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May 9, 1994

Ms. Eva Chu  
Alameda County Health Care Services Agency  
Department of Environmental Health  
80 Swan Way, Room 200  
Oakland, Ca 94621

**Subject: Preliminary Investigation and Evaluation Report, Continental Baking  
Company, 6841 Village Parkway, Dublin, CA, dated April 18, 1994**

Dear Ms. Chu:

The attached report is being submitted for your review and approval.

Woodward-Clyde Consultants is providing environmental consulting services to CBC and is submitting this report on their behalf. If you have any questions, please feel free to phone me at (510) 874-3138.

I am looking forward to working with you on this project in the future.

Sincerely,



Jo Beth Folger  
Project Manager

cc: Fred Dannecker, CBC-SF  
Charles Gjersvik, CBC\_SL  
Jim Hummert, WCC-SL  
Charles Noyes, RWQCB-Oakland

Attachment



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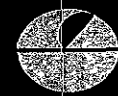
■■■■■■■ **PRELIMINARY INVESTIGATION  
AND EVALUATION REPORT  
CONTINENTAL BAKING  
COMPANY FACILITY  
6841 Village Parkway  
Dublin, California**

Prepared for

**Continental Baking Company  
1525 Bryant Street  
San Francisco, CA 94103**

April 18, 1994

**Woodward-Clyde  
Consultants**



500 12th Street, Suite 100  
Oakland, California 94607-4014

CERTIFICATION

PRELIMINARY INVESTIGATION AND EVALUATION REPORT  
CONTINENTAL BAKING COMPANY  
6841 Village Parkway, Dublin, CA

APRIL 18, 1994  
92CB037-10

This report has been prepared by the staff of Woodward-Clyde Consultants and has been reviewed and approved by the professional whose signature appears below.

The findings, recommendations, specifications, or professional opinions are presented within the limits prescribed by the client and in accordance with generally accepted engineering practice in Northern California at the time this work plan was prepared. No other warranty is either expressed or implied.

WOODWARD-CLYDE CONSULTANTS



Jo Beth Folger  
Project Manager



Albert P. Ridley, C.E.G.  
Senior Associate Geologist





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**1.1 SCOPE OF WORK**

This report has been prepared in accordance with the Tri-Regional Recommendations and Regional Water Quality Control Board guidelines. This report addresses the procedures involved with the Preliminary Investigation and Evaluation of the Continental Baking Company facility at 6841 Village Parkway in Dublin, California. This work was performed to investigate the extent and magnitude of the presence of petroleum hydrocarbons in the subsurface soil and groundwater at the site. Specific activities performed included the collection of soil samples during the drilling and construction of three groundwater monitoring wells at the site, initial monitoring well groundwater sample collection, sample analysis, and waste disposal. The investigation was centered on the vicinity of a former diesel underground storage tank.

**1.2 SITE CONTACTS**

The site is owned by Continental Baking Company (CBC) which has its headquarters in Saint Louis, Missouri. There is a local CBC office and site contact in San Francisco, California. Table 1 presents the name and address of the local CBC site contact and lists other important entities involved with the site investigation. Table 1 includes the regulatory agencies who will receive courtesy copies of reports and correspondence regarding this site investigation.

**1.3 SITE LOCATION**

The site is located in the San Francisco Bay Area in the City of Dublin, California (Figure 1). Village Parkway is a major thoroughfare that runs parallel and to the east of Interstate 680. The local land use is commercial along Village Parkway, with residences located along the intersecting streets (Figure 2). A review of public records revealed a number of cases of leaking underground fuel tanks in the vicinity of the site.

## 1.4 SITE HISTORY

The site is a baked goods distribution center and Thrift Store facility with an attached maintenance garage. On December 17, 1992, one underground storage tank (UST) was excavated and removed from the Continental Banking Company site, located at 6841 Village Parkway in Dublin, California, as described by Woodward-Clyde Consultants (WCC) in their report dated October 11, 1993.

A 4,000-gallon fuel storage tank was removed from its underground location behind the facility. The age of the UST was estimated at least 19 years old at the time of the removal. Historically, this tank had been used to store diesel fuel for the delivery trucks. Personnel from the Alameda County Health Agency and from the Dougherty Regional Fire Authority were present during the time of the UST removal to conduct their respective inspections. No holes were found in the UST nor in the connecting pipes during the inspection.

Two closure samples were collected from the bottom of the excavation and they were analyzed for petroleum hydrocarbon constituents. Results from the analysis indicate that both samples contained elevated concentrations of diesel (2,200 and 1,600 mg/kg) and moderate levels of the more volatile fractions (ethylbenzene 38-88 µg/kg and total xylenes 60 and 53 µg/kg). No standing water or free product was observed at the site.

Four stockpile samples were collected from the removed soil and composited into one sample by the laboratory. This sample was analyzed for petroleum hydrocarbons, reactivity, corrosivity and ignitability to conform with the hazardous waste disposal characterization. Additionally, the composite sample was analyzed for lead as requested by the Alameda County Health Agency.

The analytical results of the composite sample indicate that 6,800 mg/kg of diesel and unknown hydrocarbons in the range of 220 mg/kg (possible weathered diesel) were reported. The tests indicated the soil was not corrosive, reactive or ignitable. The stockpiled soil totalling approximately 54 cubic yards was subsequently disposed at Forward, Inc. Landfill.



This section describes field activities that were completed to evaluate and delineate petroleum hydrocarbons in the soil and groundwater that may be attributable to the former UST at the CBC Dublin Facility.

### **2.1 DRILLING LOCATIONS**

Four boreholes were drilled and sampled on February 28 and March 1, 1994 at the CBC Dublin facility. Of the four boreholes, three were completed as groundwater monitoring wells, identified as MW-1, MW-2, and MW-3. The borings for the installation of the monitoring wells were placed between the former UST location and the CBC Dublin facility property line to assess the lateral and vertical extent of fuel constituents within the property and to evaluate the site-specific groundwater flow direction and gradient. Monitoring well MW-1 was installed at a location deemed to be upgradient of the former UST. Well MW-2 was installed at a location selected to evaluate the site specific groundwater gradient. Monitoring well MW-3, was installed downgradient of the former UST location to intercept groundwater which may have been affected by former UST's contents.

The remaining boring was drilled, sampled, and backfilled with cement/bentonite grout. The boring was identified as SB-1. This borings was placed in the vicinity of the former fuel dispenser to investigate the potential residual fuel constituents in soil. Figure 3 shows the approximate location of each drilling location.

### **2.2 DRILLING AND SUBSURFACE SOIL SAMPLING METHODOLOGY**

The boreholes were drilled using a truck mounted Mobile B-61 drill rig equipped with 12-inch outside diameter, hollow-stem, continuous flight augers. The drilling subcontractor was Kvilhaug Well Drilling and Pump Company, Inc., of Concord, California. The wells were constructed in accordance with a permit issued by the Alameda County Flood Control and Water Conservation District.

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The drilling method consisted of advancing 5-foot long hollow-stem auger flights downward. Soil samples were collected using a split spoon drive sampler capable of holding three 2.5-inch diameter, 6-inch long brass liners. Samples were collected by advancing the hollow-stem auger flights to the specified depth and then driving the sampler within the augers to obtain the sample. A 140-pound hammer with 30-inch drop was used to drive the sampler. Subsurface soil samples were collected for chemical analysis and lithologic logging during drilling at each borehole location. The head space vapors for each sampling interval were tested for the presence of volatile organic compounds (VOCs) with an HNU-Photoionization Detector. The contents of one liner were emptied into a new ziplock bag and allowed to sit in the sun for about 15 minutes. The tip of the HNU was inserted into the bag and the results were recorded on the boring logs. Soil samples were described in accordance with the Unified Soil Classification System (USCS). A boring log was completed by the WCC hydrogeologist for each borehole. Boring logs for the monitoring wells and the soil boring are provided in Appendix A. All cuttings generated during drilling were contained in labeled 55-gallon drums for disposal.

Following collection, the soil sample liner designated for chemical analysis was sealed with teflon sheeting, plastic end caps, and labeled. Each sample was sealed in a plastic ziplock bag and placed in a chilled cooler containing ice for transport to the analytical laboratory. The soil samples were shipped for analysis under chain-of-custody protocol to Anametrix Laboratories of San Jose, California a state certified laboratory. The soil samples submitted to the laboratory were analyzed for TPH-diesel by modified EPA Method 8015 and for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020.

### **2.3 MONITORING WELL INSTALLATION PROCEDURES**

After reaching total depth, three of the four boreholes were completed as groundwater monitoring wells. All well construction materials were emplaced through the center of the hollow-stem auger flights. Prior to construction, well casing materials were decontaminated by steam cleaning. The monitoring wells were constructed using 4-inch diameter, flush threaded, Schedule 40 polyvinylchloride (PVC) well casing. The screened portion of each well consisted of 0.02-inch factory slotted PVC of the same diameter and grade as the solid pipe. Monitoring wells MW-1, MW-2 and MW-3 were screened approximately between 5 and 18 feet below ground surface. The screen intervals were selected to straddle the

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uppermost groundwater zone encountered and to allow for monitoring seasonal fluctuations of the water table.

After installing the well casing and screen in the borehole, a sand filter pack consisting of Lonestar No. 2/12 sand was poured down the annulus of the augers. As the sand was added, the augers were pulled to allow the sand filter pack to fill the borehole annulus. The bottom of the augers was not pulled above the level of the sand during sand placement to help ensure a complete and continuous sand filter pack around the well screen. The sand filter pack extended from the bottom of the boring to one foot above the top of the well screen.

Following installation of the sand filter pack a one-foot-thick bentonite seal was placed on top of the sand filter pack. The seal consisted of 3/8-inch bentonite pellets hydrated in place with approximately five-gallons of water. The seal was allowed to hydrate for a minimum of 30-minutes before grouting was performed. Wells were capped with water-tight locking caps secured with keyed-alike locks.

A neat cement grout mixture was used to seal the borehole annulus from the top of the bentonite seal to just below ground surface. The neat cement grout consisted of a mixture of Type I and II Portland cement (94-lbs per bag), bentonite powder (up to 5 percent), and potable water (approximately 7 gallons per bag of cement).

After grouting, surface completions were performed at each monitoring well location. The surface completion consisted of a grouted in-place traffic rated utility box mounted nearly flush with the surrounding grade. Table 2 is a summary of all monitoring well construction details.

## 2.4 MONITORING WELL DEVELOPMENT PROCEDURES

Following construction, each monitoring well was developed to remove materials introduced during well construction, so that the well would yield representative groundwater samples. The wells were developed on March 4, 1994. The monitoring wells were developed according to the following procedures:

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- All downhole equipment (e.g., surge block, hoses, etc.) was cleaned with a solution of laboratory grade soap (Alconox) and potable water before use.
- Prior to development, an Oil/Water Interface probe was used to measure the presence of a floating immiscible layer in each well. The water level and total depth of each well was measured and recorded.
- The screened interval of each well was swabbed for a maximum of 10-minutes to agitate the sand pack and loosen formational sand and silt.
- Each well was then purged dry until 10 casing volumes had been removed.
- Purging of each monitoring well was accomplished using a centrifugal pump.
- During well purging, general water quality parameters (pH, specific conductance, temperature, turbidity) were periodically measured and recorded, water color and odor were periodically observed and recorded.

Water removed from the wells during well development was contained in 55-gallon drums and stored on-site. Water Sample Logs used to document monitoring well development are provided in Appendix B.

### **2.5 GROUNDWATER SAMPLING PROCEDURES**

Groundwater monitoring wells MW-1, MW-2, and MW-3 were sampled on March 7, 1994. Groundwater samples were collected from each monitoring well according to the following procedures:

- Purging and sampling equipment was cleaned in a solution of laboratory soap (Alconox) and potable water; rinsed with potable water; and finally rinsed with distilled water.
- Prior to sampling, an Oil/Water Interface probe was used to measure the presence of a floating immiscible layer in each well.

