ENVIRONMENTAL ENGINEERING, INC
2680 Bishop Drive, Suite 203, San Ramon, CA 94583
TEL (925) 244-6600 • FAX (925) 244-6601

August 31, 2000

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Mr. Barney M. Chan
Alameda County
Department of Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Claim No. 7912
Site Address: 3609 International Blvd., Oakland, California

Dear Mr. Chan:

A copy of SOMA's "Third Quarter 2000 Groundwater Monitoring Report" for the subject property is enclosed.

Thank you for your time in reviewing our report. If you have any questions or comments, please call me at (925) 244-6600.

Sincerely,

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

MS/jb

Enclosure

cc: Mr. Abolghassem Razi w/enclosure
Tony's Express Auto Service

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1.0 INTRODUCTION

This report presents the results of the third quarter 2000 groundwater monitoring activities conducted by SOMA Environmental Engineering, Inc. (SOMA) on behalf of Mr. Abolghassem Razi, the property owner. The report also includes the status of the pump and treat system (PATS) and vapor extraction system (VES) installed by SOMA in December 1999 and July 2000, respectively. The project site is Tony's Express Auto Service, located at 3609 International Boulevard, Oakland, California (the "Site"), see Figure-1.

The Site is located at the intersection of 36th Avenue and International Boulevard (formerly known as East 14th Street), Oakland, California, see Figure-1. It is currently used as a gasoline service station and mechanic shop. The Site is relatively flat, and the surrounding properties are primarily commercial businesses and residential housing. Figure-2 shows the location of the main building, fuel tank areas, and on-site and off-site groundwater monitoring wells. Currently, the groundwater monitoring wells are being monitored on a quarterly basis. The results of the groundwater monitoring programs have indicated elevated levels of petroleum hydrocarbons in the groundwater beneath the Site. The source of petroleum hydrocarbons in the groundwater is believed to be the former underground storage tanks (USTs), which were used to store gasoline at the Site. This report includes the results of historical groundwater monitoring events, as well as the results of the third quarter 2000 groundwater monitoring event.

Based on the property owner's request, the recent groundwater-monitoring event was conducted by SOMA in response to Alameda County Environmental Health Services (ACEHS) requirements.

1.1 BACKGROUND

Currently, the Site is used as a gasoline service station. The environmental investigation at the subject property started since 1992, when Mr. Razi, the property owner retained Soil Tech Engineering, Inc. (STE) of San Jose to conduct a limited subsurface investigation. The purpose of STE's investigation was to determine whether or not the soil near the product lines and underground storage tanks (USTs) have been impacted with petroleum hydrocarbons.

In July 1993, STE removed one single-walled 10,000-gallon gasoline tank and one single-walled 6,000-gallon gasoline tank along with a 550-gallon waste oil tank from the Site. Three double-walled USTs replaced these tanks. Currently, there are one-10,000 gallon double-walled gasoline tank and two-6,000 gallon double-walled gasoline tanks beneath the Site (Figure 2).

In December 1997, Mr. Razi retained Western Geo-Engineers (WEGE) to conduct additional investigation and perform groundwater monitoring on a quarterly basis. The results of WEGE groundwater monitoring events indicated elevated levels of petroleum hydrocarbons and methyl tertiary butyl ether (MTBE) in the groundwater. The historical groundwater elevation data, total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethlybenzene, xylenes, (BTEX) and MTBE concentrations reported by STE and WEGE are included in Table-2 and Table-5.

In April 1999, Mr. Razi retained SOMA to conduct groundwater monitoring, risk based corrective action (RBCA), corrective action plan (CAP) and soil and groundwater remediation at the Site. The results of the RBCA study indicated that the site is a high risk area, therefore, the soil and groundwater in on-and off-site areas need to be remediated. The results of the CAP study indicated that installation of a French drain along with air sparging technique is a cost effective alternative for site remediation.

In late August 1999, SOMA installed a French drain and initiated a groundwater treatment system to prevent further migration of chemically impacted groundwater. Currently, this treatment system has been in operation since early December 1999.

In July 2000, SOMA installed a vapor extraction system based on the recommendation of the Corrective Action Plan (CAP) document dated July 1, 1999 prepared by SOMA, followed by approval from the Alameda County Department of Environmental Health.

1.2 SITE HYDROGEOLOGY

Based on the results of previous investigations, groundwater is encountered at depths ranging between 10 and 11 feet beneath the Site. Figure-2 shows the location of on-site and off-site groundwater monitoring wells. Prior to the operation of the French drain, groundwater flow was found to be from the north to the south with an average gradient of 0.014 ft/ft. As shown in Figure-3, the groundwater now flows from all directions toward the French drain. As it shows, the capture zone of the drain has extended down gradient to well MW-10.

Based on the results of a pumping test conducted by SOMA, hydraulic conductivity of the saturated sediments ranges between 1.5 and 18.3 feet per day. Assuming the effective porosity of saturated sediments to be 0.35, the groundwater flow velocity ranges between 22 feet and 267 feet per year.

2.0 FIELD ACTIVITIES

Field activities were performed in accordance with the procedures and guidelines of the California Regional Water Quality Control Board, San Francisco Bay

Region.

On August 9, 2000, the SOMA field crew measured depth to groundwater in the monitoring wells from the top of casings to the nearest 0.01 foot using an electrical sounder. The depth to groundwater and top of casing elevation data at each groundwater monitoring well were used to calculate the groundwater elevation. A total of 11 groundwater monitoring wells and three risers of the French drain were monitored during this event. Table-1 presents the groundwater elevations and Appendix A presents a summary of field notes for each groundwater monitoring well and the French drain risers.

Before sample collection, each well was purged at least three casing volumes while field readings of pH and temperature were recorded. Each groundwater monitoring well was purged using a 2-inch diameter submersible pump, model ES-60 DC. Groundwater samples were collected using disposable bailers. Each groundwater sample was transferred into two 40-ml VOA vials and sealed properly to prevent developing any air bubbles within the headspace area. The vials were placed in an ice chest and delivered to Delta Environmental Laboratories, of Benicia, California for analysis. For field measurements a sufficient sample was transferred into a 500-ml polyethylene container.

The groundwater samples that were kept in polyethylene bottles were immediately used for on-site measurements of ferrous iron ($Fe+^{2}$), nitrate-N (NO_3^--N), sulfate (SO_4^{-2}), pH, and electrical conductivity (EC).

The D.O. and temperature were measured with a dissolved oxygen meter, YSI Model 50B (YSI Incorporated, Yellow Springs, Ohio 45387 USA), see Appendix A for the result of field measurements. The instrument was calibrated at the Site according to a procedure provided by the manufacturer and prescribed by Taras *et.al.* (1975). Detail of the calibration and measurement procedures can be

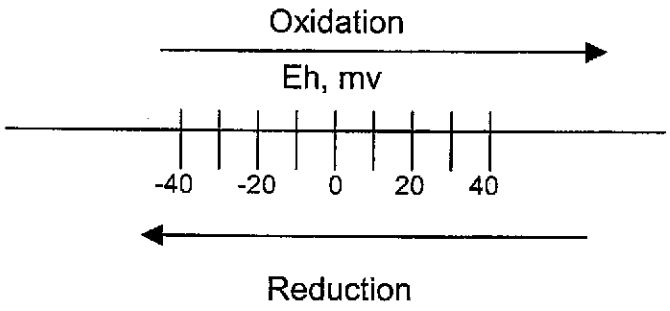
found in the instrument's handbook. The measurements were corrected for barometric pressure, temperature and salinity using correction factors provided by the user's manual, see Appendix A.

In order to avoid the intrusion of oxygen in ambient air to groundwater samples, the D.O. and temperature measurements were conducted in situ (down-hole inside each monitoring well).

Turbidity was measured with HANNA Instruments (HI) Model 93703 portable turbidity meter. The HI 93703 portable microprocessor-based turbidity meter provides lab-grade accuracy even in the field. The unit of measure adopted by the ISO Standard is the FTU (Formazine Turbidity Unit), which is identical to NTU (Nephelometric Turbidity Unit). The instrument was calibrated at two points, 0 FTU and 10 FTU. Two calibration solutions of primary standard AMCO-AEPA-1 at 0 FTU and 10 FTU are supplied with the meter. Suspended materials cause the cloudy appearance of water or turbidity. Turbidity is one of the most important parameters used to determine the quality of drinking water. It has been found that there is a strong correlation between the turbidity level and the Biological Oxygen Demand of the natural water bodies. Turbidity is an indicator and will not reveal the presence of a specific pollutant in groundwater. It will however, provide general information on the extent of the suspended solids in groundwater.

Oxidation-Reduction Potential of groundwater samples was measured using HANNA's ORP electrode. Oxidation is a process in which a molecule or ion loses one or several electrons. Reduction is a process by which electrons are gained. A measure of the potential for these processes to occur is called Oxidation Reduction Potential or Eh. The unit of Eh is volt or m-volt and is commonly referred as the redox potential. The most important redox reaction in petroleum contaminated groundwater is the oxidation of petroleum hydrocarbons in the presence of bacteria and free molecular oxygen. Because the solubility of O_2 in

water is low (9 mg/L at 25 °C and 11 mg/L at 5 °C), and because O_2 replenishment in subsurface environments is limited, oxidation of only a small amount of petroleum hydrocarbons can result in consumption of all the dissolved oxygen. When all the dissolved O_2 in groundwater is consumed, oxidation of petroleum hydrocarbons can still occur, but the oxidizing agents (i.e., constituents that undergo reduction) are NO^-_3, MnO_2, $Fe(OH)_3$, SO_4^{2-} and others (Freeze and Cherry, 1979). As these oxidizing agents are consumed, the groundwater environment becomes more and more reduced. If the process proceeds far enough, the environment may become very strong reduced in that the petroleum hydrocarbons may undergo anaerobic degradation and production of methane and carbon dioxide. The concept of oxidation and reduction in terms of changes in oxidation states is illustrated below.



Fe^{+2}, NO^-_3-N and SO_4^{-2} were measured colorimetrically using the Hach Model DR/850 colorimeter (Hach Company World Headquarters, P.O. Box 389, Loveland, Colorado 80539-0389). The Hach DR/800 Series Colorimeter is a microprocessor-controlled photometer suitable for colorimetric testing in the laboratory or the field. The required reagents for each specific test are provided in AccuVac ampuls.

Fe^{+2} was measured colorimetrically using Method 8146 (1,10-phenanthroline Method). The 1,10-phenathroline indicator in Ferrous Iron Reagent reacts with Fe^{+2} in the sample to form an orange color. The intensity of orange color is proportional to the iron concentration.

SO_4^{-2} was measured colorimetrically using Method 8051 of Sulfa Ver 4 Method. Sulfate ions in the sample react with Sulfa Ver 4 Sulfate Reagent to form insoluble barium sulfate. The amount of turbidity formed is proportional to the sulfate concentration. The Sulfa Ver 4 also contains a stabilizing agent to hold the barium sulfate in suspension.

NO^-_3-N was measured colorimetrically using Method 8039 or Cadmium Reduction Method. Cadmium metal in the Nitra Ver 5 Nitrate Reagent reduces nitrates present in the sample to nitrite the nitrite ion reacts in an acidic medium with sulfanilic acid to form an intermediate diazonium salt which couples to getistic acid to form an amber-colored product. The intensity of the color is proportional to nitrate-N concentration in the sample.

Electrical conductivity, pH were measured with Hydac Model 910 pH meter. The instrument was calibrated for conductance with a standard solution of known concentration (12,000 us/cm) and for pH with 4, 7 and 10 pH units buffer solutions. All measurements were performed according to the instruction manual provided by the manufacturer.

2.1 LABORATORY ANALYSIS

Delta Environmental Laboratories, analyzed the groundwater samples. The measured constituents included TPH –g, BTEX and MTBE.

TPH-g was measured using EPA Method 5030/GCFID. EPA Method 8020 was used to measure BTEX. MTBE levels in the groundwater were measured using EPA Method 8020 and confirmed using EPA Method 8260. The results are presented in Table-4. As discussed, the groundwater parameters in connection with bio-degradation activities such as dissolved oxygen, redox potential,

turbidity, nitrate, sulfate and ferrous iron were analyzed in the field by SOMA's field staff.

3.0 RESULTS

Table-1 presents the measured groundwater elevations at different groundwater monitoring wells and the center riser of the French drain. At each location, depth to watertable and the elevation of the top of casing were used to calculate the watertable elevation relative to the assumed datum.

Depths to watertable in different monitoring wells and the center riser of the French drain ranged between 11.52 and 15.7 feet. Watertable elevations ranged between 81.4 and 85.82 feet. A groundwater elevation contour map is displayed in Figure-3. Figure 3 shows the impact of the French drain operation on the water level elevations of the surrounding monitoring wells. On the Site, during the recent monitoring event the groundwater flow was found to be from the north towards the south. This is consistent with the findings of the previous monitoring events that were conducted prior to the installation of the French drain. However, on the off-site properties south of the Site, the groundwater flow has been reversed by the effects of the French drain and is now flowing from the south towards the north. As Figure 3 shows, the capture zone of the French drain has been extended as far as well MW-10, which is located about 170 feet downgradient of the center riser of the French drain.

The historical static water level elevations measured at different monitoring wells and the center riser of the French drain are presented in Table 2. During the recent monitoring event, in comparison with the previous monitoring event, the water level elevations decreased in the range of 0.1 feet to 5.22 feet. The drop in the elevations is mainly due to a lack of precipitation and the operation of the French drain. Historically no floating products have been reported in any of the

on-or-off site monitoring.

The results of field measurements of some physical and chemical parameters of the groundwater samples are presented in the field notes and summarized in Table-3. Temperature ranged between 19.2 ^{0}C and 20.8 ^{0}C. The variation in temperature may reflect the changes in air temperature during sampling, see field notes in Appendix A. Temperature measurements allowed us to make corrections to pH and EC measurements using a Manual Temperature Compensation procedure described in the Hydac Model 910 pH meter manual. D.O. measurements were also corrected automatically for the recorded temperatures, see Appendix A.

