THRIFTY OIL CO.

R05

April 26, 2006

O.65987

Mr. Amir Gholami, REHS
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Local #RO0000005
RWQCB #01-1479

2006 MAY -1 PM 2:46

RE: **Former Thrifty Oil Co. Station #063**
ARCO Products Company Station #9542
6125 Telegraph Avenue
Oakland, CA
Site Conceptual Model and
Plume Travel Time Report

Dear Mr. Gholami:

Presented herein is the *Site Conceptual Model and Plume Travel Time Report* prepared for former Thrifty Oil Co. (Thrifty) Station #063 located at 6125 Telegraph Avenue, Oakland, California. As requested this report contains a discussion of sensitive receptors, plot plans showing excavation areas and existing UST components, depth specific soil and groundwater isoconcentration maps for pre- and post-remediation, tables of historical soil and groundwater data with comparisons to ESLs and Regional Board Basin Plan water quality objectives, a complete list of all boring logs, and cross sections showing borings, wells, preferential pathways, excavation boundaries, water levels, and residual contamination.

Should you have any questions regarding this report, please contact either Michael Bowery or myself at 562 921-3581.

Respectfully submitted,

Chris Panaitescu
General Manager
Environmental Affairs

cc: BP West Coast Products LLC; Mr. Bobby Lu, P.G
File

Site Conceptual Model and Plume Travel Time Report

Thrifty Oil Co. Station No. 063
6125 Telegraph Avenue
Oakland, California

RWQCB File No. 01-1479
Facility Global ID No. T0600101366

April 24, 2006
GHC 1332

Prepared for
Thrifty Oil Co.
13116 Imperial Highway
Santa Fe Springs, California 90670

Prepared by
GeoHydrologic Consultants, Inc.
5912 Bolsa Avenue, Suite 200
Huntington Beach, California 92649

CONTENTS

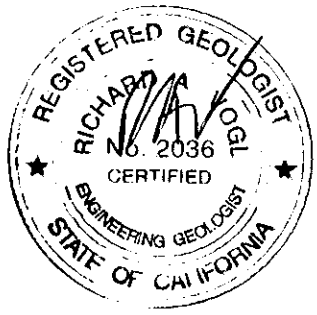
APPENDICES

CERTIFICATION

All hydrogeologic and geologic information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by a GeoHydrologic Consultants, Inc. California Registered Geologist.

April 24, 2006

Richard A. Vogl — Date
Principal Hydrogeologist
California Registered Geologist (5526)
California Certified Hydrogeologist (47)
California Certified Engineering Geologist (2036)



1.0 INTRODUCTION

On behalf of Thrifty Oil Co. (Thrifty), GeoHydrologic Consultants, Inc. (GHC) has prepared this report to fulfill the requirements of the Alameda County Health Care Agency (ACHCA), which required Thrifty to prepare a Site Conceptual Model for Thrifty Station No. 063 located at 6125 Telegraph Avenue in Oakland, California ("the Site"; **Figure 1**). The requirements of this work were set forth in the ACHCA's letter to Thrifty dated December 7, 2005. The purpose of this work is to summarize all activities that have occurred at the Site to date.

2.0 SITE DESCRIPTION

The Site is an active service station located at the southwest corner of the intersection of Telegraph Avenue and 62nd Street in the City of Oakland, California. The Site consists of two active pump islands, a service station building, and two 20,000-gallon double-walled underground storage tanks (USTs) (**Figure 2**).

3.0 SITE CHARACTERIZATION DATA

3.1 Geology / Hydrogeology

3.1.1 Geology

The Site is located at 6125 Telegraph Avenue in the City of Oakland (**Figure 1**) at an elevation of approximately 145 feet above mean sea level. Local topography slopes to the southwest at approximately 0.025 feet/foot. The Site is located within the San Francisco Bay structural depression of the Coast Ranges Physiographic Province in north-central Alameda County, California. The Site is situated in the flatland region between the San Francisco Bay and the Oakland Hills. This flatland region is comprised of Quaternary alluvium and estuarine bay and marsh deposits. Bedrock in the area consists of sedimentary, metasedimentary, volcanic, and intrusive rocks of Jurassic through Tertiary geologic age. Quaternary-age marine and alluvial sediments blanket the downwarped bedrock within the basin in which the Site is located. Shallow groundwater is locally present within the Quaternary sediments. The Site is underlain by Holocene alluvium and marsh deposits comprised of silts and clay. Soil types encountered during site investigation activities consisted predominantly of silty clay and silty sand from the ground surface to the total depth of investigation (30 feet).

Geologic cross sections are included as **Figures 3A, 3B,** and **3C**. The lines of cross section are shown in **Figure 2**.

3.1.2 Hydrogeology

The area of investigation lies within the East Bay Plain groundwater basin which consists of two main water bearing units. The primary unit is comprised of unconsolidated alluvial deposits of Late Quaternary age and a secondary, older semi-consolidated deposit of Tertiary-Quaternary age. Groundwater within these deposits is both confined and unconfined, with the majority of the aquifers being confined. The Site is within the Berkeley alluvial plain sub area of the Bay Plains Groundwater Basin.

Groundwater is present beneath the Site under unconfined conditions at depths ranging from approximately 14.55 feet bgs in MW-6 to 18.19 feet bgs in MW-1 (**Table 2A**). A groundwater elevation contour map based on the October 12, 2005 monitoring data indicates that groundwater flows to the west-southwest at an approximate gradient of 0.0649 feet/foot (**Figure 5**).

3.1.3 Production Well Survey

In 1986, Woodward Clyde Consultants (WCC) conducted a production well survey. Records found indicated that approximately five wells exist within a one mile radius of the Site. Two of the wells in the area are, or were, used for industrial purposes, two for irrigation, and one for domestic use. No municipal wells were identified anywhere near the Site. The closest well is the domestic well located approximately ¼ mile (approximately 1,300 feet) to the south of the Site. The closest well in the downgradient direction is an irrigation well located ½ mile (approximately 2,640 feet) to the west-northwest of the Site. *Through phone correspondence on April 12, 2006 with James Yoo of the County of Alameda Public Works Agency, it was found that no production wells have been installed near the Site since WCC conducted their production well survey, and that there are no closer wells than the ones described above.* The locations of the wells are shown in **Appendix E**.

3.2 Sensitive Receptor Survey

Based on the production well survey conducted by WCC, the closest sensitive receptor is a domestic well located approximately ¼ mile (approximately 1,300 feet) to the south of the Site. There appear to be no sensitive receptors such as surface water bodies within at least a half mile radius of the Site. The San Francisco Regional Water Quality Control Board's (SFRWQCB) Basin Plan indicates that groundwater within the basin has existing beneficial uses for municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply (**Appendix F**).

3.3 Previous Site Assessment Activities

An initial site assessment was conducted by Groundwater Technology from June through August of 1986 which consisted of advancing three soil borings and installing three 2-inch monitoring wells (MW-1 through MW-3) to 30 feet bgs. Soil samples were taken at

five foot intervals in all borings beginning at a depth of 6 to 8 feet. The samples taken at a depth of 14 to 14.5 in borings MW-2 and MW-3 and at a depth of 17 to 17.5 feet in boring MW-1 were submitted for laboratory analysis. The sample from MW-2 was found to contain 735 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPHg) while samples from MW-1 and MW-3 contained 471.5 ppm and 52 ppm, respectively. Benzene concentrations in the three wells ranged from 5.4 ppm to 12.6 ppm. Groundwater samples were collected and TPHg was detected in MW-4 at 100 ppm. The SFRWQCB Environmental Screening Levels (ESLs) for TPHg, benzene, toluene, ethylbenzene, xylenes, and MTBE in soil are 100 mg/kg, 0.044 mg/kg, 2.9 mg/kg, 3.3 mg/kg, 2.3 mg/kg, and 0.023 mg/kg, respectively. The presence of free product was observed in all three wells at a thickness of 0.01 feet in MW-1, 0.84 feet in MW-2, and 0.46 feet in MW-3.

A follow-up assessment in November 1986 was conducted by Woodward-Clyde Consultants (WCC) and consisted of advancing three 30-foot deep borings and installing three monitoring wells (MW-4 through MW-6). Soil samples were taken at five foot intervals down to the water table in all borings. Only those samples exhibiting signs of contamination and/or located at the water table were submitted for laboratory analysis. TPHg and benzene were detected in MW-4 at the 16 foot interval at concentrations of 1,100 mg/kg and 13 mg/kg, respectively (TPHg soil ESL is 100 mg/kg). Groundwater samples were collected and TPHg was detected in MW-4 at 100 ppm (TPHg Regional Board Basin Plan Groundwater Objective (BPO) is 100 µg/L). The presence of free product was observed in MW-1 through MW-3, which supported a previous assumption that some free product was still present in the tank backfill. The original product thicknesses were greater, but a manual bailing recovery program implemented by Thrifty had reduced the thicknesses considerably. The presence of product in MW-2 was likely due to its close proximity to the backfill while the product in MW-3 was probably a result of it being located downgradient of the backfill. The low permeability nature of the clayey substrate surrounding the tank pit area would have tended to contain, within the backfill, any free product that may have accumulated from occasional overfills or historical leaks.

On September 11, 1987, a limited subsurface investigation was conducted by Hydrotech Consultants, Inc. Four soil borings were advanced to 20 feet bgs and soil samples were taken at five foot intervals. Laboratory analysis was performed on soil samples recovered from B-1 at the 10 and 20 foot intervals. Both soil samples analyzed contained less than 10 mg/kg TPHg.

On June 11 and 12, 1997, a baselining subsurface investigation was conducted by Pacific Environmental Group, Inc. Seven soil borings were advanced to 20 feet bgs (TDD-1 through TDD-5,TDD-8 and TDD-9) and two soil borings were advanced to 10 feet bgs (TDD-6 and TDD-7) and soil samples were collected at five foot intervals. TPHg was detected in boring TDD-6 at the five foot interval at a concentration of 550 mg/kg, and in borings TDD-1 through TDD-4 at the 15 foot interval at concentrations of 480 mg/kg, 37.0 mg/kg, 7.5 mg/kg, and 36 mg/kg, respectively (TPHg soil ESL is 100 mg/kg). Benzene concentrations ranged from below the laboratory method detection limit (MDL) to 2.5 mg/kg in TDD-6 at the five foot interval (benzene soil ESL is 0.044 mg/kg).

MTBE concentrations ranged from below the MDL to 12 mg/kg in TDD-3 at the 15 foot interval (MTBE soil ESL is 0.023 mg/kg). MTBE was not confirmed using EPA method 8260B.

On February 4, 1998, three gasoline USTs and their associated piping were removed from the Site under the supervision of Pacific Environmental Group, Inc. The tanks consisted of two 10,000-gallon and one 12,000-gallon capacity USTs and were constructed of steel coated with fiberglass. On February 10, 1998, two 20,000-gallon double-walled USTs were installed at the Site. Approximately 977 tons of impacted soil was excavated and disposed of offsite. Soil samples were collected and analyzed. Areas of petroleum hydrocarbon impacted soil were present in the former UST basin and the product piping trenches. TPHg concentrations from the former UST excavation ranged from below the laboratory MDL in T-3 to 260 mg/kg in T-2. TPHg concentrations from the piping samples ranged from below the laboratory MDL in P-3 to 1,200 mg/kg in P-2 (TPHg ESL for soil is 100 mg/kg).

Copies of historic boring and well logs are included in **Appendix C**. The ESLs for soil and the BPOs for groundwater are included in **Appendix D**.

3.4 Previous Remedial Activities

During the UST removal activities in February 1988, approximately 977 tons of impacted soil was excavated and disposed of offsite.

Site remedial activities were initiated in April 1991. Presently, the remediation system consists of a groundwater treatment system that extracts groundwater from monitoring wells MW-3 and MW-4 with treatment utilizing activated carbon. System operational data is included in **Appendix B**. As of December 15, 2005, the groundwater treatment system treated approximately 2,705,679 gallons of groundwater since start-up in April 1991. The system was upgraded in the 2nd quarter 2005, consisting of a pump replacement in well MW-3 and the adding of well MW-4 to the extraction well array. On May 10, 2005, the system was restarted with a new pump in well MW-3 and on May 13, 2005 a pump was installed in well MW-4. The pump in well MW-4 was started on May 20, 2005.

4.0 SITE CONCEPTUAL MODEL

This Site Conceptual Model was prepared on behalf of Thrifty Oil Co. (Thrifty) to fulfill the requirements set forth by the Alameda County Health Care Agency (ACHCA) in their letter dated December 7, 2005. As additional information is obtained from the Site, the Site Conceptual Model will be updated appropriately. The current Site Conceptual Model is as follows:

- Soils beneath the Site consist primarily of silty clay and silty sand from the ground surface to the total depth of investigation (30 feet) (**Figures 3A, 3B**, and **3C**).

Bedrock in the area consists of sedimentary, metasedimentary, volcanic, and intrusive rocks of Jurassic through Tertiary geologic age. **Figures 4A** through **4L** show the pre and post- remediation distributions of TPHg, benzene, and MTBE in shallow and deep soil depths.

- Groundwater beneath the Site is under unconfined conditions at a depth of approximately 15 to 18 feet below grade. Groundwater has historically flowed approximately southwest at a hydraulic gradient ranging from approximately 0.04 feet per foot to 0.06 feet per foot. Currently, the depth to groundwater beneath the Site ranges from 18.19 feet below the ground surface (81.15 feet above sea level) in MW-1 to 14.55 feet below the ground surface (85.89 feet above sea level) in MW-6, as measured on October 12, 2005. Groundwater is flowing towards the west-southwest at an approximate gradient of 0.0649 feet/foot (**Figure 5**). Based on this gradient, an estimated hydraulic conductivity of a silt of 0.08 m/day (Todd, 1980) and an assumed porosity of 46 percent, the groundwater velocity beneath the Site is calculated to be approximately 0.01 meters per day or 4 meters per year.

- Utility locations including gas, cable, electric, sewer, and storm drains are located under 62nd Street and Telegraph Avenue at depths between 5 and 10 feet as shown in **Figure 8**.

- During the 4th quarter 2005 groundwater sampling event on October 12, 2005, samples were taken from wells MW-1 and MW-3 through MW-6. TPHg was detected in wells MW-4 and MW-5 at concentrations of 25,700 µg/L and 149 µg/L, respectively. Benzene was detected in well MW-4 at a concentration of 177 µg/L. MTBE was detected in wells MW-4 and MW-5 at concentrations of 4,810 µg/L and 183 µg/L, respectively. The BPOs for TPHg, benzene, and MTBE in groundwater are 100 µg/L, 1 µg/L, and 5 µg/L, respectively. Post-remediation (samples taken on October 12, 2005) distributions of TPHg, benzene, and MTBE in groundwater are shown in **Figures 6A**, **6B**, and **6C**, respectively. Pre-remediation (samples taken on November 21, 1986) distributions of TPHg, benzene, and MTBE in groundwater are shown in **Figures 6D**, **6E**, and **6F**, respectively. Pre-remediation results also show the presence of free product in wells MW-2 and MW-3. Groundwater sample laboratory results with reference to the BPOs are shown in **Table 2A**. The results for other oxygenates detected in groundwater are shown in **Table 2B**.

- The main contaminants of concern at the Site are benzene and MTBE, because of the toxicity of benzene, and the solubility, odor, and taste threshold associated with MTBE. Potential exposure pathways include ingestion of groundwater that has been impacted by these fuel constituents. Under typical subsurface conditions, benzene will naturally attenuate through volatilization, dispersion, and biodegradation to plume lengths of less than 150 to 200 feet. Based on historical data for the Site, it appears that the benzene plume and the total petroleum hydrocarbons (TPH), ethylbenzene, toluene, and xylene plumes have all been stable and/or shrinking as a result of natural attenuation. On the other hand, MTBE is very soluble, appears to be far more resilient to biodegradation compared to TPH and benzene, toluene, ethylbenzene, and total xylenes (BTEX) compounds, and longer plumes can typically

be expected. The concentrations of MTBE detected in groundwater in the onsite wells have decreased somewhat over time (**Figure 7** series). The groundwater sampling event (October 2005) indicated that the maximum MTBE concentration detected in groundwater was 4,810 µg/L in MW-4.

- Hydrocarbon soil contamination was first detected in June 1986 in three 30-foot deep borings (MW-1 through MW-3) at concentrations up to 735 mg/kg of total recoverable petroleum hydrocarbons, indicating that the initial petroleum hydrocarbons release occurred at some point prior to this first assessment in the area of the USTs.

- On February 4, 1998, three gasoline USTs and their associated piping were removed from the Site under the supervision of Pacific Environmental Group, Inc. The tanks consisted of two 10,000-gallon and one 12,000-gallon capacity USTs and were constructed of steel coated with fiberglass. On February 10, 1998, two 20,000-gallon double-walled USTs were installed at the Site. Approximately 977 tons of impacted soil was excavated.

- Based on calculations using a soil density of 120 lbs/ft^3, the area of lateral and vertical extent of contamination, and the average constituent concentration per plume, GHC estimates the mass of TPHg in soil beneath the Site to be approximately 4,941 pounds (based on an area that is 100 feet long by 75 feet wide by 15 feet deep), the mass of benzene in soil beneath the Site to be approximately 21 pounds (based on an areas that are 50 feet wide by 65 feet long by 15 feet deep and 25 feet long by 15 feet wide by 15 feet deep), and the mass of MTBE in soil beneath the Site to be approximately 18 pounds (based on areas that are 38 feet long by 17 feet wide by 15 feet deep and 10 feet long by 10 feet wide by 15 feet deep). These figures were calculated from the historic soil concentration data (**Table 1**) and soil concentration maps (**Figures 4A** through **4L**).

- TPHg concentrations in excess of 100 mg/kg are confined to depths of 17 feet bgs or less and the vertical and horizontal extent of contamination has been fairly defined at the Site. The downward vertical migration of petroleum hydrocarbons in soil beneath the Site appears to have been substantially attenuated at relatively shallow depths as a result of the lower permeability soils which were encountered at these same shallow depths beneath the Site, as demonstrated by the decrease in hydrocarbon soil concentrations to low levels or non-detectable levels at depth. For example, soil samples analyzed for TPHg from borings TDD-1, TDD-2, and TDD-3 at the 15 foot interval were 480 mg/kg, 37.0 mg/kg, and 7.5 mg/kg, respectively. At the 20 foot interval, TPHg is below the laboratory method detection limits, as shown in **Table 1** along with reference to soil ESLs. Shallow, pre-remediation (samples taken between 0-10 feet bgs before April, 1991) TPHg, benzene, and MTBE soil concentration maps are included as **Figures 4A** through **4C**, respectively. Deep, pre-remediation (samples taken between 11-20 feet bgs before April, 1991) TPHg, benzene, and MTBE soil concentration maps are included as **Figures 4D** through **4F**, respectively. Shallow, post-remediation (samples taken between 0-10 feet bgs after April, 1991) TPHg, benzene, and MTBE soil concentration maps are included as **Figures 4G** through **4I**,

respectively. Deep, post-remediation (samples taken between 11-20 feet bgs after April, 1991) TPHg, benzene, and MTBE soil concentration maps are included as **Figures 4J** through **4L**, respectively.

- Site remedial activities were initiated in April 1991. Presently, the remediation system consists of a groundwater treatment system that extracts groundwater from monitoring well MW-3 and MW-4 with treatment utilizing activated carbon. System operational data is included in **Appendix B**. As of March 1, 2006, the groundwater treatment system has treated approximately 2,728,169 gallons of groundwater since start-up in April 1991. The system was upgraded in the 2nd quarter 2005, consisting of a pump replacement in well MW-3 and the adding of well MW-4 to the extraction well array. On May 10, 2005, the system was restarted with a new pump in well MW-3 and on May 13, 2005 a pump was installed in well MW-4. The pump in well MW-4 was started on May 20, 2005.

- As demonstrated by the BIOSCREEN Natural Attenuation Decision Support System runs included in the following section, the MTBE contaminant plume with no degradation arrives at the receptor (groundwater production well; 1,300 feet downgradient) at year 80. A maximum concentration of MTBE is observed at this receptor well at years 116 and 117 at a concentration of 0.489 mg/L, which is above the MCL of 0.013 mg/L, and the plume becomes detached from the source at year 308. The plume impacts the assumed well at concentration below the MCL from approximately year 80 through year 87. The results of using the 1st Order Decay model show that the contaminant plume never arrives at the receptor (groundwater production well; 1,300 feet). The plume never impacts the well at concentration above the MCL.

- As demonstrated by the BIOSCREEN Natural Attenuation Decision Support System runs included in the following section, the benzene contaminant plume with no degradation arrives at the receptor (groundwater production well; 1,300 feet downgradient) at year 120. A maximum concentration of benzene is observed at this receptor well at years 140 through 211 at a concentration of 0.029 mg/L, which is above the MCL of 0.001 mg/L, and the plume becomes detached from the source at year 11,955. The 1st Order Decay model results in the benzene plume never arriving at the receptor and only achieving a plume length under 100 feet in total length. The plume never impacts the assumed well at concentration above the MCL.

5.0 PLUME TRAVEL TIME REPORT

The plume travel time was estimated using BIOSCREEN Natural Attenuation Decision Support System. BIOSCREEN is an easy to use screening model that simulates remediation through natural attenuation (RNA) of dissolved hydrocarbons at petroleum release sites. The software, programmed in Microsoft Excel spreadsheet environment and based on the Domenico analytical solute transport model, has the ability to simulate advection, dispersion, adsorption, and aerobic decay as well as anaerobic reactions that

have been shown to be the dominant biodegradation process at many petroleum release sites. BIOSCREEN includes three different model types:

- solute transport without decay
- solute transport with biodegradation modeled as a first-order decay process (simple, lumped-parameter approach)
- solute transport with biodegradation modeled as an "instantaneous" biodegradation reaction (approach used by BIOPLUME models)

In our case all three models types would be applicable for the Site, although the solute transport without decay model will be used as a worst case scenario. Based on the actual observed groundwater conditions at the Site, the solute transport first-order decay model appears to be most representative of actual Site conditions including plume sizes and concentrations for MTBE. If natural attenuation analytical results were present for the Site these values were used for input parameters in the "Instantaneous" Biodegradation Reaction. If Site data was not available, model default parameters were used.

The model is designed to simulate biodegradation by both aerobic and anaerobic reactions. It was developed for the Air Force Center for Environmental Excellence (AFCEE) Technology Transfer Division at Brooks Air Force Base by Groundwater Services, Inc., of Houston, Texas.

BIOSCREEN attempts to answer the two fundamental questions regarding RNA:

- How far will the dissolved contaminant plume extend if no engineered controls or further source reduction measures are implemented?
- How long will the plume persist until natural attenuation processes cause it to dissipate?

BIOSCREEN has the following limitations:

- As an analytical model, BIOSCREEN assumes simple groundwater flow conditions.
- As a screening tool, BIOSCREEN only approximates more complicated processes that occur in the field.

Site-specific data was entered into BIOSCREEN to determine the degree of RNA. Site-specific data such as hydraulic conductivity and porosity were based on text book values for similar as observed at the Site (Todd 1980). The Site specific groundwater gradient which was obtained from the latest quarterly sampling event was used and the model length was set at the distance from the closest groundwater production well (which is located approximately 1,300 feet to the south of the Site, based on a production well survey performed by WCC). It was assumed that this well was downgradient during the simulation, and that the gradient in the model was equal to that measured at the Site

during this quarter. Input parameters such as the estimated plume length and the concentrations of MTBE and benzene were also based on the actual Site data collected this quarter. The highest concentration of benzene in groundwater was detected at 177 µg/L (0.117 mg/L), which was used for the purpose of the model. The highest concentration of MTBE in groundwater was detected at 4,810 µg/L (4.81 mg/L), which was used for the purpose of the model. The source mass for benzene was assumed to be equal to the mass of benzene in one pore volume of groundwater for a dissolved phase benzene plume measuring 15 feet by 15 feet by 20 feet thick, at a concentration of 0.177 mg/L. The source mass for MTBE was assumed to be equal to the mass of MTBE in one pore volume of groundwater for a dissolved phase MTBE plume measuring 40 feet by 70 feet by 20 feet thick, at an MTBE concentration of 4.81 mg/L. The partitioning coefficient for MTBE (12.59 L/kg) was obtained from the American Petroleum Institute's Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE (Regulatory and Scientific Affairs Publication Number 4699 dated February 2000). The partitioning coefficient used for benzene was 38 L/kg. The fraction of organic carbon used (0.0025) was the mean concentration for site soils in the Los Angeles area as reported by the RWQCB in their Interim Site Assessment & Cleanup Guidebook dated May 1996.

- The input parameters and model results for MTBE at years 1, 79, 80, 87, 88, 115, 116, 117, 118, 307, and 308 are included in **Appendix A**. As demonstrated by the output included in **Appendix A**, the MTBE contaminant plume with no degradation arrives at the receptor (groundwater production well; 1,300 feet downgradient) at year 80. A maximum concentration of MTBE is observed at this receptor well at years 116 and 117 at a concentration of 0.489 mg/L, which is above the MCL of 0.013 mg/L, and the plume becomes detached from the source at year **308**. The plume impacts the assumed well at concentration below the MCL from approximately year 80 through year 87. The results of using the 1st Order Decay model show that the contaminant plume never arrives at the receptor (groundwater production well; 1,300 feet). The plume never impacts the well at concentration above the MCL.

- The input parameters and model results for benzene at years 1, 119, 120, 139, 140, 211, 212, 11,954, and 11,955 are included in **Appendix A**. As demonstrated by the BIOSCREEN Natural Attenuation Decision Support System runs included in the following section, the benzene contaminant plume with no degradation arrives at the receptor (groundwater production well; 1,300 feet downgradient) at year 120. A maximum concentration of benzene is observed at this receptor well at years 140 through 211 at a concentration of 0.029 mg/L, which is above the MCL of 0.001 mg/L, and the plume completely attenuates at the source at year 11,955. The 1st Order Decay model results in the benzene plume never arriving at the receptor and only achieving a plume length under 100 feet in total length. The plume never impacts the well at concentration above the MCL.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Site remedial activities have been progressing for the past 15 years. As of March 1, 2006, the groundwater treatment system treated approximately 2,728,169 gallons of groundwater since start-up in April 1991. Free product has successfully been removed from the subsurface since 1996. The quarterly groundwater monitoring results confirm that the contaminant plume is attenuating and that groundwater concentrations have been decreasing over time.

There are no sensitive receptors identified within 1,000 feet of the Site. Based on the BIOSCREEN 1st Order Decay model results for MTBE and benzene, it appears that the contaminant plume never impacts the nearest receptor (groundwater production well; 1,300 feet south of the Site) above the respective MCLs for MTBE and benzene, and the plume never reaches the sensitive receptor. The MTBE plume length stays below a length of 1,300 feet, and the benzene plume stays below a length of 100 feet.

Based on these conclusions, on behalf of Thrifty, GHC requests closure of the Site based on low risk criteria.

TABLES

TABLE 1

Historic Soil Sample Laboratory Analytical Results

Thrifty Oil Station #063 - Oakland, CA

GHC - 1332

Sample ID	Date Sampled	ANALYTICAL PARAMETERS					
		TPHg (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	MTBE (mg/Kg)
ESLs shallow soil (≤ 3m bgs)		***100***	***0.044***	***2.9***	***3.3***	***2.3***	***0.023***
ESLs deep soil (>3m bgs)		***100***	***0.044***	***2.9***	***3.3***	***2.3***	***0.023***
MW1-17	6/21/1986	**471**	**7.6**	**6.3**	**7.3**	**39.7**	-
MW2-14	6/21/1986	**735**	**12.6**	**26.4**	**10.7**	**64.3**	-
MW3-14	6/21/1986	**52**	**5.4**	**1.9**	**1.3**	**6.9**	-
MW4-10	11/13/1986	<10	<0.5	<0.5	-	<0.5	-
MW4-16	11/13/1986	**1100**	**13.0**	**14.0**	-	**34.0**	-
MW5-16	11/13/1986	<10	<0.5	<0.5	-	<0.5	-
MW6-15	11/13/1986	<10	<0.5	<0.5	-	<0.5	-
C-1	11/13/1986	**58**	<0.5	**5.8**	-	<0.5	-
B1-5	9/11/1987	-	-	-	-	-	-
B1-10	9/11/1987	<10	-	-	-	-	-
B1-15	9/11/1987	-	-	-	-	-	-
B1-20	9/11/1987	<10	-	-	-	-	-
B2-5	9/11/1987	-	-	-	-	-	-
B2-10	9/11/1987	-	-	-	-	-	-
B2-15	9/11/1987	-	-	-	-	-	-
B2-20	9/11/1987	-	-	-	-	-	-
B3-5	9/11/1987	-	-	-	-	-	-
B3-10	9/11/1987	-	-	-	-	-	-
B3-15	9/11/1987	-	-	-	-	-	-
B3-20	9/11/1987	-	-	-	-	-	-
B4-5	9/11/1987	-	-	-	-	-	-
B4-10	9/11/1987	-	-	-	-	-	-
B4-15	9/11/1987	-	-	-	-	-	-
B4-20	9/11/1987	-	-	-	-	-	-
TDD1-15	6/11/1997	**480**	**2.3**	<0.75	**7.0**	**42**	**1.7**
TDD1-20	6/11/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD2-15	6/11/1997	**37.0**	**0.19**	**0.13**	**0.61**	1.9	<1.0
TDD2-20	6/11/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD3-15	6/11/1997	**7.5**	**0.043**	<0.015	**0.044**	<0.045	**12**
TDD3-20	6/11/1997	<1.0	**0.11**	<0.0050	**0.0070**	<0.015	**3.2**
TDD4-15	6/11/1997	**36**	**0.41**	<0.038	**0.39**	**1.2**	**14**
TDD4-20	6/11/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	**1.4**
TDD5-10	6/12/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD5-20	6/12/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD6-5	6/11/1997	**550**	**2.5**	**5.5**	**9.7**	**50**	**6.0**
TDD6-10	6/11/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD7-5	6/11/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD7-10	6/11/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD8-10	6/12/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD8-20	6/12/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD9-5	6/12/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD9-10	6/12/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
TDD9-20	6/12/1997	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<1.0
T-1(8')	2/4/1998	**61**	**0.085**	1.3	**0.77**	**4.6**	**0.60**
T-2(8')	2/4/1998	**260**	<0.03	**0.18**	**3.0**	**1.1**	<0.3

TABLE 1
Historic Soil Sample Laboratory Analytical Results
Thrifty Oil Station #063 - Oakland, CA
GHC - 1332

Sample ID	Date Sampled	ANALYTICAL PARAMETERS					
		TPHg (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	MTBE (mg/Kg)
T-3(8')	2/4/1998	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
T-4(8')	2/4/1998	**2**	<0.005	<0.005	<0.005	**0.01**	**0.07**
UST-10	2/4/1998	**210**	<0.12	<0.5	**0.71**	**1.1**	<1.2
P-1	2/4/1998	**49**	**0.071**	**0.39**	**0.44**	**2.6**	<0.25
P-2	2/4/1998	**1,200**	**1.7**	**24**	**21**	**96**	**15**
P-3	2/4/1998	<5	**0.062**	**0.092**	**0.031**	**0.098**	**9.4**
P-4	2/4/1998	**310**	**1.6**	**25**	**7.4**	**47**	**26**
P-5	2/4/1998	**920**	**6.5**	**35**	**15**	**78**	**13**
P-6	2/4/1998	**330**	**1.9**	**5.5**	**8.3**	**38**	<2.5
SS-1	2/4/1998	<1.0	<0.005	<0.005	<0.005	**0.022**	**0.56**
SS-2	2/4/1998	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
SS-3	2/4/1998	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
SS-4	2/4/1998	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
SS-5	2/4/1998	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
SS-6	2/4/1998	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
SS-7	2/4/1998	<1.0	<0.005	**0.009**	<0.005	**0.008**	<0.05
SS-8	2/4/1998	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
SS-9	2/4/1998	<1.0	<0.005	**0.006**	<0.005	**0.017**	<0.05
SS-10	2/4/1998	<1.0	<0.005	<0.005	<0.005	**0.016**	<0.05
SS-11	2/4/1998	<1.0	<0.005	**0.007**	<0.005	**0.007**	<0.05
SS-12	2/4/1998	<1.0	<0.005	**0.032**	**0.017**	**0.19**	**0.56**
SS-13	2/4/1998	**2,700**	**4.03**	**66**	**42**	**220**	**6.4**
SS-14	2/4/1998	**4**	<0.005	**0.74**	**0.047**	**0.33**	**0.86**
SS-15	2/4/1998	**3,600**	**4.2**	**78**	**49**	**260**	**7.3**
SS-16	2/4/1998	**2,100**	**2.4**	**41**	**27**	**130**	**5.2**
SS-17	2/4/1998	**2,900**	**3.8**	**67**	**42**	**230**	**4.7**
SS-19	2/4/1998	**15**	**0.04**	**0.055**	**0.1**	**0.42**	**0.45**
SS-20	2/4/1998	**270**	<0.12	**1.9**	**2.7**	**16**	<1.2
SS-21	2/4/1998	**86**	<0.05	**0.6**	**0.75**	**4.2**	<0.5
SS-22	2/4/1998	**240**	**0.25**	**4.1**	**3.3**	**19**	<1.2
SS-23	2/4/1998	1	<0.005	**0.007**	**0.007**	**0.082**	**0.1**

NOTES: TPHg analyzed by EPA Method 8015M
BTEX and MTBE analysis by EPA Method 8260B
"<" = Less than the specified laboratory detection limit
"J" = Trace
* = Total Recoverable Petroleum Hydrocarbons
\- = Not analyzed
ESLs = Environmental Screening Levels
3m bgs = 3 meters (10 feet) below ground surface