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- At each well, the water level and total depth were measured.
- Wells MW-1, MW-2, and MW-3 were purged using a centrifugal pump.
- During purging, general water quality parameters (pH, specific conductance, temperature, turbidity) were periodically measured and recorded. Water color and odor were periodically observed and recorded.
- Purging continued until a minimum of 4-casing volumes of water were removed and water quality parameters stabilized.
- Groundwater samples were collected at each well with a new disposable bailer and were poured into appropriate sample containers provided by the analytical laboratory. Sample containers were sealed, labeled, wrapped in cushioned wrapping, and then placed in a chilled cooler containing ice for shipment to the analytical laboratory.
- After sampling was complete, general water quality parameters, water level, and total depth were again measured and recorded.

Immediately following sample collection, the sample bottles were placed in a chilled cooler for storage and transport to the analytical laboratory. All groundwater samples collected were recorded on chain-of-custody forms prior to shipment to the laboratory. Groundwater samples collected were submitted to a state certified laboratory for analysis. The samples collected for this project were submitted to Anametrix Laboratories of San Jose, California. The groundwater samples were analyzed for TPH-diesel by modified EPA Method 8015 and for BTEX by EPA Method 8020.

Water removed from the wells during purging was contained in 55-gallon drums for disposal. Water Sample Logs used to document monitoring well purging and sampling are provided in Appendix B.

## 2.6 DECONTAMINATION PROCEDURES

All down-hole drilling equipment such as augers were steam-cleaned prior to use between wells. The California split-spoon sampler, brass tube liners, oil-water interface probe, water level indicators and bailers were cleaned before each use by washing in a laboratory grade solution followed by two tap water rinses and one rinse with distilled water.

## 2.7 HEALTH AND SAFETY

Field activities at the CBC Dublin Facility were conducted in accordance with the provisions of the WCC site specific Health and Safety Plan. The plan was prepared to comply with state and federal occupational health and safety regulations to ensure health and safety of all workers, regulators, and public at the site. The Health and Safety Plan covering field work for this investigation is effective for the period 11 February 1994 through 01 August 1994.

## 2.8 ENGINEERING SURVEY

After installation, the three monitoring wells were surveyed by Hunter Surveying, Inc., of Orangevale, California, a state licensed engineering surveyor. The soil boring was surveyed for location and elevation. Each well location was surveyed to an accuracy of 0.01 foot for the following points:

- The north rim of the top of well casing (with cap off) was surveyed for elevation and location.
- The ground surface at each monitoring well was surveyed for elevation.
- The rim of the protective traffic rated box was surveyed for elevation.

The survey data for the newly installed monitoring wells are provided in Table 3.

This section describes hydrogeologic conditions for the CBC Dublin facility and provides an assessment of the vertical and horizontal extent of contamination at the site.

### **3.1 HYDROGEOLOGIC SETTING**

The area of the CBC Dublin facility is mapped as Quaternary terrace deposits consisting of poorly bedded deposits of clay, silt, and sand. The terrace deposits in this area can attain a thickness of about 75 (Ford and Hill 1974). The site is located within the San Ramon Valley, approximately 3,000 feet west of the South San Ramon Creek which flows south.

Groundwater in the Dublin subbasin is both confined and unconfined (Ford and Hill 1974). The Dublin subbasin is bound to the east by the Pleasanton Fault and to the west by the Calaveras Fault. Groundwater in the shallow unconfined aquifer is generally found at about 20 feet below the ground surface. The deeper confined aquifers are generally found between 50 and 80 feet below ground surface (Ford and Hill 1974). Groundwater flow in the vicinity of the site is expected to be southward. Groundwater flow below the site is anticipated to have a local southeastward component.

### **3.2 SITE HYDROGEOLOGY**

The depth to groundwater at the CBC Dublin facility during drilling was encountered at a depth of about 13 feet below grade and stabilized at depths of around 10 feet below grade. Groundwater elevations stabilized in the wells at a range from 330.7 to 330.9 feet above mean sea level (MSL). Figure 4 is a groundwater elevation contour map depicting water elevations measured on March 7, 1994. The groundwater flow direction is towards the northwest. The groundwater flow direction was anticipated to be towards the southeast. The horizontal hydraulic gradient across the site was estimated to be about 0.004 feet per foot.

## 3.3 ANALYTICAL RESULTS

### 3.3.1 Subsurface Soils

Subsurface soil sampling was conducted on February 28 and March 1, 1994. The soil samples were submitted to Anametrix Laboratories for the following analyses: TPH-diesel by modified EPA Method 8015 and for BTEX by EPA Method 8020. Analytical results of soil samples collected are summarized in Table 5. A quality assurance/quality control (QA/QC) review was performed on the analytical data. The results of the review indicate that data are of acceptable quality. The QA/QC review and laboratory analytical data sheets are provided in Appendix C.

Laboratory results indicate concentrations of TPH - diesel in soil ranging from 61 milligrams per kilogram (mg/Kg) to 3,100 mg/Kg. Concentrations of toluene, ethylbenzene, and total xylenes were also detected in the soil (Table 5). One duplicate soil sample was collected from boring SB-1, analytical results indicate that the concentration in the deeper sample (identified as the duplicate) was about 20 times higher than the shallower sample. The primary soil sample was collected at a depth of 5.5 feet below grade, the duplicate sample was collected immediately below from a depth of 6 feet below grade. The variation in the analytical results may be attributed to soil variations.

### 3.3.2 Groundwater

An oil-water interface probe was used to measure the thickness of any floating immiscible layer, if present. The probe was inserted in each monitoring well prior to purging, it was determined that a measurable immiscible layer was not present in any of the monitoring wells at the CBC-Dublin facility. A very light non-measurable sheen was observed in the first 9 gallons of water removed from monitoring well MW-1.

Groundwater samples were analyzed for TPH quantified as diesel (modified EPA Method 8015) and BTEX (EPA Method 8020). In addition to the groundwater samples collected from the three monitoring wells, one duplicate sample was collected from well MW-1 (labelled MW-4 on the chain-of-custody and the analytical data sheets) and an equipment blank was collected prior to sampling well MW-3 (labelled MW-5). A QA/QC review was



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performed on the groundwater data. Analytical results indicated that the equipment blank (collected prior to sampling MW-3) had 3.0 µg/L of total xylenes present. No concentrations of total xylene was detected in the groundwater sample from well MW-3, or in samples collected from wells MW-1 or MW-2. The detection of total xylene may be due to contamination during sample collection, sample shipment, or at the laboratory. The environmental samples collected were not affected by the contamination detected in the equipment blank (MW-5). The results of the QA/QC review indicate that data are of acceptable quality. Analytical results of groundwater samples collected are summarized in Table 6. The QA/QC review and the laboratory analytical data sheets are provided in Appendix C.

Concentrations of BTEX were not detected in any of the three groundwater monitoring wells at the CBC-Dublin facility. Concentrations of TPH-diesel were detected in monitoring well MW-1 at 210 µg/L (230 µg/L duplicate sample) and in well MW-2 at 240 µg/L.

**SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

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**4.1 SUMMARY**

Groundwater elevation at the CBC Dublin facility was calculated to be at about 330 feet above mean sea level. The calculated groundwater flow direction was estimated to be towards the northwest. The anticipated flow direction was towards the southeast. Based on the water levels measured, there appears to be a localized gradient at the site, which may be influenced by topography or some other local condition. The general slope of the CBC Dublin facility is relatively flat, sloping slightly towards the northwest in the direction of the drainage ditch.

Total petroleum hydrocarbons quantified as diesel and the gasoline constituents of toluene, ethylbenzene, and total xylenes were detected in soil samples collected in the immediate vicinity of the former excavation (wells MW-1 and MW-2).

An oil/water interface probe was used to detect and measure the presence of an immiscible layer prior to well development and again prior to initiating groundwater sampling. No measurable immiscible layer was detected in any of the wells. During well purging a slight sheen was noted in the purged groundwater from monitoring well MW-1.

TPH quantified as diesel was only detected in groundwater samples collected from monitoring wells MW-1 and MW-2. TPH as diesel was detected in well MW-1 at a concentration of 210 µg/L (230 µg/L duplicate sample) and in well MW-2 at 240 µg/L. Gasoline constituents (BTEX) were not detected in any of the groundwater samples collected from the newly installed monitoring wells.

**4.2 CONCLUSIONS AND RECOMMENDATIONS**

This report satisfies the requirements for a Preliminary Investigation and Evaluation Report (PIER) and, as noted previously, concludes that the groundwater beneath the site has been impacted by petroleum hydrocarbons as diesel. WCC recommends that quarterly monitoring

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of water levels and sampling for petroleum hydrocarbons quantified as diesel be performed for a period of at least one year.

The conclusions presented in this report are based on the available data and the professional opinion and experience of WCC. If additional data are collected, the conclusions presented herein may be revised. WCC's services were performed with the standard of care and skill commonly used as state of the practice in the profession. No other representation, expressed or implied, and no warranty or guarantee, is included or intended.

Ford, Robert S., Hills, Edward E. 1974. Department of Water Resources "Evaluation of Groundwater Resources: Livermore and Sunol Valleys". Bulletin No. 118-2.

State of California Regional Water Quality Control Board, Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, August 10, 1990 and Appendix A - Reports, August 30, 1991.

Woodward-Clyde Consultants, *Preliminary Site Assessment Work Plan, Continental Baking Company Facility, 6841 Village Parkway, Dublin, California - November 19, 1993.*

Woodward-Clyde Consultants, *Underground Storage Tank Removal and Closure Report, 6841 Village Parkway, Dublin, California, October 11, 1993.*

**TABLE 1**

**LIST OF CONTACTS  
CONTINENTAL BAKING COMPANY FACILITY  
6841 VILLAGE PARKWAY  
DUBLIN, CALIFORNIA**

---

**Facility Owner/Operator:**

Continental Baking Company  
1525 Bryant Street  
San Francisco, California 94103

Fred Dannecker  
(415) 552 0950

**Environmental Consultants to Continental Baking Company:**

Woodward-Clyde Consultants  
500-12th Street, Suite 100  
Oakland, California 94607

Jo Beth Folger  
(510) 874 3138

**Lead Implementing Agency:**

Alameda County Health Agency  
80 Swan Way, Room 200  
Oakland, California 94621

Eva Chu  
(510) 271 4530

**Regional Water Quality Control Board:**

Regional Water Quality Control Board  
1800 Harrison Street  
Oakland, California 94612

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**TABLE 2**  
**MONITORING WELL CONSTRUCTION DETAILS**

Well Identification	Total Boring Depth (feet below grade)	Total Well Depth (feet below grade)	Depth of Screened Interval (feet below grade)	Type of Well Casing	Perforation Type
MW-1	18.5	18.1	5-18	4-inch schedule 40 PVC	0.02 inch slots
MW-2	18.5	18.2	5-18	4-inch schedule 40 PVC	0.02 inch slots
MW-3	18.2	17.8	5-17.5	4-inch schedule 40 PVC	0.02 inch slots

PVC - polyvinylchloride

**TABLE 3**

**RESULTS OF THE MONITORING WELL SURVEY**

Well Number	Coordinates		Top of PVC Casing	Ground Surface Elevation
	Northing	Easting	Elevation (feet above MSL)	(feet above MSL)
MW-1	4983.22	5034.27	340.80	341.37
MW-2	5012.96	5009.31	340.39	341.16
MW-3	5003.59	5072.44	340.47	340.78

Coordinates based on local site coordinate system, elevation referenced to mean sea level (MSL) based on Alameda County Benchmark "VIL-LEW" Published elevation of 332.866 ft., MSL (NGVD 1929).