Dissolved oxygen concentration in the groundwater samples ranged between 0.26 mg/L at MW-7 and 1.97 mg/L in MW-5. The low oxygen content may suggest an anaerobic biodegradation process in this groundwater system. Figure-4 shows the contour map of D.O. concentrations in the groundwater. The dissolved oxygen measurement was conducted down-hole (in-situ) after purging the wells.

Turbidity of the groundwater samples ranged between 42 FTU and 1000 FTU. The maximum turbidity was recorded in monitoring wells MW-2 and MW-6.

Redox potential in the groundwater samples ranged between -91 mv in well MW-8 and +80 mv in Well MW-5. Monitoring wells MW-5, MW-10 and MW-11 showed an oxidation condition and the remainder of the wells showed strong reduced conditions. A low oxygen level in well MW-10 in combination with the positive redox potential is an indication of a weak aerobic oxidation of the petroleum hydrocarbons in this well. However, all other monitoring wells impacted by petroleum are showing strong reduced conditions. In these oxygen depleted environment anaerobic processes utilizing alternate electron acceptors for

Reduction
gain 2é
MnO_2 → Mn^{+2}
+4

$SO_4 \rightarrow SO_2$
$Fe^{+3} \rightarrow Fe^{+2}$

lose O_2

oxidation of petroleum hydrocarbons, may be responsible for strong reduced conditions. Possible alternate electron acceptors include nitrate, iron (III) and sulfate (Lovley *et. al.*, 1994). Under strong reduced conditions and a lack of other terminal electron acceptors, the occurrence of methanogenesis and production of methane gas is highly possible.

During this monitoring event, nitrate was detected in wells MW-2, MW-4, MW-6 and MW-11. As discussed earlier, the concentrations of dissolved oxygen in all wells are significantly low, and because replenishment of oxygen in subsurface environments is limited, oxidation of only a small amount of petroleum hydrocarbons depletes the oxygen. Under this condition, oxidation of petroleum hydrocarbons can still occur, but the oxidizing agents (i.e., constituents that undergo reduction) are NO^-_3, MnO_2, $Fe(OH)_3$, SO_4^{2-} and others (Lovley *et. al.*, 1994). Disappearance of nitrate in most of the wells may suggest that, under the observed anaerobic condition, nitrate may have been used as a source of terminal electron acceptor by microorganisms (Lovley *et. al.*, 1994). Figure-5 shows the contour map of nitrate concentration in the groundwater.

Sulfate concentrations ranged between non-detectable in wells MW-1, MW-2 MW-3, MW-6, MW-10, MW-11 and MW-12 and 26 mg/L in well MW-5. Sulfate depleted subsurface contaminated environment may reveal a strong demand by microorganisms for a source of terminal electron acceptor for oxidizing contaminant hydrocarbons (Lovley *et. al.*, 1994). Figure-6 shows the groundwater sulfate concentration measured on August 9, 2000.

Ferrous iron concentration in the groundwater samples ranged between 0.0 mg/L and 6.1 mg/L. High concentrations of ferrous iron in the groundwater is a good indication of biological activities. Figure-7 shows the groundwater ferrous iron concentration measured on August 9, 2000. The presence of higher ferrous iron and absence/lack of electron receptors such as nitrogen, sulfate and dissolved

oxygen is indicative of anaerobic biodegradation beneath the Site. Due to the presence of low levels of dissolved oxygen, as well as the nutrients such as nitrates and sulfate, generation of methane gas from petroleum hydrocarbons seems likely.

The pH measurements ranged between 6.95 and 7.25 pH units. Electrical conductivity ranged between 370 µs/cm and 569 µs/cm. The unit of electrical conductivity is Siemens (s) or micro-Siemens (µs) in the SI system. In the past, these units have been known as millimhos and micromhos.

The results of chemical analyses are shown in Table 4. The concentrations of TPH-g were below the detection limit of 50 µg/L in monitoring wells MW-2 and MW-5 and peaked at 76,000 µg/L in monitoring well MW-3. Benzene concentrations were below the detection limit of 5 µg/L in three monitoring wells MW-2, MW-5 and MW-7 and peaked at 8,900 µg/L in MW-3. TPH-g and benzene concentration contours in the groundwater have been shown in Figures 8 and 9, respectively. MTBE concentrations were below the detection limit of 5 µg/L in five monitoring wells MW-2, MW-4, MW-5, MW-6, MW-5 and MW-11 and peaked at 1283 µg/L in MW-10. MTBE concentrations contour map in the groundwater has been shown in Figure-10.

The historical data of groundwater contamination is presented in Table 5. Generally, chemical concentrations showed a decreasing pattern during the recent groundwater monitoring event in most of the wells. However, TPHg concentrations increased in four monitoring wells MW-3, MW-6, MW-10 and MW-11. While benzene concentrations slightly increased in only monitoring well MW-1. MTBE concentrations also slightly increased in two monitoring wells MW-1 and MW-3 but almost doubled in MW-10. This is the ninth consecutive monitoring event that MW-10 showing elevated concentrations of MTBE. The results of this monitoring event confirmed the findings of the previous monitoring event that

petroleum hydrocarbons are showing a decreasing trend in well MW-12 that is located at BART property south of the Site. This decrease is concentrations in MW-12 is mainly due to the operation of the French Drain. It is expected that due to biodegradation activities the concentration of contaminants in MW-12 will drop gradually to non-detectable levels.

4.0 TREATMENT SYSTEM OPERATION

The operation of the treatment system was started on December 9, 1999. Since then, more than 778,000 gallons (recording date is August 24, 2000) of groundwater has been treated and discharged to the East Bay Municipal Utility District (EBMUD) under the existing discharge permit.

As required by the discharge permit and the ACEHS, sampling has been performed on a routine basis. The effluent sampling and maintenance of the system have been performed on a weekly basis from the start of the system to the end of July. From August onward maintenance of the system continued weekly but sampling was performed on monthly basis. The result of the first effluent testing was used to acquire a discharge permit from EBMUD.

Table 6 presents the total volume and chemical composition of the effluent treated at the Site. Table 6 shows that all effluent samples during discharge have maintained compliance with the permit, having values below the level of detection limit. Approximately, 7,000 gallons of chemically impacted groundwater per week was treated during the third quarter of 2000 by the treatment system. As discussed in the previous monitoring reports, the effluent passing both GAC units is regularly being collected for chemical analysis. The schedule for re-furbishing the GAC units is based on the analytical results of the effluent samples. The first GAC unit was re-furbished as soon as the traces of chemicals broke through the unit. The second GAC unit is serving as a polishing

unit and is always kept highly active. This procedure ensures that the effluent discharging to EBMUD has non-detectable levels of contaminants.

As Figure 11 shows, a total of 62 pounds TPHg and 3.5 pounds MTBE have been removed during the operation of the treatment system.

5.0 Vapor Extraction System Operation

The system is consisted of 6 vapor extraction wells, a de-moisturizing unit, a blower and four drums of Granulated Active Carbon (GAC) filters. The operation of the Vapor Extraction System (VES) was started on July 24, 2000. Since then, more than 3,000,000 liters/day of soil gas has been extracted from the vadose zone and refined with GAC filters before being discharged into the atmosphere. At the beginning, the influent had a concentration of 394 ppmv petroleum hydrocarbons, but gradually dropped and after 31 days of operation reached to 68 ppmv. During the operation period, a total of 72 pounds of petroleum hydrocarbons have been removed. Based on the requirements of the Bay Area Air Quality Management District (BAAQMD) permit, the frequency of monitoring and GAC unit replacement, were scheduled in a way to keep the concentration of the hydrocarbons in the exhaust air below 10 ppmv.

6.0 CONCLUSIONS

The results of the August 9, 2000 groundwater monitoring event are summarized as follows:

1. The groundwater flow direction was found to be from the north towards the south, which is consistent with the findings of the previous monitoring events. However, on the off-site properties south of the Site, the groundwater flow has been reversed by the effects of the French drain and is now flowing from

the south towards the north.

2. In comparison with the previous monitoring event, the water level elevations decreased in the range of 0.1 feet to 2.19 feet. This is mainly due to a lack of precipitation and the operation of the French drain.
3. Benzene concentrations ranged between non-detectable (less than 5 µg/L) in MW-2, MW-5 and MW-7 and 8,900 µg/L in MW-3.
4. MTBE concentrations were below the detection limit of 5 µg/L in wells MW-1, MW-2, MW-4, MW-5, MW-6 and MW-11 and peaked at 1,283 µg/L in MW-10.
5. The concentrations of TPH-g were below the detection limit of 50 µg/L in monitoring wells MW-2 and MW-5 and peaked at 76,000 µg/L in monitoring well MW-3.
6. The results of the ~~resent~~ recent monitoring event confirmed the findings of the previous monitoring event that petroleum hydrocarbons are showing a decreasing trend in well MW-12 that is located at BART property south of the Site.
7. Due to the presence of low levels of dissolved oxygen, as well as the nutrients such as nitrates and sulfate, generation of methane gas from petroleum hydrocarbon seems likely.
8. So far, more than 778,000 gallons (recording date is August 24, 2000) of groundwater has been treated and discharged to the East Bay Municipal Utility District (EBMUD) under the existing discharge permit.
9. All effluent samples during discharge have maintained compliance with the permit, having values below the level of detection limit.
10. A total of 62 pounds TPHg and 3.5 pounds MTBE have been removed during the operation of the treatment system.
11. A total of 72 pounds petroleum hydrocarbons have been removed from the vadose zone of the Site during the operation of the Vapor Extraction System. (non specific)

7.0 REPORT LIMITATIONS

This report is the summary of work done by SOMA including observations and descriptions of the Site conditions. It includes the analytical results produced by Delta Environmental Laboratories, as well as the data summaries produced by the previous environmental consultants. The number and location of the wells were selected to provide the required information, but may not be completely representative of the entire Site conditions. All conclusions and recommendations are based on the results of laboratory analysis. Conclusions beyond those specifically stated in this document should not be inferred from this report.

SOMA warrants that the services provided were done in accordance with the generally accepted practices in the environmental engineering and consulting field at the time of this sampling.

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TABLES

Table 1

Groundwater Elevation Data, August 9, 2000

Monitoring Well	Depth to Water (ft.)	Top of Casing Elevation (ft.)	Groundwater Elevation (ft.)	Product Thickness (ft.)
MW-1	13.36	97.99	84.63	ND
MW-2	13.03	98.58	85.55	ND
MW-3	13.73	97.78	84.05	ND
MW-4	13.35	97.85	84.50	ND
MW-5	13.22	99.04	85.82	ND
MW-6	13.78	98.77	84.99	ND
MW-7	12.63	97.83	85.20	ND
MW-8	12.87	97.25	84.38	ND
MW-10	11.52	94.54	83.02	ND
MW-11	14.87	95.94	81.07	ND
MW-12	12.07	94.84	82.77	ND
F.D. Center	15.70	97.10	81.40	ND

TABLE 2

Historical Groundwater Elevation Data
Tony's Express
Oakland, California

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-10	MW-11	MW-12	French Drain
Aug-00	**84.63**	**85.55**	**84.05**	**84.5**	**85.82**	**84.99**	**85.2**	**84.38**	**83.02**	**81.07**	**82.77**	**81.4**
May-00	86.50	87.70	86.10	86.39	88.01	87.07	87.31	86.10	85.09	82.14	84.36	81.50
Feb-00	86.79	88.73	86.83	86.60	89.19	87.82	88.33	86.40	85.29	82.34	84.64	81.70
Nov-99	83.54	84.48	83.08	83.75	84.74	84.02	84.58	83.60	82.04	82.09	81.64	
Aug.99	84.64	85.08	83.93	84.65	85.49	84.87	85.03	84.50	82.94	83.19		
Jun.99	86.89	87.34	85.98	86.55	87.54	86.87	87.13	86.45	84.59	84.44		
Mar.99	88.08	90.98	89.34	89.39	91.31	90.37	90.83	89.67	87.24	87.13		
Dec.98	86.89	87.64	86.23	86.72	87.84	87.17	87.31	86.50	84.35	84.36		
Sep.98	84.41	85.00	83.10	84.21	85.22	84.67	84.74	84.23	82.61	82.70		
Dec.97	88.69	89.54		88.42	89.89	89.47	89.18	88.30	85.76	85.54		
Apr.97	86.85	87.18	86.05	86.62	87.69	87.01	84.88	84.30	84.47	84.47		
Dec.96	86.32	86.91	85.76	86.27	87.56	86.73	86.86	86.12	84.10	83.95		
Apr.96	89.70	90.45	89.02	89.50	90.80	90.01	90.08	89.27				
Jan.96	87.92	88.65	87.23	87.74	89.01	88.22	88.26	87.46				
Oct.95	84.70	85.16	84.87		85.47	84.83	84.88	84.39				
Jun.95	88.46	88.99	87.53									
Mar.95	89.92	90.90	89.09									
Dec.94	88.67	89.98	87.99									
Oct.94	82.60	83.22	81.99									

