (check one): Laboratory Standard Other
 Level of QC (see Side 2): 1 2 3 4 5 6A 6B 6C 6D 6E 7
 Write in Analysis Method →

ANALYSES REQUESTED

FOR LABORATORY USE ONLY Lab ID	Sample ID Number	Date	Time	Description		Container(s)		Matrix Type	Pres. Type	TAT	ANALYSES REQUESTED	
				Locator	Depth	#	Type				TPH - 9 (LIFT)	BTEX (10%)
1 8984-001	243759-1	3/24/94	1016	TRINITY BANK	AA	4	V	H ₂ O	H ₂ O	4	X	X
2	-002	3/25/94	1152	TRINITY - 1							X	X
3	-003	3/26/94	1258	TRINITY - 2							X	X
4	-004	3/27/94	1420	TRINITY - 3							X	X
5	-005	3/29/94	1130	MW-6							X	X
6	-006	3/29/94	1640	MW-2							X	X
7												
8												
9												
10												

Special Instructions/Comments: _____
 Container Types: A=1 Liter Amber TAT (Analytical Turn Around Time)
 B=Brass Tube C=Cassette 1 = 24 hours 2 = 48 hours
 G=Glass Jar P=Polyethylene 3 = 1 week 4 = 2 weeks
 O=Other V=Voa Vial 0 = Other

FOR LABORATORY USE ONLY Sample Condition Upon Receipt: TEMP. GOOD, SAMPLES INTACT
TOP CAPS HAVE AIR BUBBLES
 SEND DOCUMENTATION AND RESULTS TO (Check one):
 Project Manager/Office: [Signature]
 Client Name: _____
 Company: _____
 Address: _____
 Phone: _____ FAX: _____

- Common Analytical Methods
- 413.1
 - 413.2 Long Method
 - 413.2 Short Method
 - 418.1 Long Method
 - 418.1 Short Method
 - 420.1
 - 502.2
 - 503E
 - 503.1
 - 524.2
 - 601
 - 602
 - 604
 - 608
 - 610
 - 624
 - 625
 - 8010
 - 8015
 - 8015 Mod.
 - 8020
 - 8021
 - 8040
 - 8080
 - 8100
 - 8150
 - 8240
 - 8270
 - 8310
 - Acidity
 - Alkalinity
 - BTEX
 - Chloride
 - CLP (see Side 2)
 - COD
 - Color
 - Conductivity
 - Corrosivity
 - Cyanide
 - Flashpoint
 - Fluoride
 - General Mineral
 - Hex. Chromium
 - Ion Balance
 - Metals (write specific metal & method #)
 - Metals 6010*
 - Metals PP*
 - Metals Title 22:
 - TTLIC Level
 - STLC Level (see Side 2)
 - Nitrate
 - Nitrite
 - Odor
 - Org. Lead
 - Org. Mercury
 - Percent Moisture
 - Percent Solid
 - Perchlorate
 - pH
 - Phosphates
 - Phosphorus
 - Sulfate
 - Sulfides
 - TCLP:
 - VOA
 - Semivolatile Metals
 - Pesticide
 - TDS
 - Total Hardness
 - Total Solids
 - TPH/D
 - TPH/G
 - TSS
 - Turbidity
- * Specify Total or Dissolved

APPENDIX II
ANALYTICAL DATA SHEETS
AND
CHAIN-OF-CUSTODY RECORDS

VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030

Project Name: *Target Dublin*

Project Number: 040122629000

Sample Description: *Trip Blank*

Lab Project-ID Number: 8984-1

Sample Number: 243759

Date Sampled: 03/28/94

Date Received: 03/31/94

Date Analyzed: 04/07/94

Analyte	Concentration ug/L (ppb)	Reporting Limit ug/L (ppb)
Benzene	BRL	0.30
Toluene	BRL	0.30
Ethylbenzene	BRL	0.30
1,2-Xylene	BRL	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	BRL	0.30
Total Petroleum Hydrocarbons - Gasoline	BRL	50