PVC = polyvinylchloride



**TABLE 4**

**WATER LEVEL MEASUREMENTS**

Well Number	Top of Casing Elevation (feet, MSL)	Depth to Water (feet below TOC) 3/7/94	Water Elevation (feet, MSL) 3/7/94
MW-1	340.80	9.97	330.83
MW-2	340.39	9.71	330.68
MW-3	340.47	9.53	330.94

TOC = Top of PVC casing

MSL = Mean Sea Level (U.S. Geological Survey datum).

**TABLE 5**  
**ANALYTICAL RESULTS OF SOIL SAMPLES**

Soil Sample Identification	Depth of Sample Collection (feet)	BTEX (mg/Kg)	TPH-diesel (mg/Kg)
MW-1	7-7.5	ND	ND
MW-1	11.5-12	0.35 (ethylbenzene) 3.1 (total xylenes)	3100
MW-2	5-5.5	ND	ND
MW-2	9-9.5	0.11 (toluene) 0.18 (ethylbenzene) 0.67 (total xylenes)	1100
MW-3	6-6.5	ND	ND
MW-3	11-11.5	ND	ND
SB-1	5.5-6	0.027 (ethylbenzene) 0.071 (total xylenes)	61
SB-1*	6-6.5	0.14 (toluene) 0.24 (ethylbenzene) 0.73 (total xylenes)	1200
SB-1	10-10.5	0.18 (toluene) 0.50 (ethylbenzene) 1.4 (total xylenes)	720

\* Duplicate sample, collected at interval immediately below initial sample  
 ND = not detected at or above the laboratory reporting limit  
 mg/Kg = milligrams per kilogram  
 TPH = total petroleum hydrocarbons

**TABLE 6**

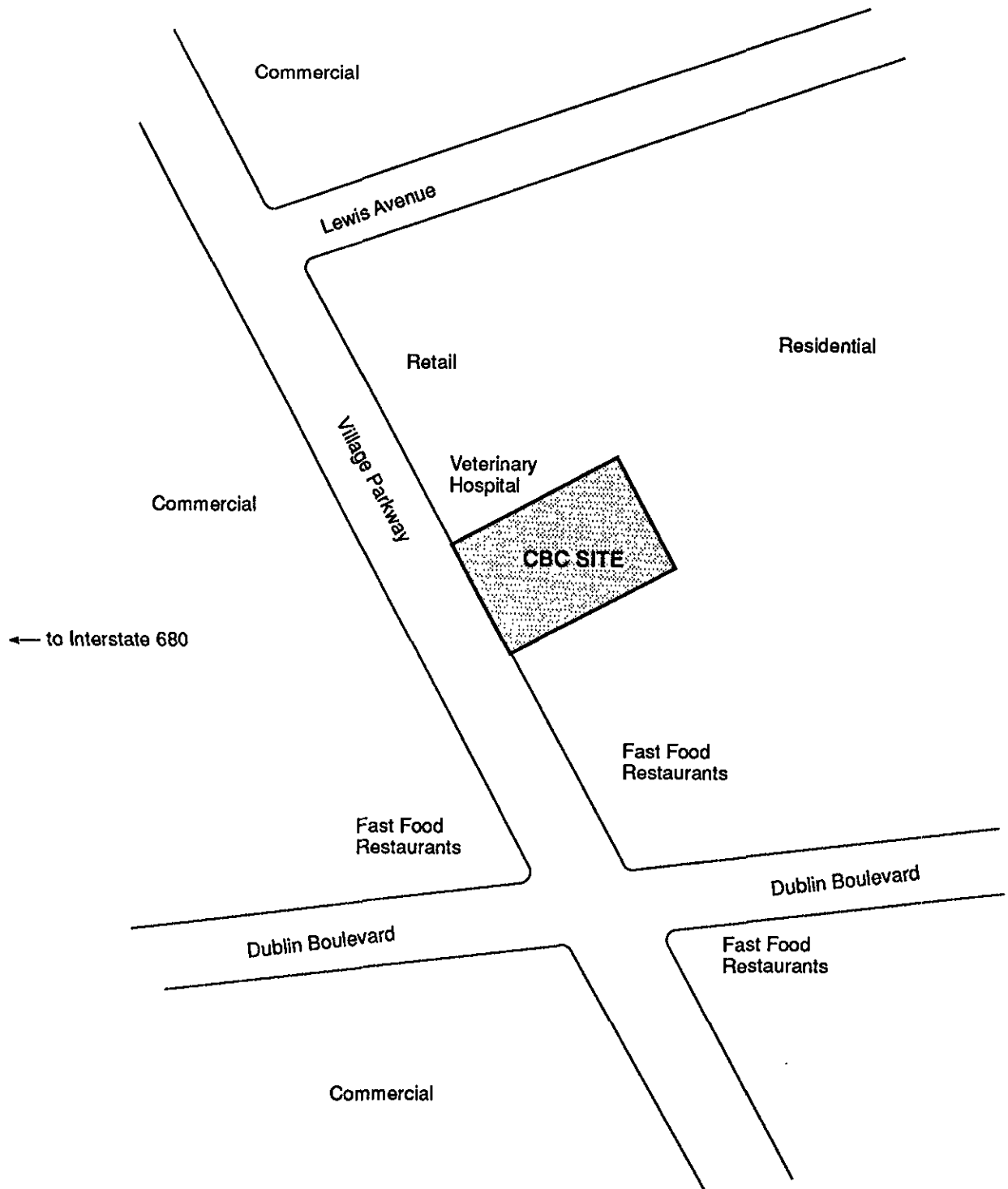
**ANALYTICAL RESULTS OF GROUNDWATER SAMPLES**

Well Number	BTEX (µg/L)	TPH-Diesel (µg/L)
MW-1	ND, ND	210, 230
MW-2	ND	240
MW-3	ND	ND

ND = Not detected at or above the practical quantitation limit for the method.

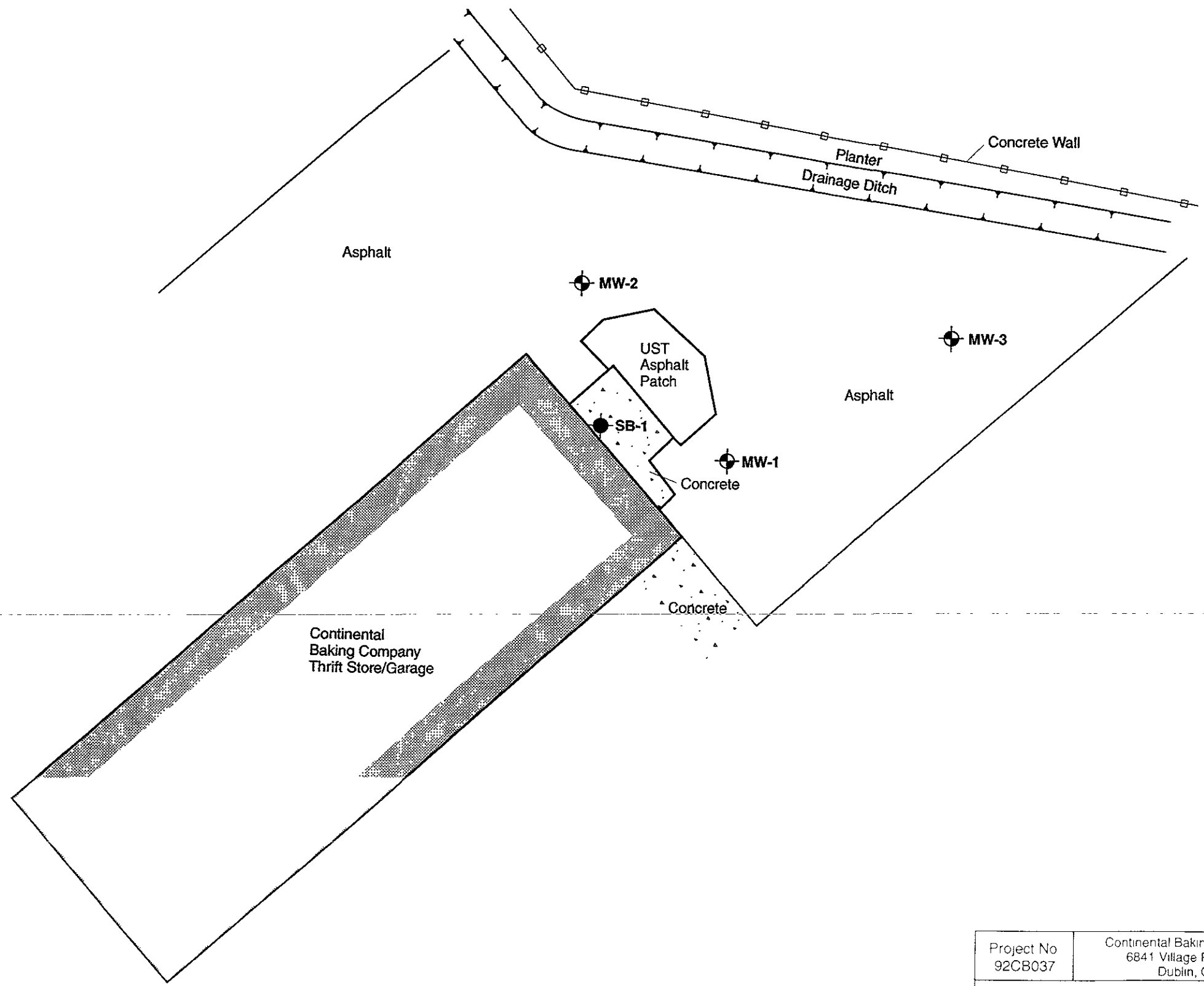
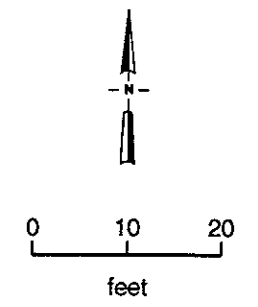
Results of duplicate analysis are shown separated by a comma.