TABLE 3

Analytical Results of Groundwater Biodegradation Parameters

WELL	DATE	Nitrate (mg/L)	Sulfate (mg/L)	Ferrous Iron (mg/L)	Dissolved Oxygen (mg/L)	Redox Poteatial (mv)	Turbidity (FTU)
MW-1	**8/9/00**	**0.0**	**0.0**	**1.7**	**0.32**	**-40.0**	**219.0**
	5/31/00	2.8	0.0	0.57	0.30	-37.0	30
	2/7/00	0.0	1.0	3.3	0.77	-74.0	
	11/9/99	0.0	26.0	5.1	0.2		
	8/23/99	0.0	8.0	2.67	1.4		
	6/10/99	0	1	3.17	0.14		
	12/30/97	<0.1	<1	3.04	0.5		
MW-2	**8/9/00**	**5.4**	**0**	**0.72**	**0.76**	**-74**	**1000**
	5/31/00	2.5	54.0	0.18	0.8	-55.0	30.9
	2/7/00	6.2	55.0	0.15	1.12	-20.0	
	11/9/99	0.9	55.0	1.0	0.8		
	8/23/99	1.0	60.0	0.62	0.7		
	6/10/99	0.7	40	0.55	0.44		
	6/30/98	<0.1	14	0.5	3.2		
	12/30/97	<0.1	<1	3.35	<0.1		
MW-3	**8/9/00**	**0**	**0**	**6.1**	**0.4**	**-72**	**123**
	5/31/00	0.00	4.00	7.80	0.45	-117.0	188.0
	2/7/00	0.00	140.00	3.60	0.70	-82.00	
	11/9/99	0.00	0.00	3.50	0.61		
	8/23/99	0.00	0.00	3.90	0.80		
	6/10/99	0.00	0.00	3.10	0.42		
	6/30/98	0.10	77.00	0.37	2.00		
MW-4	**8/9/00**	**1**	**14**	**0.32**	**0.46**	**-50**	**83**
	5/31/00	0.50	40.00	0.25	0.50	-40.0	26.8
	2/7/00	0.00	1.00	1.56	1.30	-31.0	
	11/9/99	0.50	23.00	0.99	0.12		
	8/23/99	0.50	28.00	0.67	0.15		
	6/10/99	0.40	10.00	0.81	0.15		
	6/30/98	0.90	7.00	0.93	1.30		
	12/30/97	4.50	42.00	0.39	<0.1		
MW-5	**8/9/00**	**0**	**26**	**0**	**1.97**	**80**	**490**
	5/31/00	0.00	50.00	0.35	0.48	-25.0	27.2
	2/7/00	0.00	47.00	0.64	0.90	18.0	
	11/9/99	2.00	32.00	0.72	0.27		
	8/23/99	2.40	45.00	1.19	0.75		
	6/10/99	2.50	33.00	0.34	0.25		
	6/30/98	1.60	6.00	0.50	0.60		
	12/30/97	0.30	18.00	0.94	<0.1		
MW-6	**8/9/00**	**2.5**	**0**	**4.1**	**0.65**	**-33**	**1000**
	5/31/00	0.00	0.00	3.27	0.72	-62.0	111.0

TABLE 3

Analytical Results of Groundwater Biodegradation Parameters

WELL	DATE	Nitrate (mg/L)	Sulfate (mg/L)	Ferrous Iron (mg/L)	Dissolved Oxygen (mg/L)	Redox Potential (mv)	Turbidity (FTU)
	2/7/00	0.00	0.00	3.02	1.25	-51.0	
	11/9/99	0.00	0.00	7.00	0.22		
	8/23/99	0.00	9.00	3.30	0.55		
	6/10/99	0.00	23.00	2.52	0.61		
	6/30/98	0.70	4.00	0.40	2.50		
	12/30/97	<0.1	5.00	0.30	<0.1		
MW-7	**8/9/00**	**0**	**17**	**0.95**	**0.26**	**-33**	**131**
	5/31/00	0.00	28.00	0.72	0.30	-52.0	34.9
	2/7/00	0.00	41.00	0.53	0.91	-19.0	
	11/9/99	0.00	25.00	0.99	0.14		
	8/23/99	0.00	20.00	1.40	0.65		
	6/10/99	0.00	22.00	0.19	0.15		
	6/30/98	0.50	4.00	0.78	1.00		
	12/30/97	0.20	32.00	0.23	1.20		
MW-8	**8/9/00**	**0**	**7**	**3.3**	**0.5**	**-91**	**94**
	5/31/00	0.00	0.00	3.30	0.45	-95.0	13.0
	2/7/00	0.00	0.00	3.46	0.65	-90.0	
	11/9/99	0.00	0.00	8.90	0.38		
	8/23/99	0.00	13.00	8.20	0.20		
	6/10/99	0.00	0.00	4.70	0.10		
	6/30/98	<0.1	3.00	2.82	1.30		
	12/30/97	0.10	<1	3.35	2.50		
MW-10	**8/9/00**	**0**	**0**	**0.4**	**0.45**	**19**	**116**
	5/31/00	0.00	0.00	0.29	0.40	17.0	22.4
	2/7/00	0.00	0.00	0.00	0.82	55.0	
	11/9/99	0.00	12.00	0.37	0.44		
	8/23/99	0.00	9.00	0.52	0.50		
	6/10/99	0.00	0.00	0.25	0.20		
	6/30/98	<0.1	<1	0.38	0.90		
	12/30/97	0.30	<1	2.21	<0.1		
MW-11	**8/9/00**	**1.5**	**0**	**0.8**	**0.48**	**10**	**42**
	5/31/00	5.20	10.00	0.69	0.50	-15.0	12
	2/7/00	0.00	24.00	0.75	1.10	-14.0	
	11/9/99	0.00	21.00	0.06	0.22		
	8/23/99	0.00	52.00	0.92	0.60		
	6/10/99	0.00	0.00	0.28	0.19		
	6/30/98	1.20	6.00	0.15	2.20		
	12/30/97	3.50	35.00	0.32	<0.1		
MW-12	**8/9/00**	**0**	**0**	**2.84**	**0.31**	**-48**	**56**

TABLE 3

Analytical Results of Groundwater Biodegradation Parameters

WELL	DATE	Nitrate (mg/L)	Sulfate (mg/L)	Ferrous Iron (mg/L)	Dissolved Oxygen (mg/L)	Redox Potential (mv)	Turbidity (FTU)
	5/31/00	0.00	0.00	2.11	0.29	-54.0	7.7
	2/7/00	0.00	0.00	1.53	0.62	-42.0	
	11/9/99	3.10	9.00	2.21	0.34		

Table 4

Groundwater Analytical Data, August 9, 2000

Monitoring Well	Benzene (ug/L)	Toluene (ug/L)	Ethyl-Benzene (ug/L)	Total Xylenes (ug/L)	MTBE* (ug/L)	TPH-G (ug/L)
MW-1	638	<5	<5	<5	17.1	11,000
MW-2	<5	<5	<5	<5	<5	<5
MW-3	8,900	5,636	883	7,356	176	76,000
MW-4	5.08	<5	<5	<5	<5	370
MW-5	<5	<5	<5	<5	<5	<5
MW-6	1,306	870	<5	5,162	<5	24,000
MW-7	<5	<5	<5	<5	11.7	80
MW-8	632	5.38	<5	2,686	37.3	22,000
MW-10	1,055	25.8	54.2	53.8	1,283	6,800
MW-11	10.5	5.94	<5	7.75	<5	590
MW-12	15.4	12.4	<5	<5	185	1,730
French Drain	17	4.74	<5	5.18	171	1,720

* MTBE analyzed with EPA Method 8260

TABLE 5

Historical Groundwater Analytical Data

WELL	DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	MTBE (mg/L)	TPH-g (mg/L)
MW-1	**8/9/00**	**638**	**<5**	**<5**	**<5**	**17.1**	**11,000**
	5/31/00	610	350	310	1,400	<5	15,610
	2/7/00	2,280	1,380	8	6,130	47	40,000
	11/9/99	693	15	<5	3,471	50	10,000
	8/23/99	678	463	893	2,938	38	19,750
	6/10/99	1,110	1,460	1,330	5,265	77	25,000
	3/16/99	480	860	850	3,000	190	17,000
	12/16/98	2,500	2,400	2,300	9,500	160	65,000
	12/30/97	2,300	2,100	1,400	5,100	NA	27,000
	4/10/97	NA	NA	NA	NA	NA	NA
	12/9/96	NA	NA	NA	NA	NA	NA
	4/3/96	98	120	63	170	NA	31,000
	1/3/96	71	73	50	120	NA	30,000
	10/2/95	140	130	140	390	NA	59,000
	6/5/95	950	650	570	150	NA	21,000
	3/6/95	190	160	150	490	NA	32,000
	12/2/94	3,800	6,600	2,300	11,000	NA	80,000
	10/5/94	24,000	21,000	2,600	15,000	NA	320,000
MW-2	**8/9/00**	**<5**	**<5**	**<5**	**<5**	**<5**	**<50**
	5/31/00	130	330	130	570	<5	2,930
	2/7/00	372	639	46	134	8	6,400
	11/9/99	<5	<5	<5	<5	<5	<50
	8/23/99	6	9	4	11	ND	60
	6/10/99	290	428	211	744	ND	3,500
	3/16/99	730	830	610	1,900	55	7,600
	12/16/98	1,400	1,600	880	9,500	<5	26,000
	9/29/98	290	180	160	360	<0.5	29,000
	6/30/98	2,000	2,000	1,300	4,300	NA	25,000
	12/30/97	4,900	4,900	1,600	7,000	NA	35,000
	4/10/97	150	110	37	0	ND	53,000
	12/9/96	11	7	2	14	ND	6,200
	4/3/96	0	92	44	13	NA	27,000
	1/3/96	160	130	93	240	NA	46,000
	10/2/95	160	130	93	240	NA	46,000
	6/5/95	220	330	350	660	NA	8,000
	3/6/95	3	3	3	1	NA	490
	12/2/94	1,700	2,200	1,200	3,600	NA	42,000
MW-3	**8/9/00**	8,900	5,636	883	7,356	176	76,000
	5/31/00	15,000	8,900	1,500	7,400	<5	68,000
	2/7/00	6,090	3,360	<5	5,780	276	44,000
	11/9/99	3,218	1,319	<5	6,697	126	26,000
	8/23/99	7,484	8,052	1,744	9,749	141	64,000
	6/10/99	8,245	6,425	1,015	7,173	274	46,000

TABLE 5

Historical Groundwater Analytical Data

WELL	DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	MTBE (mg/L)	TPH-g (mg/L)
	3/16/99	4,100	6,400	1,000	6,100	470	45,000
	12/16/98	5,700	3,900	1,200	6,300	410	51,000
	1/3/96	510	410	210	650	NA	150,000
	10/2/95	510	410	210	65	NA	150,000
	6/5/95	20,000	42,000	5,800	36,000	NA	350,000
	3/6/95	20,000	42,000	5,800	36,000	NA	350,000
	12/2/94	19,000	22,000	4,400	28,000	NA	250,000
	10/5/94	190,000	740,000	310,000	130,000	NA	3,000,000
MW-4	**8/9/00**	**5.08**	**<5**	**<5**	**<5**	**<5**	**370**
	5/31/00	42	19	16	67	<5	552
	2/7/00	1,200	61	<5	781	<5	7,800
	11/9/99	<5	<5	<5	<5	<5	<50
	8/23/99	497	41	54	145	6	660
	6/10/99	298	44	19	64	13	1,000
	3/16/99	200	35	19	56	11	600
	12/16/98	590	33	28	94	24	1,400
	9/29/98	910	77	68	200	18	6,200
	6/30/98	780	160	54	200	NA	1,700
	12/30/97	410	270	100	1,500	NA	2,300
	4/10/97	ND	ND	ND	ND	ND	ND
	12/9/96	14	6	4	12	ND	4,000
	4/3/96	12	8	5	14	NA	1,900
	1/3/96	230	110	10	29	NA	9,300
	10/2/95	23	11	10	29	NA	9,300
MW-5	**8/9/00**	**<5**	**<5**	**<5**	**<5**	**<5**	**<50**
	5/31/00	7.4	24	12	32.4	<5	627.4
	2/7/00	<5	<5	<5	7	<5	70
	11/9/99	<5	<5	<5	<5	<5	<50
	8/23/99	ND	4	ND	4	ND	120
	6/10/99	4	3	6	4	ND	270
	3/16/99	3	1	16	2	10	650
	12/16/98	1	1	ND	2	ND	1,400
	9/29/98	2	1	3	3	<.5	270
	6/30/98	<5	<5	15	<10	NA	400
	12/30/97	82	66	59	160	NA	790
	4/10/97	NA	NA	NA	NA	NA	NA
	12/9/96	NA	NA	NA	NA	NA	NA
	4/3/96	1	1	5	4	NA	780
	1/3/96	1	1	4	5	NA	1,500
	10/2/95	1	1	4	5	NA	1,500
MW-6	**8/9/00**	**1,306**	**870**	**<5**	**5,162**	**<5**	**24,000**
	5/31/00	1,700	1,200	17	3,600	<5	21,700

TABLE 5

Historical Groundwater Analytical Data

WELL	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	TPH-g (µg/L)
	2/7/00	1,360	521	<5	4,150	6	17,000
	11/9/99	1,084	130	<5	10,940	<5	40,000
	8/23/99	3,806	3,649	1,554	7,996	10	42,000
	6/10/99	2,060	1,650	735	3,170	ND	18,500
	3/16/99	3,900	4,300	1,600	7,000	180	37,000
	1/3/96	350	310	200	610	NA	120,000
	10/2/95	350	310	200	610	NA	120,000
MW-7	**8/9/00**	**<5**	**<5**	**<5**	**<5**	**11.7**	**80**
	5/31/00	4.9	22	4.2	21.9	29	494.9
	2/7/00	<5	<5	<5	<5	23	80
	11/9/99	<5	9	<5	<5	12	290
	8/23/99	5	10	ND	ND	ND	570
	6/10/99	3	7	4	3	26	320
	3/16/99	3	1	1	1	62	300
	12/16/98	5	10	5	20	160	990
	9/29/98	1	1	1	2	68	1,800
	6/30/98	4	<5	9	<10	NA	620
	12/30/97	130	98	75	200	NA	1,400
	4/10/97	NA	NA	NA	NA	NA	NA
	12/9/96	NA	NA	NA	NA	NA	NA
	4/3/96	2	3	5	7	NA	1,900
	1/3/96	9	12	17	45	NA	3,300
	10/2/95	10	12	17	NA	3,300	NA
MW-8	**8/9/00**	**632**	**5.38**	**<5**	**2,686**	**37.3**	**22,000**
	5/31/00	940	130	1,600	3,960	75	25,940
	2/7/00	1,080	617	<5	4,160	240	44,200
	11/9/99	92	<5	<5	3,414	769	10,500
	8/23/99	5,379	2,438	3,001	6,960	639	58,000
	6/10/99	3,610	1,635	2,175	5,913	988	39,500
	3/16/99	1,800	470	2,000	2,000	820	22,000
	12/16/98	6,300	1,700	2,200	4,400	1,300	61,000
	6/30/98	4,600	2,800	3,500	7,300	NA	54,000
	12/30/97	6,000	1,600	2,100	4,700	NA	28,000
	4/10/97	86	55	50	100	ND	24,000
	12/9/96	88	43	44	80	ND	27,000
	4/3/96	250	170	140	330	NA	58,000
	1/3/96	310	250	180	480	NA	94,000
	10/2/95	310	250	180	480	NA	94,000
MW-10	**8/9/00**	**1,055**	**26** 25.8	**54**, 2	**53.8**	**1,283**	**6,800**
	5/31/00	1,500	25	390	107.1	580	4,400
	2/7/00	<5	<5	<5	<5	448	<50
	11/9/99	1,134	20	<5	70	652	2,950