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER (feet)	DEPTH TO PRODUCT (feet)	PRODUCT THICKNESS (feet)	CASING ELEVATION (feet)	GROUNDWATER ELEVATION (feet)
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)					
BPOs	100	1.0	40	30	20	5.0					
MONITORING WELL #MW-1				***Screen Interval = 15 to 30 feet***							
11/21/86	-	-	-	-	-	-	15.42	NP	0.00	99.34	83.92
07/22/91	-	-	-	-	-	-	20.41	FILM	0.00	99.34	78.93
10/24/91	-	-	-	-	-	-	19.06	SHEEN	0.00	99.34	80.28
01/22/92	-	-	-	-	-	-	18.78	SHEEN	0.00	99.34	80.56
03/24/92	-	-	-	-	-	-	13.55	SHEEN	0.00	99.34	85.79
07/15/92	-	-	-	-	-	-	18.90	FILM	0.00	99.34	80.44
10/05/92	-	-	-	-	-	-	20.50	FILM	0.00	99.34	78.84
01/06/93	-	-	-	-	-	-	14.93	FILM	0.00	99.34	84.41
07/13/93	-	-	-	-	-	-	15.44	FILM	0.00	99.34	83.90
10/11/93	-	-	-	-	-	-	20.36	FILM	0.00	99.34	78.98
01/11/94	-	-	-	-	-	-	19.50	FILM	0.00	99.34	79.84
04/12/94	-	-	-	-	-	-	18.10	FILM	0.00	99.34	81.24
07/14/94	-	-	-	-	-	-	20.03	FILM	0.00	99.34	79.31
01/15/96	11,000	2,800	150	780	770	-	19.02	NP	0.00	99.34	80.32
04/15/96	17,000	3,600	330	1,500	3,400	-	18.82	NP	0.00	99.34	80.52
07/15/96	12,000	1,300	200	1,200	4,600	250		NP	-	-	-
10/09/96	-	-	-	-	-	-	14.87	NP	0.00	99.34	84.47
01/13/97	27,000	810	6,000	570	4,100	2,700	10.20	NP	0.00	99.34	89.14
04/14/97	2,900	3.0	2.9	<0.3	1.7	9,900		NP	-	-	-
07/07/97	5,200	0.57	0.57	<0.3	0.71	16,000	18.75	NP	0.00	99.34	80.59
10/16/97	680	<0.3	0.55	<0.3	<0.5	-	17.92	NP	0.00	99.34	81.42
01/07/98	42,000	980	2,800	1,200	5,200	1.3	9.80	NP	0.00	99.34	89.54
04/06/98	7,100	700	340	170	2,600	1,000	9.60	NP	0.00	99.34	89.74
07/14/98	19,000	2,100	400	890	5,800	1,600	13.70	NP	0.00	99.34	85.64
10/15/98	490	<0.3	<0.3	<0.3	<0.5	1,300	15.25	NP	0.00	99.34	84.09
01/20/99	350	<0.3	<0.3	<0.3	<0.5	* 670 / 820	12.20	NP	0.00	99.34	87.14
04/16/99	320	<0.3	<0.3	<0.3	<0.5	* 540 / 630	12.20	NP	0.00	99.34	87.14
07/14/99	290	<0.3	<0.3	<0.3	<0.5	*590 / 580	13.75	NP	0.00	99.34	85.59
10/07/99	130	<0.3	<0.3	<0.3	<0.5	270	12.15	NP	0.00	99.34	87.19
01/26/00	13,000	460	54	290	3,700	940	13.14	NP	0.00	99.34	86.20
04/19/00	546	<0.25	<0.25	<0.25	<0.5	*430 / 606	10.63	NP	0.00	99.34	88.71
05/26/00	<50	<0.3	<0.3	<0.3	<0.6	<5	9.11	NP	0.00	99.34	90.23
07/26/00	<50	<0.3	<0.3	<0.3	<0.6	<5	9.10	NP	0.00	99.34	90.24

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER (feet)	DEPTH TO PRODUCT (feet)	PRODUCT THICKNESS (feet)	CASING ELEVATION (feet)	GROUNDWATER ELEVATION (feet)
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)					
10/25/00	<50	<0.18	<0.14	<0.18	<0.26	<0.24	9.08	NP	0.00	99.34	90.26
01/10/01	<50	<0.18	<0.14	<0.18	<0.26	<0.24	12.16	NP	0.00	99.34	87.18
04/23/01	18,100	740	55	650	4,000	*1,850 / 842	10.60	NP	0.00	99.34	88.74
07/16/01	<50	<0.18	<0.14	<0.18	<0.26	<0.24	9.07	NP	0.00	99.34	90.27
10/17/01	<50	<0.18	<0.14	<0.18	<0.26	<0.24	12.16	NP	0.00	99.34	87.18
01/23/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	15.23	NP	0.00	99.34	84.11
04/10/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	15.17	NP	0.00	99.34	84.17
07/24/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	16.71	NP	0.00	99.34	82.63
10/30/02	<50	2.2	<0.14	<0.18	<0.26	13	15.16	NP	0.00	99.34	84.18
01/15/03	465 J	<0.14	<0.07	<0.08	<0.35	147	16.70	NP	0.00	99.34	82.64
04/16/03	<15	<0.04	<0.02	<0.02	<0.06	<0.03	15.16	NP	0.00	99.34	84.18
07/14/03	<15	<0.22	<0.32	<0.31	<0.4	<0.18	13.64	NP	0.00	99.34	85.70
10/08/03	761	11	<0.32	1.4 J	2.9 J	653	15.50	NP	0.00	99.34	83.84
01/15/04	853	<0.04	<0.02	<0.02	<0.06	*1,100 / 558	14.20	NP	0.00	99.34	85.14
04/14/04	494	<2.2	<3.2	<3.1	<4.0	843	12.93	NP	0.00	99.34	86.41
07/29/04	1,040	<2.2	<3.2	<3.1	<4.0	1,070	14.73	NP	0.00	99.34	84.61
10/14/04	3,250	266	<0.32	59	78	811	15.26	NP	0.00	99.34	84.08
01/06/05	197	<0.22	<0.32	<0.31	<0.4	406	15.14	NP	0.00	99.34	84.20
04/13/05	<15	<0.22	<0.32	<0.31	<0.4	<0.18	9.40	NP	0.00	99.34	89.94
07/27/05	<2.9	<0.32	<0.10	<0.24	<0.30	<0.63	16.65	NP	0.00	99.34	82.69
10/12/05	<2.9	<0.32	<0.10	<0.24	<0.30	<0.63	18.19	NP	0.00	99.34	81.15
MONITORING WELL #MW-2				***Screen Interval = 15 to 30 feet***							
11/21/86	-	-	-	-	-	-	14.90	0.11	14.79	100.01	96.28
07/22/91	-	-	-	-	-	-	17.84	0.38	17.46	100.01	95.35
10/24/91	-	-	-	-	-	-	17.00	16.97	0.03	100.01	83.03
01/22/92	-	-	-	-	-	-	16.72	FILM	0.00	100.01	83.29
03/24/92	-	-	-	-	-	-	15.81	11.98	3.83	100.01	87.09
07/15/92	-	-	-	-	-	-	16.37	FILM	0.00	100.01	83.64
10/05/92	-	-	-	-	-	-	18.41	18.09	0.32	100.01	81.84
01/06/93	-	-	-	-	-	-	12.37	FILM	0.00	100.01	87.64
07/13/93	-	-	-	-	-	-	15.19	FILM	0.00	100.01	84.82
10/11/93	-	-	-	-	-	-	18.05	0.10	17.95	100.01	95.51
01/11/94	-	-	-	-	-	-	16.98	0.03	16.95	100.01	95.83

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER (feet)	DEPTH TO PRODUCT (feet)	PRODUCT THICKNESS (feet)	CASING ELEVATION (feet)	GROUNDWATER ELEVATION (feet)
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)					
04/12/94	-	-	-	-	-	-	15.54	FILM	0.00	100.01	84.47
07/14/94	-	-	-	-	-	-	17.93	FILM	0.00	100.01	82.08
01/15/96	7,100	720	280	48	660	-	17.20	NP	0.00	100.01	82.81
04/15/96	11,000	600	59	420	870	-	17.26	NP	0.00	100.01	82.75
07/15/96	19,000	360	51	610	1,600	<250		-	-	-	-
10/09/96	-	-	-	-	-	-	14.42	NP	0.00	100.01	85.59
01/13/97	11,000	230	30	91	700	56	10.25	NP	0.00	100.01	89.76
04/14/97	141	1.2	0.33	0.44	<0.5	20		-	-	-	-
07/07/97	<50	<0.3	<0.3	<0.3	<0.5	<20	17.20	NP	0.00	100.01	82.81
10/16/97	<50	<0.3	<0.3	<0.3	<0.5	-	16.20	NP	0.00	100.01	83.81
01/07/98	-	-	-	-	-	-	16.26	16.18	0.08	100.01	83.81
	Well Abandoned 1/30/98										
MONITORING WELL #MW-3				***Screen Interval = 15 to 30 feet***			***(GROUNDWATER SYSTEM'S PUMPING WELL)***				
11/21/86	-	100	5.1	<1.0	25	-	16.25	0.10	16.15	99.76	95.70
07/22/91	-	-	-	-	-	-	24.00	NP	0.00	99.76	75.76
10/24/91	-	-	-	-	-	-	18.10	NP	0.00	99.76	81.66
01/22/92	-	-	-	-	-	-	25.80	SHEEN	0.00	99.76	73.96
03/24/92	-	-	-	-	-	-	15.60	NP	0.00	99.76	84.16
07/15/92	-	-	-	-	-	-	25.10	FILM	0.00	99.76	74.66
10/05/92	-	-	-	-	-	-	25.20	NP	0.00	99.76	74.56
01/06/93	-	-	-	-	-	-	25.45	NP	0.00	99.76	74.31
07/13/93	-	-	-	-	-	-	14.24	NP	0.00	99.76	85.52
10/11/93	-	-	-	-	-	-	25.60	NP	0.00	99.76	74.16
01/11/94	-	-	-	-	-	-	25.90	NP	0.00	99.76	73.86
04/12/94	-	-	-	-	-	-	25.70	NP	0.00	99.76	74.06
07/14/94	-	-	-	-	-	-	25.10	NP	0.00	99.76	74.66
01/15/96	-	-	-	-	-	-	26.04	NP	0.00	99.76	73.72
04/15/96	-	-	-	-	-	-	21.03	NP	0.00	99.76	78.73
07/15/96	5,900	240	30	270	730	780		-	-	-	-
10/09/96	-	-	-	-	-	-	21.43	NP	0.00	99.76	78.33
01/13/97	-	-	-	-	-	-	11.20	NP	0.00	99.76	88.56
07/07/97	-	-	-	-	-	-	23.40	NP	0.00	99.76	76.36
10/16/97	-	-	-	-	-	-	22.30	NP	0.00	99.76	77.46
01/07/98	-	-	-	-	-	-	20.10	NP	0.00	99.76	79.66

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER (feet)	DEPTH TO PRODUCT (feet)	PRODUCT THICKNESS (feet)	CASING ELEVATION (feet)	GROUNDWATER ELEVATION (feet)
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)					
07/14/98	-	-	-	-	-	-	14.40	NP	0.00	99.76	85.36
10/15/98	-	-	-	-	-	-		-	-	-	-
01/20/99	-	-	-	-	-	-		-	-	-	-
04/16/99	-	-	-	-	-	-	11.20	NP	0.00	99.76	88.56
07/14/99	5,600	9.6	1.3	3.5	8.1	*14,000 / 14,000	25.87	NP	0.00	99.76	73.89
10/07/99	-	-	-	-	-	-	15.40	NP	0.00	99.76	84.36
01/26/00	-	-	-	-	-	-	14.25	NP	0.00	99.76	85.51
04/19/00	-	-	-	-	-	-	14.20	NP	0.00	99.76	85.56
05/26/00	-	-	-	-	-	-	15.12	NP	0.00	99.76	84.64
07/26/00	-	-	-	-	-	-	14.30	NP	0.00	99.76	85.46
10/25/00	-	-	-	-	-	-	14.32	NP	0.00	99.76	85.44
01/10/01	-	-	-	-	-	-	13.46	NP	0.00	99.76	86.30
04/23/01	-	-	-	-	-	-		-	-	-	-
07/16/01	-	-	-	-	-	-	12.80	NP	0.00	99.76	86.96
10/17/01	-	-	-	-	-	-	15.30	NP	0.00	99.76	84.46
01/23/02	-	-	-	-	-	-		-	-	-	-
04/10/02	-	-	-	-	-	-	13.22	NP	0.00	99.76	86.54
07/24/02	-	-	-	-	-	-	14.32	NP	0.00	99.76	85.44
10/30/02	-	-	-	-	-	-	16.20	NP	0.00	99.76	83.56
01/15/03	-	-	-	-	-	-	14.10	NP	0.00	99.76	85.66
04/16/03	-	-	-	-	-	-		-	-	99.76	-
07/14/03	2,490	<0.22	<0.32	<0.31	1.3 J	2,050	18.30	NP	0.00	99.76	81.46
10/08/03	3,330	<0.22	<0.32	<0.31	<0.4	4,070	16.65	NP	0.00	99.76	83.11
01/15/04	102	2.1	3.5	<0.02	12	*28 / 17	14.18	NP	0.00	99.76	85.58
04/14/04	464	63	18	<0.31	16	189	13.45	NP	0.00	99.76	86.32
07/29/04	1,560	74	<3.2	30 J	<4.0	729	15.94	NP	0.00	99.76	83.82
10/14/04	2,490	25	<0.32	<0.31	<0.4	2,530	16.11	NP	0.00	99.76	83.65
01/06/05	394	12	<0.32	1.5 J	<0.4	51	15.61	NP	0.00	99.76	84.15
04/13/05	<15	<0.22	<0.32	<0.31	<0.4	<0.18	9.19	NP	0.00	99.76	90.57
07/27/05	383	5.6	<0.10	17	2.4 J	125	16.63	NP	0.00	99.76	83.13
10/12/05	<2.9	<0.32	<0.10	<0.24	<0.30	<0.63	16.97	NP	0.00	99.76	82.79
MONITORING WELL #MW-4				***Screen Interval = 9 to 29 feet***							
11/21/86	100,000	3,200	2,700	2,400	14,000	-	16.22	FILM	0.00	99.48	83.26

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER	DEPTH TO PRODUCT	PRODUCT THICKNESS	CASING ELEVATION	GROUNDWATER ELEVATION
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)	(feet)	(feet)	(feet)	(feet)	(feet)
07/22/91	-	-	-	-	-	-	21.80	21.35	0.45	99.48	78.02
10/24/91	-	-	-	-	-	-	20.02	SHEEN	0.00	99.48	79.46
01/22/92	-	-	-	-	-	-	19.78	SHEEN	0.00	99.48	79.70
03/24/92	-	-	-	-	-	-	13.94	FILM	0.00	99.48	85.54
07/15/92	-	-	-	-	-	-	19.27	FILM	0.00	99.48	80.21
10/05/92	-	-	-	-	-	-	21.44	FILM	0.00	99.48	78.04
01/06/93	-	-	-	-	-	-	14.08	FILM	0.00	99.48	85.40
07/13/93	-	-	-	-	-	-	16.09	FILM	0.00	99.48	83.39
10/11/93	-	-	-	-	-	-	21.33	FILM	0.00	99.48	78.15
01/11/94	-	-	-	-	-	-	20.45	FILM	0.00	99.48	79.03
04/12/94	-	-	-	-	-	-	19.05	FILM	0.00	99.48	80.43
07/14/94	-	-	-	-	-	-	20.41	FILM	0.00	99.48	79.07
01/15/96	5,000	370	38	300	390	-	19.89	NP	0.00	99.48	79.59
04/15/96	38,000	300	78	540	470	-	19.62	NP	0.00	99.48	79.86
07/15/96	13,000	880	69	820	1,100	3,600		-	-	-	-
10/09/96	-	-	-	-	-	-	15.32	NP	0.00	99.48	84.16
01/13/97	47,000	2,500	2,500	1,100	2,800	70,000	10.80	NP	0.00	99.48	88.68
04/14/97	8,700	<0.3	0.45	<0.3	0.64	29,000		-	-	-	-
07/07/97	12,000	<0.3	<0.3	<0.3	<0.5	-	18.80	NP	0.00	99.48	80.68
10/16/97	770	<0.3	<0.3	<0.3	<0.5	-	17.76	NP	0.00	99.48	81.72
01/07/98	75,000	3,000	900	1,400	2,500	110	11.60	NP	0.00	99.48	87.88
04/08/98	18,000	1,200	130	710	1,400	22,000	10.10	NP	0.00	99.48	89.38
07/14/98	21,000	1,300	58	1,200	1,100	23,000	16.30	NP	0.00	99.48	83.18
10/15/98	9,100	1.1	0.62	<0.3	<0.5	30,000	16.90	NP	0.00	99.48	82.58
01/20/99	16,000	<0.3	0.91	0.72	1.4	* 43,000 / 42,000	15.35	NP	0.00	100.48	85.13
04/16/99	17,000	0.48	0.92	0.54	1.4	* 28,000 / 26,000	15.30	NP	0.00	100.48	85.18
07/14/99	8,500	<6	<6	<6	<10	*21,000 / 16,000	18.40	NP	0.00	100.48	82.08
10/07/99	2,500	<1.5	3.1	<1.5	<2.5	4,800	16.89	NP	0.00	100.48	83.59
01/26/00	9,900	350	9	460	460	2,800	12.62	NP	0.00	100.48	87.86
04/19/00	8,990	0.7	<0.25	<0.25	<0.5	*3,240 / 5,450	12.28	NP	0.00	100.48	88.20
05/26/00	94	<0.3	<0.3	<0.3	<0.6	*746 / 419	13.81	NP	0.00	100.48	86.67
~~07/26/00~~	~~<50~~	~~<0.3~~	~~<0.3~~	~~<0.3~~	~~<0.6~~	~~3,110 / 2,060~~	~~12.29~~	~~NP~~	~~0.00~~	~~100.48~~	~~88.19~~
10/25/00	2,480	<0.18	<0.14	<0.18	<0.26	*3,690 / 3,040	12.26	NP	0.00	100.48	88.22
01/10/01	<50	<0.18	2	<0.18	1	962	10.75	NP	0.00	100.48	89.73
04/23/01	482	<0.18	<0.14	<0.18	<0.26	*875 / 453	12.26	NP	0.00	100.48	88.22

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER (feet)	DEPTH TO PRODUCT (feet)	PRODUCT THICKNESS (feet)	CASING ELEVATION (feet)	GROUNDWATER ELEVATION (feet)
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)					
07/16/01	71,700	9,440	12,600	514	8,980	*1,330 / 389	13.80	NP	0.00	100.48	86.68
10/17/01	13,500	1,950	425	<5.94	1,110	*829 / 329	16.87	NP	0.00	100.48	83.61
01/23/02	12,100	196	57	68	2,090	*688/738	12.28	NP	0.00	100.48	88.20
04/10/02	655	7	8	1	1	587	13.80	NP	0.00	100.48	86.68
07/24/02	17,400	<0.18	1.9	1.4	2.2	12,800	15.33	NP	0.00	100.48	85.15
10/30/02	17,300	400	47	748	131	12,300	17.00	NP	0.00	100.48	83.48
01/15/03	23,000	568	39	832	268	18,300	16.84	NP	0.00	100.48	83.64
04/16/03	15,800	411	15	26	14	18,200	16.86	NP	0.00	100.48	83.62
07/14/03	13,300	145	26	2.8 J	12	17,600	10.69	NP	0.00	100.48	89.79
10/08/03	12,500	64	<3.2	359	24 J	11,400	16.32	NP	0.00	100.48	84.16
01/15/04	12,300	11	4.4	66	4.0	*17,000 / 9,560	14.67	NP	0.00	100.48	85.81
04/14/04	7,340	<11	<16	<15.5	<20	13,500	13.68	NP	0.00	100.48	86.80
07/29/04	5,400	<2.2	<3.2	57	<4.0	6,730	15.50	NP	0.00	100.48	84.98
10/14/04	10,200	197	<3.2	233	13 J	3,940	16.08	NP	0.00	100.48	84.40
01/06/05	4,880	60	<3.2	74	<4.0	4,760	15.24	NP	0.00	100.48	85.24
04/13/05	2,780	57	35	20	251	3,650	9.64	NP	0.00	100.48	90.84
07/27/05	1,990	<0.32	<0.10	<0.24	<0.30	2,590	16.79	NP	0.00	100.48	83.69
10/12/05	25,700	177	<1.0	941	<3.0	4,810	16.78	NP	0.00	100.48	83.70
MONITORING WELL #MW-5				***Screen Interval = 7 to 27 feet***							
11/21/86	<1,000	4.8	2.1	<0.5	7.4	-	16.10	NP	0.00	100.98	84.88
07/22/91	-	<0.5	1.6	<1.0	2.0	-	18.20	NP	0.00	100.98	82.78
10/24/91	-	-	-	-	-	-	17.67	NP	0.00	100.98	83.31
01/22/92	600	21.0	8.0	2.0	17.0	-		-	-	-	-
03/24/92	-	-	-	-	-	-	12.98	NP	0.00	100.98	88.00
07/15/92	<200	<0.5	<0.5	<0.5	<0.5	-	17.29	NP	0.00	100.98	83.69
10/05/92	-	-	-	-	-	-	18.92	NP	0.00	100.98	82.06
01/06/93	300	2.7	<0.5	1.3	26.0	-	13.12	NP	0.00	100.98	87.86
07/13/93	<100	1.1	0.5	1.0	1.5	-	16.15	NP	0.00	100.98	84.83
10/11/93	130	1.2	<0.3	<0.3	<0.6	-	18.75	NP	0.00	100.98	82.23
01/11/94	<50	1.5	<0.3	<0.3	<0.5	-	17.80	NP	0.00	100.98	83.18
04/12/94	<50	<0.3	<0.3	<0.3	<0.5	-	13.59	NP	0.00	100.98	87.39
07/14/94	<50	0.42	<0.3	<0.3	<0.5	-	18.26	NP	0.00	100.98	82.72
07/15/95	100	1.2	<0.5	0.8	<1	-		-	-	-	-

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER (feet)	DEPTH TO PRODUCT (feet)	PRODUCT THICKNESS (feet)	CASING ELEVATION (feet)	GROUNDWATER ELEVATION (feet)
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)					
01/15/96	1,900	21	13	6.2	6.8	-	13.09	NP	0.00	100.98	87.89
04/15/96	250	5.1	2.7	1.7	1.1	-	13.16	NP	0.00	100.98	87.82
07/15/96	270	6.5	1.4	1.8	1.4	230		NP	-	-	-
10/09/96	-	-	-	-	-	-	15.37	NP	0.00	100.98	85.61
01/13/97	25,000	780	5,700	560	4,000	24,000	10.90	NP	0.00	100.98	90.08
04/14/97	6,300	260	1,600	28	550	9,000		-	-	-	-
07/07/97	7,500	300	1,500	12	110	16,000	14.70	NP	0.00	100.98	86.28
10/16/97	4,600	<0.3	0.65	<0.3	<0.5	-	13.60	NP	0.00	100.98	87.38
01/07/98	2,700	33	11	37	580	7.3	10.97	NP	0.00	100.98	90.01
04/08/98	300	9.1	<0.3	<0.3	<0.5	650	10.90	NP	0.00	100.98	90.08
07/14/98	670	5.9	<0.3	<0.3	0.53	2,300	15.20	NP	0.00	100.98	85.78
10/15/98	<50	<0.3	<0.3	<0.3	<0.5	19	15.90	NP	0.00	100.98	85.08
01/20/99	<50	<0.3	<0.3	<0.3	<0.5	<5	15.20	NP	0.00	101.98	86.78
04/16/99	<50	<0.3	<0.3	<0.3	<0.5	<5	15.25	NP	0.00	101.98	86.73
07/14/99	<50	<0.3	<0.3	<0.3	<0.5	<5	15.96	NP	0.00	101.98	86.02
10/07/99	<50	<0.3	<0.3	<0.3	<0.5	<5	16.33	NP	0.00	101.98	85.65
01/26/00	<50	<0.3	<0.3	<0.3	<0.5	<5	14.80	NP	0.00	101.98	87.18
04/19/00	965	<0.25	<0.25	<0.25	<0.5	<5	10.97	NP	0.00	101.98	91.01
05/26/00	<50	<0.3	<0.3	<0.3	<0.6	<5	14.43	NP	0.00	101.98	87.55
07/26/00	<50	<0.3	<0.3	<0.3	<0.6	<5	14.02	NP	0.00	101.98	87.96
10/25/00	<50	<0.18	<0.14	<0.18	<0.26	<0.24	14.04	NP	0.00	101.98	87.94
01/10/01	<50	<0.18	<0.14	<0.18	<0.26	<0.24	14.80	NP	0.00	101.98	87.18
04/23/01	<50	<0.18	<0.14	<0.18	<0.26	*10 / 4.2	10.97	NP	0.00	101.98	91.01
07/16/01	3,360	430	603	53	429	*41 / 4.2	14.80	NP	0.00	101.98	87.18
10/17/01	<50	<0.18	<0.14	<0.18	<0.26	*16 / 5.2	16.71	NP	0.00	101.98	85.27
01/23/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	14.80	NP	0.00	101.98	87.18
04/10/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	14.42	NP	0.00	101.98	87.56
07/24/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	14.78	NP	0.00	101.98	87.20
10/30/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	15.93	NP	0.00	101.98	86.05
01/15/03	<50	<0.14	<0.07	<0.08	<0.35	<2.0	15.55	NP	0.00	101.98	86.43
04/16/03	<15	<0.04	<0.02	<0.02	<0.06	<0.03	15.55	NP	0.00	101.98	86.43
07/14/03	<15	<0.22	<0.32	<0.31	<0.4	<0.18	15.93	NP	0.00	101.98	86.05
10/08/03	<15	<0.22	<0.32	<0.31	<0.4	<0.18	16.35	NP	0.00	101.98	85.63
01/15/04	<15	<0.04	<0.02	<0.02	<0.06	<0.03	15.06	NP	0.00	101.98	86.92
04/14/04	<15	<0.22	<0.32	<0.31	<0.4	<0.18	13.96	NP	0.00	101.98	88.02

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER (feet)	DEPTH TO PRODUCT (feet)	PRODUCT THICKNESS (feet)	CASING ELEVATION (feet)	GROUNDWATER ELEVATION (feet)
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)					
07/29/04	659	<2.2	<3.2	<3.1	<4.0	606	15.60	NP	0.00	101.98	86.38
10/14/04	411	<0.22	<0.32	<0.31	<0.4	425	16.17	NP	0.00	101.98	85.81
01/06/05	433	<0.22	<0.32	<0.31	<0.4	491	15.52	NP	0.00	101.98	86.46
04/13/05	161	<0.22	<0.32	<0.31	<0.4	465	10.12	NP	0.00	101.98	91.86
07/27/05	237	<0.32	<0.10	<0.24	<0.30	243	16.66	NP	0.00	101.98	85.32
10/12/05	149	<0.32	<0.10	<0.24	<0.30	183	16.66	NP	0.00	101.98	85.32
MONITORING WELL #MW-6				***Screen Interval = 7 to 27 feet***							
11/21/86	<1.000	<2.0	<2.0	<2.0	<2.0	-	12.64	NP	0.00	99.44	86.80
07/22/91	-	-	-	-	-	-		-	-	-	-
01/22/92	<200	<0.5	<0.5	<0.5	1.5	-		-	-	-	-
03/24/92	-	-	-	-	-	-	10.04	NP	0.00	99.44	89.40
07/15/92	<200	<0.5	<0.5	<0.5	<0.5	-	13.29	NP	0.00	99.44	86.15
10/05/92	-	-	-	-	-	-	14.69	NP	0.00	99.44	84.75
01/06/93	<200	<0.5	<0.5	<0.5	<1.0	-	10.87	NP	0.00	99.44	88.57
07/13/93	<100	<0.5	<0.5	<0.5	<1.0	-	13.10	NP	0.00	99.44	86.34
10/11/93	<60	<0.3	<0.3	<0.3	<0.6	-	14.43	NP	0.00	99.44	85.01
01/11/94	<50	<0.3	<0.3	<0.3	<0.5	-	13.56	NP	0.00	99.44	85.88
04/12/94	<50	<0.3	<0.3	<0.3	<0.3	-	12.10	NP	0.00	99.44	87.34
07/14/94	<50	<0.3	<0.3	<0.3	<0.3	-	14.16	NP	0.00	99.44	85.28
07/15/95	140	<0.5	<0.5	<0.5	<1	-		-	-	-	-
01/15/96	56	0.38	0.33	<0.3	<0.5	-	14.29	NP	0.00	99.44	85.15
04/15/96	96	4.5	<0.3	<0.3	0.53	-	14.32	NP	0.00	99.44	85.12
07/15/96	140	2.4	0.44	<0.3	0.70	110		-	-	-	-
10/09/96	-	-	-	-	-	-	12.09	NP	0.00	99.44	87.35
01/13/97	210	<0.3	1.2	<0.3	0.68	270	9.85	NP	0.00	99.44	89.59
04/14/97	<50	<0.3	<0.3	<0.3	<0.5	<20		-	-	-	-
07/07/97	<50	<0.3	<0.3	<0.3	<0.5	<20	14.20	NP	0.00	99.44	85.24
10/16/97	<50	<0.3	<0.3	<0.3	<0.5	-	13.10	NP	0.00	99.44	86.34
01/07/98	<50	<0.3	<0.3	<0.3	<0.5	0.10	9.80	NP	0.00	99.44	89.64
07/14/98	330	<0.3	<0.3	<0.3	<0.5	380	12.30	NP	0.00	99.44	87.14
10/15/98	<50	<0.3	<0.3	<0.3	<0.5	<5	14.30	NP	0.00	99.44	85.14
01/20/99	<50	0.47	<0.3	<0.3	<0.5	<5	13.60	NP	0.00	100.44	86.84
04/16/99	<50	<0.3	<0.3	<0.3	<0.5	<5	13.50	NP	0.00	100.44	86.94

TABLE 2A
GROUNDWATER DATA
THRIFTY OIL STATION #063, OAKLAND, CA

DATE SAMPLED	ANALYTICAL PARAMETERS						DEPTH TO GROUNDWATER (feet)	DEPTH TO PRODUCT (feet)	PRODUCT THICKNESS (feet)	CASING ELEVATION (feet)	GROUNDWATER ELEVATION (feet)
	TPH (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	EthylBenzene (ug/L)	XYLENE (ug/L)	MTBE (ug/L)					
07/14/99	<50	<0.3	<0.3	<0.3	<0.5	*5.4 / <5	14.65	NP	0.00	100.44	85.79
10/07/99	<50	<0.3	0.96	0.35	1.8	<5	15.39	NP	0.00	100.44	85.05
01/26/00	<50	<0.3	<0.3	<0.3	0.63	<5	13.85	NP	0.00	100.44	86.59
04/19/00	83.1	<0.25	<0.25	<0.25	<0.5	*11 / <5	9.65	NP	0.00	100.44	90.79
05/26/00	<50	<0.3	<0.3	<0.3	<0.6	<5	13.10	NP	0.00	100.44	87.34
07/26/00	<50	<0.3	<0.3	<0.3	<0.6	<5	12.35	NP	0.00	100.44	88.09
10/25/00	<50	<0.18	<0.14	<0.18	<0.26	*7 / 10	12.30	NP	0.00	100.44	88.14
01/10/01	<50	<0.18	<0.14	<0.18	<0.26	78	13.45	NP	0.00	100.44	86.99
04/23/01	<50	<0.18	<0.14	<0.18	<0.26	*9 / 4	9.65	NP	0.00	100.44	90.79
07/16/01	<50	<0.18	<0.14	<0.18	<0.26	<0.24	13.09	NP	0.00	100.44	87.35
10/17/01	<50	<0.18	<0.14	<0.18	<0.26	<0.24	15.37	NP	0.00	100.44	85.07
01/23/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	13.27	NP	0.00	100.44	87.17
04/10/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	13.07	NP	0.00	100.44	87.37
07/24/02	<50	<0.18	<0.14	<0.18	<0.26	<0.24	13.86	NP	0.00	100.44	86.58
10/30/02	<50	1.6	<0.14	<0.18	<0.26	6.4	14.20	NP	0.00	100.44	86.24
01/15/03	<50	<0.14	<0.07	<0.08	0.84	<2.0	15.35	NP	0.00	100.44	85.09
04/16/03	<15	<0.04	<0.02	<0.02	<0.06	<0.03	14.58	NP	0.00	100.44	85.86
07/14/03	<15	<0.22	<0.32	<0.31	<0.4	<0.18	15.35	NP	0.00	100.44	85.09
10/08/03	<15	<0.22	<0.32	<0.31	<0.4	<0.18	13.80	NP	0.00	100.44	86.64
01/15/04	<15	<0.04	<0.02	<0.02	<0.06	<0.03	13.51	NP	0.00	100.44	86.93
04/14/04	<15	<0.22	<0.32	<0.31	<0.4	<0.18	11.62	NP	0.00	100.44	88.82
07/29/04	<15	<0.22	<0.32	<0.31	<0.4	<0.18	13.12	NP	0.00	100.44	87.32
10/14/04	346	<0.22	<0.32	<0.31	<0.4	159	13.53	NP	0.00	100.44	86.91
01/06/05	<15	<0.22	<0.32	<0.31	<0.4	<0.18	13.02	NP	0.00	100.44	87.42
04/13/05	<15	<0.22	<0.32	<0.31	<0.4	<0.18	9.32	NP	0.00	100.44	91.12
07/27/05	<2.9	<0.32	<0.10	<0.24	<0.30	<0.63	13.17	NP	0.00	100.44	87.27
10/12/05	<2.9	<0.32	<0.10	<0.24	<0.30	<0.63	14.55	NP	0.00	100.44	85.89
		0.0									

NOTE:

NP = No free hydrocarbon product

" - " = Not analyzed / Not available

~~* MTBE 8020 / 8260~~

BPOs =Regional Board Basin Plan Groundwater Objectives

Benzene, toluene, ethlybenzene, and xylene analyzed by EPA method 8020/8021B.

Total petroleum hydrocarbons (TPH) analyzed by EPA method 8015 modified for gasoline

~~Methyl-tert Butyl Ether (MTBE) analyzed by EPA method 8020/8021B~~

On 10/8/03 & 7/14/2003, BTEX and MTBE analyzed by 8260B

Beginning 4/14/2004, BTEX and MTBE analyzed by 8260B

TABLE 2B
OXYGENATES DATA IN GROUNDWATER
THRIFTY OIL STATION # 063, OAKLAND, CA.