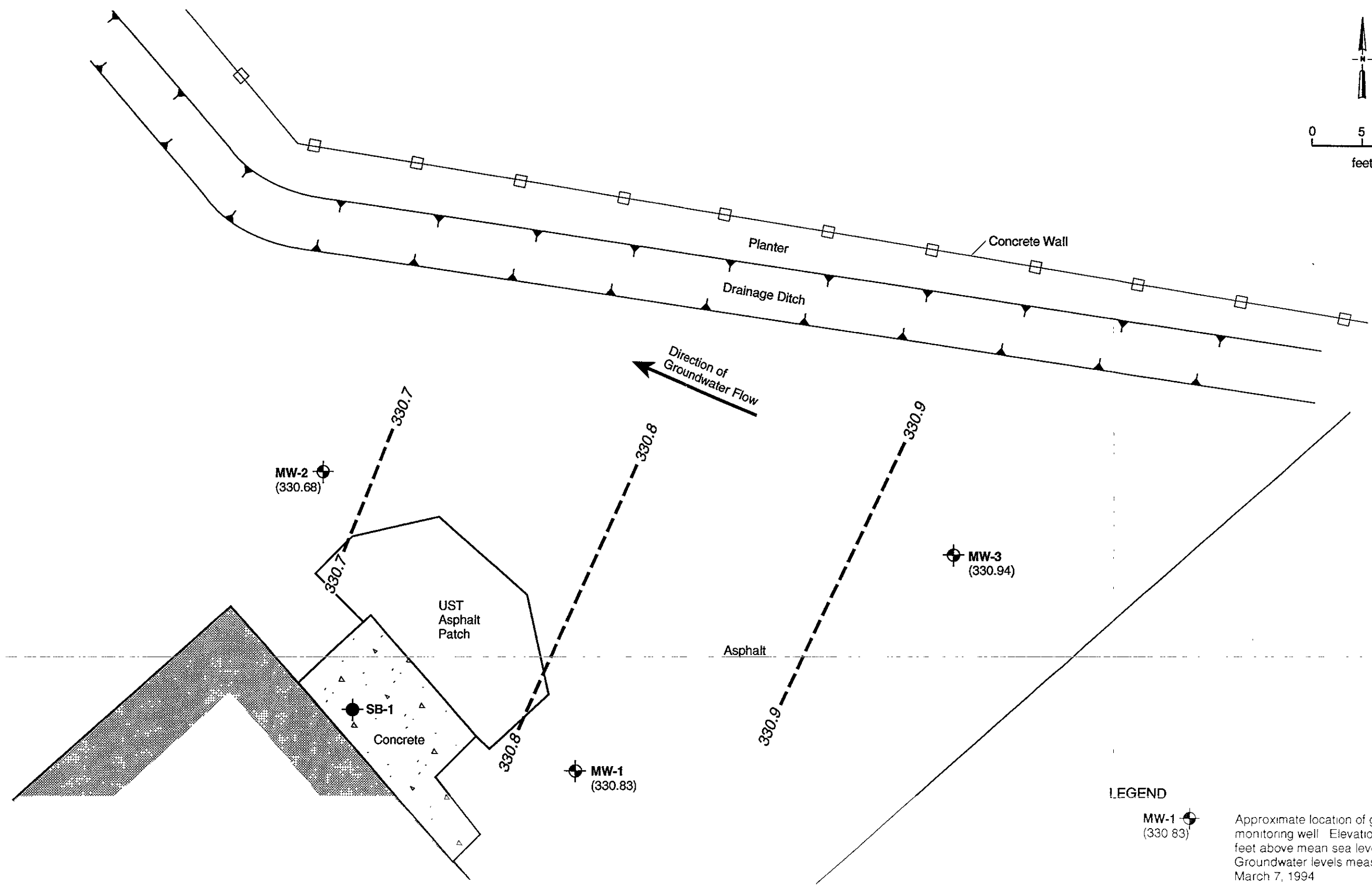
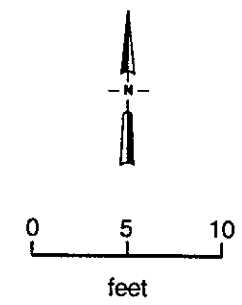
(not to scale)

Project No. 92CB037	Continental Baking Company 6841 Village Parkway Dublin, California	<b>LOCAL LAND USE</b>	<b>Figure 2</b>
<b>Woodward-Clyde Consultants</b>			



- LEGEND**
- MW-1 Approximate location of groundwater monitoring well
  - SB-1 Approximate location of soil boring
  - UST Former underground storage tank area

Project No 92CB037	Continental Baking Company 6841 Village Parkway Dublin, CA	<b>MONITORING WELL LOCATION MAP</b>	Figure 3
<b>Woodward-Clyde Consultants</b>			



**LEGEND**

MW-1 (330.83) Approximate location of groundwater monitoring well. Elevation of groundwater feet above mean sea level in parentheses. Groundwater levels measured on March 7, 1994.

330.9 Inferred groundwater elevation contour

Project No 92CB037	Continental Baking Company 6841 Village Parkway Dublin, CA	<b>GROUNDWATER ELEVATION CONTOUR MAP</b>	Figure 4
<b>Woodward-Clyde Consultants</b>			

APPENDIX A  
BORING LOGS

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Project: CBC - Dublin  
 Project Location: 6841 Village Parkway, Dublin, CA  
 Project Number: 92CB037

# Log of Boring MW-1

Sheet 1 of 1

Date(s) Drilled	2/28/94			Logged By	M. Castellano		Checked By	
Drilling Method	Hollow Stem Auger			Drill Bit Size/Type	11 1/4" Bullet Type		Approx. Surface Elevation (feet)	341.37 msl
Drill Rig Type	Mobile B-61			Drilled By	Kvilhaug Well Drilling		Total Depth Drilled (feet)	18.5
Groundwater Level (feet, bgs)	First	Completion	24 Hours	Number of Samples	Disturbed:	Undisturbed:	Sampler Type	2 1/2-inch Split Spoon
	12.5	10.4	10.28					
Diameter of Hole (inches)	12	Diameter of Well (inches)	4	Type of Well Casing	4-inch Schedule 40 PVC		Screen Perforation	0.02-inch Slot 5'-18.5'
Type of Sand Pack	#2/12 Lonestar 5'-18.5'			Type/Thickness of Seal(s)	Bentonite 3'-4' / Grout (Neat Cement) 0.5'-3'			
Comments	Located downgradient of former UST							

Depth, feet	Elevation, feet	SAMPLES		USCS Classification	Graphic Log	MATERIAL DESCRIPTION	Well Completion Log	HNu (ppm)		REMARKS
		Type	Blows/foot					Headspace	Background	
0	340					ASPHALT				
5	335	6-6.5	25	CL		SANDY CLAY Dark grayish green, firm, dry to slightly moist, 20% fine sand, clay of moderate plasticity		5	2	
		6.5-8	11	SM		SILTY SAND Light olive gray, trace of clay, dry, 70% fine-grained sand, ~20% silt				Odoriferous Soil at 7' Chemical Sample (7'-7.5')
10	330	11-12.5	17	SC		CLAYEY SAND Dark gray to moderate brown, dense, 40% clay, 60% fine to medium sand			44	Chemical Sample (11.5'-12.0') Note: Well completed below grade inside a traffic rated christy type box and locking cap
15	325	14.5-16	10			CLAYEY SAND Moderate brown, medium dense, fine to medium grained sand, 30% clay of moderate plasticity				
20	320									
25	315									
30										

Project: CBC - Dublin  
 Project Location: 6841 Village Parkway, Dublin, CA  
 Project Number: 92CB037

# Log of Boring MW-2

Sheet 1 of 1

Date(s) Drilled	2/28/94			Logged By	M. Castellanos		Checked By	
Drilling Method	Hollow Stem Auger			Drill Bit Size/Type	11 1/4" Bullet Type		Approx. Surface Elevation (feet)	341.16 msl
Drill Rig Type	Mobile Drill B-61			Drilled By	Kvilhaug Well Drilling		Total Depth Drilled (feet)	18.5
Groundwater Level (feet, bgs)	First	Completion	24 Hours	Number of Samples	Disturbed:	Undisturbed:	Sampler Type	2 1/2-inch Split Spoon
	13	10.3	10.32				Screen Perforation	0.02-inch Slot 5'-18.5'
Diameter of Hole (inches)	12		Diameter of Well (inches)	4		Type of Well Casing	4-inch Schedule 40 PVC	
Type of Sand Pack	#2/12 Lonestar 4'-18.5'			Type/Thickness Bentonite 3'-4' / Grout (Neat Cement) 0.5'-3'				
Comments	Continuously Sampled. Located upgradient of former UST							

Depth, feet	Elevation, feet	SAMPLES		USCS Classification	Graphic Log	MATERIAL DESCRIPTION	Well Completion Log	HNU (ppm)		REMARKS
		Type	Blows/foot					Headspace	Background	
0	340					ASPHALT				
		1-2.5	42	CL		SANDY CLAY Olive gray, slightly moist, 30% fine to medium-grained sand, few rounded gravels, some silt, non plastic clay		<1	<1	Air Monitored with HNU
		2.6-4	43					<1	<1	
		4-6.5	22					<1	<1	
5	335	5.5-7	32			SILTY SAND Light olive gray, dry, 30% fine-grained sand, 40% medium grained sand, trace of silt, some slightly plastic clay		20		Chemical Sample (5'-6.5')
		7-8.5	25	SM				20		
		8.5-10	22	ML		SILTY CLAY Gray, firm to hard, moderately plastic clay, trace of fine sand		20		Odiferous Soil at 8' Chemical Sample (9'-9.5')
10	330	10-11.5	8					25		
		11.5-13	20	ML		SILTY CLAY Brownish gray with white crystalline veins, firm, moist, moderately plastic clay,				Note: Well completed below grade inside a christy type box (traffic rated)
		13-14.5	10							
		14.5-16	11	SC		CLAYEY SAND Moderate brown, saturated, very dense to dense, 40% fine-grained sand, plastic to very plastic clay				
15	325	16-17.5	14							
						Trace of gravel at bottom of sampling shoe				
20	320									
25	315									
30										



Project: CBC - Dublin  
 Project Location: 6841 Village Parkway, Dublin, CA  
 Project Number: 92CB037

# Log of Boring MW-3

Sheet 1 of 1

Date(s) Drilled	3/1/94			Logged By	M. Castellanos		Checked By	
Drilling Method	Hollow Stem Auger			Drill Bit Size/Type	11 1/4" Bullet Type		Approx. Surface Elevation (feet)	340.78 msl
Drill Rig Type	Mobile Drill B-61			Drilled By	Kvlhaug Well Drilling		Total Depth Drilled (feet)	18.2
Groundwater Level (feet, bgs)	First	Completion	24 Hours	Number of Samples	Disturbed:	Undisturbed:	Sampler Type	2 1/2-inch Split Spoon
	12.5	9.32	9.31				Screen Perforation	0.02-inch Slot 5'-17.5'
Diameter of Hole (inches)	12		Diameter of Well (inches)	4		Type of Well Casing	4-inch Schedule 40 PVC	
Type of Sand Pack	#2/12 Lonestar 4'-18.2'			Type/Thickness Bentonite 3'-4' / Grout (Neat Cement) 0.5'-3' of Seal(s)				
Comments	Located cross-gradient of former UST							

Depth, feet	Elevation, feet	SAMPLES		USCS Classification	Graphic Log	MATERIAL DESCRIPTION	Well Completion Log	HNU (ppm)		REMARKS
		Type	Depth bgs feet					Blows/foot	Headspace	
0	340					ASPHALT				Air Monitored with HNU
5	335		5-8.5	14	CL	<b>SANDY CLAY</b> Dark grayish green, firm, dry to slightly damp, 20% fine-grained sand, clay of low to moderate plasticity		<1		Chemical Sample (6'-8.5')
					SM	<b>SILTY SAND</b> Light olive gray, dry, ~70% fine-grained sand, 20% silt				
10	330		10'-11.5	13	CL/ML	<b>SILTY SANDY CLAY</b> Brownish gray, 40% fine sand to silt, clay of medium plasticity, moisture increase at 11', trace of white crystalline veins		<1		Chemical Sample (11'-11.5)
15	325		15-16.5	11	SC	<b>CLAYEY SAND</b> Moderate brown, dense, 40% fine sand, plastic to very plastic clay, trace of gravel				Note: Well completed below grade inside a traffic rated chrisy type box and locking cap
20	320									
25	315									
30										



Project: **CBC - Dublin**  
 Project Location: **6841 Village Parkway, Dublin, CA**  
 Project Number: **92CB037**

# Log of Boring SB-1

Sheet 1 of 1

Date(s) Drilled	3/1/94			Logged By	M. Castellanos		Checked By	
Drilling Method	Hollow Stem Auger			Drill Bit Size/Type	6" Bullet Type		Approx. Surface Elevation (feet)	341.93 msl
Drill Rig Type	Mobile Drill B-61			Drilled By	Kvilhaug Well Drilling		Total Depth Drilled (feet)	10.5
Groundwater Level (feet, bgs)	First	Completion	24 Hours	Number of Samples	Disturbed:	Undisturbed:	Sampler Type	2 1/2-inch Split Spoon
Diameter of Hole (inches)	6 1/4		Diameter of Well (inches)	-		Type of Well Casing	NA	
Type of Sand Pack	NA			Type/Thickness Grout (Neat Cement) of Seal(s)			0'-10.5'	
Comments	Hole backfilled after sampling, boring located near former fuel dispenser							

Depth, feet	Elevation, feet	SAMPLES		USCS Classification	Graphic Log	MATERIAL DESCRIPTION	Well Completion Log	HNU (ppm)		REMARKS
		Type	Depth bgs feet					Blows/foot	Headspace	
0						CEMENT				Air Monitored with HNU
340										
5			5-8.5	28	CL	SANDY CLAY Dark olive gray, dry, 80% clay of low plasticity, 40% fine to medium grained sand, sparse gravels		5		Chemical Sample (5.5'-8') Duplicate (6'-6.5')
335										
10			8-10	14	ML	SILTY CLAY Gray, firm, 40% fine-grained sand and silt, clay of medium plasticity		< 1		Chemical Sample (10'-10.5')
330										
15										
325										
20										
320										
25										
315										
30										

APPENDIX B  
WATER SAMPLE LOGS (DEVELOPMENT AND GROUNDWATER SAMPLING)

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# WATER SAMPLE LOG

Sample No. MW-1

Project No.: 92CB037-0010 Date: 3-4-94

Project Name: CBC - Dublin

Sample Location: MW-1

Well Description: 4" sch 40 PVC w/water tight lockable cap inside christy box

Weather Conditions: Clear, Sunny & warm

Observations / Comments: Swabbed well 10 mins. prior to pouring. poured well w/ centrifugal pump 1/2" wrench & Dolphin lock to operate!

