



**EMCON**

1433 North Market Boulevard • Sacramento, California 95834-1943 • (916) 928-3300 • Fax (916) 928-3341

Date May 23, 1997  
Project 22605-103.001

To:  
Ms. Susan Hugo  
Alameda County Environmental Health Department  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

We are enclosing:

Copies	Description
<u>1</u>	<u>Quarterly Groundwater Monitoring Report, First Quarter 1997, for Interstate Brands Corporation Facility, Located at 1010 - 46th Street, Oakland, California</u>

For your:	<u>X</u>	Use	Sent by:	<u>X</u>	Regular mail
		Approval			Standard Air
		Review			Courier
	<u>X</u>	Information			Fedex

Comments: On behalf of Interstate Brands Corporation, we are forwarding a copy of the above-referenced report. If you have any questions, please do not hesitate to call us at (916) 928-3300.

60 MAY 23 1997  
7:11 PM '97

Deanna Santos  
Deanna Santos  
Project Assistant





**EMCON**

1433 North Market Boulevard • Sacramento, California 95834-1943 • (916) 928-3300 • Fax (916) 928-3341

May 22, 1997  
Project 2605-103.001

Mr. Larry Brown  
Fleet Superintendent  
Interstate Brands Corporation  
1324 Arden Way  
Sacramento, California 95815

Re: Quarterly Groundwater Monitoring Report, First Quarter 1997, for Interstate Brands Corporation Facility, Located at 1010 46th Street, Oakland, California

Dear Mr. Brown:

At the request of Interstate Brands Corporation (IBC), EMCON has conducted quarterly groundwater monitoring at the subject site (see Figure 1). We have prepared this report on the work conducted during the first quarter 1997. Groundwater monitoring consisted of collecting groundwater samples for subjective and laboratory analyses from each monitoring well, measuring thickness of floating product in the wells (if present), measuring groundwater elevation in each monitoring well, and evaluating the groundwater gradient and direction of groundwater flow beneath the site.

The quarterly groundwater monitoring program is in compliance with the Alameda County Environmental Health Department requirements regarding underground storage tank investigations.

### **GROUNDWATER MONITORING: FIRST QUARTER 1997**

On April 4, 1997, an EMCON technician measured depths to groundwater and collected groundwater samples from the monitoring wells for subjective and laboratory analyses. Floating product was not observed in any of the monitoring wells. EMCON compiled and evaluated groundwater data. Sample locations are shown on Figure 2. EMCON's sampling and analysis procedures are presented in Appendix A.

The groundwater flow direction during the first quarter 1997 was toward the southwest. Approximate depths to groundwater elevations were between 8.70 and 13.23 feet below ground surface. The hydraulic gradient was 0.04. The groundwater contour map for the April 4, 1997, sampling event is presented on Figure 3.

Groundwater samples collected from wells MW-1 through MW-3 were analyzed for total petroleum hydrocarbons as gasoline (TPHG) and diesel, benzene, toluene, ethylbenzene and



Mr. Larry Brown  
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total xylenes, and methyl tert-butyl ether. The samples were analyzed at Columbia Analytical Services, Inc., in San Jose, California. Analytical results for groundwater samples are summarized in Table 1, and copies of the chain-of-custody records and laboratory analysis reports are presented in Appendix B. Concentrations of TPHG and benzene are shown on Figure 2.

## **CONCLUSIONS**

Results of this monitoring event indicate that levels of dissolved gasoline hydrocarbons are consistent with levels detected during previous sampling events. The groundwater gradient and direction of groundwater flow are also consistent with previous monitoring events.

## **WORK PROPOSED FOR SECOND QUARTER 1997**

EMCON will continue to perform groundwater monitoring at the subject site on behalf of IBC. The next sampling event is tentatively scheduled for June 1997.

## **DOCUMENT DISTRIBUTION**

We recommend submitting copies of this status report to the following:

Susan Hugo  
Alameda County Environmental Health Department  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Eddy So  
California Regional Water Quality Control Board  
San Francisco Bay Region  
2101 Webster Street, Suite 500  
Oakland, California 94612


Mr. Larry Brown  
May 22, 1997  
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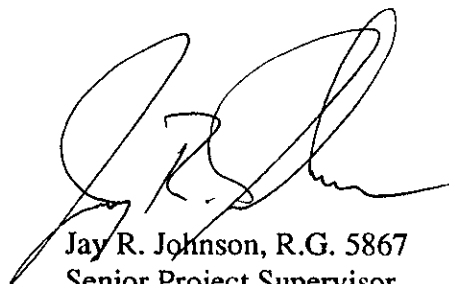
Project 2605-103.001

Please call if you have any questions regarding this status report.