DATE SAMPLED	OXYGENATES			
	Di-isopropyl Ether (DIPE) (ug/L)	Ethyl-Tert-Butyl Ether (ETBE) (ug/L)	Tert-Amyl Methyl Ether (TAME) (ug/L)	Tert-Butyl Alcohol (TBA) (ug/L)
MONITORING WELL # MW-1				
10/16/97	<20	<20	<20	3,900
01/07/98	<20	<20	92	<500
04/03/98	<20	<20	65	<500
07/14/03	<0.29	<0.17	<0.28	<10
10/08/03	<0.29	<0.17	15	487
	DISCONTINUED ANALYSIS			
MONITORING WELL # MW-2				
10/16/97	<20	<20	<20	<500
MONITORING WELL # MW-3 (GROUNDWATER SYSTEM'S PUMPING WELL)				
10/16/97	-	-	-	-
01/07/98	-	-	-	-
04/03/98	-	-	-	-
07/14/03	<0.29	<0.17	24	608
10/08/03	<0.29	<0.17	30	<10
	DISCONTINUED ANALYSIS			
MONITORING WELL # MW-4				
10/16/97	<20	<20	<20	14,000
01/07/98	<20	<20	230	<500
04/03/98	<200	<200	<200	<5,000
07/14/03	<0.29	<0.17	62	2,490
10/08/03	<2.9	<1.7	101	<100
	DISCONTINUED ANALYSIS			
MONITORING WELL # MW-5				
10/16/97	<20	<20	<20	4,700
01/07/98	<20	<20	<20	<500
04/03/98	<20	<20	<20	<500
07/14/03	<0.29	<0.17	<0.28	<10
10/08/03	<0.29	<0.17	<0.28	<10
	DISCONTINUED ANALYSIS			
MONITORING WELL # MW-6				
10/16/97	<20	<20	<20	<500
01/07/98	<20	<20	40	<500
04/03/98	-	-	-	-
07/14/03	<0.29	<0.17	<0.28	<10
10/08/03	<0.29	<0.17	<0.28	<10
	DISCONTINUED ANALYSIS			

NOTE: DIPE, ETBE, TAME, TBA analyzed by EPA Method 8260/8260B

TABLE 3

WELL COMPLETION DETAILS

Thrifty Oil Station #063 - Oakland, CA

GHC - 1332

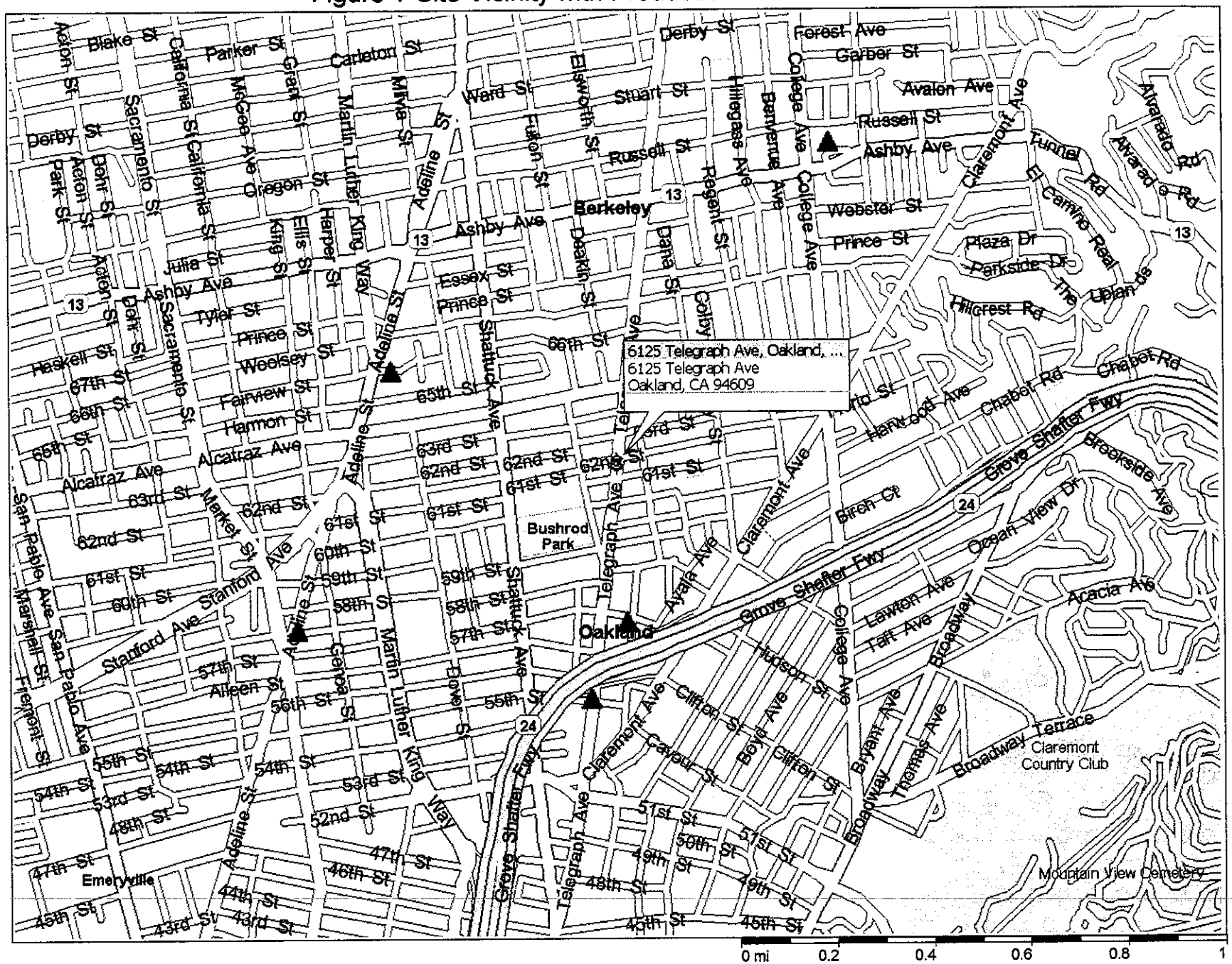
Well ID	Date Constructed	Total Depth	Casing Diameter	Screen Interval	TOC Elevation *
MW-1	06/21/86	30 ft	2 - inch	15-30 ft	99.34
MW-2	06/21/86	30 ft	2 - inch	15-30 ft	abandoned
MW-3	06/21/86	30 ft	2 - inch	15-30 ft	99.76
MW-4	11/13/86	29 ft	4 - inch	9-29 ft	99.48
MW-5	11/13/86	27 ft	4 - inch	7-27 ft	100.98
MW-6	11/13/86	27 ft	4 - inch	7-27 ft	99.44

NOTES: * Feet above mean sea level

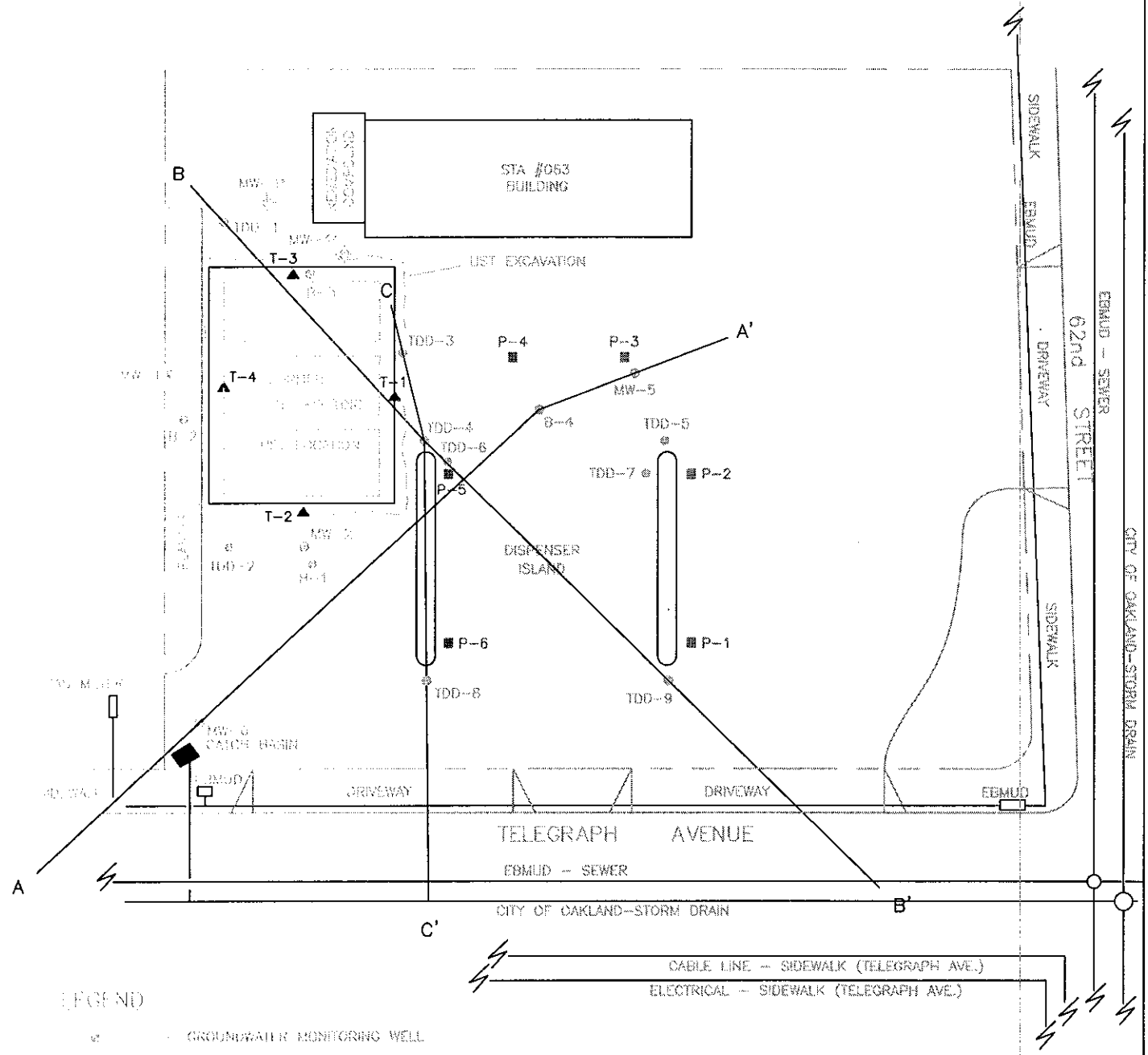
- = Not surveyed

FIGURES

Figure 1-Site Vicinity with Production Well Locations



GeoHydrologic Consultants, Inc.



GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

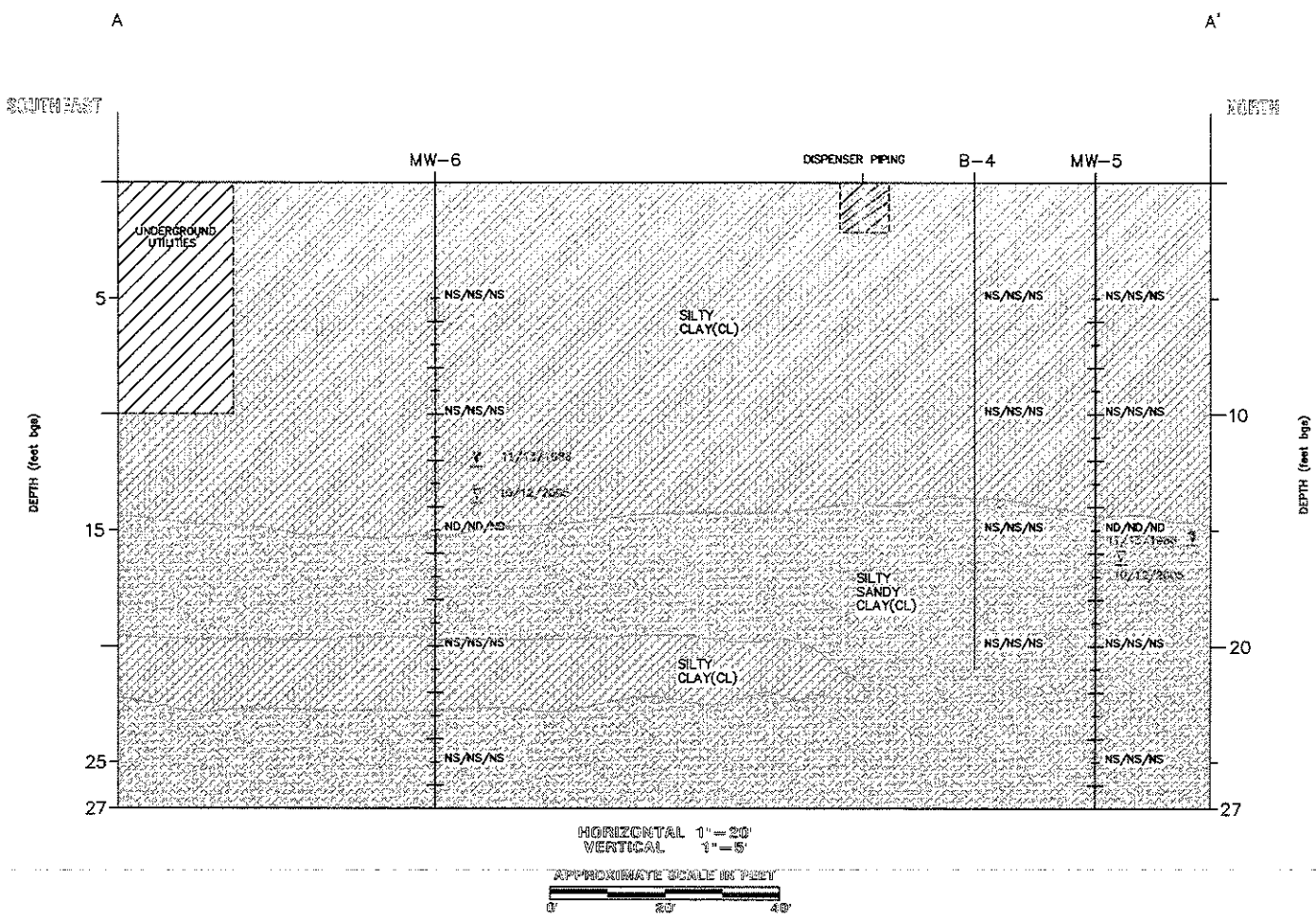
NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 2
SITE PLAN WITH CONDUIT LOCATIONS
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA

VIEW SOUTHWEST



HORIZONTAL 1"=20'
VERTICAL 1"=5'

APPROXIMATE SCALE IN FEET
0' 20' 40'

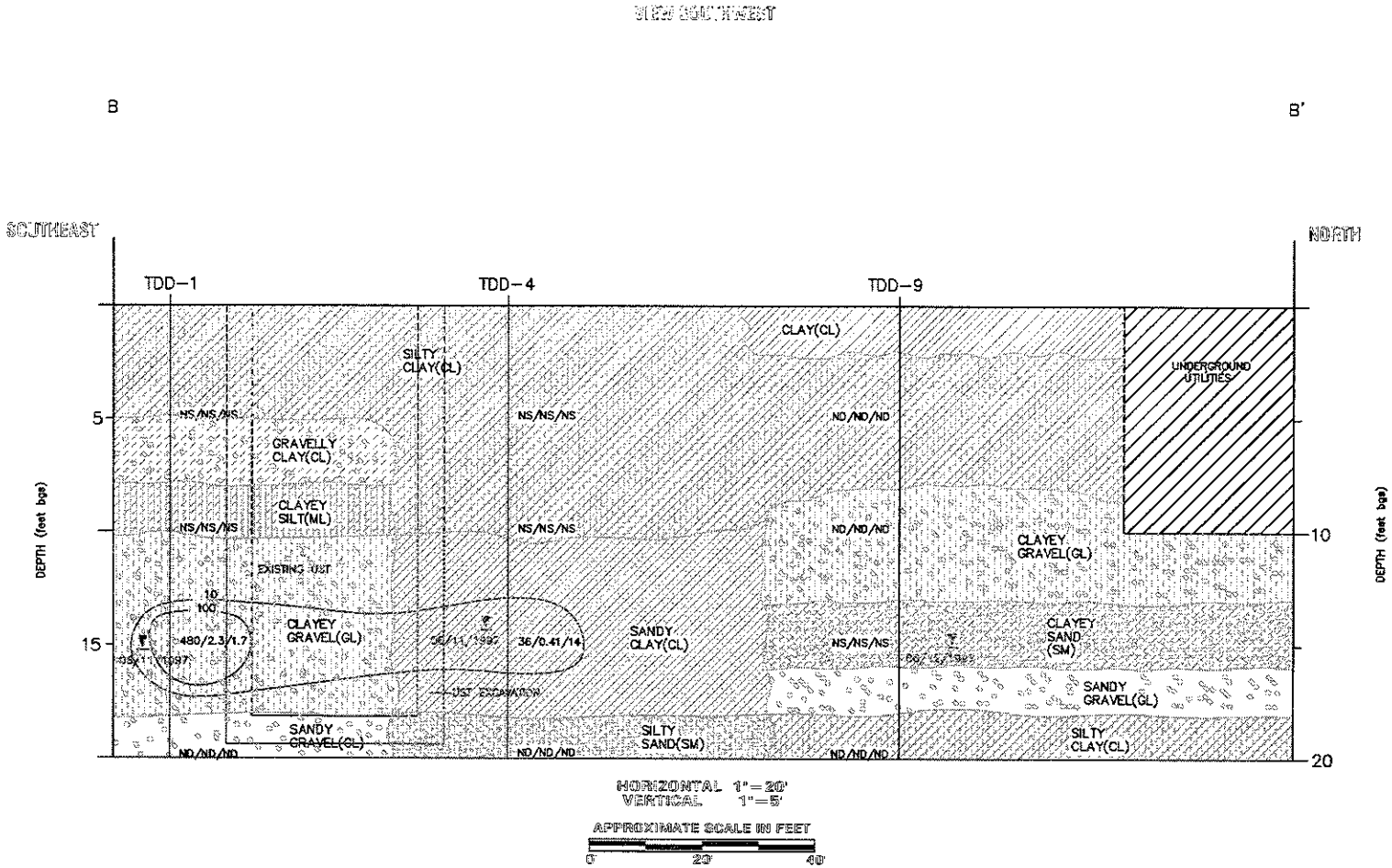
LEGEND

- ▼ – WATER LEVEL AT TIME OF DRILLING (DATE)
- ▽ – WATER LEVEL MOST RECENT (DATE)
- ND/ND/ND – TPHg/BENZENE/MTBE CONCENTRATIONS in mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED

GHC: 1332
DATE: 03/27/06

GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

FIGURE 3A
GEOLOGIC CROSS-SECTION A-A'
THRIFTY SERVICE STATION #063
5125 Telegraph Avenue
Oakland, CA



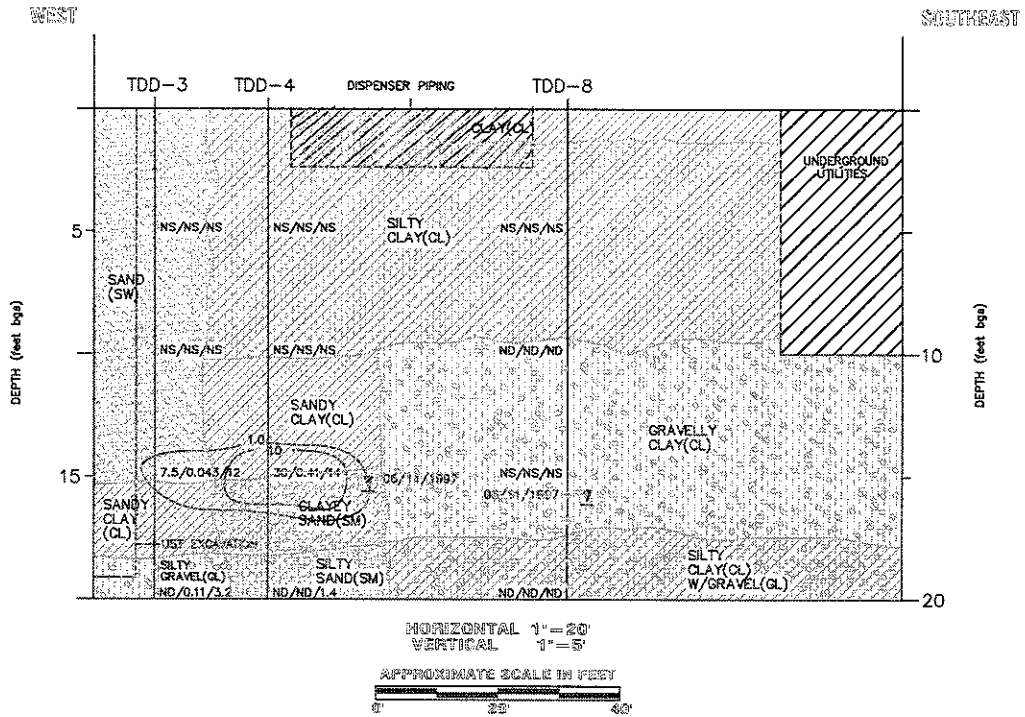
LEGEND

- ▼ – WATER LEVEL AT TIME OF DRILLING (DATE)
- ▽ – WATER LEVEL MOST RECENT (DATE)
- ND/ND/ND – TPHg/BENZENE/MTBE CONCENTRATIONS in mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- — 100 — – TPHg SOIL CONTOUR in mg/L

GHC: 1332 DATE: 03/27/06

GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

FIGURE 3B
GEOLOGIC CROSS-SECTION B-B'
THRIFTY SERVICE STATION #063
5125 Telegraph Avenue
Oakland, CA



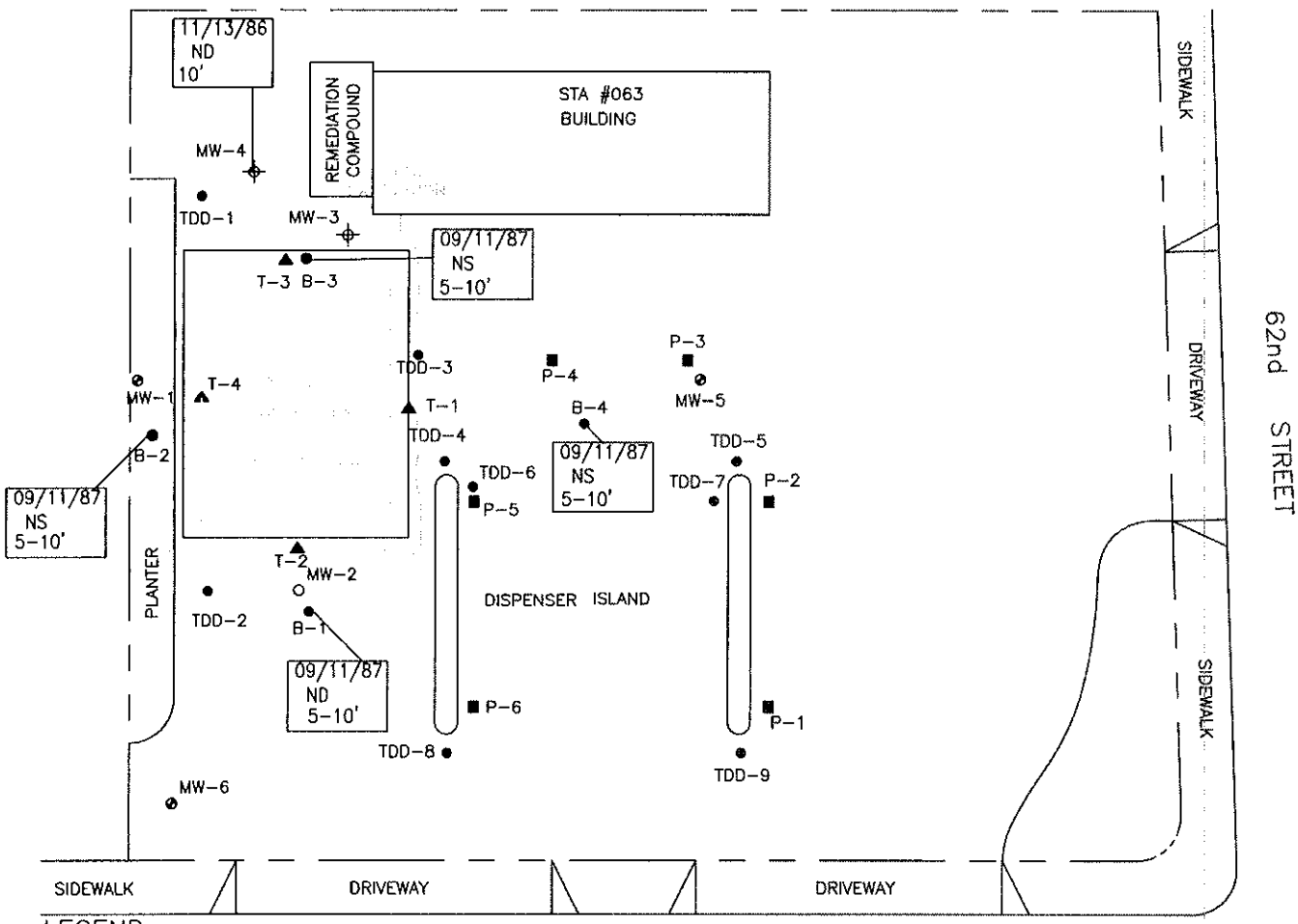
LEGEND

- ▽ – WATER LEVEL AT TIME OF DRILLING (DATE)
- ▽ – WATER LEVEL MOST RECENT (DATE)
- ND/ND/ND – TPH$_G$/BENZENE/MTBE CONCENTRATIONS in mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- — 10 — – BENZENE SOIL CONTOUR in mg/L

GHC: 1332
DATE: 03/27/06

GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

FIGURE 3C
GEOLOGIC CROSS-SECTION C-C'
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 09/11/87 ND 5-10' – DATE SAMPLED, MAXIMUM TPHg SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- —1,000— – MAXIMUM TPHg SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Pre-Remediation (0-10 feet below ground surface)

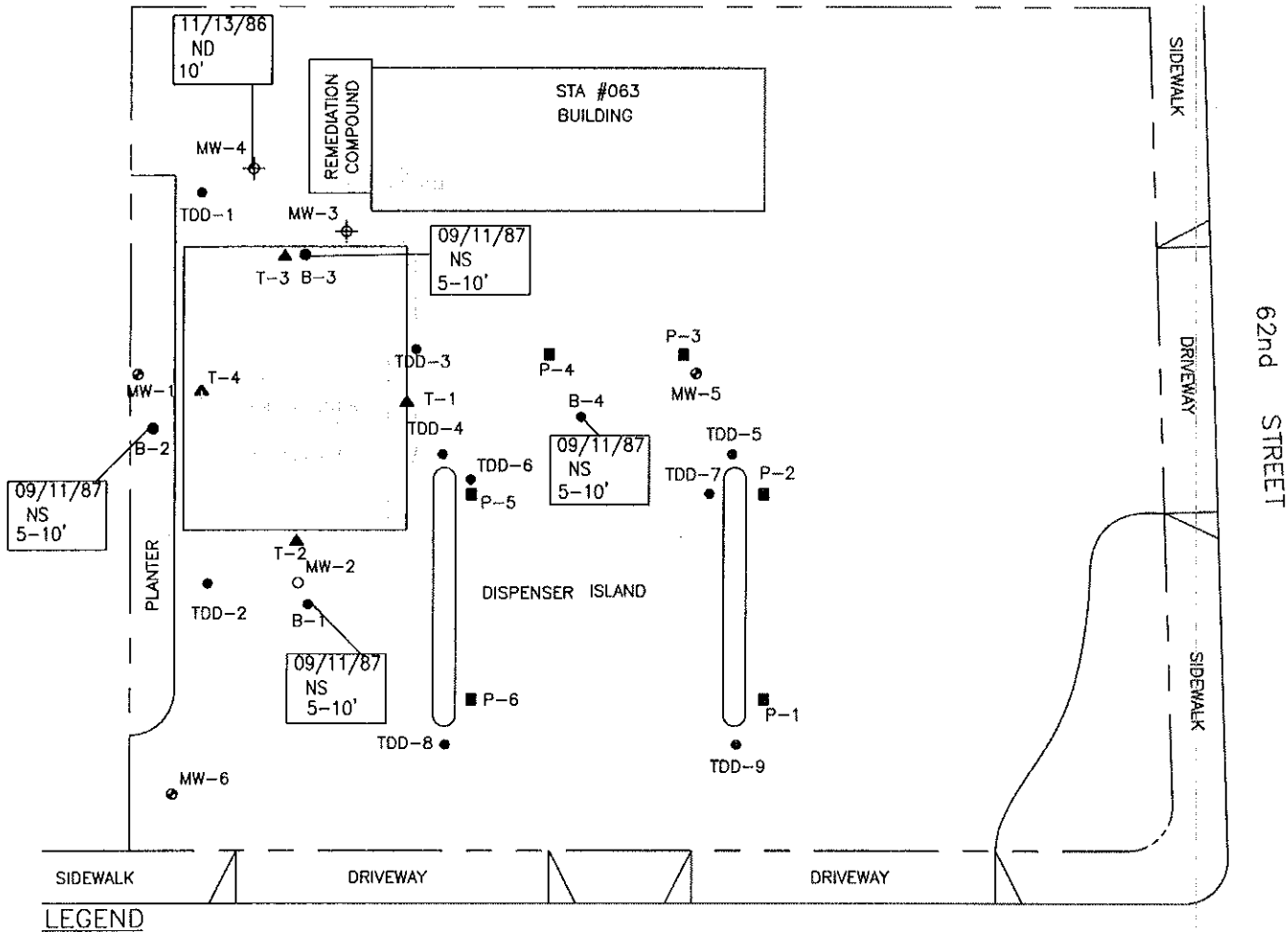
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4A
DISTRIBUTION OF TPHg IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 09/11/87 NS 5-10' – DATE SAMPLED, MAXIMUM BENZENE SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- —1,000— – MAXIMUM BENZENE SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Pre-Remediation (0-10 feet below ground surface)

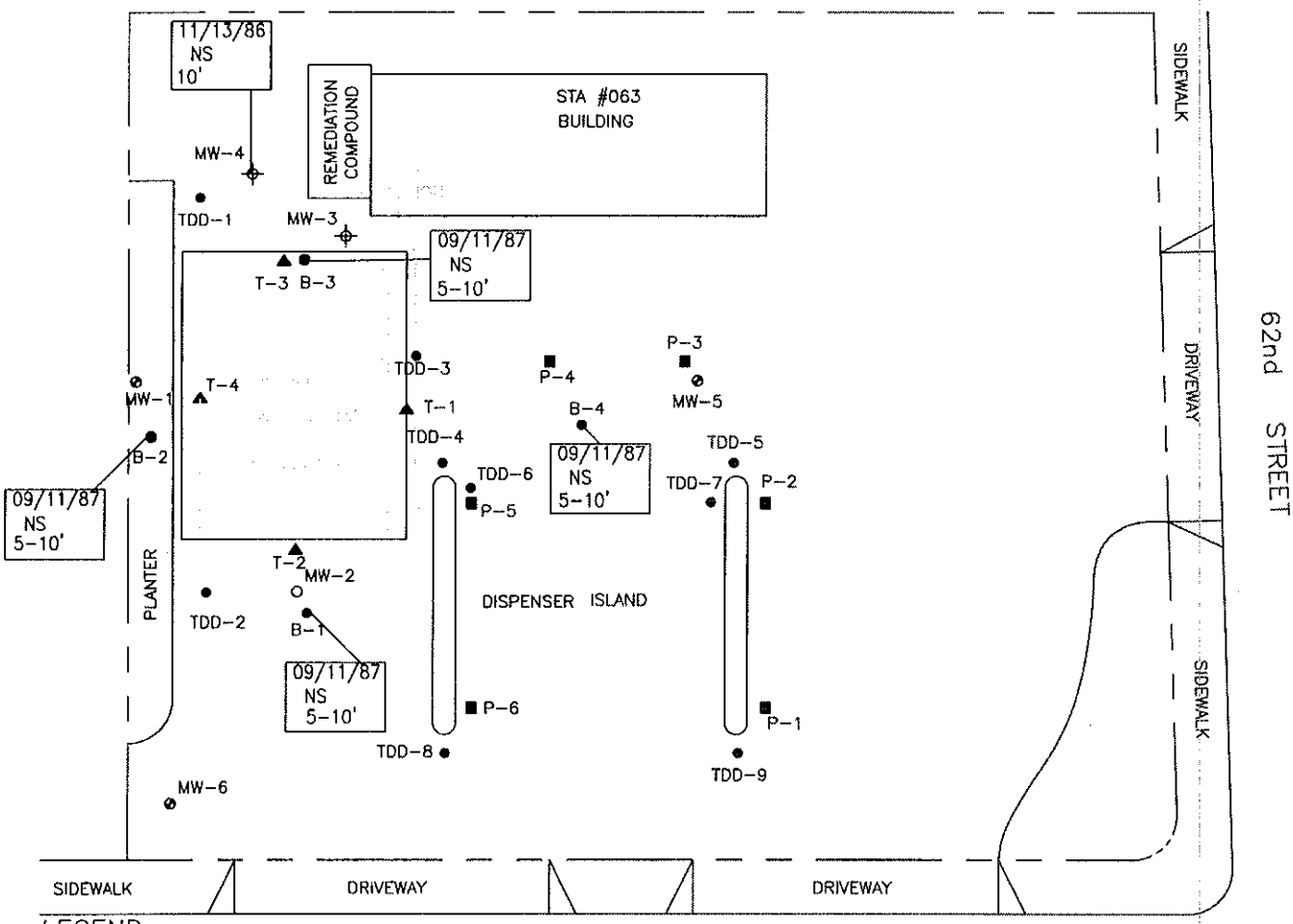
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4B
DISTRIBUTION OF BENZENE IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 09/11/87 NS 5-10' – DATE SAMPLED, MAXIMUM MTBE SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- —1,000— – MAXIMUM MTBE SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Pre-Remediation (0-10 feet below ground surface)

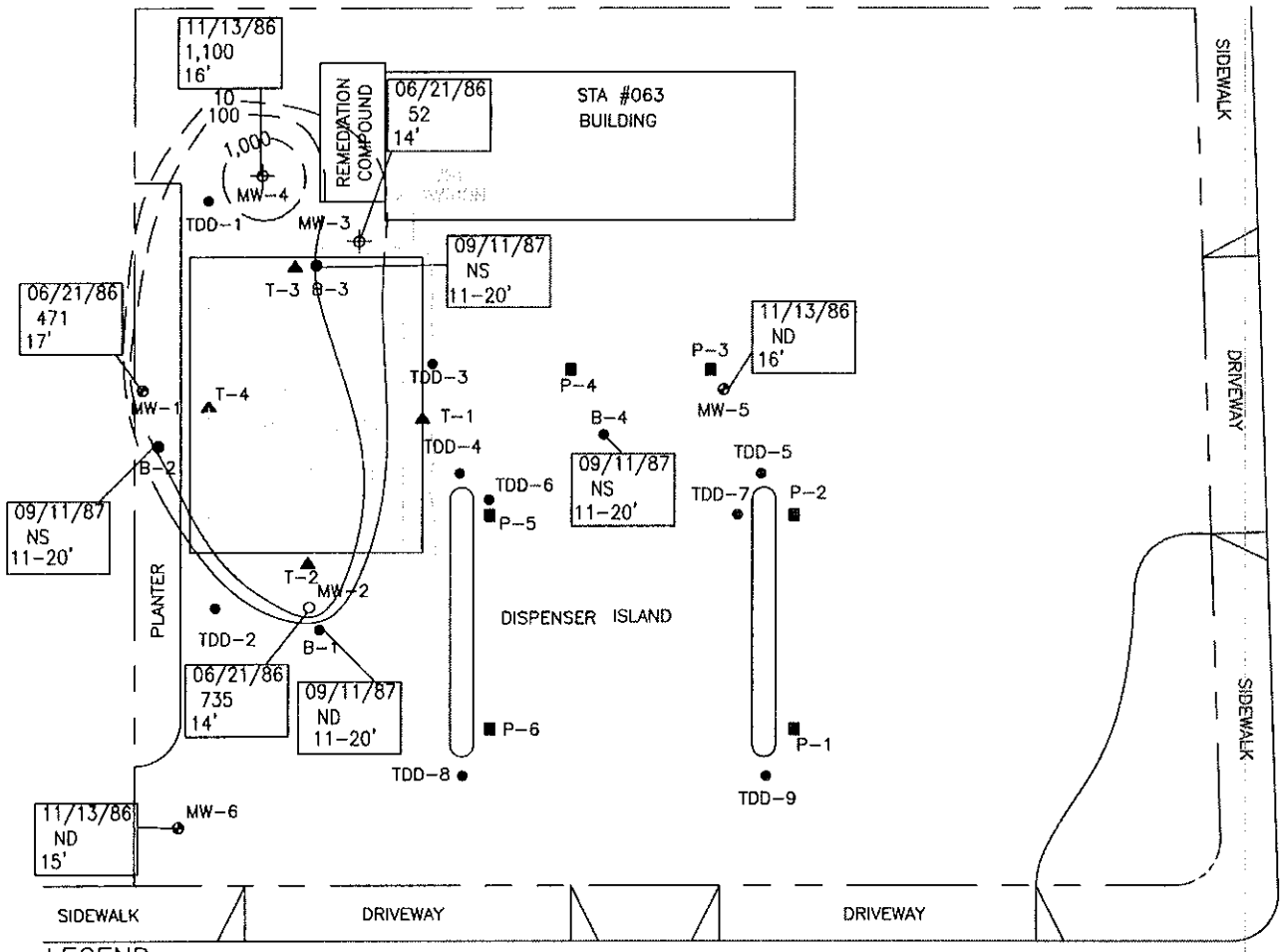
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4C
DISTRIBUTION OF MTBE IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊕ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/21/86 / 471 / 17' – DATE SAMPLED, MAXIMUM TPHg SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- —1,000— – MAXIMUM TPHg SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET
0' 30' 60'