Surrogates	Percent Recovery	Acceptance Limits
a,a,a-Trifluorotoluene (PID)	101	63 - 134
a,a,a-Trifluorotoluene (FID)	100	63 - 134

Comments

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

Approved by: 

Date: 4/11/94

063

Page 1

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VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030

Project Name: *Target Dublin*

Project Number: 040122629000

Sample Description: *MW-1*

Lab Project-ID Number: 8984-2

Sample Number: 243763

Date Sampled: 03/28/94

Date Received: 03/31/94

Date Analyzed: 04/07/94

Analyte	Concentration ug/L (ppb)	Reporting Limit ug/L (ppb)
Benzene	BRL	0.30
Toluene	BRL	0.30
Ethylbenzene	BRL	0.30
1,2-Xylene	BRL	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	BRL	0.30
Total Petroleum Hydrocarbons - Gasoline	BRL	50

Surrogates	Percent Recovery	Acceptance Limits
a,a,a-Trifluorotoluene (PID)	100	63 - 134
a,a,a-Trifluorotoluene (FID)	100	63 - 134

Comments

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

Approved by: _____

Date: 4-11-94

VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030

Project Name: *Target Dublin*

Project Number: 040122629000

Sample Description: *MW-2*

Lab Project-ID Number: 8984-6

Sample Number: 243779

Date Sampled: 03/29/94

Date Received: 03/31/94

Date Analyzed: 04/07/94

Analyte	Concentration ug/L (ppb)	Reporting Limit ug/L (ppb)
Benzene	9.2	0.50
Toluene	0.47	0.50
Ethylbenzene	2.5	0.50
1,2-Xylene	0.40	0.50
1,3-Xylene	1.3	0.50
1,4-Xylene	2.7	0.50
Total Petroleum Hydrocarbons - Gasoline	67	50

Surrogates	Percent Recovery	Acceptance Limits
a,a,a-Trifluorotoluene (PID)	102	63 - 134
a,a,a-Trifluorotoluene (FID)	101	63 - 134

Comments

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

Non-target analytes are present on the chromatograph.

Approved by: 

Date: 4-11-94

VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030

Project Name: Target Dublin

Project Number: 040122629000

Sample Description: MW-4

Lab Project-ID Number: 8984-4

Sample Number: 243772

Date Sampled: 03/28/94

Date Received: 03/31/94

Date Analyzed: 04/08/94

Analyte	Concentration ug/L (ppb)	Reporting Limit ug/L (ppb)
Benzene	3.2	3.0
Toluene	BRL	3.0
Ethylbenzene	45	3.0
1,2-Xylene	BRL	3.0
1,3-Xylene	BRL	3.0
1,4-Xylene	19	3.0
Total Petroleum Hydrocarbons - Gasoline	{a} 460	500

Surrogates	Percent Recovery	Acceptance Limits
a,a,a-Trifluorotoluene (PID)	97	63 - 134
a,a,a-Trifluorotoluene (FID)	113	63 - 134

Comments

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

A 10 fold dilution was required to quantitate target analytes due to the presence of non-target analyte interferences.

{a} The data is reported as an estimated concentration below the established reporting limit.

Approved by: 

Date: 4-11-94

063

Page 1

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VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030

Project Name: *Target Dublin*

Project Number: *040122629000*

Sample Description: *MW-5*

Lab Project-ID Number: *8984-3*

Sample Number: *243767*

Date Sampled: *03/28/94*

Date Received: *03/31/94*

Date Analyzed: *04/07/94*

Analyte	Concentration ug/L (ppb)	Reporting Limit ug/L (ppb)
Benzene	BRL	0.30
Toluene	BRL	0.30
Ethylbenzene	BRL	0.30
1,2-Xylene	BRL	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	BRL	0.30
Total Petroleum Hydrocarbons - Gasoline	BRL	50

Surrogates	Percent Recovery	Acceptance Limits
a,a,a-Trifluorotoluene (PID)	94	63 - 134
a,a,a-Trifluorotoluene (FID)	96	63 - 134

Comments

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

Approved by: 