Sincerely,

EMCON

  
Claudio Avila  
Project Geologist

  
Jay R. Johnson, R.G. 5867  
Senior Project Supervisor

Attachments:	Table 1	Groundwater Monitoring Data
	Figure 1	Site Vicinity Map
	Figure 2	Generalized Site Plan
	Figure 3	Groundwater Contour Map (April 4, 1997)
	Appendix A	Sampling and Analysis Procedures
	Appendix B	Laboratory Analysis Reports and Chain-of-Custody Records

cc: Travis Bryant, IBC

Table 1

**Groundwater Monitoring Data  
Interstate Brands Corporation  
1010 46th Street  
Oakland, California**

Page 1 of 2

Well	Date	Top of Casing Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet MSL*)	TPH diesel µg/L	TPH gasoline µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L	Total Oil & Grease mg/L	MTBE µg/L
MW-1	05/26/94	61.84	9.27	52.57	1300	12000	57	340	370	3100	<5.0	NA
MW-1	07/29/94	61.84	9.81	52.03	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	08/26/94	61.84	9.87	51.97	510/650 [1]	6700/8400	22/35	71/97	310/410	1000/1400	<5.0/<5.0	NA
MW-1	10/04/94	61.84	9.89	51.95	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	10/27/94	61.84	9.94	51.90	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	11/30/94	61.84	8.92	52.92	1300	29000	480	1100	1200	5300	<5.0	NA
MW-1	01/03/95	61.84	8.79	53.05	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	01/31/95	61.84	8.33	53.51	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	03/16/95	61.84	8.07	53.77	1900	29000	140	1400	1800	9700	<5.0	NA
MW-1	06/12/95	61.84	9.02	52.82	810/540 [1]	3900/11000	23/280	57/610	200/400	680/2000	<5.0/<5.0	NA
MW-1	08/30/95	61.84	9.44	52.40	350 [1]	3300	26	36	250	490	<5.0	NA
MW-1	11/29/95	61.84	9.93	51.91	270	1700	20	21	110	210	<5.0	NA
MW-1	03/06/96	61.84	8.37	53.47	2500/2400 [1]	39000/38000	690/1000	1800/2000	2300/2300	14000/15000	5.9	NA
MW-1	07/08/96	61.84	9.10	52.74	670/580 [1]	3000/2600	89/9.5	79/85	140/120	350/270	NA	NA
MW-1	04/04/97	61.84	9.14	52.70	1400	3500	13	27	190	410	NA	<30 [5]
MW-2	05/26/94	63.10	9.30	53.80	<50/<50	<50/<50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<5.0	NA
MW-2	07/29/94	63.10	9.70	53.40	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	08/26/94	63.10	9.89	53.21	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	10/04/94	63.10	9.86	53.24	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	10/27/94	63.10	9.96	53.14	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	11/30/94	63.10	8.95	54.15	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	01/03/95	63.10	8.15	54.95	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	01/31/95	63.10	6.96*	56.14	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	03/16/95	63.10	6.37*	56.73	<50/<50	<50/<50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<5.0	NA
MW-2	06/12/95	63.10	9.07	54.03	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	08/30/95	63.10	9.53	53.57	52 [3]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	11/29/95	63.10	9.74	53.36	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	03/06/96	63.10	7.23	55.87	68 [4]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-2	07/08/96	63.10	8.84	54.26	<50	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
MW-2	04/04/97	63.10	8.70	54.40	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<3
MW-3	05/26/94	62.51	12.88	49.63	99	<50	<0.50	<0.50	<0.50	1.7	<5.0	NA
MW-3	07/29/94	62.51	13.61	48.90	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	08/26/94	62.51	13.71	48.80	66 [2]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	10/04/94	62.51	13.74	48.77	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	10/27/94	62.51	13.77	48.74	NA	NA	NA	NA	NA	NA	NA	NA

Table 1

**Groundwater Monitoring Data  
Interstate Brands Corporation  
1010 46th Street  
Oakland, California**

Page 2 of 2

Well	Date	Top of Casing Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet MSL*)	TPH diesel µg/L	TPH gasoline µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L	Total Oil & Grease mg/L	MTBE µg/L
MW-3	11/30/94	62.51	11.85	50.66	78/85	100/100	<0.50/1.9	<0.50/<0.50	<0.50/1.0	2.1/4.3	<5.0	NA
MW-3	01/03/95	62.51	12.09	50.42	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	01/31/95	62.51	10.64	51.87	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	03/16/95	62.51	10.79	51.72	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	06/12/95	62.51	12.05	50.46	120 [2]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	08/30/95	62.51	13.54	48.97	88/57 [3]	<50/<50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<0.50/<0.50	<5.0/<5.0	NA
MW-3	11/29/95	62.51	13.72	48.79	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	03/06/96	62.51	10.78	51.73	140 [3]	<50	<0.50	<0.50	<0.50	<0.50	<5.0	NA
MW-3	07/08/96	62.51	13.39	49.12	<50	<50	<0.50	<0.50	<0.50	<0.50	NA	NA
MW-3	04/04/97	62.51	13.23	49.28	<50	<50	<0.5	<0.5	<0.5	<0.5	NA	<3

MSL = Mean sea level.  
\* Noted to be under pressure when opened.  
µg/L = Microgram per liter  
TPH = Total Petroleum Hydrocarbon  
MTBE = Methyl-tert-Butyl Ether  
[1] Primarily due to lighter petroleum product of hydrocarbon range C6-C12, possibly gasoline.  
[2] Primarily due to heavier petroleum product of hydrocarbon range C18-C36.  
[3] Due to a combination of diesel and a discrete peak not indicative of diesel fuel.  
[4] Due to the presence of discrete peaks not indicative of diesel fuel.  
[5] The MRL was elevated due to high analyte concentration requiring sample dilution.