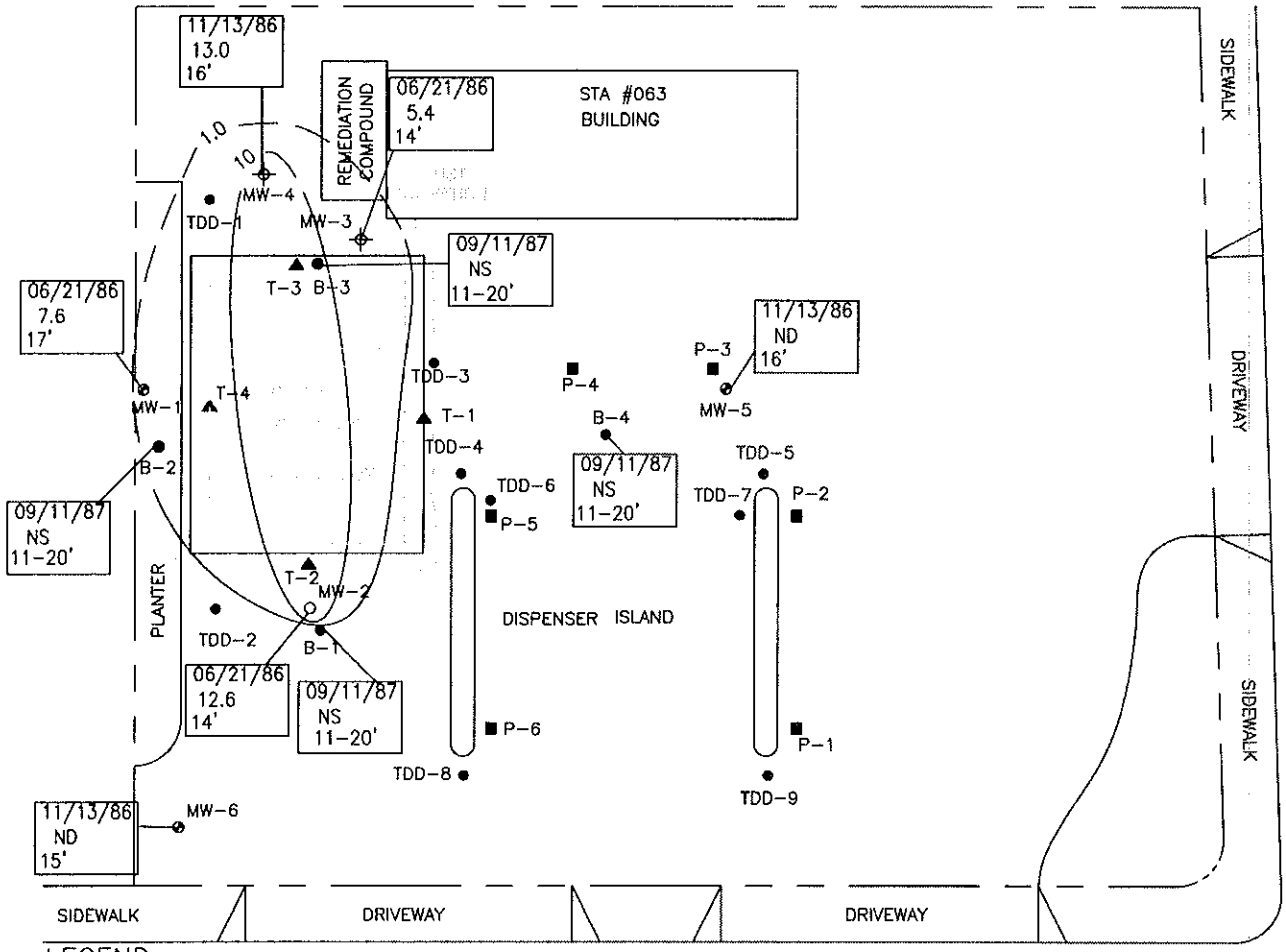
Pre-Remediation (11-20 feet below ground surface)

GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332 DATE: 02/20/06

FIGURE 4D
DISTRIBUTION OF TPHg IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/21/86 / 7.6 / 17' – DATE SAMPLED, MAXIMUM BENZENE SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- — 10 — – MAXIMUM BENZENE SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Pre-Remediation (11-20 feet below ground surface)

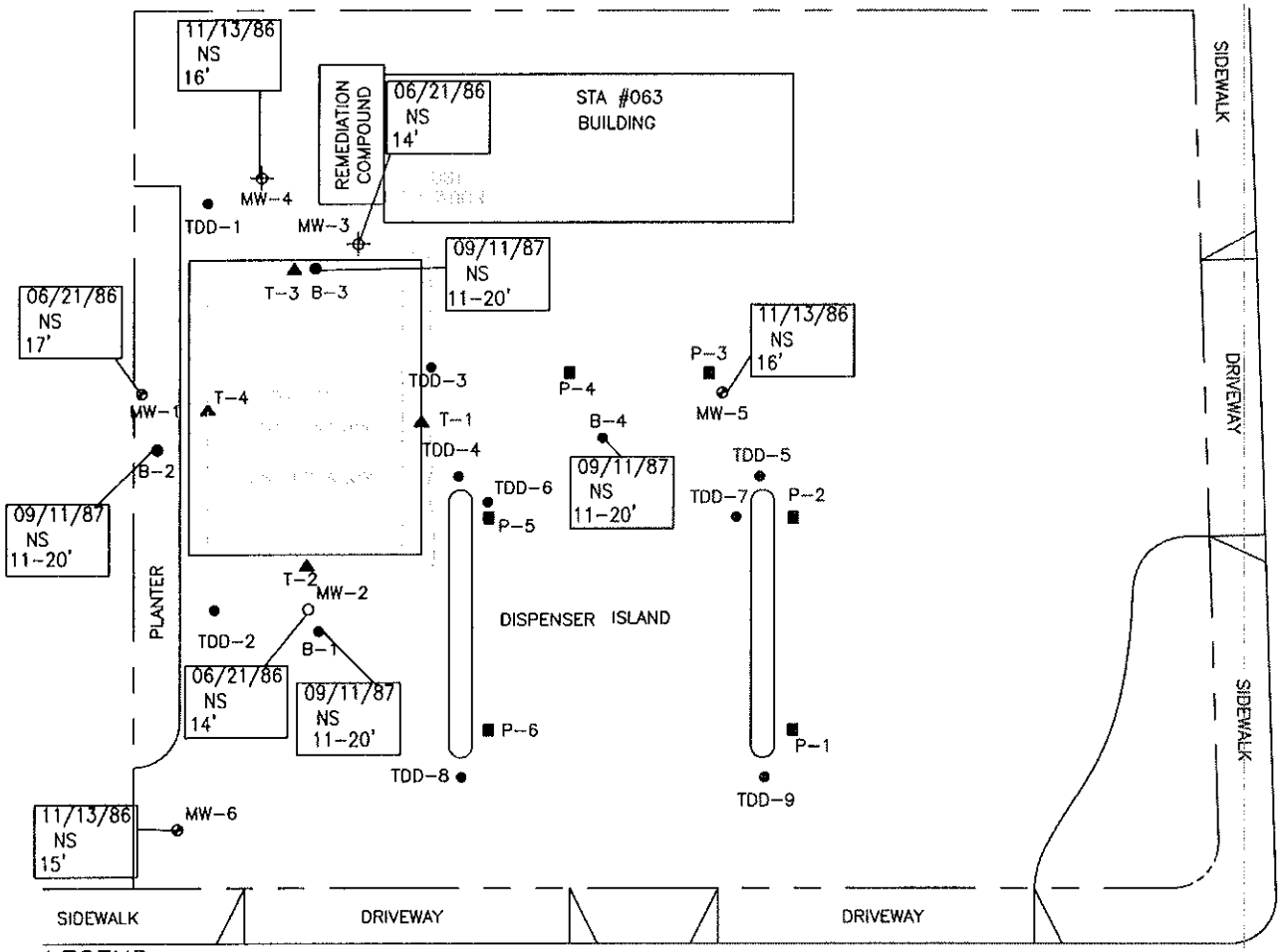
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4E
DISTRIBUTION OF BENZENE IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊗ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/21/86 NS 17' – DATE SAMPLED, MAXIMUM MTBE SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- — 10 — – MAXIMUM MTBE SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Pre-Remediation (11-20 feet below ground surface)

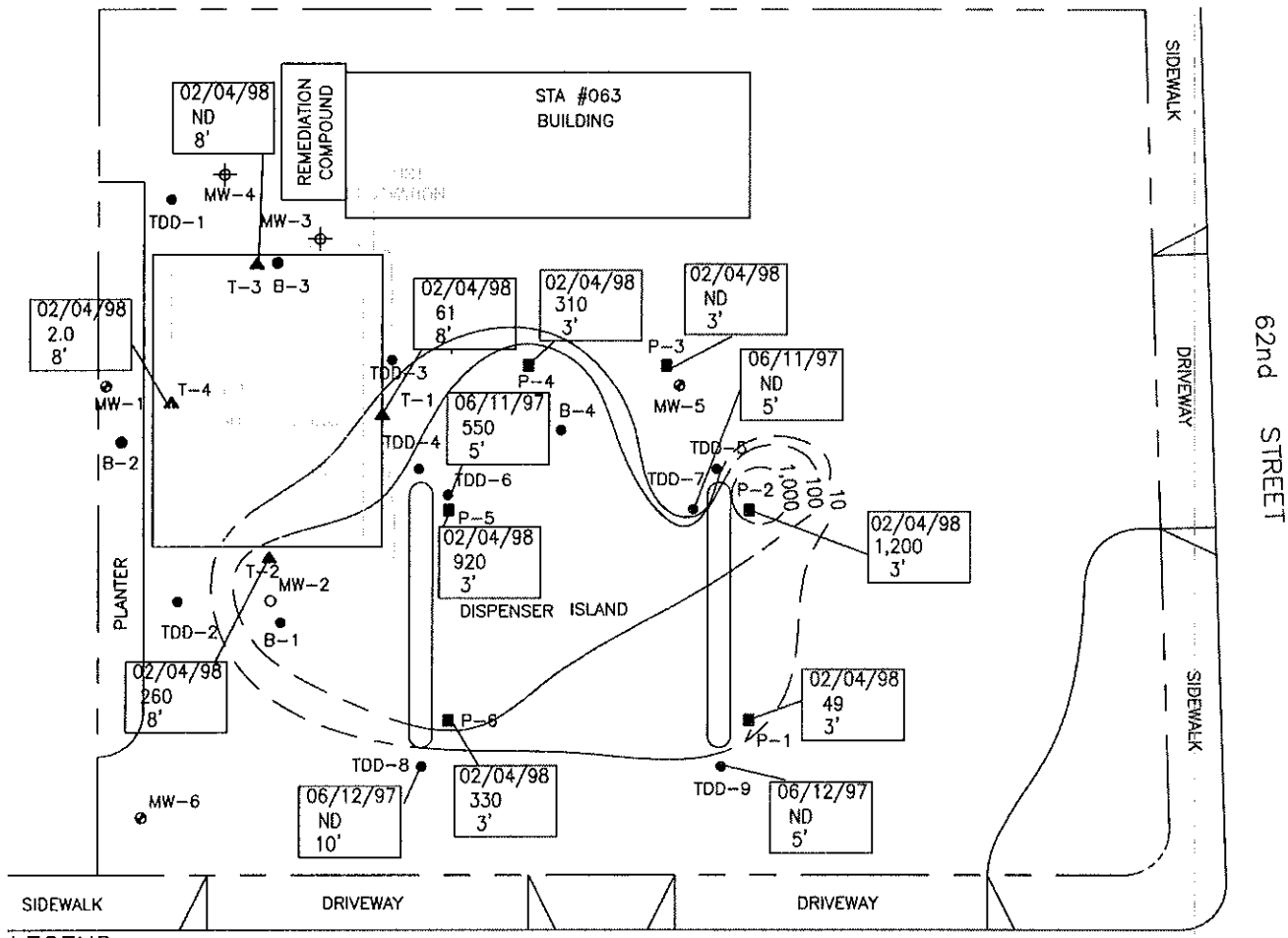
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4F
DISTRIBUTION OF MTBE IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/11/97 / 550 / 5' – DATE SAMPLED, MAXIMUM TPHg SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- — 100 — – MAXIMUM TPHg SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET
0' 30' 60'

Post–Remediation (0–10 feet below ground surface)

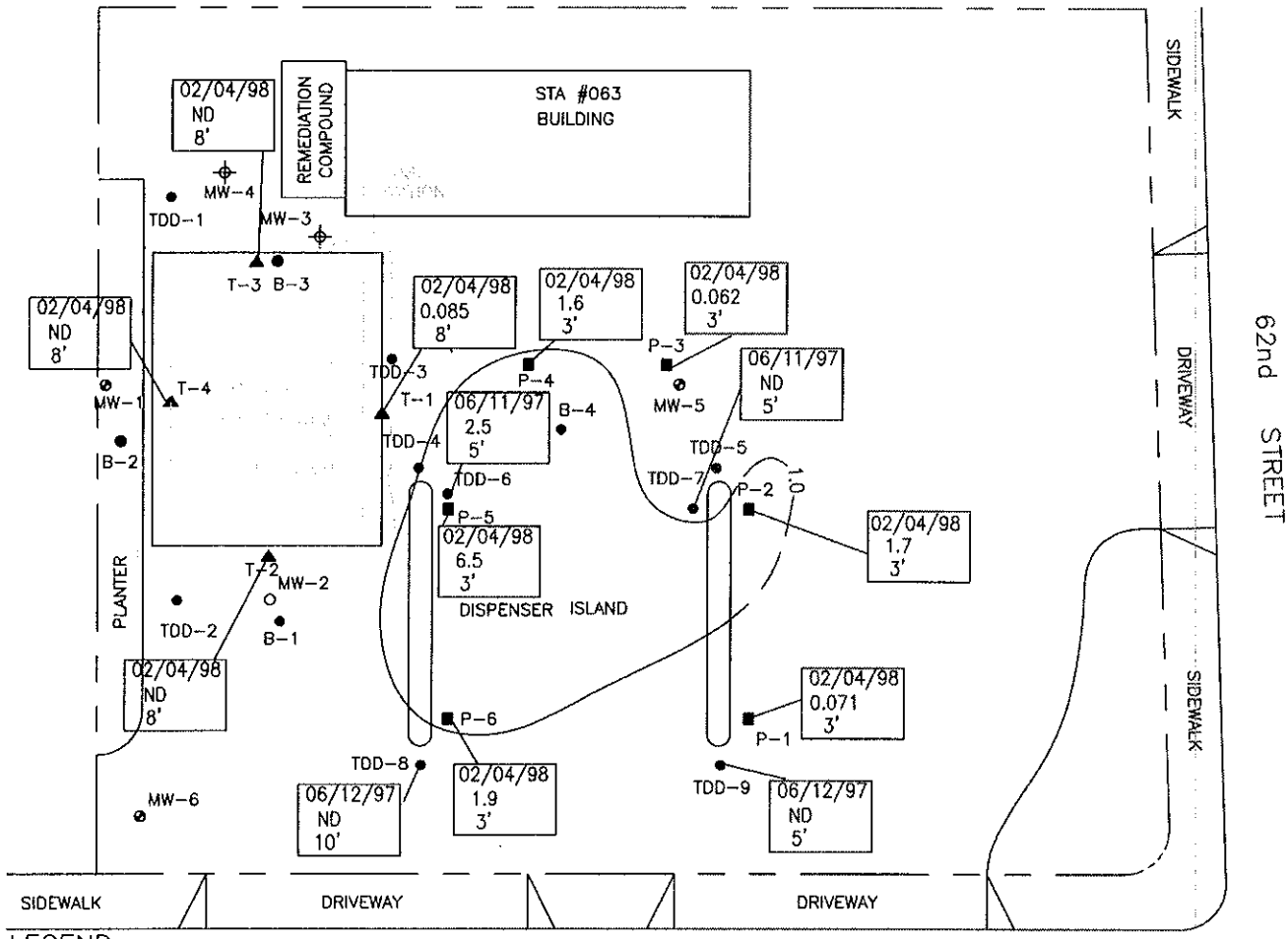
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4G
DISTRIBUTION OF TPHg IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/11/97 / 2.5 / 5' – DATE SAMPLED, MAXIMUM BENZENE SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- — 1.0 — – MAXIMUM BENZENE SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Post-Remediation (0-10 feet below ground surface)

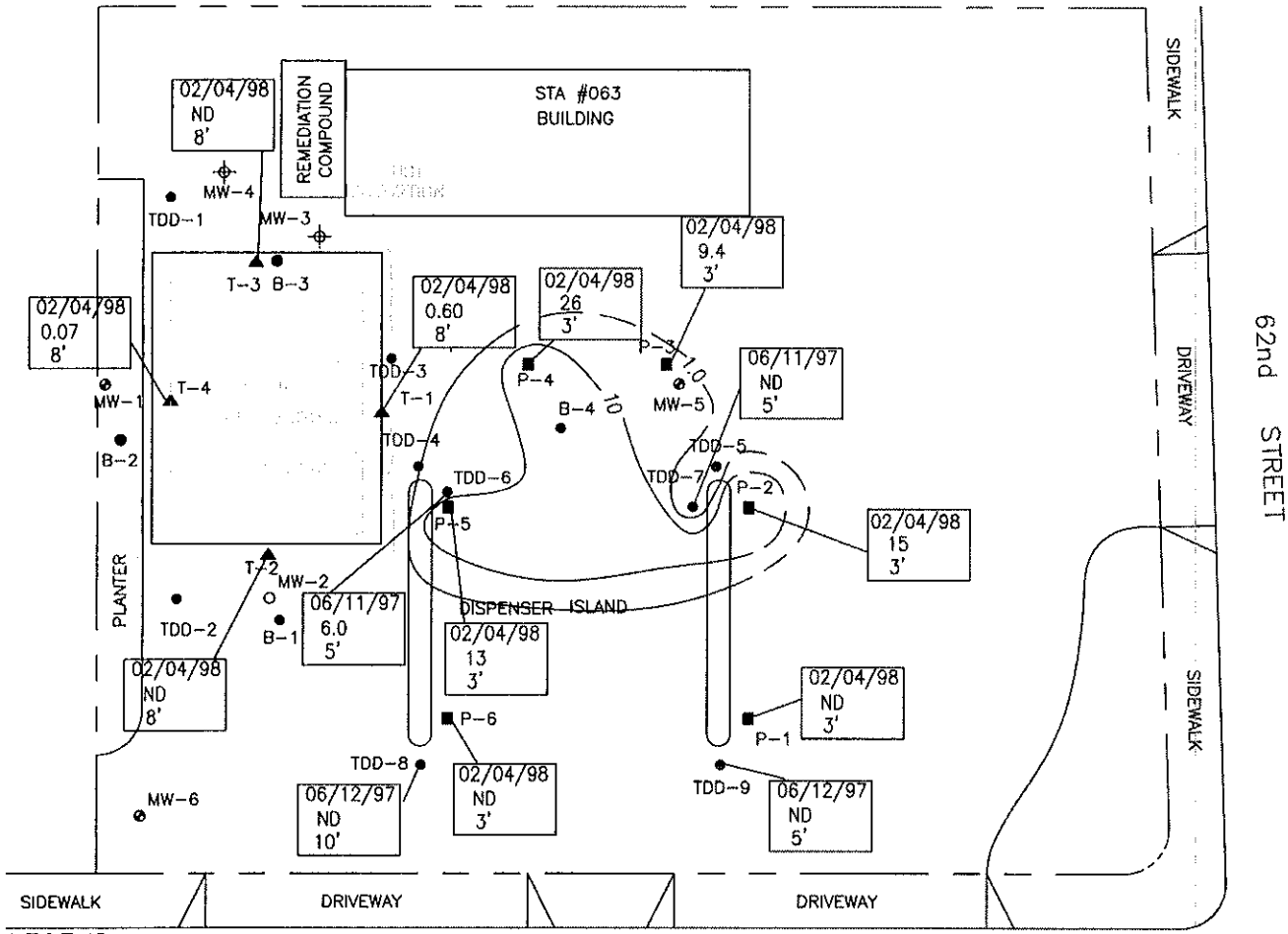
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4H
DISTRIBUTION OF BENZENE IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊕ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/11/97 / 6.0 / 5' – DATE SAMPLED, MAXIMUM MTBE SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- — 10 — – MAXIMUM MTBE SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Post-Remediation (0-10 feet below ground surface)

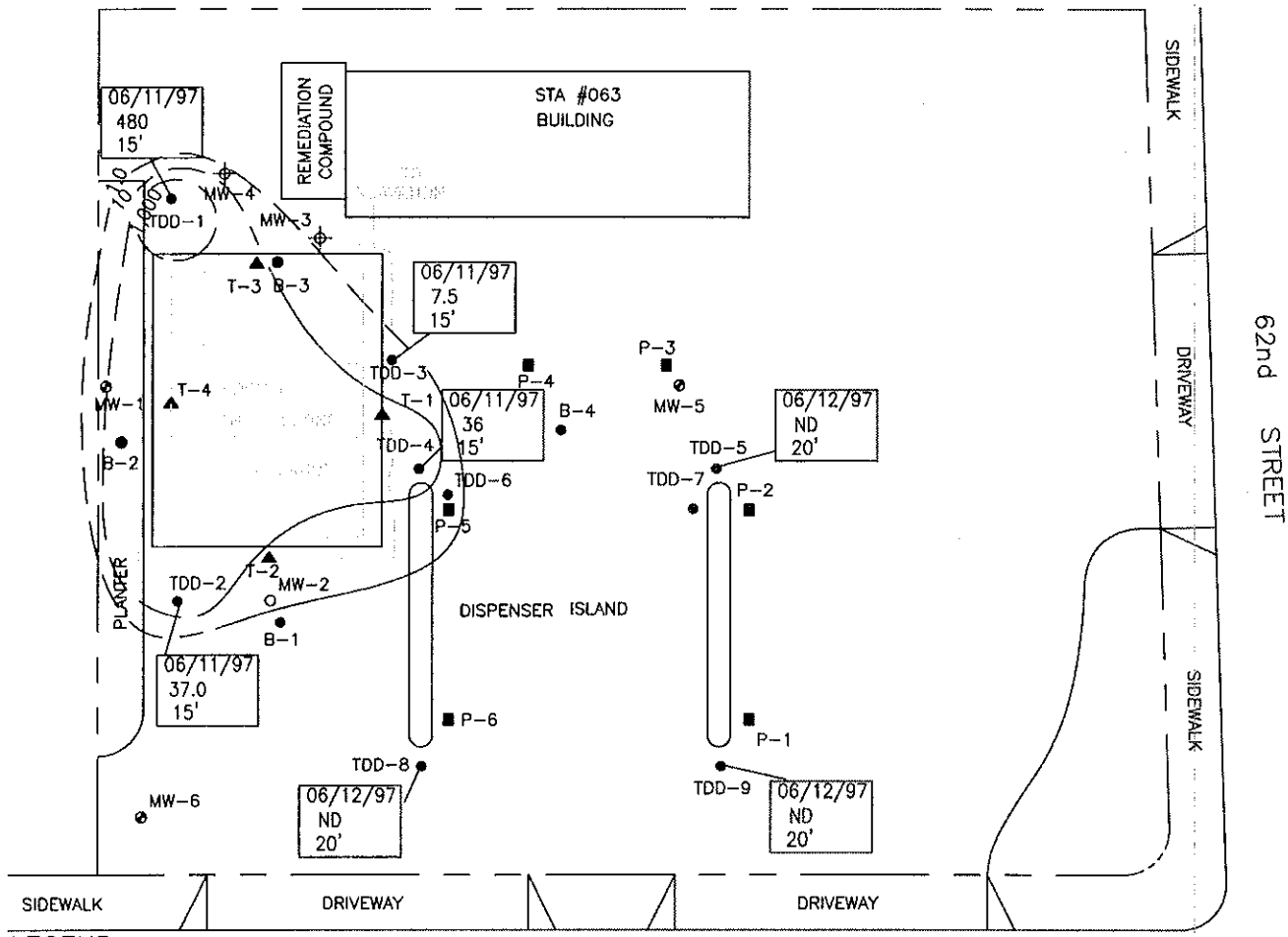
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4I
DISTRIBUTION OF MTBE IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/11/97 / 480 / 15' – DATE SAMPLED, MAXIMUM TPHg SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- — 100 — – MAXIMUM TPHg SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Post-Remediation (11-20' feet below ground surface)

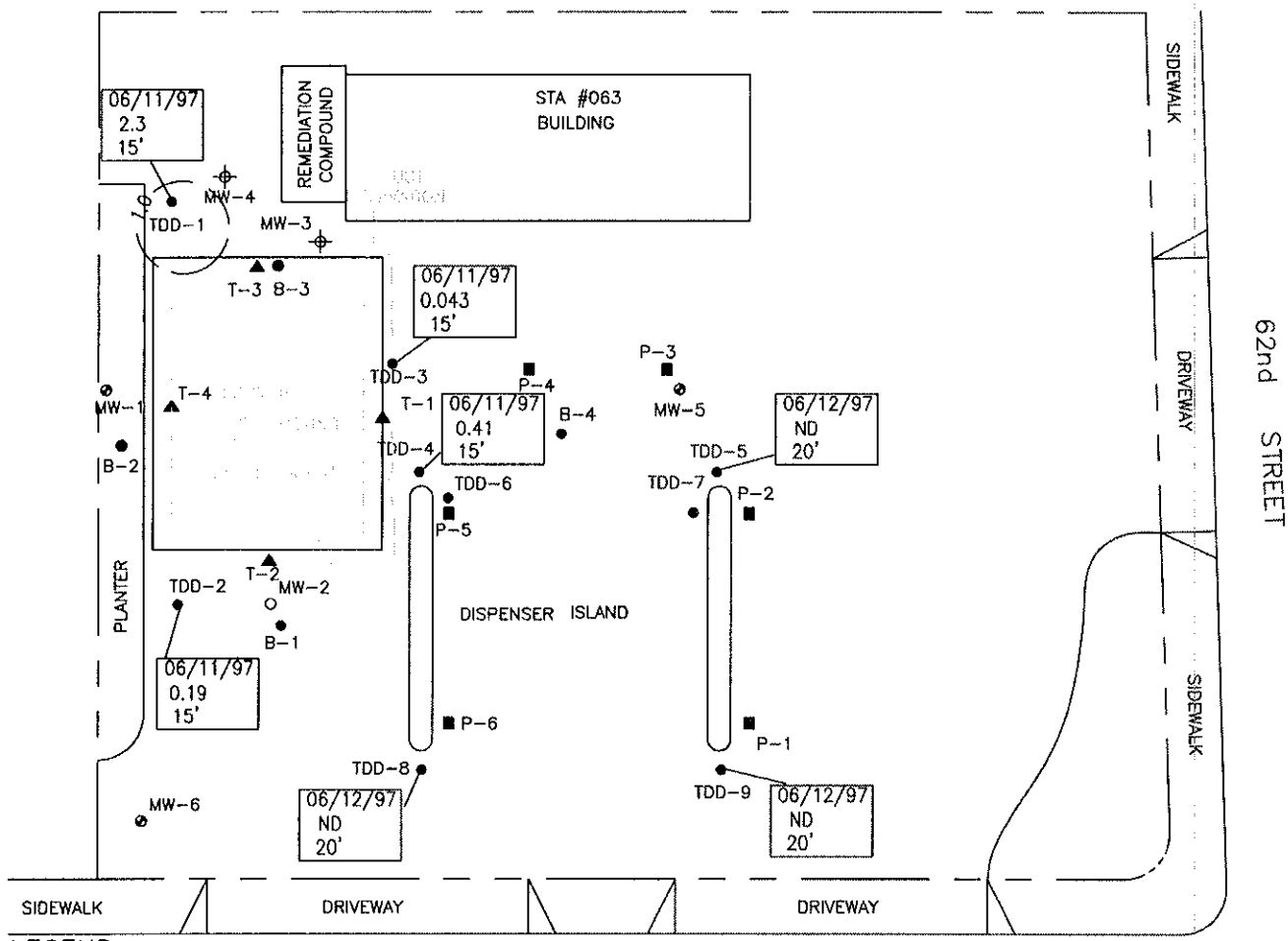
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4J
DISTRIBUTION OF TPHg IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/11/97 / 2.3 / 15' – DATE SAMPLED, MAXIMUM BENZENE SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- — 1.0 — – MAXIMUM BENZENE SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

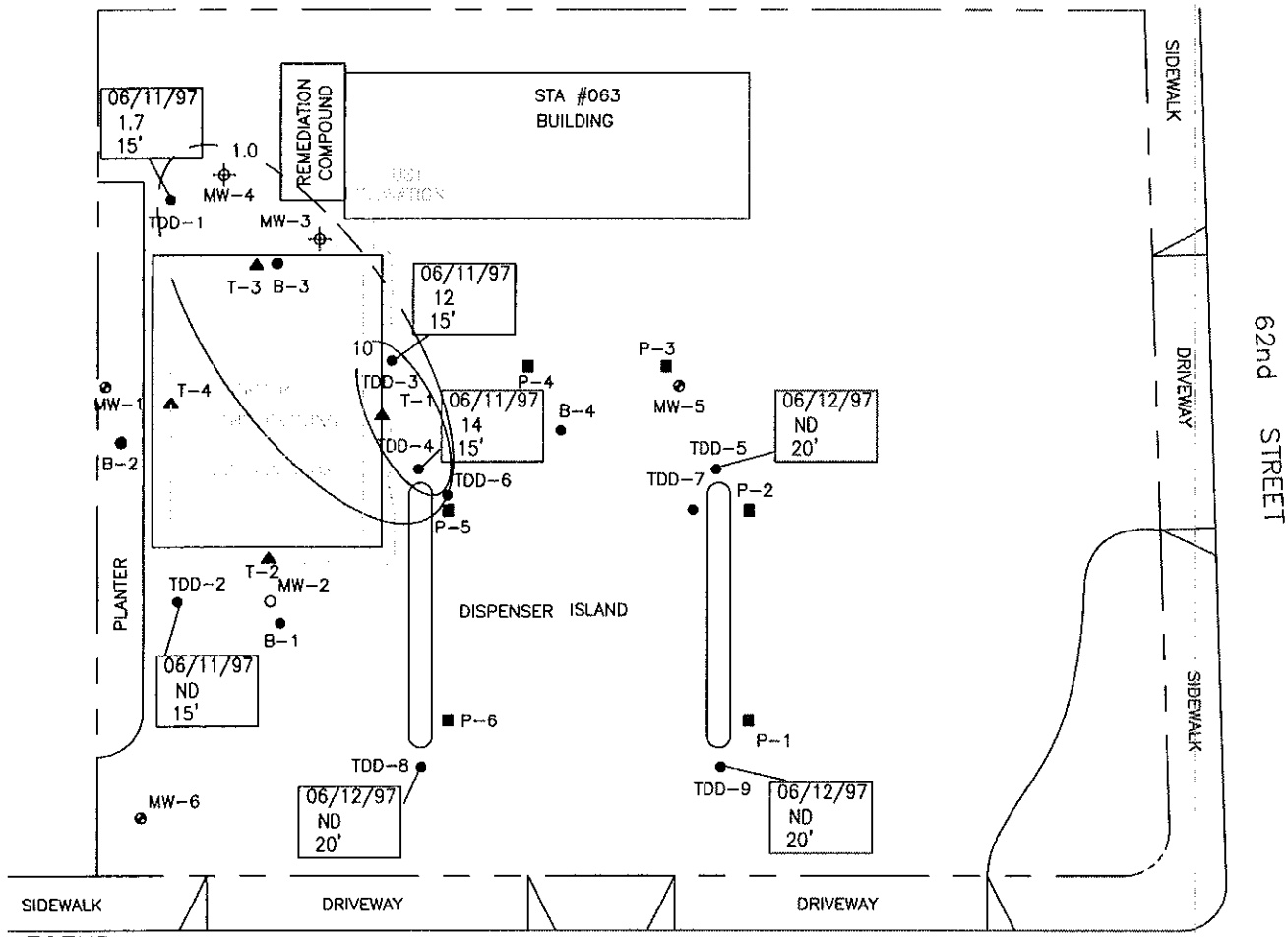
Post-Remediation (11-20' feet below ground surface)

GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332 DATE: 02/20/06

FIGURE 4K
DISTRIBUTION OF BENZENE IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- ● – SOIL BORING
- ▲ – TANK BOTTOM SAMPLE POINT
- ■ – PIPING SAMPLE POINT
- 06/11/97 / 12 / 15' – DATE SAMPLED, MAXIMUM MTBE SOIL CONCENTRATIONS IN mg/Kg, DEPTH OF SAMPLE
- — 10 — – MAXIMUM MTBE SOIL CONTOUR IN mg/Kg
- ND – NOT DETECTED ABOVE LABORATORY REPORTING LIMITS
- NS – NOT SAMPLED
- NA – DEPTH DATA NOT AVAILABLE

APPROXIMATE SCALE IN FEET

0' 30' 60'