Quality Assurance Development Sampling Method: Swab/Pump  
 Method to Measure Water Level: 200' solinst

Pump Lines: New / Cleaned \_\_\_\_\_ Bailer Lines: New / Cleaned \_\_\_\_\_

Method of cleaning Pump / Bailer: \_\_\_\_\_

pH Meter No.: 218552 Calibrated 3/4 7.00  
10.01 @ 25°C

Specific Conductance Meter No.: 13749 Calibrated Red Line

Comments: TD = 17.43 + .36 = 17.79 - 9.86 = 7.93 x .653 = 5.2 x 10 = 52 gallons.

Sampling Measurements Water Level (below MP) at Start: 9.86 End: 13.04  
 Measuring Point (MP): Notch on Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1422	7	7.21	21.7	8800	7100	PK Blue Brown	None	Dry @ 12 gallons
1428	14	7.01	21.1	9000	7100	"	"	Dry @ 16 gal.
1456	21	6.99	20.4	8800	7100	"	"	Dry @ 22 gals.
1508	28	7.03	20.3	8400	7100	"	Lite ?	Lite Smell Dry @ 28 gals
1527	35	7.04	20.6	8600	7100	MED Blue Brown	"	Dry @ 38 gals.
1546	42	7.01	20.6	8700	7100	"	"	Dry @ 44 gals.
1655	49	7.05	20.2	8600	7100	"	"	Dry @ 49 gals.
1606	52	7.05	20.3	5000	7100	Lite Blue Brown	"	

Total Discharge: 52 gallons Casing Volumes Removed: 10

Method of disposal of discharged water: 55 gallon Drum

Number and size of sample containers filled: NA

Collected by: S. Penman / J. Haus

**Woodward-Clyde Consultants**  
 500 12th Street, Suite 100, Oakland, CA 94607-4014  
 (415) 893-3600

Sample No.

**WATER SAMPLE LOG** Well Development  
Sample No. MW-2

Project No.: 92CB037-0010 Date: 3-4-94  
 Project Name: CBC Dublin  
 Sample Location: MW-2  
 Well Description: 4" sch. 40 PVC w/ watertight lockable cap in chesty Box  
 Weather Conditions: Clear Sunny & warm  
 Observations / Comments: 9/16" wrench & Dolphin key opened Centrifugal pump to purge well.

**Quality Assurance** Development Sampling Method: Swabb/Pump  
 Method to Measure Water Level: 200' Solinst  
 Pump Lines: New / Cleaned Bailer Lines: New / Cleaned  
 Method of cleaning Pump / Bailer: \_\_\_\_\_  
 pH Meter No.: 21852 Calibrated 3/4 7.00  
 Specific Conductance Meter No.: 13749 Calibrated Red lined  
 Comments: TD = 17.31 + .36 = 17.67 - 9.59 = 8.08 x .653 = 5.3 x 10 = 53 gallons

**Sampling Measurements** Water Level (below MP) at Start: 9.59 End: 15.30↑  
 Measuring Point (MP): Notch on top of casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1435	7	7.17	20.7	11600	7100	dk blue brown	NA	Silty/Fine sand Dry @ 8 gals.
1444	14	7.00	20.3	11900	7100	"	"	Dry @ 16 gals.
1454	21	6.93	19.9	11900	7100	dk blue brown	"	Dry @ 21 gals.
1518	28	7.03	20.0	11800	7100	"	"	Dry @ 28 gals.
1549	35	6.96	20.0	12200	7100	dk blue brown	"	Dry @ 39 gals.
1558	42	7.02	19.6	11200	7100	"	"	Dry @ 43 gals.
1620	49	6.99	19.8	11800	7100	lt gray brown	"	Dry @ 49 gals.
1631	53	7.01	19.5	11100	7100	"	"	-

Total Discharge: 53 gallons Casing Volumes Removed: 10  
 Method of disposal of discharged water: 55 gallon Drum  
 Number and size of sample containers filled: NA

Collected by: S. Penman J. Haus **Woodward-Clyde Consultants**  
500 12th Street, Suite 100, Oakland, CA 94607-4014  
(415) 893-3600

Sample No.

WATER SAMPLE LOG

Well Development  
Sample No. MW-3

Project No.: Y2CB037-0010 Date: 3-4-94  
 Project Name: CBC - Dublin  
 Sample Location: MW-3  
 Well Description: 4" sch. 40 PVC w/watertight Lockable Cap in Christy Box  
 Weather Conditions: Clear Sunny & Warm  
 Observations / Comments: 3/16" wrench & Dolphin key to open  
parged w/centrifugal pump

Quality Assurance

Development Sampling Method: Swirl / Pump  
 Method to Measure Water Level: 200' Solinst

Pump Lines: New / Cleaned Bailer Lines: New / Cleaned

Method of cleaning Pump / Bailer:

pH Meter No.: 218552 Calibrated 3/4 7.00 @ 25°

Specific Conductance Meter No.: 13749 Calibrated Red Lined

Comments: ID = 17.31 + .36 = 17.67 - 9.31 = 8.36 x .653 = 5.5 x 10 = 55 gallons

Sampling Measurements

Water Level (below MP) at Start: 9.31 End: 14.06↑  
 Measuring Point (MP): Notch at Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1449	7	7.34	20.2	9600	7100	85 Blue Brown	None	Dry @ 8 gallons
1501	14	7.18	20.0	9600	7100	"	"	Dry @ 14 gallons
1523	21	7.16	20.4	9200	7100	"	"	Dry @ 25 gallons
1536	28	7.16	20.1	9200	7100	"	"	Dry @ 31 gals.
1657	35	7.16	20.0	9000	7100	85 Blue Brown	"	Dry @ 37 gals.
1602	42	7.19	20.0	9100	7100	"	"	Dry @ 43 gals.
1616	49	7.20	20.0	9000	7100	"	"	Dry @ 49 gals.
1623	55	7.30	19.8	9200	7100	"	"	

Total Discharge: 55 gallons Casing Volumes Removed: 10

Method of disposal of discharged water: 55 gallon Drum

Number and size of sample containers filled: NA

Collected by: S. Penman, J. Haus

Woodward-Clyde Consultants  
 500 12th Street, Suite 100, Oakland, CA 94607-4014  
 (415) 893-3600



Sample No.

# WATER SAMPLE LOG

Sample No. MW-1

Project No.: 92CB037-0010 Date: 3-7-94

Project Name: CBC-Dubling

Sample Location: MW-1

Well Description: 4" Schedule 40 PVC w/ watertight Locking Cap inside Christy Box

Weather Conditions: Clear, Sunny & Warm

Observations / Comments: 9/16" wrench & Dolphin key to access well  
Purged w/ centrifugal pump.

Quality Assurance Sampling Method: Disposable PVC Bailer  
Method to Measure Water Level: Interface probe

Pump Lines: New / Cleaned Bailer Lines: New / Cleaned

Method of cleaning Pump / Bailer:

pH Meter No.: 218552 Calibrated 3/7 700 10.01 @ 25°C

Specific Conductance Meter No.: 13749 Calibrated Red lined

Comments:  $TD = 17.79 - 9.97 = 7.82 \times 6.53 = 5.1 \times 4 = 20.4$  gallons / 4 C.V.  
No Measurable FPLH  
80% Recovery = 11.53' from (TBC). #AT Time of Sampling water was Effervescent.

Sampling Measurements Water Level (below MP) at Start: 9.97 End: \_\_\_\_\_  
Measuring Point (MP): Notch on Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1256	3	7.05	20.8	8800	7100	lt blue green	very slight	very lite streak
1258	6	6.99	21.0	8800	7100	"	"	" dry @ 7 gal.
1309	9	6.97	20.8	9200	7100	"	"	"
1310	12	6.96	20.9	8800	7100	"	"	Dry @ 14 gallons
1348	15	6.99	23.7	9600	7100	"	"	
1349	18	6.93	21.6	8800	7100	"	"	
1350	21	6.96	21.4	8800	7100	"	"	
1410	After sampling	6.95	20.9	8800	7100	"	"	

Total Discharge: 21 gallons Casing Volumes Removed: \_\_\_\_\_

Method of disposal of discharged water: 55 gallon Drum

Number and size of sample containers filled: @ 1400 3 VOAS w/ HCL 5000 (DTEX);  
2 Liters N/P MOD. 5015-diesel

sample Duplicate MW-4 @ 1300  
collected by: S. Penman

Woodward-Clyde Consultants  
500 12th Street, Suite 100, Oakland, CA 94607-4014

Sample No.

### WATER SAMPLE LOG

Sample No. MW-2

Project No.: 92CB037 Date: 3-7-94  
 Project Name: CBC-Dublin  
 Sample Location: MW-2  
 Well Description: 4" sch. 40 PVC w/waterfight locking cap in Christy Box  
 Weather Conditions: Clear, Sunny + Hot!  
 Observations / Comments: Need 9/16" wrench + Dolphin key to access well  
Purged w/centrifugal pump.

**Quality Assurance** Sampling Method: Disposable PVC Bailer  
 Method to Measure Water Level: Interface Probe

Pump Lines: New / Cleaned Bailer Lines: New / Cleaned  
 Method of cleaning Pump / Bailer:  
 pH Meter No.: 218552 Calibrated 3/7 7.00 @ 25°C  
 Specific Conductance Meter No.: 13749 Calibrated Red lined  
 Comments: TD = 17.67 - 9.71 = 7.96 x .653 = 5.2 x 4 = 20.8 gallons / 4 C.U.  
No measurable FPLH  
90% Recovery = 11.30

**Sampling Measurements** Water Level (below MP) at Start: 9.71 End: 11.28↑  
 Measuring Point (MP): Notch on Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1301	3	6.93	20.4	11700	40	Cloudy w/gray	None	
1303	6	6.93	20.0	11200	7100	Lightest Brown	"	Dry @ 7 gallons
1312	9	6.89	20.5	12300	7100	"	"	
1313	12	6.92	20.2	11200	7100	"	"	Dry @ 13 gals.
1421	15	6.87	20.8	12800	7100	"	"	
1422	18	6.87	19.9	11800	7100	Cloudy gray	"	
1423	21	6.89	20.1	11200	7100	"	"	Dry @ 21 gals.
1450	After Sampling	6.90	20.5	11200	7100	"	"	

Total Discharge: 21 gallons Casing Volumes Removed: \_\_\_\_\_  
 Method of disposal of discharged water: 55 gallon Drum  
 Number and size of sample containers filled: @ 1445 Jwas w/ #1 8020 (BTEX),  
2 Liters N/P Mod 8015 Diesel

**Woodward-Clyde Consultants**  
 500 12th Street, Suite 100, Oakland, CA 94607-4014

Collected by: S. Donnan J. Huss

Sample No.