EA-SACRAMENTO/CAD: I:\DWGS\2605\103\SUBSP01.dwg Xrefs: BX11P  
 Scale: 1 = 1.00 DimScale: 1 = 1.00 Date: 5/19/97 Time: 10:20 AM Operator: AVK



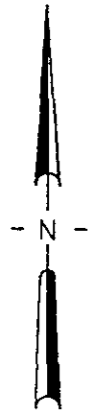
BASE MAP FROM U.S.G.S 7.5 MINUTE SERIES  
 QUADRANGLE: OAKLAND EAST, CALIFORNIA

SCALE: 0 2000 4000 FEET



DATE 5/13/97  
 DWN AVK  
 APP \_\_\_\_\_  
 REV \_\_\_\_\_  
 PROJECT NO.  
 22605-103.001

**FIGURE 1**  
 INTERSTATE BRANDS CORPORATION  
 1010 46TH STREET  
 OAKLAND, CALIFORNIA  
**SITE LOCATION MAP**



53RD STREET

PARKING

FORMER UST EXCAVATION AREA  
(UNPAVED, FILLED WITH GRAVEL)

THRIFTY RETAIL  
BAKERY OUTLET

MW-1  
(3500/13)

MW-2  
(<50/<0.5)

HOIST UNIT

MW-3  
(<50/<0.5)

EXISTING  
MAINTENANCE  
AND  
WAREHOUSE  
FACILITY

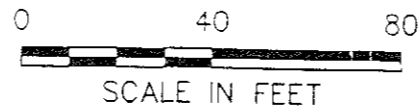
EXPLANATION

● MONITORING WELL

(3500/13) CONCENTRATION OF TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPHG) AND BENZENE MEASURED IN PARTS PER BILLION (ppb); WATER SAMPLES COLLECTED APRIL 4, 1997

I:\A\AN1031-CAD\DRAWINGS\1\2605103\1\SITE.dwg Xrefs: <NONE>  
Scale 1" = 40.00' DimScale: 1" = 40.00' Date: 5/13/97 Time: 12:13 PM Operator: KAJ

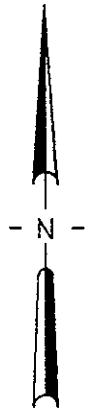
Base map adapted from plan by  
Woodward-Clyde Consultants, dated 7/8/96



DATE	MAY 1997
DWN	KLT
APP	
REV	
PROJECT NO	2605-103.001

**FIGURE 2**  
 INTERSTATE BRANDS CORPORATION  
 1010 46TH STREET  
 OAKLAND, CALIFORNIA  
**GENERALIZED SITE PLAN**





53RD STREET

PARKING

THRIFTY RETAIL BAKERY OUTLET

FORMER UST EXCAVATION AREA:  
(UNPAVED, FILLED WITH GRAVEL)

MW-1  
(52.70)





MW-2  
(54.40)