TABLE 5

Historical Groundwater Analytical Data

WELL	DATE	BENZENE (µg/L)	TOLUENE (µg/L)	ETHYL-BENZENE (µg/L)	XYLENES (µg/L)	MTBE (µg/L)	TPH-g (µg/L)
	8/23/99	2,135	97	600	248	1,800	3,250
	6/10/99	1,168	34	264	154	1,195	4,200
	3/16/99	15	28	420	250	2,800	4,100
	12/16/98	3,800	51	790	420	1,800	8,700
	9/29/98	5,400	66	970	620	2,600	9,900
	12/30/97	5,300	76	1,100	780	NA	10,000
	4/10/97	21	9	3	3	ND	1,000
MW-11	**8/9/00**	**10.5**	**5.94**	**<5**	**7.75**	**<5**	**590**
	5/31/00	27	13	9.5	29.0	<5	477
	2/7/00	20	15	<5	35	<5	700
	11/9/99	<5	<5	<5	<5	<5	<50
	8/23/99	4	4	ND	6	ND	170
	6/10/99	1,240	35	290	159	1,291	4,600
	3/16/99	30	6	53	84	8	710
	12/16/98	27	4	25	33	>0.5	650
	9/29/98	7	1	4	9	22	170
	6/30/98	45	24	71	100	NA	1,100
	12/30/97	66	97	59	190	NA	710
	4/10/97	ND	ND	ND	ND	ND	ND
MW-12	**8/9/00**	15.4	12.4	<5	<5	185	1,730
	5/31/00	230	10	34	12	200	3,930
	2/7/00	351	37	<5	24	513	4,000
	11/9/99	<5	<5	<5	<5	229	80
F. D.*	**8/9/00**	**17**	**4.74**	**<5**	**5.18**	**171**	**1,720**
	5/31/00	2,400	1,000	210	1,440	230	12,400
	2/7/00	419	72	<5	522	797	5,200

ND Not Detected

\# Duplicate sample of MW-10

* French drain

Table 6: Total Volume of Treated Groundwater and Composition of Influent and Effluent Groundwater

Tony's Auto Express, Oakland, California

	Date Meter Read	Meter Reading (Gallons)	Lab Results For GAC-1 and Effluent* (concentrations in ug/L)					
			MTBE	TPH-g	Benzene	Toluene	Ethylbenzene	Total Xylene
August	08/24/00	778,000	NA	NA	NA	NA	NA	NA
July	07/26/00	730,000	ND	ND	ND	ND	ND	ND
	07/19/00	720,000	ND	ND	ND	ND	ND	ND
	07/13/00	714,000	ND	ND	ND	ND	ND	ND
	07/07/00	707,000	ND	ND	ND	ND	ND	ND
June	06/29/00	700,000						
	06/21/00	682,220	ND	ND	ND	ND	ND	ND
	06/16/00	669,720	ND	ND	ND	ND	ND	ND
	06/10/00	651,200	ND	ND	ND	ND	ND	ND
May	05/31/00	629,000	ND	ND	ND	ND	ND	ND
	05/23/00	603,700	ND	ND	ND	ND	ND	ND
	05/18/00	570,000	ND	ND	ND	ND	ND	ND
	05/10/00	530,400	ND	ND	ND	ND	ND	ND
April								
	04/30/00	488,300	ND	ND	ND	ND	ND	ND
	04/18/00	485,300	ND	ND	ND	ND	ND	0.51
	04/10/00	440,200	ND	ND	ND	ND	ND	ND
	04/04/00	390,100	ND	ND	ND	ND	ND	ND
March								
	03/24/00	388,000	ND	ND	ND	ND	ND	ND
	03/17/00	357,100	ND	ND	ND	ND	ND	ND
	03/10/00	329,000	ND	ND	ND	ND	ND	ND
	03/03/00	300,000						
February								
	02/25/00	274,000	ND	ND	ND	ND	ND	ND

Table 6: Total Volume of Treated Groundwater and Composition of Influent and Effluent Groundwater

Tony's Auto Express, Oakland, California

	Date Meter Read	Meter Reading (Gallons)	Lab Results For GAC-1 and Effluent* (concentrations in ug/L)					
			MTBE	TPH-g	Benzene	Toluene	Ethylbenzene	Total Xylene
	02/18/00	233,000	ND	ND	ND	ND	ND	ND
	02/11/00	190,000	ND	ND	ND	ND	ND	ND
	02/04/00	160,800	ND	ND	ND	ND	ND	ND
January								
	01/28/00	130,600	ND	ND	ND	ND	ND	ND
	01/21/00	103,435	ND	ND	ND	ND	ND	ND
	01/14/00	83,500	185	ND	ND	ND	ND	ND
December	12/23/99	51,680	1486	NA	ND	ND	ND	ND
	12/23/99		ND	NA	ND	ND	ND	ND
	12/16/99	30,450	963	NA	ND	ND	ND	ND
	12/16/99		ND	NA	ND	ND	ND	ND
	12/09/99	9,000	230	ND	ND	ND	ND	ND
Pumping began on December 6, 1999								

* Effluent is equivalent to GAC-2

Table 7

Total Mass of Petroleum Hydrocarbons Removed by Vapor Extraction System
at Tony,s Auto Express, 3609 International Blvd Oakland California

Date	Time	Time	PID (ppmv)		Flow Rate	Daily Flux	Daily Mass *
		Elapsed	Influent	Effluent	(cfm)	(Liters)	(pounds)
7/24/00	5:00	0	394	0	85	0	0.00
7/25/00	5:15	24.25	38	2	95	3,914,096	1.01
7/26/00	5:05	48	207	1	80	3,228,121	4.52
7/27/00	9:00	64	160	5	92	2,500,944	2.71
7/28/00	4:30	95.5	141	7	87	4,656,139	4.44
7/29/00	1:30	116.5	225	8	85	3,032,734	4.62
7/30/00	9:00	136	226	12	85	2,816,110	4.31
7/31/00	3:00	166	141	5	85	4,332,478	4.13
8/1/00	5:00	192	135	4	80	3,533,942	3.23
8/2/00	4:00	215	80	4	80	3,126,180	1.69
8/3/00	5:00	240	60	5	85	3,610,398	1.47
8/4/00	3:00	262	57	4	85	3,177,150	1.23
8/5/00	2:00	285	97	8	87	3,399,721	2.23
8/6/00	12:00	307	114	8	80	2,990,259	2.31
8/7/00	12:00	331	93	9	85	3,465,982	2.18
8/8/00	4:30	359.5	152	10	85	4,115,854	4.23
8/10/00	10:00	377	173	1	85	2,527,279	2.96
8/11/00	7:00	410	78	4	70	3,924,715	2.07
8/12/00	9:00	424	100	6	70	1,665,031	1.13
8/13/00	5:00	456	107	9	70	3,805,784	2.75
8/14/00	12:30	475.5	122	5	70	2,319,150	1.91
8/15/00	6:00	505	103	12	70	3,508,457	2.44
8/16/00	12:30	523.5	112	0	70	2,200,219	1.67
8/18/00	9:00	568	90	0	75	5,670,449	3.45
8/21/00	12:00	643	74	5	80	10,194,065	5.10
8/24/00	12:00	712	68	13	80	9,378,540	4.31
			Total Mass of Petroleum Hydrocarbons Removed=				**72.10**
					Average Daily Removal		***2.32***

* The represantetive molecular weight of hydrocarbons was assumed to be 78 gram/mole and used the measured temperature of Vapor (36 ^{o}C) in converting ppm-v to ppm on mass basis.

FIGURES

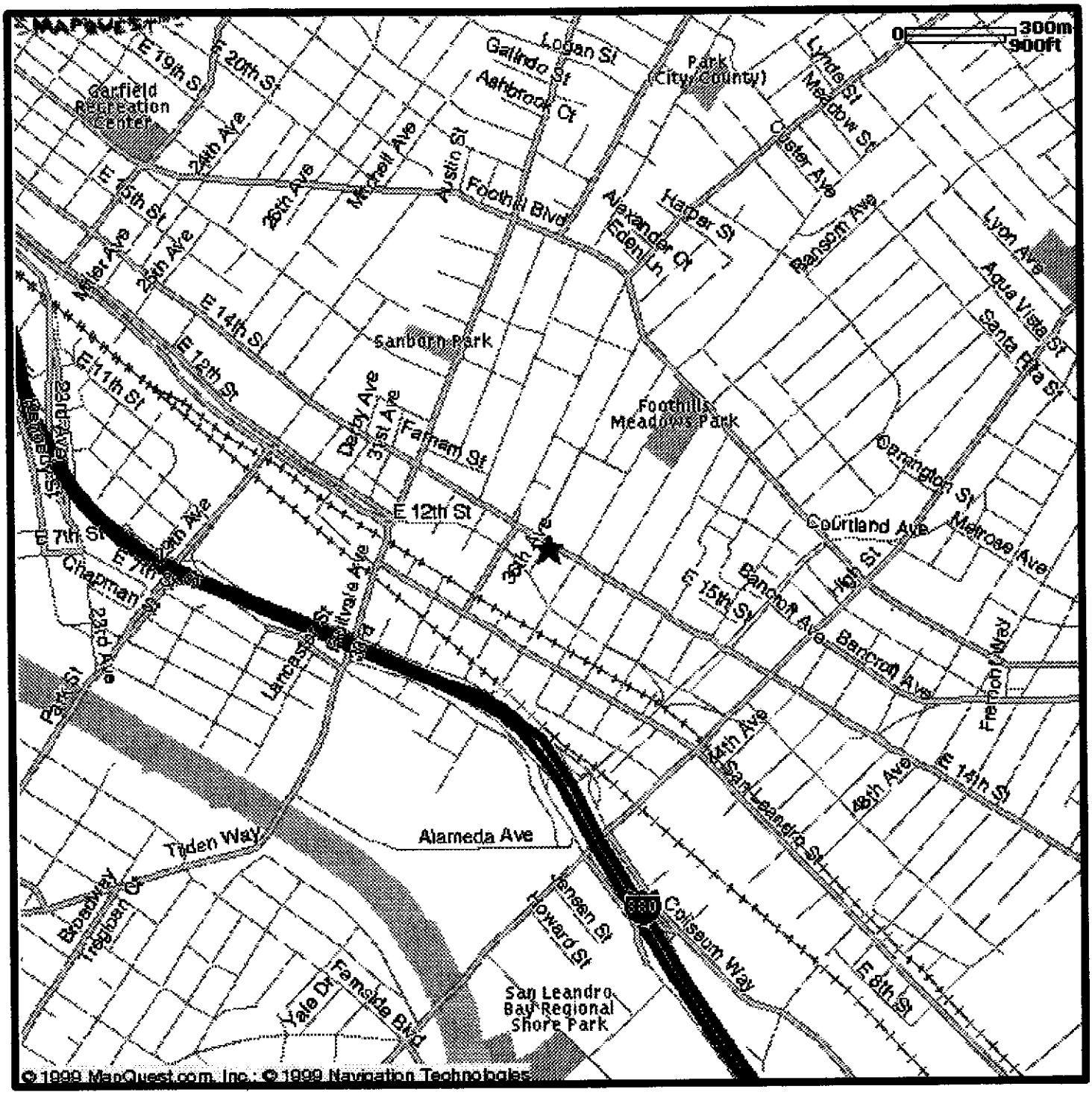


Figure 1: Site Location Map

SOMA
ENVIRONMENTAL ENGINEERING, INC.