### WATER SAMPLE LOG

Sample No. MW-3

Project No : 92CB037 Date: 3-7-94  
 Project Name: CBC Dublin  
 Sample Location: MW-3  
 Well Description: 4" sch 40 PVC w/watertight locking cap inside Christy Box  
 Weather Conditions: Clear, Sunny & Hot!  
 Observations / Comments: Need 9/16" wrench & Dolphin key to access well  
Purged w/ centrifugal pump.

#### Quality Assurance

Sampling Method: Disposable PVC Bailer  
 Method to Measure Water Level: Interface Probe

Pump Lines: (New) / Cleaned Bailer Lines: (New) / Cleaned

Method of cleaning Pump / Bailer:

pH Meter No.: 218552 Calibrated 3/7 7.00 @ 25°C  
10.01

Specific Conductance Meter No.: 13749 Calibrated Red Lined  
4 = 21.2

Comments: TD = 17.67 - 9.53 = 8.14 x .553 = 5.3 x 2 = 10.6 gallons/4cu

NO Measurable FPLH

50% Recovery = 11.16

#### Sampling Measurements

Water Level (below MP) at Start: 9.53 End: 11.05

Measuring Point (MP): Notch on Top of Casing

Time	Discharge (gallons)	pH	Temp. (°C)	Specific Conductance (µmhos / cm)	Turbidity	Color	Odor	Comments
1306	3	7.14	20.4	9600	7100	<del>15</del>	<del>None</del>	
1307	6	7.13	20.4	9500	7100	"	"	Dry @ 7.5 gallons
1316	9	7.09	21.1	9700	7100	"	"	
1317	12	7.10	20.7	8900	7100	"	"	Dry @ 13.5 gallons
1437	15.5	7.05	22.0	9800	7100	"	"	
1438	18.5	7.05	21.7	9600	7100	"	"	
1439	22	7.03	22.7	9800	7100	"	"	Dry @ 22 gallons
1517	Sampling	7.08	20.06	9800	7100	"	"	

Total Discharge: 22 gallons Casing Volumes Removed:

Method of disposal of discharged water: 55 gallon Drum

Number and size of sample containers filled: @ 5/10 3 vials w/ HPL 8020 DTEX,  
2 Liter w/ Mod. 5015 Diesel

EQ. Blank MW-5 @ 1100

Woodward-Civde Consultants

APPENDIX C  
QUALITY ASSURANCE/QUALITY CONTROL REVIEW OF CHEMICAL DATA

---

**APPENDIX C**

**QUALITY ASSURANCE/QUALITY CONTROL REVIEW OF CHEMICAL DATA**

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**C.1 INTRODUCTION**

Water and soil samples collected for this investigation were analyzed by Inchscape Testing Services, Anametrix Laboratory located in San Jose, California. The samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (modified EPA Method 8015), BTEX (EPA Method 8020), and TPH as diesel (modified EPA Method 8015). The analytical results for this project were submitted to a thorough QA/QC review. The review included the following:

- Holding Time Review - Check for exceedences of prescribed holding times.
- Blank Review - Review blank analyses for evidence of potential contaminants.
- Spike Review - Review spike recoveries and spike duplicate relative percent differences as a check for analytical precision and accuracy.
- Duplicate Review - Review duplicate analyses for agreement of results as a check for analytical precision.
- Surrogate Review - Review surrogate recoveries for possible matrix interferences.
- Elevated Detection Limits - Analytical results are reviewed to check for effects of elevated detection limits.

Each of the above QA/QC checks is discussed in detail in this section.

**C.2 HOLDING TIME REVIEW**

Analytical methods used for this study have an associated prescribed holding time, that is the maximum amount of time after collection that a sample may be held prior to extraction

and/or analysis. Sample integrity becomes questionable for samples extracted and/or analyzed outside of the holding times owing to physical and chemical changes to the sample such as degradation or volatilization. Results of such analyses are suspect. The holding times for each of the samples for each of the individual analyses were reviewed. Sample analyses were performed within the prescribed holding times.

### **C.3 BLANK REVIEW**

Blank samples are analyzed in order to check for potential sample contamination. Information regarding the source of contamination may also be gained by analyzing a variety of blanks prepared at several points during sample collection and analysis. The blanks analyzed for this project included the following:

- Method Blanks - Deionized, distilled water that is extracted and analyzed as a sample. Analysis of the method blank indicates potential sources of contamination from laboratory sources (e.g. contaminated reagents, improperly cleaned laboratory equipment, or persistent contamination due to presence of certain compounds in the ambient laboratory air). A method blank was analyzed for each analytical method at least once every day that the method was used.
- Equipment Blanks - A blank that is prepared in the field by pouring distilled water into sampling equipment, then into sample containers. Usually, the equipment blank is submitted to the laboratory 'blind' (under a fictitious location designation). Analysis of the equipment blank indicates potential sources of contamination of samples from improperly cleaned sampling equipment or sample containers or from ambient air contamination. One equipment blank was collected with the groundwater samples. The equipment blank was analyzed for the entire suite of project parameters.
- Trip Blanks - A blank that is prepared by the laboratory by pouring deionized, distilled water into sample containers. The trip blank is shipped to the field with the sample bottles, is taken into the field (but not opened) and is shipped back to the laboratory with the filled sample bottles. Analysis of the trip blank indicates potential sources of contamination of samples from ambient air contamination or

from improperly cleaned sample containers. Trip blanks are typically analyzed for volatile organic compounds only. One trip blank was prepared and transported with water samples collected for this investigation. The trip blank were analyzed for TPH as gasoline/BTEX.

The method blank results were reported as not detected (ND) for each of the analyses. Laboratory conditions are considered acceptable. The equipment blank (fictitious I.D. MW-5) results were ND, with the exception of a low level xylene detection (3.0 µg/L). Xylene was not detected in any of the project samples, thus the xylene detection in the equipment blank does not impact the results. The trip blank results were ND, sample transportation procedures are considered acceptable.

#### **C.4 SPIKE REVIEW**

Spikes are performed in order to evaluate the efficiency of the sample extraction and analysis procedures. Spikes are performed in the form of matrix spikes and reagent spikes. Matrix spikes are necessary as matrix interference (that is, interferences from the sample matrix - water, soil, or other) which may have widely varying impacts on the accuracy and precision of the extraction and analysis. The matrix spike is prepared by the addition of known quantities of target analytes to a sample. The sample is extracted and analyzed. The results of the analysis are compared with the known additions and a matrix spike recovery is calculated. The recovery gives an evaluation of the accuracy of the extraction and analysis procedures. Typically matrix spikes are performed in duplicate in order to also evaluate the precision of the methods. Matrix spike recoveries are reviewed to check that they are within acceptable range. However, the acceptable ranges vary widely according to analytical method and matrix. The reagent spike, sometimes referred to as Laboratory Control Sample (LCS) are necessary to monitor accuracy only. The reagent spike is prepared similarly to the matrix spike, except a control (contaminant free) matrix is used in place of the sample matrix. The recovery of the reagent spike gives an evaluation of laboratory accuracy independent of matrix interferences.

The matrix spike and LCS recovery ranges were within the laboratory established acceptable ranges for each of the analyses. The matrix spike recoveries ranged from 83 and 135 percent

and the LCS recoveries ranged from 71 to 115 percent. Thus, accuracy is considered acceptable and matrix interferences minimal.

### C.5 DUPLICATE ANALYSES

Typically matrix spikes are performed in duplicate and some inorganic analyses are performed in duplicate (i.e. total hardness) in order to also evaluate the precision of the methods using matrix spike duplicate recovery or laboratory duplicate relative percent differences (RPDs) calculated as:

$$RPD = [(Result 1 - Result 2) / (Average of Result 1 and Result 2)] \times 100$$

The reported matrix spike duplicate recovery and laboratory duplicate RPDs were within the laboratory-established acceptable ranges, with the exception of benzene and xylenes in the soil matrix spike samples analyzed on March 4, 1994. The reported RPDs for these compounds (31%) were slightly above the control limit of 30%. No qualification of associated data is required due to this slight exceedence. The RPDs indicate acceptable precision.

Two samples were collected in duplicate. Soil sample SB15.5-6 was collected in duplicate and given the fictitious I.D. SB16-16.5 and groundwater sample MW-1 was collected in duplicate and given the fictitious I.D. MW-4. The soils results did not agree with regard to detected compounds or reported concentrations. The discrepancy in the reported soil concentrations is attributed to contaminant heterogeneity, which is common in soil matrices. The results for soil samples should be considered estimated values, because of the matrix heterogeneity.

The groundwater results were ND for TPHg/BTEX and an RPD of 13 percent was calculated for the TPH as diesel results. Thus, sampling and laboratory precision for groundwater samples are considered acceptable.



## C.6 ELEVATED DETECTION LIMITS

Detection limits for target analytes may sometimes be elevated due to sample size limitations or to dilutions necessary to counter matrix interference effects or to bring target analyte concentrations to within calibration linear range. Results reported as below an elevated detection limit must be noted and interpreted with care. None of the samples for this investigation were run with a dilution, unless a concentration was detected outside of the linear dynamic range of the analysis (i.e. lead). Several soil samples required dilutions due to high target compound detections. The following samples required the following dilutions

<u>Sample I.D.</u>	<u>Analysis</u>	<u>Dilution Factor</u>
MW2 9-9.5	TPHg/BTEX	5
SB1 5.5-6	TPHg/BTEX	25
SB1 6-6.5	TPHg/BTEX	5
SB1 10-10.5	TPHg/BTEX	10
MW1 11.5-12	TPHg/BTEX	25

Each of the samples that required dilutions reported ND's for one or more target compounds with elevated reporting limits. Samples reported as ND with an elevated detection limit should be interpreted with this in mind.

## C.7 SURROGATE RECOVERIES

Surrogates are organic compounds which are similar to the analytes of interest in chemical behavior, but which are not normally found in environmental samples. Surrogates are added to samples to monitor the effect of the matrix on the accuracy of the analysis. Results are reported in terms of percent recovery. The surrogate recoveries for TPH as gasoline and diesel ranged from 49 to 138 percent and were within required limits. Accuracy is considered acceptable and matrix interferences minimal.

## C.8 QA/QC SUMMARY

The data for the investigation have been subjected to an extensive QA/QC review, and has been found to be of satisfactory quality. Holding times were met for all sample analyses. No significant blank contamination was found in the blank analyses. A low level of xylene was detected in the equipment blank. As this compound was detected in the project samples, results were not impacted. Spike recoveries were within acceptable ranges, with the exception of the lead matrix spike recoveries. The other matrix spike and LCS recoveries indicate good analytical accuracy. Matrix spike relative percent differences were within acceptable ranges indicating good analytical precision. The soil blind duplicate results indicate contaminate heterogeneity for soil samples. The groundwater blind duplicate results indicate acceptable sampling and laboratory precision for groundwater samples. Surrogate recoveries were within laboratory established limits.

In summary, the results of the QA/QC review show that the data set is of high quality and has acceptable analytical accuracy and precision.