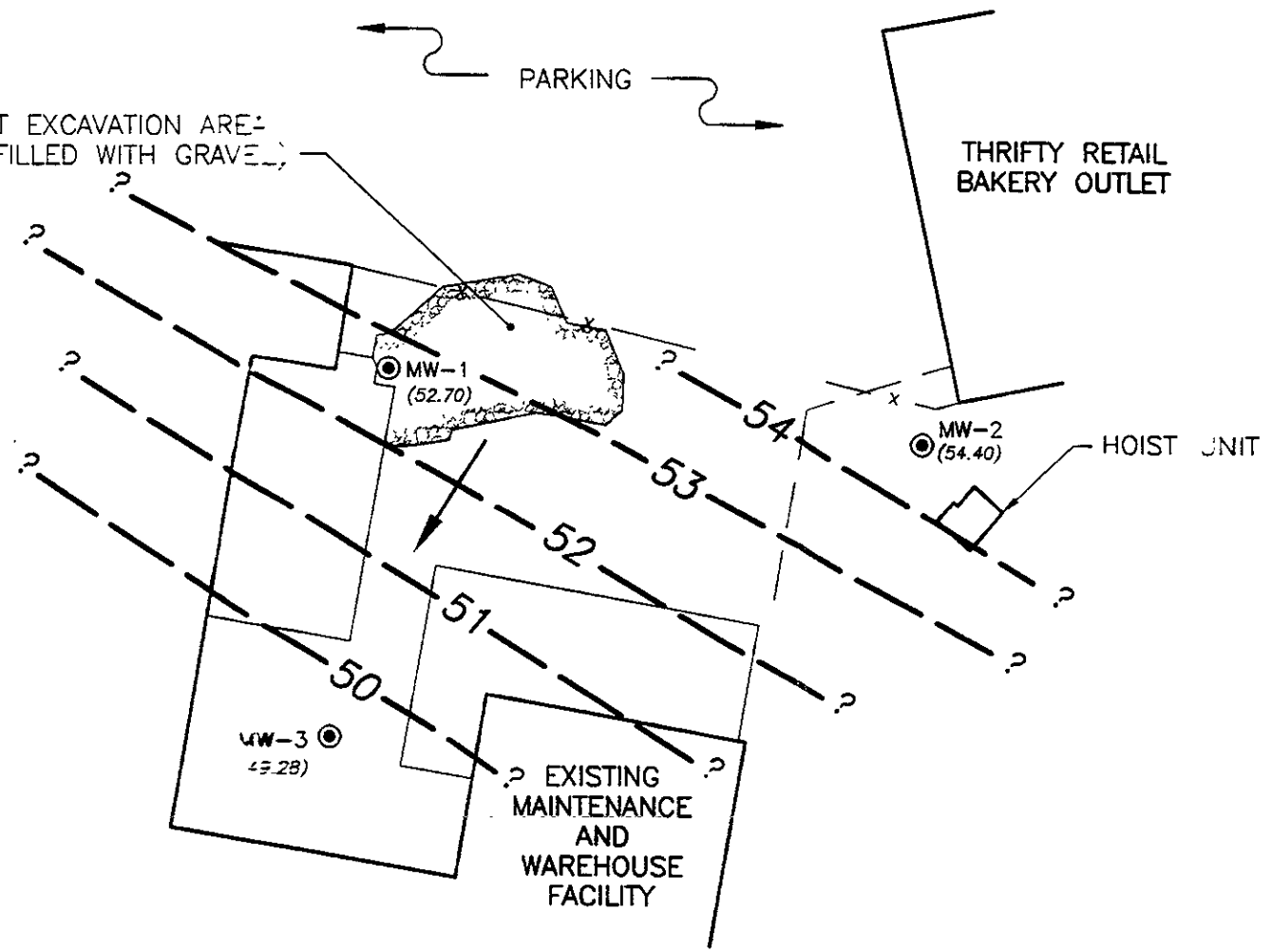
HOIST UNIT

MW-3  
(49.28)

EXISTING MAINTENANCE AND WAREHOUSE FACILITY

EXPLANATION

-  MONITORING WELL
-  GROUNDWATER ELEVATION (Ft.-MSL)
-  GROUNDWATER ELEVATION CONTOUR (Ft.-MSL)
-  DIRECTION OF GROUNDWATER FLOW  
Gradient ( $i$ ) = 0.04



Base map adapted from plan by  
Woodward-Clyde Consultants, dated 7/8/96



DATE MAY 1997  
 DWN KLT  
 APP \_\_\_\_\_  
 REV \_\_\_\_\_  
 PROJECT NO  
 2605-103 001

**FIGURE 3**  
 INTERSTATE BRANDS CORPORATION  
 1010 46TH STREET  
 OAKLAND, CALIFORNIA  
**GROUNDWATER CONTOURS-4/4/97**

EA SANJOSE - CAD/DRAWINGS I:\2605103\SIGWEL.dwg Xrefs: <NONE>  
 Date: 5/13/97 Time: 12:17 PM Operator: KAJ  
 Scale: 1 = 40.00 DimScale: 1 = 40.00

**APPENDIX A**  
**SAMPLING AND ANALYSIS PROCEDURES**

## APPENDIX A

### SAMPLING AND ANALYSIS PROCEDURES

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The sampling and analysis procedures for water quality monitoring programs are contained in this appendix. The procedures provided for consistent and reproducible sampling methods, proper application of analytical methods, and accurate and precise analytical results. Finally, these procedures provided guidelines so that the overall objectives of the monitoring program were achieved.

The following documents have been used as guidelines for developing these procedures:

- Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities, Environmental Protection Agency (EPA)-530/SW-611, August 1977
- Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Technical Enforcement Guidance Document, Office of Solid Waste and Emergency Response (OSWER) 9950.1, September 1986
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, 3rd edition, November 1986
- Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water, EPA-600/4-82-057, July 1982
- Methods for Organic Chemical Analysis of Water and Wastes, EPA-600/4-79-020, revised March 1983
- Leaking Underground Fuel Tank (LUFT) Field Manual, California State Water Resources Control Board, revised October 1989

### Sample Collection

Sample collection procedures include equipment cleaning, water level and total well depth measurements, and well purging and sampling.

## Equipment Cleaning

Before the sampling event was started, equipment that was used to sample groundwater was disassembled and cleaned with detergent water and then rinsed with deionized water. During field sampling, equipment surfaces that were placed in the well or came into contact with groundwater during field sampling were steam cleaned with deionized water before the next well was purged or sampled.

## Water Level, Floating Hydrocarbon, and Total Well Depth Measurements

Before purging and sampling occurred, the depth to water, floating hydrocarbon thickness, and the total well depth were measured using an oil/water interface measuring system. The oil/water interface measuring system consists of a probe that emits a continuous audible tone when immersed in a nonconductive fluid, such as oil or gasoline, and an intermittent tone when immersed in a conductive fluid, such as water. The floating hydrocarbon thickness and water level were measured by lowering the probe into the well. Liquid levels were recorded relative to the tone emitted at the groundwater surface. The sonic probe was decontaminated by being rinsed with deionized water or steam cleaned after each use. A bottom-filling, clear Teflon<sup>®</sup> bailer was used to verify floating hydrocarbon thickness measurements of less than 0.02 foot. Alternatively, an electric sounder and a bottom-filling Teflon bailer may have been used to record floating hydrocarbon thickness and depth to water.

The electric sounder is a transistorized instrument that uses a reel-mounted, two-conductor, coaxial cable that connects the control panel to the sensor. Cable markings are stamped at 1-foot intervals. The water level was measured by lowering the sensor into the monitoring well. A low-current circuit was completed when the sensor contacted the water, which served as an electrolyte. The current was amplified and fed into an indicator light and audible buzzer, signaling when water had been contacted. A sensitivity control compensated for highly saline or conductive water. The electric sounder was decontaminated by being rinsed with deionized water after each use. The bailer was lowered to a point just below the liquid level, retrieved, and observed for floating hydrocarbon.

Liquid measurements were recorded to the nearest 0.01 foot on the depth to water/floating product survey form. The groundwater elevation at each monitoring well was calculated by subtracting the measured depth to water from the surveyed elevation of the top of the well casing. (Every attempt was made to measure depth to water for all wells on the same day.) Total well depth was then measured by lowering the sensor to the bottom of the well. Total well depth, used to calculate purge volumes and to determine whether the well screen was partially obstructed by silt, was recorded to the nearest 0.1 foot on the depth to water/floating product survey form.