Post-Remediation (11-20' feet below ground surface)

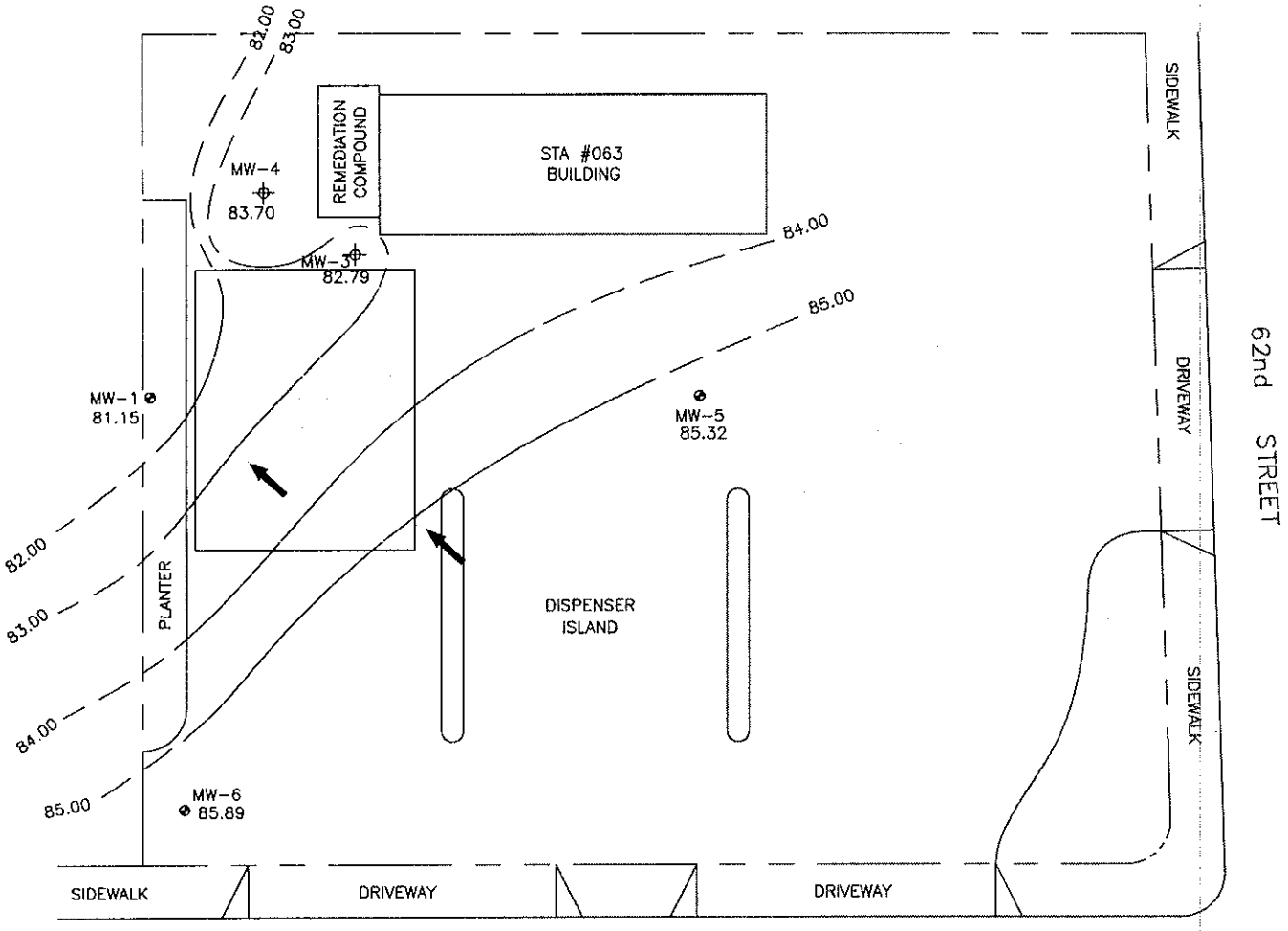
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 4L
DISTRIBUTION OF MTBE IN SOIL
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- – GROUNDWATER MONITORING WELL
- – GROUNDWATER RECOVERY WELL
- 85.32 – FEET ABOVE MEAN SEA LEVEL (GROUNDWATER)
- 85.00 – GROUNDWATER ELEVATION IN FT. ABOVE MEAN SEA LEVEL
- – APPROXIMATE DIRECTION OF GROUNDWATER FLOW

APPROXIMATE SCALE IN FEET

0' 30' 60'

OCTOBER 12, 2005

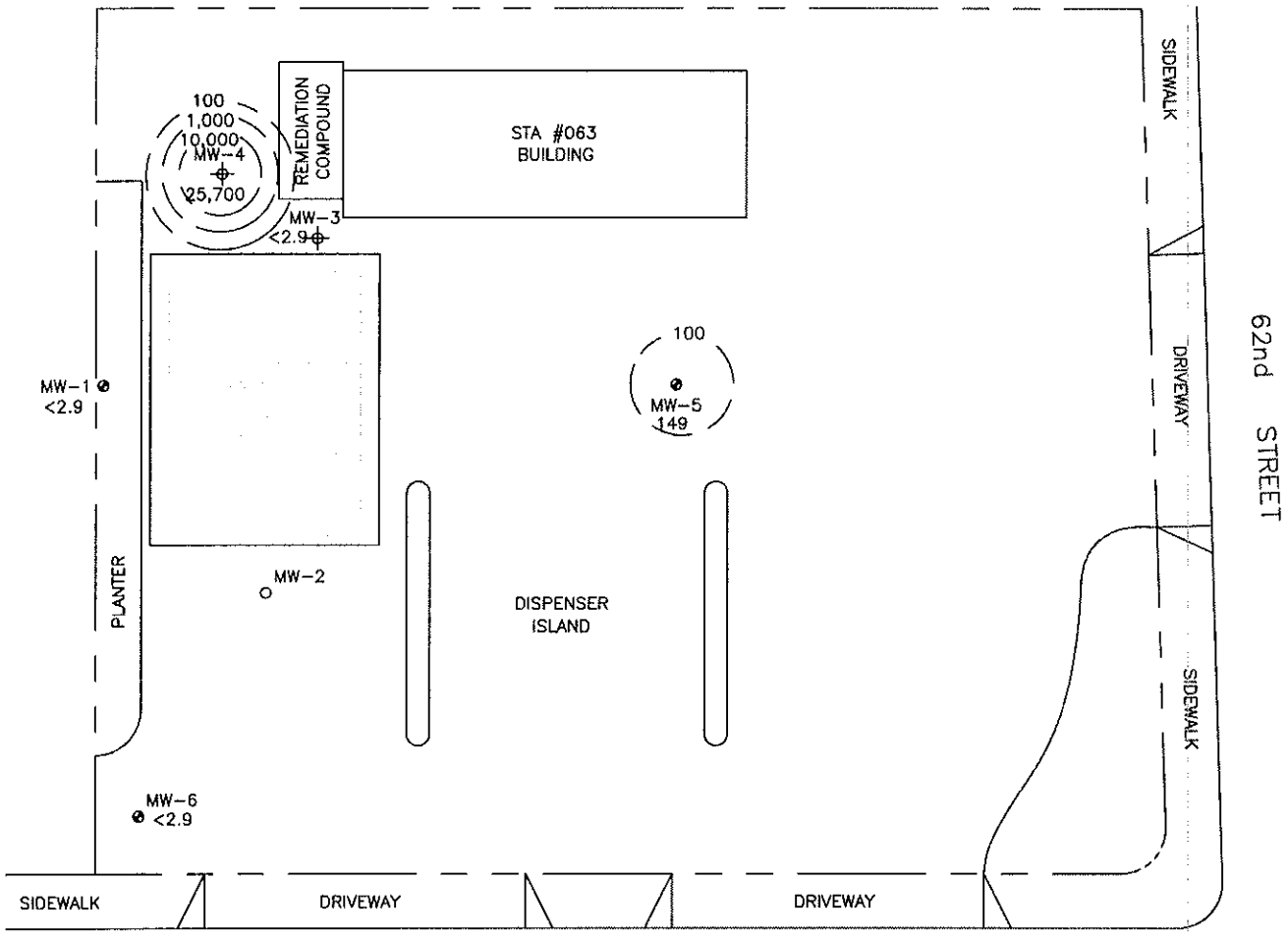
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 5
GROUNDWATER ELEVATION CONTOUR MAP
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⌀ – GROUNDWATER MONITORING WELL
- ⌖ – GROUNDWATER RECOVERY WELL
- o – ABANDONED GROUNDWATER MONITORING WELL
- 149 – TPHg GROUNDWATER CONCENTRATIONS in µg/L
- — 100 — – TPHg GROUNDWATER CONTOUR in µg/L

APPROXIMATE SCALE IN FEET

0' 30' 60'

OCTOBER 12, 2005 (Post-Remediation)

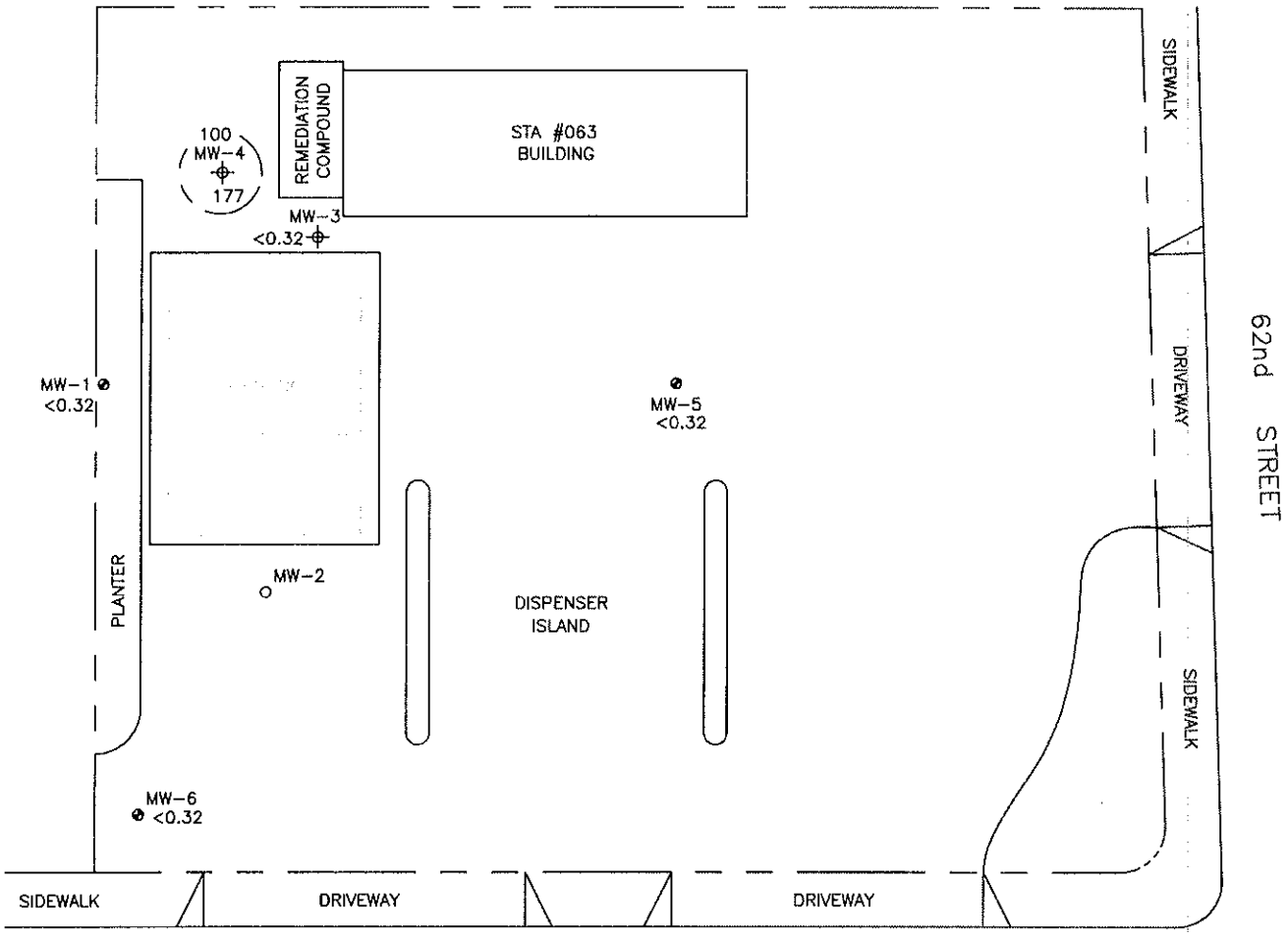
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 6A
DISTRIBUTION OF TPHg IN GROUNDWATER
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⌀ – GROUNDWATER MONITORING WELL
- ⌖ – GROUNDWATER RECOVERY WELL
- o – ABANDONED GROUNDWATER MONITORING WELL
- 177 – BENZENE GROUNDWATER CONCENTRATIONS in µg/L
- — 100 — – BENZENE GROUNDWATER CONTOUR in µg/L

APPROXIMATE SCALE IN FEET

0' 30' 60'

OCTOBER 12, 2005 (Post-Remediation)

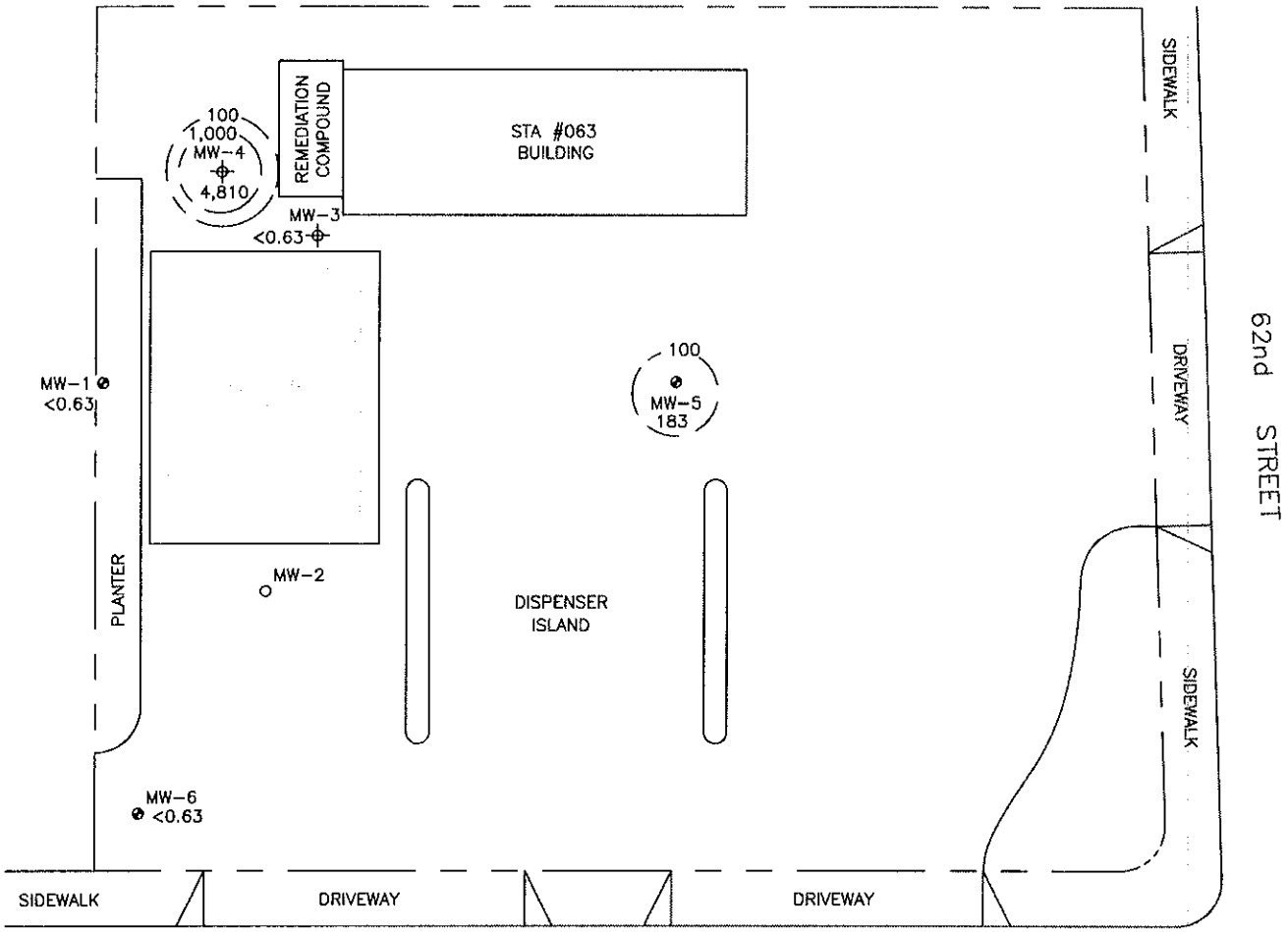
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 6B
DISTRIBUTION OF BENZENE IN GROUNDWATER
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⌖ – GROUNDWATER RECOVERY WELL
- ○ – ABANDONED GROUNDWATER MONITORING WELL
- 183 – MTBE GROUNDWATER CONCENTRATIONS in µg/L
- — 100 — – MTBE GROUNDWATER CONTOUR in µg/L

APPROXIMATE SCALE IN FEET

0' 30' 60'

OCTOBER 12, 2005 (Post-Remediation)

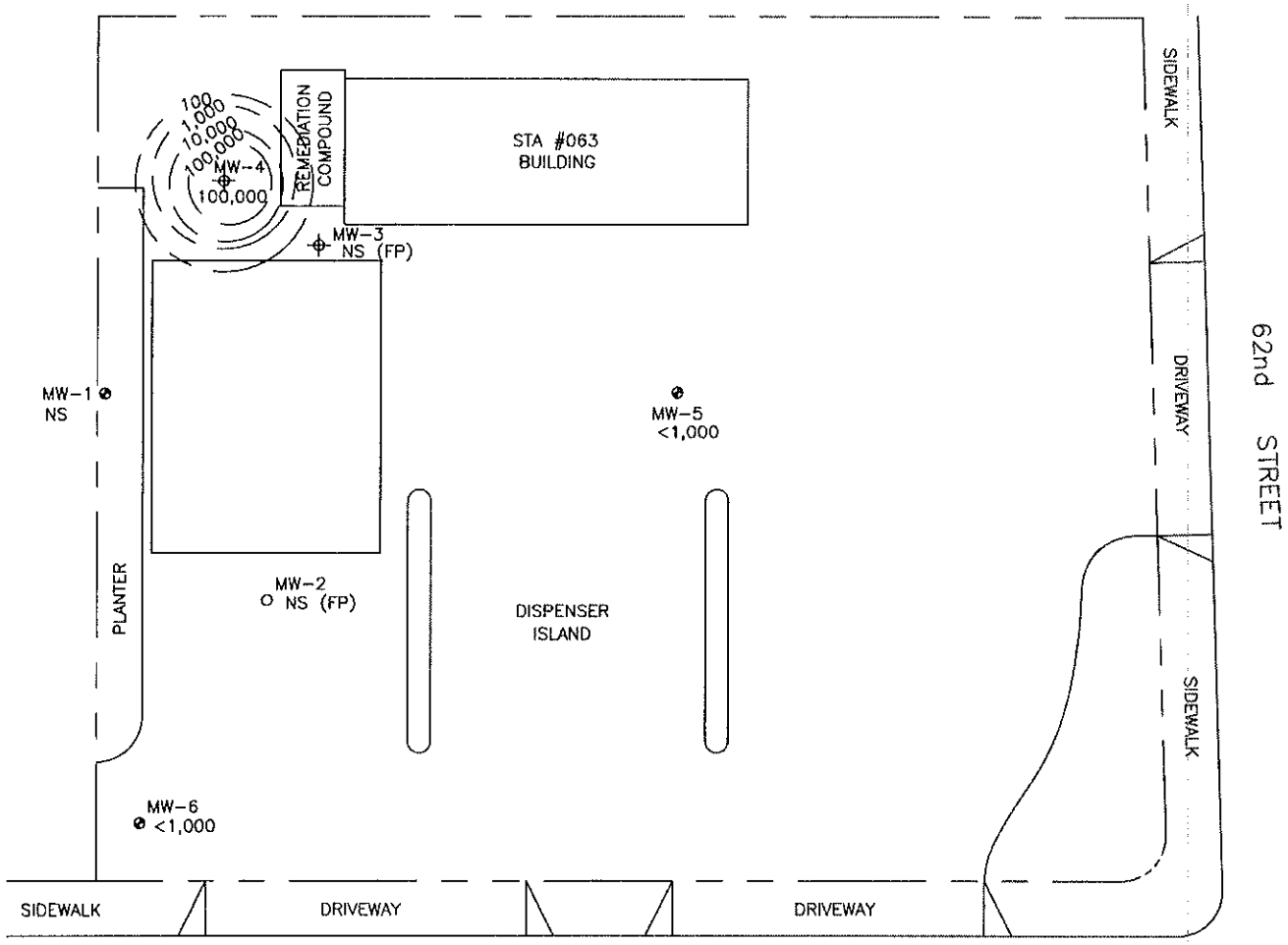
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 6C
DISTRIBUTION OF MTBE IN GROUNDWATER
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⌀ – GROUNDWATER MONITORING WELL
- ⌖ – GROUNDWATER RECOVERY WELL
- O – ABANDONED GROUNDWATER MONITORING WELL
- 100,000 – TPHg GROUNDWATER CONCENTRATIONS in µg/L
- — 100,000 — – TPHg GROUNDWATER CONTOUR in µg/L
- NS – NOT SAMPLED
- FP – FREE PRODUCT PRESENT

APPROXIMATE SCALE IN FEET

0' 30' 60'

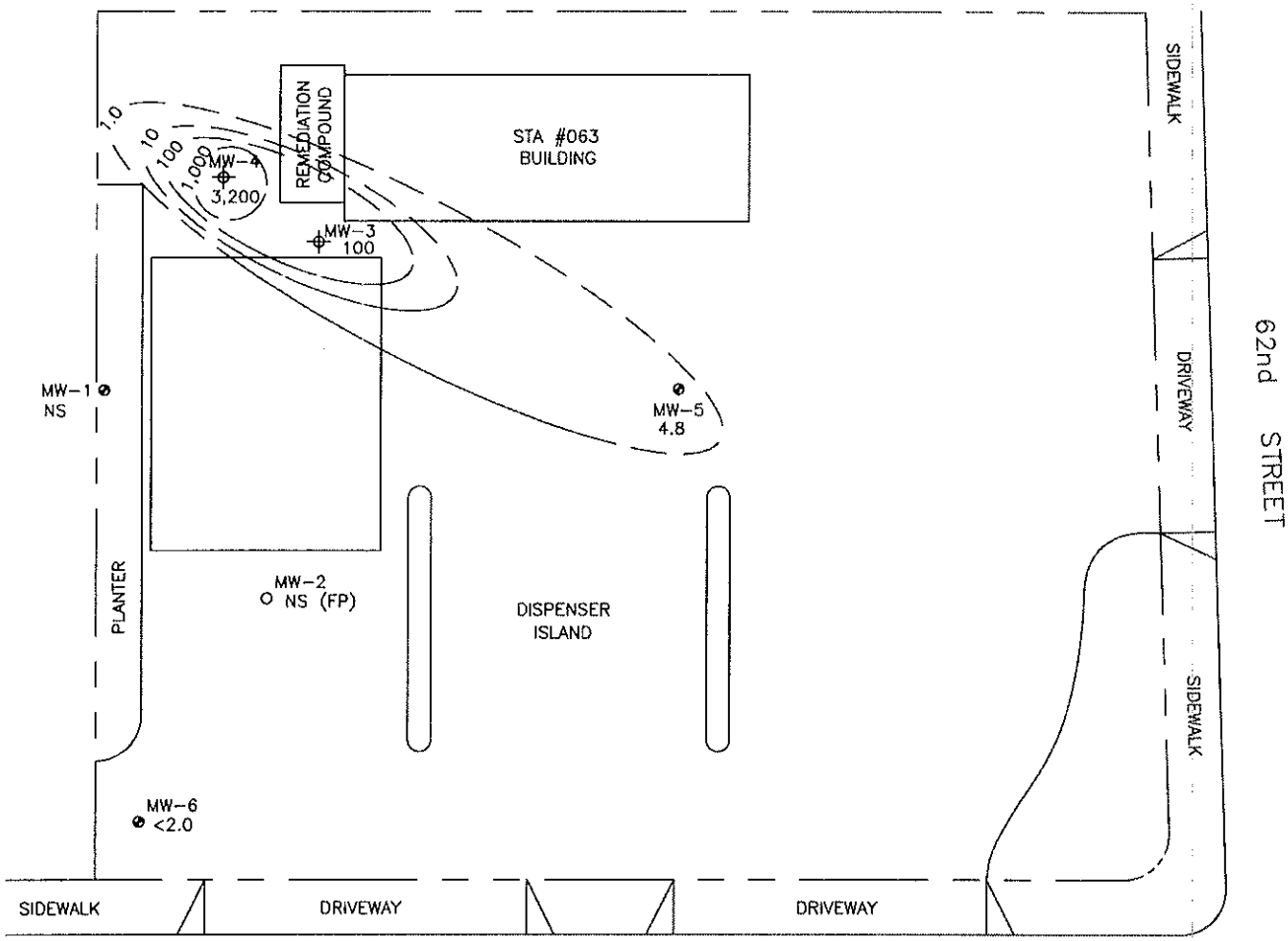
NOVEMBER 21, 1986 (Pre-Remediation)

GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332 DATE: 02/20/06

FIGURE 6D
DISTRIBUTION OF TPHg IN GROUNDWATER
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- O – ABANDONED GROUNDWATER MONITORING WELL
- 3,200 – BENZENE GROUNDWATER CONCENTRATIONS in µg/L
- — 1,000 — – TPHg GROUNDWATER CONTOUR in µg/L
- NS – NOT SAMPLED
- FP – FREE PRODUCT PRESENT

APPROXIMATE SCALE IN FEET

0' 30' 60'

NOVEMBER 21, 1986 (Pre-Remediation)

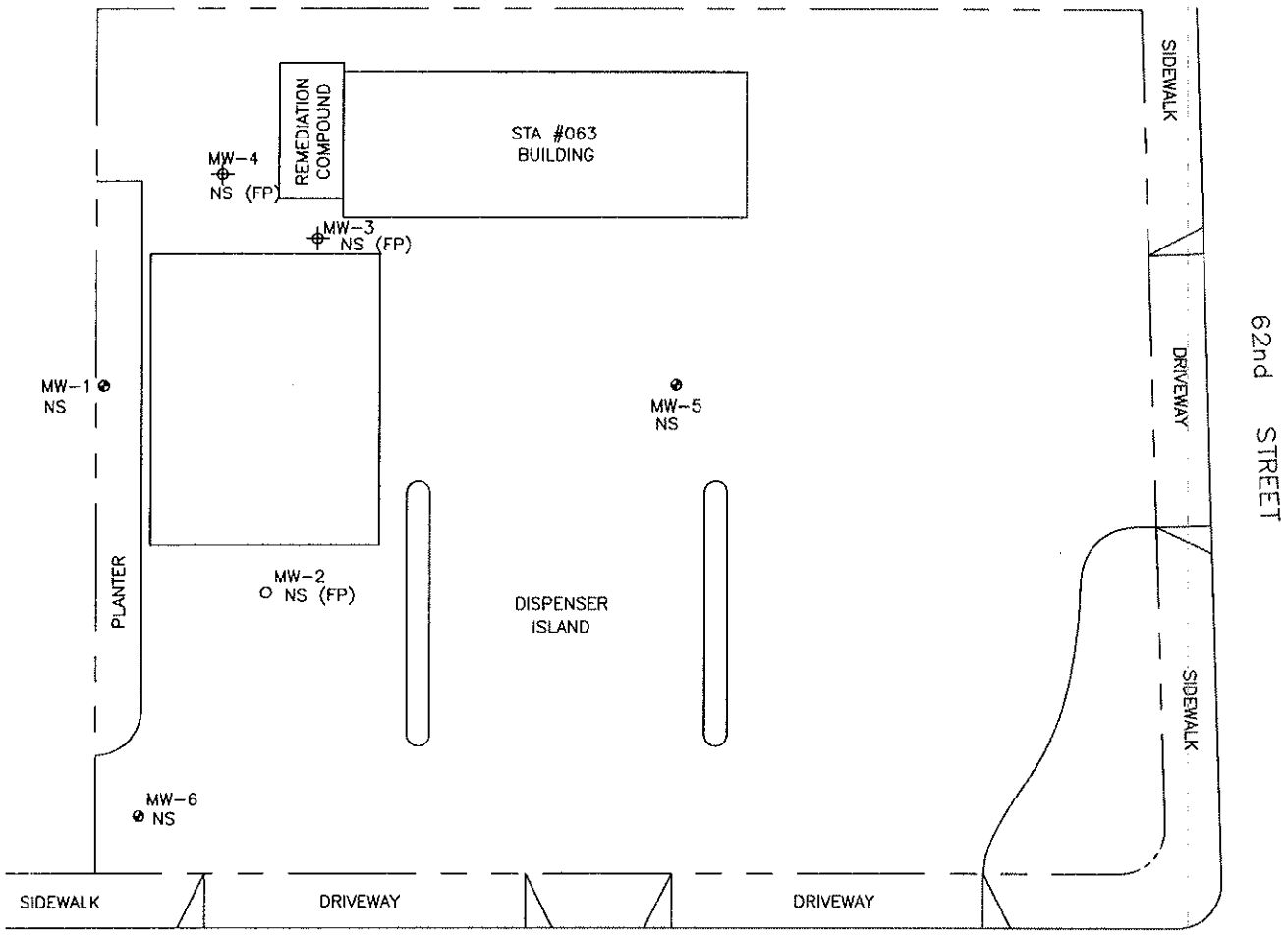
GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 6E
DISTRIBUTION OF BENZENE IN GROUNDWATER
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA



LEGEND

- ⊘ – GROUNDWATER MONITORING WELL
- ⊕ – GROUNDWATER RECOVERY WELL
- O – ABANDONED GROUNDWATER MONITORING WELL
- 100 – MTBE GROUNDWATER CONCENTRATIONS in µg/L
- — 100 — – MTBE GROUNDWATER CONTOUR in µg/L
- NS – NOT SAMPLED
- FP – FREE PRODUCT PRESENT

APPROXIMATE SCALE IN FEET

0' 30' 60'

NOVEMBER 21, 1986 (Pre-Remediation)

GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 6F
DISTRIBUTION OF MTBE IN GROUNDWATER
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA

FIGURE 7A: Benzene / MTBE Concentrations and Groundwater Elevations vs. Time TOC Station 063 (MW-1)

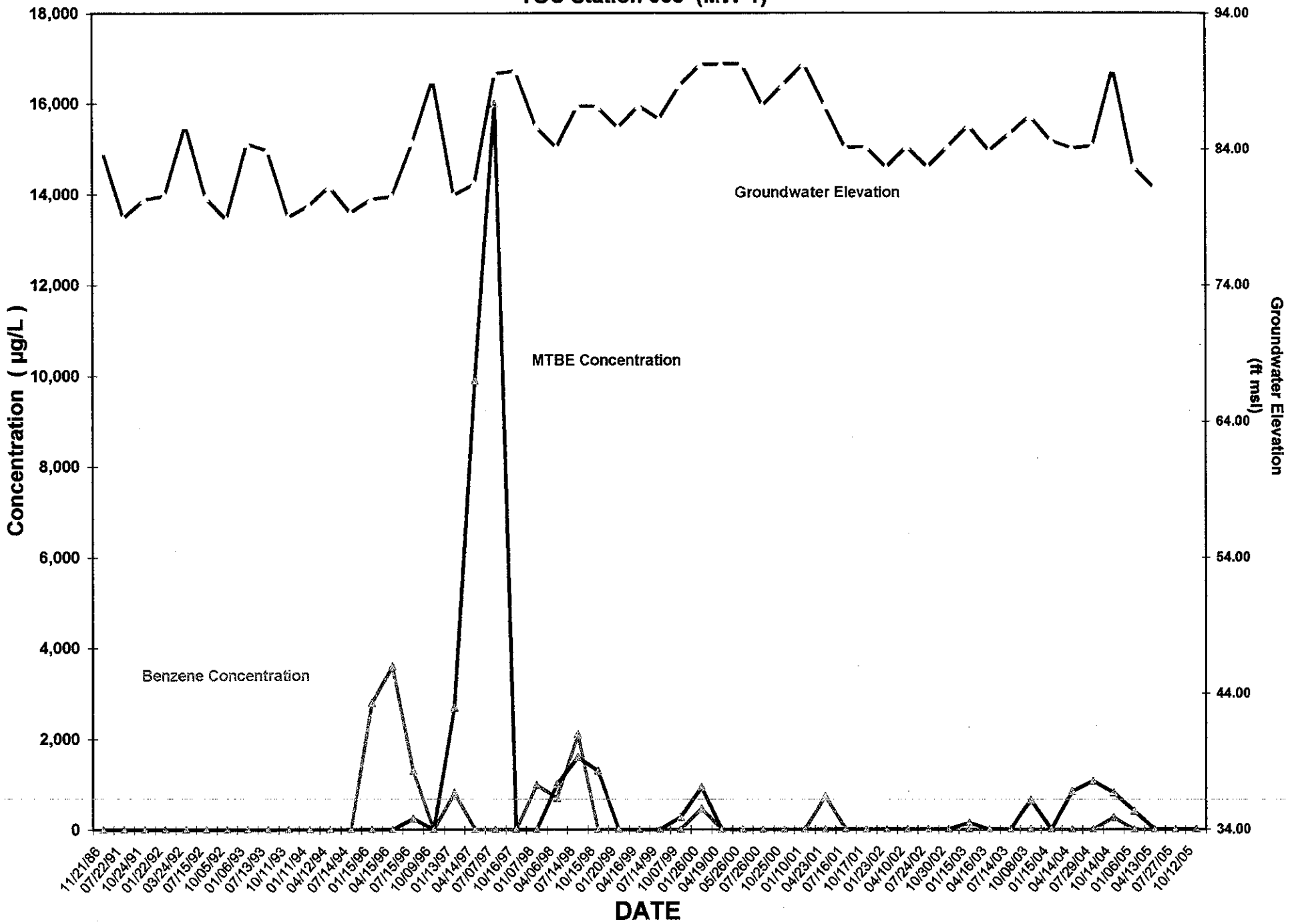


FIGURE 7B: Benzene / MTBE Concentrations and Groundwater Elevations vs. Time TOC Station 063 (MW-2)