# Inchcape Testing Services

## Anamatrix Laboratories

1961 Concourse Drive  
 Suite E  
 San Jose, CA 95131  
 Tel: 408-432-8192  
 Fax: 408-432-8198

MAYRA CASTELLANOS  
 WOODWARD-CLYDE CONSULTANTS  
 500 12TH STREET, SUITE 100  
 OAKLAND, CA 94607-4041

Workorder # : 9403032  
 Date Received : 03/02/94  
 Project ID : 92CB037/0010  
 Purchase Order: N/A

The following samples were received at Anamatrix for analysis :

ANAMATRIX ID	CLIENT SAMPLE ID
9403032- 1	MW25-5.5
9403032- 2	MW29-9.5
9403032- 3	MW17-7.5
9403032- 4	MW111.5-12
9403032- 5	MW36-6.5
9403032- 6	MW311-11.5
9403032- 7	SB15.5-6
9403032- 8	SB16-6.5
9403032- 9	SB110-10.5

This report consists of 9 pages not including the cover letter, and is organized in sections according to the specific Anamatrix laboratory group which performed the analysis(es) and generated the data.

The results contained within this report relate to only the sample(s) tested. Additionally, these data should be considered in their entirety and Anamatrix cannot be responsible for the detachment, separation, or otherwise partial use of this report.

Anamatrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234.

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

*Corinne Pham for*  
 \_\_\_\_\_  
 Doug Robbins  
 Laboratory Director

*03/16/94*  
 \_\_\_\_\_  
 Date

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

MAYRA CASTELLANOS  
WOODWARD-CLYDE CONSULTANTS  
500 12TH STREET, SUITE 100  
OAKLAND, CA 94607-4041

Workorder # : 9403032  
Date Received : 03/02/94  
Project ID : 92CB037/0010  
Purchase Order: N/A  
Department : GC  
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9403032- 1	MW25-5.5	SOIL	02/28/94	BTEX
9403032- 2	MW29-9.5	SOIL	02/28/94	BTEX
9403032- 3	MW17-7.5	SOIL	02/28/94	BTEX
9403032- 4	MW111.5-12	SOIL	02/28/94	BTEX
9403032- 5	MW36-6.5	SOIL	03/01/94	BTEX
9403032- 6	MW311-11.5	SOIL	03/01/94	BTEX
9403032- 7	SB15.5-6	SOIL	03/01/94	BTEX
9403032- 8	SB16-6.5	SOIL	03/01/94	BTEX
9403032- 9	SB110-10.5	SOIL	03/01/94	BTEX
9403032- 1	MW25-5.5	SOIL	02/28/94	TPHd
9403032- 2	MW29-9.5	SOIL	02/28/94	TPHd
9403032- 3	MW17-7.5	SOIL	02/28/94	TPHd
9403032- 4	MW111.5-12	SOIL	02/28/94	TPHd
9403032- 5	MW36-6.5	SOIL	03/01/94	TPHd
9403032- 6	MW311-11.5	SOIL	03/01/94	TPHd
9403032- 7	SB15.5-6	SOIL	03/01/94	TPHd
9403032- 8	SB16-6.5	SOIL	03/01/94	TPHd
9403032- 9	SB110-10.5	SOIL	03/01/94	TPHd

Organic Analysis Data Sheet  
 Total Petroleum Hydrocarbons as Gasoline with BTEX  
 ITS - Anametrix Laboratories - (408)432-8192

Lab Workorder : 9403032  
 Matrix : SOIL

Client Project ID : 92CB037/0010  
 Units : mg/Kg

Compound Name	Method Reporting Limit*	Client ID	Client ID	Client ID	Client ID	Client ID
		MW25-5.5	MW29-9.5	MW17-7.5	MW111.5-12	MW36-6.5
		Lab ID	Lab ID	Lab ID	Lab ID	Lab ID
		9403032-01	9403032-02	9403032-03	9403032-04	9403032-05
Benzene	0.0050	ND	ND	ND	ND	ND
Toluene	0.0050	ND	0.11	ND	ND	ND
Ethylbenzene	0.0050	ND	0.18	ND	0.35	ND
Total Xylenes	0.0050	ND	0.67	ND	3.1	ND
TPH as Gasoline	0.50	-	-	-	-	-
Surrogate Recovery		113%	131%	109%	127%	104%
Instrument ID		HP4	HP4	HP4	HP4	HP4
Date Sampled		02/28/94	02/28/94	02/28/94	02/28/94	03/01/94
Date Analyzed		03/04/94	03/04/94	03/04/94	03/04/94	03/04/94
RLMF		1	5	1	25	1
Filename Reference		FPM03201.D	FPM03202.D	FPM03203.D	FPM03204.D	FPM03205.D

\* The Method Reporting Limit must be multiplied by the Reporting Limit Multiplication Factor (RLMF) to achieve the compound's reporting limit in the analysis.

ND : Not detected at or above the reporting limit for the analysis as performed.

TPHg : Determined by GC/FID following sample purge & trap by EPA Method 5030.

BTEX : Determined by modified EPA Method 8020 following sample purge & trap by EPA Method 5030.

Lab Control Limits for surrogate compound p-Bromofluorobenzene are 53-147%.

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

*[Signature]*  
 Analyst

03/14/94  
 Date

*[Signature]* 3/14/94  
 Supervisor Date

Organic Analysis Data Sheet  
 Total Petroleum Hydrocarbons as Gasoline with BTEX  
 ITS - Anametrix Laboratories - (408)432-8192

Lab Workorder : 9403032  
 Matrix : SOIL

Client Project ID : 92CB037/0010  
 Units : mg/Kg

Compound Name	Method Reporting Limit*	Client ID	Client ID	Client ID	Client ID	Client ID
		MW311-11.5	SB15.5-6	SB16-6.5	SB110-10.5	
		Lab ID	Lab ID	Lab ID	Lab ID	Lab ID
		9403032-06	9403032-07	9403032-08	9403032-09	METHOD BLANK
Benzene	0.0050	ND	ND	ND	ND	ND
Toluene	0.0050	ND	ND	0.14	0.18	ND
Ethylbenzene	0.0050	ND	0.027	0.24	0.50	ND
Total Xylenes	0.0050	ND	0.071	0.73	1.4	ND
TPH as Gasoline	0.50	-	-	-	-	-
Surrogate Recovery		104%	114%	123%	122%	99%
Instrument ID		HP4	HP4	HP4	HP4	HP4
Date Sampled		03/01/94	03/01/94	03/01/94	03/01/94	N/A
Date Analyzed		03/04/94	03/04/94	03/04/94	03/04/94	03/04/94
RLMF		1	2.5	5	10	1
Filename Reference		FPM03206.D	FPM03207.D	FPM03208.D	FPM03209.D	BM0401E1.D

\* The Method Reporting Limit must be multiplied by the Reporting Limit Multiplication Factor (RLMF) to achieve the compound's reporting limit in the analysis.

ND : Not detected at or above the reporting limit for the analysis as performed.

TPHg : Determined by GC/FID following sample purge & trap by EPA Method 5030.

BTEX : Determined by modified EPA Method 8020 following sample purge & trap by EPA Method 5030.

Lab Control Limits for surrogate compound p-Bromofluorobenzene are 53-147%.

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

*J. R. Palmer*                      03/14/94  
 Analyst    Date

*Cheryl Palmer*    3/14/94  
 Supervisor    Date

**Matrix Spike Report**  
**Total Petroleum Hydrocarbons as BTEX**  
**ITS - Anametrix Laboratories - (408)432-8192**

Project ID : 92CB037/0010  
Sample ID : MW311-11.5  
Matrix : SOIL  
Date Sampled : 03/01/94

Laboratory ID : 9403032-06  
Analyst : IS  
Supervisor : OS  
Instrument ID : HP4  
Units : mg/Kg

COMPOUND NAME	SPIKE AMOUNT	SAMPLE RESULTS	MS RECOVERY	MSD RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS
Benzene	0.040	ND	83%	113%	45-139	-31%	30
Toluene	0.040	ND	88%	118%	51-138	-29%	30
Ethylbenzene	0.040	ND	90%	120%	48-146	-29%	30
Total Xylenes	0.040	ND	83%	113%	50-139	-31%	30
Surrogate Recovery		104%	105%	103%			
Date Analyzed		03/04/94	03/04/94	03/04/94			
Multiplier		2	2	2			
Filename Reference		FPM03206.D	FMM03206.D	FDM03206.D			

\* Limits established by Incape Testing Services, Anametrix Laboratories.

Laboratory Control Spike Report  
 Total Petroleum Hydrocarbons as BTEX  
 ITS - Anametrix Laboratories - (408)432-8192

Instrument ID : HP4  
 Matrix : SOLID

Analyst : IS  
 Supervisor : ✓  
 Units : mg/Kg

COMPOUND NAME	SPIKE AMOUNT	LCS RECOVERY	RECOVERY LIMITS
Benzene	0.020	100%	52-133
Toluene	0.020	110%	57-136
Ethylbenzene	0.020	115%	56-139
Total Xylenes	0.020	110%	56-141
Surrogate Recovery		117%	53-147
Date Analyzed		03/04/94	
Multiplier		1	
Filename Reference		MM0402E1.D	

\* Limits established by Inchcape Testing Services, Anametrix Laboratories.



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

MAYRA CASTELLANOS  
WOODWARD-CLYDE CONSULTANTS  
500 12TH STREET, SUITE 100  
OAKLAND, CA 94607-4041

Workorder # : 9403032  
Date Received : 03/02/94  
Project ID : 92CB037/0010  
Purchase Order: N/A  
Department : GC  
Sub-Department: TPH

QA/QC SUMMARY :

- The RPD for the BTEX matrix spike and matrix spike duplicate is outside of quality control limits due to a soil matrix effect.

Cheryl Belman 3/14/94  
Department Supervisor Date

JRB Pelen 03/14/94  
Chemist Date



TOTAL EXTRACTABLE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT  
 EPA METHOD 3550 WITH GC/FID  
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE  
 Matrix : SOIL  
 Date Sampled : N/A  
 Date Extracted: 03/07/94  
 Date Analyzed : 03/09/94

Anametrix I.D. : MM07H1F9  
 Analyst : *AF*  
 Supervisor : *CS*  
 Date Released : 03/14/94  
 Instrument I.D.: HP23

COMPOUND	SPIKE AMT (mg/Kg)	REC LCS (mg/Kg)	% REC LCS	% REC LIMITS *
DIESEL	125	110	88%	48-113
SURROGATE			104%	30-130

\* Quality control limits established by Anametrix, Inc.

MATRIX SPIKE RECOVERY FORM -- EPA METHOD TPHd  
 ANAMETRIX, INC. (408)432-8192

Project ID : 276  
 Sample ID : N424  
 Matrix : SOIL  
 Date Sampled : 2/25/94  
 Date Extracted : 3/ 7/94  
 Date Analyzed : 3/ 7/94  
 Instrument ID : HP9

Anamatrix ID : 9402270-06  
 Analyst : *AF*  
 Supervisor : *CS*

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	%REC LIMITS
DIESEL	147059.	0.	112445.	76	50-150

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	% RPD	RPD LIMITS	%REC LIMITS
DIESEL	147059.	113769.	77	1	50	50-150

\* Value is outside of Anamatrix QC limits

RPD: 0 out of 1 outside limits  
 Spike Recovery: 0 out of 2 outside limits

# 1401

9403032 (2)

### Woodward-Clyde Consultants

500 12th Street, Suite 100, Oakland, CA 94607-4014  
(510) 893-3600

### Chain of Custody Record

PROJECT NO. *CBC Dublin*  
*92CB057/0010*

SAMPLERS: (Signature)  
*Marshall Condit*

#### ANALYSES

DATE 1994	TIME	SAMPLE NUMBER	Sample Matrix (Soil, Water, Air)	ANALYSES				Number of Containers
				EPA Method 8015 (dism)	EPA Method 8020 (Pb, Cr)	EPA Method	EPA Method	
① 2/23	1035	MW-2 (5'-5.5')	S	X	X			1
② 2/23	1055	MW-2 (9'-9.5')	S	X	X			1
③ 2/28	1350	MW-1 (7'-7.5')	S	X	X			1
④ 2/28	1405	MW-1 (11.5'-12')	S	X	X			1
⑤ 3/1	0900	MW-3 (6'-6.5')	S	X	X			1
⑥ 3/1	0953	MW-3 (11'-11.5')	S	X	X			1
⑦ 3/1	1020	SB-1 (5.5'-6.0')	S	X	X			1
⑧ 3/1	1025	SB-1 (6.0'-6.5')	S	X	X			1
⑨ 3/1	1030	SB-1 (10'-10.5')	S	X	X			1

All SAMPLES WERE STORED AND SHIPPED in a cooler containing ICE.