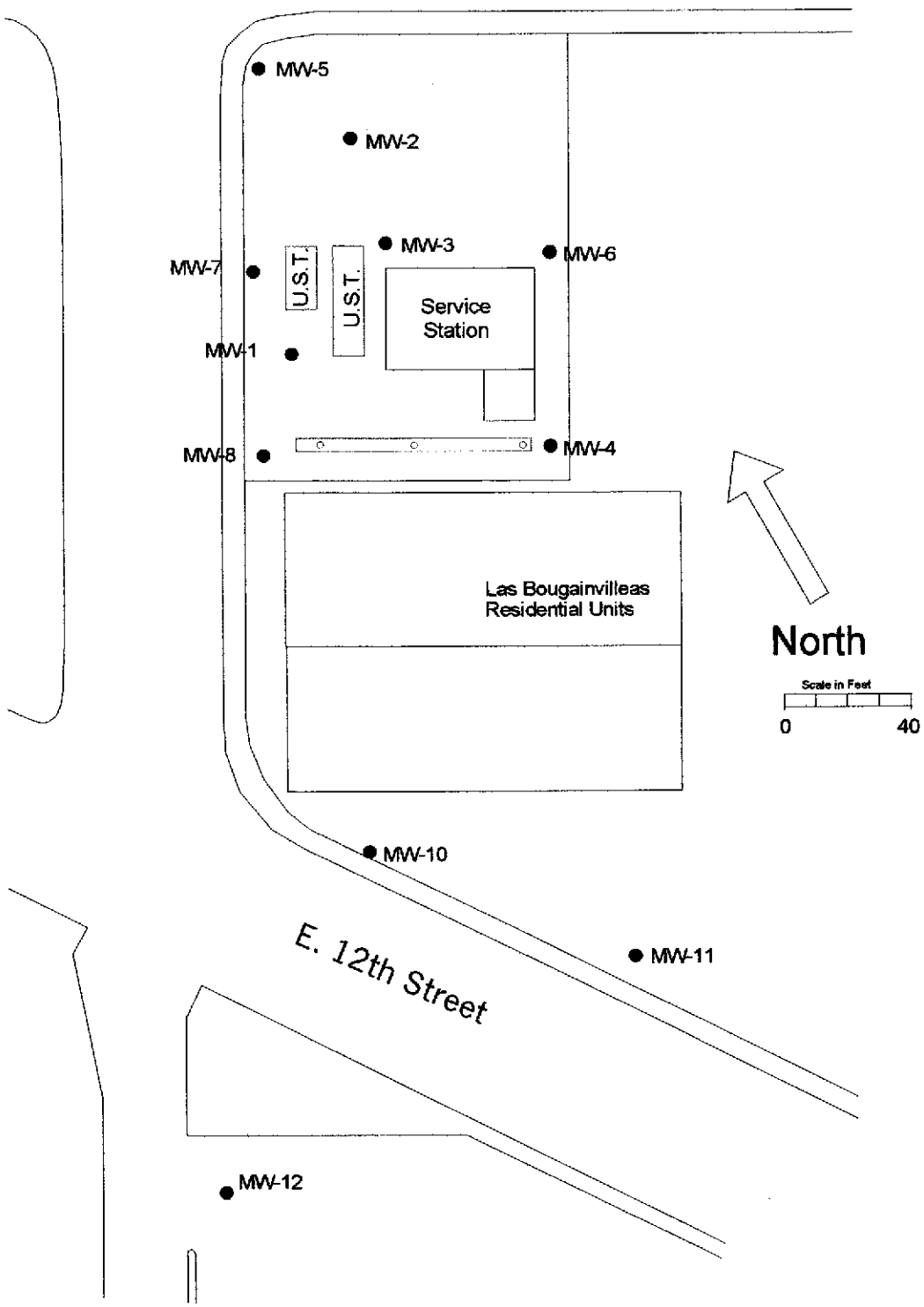


Figure 2: Location of Groundwater Monitoring Wells

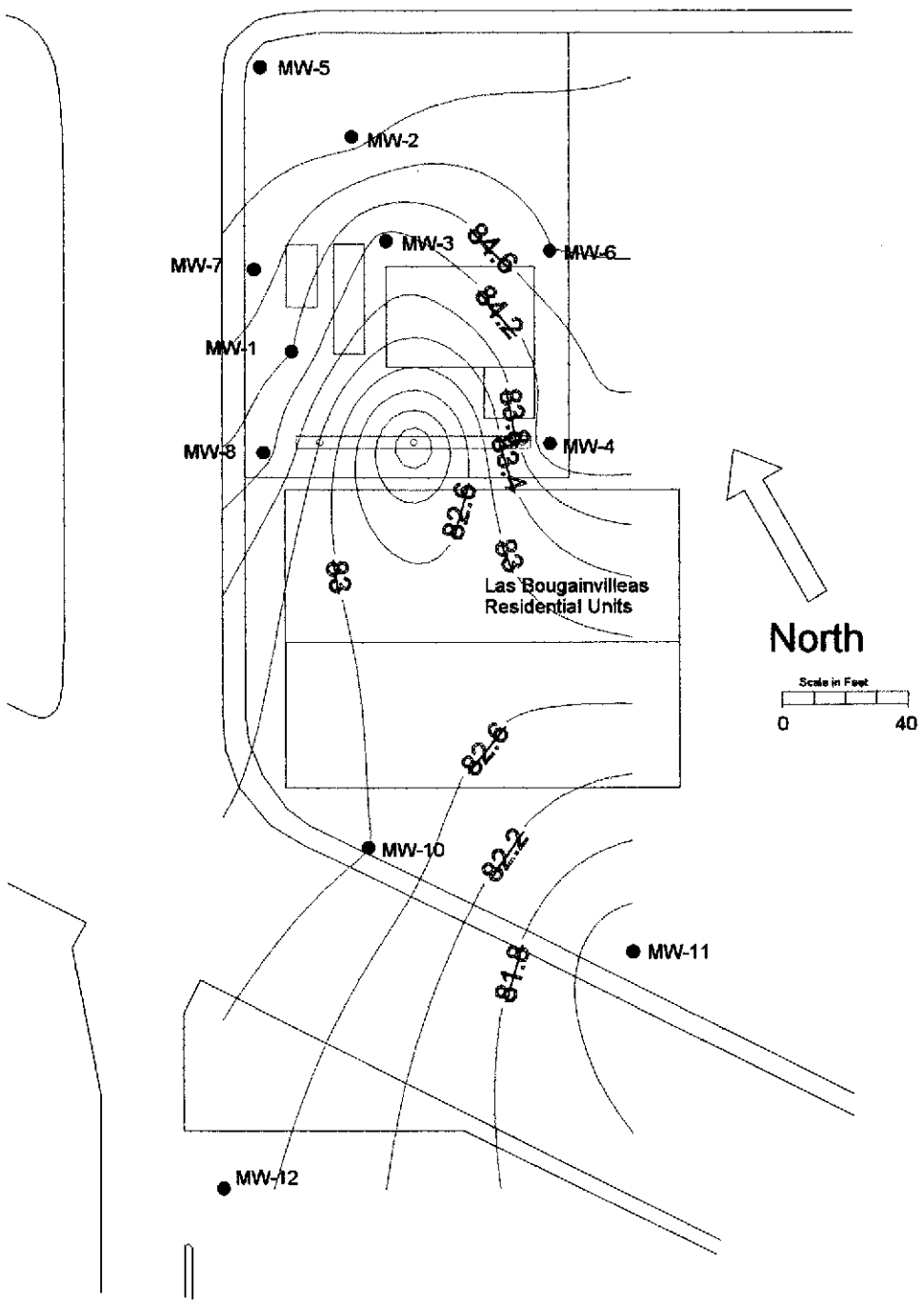


Figure 3: Groundwater Elevation Contour Map, August 9, 2000

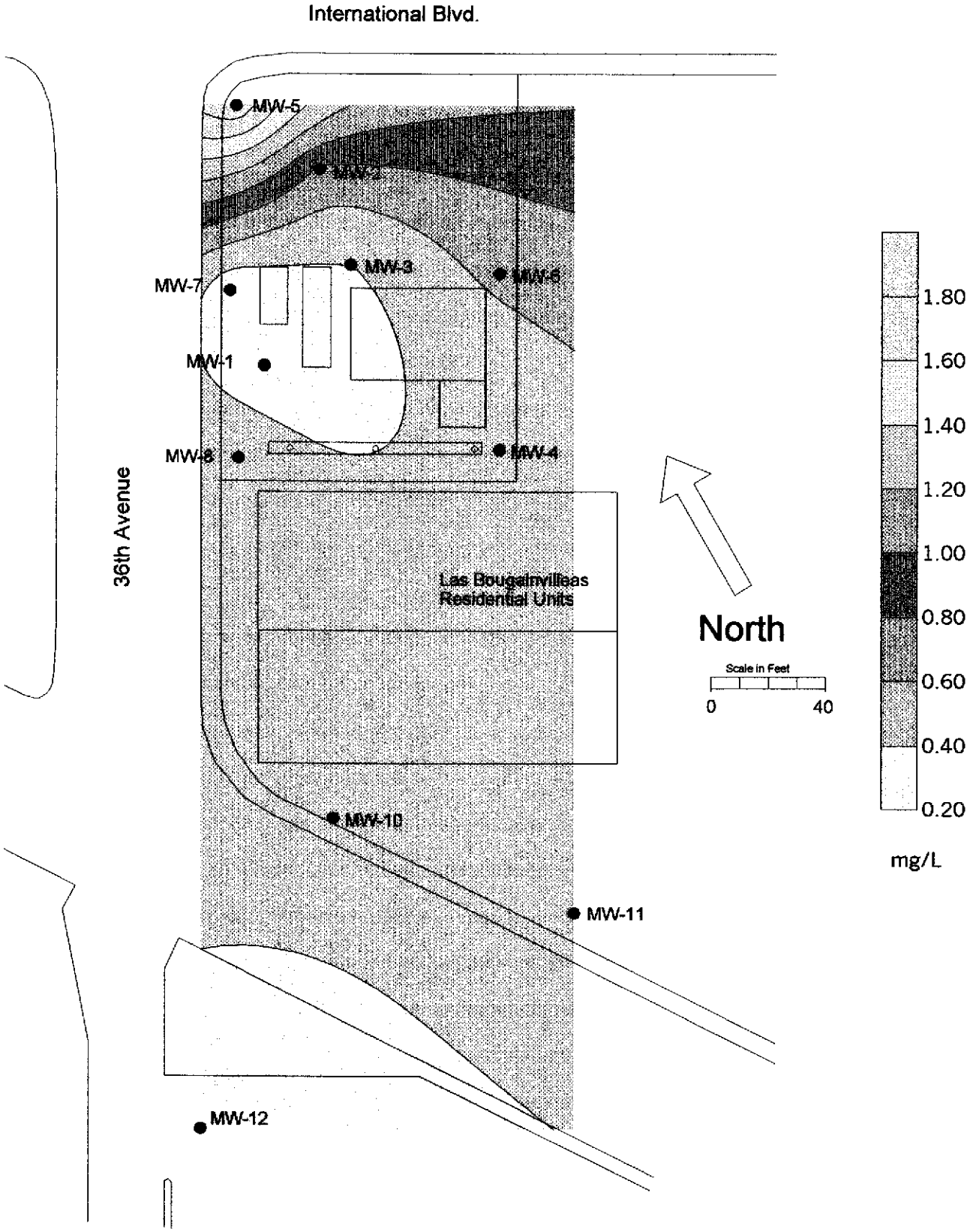


Figure 4: Dissolved Oxygen Concentration in Groundwater, August 9, 2000

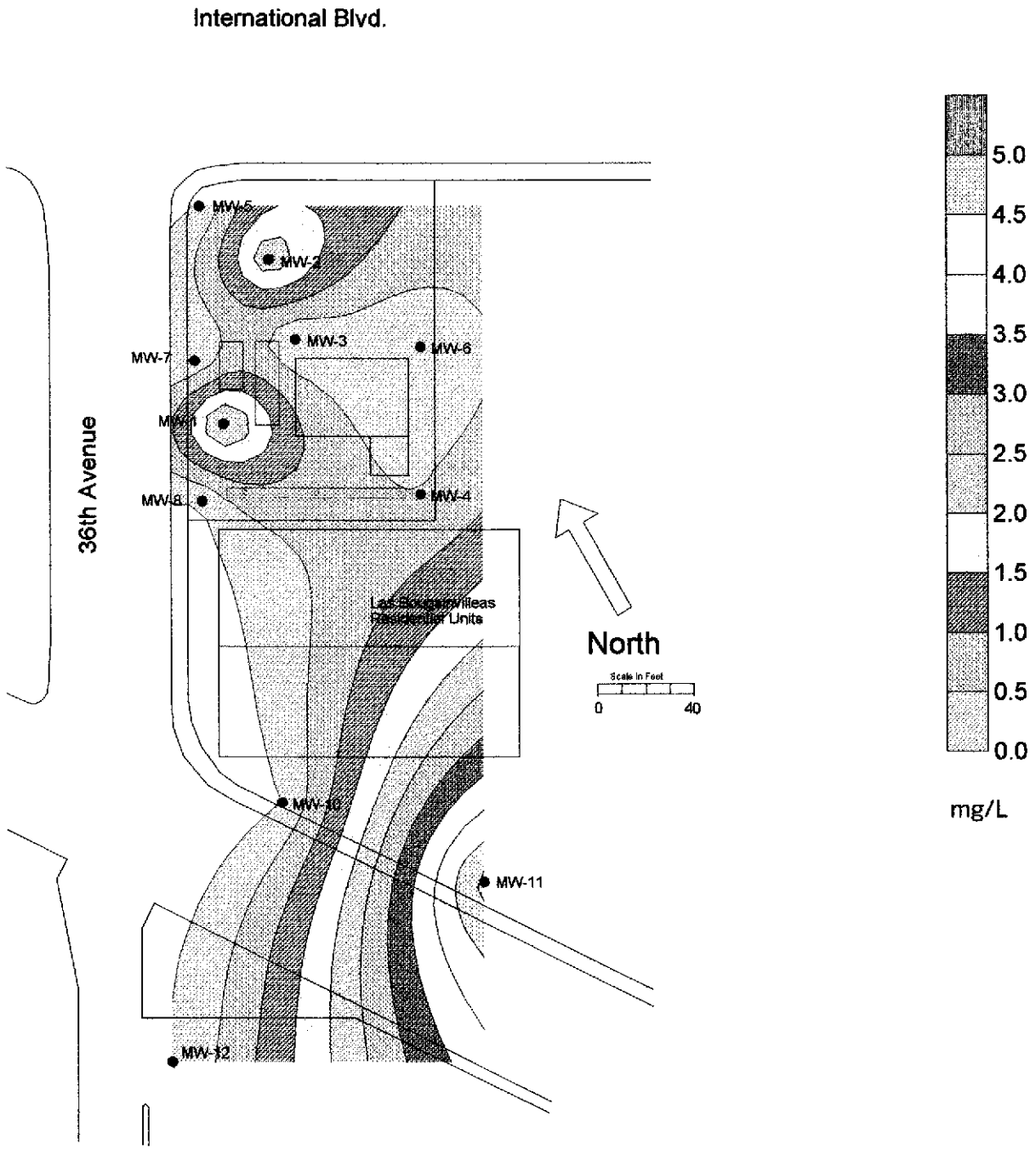


Figure 5: Nitrate Concentration Contour Map in Groundwater, August 9, 2000

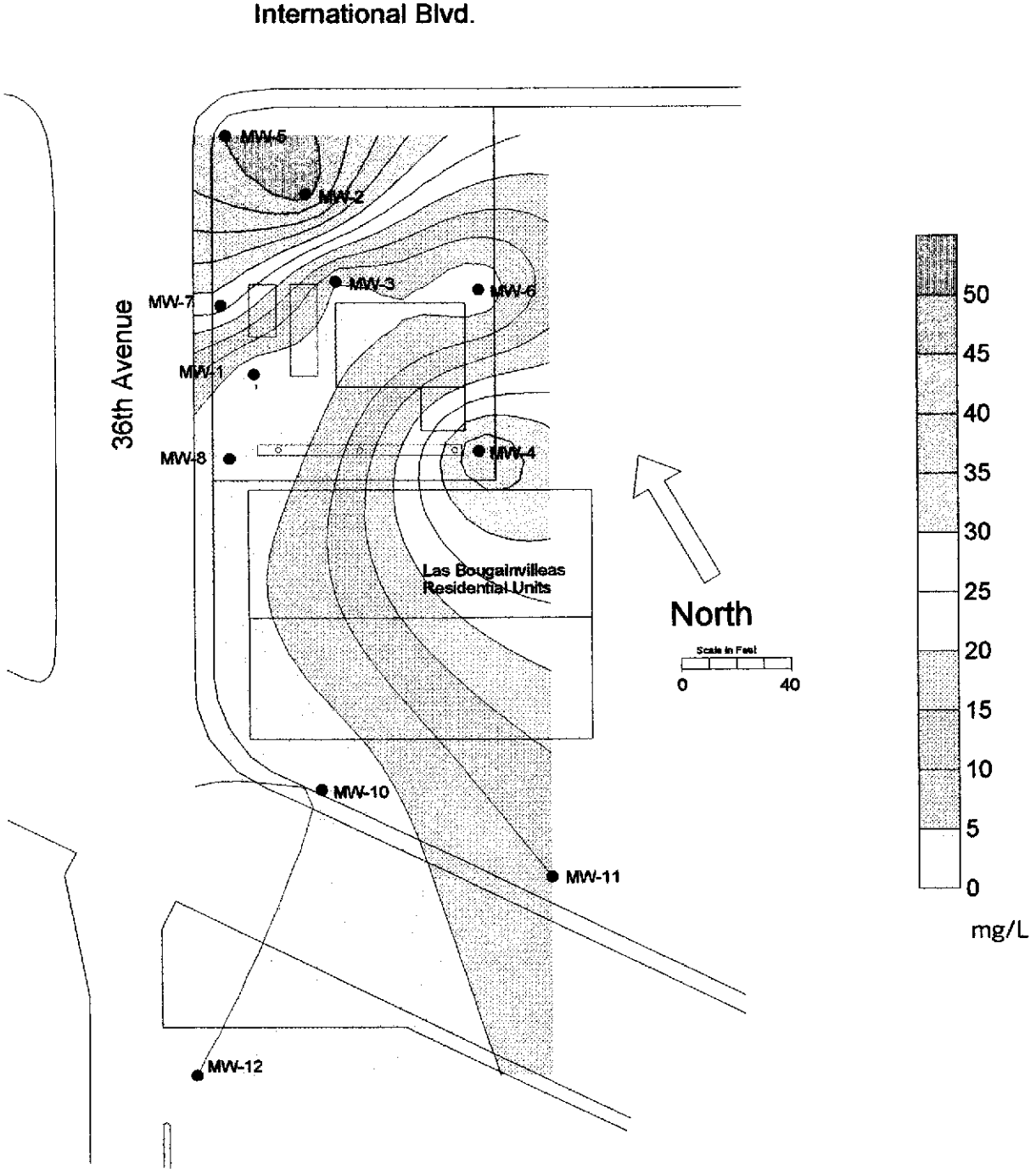


Figure 6: Sulfate Concentration Contour Map in Groundwater, August 9, 2000

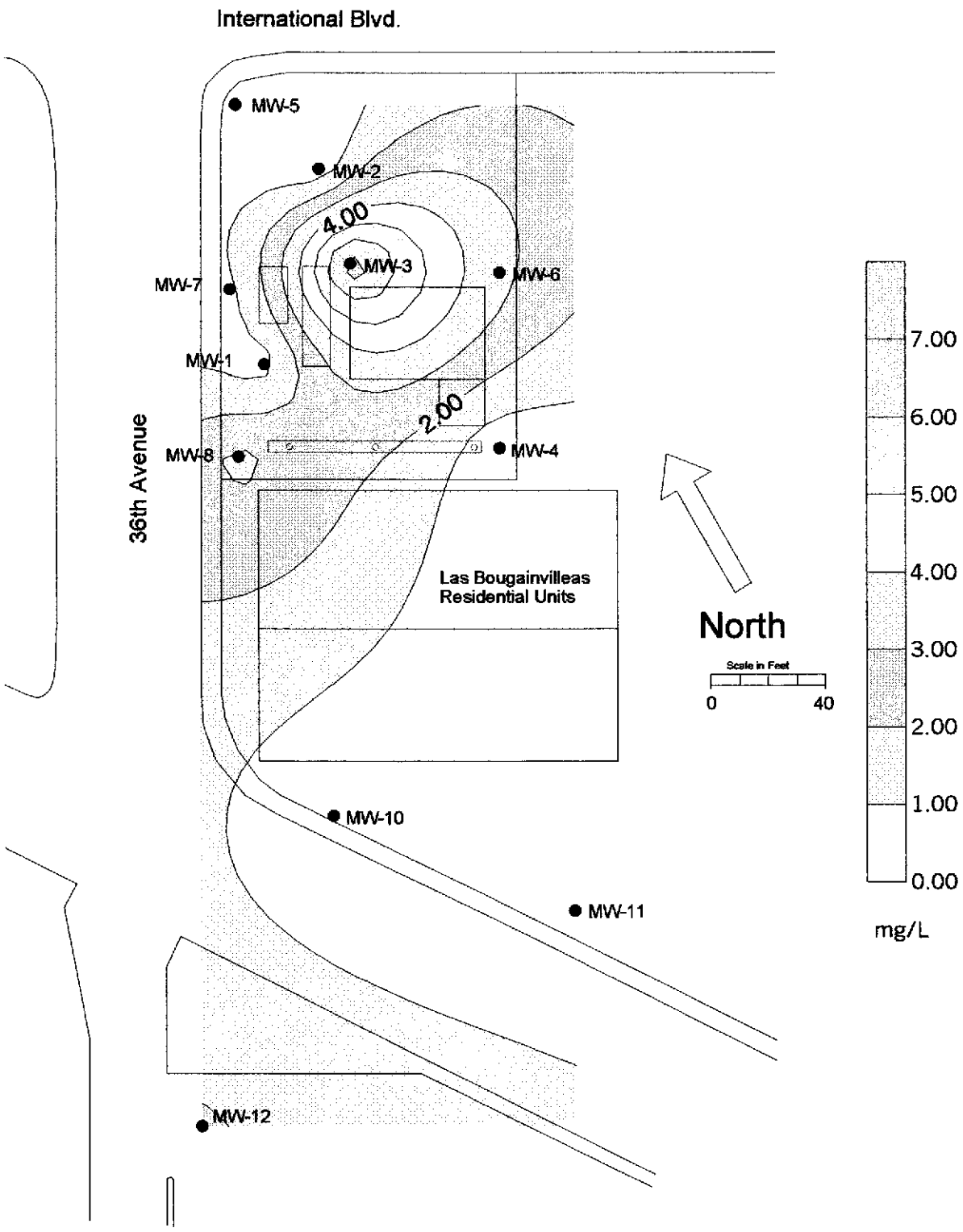


Figure 7: Ferrous Iron Concentration Contour Map in Groundwater, August 9, 2000

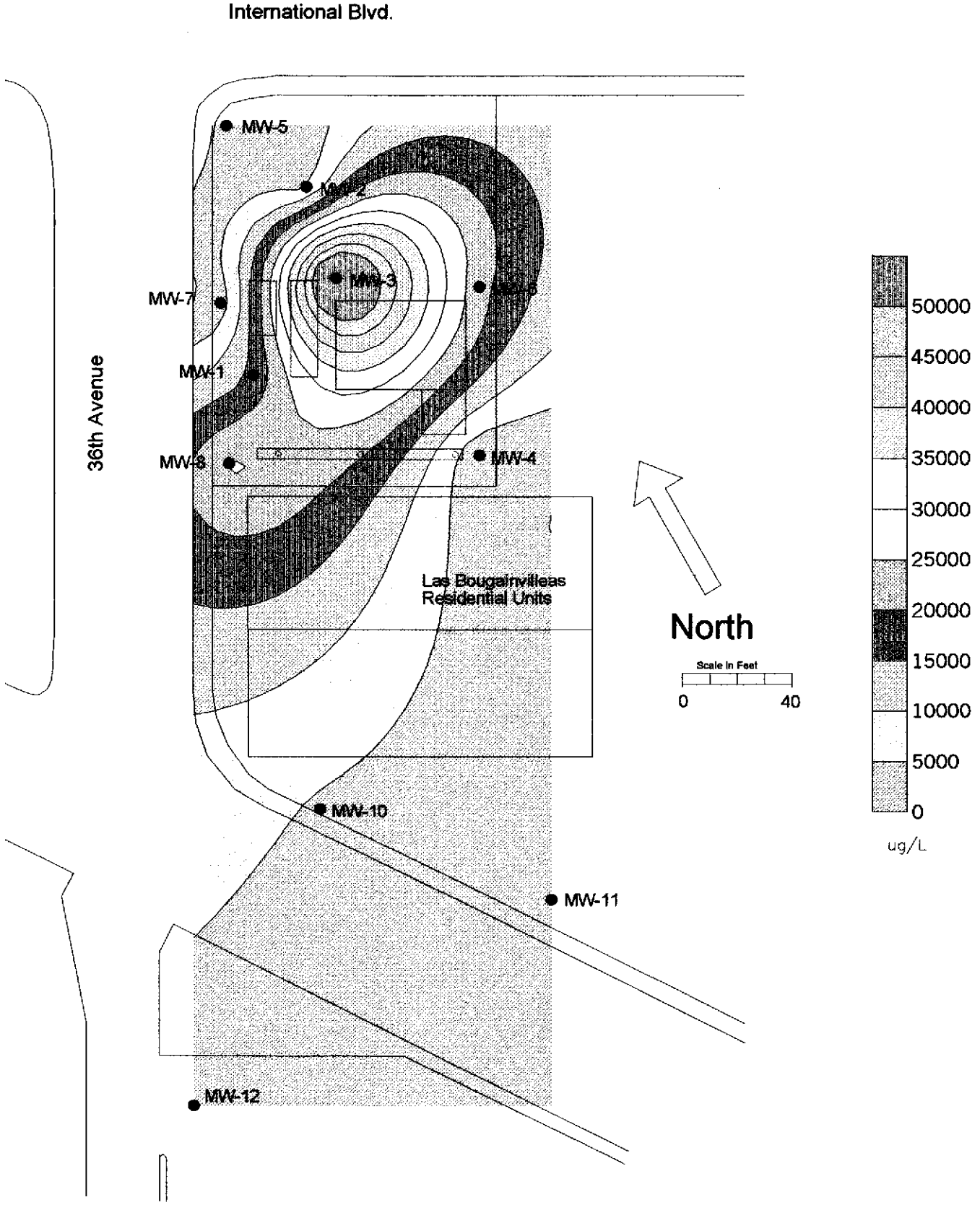


Figure 8: TPH-g Concentration Contour Map in Groundwater, August 9, 2000

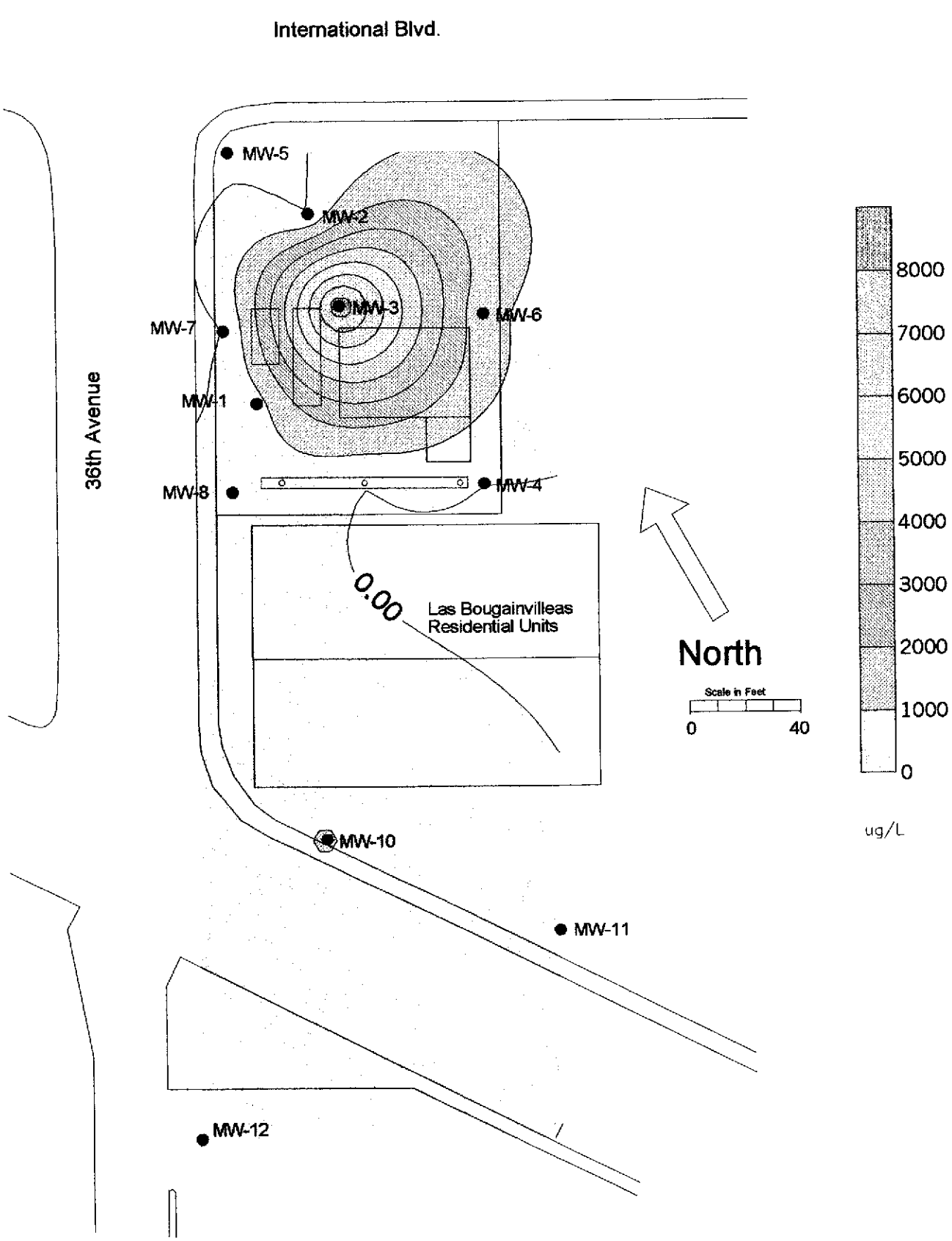


Figure 9: Benzene Concentration Contour Map in Groundwater, August 9, 2000

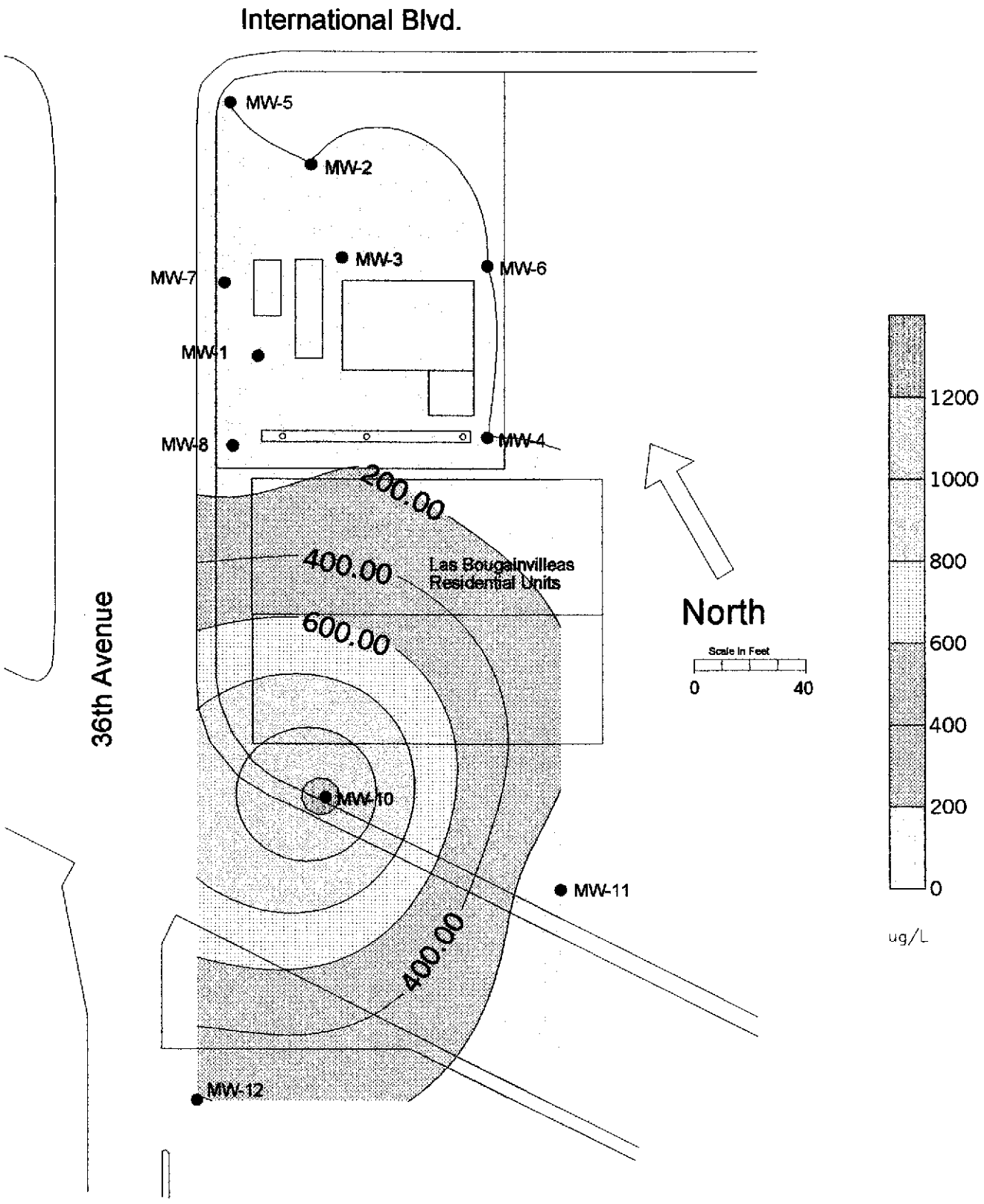
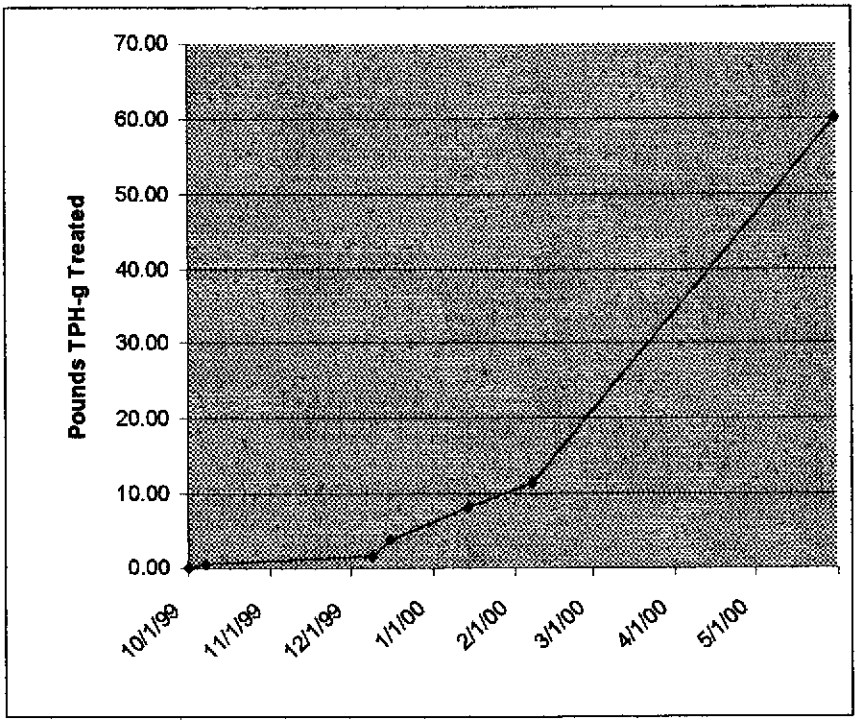


Figure 10: MTBE Concentration Contour Map in Groundwater, August 9, 2000



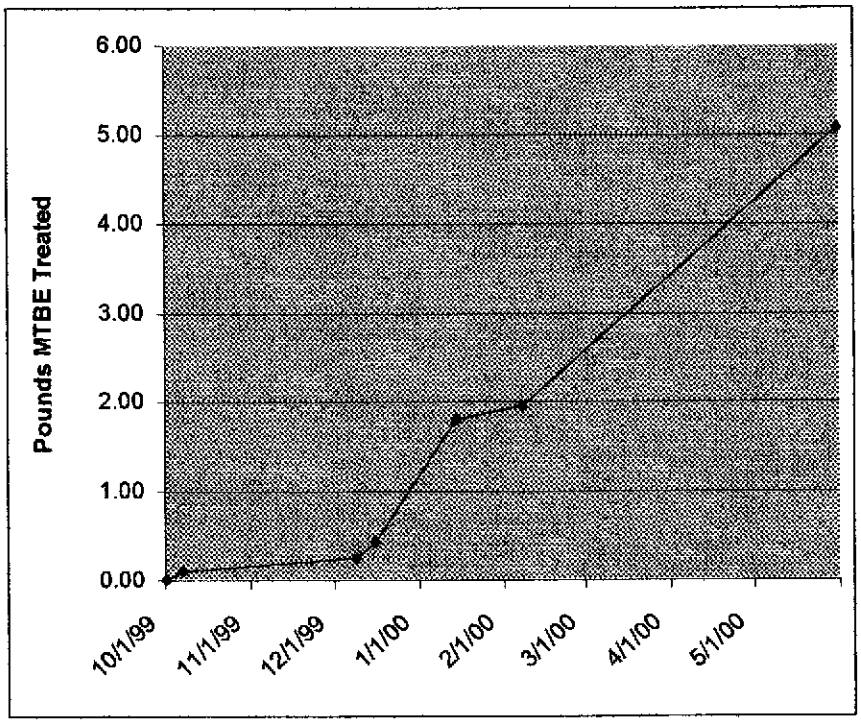


Figure 11: Total Mass of Contaminants Removed in Pounds

APPENDIX A

FIELD NOTES, LABORATORY REPORTS, CHAIN OF CUSTODY FORMS, D.O. CORRECTION TABLES

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-1		Project NO:	2331
Casing Diameter:	2	inch	Address:	3609 International Blvd.
Depth of Well:	29.70	feet		Oakland, CA
Elevation of the Casing:	97.99	feet	Date:	August 9, 2000
Depth to Water Table:	13.36	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	84.63	feet		Patrick Sullivan
Height of Water:	16.34	feet		
Purged Volume:	6	gallons		

Purging Method: Bailer ☐ Pump ■

Sampling Method: Bailer ■ Bailer ☐

Sheen: Yes ☐ No ■ Describe

Odor: Yes ■ No ☐ Describe Slight

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
12:15 PM	-40	0.32	1.7	0	0	7.15	19.6	463	219