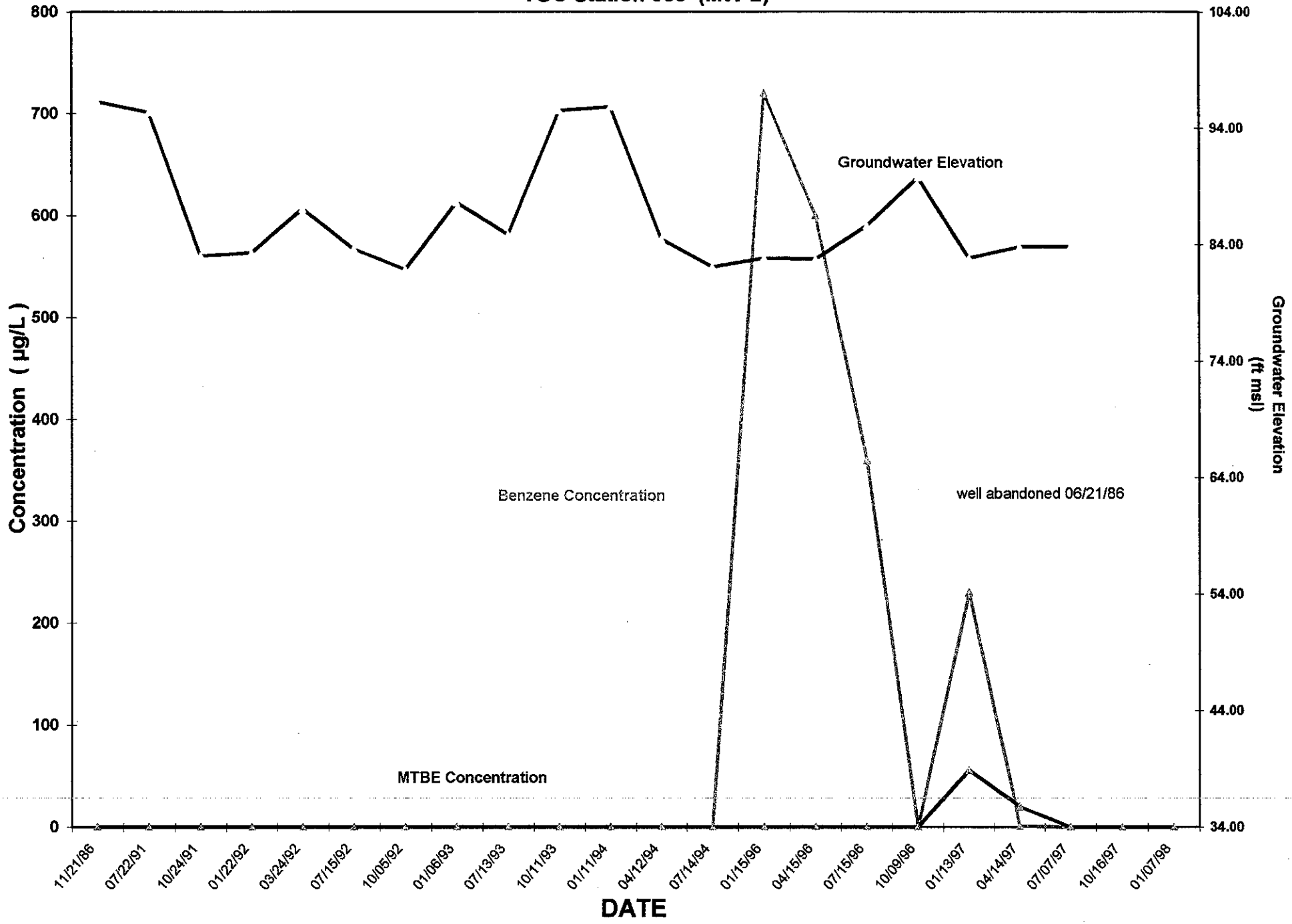


FIGURE 7C: Benzene / MTBE Concentrations and Groundwater Elevations vs. Time TOC Station 063 (MW-3)

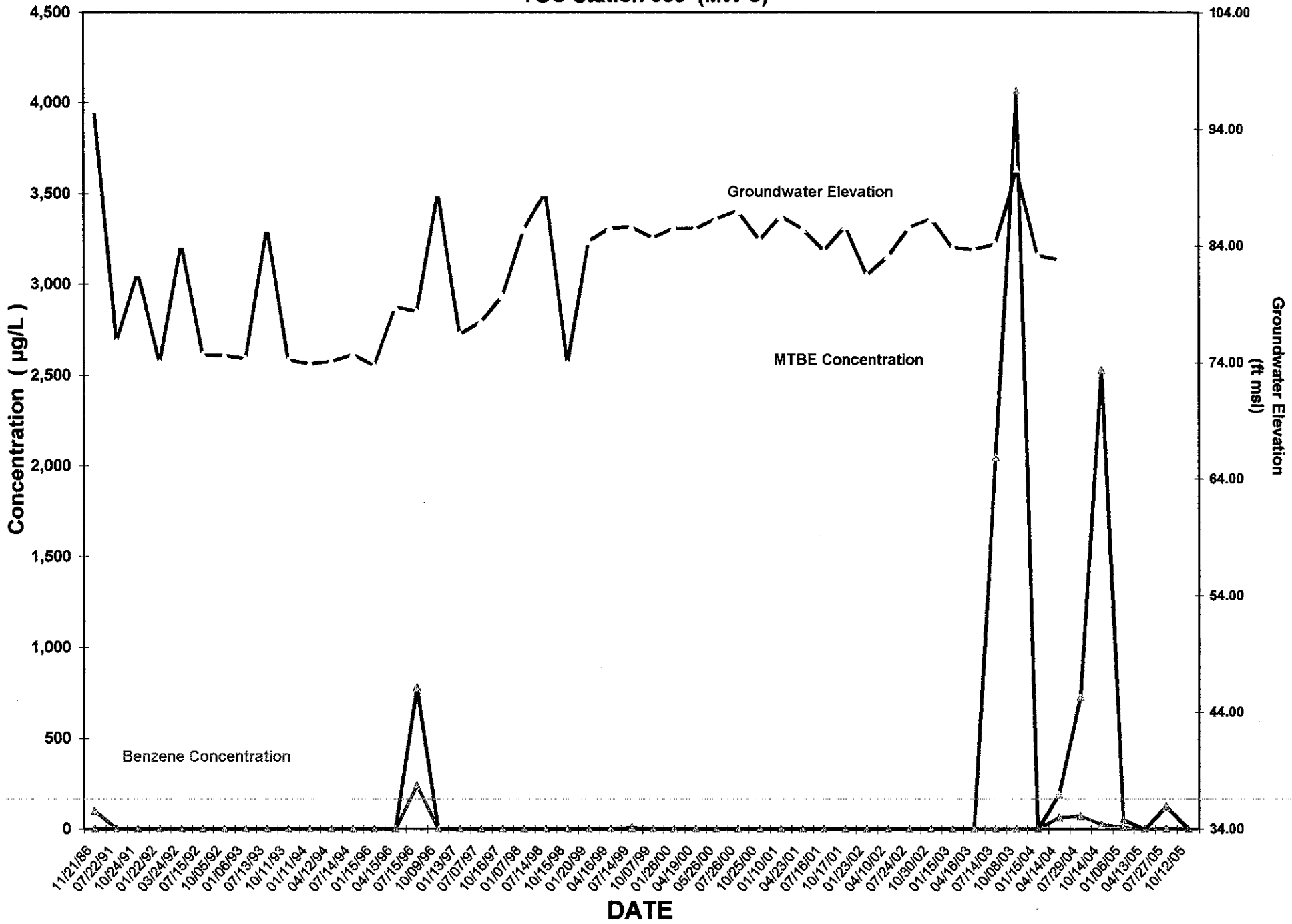


FIGURE 7D: Benzene / MTBE Concentrations and Groundwater Elevations vs. Time
TOC Station 063 (MW-4)

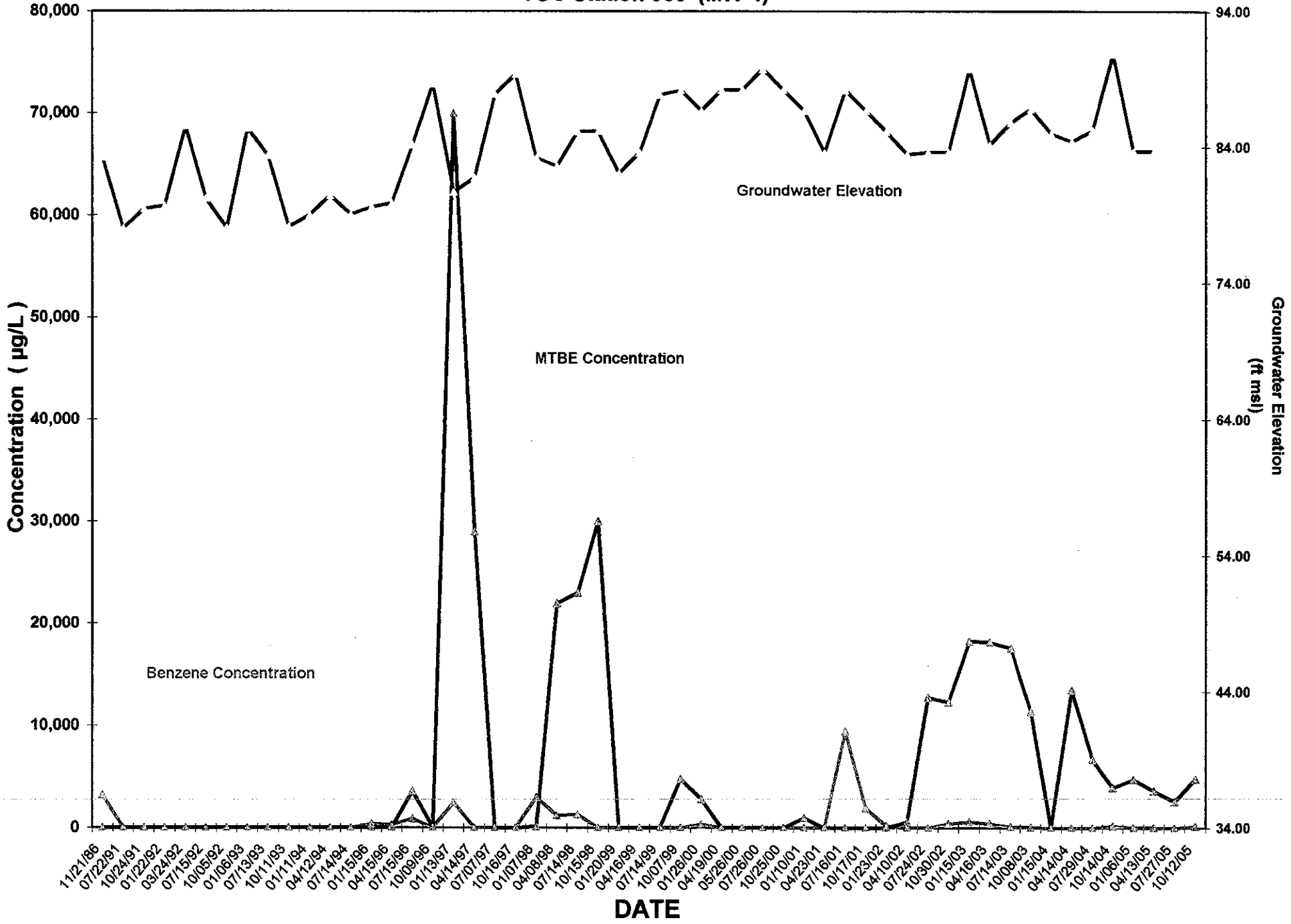


FIGURE 7E: Benzene / MTBE Concentrations and Groundwater Elevations vs. Time TOC Station 063 (MW-5)

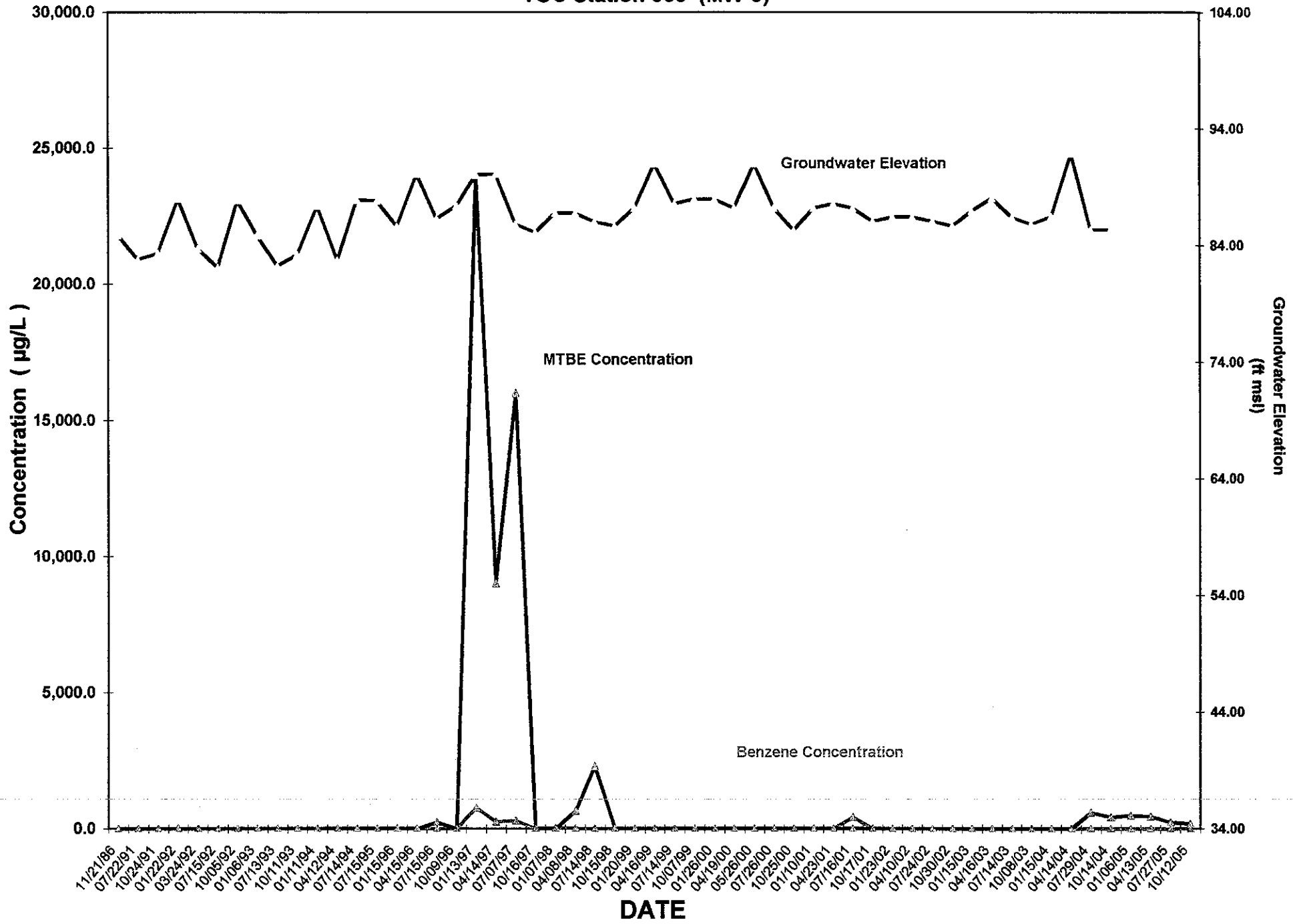
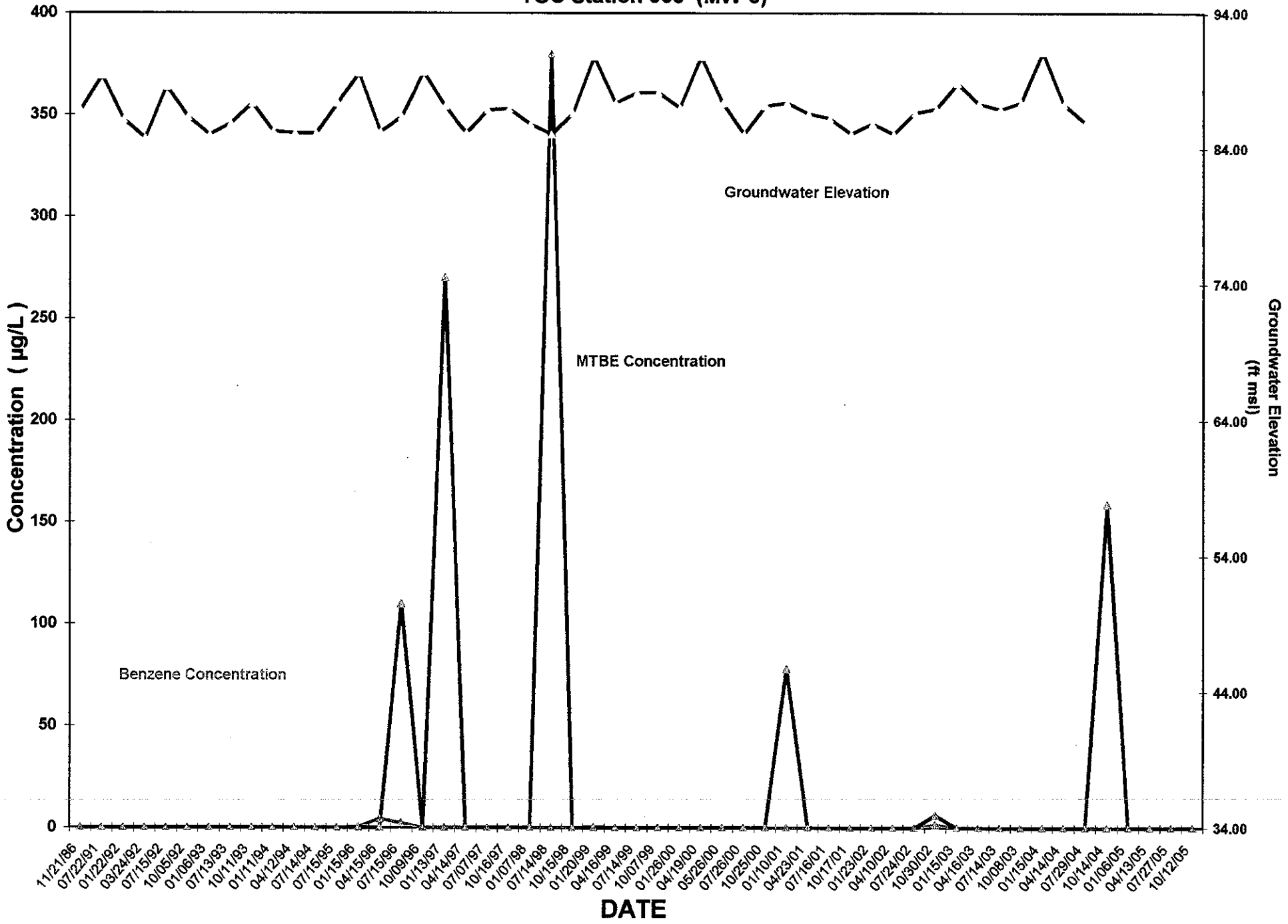
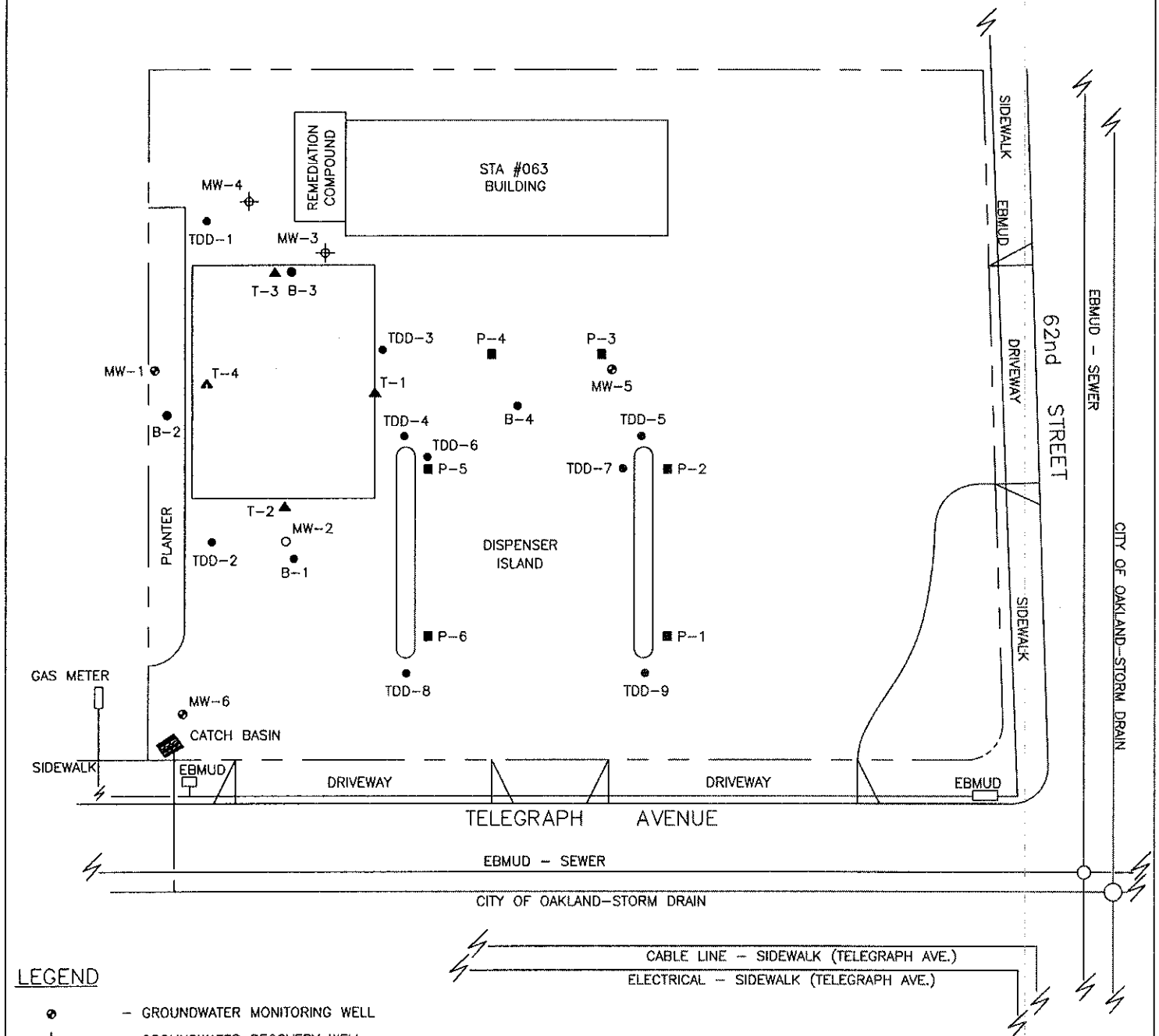


FIGURE 7F: Benzene / MTBE Concentrations and Groundwater Elevations vs. Time
TOC Station 063 (MW-6)





GEOHYDROLOGIC CONSULTANTS, INC.
5912 Bolsa Avenue, Suite 200
Huntington Beach, CA 92649
www.geohydrologic.com

NORTH

GHC: 1332

DATE: 02/20/06

FIGURE 8
SITE PLAN WITH CONDUIT LOCATIONS
THRIFTY SERVICE STATION #063
6125 Telegraph Avenue
Oakland, CA

APPENDICES

APPENDIX A

BIOSCREEN Plume Travel Time Output

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

TOC 063 MTBE

Run Name

Data Input Instructions:

1. *Enter value directly....or*
2. *Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Data used directly in model.

Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	13.6	*(ft/yr)*
or		↑ *or*	
Hydraulic Conductivity	*K*	9.3E-05	*(cm/sec)*
Hydraulic Gradient	*i*	0.0649	*(ft/ft)*
Porosity	*n*	0.46	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	5.4	*(ft)*
Transverse Dispersivity*	*alpha y*	0.5	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		↑ *or*	
Estimated Plume Length	*Lp*	70	*(ft)*

3. ADSORPTION

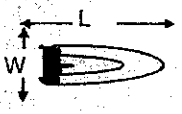
Retardation Factor*	*R*	1.1	*(-)*
or		↑ *or*	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	12.59	*(L/kg)*
FractionOrganicCarbon	*foc*	2.5E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	6.9E-2	*(per yr)*
or		↑ *or*	
Solute Half-Life	*t-half*	10.00	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*	1.65	*(mg/L)*
Delta Nitrate*	*NO3*	0.7	*(mg/L)*
Observed Ferrous Iron*	*Fe2+*	16.6	*(mg/L)*
Delta Sulfate*	*SO4*	22.4	*(mg/L)*
Observed Methane*	*CH4*	6.6	*(mg/L)*

5. GENERAL

Modeled Area Length*	1,300	*(ft)*
Modeled Area Width*	40	*(ft)*
Simulation Time*	1	*(yr)*



115 ↑ *or* 0.02

Variable*

20

6. SOURCE DATA

Source Thickness in Sat.Zone* 20 *(ft)*

Source Zones:

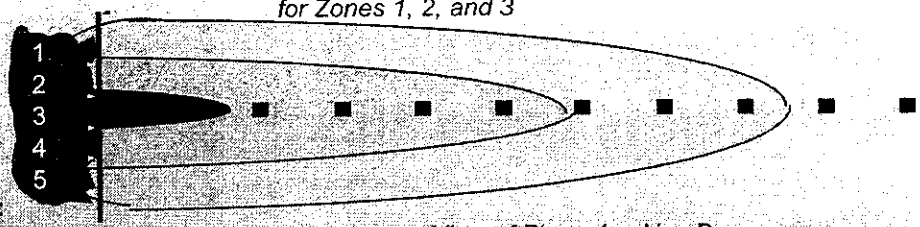
	Width* (ft)	Conc. (mg/L)*
1	5	0.15
2	5	1.5
3	20	2.9
4	5	1.5
5	5	0.15

Source Halflife (see Help):

Inst. React.	1st Order
3	20 *(yr)*

Soluble Mass In Source NAPL, Soil: 9.35 *(Kg)*

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	4.81	.001									
Dist. from Source (ft)	0	130	260	390	520	650	780	910	1040	1170	1300

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

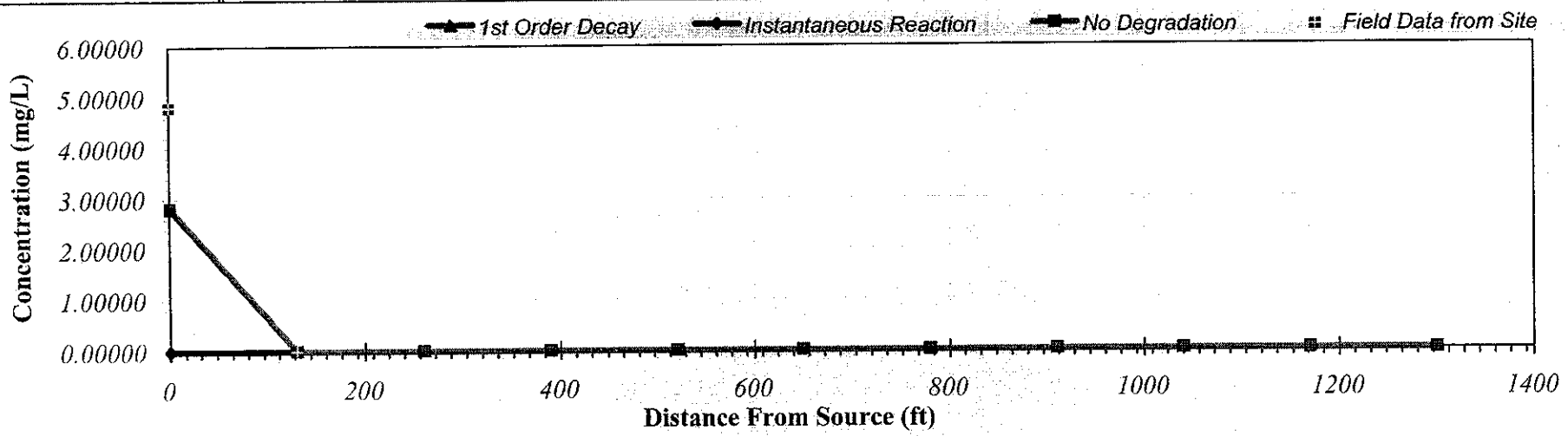
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	2.819	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	2.819	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

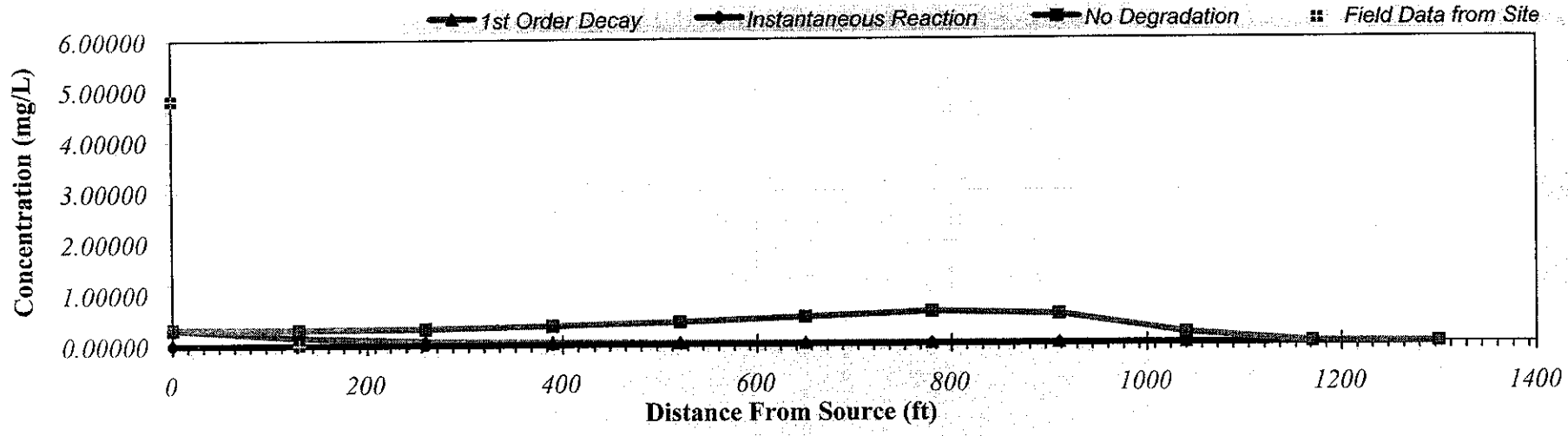
Time: 1 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.313	0.299	0.314	0.358	0.427	0.520	0.623	0.565	0.191	0.017	0.000
1st Order Decay	0.313	0.146	0.075	0.042	0.024	0.014	0.009	0.005	0.001	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

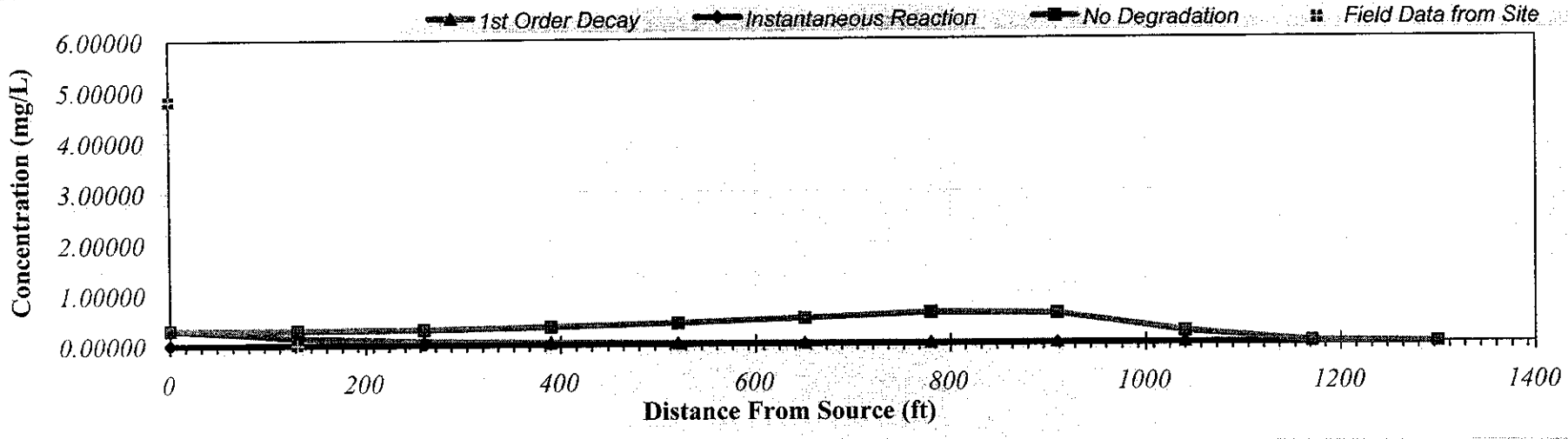
Time: 79 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.305	0.291	0.305	0.348	0.415	0.506	0.611	0.580	0.224	0.023	0.001
1st Order Decay	0.305	0.142	0.073	0.040	0.023	0.014	0.008	0.005	0.001	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

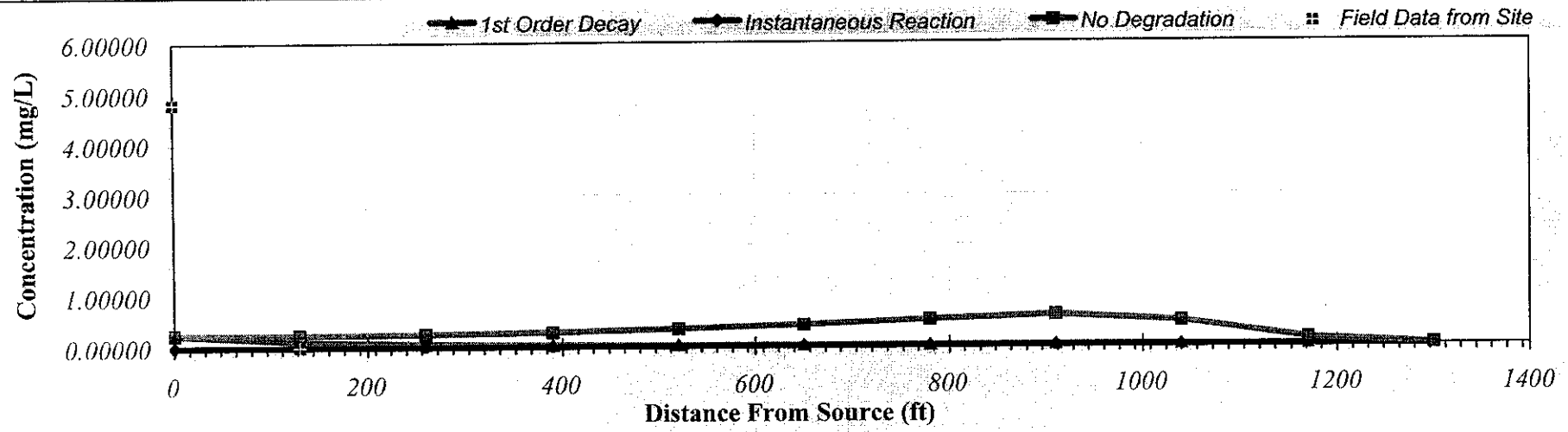
Time: 80 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.250	0.239	0.251	0.286	0.341	0.416	0.514	0.596	0.471	0.123	0.010
1st Order Decay	0.250	0.116	0.060	0.033	0.019	0.011	0.007	0.004	0.002	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