## Well Purging

If the depth to groundwater was above the top of screens of the monitoring wells, then the wells were purged. Before sampling occurred, a polyvinyl chloride (PVC) bailer, centrifugal pump, low-flow submersible pump, or Teflon bailer was used to purge standing water in the casing and gravel pack from the monitoring well. Monitoring wells were purged according to the protocol presented in Figure A-1. In most monitoring wells, the amount of water purged before sampling was greater than or equal to three casing volumes. Some monitoring wells were expected to be evacuated to dryness after removing fewer than three casing volumes. These low-yield monitoring wells were allowed to recharge for up to 24 hours. Samples were obtained as soon as the monitoring wells recharged to a level sufficient for sample collection. If insufficient water recharged after 24 hours, the monitoring well was recorded as dry for the sampling event.

Groundwater purged from the monitoring wells was transported in a 500-gallon water trailer, 55-gallon drum, or a 325-gallon truck-mounted tank, to EMCON's San Jose or Sacramento office location for temporary storage. EMCON arranged for transport and disposal of the purged groundwater through Integrated Waste Stream Management, Inc.

Field measurements of pH, specific conductance, and temperature were recorded in a waterproof field logbook. Figure A-2 shows an example of the water sample field data sheet on which field data are recorded. Field data sheets were reviewed for completeness by the sampling coordinator after the sampling event was completed.

The pH, specific conductance, and temperature meter were calibrated each day before field activities were begun. The calibration was checked once each day to verify meter performance. Field meter calibrations were recorded on the water sample field data sheet.

## Well Sampling

A Teflon bailer was the only equipment acceptable for well sampling. When samples for volatile organic analysis were being collected, the flow of groundwater from the bailer was regulated to minimize turbulence and aeration. Glass bottles of at least 40-milliliters volume and fitted with Teflon-lined septa were used in sampling for volatile organics. These bottles were filled completely to prevent air from remaining in the bottle. A positive meniscus formed when the bottle was completely full. A convex Teflon septum was placed over the positive meniscus to eliminate air. After the bottle was capped, it was inverted and tapped to verify that it contained no air bubbles. The sample containers for other parameters were filled, filtered as required, and capped.

When required, dissolved concentrations of metals were determined using appropriate field filtration techniques. The sample was filtered by emptying the contents of the Teflon bailer into a pressure transfer vessel. A disposable 0.45-micron acrylic copolymer filter was threaded onto the transfer vessel at the discharge point, and the vessel was sealed.

Pressure was applied to the vessel with a hand pump and the filtrate directed into the appropriate containers. Each filter was used once and discarded.

## **Sample Preservation and Handling**

The following section specifies sample containers, preservation methods, and sample *handling procedures*.

### **Sample Containers and Preservation**

Sample containers vary with each type of analytical parameter. Container types and materials were selected to be nonreactive with the particular analytical parameter tested.

### **Sample Handling**

Sample containers were labeled immediately prior to sample collection. Samples were kept cool with cold packs until received by the laboratory. At the time of sampling, each sample was logged on an chain-of-custody record that accompanied the sample to the laboratory.

Samples that required overnight storage prior to shipping to the laboratory were kept cool (4°C) in a refrigerator. The refrigerator was kept in a warehouse, which was locked when not occupied by an EMCON employee. A sample/refrigerator log was kept to record the date and time that samples were placed into and removed from the refrigerator.

Samples were transferred from EMCON to an approved laboratory by courier or taken directly to the laboratory by the environmental sampler. Sample shipments from EMCON to laboratories performing the selected analyses routinely occurred within 24 hours of sample collection.

## **Sample Documentation**

The following procedures were used during sampling and analysis to provide chain-of-custody control during sample handling from collection through storage. Sample documentation included the use of the following:

- Water sample field data sheets to document sampling activities in the field
- Labels to identify individual samples
- Chain-of-custody record sheets for documenting possession and transfer of samples
- Laboratory analysis request sheets for documenting analyses to be performed

## Field Logbook

In the field, the sampler recorded the following information on the water sample field data sheet (see Figure A-2) for each sample collected:

- Project number
- Client's name
- Location
- Name of sampler
- Date and time
- Well accessibility and integrity
- Pertinent well data (e.g., casing diameter, depth to water, well depth)
- Calculated and actual purge volumes
- Purging equipment used
- Sampling equipment used
- Appearance of each sample (e.g., color, turbidity, sediment)
- Results of field analyses (temperature, pH, specific conductance)
- General comments

The water sample field data sheet was signed by the sampler and reviewed by the sampling coordinator.

## Labels

Sample labels contained the following information:

- Project number
- Sample number (i.e., well designation)
- Sample depth
- Sampler's initials
- Date and time of collection
- Type of preservation used (if any)

## Sampling and Analysis Chain-of-Custody Record

The chain-of-custody record initiated at the time of sampling contained, at a minimum, the sample designation (including the depth at which the sample was collected), sample type, analytical request, date of sampling, and the name of the sampler. The record sheet was signed, timed, and dated by the sampler when transferring the samples. The number of custodians in the chain of possession was minimized. A copy of the chain-of-custody record was returned to EMCON with the analytical results.