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-2		Project NO:	2331
Casing Diameter:	4	inch	Address:	3609 International Blvd.
Depth of Well:	30.00	feet		Oakland, CA
Elevation of the Casing:	98.58	feet	Date:	August 9, 2000
Depth to Water Table:	13.03	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	85.55	feet		Patrick Sullivan
Height of Water:	16.97	feet		
Purged Volume:	12	gallons		

Purging Method:	Bailer ☐	Pump ■
Sampling Method:	Bailer ■	Bailer ☐

Sheen:	Yes ☐	No ■	Describe	
Odor:	Yes ■	No ☐	Describe	Slight

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
9:30 AM	-74	0.76	0.72	5.4	0	7.15	20	462	1000

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-3		Project NO:	2331
Casing Diameter:	4	inch	Address:	3609 International Blvd.
Depth of Well:	29.75	feet		Oakland, CA
Elevation of the Casing:	97.78	feet	Date:	August 9, 2000
Depth to Water Table:	13.73	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	84.05	feet		Patrick Sullivan
Height of Water:	16.02	feet		
Purged Volume:	12	gallons		

Purging Method:	Bailer ☐	Pump ■
Sampling Method:	Bailer ■	Bailer ☐

Sheen:	Yes ■	No ☐	Describe	Slight
Odor:	Yes ■	No ☐	Describe	Strong

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
10:00 AM	-72	0.40	>3.3	0	0	6.98	19.3	569	123
			6.1						

D.F.=10

Reading = 0.61

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-4		Project NO:	2331
Casing Diameter:	2	inch	Address:	3609 International Blvd.
Depth of Well:	24.34	feet		Oakland, CA
Elevation of the Casing:	97.85	feet	Date:	August 9, 2000
Depth to Water Table:	13.35	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	84.50	feet		Patrick Sullivan
Height of Water:	10.99	feet		
Purged Volume:	6	gallons		

Purging Method: Bailer □ Pump ■

Sampling Method: Bailer ■ Bailer □

Sheen: Yes □ No ■ Describe

Odor: Yes ■ No □ Describe Slight

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
2:00PM	-50	0.46	0.32	1	14	6.95	19.8	401	83