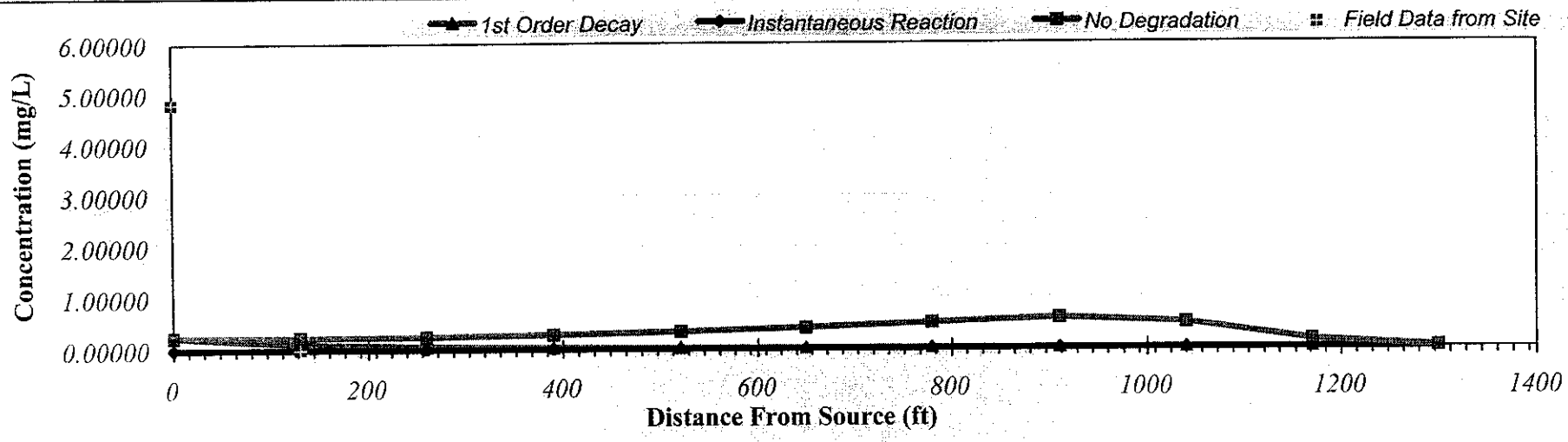
Time: 87 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

	Distance from Source (ft)										
TYPE OF MODEL	0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.243	0.232	0.244	0.278	0.331	0.404	0.501	0.589	0.493	0.147	0.013
1st Order Decay	0.243	0.113	0.058	0.032	0.019	0.011	0.007	0.004	0.002	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

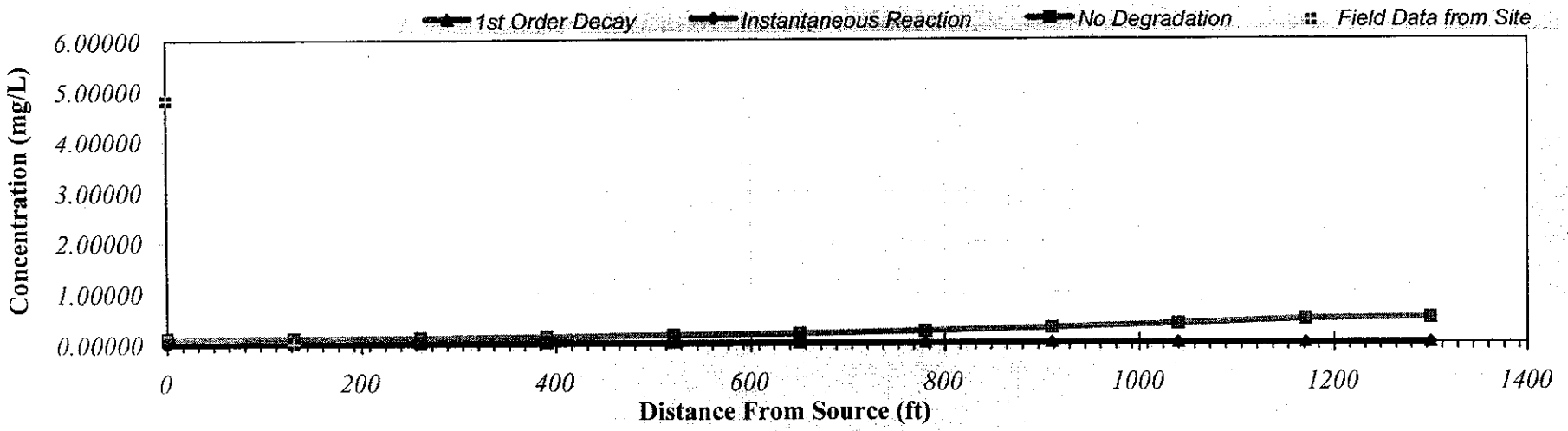
Time: 88 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.114	0.109	0.114	0.130	0.155	0.189	0.235	0.295	0.374	0.464	0.487
1st Order Decay	0.114	0.053	0.027	0.015	0.009	0.005	0.003	0.002	0.001	0.001	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

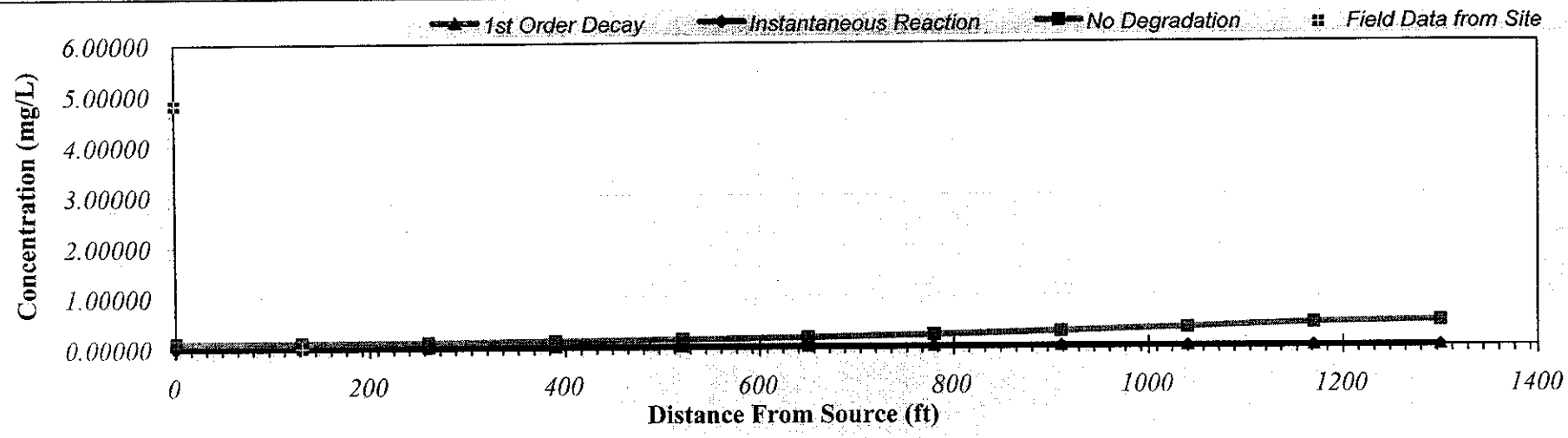
Time: 115 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.111	0.106	0.111	0.126	0.150	0.184	0.228	0.287	0.364	0.453	0.489
1st Order Decay	0.111	0.051	0.026	0.015	0.009	0.005	0.003	0.002	0.001	0.001	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

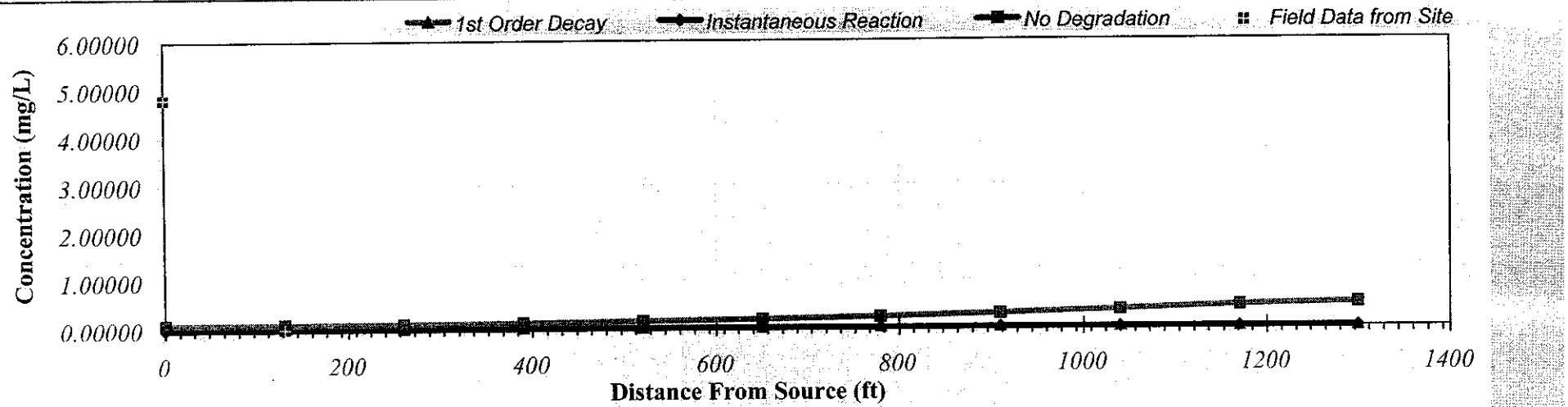
Time: 116 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.107	0.103	0.108	0.123	0.146	0.179	0.222	0.279	0.354	0.443	0.489
1st Order Decay	0.107	0.050	0.026	0.014	0.008	0.005	0.003	0.002	0.001	0.001	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

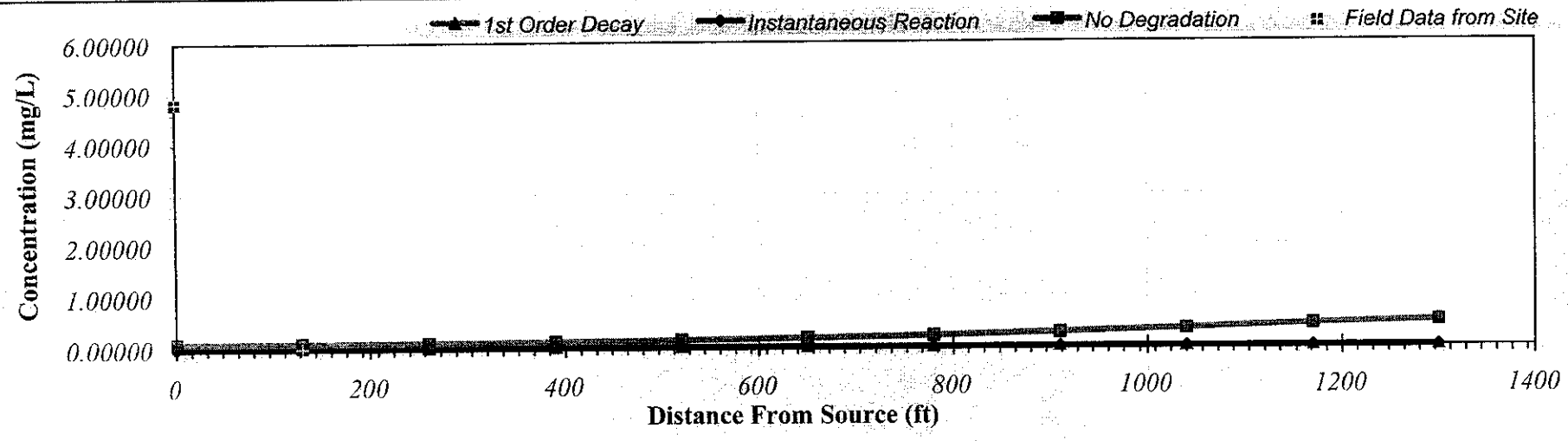
Time: 117 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.105	0.100	0.105	0.119	0.142	0.174	0.216	0.271	0.344	0.432	0.488
1st Order Decay	0.105	0.049	0.025	0.014	0.008	0.005	0.003	0.002	0.001	0.001	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

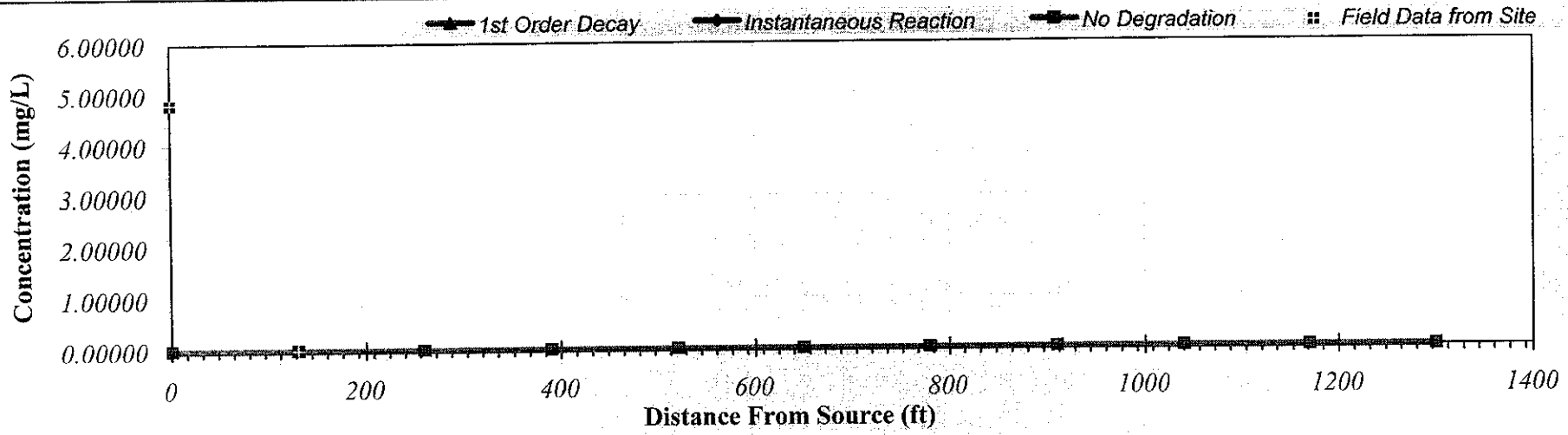
Time: 118 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003
1st Order Decay	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

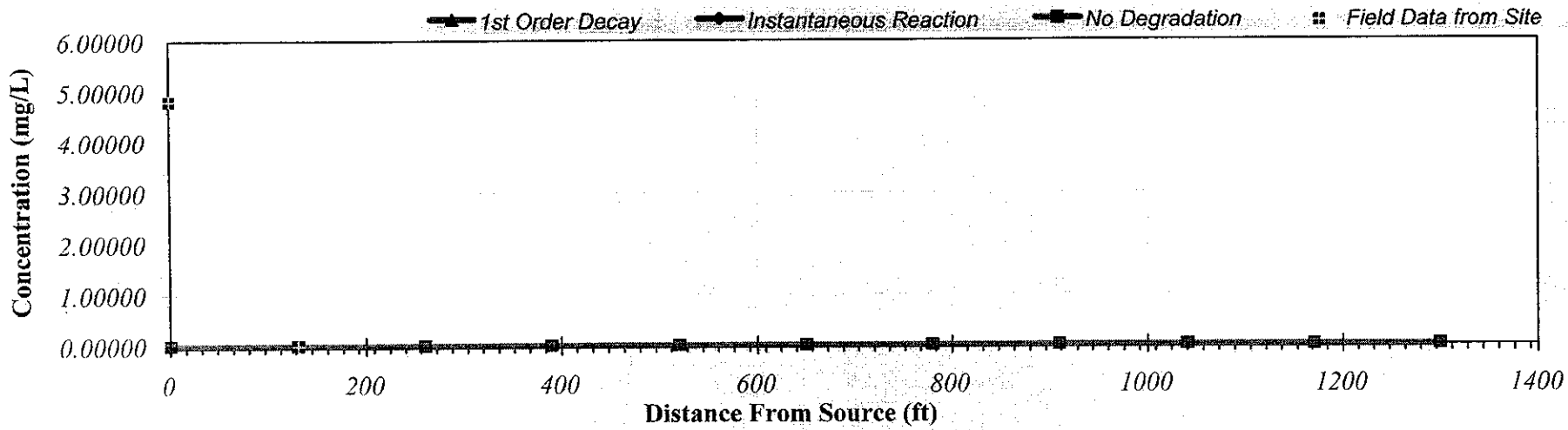
Time: 307 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003
1st Order Decay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	4.81000	0.00100									



Calculate Animation

Time: 308 Years

Return to Input

Recalculate This Sheet

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence

Version 1.4

TOC 063
Benzene
Run Name

Data Input Instructions:

1. *Enter value directly....or*
2. *Calculate by filling in grey cells below. (To restore formulas, hit button below).*

Data used directly in model.
Value calculated by model. (Don't enter any data).

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	13.6	*(ft/yr)*
or		↑ or	
Hydraulic Conductivity	*K*	9.3E-05	*(cm/sec)*
Hydraulic Gradient	*i*	0.0649	*(ft/ft)*
Porosity	*n*	0.46	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	1.0	*(ft)*
Transverse Dispersivity*	*alpha y*	0.1	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		↑ or	
Estimated Plume Length	*Lp*	15	*(ft)*

3. ADSORPTION

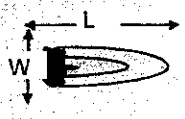
Retardation Factor*	*R*	1.4	*(-)*
or		↑ or	
Soil Bulk Density	*rho*	1.7	*(kg/l)*
Partition Coefficient	*Koc*	38	*(L/kg)*
FractionOrganicCarbon	*foc*	2.5E-3	*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	6.9E-1	*(per yr)*
or		↑ or	
Solute Half-Life	*t-half*	1.00	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*	5.8	*(mg/L)*
Delta Nitrate*	*NO3*	6.3	*(mg/L)*
Observed Ferrous Iron*	*Fe2+*	16.6	*(mg/L)*
Delta Sulfate*	*SO4*	24.6	*(mg/L)*
Observed Methane*	*CH4*	7.2	*(mg/L)*

5. GENERAL

Modeled Area Length*	1300	*(ft)*
Modeled Area Width*	15	*(ft)*
Simulation Time*	1	*(yr)*



115
↑ or
0.02

Variable*
20

6. SOURCE DATA

Source Thickness in Sat.Zone* 20 *(ft)*

Source Zones:

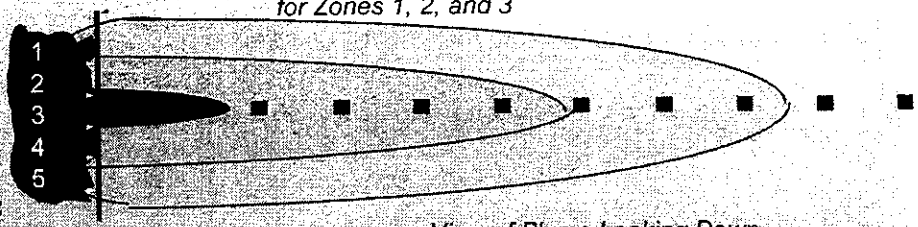
Width* (ft)	Conc. (mg/L)*
1.25	0.0055
1.25	0.03
10	0.113
1.25	0.03
1.25	0.0055

Source Halflife (see Help): 7 | >1000 *(yr)*

Inst. React. ↑ ↑ 1st Order

Soluble Mass 9.50 *(Kg)*
In Source NAPL Soil

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)	.177										
Dist. from Source (ft)	0	130	260	390	520	650	780	910	1040	1170	1300

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

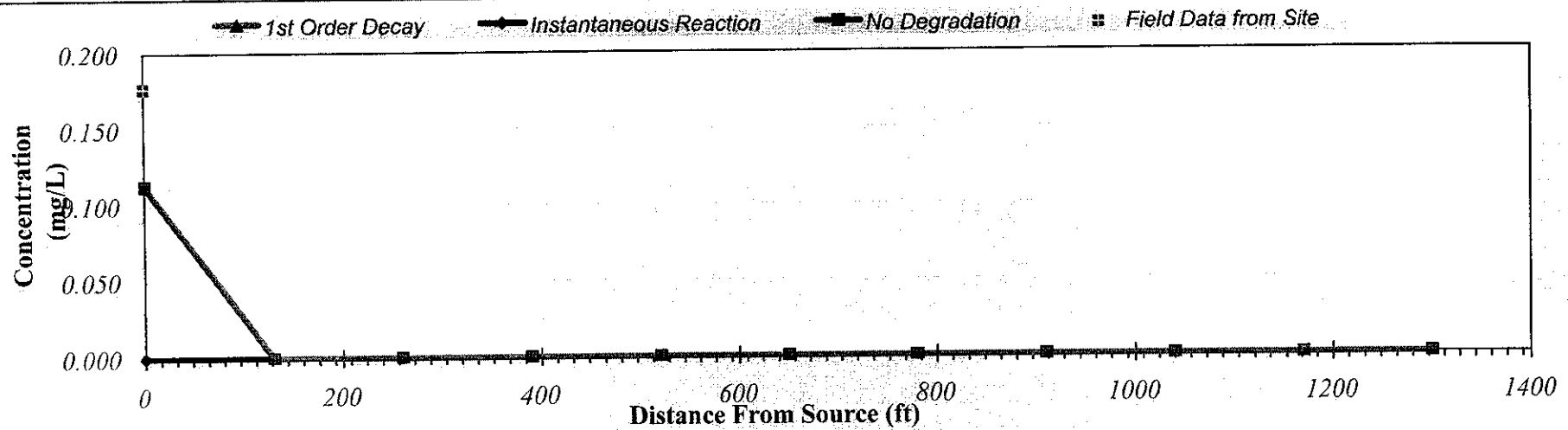
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	0.113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.177										



Calculate Animation

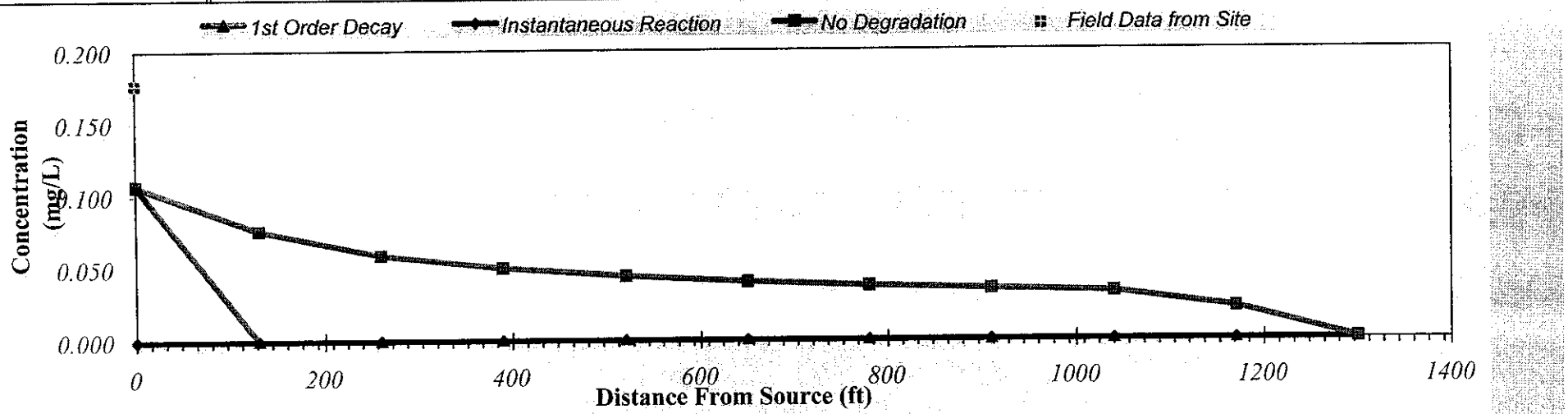
Time: 1 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.107	0.076	0.059	0.050	0.044	0.040	0.037	0.035	0.033	0.022	0.000
1st Order Decay	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.177										



Calculate Animation

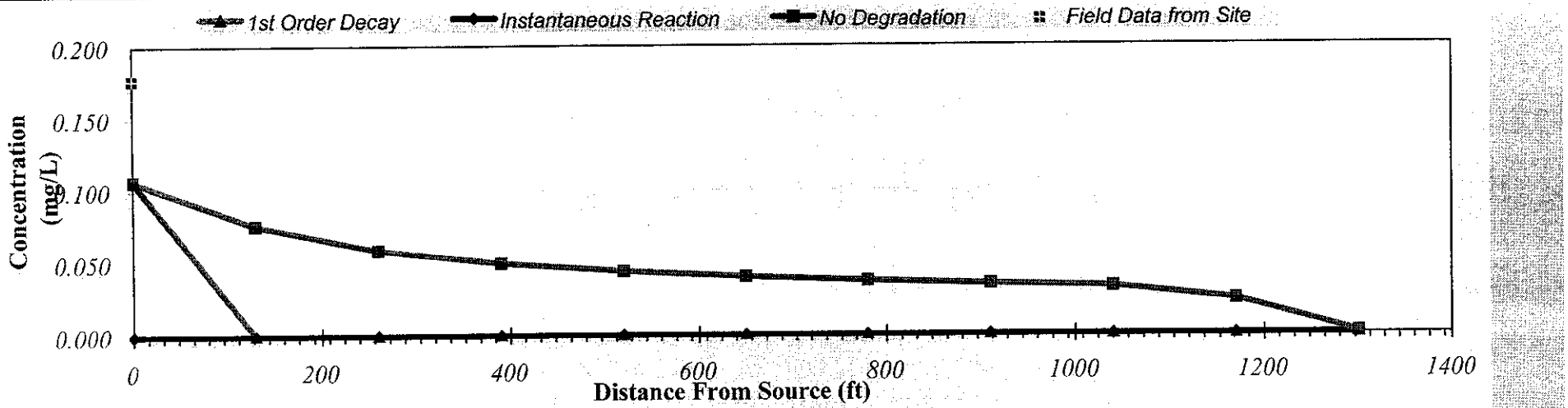
Time: 119 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.107	0.076	0.059	0.050	0.044	0.040	0.037	0.035	0.033	0.024	0.001
1st Order Decay	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.177										



Calculate Animation

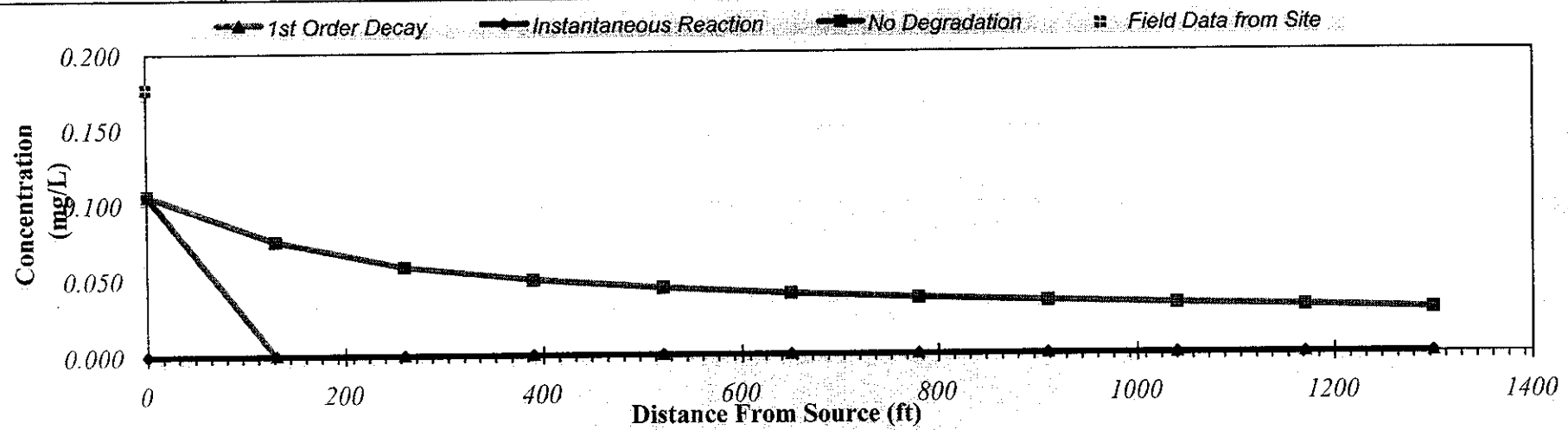
Time: 120 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.106	0.075	0.058	0.049	0.044	0.040	0.037	0.034	0.032	0.031	0.028
1st Order Decay	0.106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.177										



Time:
139 Years

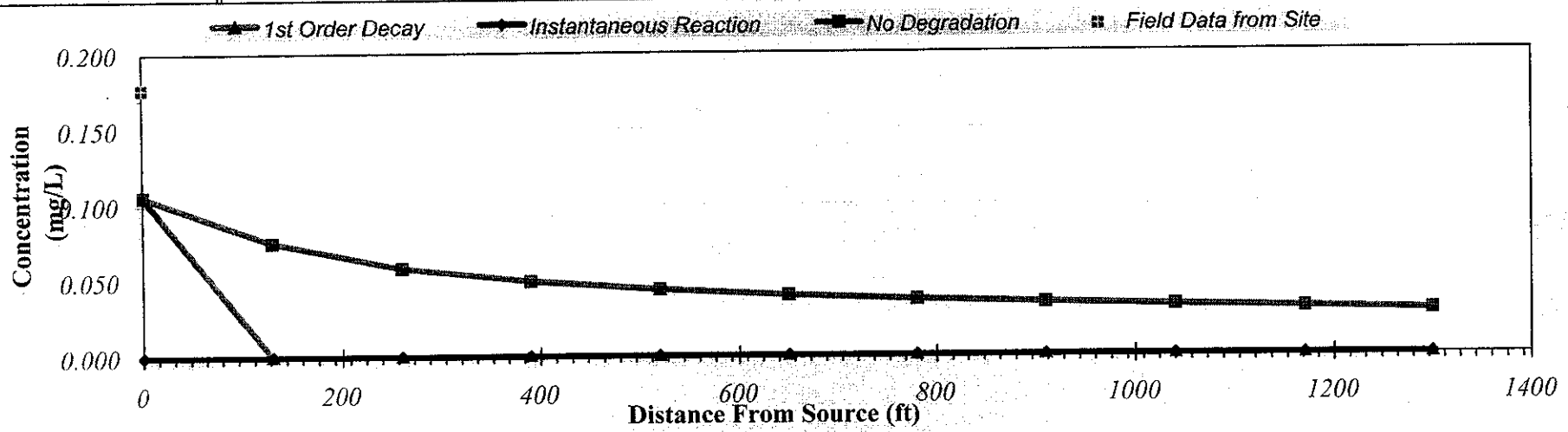
Calculate Animation

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.106	0.075	0.058	0.049	0.044	0.040	0.037	0.034	0.032	0.031	0.029
1st Order Decay	0.106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.177										



Calculate Animation

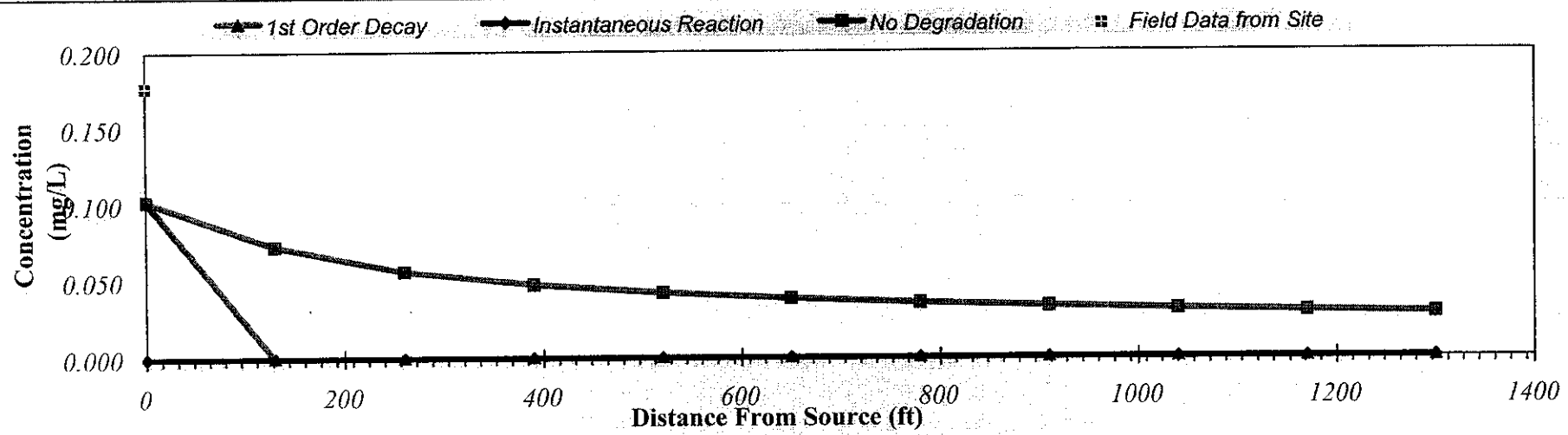
Time: 140 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.103	0.073	0.056	0.048	0.042	0.038	0.035	0.033	0.031	0.030	0.029
1st Order Decay	0.103	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.177										