## **Groundwater Sampling and Analysis Request Form**

A groundwater sampling and analysis request form (see Figure A-3) was used to communicate to the environmental sampler the requirements of the monitoring event. At a minimum, the groundwater sampling and analysis request form included the following information:

- Date scheduled
- Site-specific instructions
- Specific analytical parameters
- Well number
- Well specifications (expected total depth, depth of water, and product thickness)





OWT

# MONITORING WELL PURGING PROTOCOL

MEASURE AND RECORD DEPTH TO WATER AND WELL TOTAL DEPTH

CHECK FOR FLOATING PRODUCT

YES

MEASURE AND DOCUMENT FLOATING PRODUCT THICKNESS. DO NOT SAMPLE WELL FOR DISSOLVED CONSTITUENTS.

NO

CALCULATE PURGE VOLUME BY USING THE FOLLOWING EQUATION:  
 $P = \pi r^2 \times 7.48 \times h$   
where:  
P = calculated purge volume (gallons)  
 $\pi = 3.14$   
r = radius of well casing in feet  
h = height of water column in feet

WELL EVACUATED TO PRACTICAL LIMITS OF DRYNESS BEFORE REMOVING CALCULATED PURGE VOLUME

EVACUATE WATER FROM WELL EQUAL TO THE CALCULATED PURGE VOLUME WHILE MONITORING GROUNDWATER STABILIZATION INDICATOR PARAMETERS (pH, CONDUCTIVITY, TEMPERATURE) AT INTERVALS OF ONE CASING VOLUME.

NO

YES

FINAL TWO SETS OF GROUNDWATER STABILIZATION INDICATOR PARAMETER MEASUREMENTS MEET THE FOLLOWING CRITERIA:  
pH = ± 0.1 pH units  
COND. = ± 10 %  
TEMP. = ± 1.0 °F

WELL RECHARGES TO A LEVEL SUFFICIENT FOR SAMPLE COLLECTION WITHIN 24 HOURS OF EVACUATION TO DRYNESS.

YES

NO

YES

NO

WELL PURGING CRITERIA MET; PROCEED TO WELL SAMPLING.

CONTINUE PURGING; EVACUATE ADDITIONAL CASING VOLUME OF WATER, MONITORING INDICATOR PARAMETERS FOR STABILITY.

FIELD TEST FIRST RECHARGE WATER FOR INDICATOR PARAMETERS, THEN PROCEED TO WELL SAMPLING.

RECORD WELL AS DRY FOR PURPOSES OF SAMPLING.



EMCON

MONITORING WELL PURGING PROTOCOL

FIGURE A-1



OWT

# WATER SAMPLE FIELD DATA SHEET

Rev. 5/96

PROJECT NO : \_\_\_\_\_  
PURGED BY : \_\_\_\_\_  
SAMPLED BY : \_\_\_\_\_

SAMPLE ID : \_\_\_\_\_  
CLIENT NAME : \_\_\_\_\_  
LOCATION : \_\_\_\_\_

TYPE: Groundwater \_\_\_\_\_ Surface Water \_\_\_\_\_ Leachate \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL) : \_\_\_\_\_ VOLUME IN CASING (gal.) : \_\_\_\_\_  
DEPTH OF WELL (feet) : \_\_\_\_\_ CALCULATED PURGE (gal.) : \_\_\_\_\_  
DEPTH OF WATER (feet) : \_\_\_\_\_ ACTUAL PURGE VOL. (gal.) : \_\_\_\_\_

DATE PURGED : \_\_\_\_\_ END PURGE : \_\_\_\_\_  
DATE SAMPLED : \_\_\_\_\_ SAMPLING TIME : \_\_\_\_\_

TIME (2400 HR)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm@25°C)	TEMPERATURE (°F)	TURBIDITY (visual/NTU)	TIME (2400 HR)
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

OTHER: \_\_\_\_\_ ODOR: \_\_\_\_\_  
(COBALT 0-100) (NTU 0-200)

FIELD QC SAMPLES COLLECTED AT THIS WELL ( i.e. FB-1, XDUP-1) : \_\_\_\_\_

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

_____ 2" Bladder Pump	_____ Bailer (Teflon)	_____ 2" Bladder Pump	_____ Bailer (Teflon)
_____ Centrifugal Pump	_____ Bailer (PVC)	_____ Bomb Sampler	_____ Bailer (Stainless Steel)
_____ Submersible Pump	_____ Bailer (Stainless Steel)	_____ Dipper	_____ Submersible Pump
_____ Well Wizard™	_____ Dedicated	_____ Well Wizard™	_____ Dedicated
Other: _____		Other: _____	

WELL INTEGRITY: \_\_\_\_\_ LOCK: \_\_\_\_\_  
REMARKS: \_\_\_\_\_

pH, E.C., Temp. Meter Calibration: Date: \_\_\_\_\_ Time: \_\_\_\_\_ Meter Serial No.: \_\_\_\_\_  
E.C. 1000 \_\_\_\_\_ / \_\_\_\_\_ pH 7 \_\_\_\_\_ / \_\_\_\_\_ pH 10 \_\_\_\_\_ / \_\_\_\_\_ pH 4 \_\_\_\_\_ / \_\_\_\_\_  
Temperature °F \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ REVIEWED BY: \_\_\_\_\_ PAGE \_\_\_\_\_ OF \_\_\_\_\_



WATER SAMPLE FIELD DATA SHEET

FIGURE  
A-2



OWT

EMCON - SACRAMENTO  
GROUNDWATER SAMPLING AND ANALYSIS REQUEST FORM

PROJECT NAME :