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-5		Project NO:	2331
Casing Diameter:	2	inch	Address:	3609 International Blvd.
Depth of Well:	26.08	feet		Oakland, CA
Elevation of the Casing:	99.04	feet	Date:	August 9, 2000
Depth to Water Table:	13.22	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	85.82	feet		Patrick Sullivan
Height of Water:	12.86	feet		
Purged Volume:	6	gallons		

Purging Method: Bailer ☐ Pump ■

Sampling Method: Bailer ■ Bailer ☐

Sheen: Yes ☐ No ■ Describe

Odor: Yes ☐ No ■ Describe

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
11:30 AM	80	1.97	0	0	26	7.05	19.8	420	490

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-6		Project NO:	2331
Casing Diameter:	2	inch	Address:	3609 International Blvd.
Depth of Well:	24.45	feet		Oakland, CA
Elevation of the Casing:	98.77	feet	Date:	August 9, 2000
Depth to Water Table:	13.78	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	84.99	feet		Patrick Sullivan
Height of Water:	10.67	feet		
Purged Volume:	8	gallons		

Purging Method: Bailer ☐ Pump ■

Sampling Method: Bailer ■ Bailer ☐

Sheen: Yes ☐ No ■ Describe

Odor: Yes ■ No ☐ Describe Strong

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
11:15am	-33	0.65	4.1	2.5	0	7	19.5	437	1000

Fe DF 10

0.41

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-7		Project NO:	2331
Casing Diameter:	2	inch	Address:	3609 International Blvd.
Depth of Well:	24.60	feet		Oakland, CA
Elevation of the Casing:	97.83	feet	Date:	August 9, 2000
Depth to Water Table:	12.63	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	85.20	feet		Patrick Sullivan
Height of Water:	11.97	feet		
Purged Volume:	6	gallons		

Purging Method:	Bailer ☐	Pump ■
Sampling Method:	Bailer ■	Bailer ☐

Sheen:	Yes ☐	No ■	Describe
Odor:	Yes ☐	No ■	Describe

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
12:00 AM	-33	0.26	0.95	0	17	7.25	20.4	370	131