Date: *4-11-94*

VOLATILE AROMATIC COMPOUNDS

Analytical Method: Modified EPA 8020 (BTEX) and
Total Petroleum Hydrocarbons Gasoline by LUFT
Preparation Method: EPA 5030

Project Name: *Target Dublin*

Project Number: *040122629000*

Sample Description: *MW-6*

Lab Project-ID Number: *8984-5*

Sample Number: *243775*

Date Sampled: *03/29/94*

Date Received: *03/31/94*

Date Analyzed: *04/07/94*

Analyte	Concentration ug/L (ppb)	Reporting Limit ug/L (ppb)
Benzene	0.34	0.30
Toluene	BRL	0.30
Ethylbenzene	2.2	0.30
1,2-Xylene	BRL	0.30
1,3-Xylene	BRL	0.30
1,4-Xylene	2.2	0.30
Total Petroleum Hydrocarbons - Gasoline	{a} 45	50

Surrogates	Percent Recovery	Acceptance Limits
a,a,a-Trifluorotoluene (PID)	96	63 - 134
a,a,a-Trifluorotoluene (FID)	100	63 - 134

Comments

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

{a} The data is reported as an estimated concentration below the established reporting limit.

Non-target analytes are present on the chromatograph.

Approved by: 

Date: *4-11-94*

MBT Environmental
Laboratories

3083 Gold Canal Drive
Rancho Cordova
CA 95670
Phone 916/852-6600
Fax 916/852-7292



Master Builders Technologies

RECEIVED

APR 11 1994

McLAREN/HART

Date: April 11, 1994
LP #: 8984

Campbell McLeod
McLaren/Hart Environmental Engineering
1135 Atlantic Avenue
Alameda, CA 94501

Dear Mr. McLeod:

Enclosed are the laboratory results for the six samples submitted to MBT Environmental Laboratories on March 31, 1994, for the project *Target Dublin*.

The analysis requested is:

EPA 8020 (BTEX) and TPH/G (6 - 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 MBT Environmental Laboratories. 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,

A handwritten signature in black ink, appearing to read 'Shakoora Azimi', written over a horizontal line.

Shakoora Azimi
Laboratory Director, Principal Scientist

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 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.

(CN8984)

MBT Environmental
Laboratories



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QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8020 (BTEX) & TPH/G
Units: ug/L (ppb)

Date Analyzed: 04/07/94

<u>Analyte</u>	<u>Reporting Limit</u>	<u>Concentration</u>
Benzene	0.30	BRL
Toluene	0.30	BRL
Ethylbenzene	0.30	BRL
1,2-Xylene	0.30	BRL
1,3-Xylene	0.30	BRL
1,4-Xylene	0.30	BRL
Total Petroleum Hydrocarbons - Gasoline	50	BRL
<u>Surrogate</u>	<u>% Recovery</u>	<u>Acceptance Limits</u>
a,a,a-Trifluorotoluene (PID)	94	63 - 134
a,a,a-Trifluorotoluene (FID)	95	63 - 134

QUALITY CONTROL REPORT

METHOD BLANK

Method: Mod. EPA 8020 (BTEX) & TPH/G
Units: ug/L (ppb)

Date Analyzed: 04/08/94

<u>Analyte</u>	<u>Reporting Limit</u>	<u>Concentration</u>
Benzene	0.30	BRL
Toluene	0.30	BRL
Ethylbenzene	0.30	BRL
1,2-Xylene	0.30	BRL
1,3-Xylene	0.30	BRL
1,4-Xylene	0.30	BRL
Total Petroleum Hydrocarbons - Gasoline	50	BRL
<u>Surrogate</u>	<u>% Recovery</u>	<u>Acceptance Limits</u>
a, a, a-Trifluorotoluene (PID)	95	63 - 134
a, a, a-Trifluorotoluene (FID)	95	63 - 134