SCHEDULED DATE :

SPECIAL INSTRUCTIONS / CONSIDERATIONS :

Project Authorization: \_\_\_\_\_  
EMCON Project No.: \_\_\_\_\_  
OWT Project No.: \_\_\_\_\_  
Task Code: \_\_\_\_\_  
Originals To: \_\_\_\_\_  
cc: \_\_\_\_\_

Well Lock Number (s)

CHECK BOX TO AUTHORIZE DATA ENTRY

Site Contact: \_\_\_\_\_

Name Phone #

Well Number or Source	Casing Diameter (inches)	Casing Length (feet)	Depth to Water (feet)	ANAYSES REQUESTED

Laboratory and Lab QC Istructions:



EMCON

SAMPLING AND ANALYSIS REQUEST FORM

FIGURE

A-3

**APPENDIX B**  
**LABORATORY ANALYSES REPORTS**  
**AND**  
**CHAIN-OF-CUSTODY RECORDS**

**RECEIVED**  
APR 23 1997  
EMCON/SACRAMENTO

**Columbia  
Analytical  
Services Inc.**

April 21, 1997

Service Request No.: S9700621

Mr. Claudio Avila  
EMCON  
1433 North Market Blvd.  
Sacramento, CA 95834

**RE: IBC-Oakland**

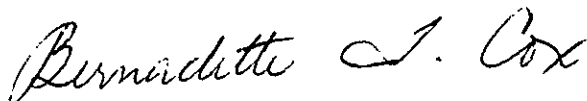
Dear Mr. Avila:

The following pages contain analytical results for sample(s) received by the laboratory on April 07, 1997. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 10, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,



Bernadette T. Cox  
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** EMCON  
**Project:** IBC-Oakland/22605-103.001  
**Sample Matrix:** Water

**Service Request:** S9700621  
**Date Collected:** 4/4/97  
**Date Received:** 4/7/97

BTEX, MTBE and TPH as Gasoline

**Sample Name:** MW-1  
**Lab Code:** S9700621-001  
**Test Notes:**

**Units:** ug/L (ppb)  
**Basis:** NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	NONE	CA/LUFT	50	10	NA	4/14/97	3500	
Benzene	NONE	8020	0.5	10	NA	4/14/97	13	
Toluene	NONE	8020	0.5	10	NA	4/14/97	27	
Ethylbenzene	NONE	8020	0.5	10	NA	4/14/97	190	
Xylenes, Total	NONE	8020	0.5	10	NA	4/14/97	410	
Methyl <i>tert</i> -Butyl Ether	NONE	8020	3	10	NA	4/14/97	<30	C1

C1                      The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON  
 Project: IBC-Oakland/22605-103.001  
 Sample Matrix: Water

Service Request: S9700621  
 Date Collected: 4/4/97  
 Date Received: 4/7/97

BTEX, MTBE and TPH as Gasoline

Sample Name: MW-2  
 Lab Code: S9700621-002  
 Test Notes:

Units: ug/L (ppb)  
 Basis: NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	NONE	CA/LUFT	50	1	NA	4/14/97	ND	
Benzene	NONE	8020	0.5	1	NA	4/14/97	ND	
Toluene	NONE	8020	0.5	1	NA	4/14/97	ND	
Ethylbenzene	NONE	8020	0.5	1	NA	4/14/97	ND	
Xylenes, Total	NONE	8020	0.5	1	NA	4/14/97	ND	
Methyl <i>tert</i> -Butyl Ether	NONE	8020	3	1	NA	4/14/97	ND	



**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** EMCON  
**Project:** IBC-Oakland/22605-103.001  
**Sample Matrix:** Water

**Service Request:** S9700621  
**Date Collected:** 4/4/97  
**Date Received:** 4/7/97

BTEX, MTBE and TPH as Gasoline

**Sample Name:** MW-3  
**Lab Code:** S9700621-003  
**Test Notes:**

**Units:** ug/L (ppb)  
**Basis:** NA

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
TPH as Gasoline	NONE	CA/LUFT	50	1	NA	4/14/97	ND	
Benzene	NONE	8020	0.5	1	NA	4/14/97	ND	
Toluene	NONE	8020	0.5	1	NA	4/14/97	ND	
Ethylbenzene	NONE	8020	0.5	1	NA	4/14/97	ND	
Xylenes, Total	NONE	8020	0.5	1	NA	4/14/97	ND	
Methyl <i>tert</i> -Butyl Ether	NONE	8020	3	1	NA	4/14/97	ND	

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** EMCON  
**Project:** IBC-Oakland/22605-103.001  
**Sample Matrix:** Water

**Service Request:** S9700621  
**Date Collected:** NA  
**Date Received:** NA

BTEX, MTBE and TPH as Gasoline

**Sample Name:** Method Blank  
**Lab Code:** S970414-WB1  
**Test Notes:**

**Units:** ug/L (ppb)  
**Basis:** NA

<b>Analyte</b>	<b>Prep Method</b>	<b>Analysis Method</b>	<b>MRL</b>	<b>Dilution Factor</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Result</b>	<b>Result Notes</b>
TPH as Gasoline	NONE	CA/LUFT	50	1	NA	4/14/97	ND	
Benzene	NONE	8020	0.5	1	NA	4/14/97	ND	
Toluene	NONE	8020	0.5	1	NA	4/14/97	ND	
Ethylbenzene	NONE	8020	0.5	1	NA	4/14/97	ND	
Xylenes, Total	NONE	8020	0.5	1	NA	4/14/97	ND	
Methyl <i>tert</i> -Butyl Ether	NONE	8020	3	1	NA	4/14/97	ND	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON  
Project: IBC-Oakland/22605-103.001  
Sample Matrix: Water