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-8		Project NO:	2331
Casing Diameter:	2	inch	Address:	3609 International Blvd.
Depth of Well:	26.34	feet		Oakland, CA
Elevation of the Casing:	97.25	feet	Date:	August 9, 2000
Depth to Water Table:	12.87	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	84.38	feet		Patrick Sullivan
Height of Water:	13.47	feet		
Purged Volume:	6	gallons		

Purging Method: Bailer □ Pump ■

Sampling Method: Bailer ■ Bailer □

Sheen: Yes □ No ■ Describe

Odor: Yes ■ No □ Describe Slight

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
1:00 PM	-91	0.50	3.3	0	7	7.04	19.2	494	94

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-10		Project NO:	2331
Casing Diameter:	2	inch	Address:	3609 International Blvd.
Depth of Well:	24.35	feet		Oakland, CA
Elevation of the Casing:	94.54	feet	Date:	August 9, 2000
Depth to Water Table:	11.52	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	83.02	feet		Patrick Sullivan
Height of Water:	12.83	feet		
Purged Volume:	6	gallons		

Purging Method: Bailer □ Pump ■

Sampling Method: Bailer ■ Bailer □

Sheen: Yes □ No ■ Describe

Odor: Yes □ No ■ Describe

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
3:00 PM	19.0	0.45	0.4	0.0	0.0	7.04	20.8	478	116

Air temperature 19.6 °C

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-11		Project NO:	2331
Casing Diameter:	2	inch	Address:	3609 International Blvd.
Depth of Well:	24.30	feet		Oakland, CA
Elevation of the Casing:	95.94	feet	Date:	August 9, 2000
Depth to Water Table:	12.87	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	83.07	feet		Patrick Sullivan
Height of Water:	11.43	feet		
Purged Volume:	6	gallons		

Purging Method:	Bailer ☐	Pump ■	
Sampling Method:	Bailer ■	Bailer ☐	
Sheen:	Yes ☐	No ■	Describe
Odor:	Yes ☐	No ■	Describe

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
3:30 PM	10.0	0.48	0.8	1.5	0	7.04	19.3	517	42

ENVIRONMENTAL ENGINEERING, INC

Well NO:	MW-12		Project NO:	2331
Casing Diameter:	4	inch	Address:	3609 International Blvd.
Depth of Well:	30.00	feet		Oakland, CA
Elevation of the Casing:	94.84	feet	Date:	August 9, 2000
Depth to Water Table:	12.07	feet	Sampler:	Naser Pakrou
Elevation of Water Table:	82.77	feet		Patrick Sullivan
Height of Water:	17.93	feet		
Purged Volume:	12	gallons		

Purging Method: Bailer □ Pump ■

Sampling Method: Bailer ■ Bailer □

Sheen: Yes □ No ■ Describe

Odor: Yes □ No ■ Describe

Field Measurements

Time	Redox	D.O.	Fe^{+2}	NO_3^--N	SO_4^{+2}	pH	Temp	E.C.	Turbidity
	mv	mg/L	mg/L	mg/L	mg/L		°C	us/cm	FTU
2:20 PM	-48.0	0.31	2.84	0.0	0.0	7.04	19.4	506	56

Soma

2680 Bishop Dr., Ste 203
San Ramon, CA 94583

Client Project ID:
2331
Tony's Express Auto
Oakland, CA

Ref.:	R5186400
Method	5030 GCFID/ 8020
Sampled:	8/9/00
Received:	8/10/00
Matrix:	Water
Analyzed:	8/16-18/00
Reported:	8/18/00
Units:	ug/L

Attention : Dr. M. Sepehr

Laboratory Results for BTEX , MTBE & TPH-G Analysis

Sample	Benzene	Toluene	Ethylbenzene	Total-Xylene	MTBE	TPH-Gas
MW-1	638	ND	ND	ND	17.1*	11000
MW-2	ND	ND	ND	ND	ND	ND
MW-3	8900	5636	883	7356	176*	76000
MW-4	5.08	ND	ND	ND	ND*	370
MW-5	ND	ND	ND	ND	ND	ND
MW-6	1306	870	ND	5162	ND*	24000
MW-7	ND	ND	ND	ND	11.7*	80
MW-8	632	5.38	ND	2686	37.3*	22000
MW-10	1055	25.8	54.2	53.8	1283*	6800
MW-11	10.5	5.94	ND	7.75	ND*	590
MW-12	15.4	12.4	ND	ND	185*	1730
Det.Limits	5 ug/L	5 ug/L	5 ug/L	5 ug/L	5 ug/L	50 ug/L
Method	8020	8020	8020	8020	8020/8260	5030/GCFID

* The results reported for MTBE are confirmed values by GC/MS; EPA 8260.

Delta Environmental Laboratories

Hossein KhoshKhoo, Ph.D.,
Laboratory Director/ President

DELTA
ENVIRONMENTAL LABORATORIES, Ltd

Quality Control Report

SOMA
2680 Bishop Drive, Suite 203
San Ramon, CA 94583

Client Project ID:
2331
Tony's Express Auto
Oakland, CA

Sample Spiked: Blank

Attention: Dr. M Sepehr

Ref.:	Q 5186400
Method	5030 GCFID/ 8020 / 8260
Sampled:	8/9/00
Received:	8/10/00
Matrix:	Water
Analyzed:	8/16-18/00
Analyst	DS
Reported:	8/18/00
Units:	ug/L

Quality Control Report for TPH ,BTEX & MTBE

Analyte	Detection Limit ug/L	Sample Result ug/L	Spike Added ug/L	% MS Recovery	% MSD Recovery	Relative % Difference RPD	Method
Benzene	5.0	ND	20	102	103	1.0	8020
Toulene	5.0	ND	20	104	105	1.0	8020
Ethylbenzene	5.0	ND	20	96	91	5.3	8020
T-Xylene	5.0	ND	40	104	105	1.0	8020
MTBE	5.0	ND	20	115	116	0.9	8260
TPH-Gas,GC/FID	50	ND	400	105	103	1.9	5030

Delta Environmental Laboratories

H.Khosh Khoo, PhD.,
Laboratory Director/President

Delta Environmental Laboratories

Chain of Custody (COC) Form

685 Stone Road #11 & 12
Benicia, Ca, 94510
(707) 747-6081, 800-747-6082 FAX (707) 747-6082

#2371

Results to:	Naser Pakrow
Client Name	SOMA
Address	
City	
Telephone	(925) 244-6600 Fax: (925) 244-6601
SAMPLER (signature)	Patrick Sullivan
Turnaround Time	Standard

Project Name: Tonys Express Auto
Oakland CA
LAB ID: 5186 (1/2)
Ref #:

Special Instructions::

#	Sample ID	Date	Time	Matrix	No. of containers	pH	Temperature	TPHg, MTBE, BTEX	confirm MTBE w/ 8260	Comments
1	MW-1	8/9	12:15	H_2O	2			✓	✓	
2	MW-2		9:30 AM		2			✓	✓	
3	MW-3		10 AM		2			✓	✓	
4	MW-4		2pm		2			✓	✓	
5	MW-5		11:30 AM		2			✓	✓	
6	MW-6		11:15 AM		2			✓	✓	
7	MW-7		12pm		2			✓	✓	
8	MW-8		1pm		2			✓	✓	
9	MW-10		3pm		2			✓	✓	
10	MW-11		3:30 PM		2			✓	✓	

Relinquished by:	Date 8/10/00	1)	Have all samples received been stored on ice? ___
Received By:	Date 8/10/00	2)	Did any VOA samples received have any head space? ___
Relinquished by:	Date	3)	Were samples in appropriate containers and packaged properly? ___
Received By:	Date	4)	Were samples receicved in good condition? ___

For Lab Use Only:

Delta Environmental Laboratories

Chain of Custody (COC) Form

685 Stone Road #11 & 12
Benicia, Ca, 94510
(707) 747-6081, 800-747-6082 FAX (707) 747-6082

#2331

Results to:	Naser Pakrou
Client Name	SOMA
Address	
City	
Telephone	(925) 244-6600 Fax (925) 244-6601
SAMPLER (signature)	Patrick C. Sullivan
Turnaround Time	Standard

Project Name: Tonys Express Auto
Oakland, CA

LAB ID: 5186 (2/2)

Ref #:

Special Instructions::

#	Sample ID	Date	Time	Matrix	No. of containers	pH	Temperature	TPHg, BTEX, MTBE by 8260	confirm MTBE by 8260	Comments
11	MW-12	8/9	2:20p	H_2O	2			X	X	

Relinquished by:	Patrick C. Sullivan	Date	8/10/00
Received By:		Date	8/10/00
Relinquished by:		Date	
Received By:		Date	

1) Have all samples received been stored on ice? ____
2) Did any VOA samples received have any head space? ____
3) Were samples in appropriate containers and packaged properly? ____
4) Were samples receicved in good condition? ____

For Lab Use Only:

TABLE A — Solubility of Oxygen in mg/L in Water Exposed to Air at 760 mm Hg Pressure

Temp °C	Chlorinity: 0 Salinity: 0	5.0 9.0	10.0 18.1	15.0 27.1	20.0 36.1	25.0 45.2
0.0	14.62	13.73	12.89	12.10	11.36	10.66
1.0	14.22	13.36	12.55	11.78	11.07	10.39
2.0	13.83	13.00	12.22	11.48	10.79	10.14
3.0	13.46	12.66	11.91	11.20	10.53	9.90
4.0	13.11	12.34	11.61	10.92	10.27	9.66
5.0	12.77	12.02	11.32	10.66	10.03	9.44
6.0	12.45	11.73	11.05	10.40	9.80	9.23
7.0	12.14	11.44	10.78	10.16	9.58	9.02
8.0	11.84	11.17	10.53	9.93	9.36	8.83
9.0	11.56	10.91	10.29	9.71	9.16	8.64
10.0	11.29	10.66	10.06	9.49	8.96	8.45
11.0	11.03	10.42	9.84	9.29	8.77	8.28
12.0	10.78	10.18	9.62	9.09	8.59	8.11
13.0	10.54	9.96	9.42	8.90	8.41	7.95
14.0	10.31	9.75	9.22	8.72	8.24	7.79
15.0	10.08	9.54	9.03	8.54	8.08	7.64
16.0	9.87	9.34	8.84	8.37	7.92	7.50
17.0	9.67	9.15	8.67	8.21	7.77	7.36
18.0	9.47	8.97	8.50	8.05	7.62	7.22
19.0	9.28	8.79	8.33	7.90	7.48	7.09
20.0	9.09	8.62	8.17	7.75	7.35	6.96
21.0	8.92	8.46	8.02	7.61	7.21	6.84
22.0	8.74	8.30	7.87	7.47	7.09	6.72
23.0	8.58	8.14	7.73	7.34	6.96	6.61
24.0	8.42	7.99	7.59	7.21	6.84	6.50
25.0	8.26	7.85	7.46	7.08	6.73	6.39
26.0	8.11	7.71	7.33	6.96	6.62	6.29
27.0	7.97	7.58	7.20	6.85	6.51	6.18
28.0	7.83	7.44	7.08	6.73	6.40	6.09
29.0	7.69	7.32	6.96	6.62	6.30	5.99
30.0	7.56	7.19	6.85	6.51	6.20	5.90
31.0	7.43	7.07	6.73	6.41	6.10	5.81
32.0	7.31	6.96	6.62	6.31	6.01	5.72
33.0	7.18	6.84	6.52	6.21	5.91	5.63
34.0	7.07	6.73	6.42	6.11	5.82	5.55
35.0	6.95	6.62	6.31	6.02	5.73	5.46
36.0	6.84	6.52	6.22	5.93	5.65	5.38
37.0	6.73	6.42	6.12	5.84	5.56	5.31
38.0	6.62	6.32	6.03	5.75	5.48	5.23
39.0	6.52	6.22	5.93	5.66	5.40	5.15
40.0	6.41	6.12	5.84	5.58	5.32	5.08
41.0	6.31	6.03	5.75	5.49	5.24	5.01
42.0	6.21	5.93	5.67	5.41	5.17	4.93
43.0	6.12	5.84	5.58	5.33	5.09	4.86
44.0	6.02	5.75	5.50	5.25	5.02	4.79
45.0	5.93	5.67	5.41	5.17	4.94	4.72

TABLE B — Calibration Values for Various Atmospheric Pressures and Altitudes

PRESSURE		ALTITUDE			CORRECTION
in. Hg	mm Hg	kPa	Feet	m	FACTOR (%)
30.23	768	102.3	-276	-84	101
29.92	760	101.3	0	0	100
29.61	752	100.3	278	85	99
29.33	745	99.3	558	170	98
29.02	737	98.3	841	256	97
28.74	730	97.3	1126	343	96
28.43	722	96.3	1413	431	95
28.11	714	95.2	1703	519	94
27.83	707	94.2	1995	608	93
27.52	699	93.2	2290	698	92
27.24	692	92.2	2587	789	91
26.93	684	91.2	2887	880	90
26.61	676	90.2	3190	972	89
26.34	669	89.2	3496	1066	88
26.02	661	88.2	3804	1160	87
25.75	654	87.1	4115	1254	86
25.43	646	86.1	4430	1350	85
25.12	638	85.1	4747	1447	84
24.84	631	84.1	5067	1544	83
24.53	623	83.1	5391	1643	82
24.25	616	82.1	5717	1743	81
23.94	608	81.1	6047	1843	80
23.62	600	80.0	6381	1945	79
23.35	593	79.0	6717	2047	78
23.03	585	78.0	7058	2151	77
22.76	578	77.0	7401	2256	76
22.44	570	76.0	7749	2362	75
22.13	562	75.0	8100	2469	74
21.85	555	74.0	8455	2577	73
21.54	547	73.0	8815	2687	72
21.26	540	71.9	9178	2797	71
20.94	532	70.9	9545	2909	70
20.63	524	69.9	9917	3023	69
20.35	517	68.9	10293	3137	68
20.04	509	67.9	10673	3253	67
19.76	502	66.9	11058	3371	66