QUALITY CONTROL REPORT

**Laboratory Control Sample
Method 602 (Modified)**

LP: 8984

Spike Sample ID: LCS W-71

Date Of Analysis: 04/08/94

Spike ID Code: W-1-905

Column: DB WAX

Surrogate ID Code: W-1-903

Instrument #: 6

Matrix: Water Units: ug/L

EPA METHOD	COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
		SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC.%	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD%	% REC.	RPD
602	Chlorobenzene	0	4.00	4.36	109	NA	NA	NA	69 - 131	≤20
602	Benzene	0	4.00	4.37	109	NA	NA	NA	72 - 134	≤20
602	Ethyl Benzene	0	4.00	4.21	105	NA	NA	NA	72 - 128	≤20

$$\text{Spike Recovery} = d = ((c-a)/b) \times 100$$

$$\text{Spike Duplicate Recovery} = f = ((e-a)/b) \times 100$$

$$\text{Relative Percent Difference} = g = (|c-e|)/((c+e) \times .5) \times 100$$

EPA METHOD	SURROGATE COMPOUNDS	DET.	(h)	(i)	(j)	(k)	(l)	ACCEPTANCE LIMITS	
			SUR. SPIKE CONC.	SAMPLE + SUR. SPIKE CONC.	SUR. REC. %	SAMPLE DUP. + SUR.SPIKE CONC.	SUR. DUP. RECOVERY %	% REC.	
602	a,a,a-Trifluorotoluene	PID	4.00	3.67	92	NA	NA	41 - 155	

$$\text{Surrogate \% Recovery} = j = (i/h) \times 100$$

$$\text{Surrogate Dup \% Recovery} = l = (k/h) \times 100$$

**Laboratory Control Sample
Total Petroleum Hydrocarbons/TPH-Gasoline**

LP: 8984

Date of Analysis: 04/08/94

Spike Sample ID: LCS W-72

Column: DB 624

Spike ID Code: W-1-828

Instrument #: 6

Surrogate ID Code: W-1-903

Matrix: Water Units: ug/L

COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
	SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC. %	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD %	% REC.	RPD
Gasoline	0	100	98	98	NA	NA	NA	100 - 127	≤20

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

SURROGATE COMPOUNDS	(h)	(i)	(j)	ACCEPTANCE LIMITS
	SURROGATE SPIKE CONC.	SAMPLE + SURROGATE SPIKE CONC.	SURROGATE RECOVERY %	% REC.
a,a,a-Trifluorotoluene	4.00	4.07	102	63 - 134

Surrogate % Recovery = j = (i/h) x 100



QUALITY CONTROL REPORT

**Matrix Spike/Matrix Spike Duplicate
Total Petroleum Hydrocarbons/TPH-Gasoline**

LP: 8984

Date of Analysis: 04/08/94

Spike Sample ID: 8984-2 MS/MSD

Column: DB 624

Spike ID Code: W-1-828

Instrument #: 6

Surrogate ID Code: W-1-903

Matrix: Water Units: ug/L

COMPOUNDS	(a)	(b)	(c)	(d)	(e)	(f)	(g)	ACCEPTANCE LIMITS	
	SAMPLE CONC.	SPIKE CONC.	SAMPLE + SPIKE CONC.	SPIKE REC. %	SAMPLE DUP. + SPIKE CONC.	SPIKE DUP. REC. %	RPD %	% REC.	RPD
Gasoline	0	100	146	146 ^a	124	124	16	100 - 127	≤20

$$\text{Spike Recovery} = d = ((c-a)/b) \times 100$$

$$\text{Spike Duplicate Recovery} = f = ((e-a)/b) \times 100$$

$$\text{Relative Percent Difference} = g = (|c-e|)/((c+e) \times .5) \times 100$$

SURROGATE COMPOUNDS	(h)	(i)	(j)	ACCEPTANCE LIMITS % REC.
	SURROGATE SPIKE CONC.	SAMPLE + SURROGATE SPIKE CONC.	SURROGATE RECOVERY %	
a,a,a-Trifluorotoluene	4.00	4.09	102	63 - 134

Surrogate % Recovery = j = (i/h) x 100

^a Matrix spike recovery is beyond advisory acceptance limits; however, the laboratory control sample data are acceptable.