Service Request: S9700621  
Date Collected: 4/4/97  
Date Received: 4/7/97

TPH as Diesel

Prep Method: EPA3510  
Analysis Method: CA/LUFT  
Test Notes:

Units: ug/L (ppb)  
Basis: NA

Sample Name	Lab Code	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
MW-1	S9700621-001	50	1	4/9/97	4/9/97	1400	D1
MW-2	S9700621-002	50	1	4/9/97	4/9/97	ND	
MW-3	S9700621-003	50	1	4/9/97	4/9/97	ND	
Method Blank	S9700409-WB1	50	1	4/9/97	4/9/97	ND	

D1 Quantitated as diesel. The sample contained components that eluted in the diesel range, but the chromatogram did not match the typical diesel fingerprint.

**APPENDIX A**

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON  
Project: IBC-Oakland/22605-103.001  
Sample Matrix: Water

Service Request: S9700621  
Date Collected: NA  
Date Received: NA  
Date Extracted: NA  
Date Analyzed: NA

Surrogate Recovery Summary  
BTEX, MTBE and TPH as Gasoline

Prep Method: NONE  
Analysis Method: 8020 CA/LUFT

Units: PERCENT  
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery	
			4-Bromofluorobenzene	a,a,a-Trifluorotoluene
MW-1	S9700621-001		97	94
MW-2	S9700621-002		103	97
MW-3	S9700621-003		99	94
Method Blank	S970414-WB1		97	90

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON  
Project: IBC-Oakland/22605-103.001  
Sample Matrix: Water

Service Request: S9700621  
Date Collected: 4/4/97  
Date Received: 4/7/97  
Date Extracted: NA  
Date Analyzed: NA

Surrogate Recovery Summary  
TPH as Diesel

Prep Method: EPA3510  
Analysis Method: CA/LUFT

Units: PERCENT  
Basis: NA

Sample Name	Lab Code	Test Notes	Percent Recovery p-Terphenyl
MW-1	S9700621-001		92
MW-2	S9700621-002		92
MW-3	S9700621-003		93
Method Blank	S9700409-WB1		92

CAS Acceptance Limits: 50-140



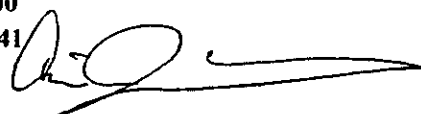
# CHAIN OF CUSTODY / LABORATORY ANALYSIS REQUEST FORM

1433 North Market Boulevard, Sacramento, CA 95834

Service Request No: S9700621 Purchase Order: #

EMCON (916) 928-3300 FAX (916) 928-3341

Lab: CAS

Project Name: **IBC-Oakland**  
Project Number: **22605-103.001**  
Project Manager: **Claudio Avila**  
Company: **EMCON**  
Address: **1433 North Market Boulevard**  
**Sacramento, CA 95834**  
Phone: **(916) 928-3300**  
FAX: **(916) 928-3341**  
Sampler's Signature: 

		Analysis Requested												REMARKS								
Sample I.D.	Date	Time	LAB I.D.	Sample Matrix	Number of Containers	TPHG/BTEX (8015:8020)	MTBE (8020)	TPHD (8015)														
						1	6															
MW-1	4/4/97	1515	①	water	4	2	2															
MW-2	↓	1409	②	water	4	2	2															
MW-3	↓	1530	③	water	4	2	2															

<b>RELINQUISHED BY</b> <i>W. Kustox Srak</i>	<b>RECEIVED BY</b> <i>Stphanne Hodge</i>
Signature <i>[Signature]</i>	Signature <i>[Signature]</i>
Printed Name <i>CHARS SIMPSON</i>	Printed Name <i>CAS/SJ</i>
Firm <i>OWT d/197</i>	Firm <i>4/7/97 1710 pm</i>
Date/Time <i>1997</i>	Date/Time <i>4/7/97 1710 pm</i>

<b>RELINQUISHED BY</b>	<b>RECEIVED BY</b>
Signature	Signature
Printed Name	Printed Name
Firm	Firm
Date/Time	Date/Time

**TURNAROUND REQUIREMENTS**

24 hr \_\_\_\_\_ 48 hr \_\_\_\_\_ 5 day \_\_\_\_\_

Standard (-10-15 working days)

Provide Verbal Preliminary Results \_\_\_\_\_

Provide FAX Preliminary Results \_\_\_\_\_

Requested Report Date \_\_\_\_\_

**REPORT REQUIREMENTS**

I. Routine Report

II. Report (includes DUP, MS MSD, as required, may be charged as samples)

III. Data Validation Report (includes All Raw Data)

RWQCB  
(MDLs/PQLs/TRACK#)

<b>RELINQUISHED BY</b>	<b>RECEIVED BY</b>
Signature	Signature
Printed Name	Printed Name
Firm	Firm

**Special Instructions/Comments:**

Container Types Key	
40 ml VOA:	1
250 ml LPE:	2
500 ml LPE:	3
1 liter HDPE:	4
500 ml glass:	5
1 liter glass:	6
2x6 s/s ring:	7
glass jar	8