TOTAL NUMBER OF CONTAINERS **9**

RELINQUISHED BY: (Signature)  
*Marsha Condit*

DATE/TIME  
*3/1/94 0735*

RECEIVED BY: (Signature)  
*Tommy Condit*

RELINQUISHED BY: (Signature)  
*Tommy Condit*

DATE/TIME  
*3/1/94 1350*

RECEIVED BY: (Signature)  
\_\_\_\_\_

METHOD OF SHIPMENT:  
*Courier - Anametric*

SHIPPED BY: (Signature)  
\_\_\_\_\_

COURIER: (Signature)  
\_\_\_\_\_

RECEIVED FOR LAB BY: (Signature)  
*W. B.*

DATE/TIME  
*3/1/94 1350*

15:00 '96



# Inchcape Testing Services

## Anamatrix Laboratories

1961 Concourse Drive  
 Suite E  
 San Jose, CA 95131  
 Tel: 408-432-8192  
 Fax: 408-432-8198

RECEIVED

MS. JO BETH FOLGER  
 WOODWARD-CLYDE CONSULTANTS  
 500 12TH STREET, SUITE 100  
 OAKLAND, CA 94607-4041

MAR 23 1994

ACCOUNTING

Workorder # : 9403129  
 Date Received : 03/08/94  
 Project ID : 92CB037  
 Purchase Order: N/A

The following samples were received at Anamatrix for analysis :

ANAMATRIX ID	CLIENT SAMPLE ID
9403129- 1	T. BLANK
9403129- 2	MW-5
9403129- 3	MW-4
9403129- 4	MW-1
9403129- 5	MW-2
9403129- 6	MW-3

This report consists of 7 pages not including the cover letter, and is organized in sections according to the specific Anamatrix laboratory group which performed the analysis(es) and generated the data.

The results contained within this report relate to only the sample(s) tested. Additionally, these data should be considered in their entirety and Anamatrix cannot be responsible for the detachment, separation, or otherwise partial use of this report.

Anamatrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234.

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

*Douglas Robbins*  
 \_\_\_\_\_  
 Doug Robbins  
 Laboratory Director

03/18/94  
 \_\_\_\_\_  
 Date

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

MS. JO BETH FOLGER  
WOODWARD-CLYDE CONSULTANTS  
500 12TH STREET, SUITE 100  
OAKLAND, CA 94607-4041

Workorder # : 9403129  
Date Received : 03/08/94  
Project ID : 92CB037  
Purchase Order: N/A  
Department : GC  
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9403129- 1	T. BLANK	WATER	03/07/94	BTEX
9403129- 2	MW-5	WATER	03/07/94	BTEX
9403129- 3	MW-4	WATER	03/07/94	BTEX
9403129- 4	MW-1	WATER	03/07/94	BTEX
9403129- 5	MW-2	WATER	03/07/94	BTEX
9403129- 6	MW-3	WATER	03/07/94	BTEX
9403129- 2	MW-5	WATER	03/07/94	TPHd
9403129- 3	MW-4	WATER	03/07/94	TPHd
9403129- 4	MW-1	WATER	03/07/94	TPHd
9403129- 5	MW-2	WATER	03/07/94	TPHd
9403129- 6	MW-3	WATER	03/07/94	TPHd

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

MS. JO BETH FOLGER  
WOODWARD-CLYDE CONSULTANTS  
500 12TH STREET, SUITE 100  
OAKLAND, CA 94607-4041

Workorder # : 9403129  
Date Received : 03/08/94  
Project ID : 92CB037  
Purchase Order: N/A  
Department : GC  
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Cheryl Bolmer 3/10/94  
Department Supervisor Date

Ernest Patel 03/16/94  
Chemist Date



Organic Analysis Data Sheet  
 Total Petroleum Hydrocarbons as Gasoline with BTEX  
 ITS - Anametrix Laboratories - (408)432-8192

Lab Workorder : 9403129

Client Project ID : 92CB037

Matrix : WATER

Units : ug/L

Compound Name	Method Reporting Limit*	Client ID	Client ID	Client ID	Client ID	Client ID
		T. BLANK	MW-5	MW-4	MW-1	MW-2
		Lab ID	Lab ID	Lab ID	Lab ID	Lab ID
		9403129-01	9403129-02	9403129-03	9403129-04	9403129-05
Benzene	0.50	ND	ND	ND	ND	ND
Toluene	0.50	ND	ND	ND	ND	ND
Ethylbenzene	0.50	ND	ND	ND	ND	ND
Total Xylenes	0.50	ND	3.0	ND	ND	ND
TPH as Gasoline	50	-	-	-	-	-
Surrogate Recovery		111%	103%	109%	115%	138%
Instrument ID		HP12	HP12	HP12	HP12	HP12
Date Sampled		03/07/94	03/07/94	03/07/94	03/07/94	03/07/94
Date Analyzed		03/13/94	03/13/94	03/13/94	03/13/94	03/13/94
RLMF		1	1	1	1	1
Filename Reference		FPM12901.D	FPM12902.D	FPM12903.D	FPM12904.D	FPM12905.D

\* The Method Reporting Limit must be multiplied by the Reporting Limit Multiplication Factor (RLMF) to achieve the compound's reporting limit in the analysis.

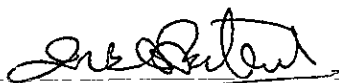
ND : Not detected at or above the reporting limit for the analysis as performed.

TPHg : Determined by GC/FID following sample purge & trap by EPA Method 5030.

BTEX : Determined by modified EPA Method 8020 following sample purge & trap by EPA Method 5030.

Lab Control Limits for surrogate compound p-Bromofluorobenzene are 61-139%.

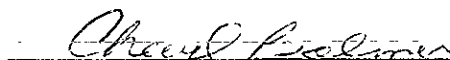
All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.



03/16/94

Analyst

Date



3/16/94

Supervisor

Date

Organic Analysis Data Sheet  
 Total Petroleum Hydrocarbons as Gasoline with BTEX  
 ITS - Anametrix Laboratories - (408)432-8192

Lab Workorder : 9403129  
 Matrix : WATER

Client Project ID : 92CB037  
 Units : ug/L

Compound Name	Method Reporting Limit*	Client ID	Client ID	Client ID	Client ID	Client ID
		MW-3	Lab ID	Lab ID	Lab ID	Lab ID
		9403129-06	METHOD BLANK			
Benzene	0.50	ND	ND			
Toluene	0.50	ND	ND			
Ethylbenzene	0.50	ND	ND			
Total Xylenes	0.50	ND	ND			
TPH as Gasoline	50	-	-			
Surrogate Recovery		127%	106%			
Instrument ID		HP12	HP12			
Date Sampled		03/07/94	N/A			
Date Analyzed		03/13/94	03/13/94			
RLMF		1	1			
Filename Reference		FPM12906.D	BM1301E1.D			

\* The Method Reporting Limit must be multiplied by the Reporting Limit Multiplication Factor (RLMF) to achieve the compound's reporting limit in the analysis.

ND : Not detected at or above the reporting limit for the analysis as performed.  
 TPHg : Determined by GC/FID following sample purge & trap by EPA Method 5030.  
 BTEX : Determined by modified EPA Method 8020 following sample purge & trap by EPA Method 5030.

Lab Control Limits for surrogate compound p-Bromofluorobenzene are 61-139%.

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

*JRB*

Analyst

03/16/94

Date

*Christy Balmer*

Supervisor

3/16/94

Date

**Laboratory Control Spike Report**  
**Total Petroleum Hydrocarbons as BTEX**  
**ITS - Anamatrix Laboratories - (408)432-8192**

Instrument ID : HP12  
 Matrix : LIQUID

Analyst : *pk*  
 Supervisor : *os*  
 Units : ug/L

COMPOUND NAME	SPIKE AMOUNT	LCS RECOVERY	RECOVERY LIMITS
Benzene	20	95%	52-133
Toluene	20	105%	57-136
Ethylbenzene	20	110%	56-139
Total Xylenes	20	110%	56-141
Surrogate Recovery		107%	61-139
Date Analyzed		03/13/94	
Multiplier		1	
Filename Reference		MM1301E1.D	

\* Limits established by Inhccape Testing Services, Anamatrix Laboratories.

**Matrix Spike Report**  
**Total Petroleum Hydrocarbons as BTEX**  
**ITS - Anamatrix Laboratories - (408)432-8192**

Project ID : N/A  
 Sample ID : N/A  
 Matrix : WATER  
 Date Sampled : 03/03/94

Laboratory ID : 9403104-06  
 Analyst : pcc  
 Supervisor : *CS*  
 Instrument ID : HP12  
 Units : ug/L

COMPOUND NAME	SPIKE AMOUNT	SAMPLE RESULTS	MS RECOVERY	MSD RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS
Benzene	20	ND	90%	85%	45-139	6%	30
Toluene	20	ND	110%	105%	51-138	5%	30
Ethylbenzene	20	3.1	135%	135%	48-146	0%	30
Total Xylenes	20	ND	120%	125%	50-139	-4%	30
Surrogate Recovery		131%	135%	126%			
Date Analyzed		03/13/94	03/13/94	03/13/94			
Multiplier		1	1	1			
Filename Reference		FPM10406.D	FMM10406.D	FDM10406.D			

\* Limits established by Incheape Testing Services, Anamatrix Laboratories.

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS AS DIESEL  
ANAMETRIX, INC. (408) 432-8192

Anametrix W.O.: 9403129  
Matrix : WATER  
Date Sampled : 03/07/94  
Date Extracted: 03/11/94

Project Number : 92CB037  
Date Released : 03/16/94  
Instrument I.D.: HP23

Anametrix I.D.	Client I.D.	Date Analyzed	Reporting Limit (ug/L)	Amount Found (ug/L)	Surrogate %Rec
9403129-02	MW-5	03/12/94	50	ND	75%
9403129-03	MW-4	03/12/94	50	230	77%
9403129-04	MW-1	03/12/94	50	210	79%
9403129-05	MW-2	03/12/94	50	240	73%
9403129-06	MW-3	03/12/94	50	ND	63%
BM1111F9	METHOD BLANK	03/11/94	50	ND	49%

Note : Reporting limit is obtained by multiplying the dilution factor times 50 ug/L.  
The surrogate recovery limits for C25 are 30-130%.

ND - Not detected at or above the practical quantitation limit for the method.

TPHd - Total Petroleum Hydrocarbons as C10-C28 is determined by GCFID following sample extraction by EPA Method 3510.

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

*[Signature]* 03/16/94.  
Analyst Date

*[Signature]* 3/16/94  
Supervisor Date

TOTAL EXTRACTABLE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT  
 EPA METHOD 3510 WITH GC/FID  
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE  
 Matrix : WATER  
 Date Sampled : N/A  
 Date Extracted: 03/11/94  
 Date Analyzed : 03/12/94

Anamatrix I.D. : MM1111F9  
 Analyst : *AL*  
 Supervisor : *CS*  
 Date Released : 03/16/94  
 Instrument I.D.: HP23

COMPOUND	SPIKE AMT (ug/L)	LCS REC (ug/L)	% REC LCS	LCSD REC (ug/L)	% REC LCSD	RPD	% REC LIMITS
DIESEL	1250	890	71%	940	75%	5%	47-130
SURROGATE			47%		51%		30-130

\* Quality control limits established by Anamatrix, Inc.