Calculate Animation

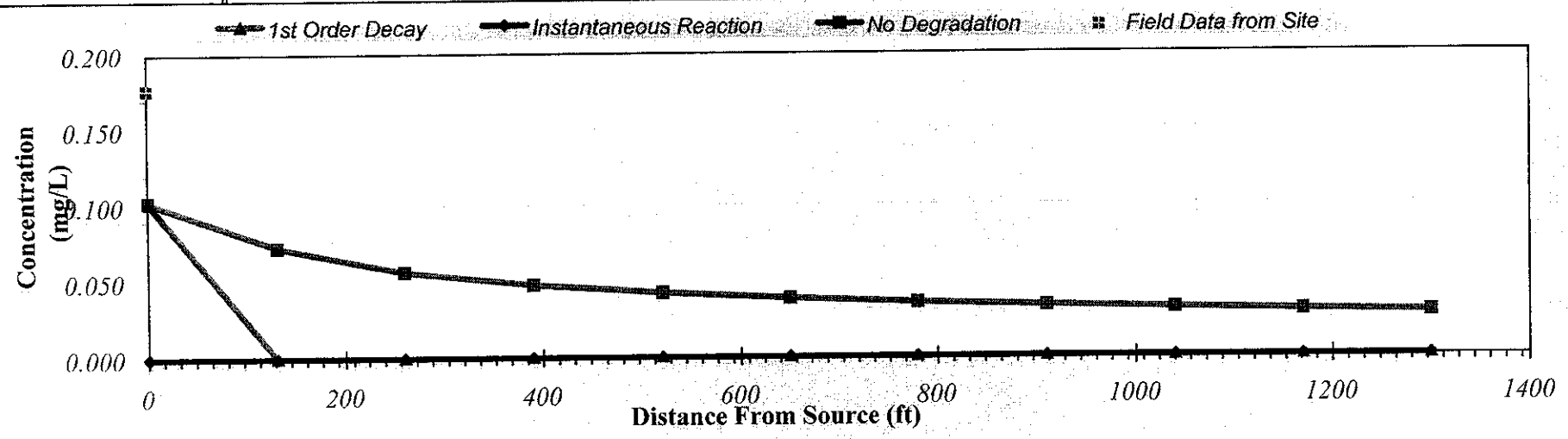
Time: 211 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.103	0.073	0.056	0.048	0.042	0.038	0.035	0.033	0.031	0.030	0.028
1st Order Decay	0.103	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Field Data from Site	0.177										



Calculate Animation

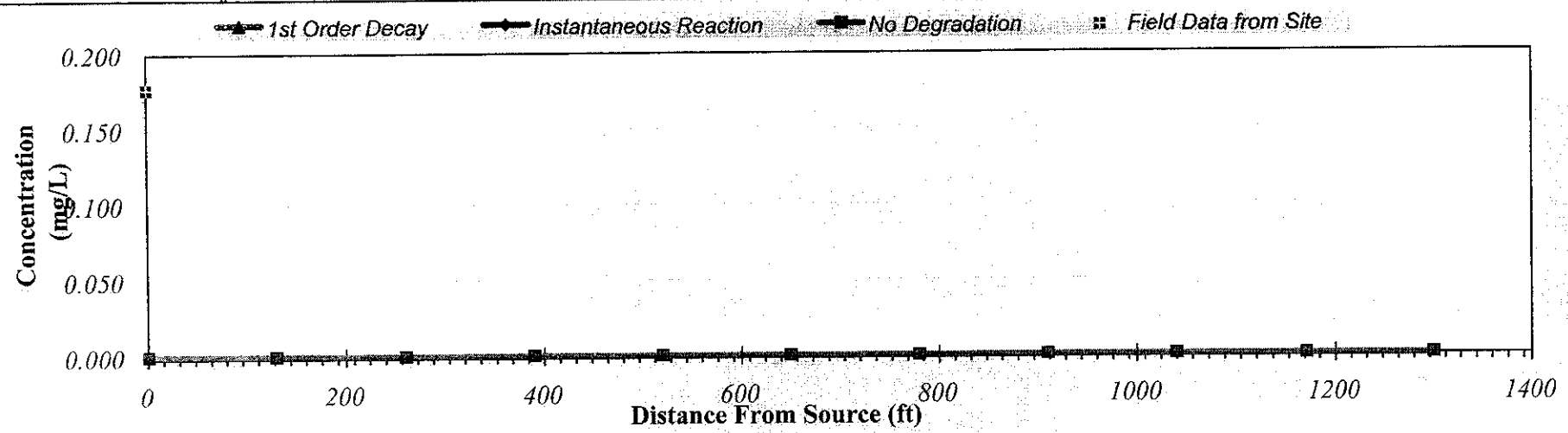
Time: 212 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

TYPE OF MODEL	Distance from Source (ft) 0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Field Data from Site	0.177										



Calculate Animation

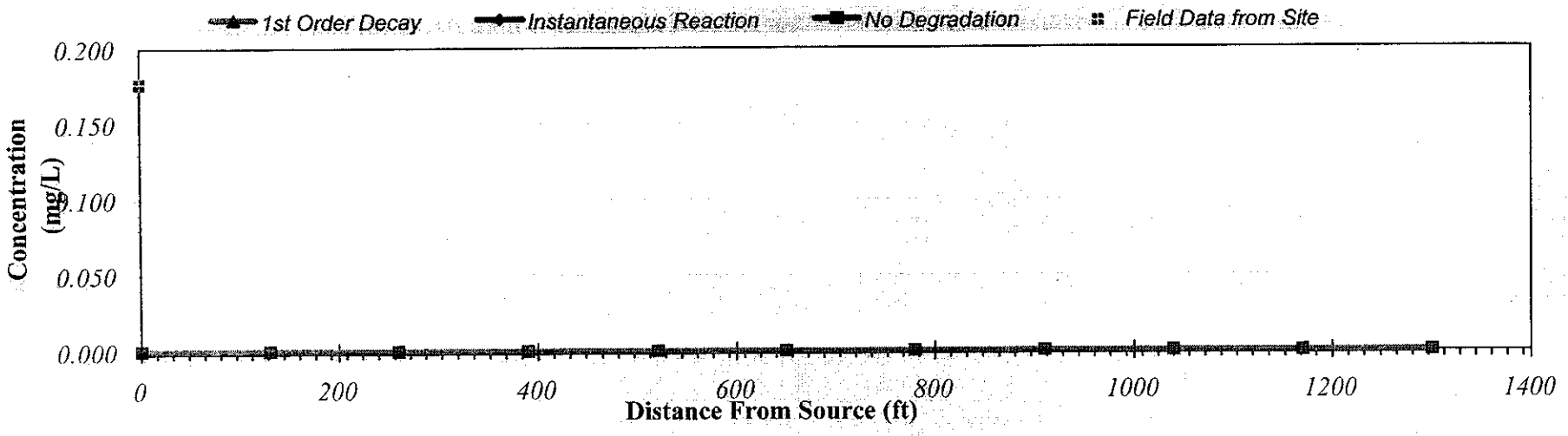
Time: 11,954 Years

Return to Input

Recalculate This Sheet

DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

	Distance from Source (ft)										
TYPE OF MODEL	0	130	260	390	520	650	780	910	1040	1170	1300
No Degradation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1st Order Decay	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inst. Reaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Field Data from Site	0.177										



Time:
11,955 Years

Calculate Animation

Return to Input

Recalculate This Sheet

APPENDIX B

Groundwater Remediation System Data

TABLE 2
GROUNDWATER REMEDIATION SYSTEM MONITORING PROGRAM
Thrifty Oil Co. Station No 063, OAKLAND, CA

Date	Totalizer (gallons)	Total/Cum. Discharge (gallons)	Flow (gal/day)	EFFLUENT (ug/L)						INFLUENT (ug/L)					
				TPH-g	B	T	E	X	MTBE	TPH-g	B	T	E	X	MTBE
4/8/1991	1,669	0	-	-	<0.3	<0.3	<0.3	<0.9	-	-	1300	120	<7.5	1300	-
4/15/1991	5,742	4,073	582	-	<0.3	<0.3	<0.3	<0.3	-	-	700	140	<15	500	-
4/22/1991	10,240	8,571	643	-	<0.3	<0.3	<0.3	<0.9	-	-	850	100	34	860	-
4/29/1991	15,510	13,841	753	-	<0.3	<0.3	<0.3	<0.9	-	-	220	8.4	<0.3	42	-
5/6/1991	20,200	18,531	670	-	<0.3	<0.3	<0.3	<0.9	-	-	280	0.8	<0.3	56	-
5/13/1991	24,430	22,761	604	-	<0.3	<0.3	<0.3	<0.9	-	-	190	5.6	<0.3	37	-
5/20/1991	28,480	26,811	579	-	<0.3	<0.3	<0.3	<0.9	-	-	150	0.83	1.4	29	-
5/28/1991	29,310	27,641	104	-	<0.3	<0.3	<0.3	<0.9	-	-	<0.3	<0.3	<0.3	<0.9	-
6/3/1991	33,080	31,411	628	-	<0.3	<0.3	<0.3	<0.9	-	-	58	4	<0.3	33	-
6/10/1991	36,939	35,270	551	-	<0.3	<0.3	<0.3	<0.9	-	-	45	<0.3	<0.3	16	-
6/17/1991	40,673	39,004	533	-	<0.3	<0.3	<0.3	<0.9	-	-	69	4.9	0.9	21	-
6/24/1991	44,453	42,784	540	-	<0.3	<0.3	<0.3	<0.9	-	-	5.4	2	<0.3	6.6	-
7/1/1991	48,173	46,504	531	-	<0.5	<0.5	<1	<1	-	-	14	15	<1	9.1	-
7/8/1991	51,681	50,012	501	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	6.9	-
7/15/1991	55,186	53,517	501	-	<0.5	<0.5	<1	<1	-	-	<0.5	0.6	<1	6.3	-
7/22/1991	62,150	60,481	995	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	2.6	-
7/29/1991	62,150	60,481	-	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	1.2	19	-
8/5/1991	63,241	61,572	156	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	<1	-
8/12/1991	66,091	64,422	407	-	<0.5	<0.5	<1	<1	-	-	2.6	<0.5	<1	12	-
8/19/1991	67,649	65,980	223	-	<0.5	<0.5	<1	<1	-	-	20	3.3	2.8	70	-
8/26/1991	70,514	68,845	409	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	1.2	19	-
9/9/1991	70,564	68,895	4	-	<0.5	<0.5	<1	<1	-	-	270	10	13	69	-
9/16/1991	73,526	71,857	423	System shut down due to damaged compressor pump					-						-
10/7/1991	73,526	71,857	-	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	3.8	-
10/14/1991	74,516	72,847	141	-	<0.5	<0.5	<1	<1	-	-	60	1.1	<1	23	-
10/21/1991	76,091	74,422	225	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	<1	-
10/28/1991	83,242	81,573	1,022	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	14	-
11/3/1991	83,242	81,573	-	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	3.1	-
11/11/1991	84,351	82,682	139	-	<0.5	<0.5	<1	<1	-	-	99	1.9	<1	14	-
11/18/1991	85,647	83,978	185	-	<0.5	<0.5	<1	<1	-	-	42	1	1	10	-
11/25/1991	89,512	87,843	552	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	3.9	-
12/3/1991	93,407	91,738	487	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	3.8	-
12/9/1991	96,210	94,541	467	-	<0.5	<0.5	<1	<1	-	-	<0.5	<0.5	<1	3.2	-
12/16/1991	99,045	97,376	405	-	<0.5	<0.5	<0.5	<0.5	-	-	1.3	<0.5	<0.5	1.5	-
12/23/1991	102,334	100,665	470	-	<0.5	<0.5	<0.5	<0.5	-	-	1.7	<0.5	<0.5	2.4	-
12/30/1991	105,124	103,455	399	-	<0.5	<0.5	<0.5	<0.5	-	-	22.6	1.2	0.7	4.9	-
1/15/1992	115,691	114,022	660	-	<0.5	<0.5	<0.5	<0.5	-	-	130	11	<0.5	50	-
2/10/1992	124,846	123,177	352	-	<0.5	<0.5	<0.5	<0.5	-	-	20	0.51	<0.5	3.6	-
3/9/1992	149,965	148,296	897	<200	<0.5	<0.5	<0.5	<0.5	-	12,000	2,100	400	170	2,100	-
4/13/1992	168,567	166,898	531	<200	<0.5	<0.5	<0.5	<0.5	-	2,100	280	3.9	<2.5	98	-
5/11/1992	187,170	185,501	664	<200	<0.5	0.7	<0.5	<0.5	-	<200	<0.5	<0.5	<0.5	<0.5	-
6/8/1992	190,490	188,821	119	-	<0.5	<0.5	<0.5	<0.5	-	-	44	3.7	0.7	64	-
7/6/1992	197,080	195,411	235	-	-	-	-	-	-	-					-
7/13/1992	197,890	196,221	116	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-

TABLE 2
GROUNDWATER REMEDIATION SYSTEM MONITORING PROGRAM
Thrifty Oil Co. Station No 083, OAKLAND, CA

Date	Totalizer (gallons)	Total/Cum. Discharge (gallons)	Flow (gal/day)	EFFLUENT (ug/L)						INFLUENT (ug/L)					
				TPH-g	B	T	E	X	MTBE	TPH-g	B	T	E	X	MTBE
7/13/1992	197,890	196,221	-	Sytem shut down for repair of electrical motor											
8/10/1992	197,890	196,221	-	Restart the system											
8/17/1992	201,300	199,631	487	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-
9/14/1992	209,647	207,978	298	-	<0.5	<0.5	<0.5	<1	-	-	<0.5	<0.5	<0.5	<1	-
10/5/1992	217,360	215,691	367	<200	<0.5	<0.5	<0.5	<1	-	<200	<0.5	<0.5	<0.5	<1	-
11/09/92	225,780	224,111	241	-	<0.5	<0.5	<0.5	<1	-	-	1.1	0.5	<0.5	10	-
12/14/92	243,048	241,379	493	-	<0.5	<0.5	<0.5	<1	-	-	720	46	<10	1,700	-
01/04/93	252,510	250,841	451	-	<0.5	<0.5	<0.5	<1	-	-	400	32	<25	520	-
02/15/93	266,210	264,541	326	<200	<0.5	<0.5	<0.5	<1	-	9,000	1,400	330	260	1,200	-
03/08/93	269,330	267,661	149	-	<0.5	<0.5	<0.5	<1	-	-	1,100	150	7.5	1,000	-
04/26/93	271,290	269,621	40	<100	<0.5	<0.5	<0.5	<1	-	7,200	1,100	100	25	780	-
04/26/93	271,290	269,621	-	System shut down fo repair											
07/15/93	272,577	270,908	16	Restart the system											
08/11/93	284,230	282,561	432	-	<0.5	<0.5	<0.5	<1	-	-	1.3	<0.5	<0.5	1.6	-
09/16/93	298,832	297,163	406	<60	<0.3	<0.3	<0.3	<0.6	-	<60	<0.3	<0.3	<0.3	<0.6	-
10/06/93	305,641	303,972	310	-	-	-	-	-	-	-	-	-	-	-	-
10/11/93	307,068	305,399	476	<60	<0.3	<0.3	<0.3	<0.6	-	<60	<0.3	<0.3	<0.3	<0.6	-
10/15/93	308,495	306,826	357	-	-	-	-	-	-	-	-	-	-	-	-
11/12/93	318,203	316,534	347	<50	<0.3	<0.3	<0.3	<0.5	-	<50	<0.3	<0.3	<0.3	<0.5	-
12/10/93	329,947	328,278	419	<50	<0.3	<0.3	<0.3	<0.5	-	<50	<0.3	<0.3	<0.3	<0.5	-
01/13/94	345,860	344,191	468	-	<0.3	<0.3	<0.3	<0.5	-	-	<0.3	<0.3	<0.3	<0.5	-
02/10/94	359,662	357,993	493	-	<0.3	<0.3	<0.3	<0.5	-	-	430	41	36	480	-
02/18/94	618,620	357,993	-	Changed air filters. The water flowmeter jumped from 359,662 to 618,620.											
03/10/94	627,540	366,913	446	-	<0.3	<0.3	<0.3	<0.5	-	-	<0.3	<0.3	<0.3	7.7	-
04/14/94	645,330	384,703	508	<50	<0.3	<0.3	<0.3	<0.5	-	170	1.5	<0.3	0.38	0.73	-
05/19/94	653,520	392,893	234	<50	<0.3	<0.3	<0.3	<0.5	-	1,500	46	4.1	0.5	84	-
06/16/94	664,015	403,388	375	<50	<0.3	<0.3	<0.3	<0.5	-	12,000	860	37	<13	1,600	-
07/14/94	672,750	412,123	312	<50	<0.3	<0.3	<0.3	<0.5	-	<50	<0.3	<0.3	<0.3	<0.5	-
08/11/94	681,920	421,293	328	<50	<0.3	<0.3	<0.3	<0.5	-	<50	<0.3	<0.3	<0.3	<0.5	-
09/15/94	692,083	431,456	290	<50	<0.3	<0.3	<0.3	<0.5	-	<50	<0.3	<0.3	<0.3	<0.5	-
10/17/94	699,979	439,352	247	<50	<0.3	<0.3	<0.5	<0.5	-	<50	<0.3	<0.3	<0.5	<0.5	-
11/14/94	712,539	451,912	449	<50	<0.3	<0.3	<0.5	<0.5	-	<50	<0.3	<0.3	<0.5	<0.5	-
12/19/94	734,620	473,993	631	<50	<0.3	<0.3	<0.5	<0.5	-	<50	<0.3	<0.3	<0.5	<0.5	-
01/10/95	742,072	481,445	339	-	-	-	-	-	-	-					
01/16/95	742,074	481,447	0	Sytem shut down for repair of compressor pump											
02/06/95	742,074	481,447	-	Restart the system											
02/13/95	744,063	483,436	284	<50	<0.3	<0.3	<0.5	<0.5	-	<50	<0.3	<0.3	<0.5	<0.5	-
03/13/95	758,930	498,303	531	<100	<0.5	<0.5	<0.5	<1	-	1,300	<0.5	<0.5	<0.5	<1	-
04/17/95	768,276	507,649	267	<100	<0.5	<0.5	<0.5	<1	-	6,200	410	73	97	280	-
05/15/95	780,716	520,089	444	<100	<0.5	<0.5	<0.5	<1	-	1,300	0.6	<0.5	<0.5	<1	-
06/12/95	784,514	523,887	136	<100	<0.5	<0.5	<0.5	<1	-	<100	<0.5	<0.5	<0.5	<1	-
07/18/95	794,158	533,531	268	<100	<0.5	<0.5	<0.5	<1	-	1,100	<0.5	<0.5	<0.5	<1	-
08/14/95	795,216	534,589	39	<100	<0.5	<0.5	<0.5	<1	-	170	<0.5	<0.5	<0.5	<1	-
09/06/95	797,631	537,004	105	<100	<0.5	<0.5	<0.5	<1	-	1,320	<0.5	<0.5	<0.5	<1	-

TABLE 2
GROUNDWATER REMEDIATION SYSTEM MONITORING PROGRAM
Thrifty Oil Co. Station No 063, OAKLAND, CA

Date	Totalizer (gallons)	Total/Cum. Discharge (gallons)	Flow (gal/day)	EFFLUENT (ug/L)						INFLUENT (ug/L)					
				TPH-g	B	T	E	X	MTBE	TPH-g	B	T	E	X	MTBE
10/17/95	800,316	539,689	65	<100	<0.5	<0.5	<0.5	<1	-	2,400	26	2.7	3.9	46	-
11/20/95	806,264	545,637	175	150	<0.3	<0.3	<0.3	<0.5	-	450	0.31	<0.3	<0.3	<0.5	-
12/11/95	809,236	548,609	142	300	<0.3	<0.3	<0.3	0.59	-	470	<0.3	<0.3	<0.3	<0.5	-
01/15/96	822,734	562,107	386	510	<0.3	<0.3	<0.3	<0.5	-	900	0.39	<0.3	<0.3	<0.5	-
02/19/96	848,213	587,586	728	800	<0.3	0.57	<0.3	0.83	-	1700	23	3.7	<0.3	80	-
03/19/96	849,587	588,960	47	930	<0.3	<0.3	<0.3	<0.5	-	1,600	5.5	1.4	<0.3	94	-
04/15/96	852,042	591,415	91	990	<0.3	<0.3	<0.3	<0.5	-	1,100	0.43	<0.3	<0.3	<0.5	-
05/13/96	890,214	629,587	1,363	840	<0.3	<0.3	<0.3	<0.5	-	910	<0.3	<0.3	<0.3	<0.5	-
05/13/96	890,214	629,587	-	System shut down for carbon change											
06/14/96	890,214	629,587	-	Restart the system											
06/18/96	890,818	630,191	151	<50	<0.3	<0.3	<0.3	<0.5	-	1,000	92	8.7	3.4	55	-
07/01/96	892,781	632,154	151	-	-	-	-	-	-	-					
07/08/96	894,210	633,583	204	System shut down due to burglary and damaged air compressor											
08/05/96	894,210	633,583	-	Restart the system											
08/13/96	896,220	635,593	251	<50	<0.3	<0.3	<0.3	<0.5	-	3,500	160	110	220	650	-
09/23/96	899,410	638,783	78	<50	<0.3	<0.3	<0.3	<0.5	-	<50	0.49	<0.3	<0.3	<0.5	-
10/09/96	899,845	639,218	27	<50	<0.3	<0.3	<0.3	<0.5	-	730	1.7	0.42	2.1	2.5	-
11/11/96	901,348	640,721	46	<50	<0.3	<0.3	<0.3	<0.5	-	81	<0.3	<0.3	<0.3	<0.5	-
12/09/96	901,576	640,949	8	<50	<0.3	<0.3	<0.3	<0.5	-	<50	<0.3	<0.3	<0.3	<0.5	-
01/13/97	904,630	644,003	87	<50	<0.3	<0.3	<0.3	<0.5	-	13,000	590	250	180	850	-
02/10/97	912,610	651,983	285	82	<0.3	0.38	<0.3	<0.5	-	700	0.92	0.75	<0.3	4.1	-
03/10/97	921,020	660,393	300	<50	<0.3	<0.3	<0.3	<0.5	-	600	<0.3	<0.3	<0.3	<0.5	-
04/14/97	932,410	671,783	325	<50	<0.3	<0.3	<0.3	<0.5	-	4,400	<0.3	<0.3	<0.3	<0.5	-
05/12/97	941,028	680,401	308	<50	<0.3	<0.3	<0.3	<0.5	-	5,600	7.3	0.32	<0.3	17	-
06/23/97	943,183	682,556	51	-	-	-	-	-	-	-	-	-	-	-	-
07/07/97	945,821	685,194	188	<50	<0.3	<0.3	<0.3	<0.5	-	1,500	3.4	<0.3	<0.3	26	-
08/04/97	951,020	690,393	186	-	-	-	-	-	-	-	-	-	-	-	-
09/02/97	957,933	697,306	238	System shut down due to stolen air compressor											
10/06/97	961,030	700,403	91	-	-	-	-	-	-	-	-	-	-	-	-
10/16/97	961,077	700,450	5	<50	<0.3	<0.3	<0.3	<0.5	-	550	<0.3	<0.3	<0.3	<0.5	-
11/17/97	970,920	710,293	308	-	-	-	-	-	-	-	-	-	-	-	-
12/23/97	986,016	725,389	419	-	-	-	-	-	-	-	-	-	-	-	-
01/05/98	991,520	730,893	423	-	-	-	-	-	-	-	-	-	-	-	-
01/07/98	992,365	731,738	423	<50	<0.3	<0.3	<0.3	<0.5	-	65,000	690	8,400	3,100	20,000	-
02/02/98	996,874	736,247	173	-	-	-	-	-	-	-	-	-	-	-	-
02/09/98		736,247	-	System shut down due to the UST replacement and station remodeling											
02/17/98		736,247	-	<50	<0.3	<0.3	<0.3	<0.5	-	35,000	150	<15	<15	8,900	-
04/13/98	53,000	736,247	-	Replaced carbons and restarted system with new meter (53,000)											
4/13 - 6/1/98	-	736,247	-	System was undergoing several maintenance / piping / hose replacement											
06/01/98	53,780	737,027	16	-	-	-	-	-	-	-	-	-	-	-	-
07/14/98	56,905	740,152	73	<50	<0.3	<0.3	<0.3	<0.5	-	3,500	14	0.56	<0.3	26	-
08/13/98	59,426	742,673	84	-	-	-	-	-	-	-	-	-	-	-	-
09/11/98	62,356	745,603	101	-	-	-	-	-	-	-	-	-	-	-	-
10/15/98	62,714	745,961	11	<50	<0.3	<0.3	<0.3	<0.5	-	2,200	21	4	<0.3	100	-

TABLE 2
GROUNDWATER REMEDIATION SYSTEM MONITORING PROGRAM
Thrifty Oil Co. Station No 063, OAKLAND, CA

Date	Totalizer (gallons)	Total/Cum. Discharge (gallons)	Flow (gal/day)	EFFLUENT (ug/L)						INFLUENT (ug/L)					
				TPH-g	B	T	E	X	MTBE	TPH-g	B	T	E	X	MTBE
11/06/98	62,952	746,199	11	-	-	-	-	-	-	-	-	-	-	-	-
11/20/98	-	746,199		System shut down for flowmeter replacement											-
12/01/98	0.0	746,199	-	Restart the system with flowmeter at 000											-
12/31/98	5,340.0	751,539	178	-	-	-	-	-	-	-	-	-	-	-	-
01/11/99	15,020.0	761,219	880	System shut down					-	-	-	-	-	-	-
1/11 - 2/1/99	-	761,219	-	System was undergoing maintenance for the compressor											
01/20/99	-	761,219	-	<50	<0.3	<0.3	<0.3	<0.5	-	110	0.43	0.42	<0.3	<0.5	260
02/01/99	15,600.0	761,799	28	Restart system					-						
02/12/99	22,840.0	769,039	658	-	-	-	-	-	-	-	-	-	-	-	-
02/22/99	22,840.0	769,039	-	System shut down for carbon canister replacement											
03/26/99	22,840.0	769,039	-	Restart the system											
03/31/99	24,620.0	770,819	356	-	-	-	-	-	-	-	-	-	-	-	-
04/16/99	29,605.0	775,804	312	<50	<0.3	<0.3	<0.3	<0.5	<5	<50	<0.3	<0.3	<0.3	<0.5	<5
05/11/99	36,010.0	782,209	256	-	-	-	-	-	-	-	-	-	-	-	-
05/25/99	46,000.0	792,199	714	System shut down due to carbon canister leaking											
09/02/99	46,000.0	792,199	-	Restart system					-						
09/17/99	46,217.0	792,416	14	-	-	-	-	-	-	-	-	-	-	-	-
10/07/99	46,809.0	793,008	30	<50	<0.3	<0.3	<0.3	<0.5	11	65	<0.3	<0.3	<0.3	<0.5	120
10/21/99	47,278.0	793,477	34	System shut down for carbon change											
11/24/99	47,283.0	793,482	0	Restart system											
12/30/99	49,388.0	795,585	58	-	-	-	-	-	-	-	-	-	-	-	-
01/26/00	50,569.0	796,768	44	<50	<0.3	<0.3	<0.3	<0.5	-	<50	<0.3	<0.3	<0.3	<0.5	-
02/25/00	51,983.0	798,182	47	-	-	-	-	-	-	-	-	-	-	-	-
03/24/00	54,603.0	800,802	94	-	-	-	-	-	-	-	-	-	-	-	-
04/19/00	56,754.0	802,953	83	<5	<0.25	<0.25	<0.25	<0.5	-	<50	1.3	<0.25	<0.25	<0.5	<5
04/30/00	58,022.0	804,221	115	-	-	-	-	-	-	-	-	-	-	-	-
05/26/00	60,086.0	806,285	79	-	-	-	-	-	-	923	<0.6	2	85	80	*8,350/4,810
06/16/00	61,889.0	808,088	86	<50	<0.3	<0.3	<0.3	<0.6	<5	3,820	<0.3	<0.3	<0.3	<0.6	3,740
07/26/00	65,987.0	812,186	102	<50	<0.3	<0.3	<0.3	<0.6	<5	<50	<0.3	<0.3	<0.3	<0.6	<5
08/25/00	68,630.0	814,829	88	-	-	-	-	-	-	-	-	-	-	-	-
09/29/00	85,661.0	831,860	487	-	-	-	-	-	-	-	-	-	-	-	-
10/13/00	93,212.0	842,411	754	-	-	-	-	-	-	-	-	-	-	-	-
10/20/00	99,700.0	845,899	498	Shut down system for QWS and replaced flowmeter starting at 000 (old meter estimated at 99,700). Sytem restarted on 10/25/00 after QWS											
10/25/00	0.0	845,899	-	<50	<0.18	<0.14	<0.18	<0.26	<0.24	17,100	111	121	141	972	998
10/27/00	2,160	848,059	1,080	-	-	-	-	-	-	-	-	-	-	-	-
11/03/00	7,420	853,319	751	-	-	-	-	-	-	-	-	-	-	-	-
11/24/00	16,560	862,459	435	-	-	-	-	-	-	-	-	-	-	-	-
12/22/00	51,530	897,429	1,249	-	-	-	-	-	-	-	-	-	-	-	-
01/10/01	54,520	900,419	157	<50	<0.18	<0.14	<0.18	<0.26	<0.24	10,000	384	223	<0.18	1,330	11,600
02/19/01	99,640	945,539	1,128	-	-	-	-	-	-	-	-	-	-	-	-
03/19/01	144,170	990,069	1,590	-	-	-	-	-	-	-	-	-	-	-	-
04/09/01	167,050	1,012,949	1,090	378	<0.18	<0.14	<0.18	<0.26	475	4,040	191	4	42	38	4,990
04/13/01	169,210	1,015,109	540	Shut down system for replacement of carbon drums											
04/18/01	169,210	1,015,109	-	Restart system											

TABLE 2
GROUNDWATER REMEDIATION SYSTEM MONITORING PROGRAM
Thrifty Oil Co. Station No 063, OAKLAND, CA

Date	Totalizer (gallons)	Total/Cum. Discharge (gallons)	Flow (gal/day)	EFFLUENT (ug/L)						INFLUENT (ug/L)					
				TPH-g	B	T	E	X	MTBE	TPH-g	B	T	E	X	MTBE
04/23/01	177,140	1,023,039	1,586	93	<0.18	<0.14	<0.18	<0.26	132	1,400	<0.18	<0.14	<0.18	<0.26	3,240
05/02/01	186,800	1,032,699	1,073	Shut down system for carbon change											
05/18/01	186,900	1,032,799	6	Restart system											
05/30/01	200,850	1,046,749	1,163	<50	<0.18	<0.14	<0.18	<0.26	<0.24	3,100	15	<0.14	1	2	*8,510 / 5,780
06/25/01	266,720	1,112,619	2,533	-	-	-	-	-	-	-	-	-	-	-	-
07/09/01	278,760	1,124,659	860	<50	<0.18	<0.14	<0.18	<0.26	<0.24	748	15	<0.14	2	2.7	1,440
08/13/01	399,700	1,245,599	3,455	-	-	-	-	-	-	-	-	-	-	-	-
09/24/01	451,240	1,297,139	1,227	-	-	-	-	-	-	-	-	-	-	-	-
10/01/01	488,310	1,334,209	5,296	<50	<0.18	<0.14	<0.18	<0.26	<0.24	956	1.2	<0.14	<0.18	<0.26	878
11/12/01	636,260	1,482,159	3,523	-	-	-	-	-	-	-	-	-	-	-	-
12/31/01	674,080	1,519,979	772	-	-	-	-	-	-	-	-	-	-	-	-
01/14/02	688,450	1,534,349	1,026	<50	<0.18	<0.14	<0.18	<0.26	<0.24	232	1	1	<0.18	<0.26	363
02/18/02	738,420	1,584,319	1,428	-	-	-	-	-	-	-	-	-	-	-	-
03/25/02	814,570	1,660,469	2,176	-	-	-	-	-	-	-	-	-	-	-	-
04/08/02	828,510	1,674,409	996	<50	<0.18	<0.14	<0.18	<0.26	<0.24	105	<0.18	<0.14	<0.18	<0.26	157
04/22/02	895,910	1,741,809	4,814	-	-	-	-	-	-	-	-	-	-	-	-
05/06/02	895,920	1,741,819	1	System off; Restart											
05/13/02	929,130	1,775,029	4,744	-	-	-	-	-	-	-	-	-	-	-	-
06/03/02	-	1,839,639	-	-	<0.5	< 0.7	< 0.8	< 3.3	-	Outlet sampling results from EBMUD (sample collected by EBMUD inspector)					
06/03/02	993,740	1,839,639	3,077	<50	<0.18	<0.14	<0.18	<0.26	<0.24	Split-sample results (sample collected by us)					
06/24/02	1,001,590	1,847,489	374	-	-	-	-	-	-	-	-	-	-	-	-
07/08/02	-	1,847,489	-	<50	<0.18	<0.14	<0.18	<0.26	<0.24	4,710	1	1.2	<0.18	2	6,980
07/12/02	1,051,430	1,897,329	2,769	-	-	-	-	-	-	-	-	-	-	-	-
07/29/02	1,052,820	1,898,719	82	System shut down for carbon change						-	-	-	-	-	-
08/16/02	1,052,820	1,898,719	-	Restart											
08/30/02	1,069,050	1,914,949	1,159	-	-	-	-	-	-	-	-	-	-	-	-
09/20/02	-	1,952,309	-	-	<0.5	<0.7	<0.8	<3.3	-	Outlet sampling results from EBMUD (sample collected by EBMUD inspector)					
09/20/02	1,106,410	1,952,309	1,779	<50	<0.1	<0.15	<0.06	-	-	Split-sample results (sample collected by us, analysis by EPA 624 & 8015M)					
09/30/02	1,110,180	1,956,079	377	-	-	-	-	-	-	-	-	-	-	-	-
10/07/02	1,114,720	1,960,619	649	<50	<0.18	<0.14	<0.18	<0.26	<0.24	128	<0.18	<0.14	<0.18	<0.26	95
10/28/02	1,127,540	1,973,439	610	-	-	-	-	-	-	-	-	-	-	-	-
11/25/02	1,149,730	1,995,629	793	-	-	-	-	-	-	-	-	-	-	-	-
12/20/02	1,166,840	2,012,739	684	-	-	-	-	-	-	-	-	-	-	-	-
12/30/02	1,173,420	2,019,319	658	-	-	-	-	-	-	-	-	-	-	-	-
01/06/03	1,182,610	2,028,509	1,313	<50	<0.14	1.2	<0.08	2.4	<2.0	9,860	<1.4	29	14	2,420	205
01/13/03	1,189,320	2,035,219	959	Shut down for QWS											
01/15/03	1,189,320	2,035,219	-	Restart											
02/24/03	1,223,450	2,069,349	853	-	-	-	-	-	-	-	-	-	-	-	-
03/10/03	1,238,640	2,084,539	1,085	-	-	-	-	-	-	-	-	-	-	-	-
03/17/03	1,257,710	2,103,609	2,724	System off	-	-	-	-	-	-	-	-	-	-	-
03/28/03	1,257,710	2,103,609	-	Restart	-	-	-	-	-	-	-	-	-	-	-
03/31/03	1,266,150	2,112,049	2,813	-	-	-	-	-	-	-	-	-	-	-	-
04/02/03	1,272,100	2,117,999	2,975	-	-	-	-	-	-	-	-	-	-	-	-
04/07/03	1,286,160	2,132,059	2,812	<15	<0.04	2.2	<0.02	<0.06	<0.03	14,000	20	20	2.2	14	9,090

TABLE 2
GROUNDWATER REMEDIATION SYSTEM MONITORING PROGRAM
Thrifty Oil Co. Station No 063, OAKLAND, CA

Date	Totalizer (gallons)	Total/Cum. Discharge (gallons)	Flow (gal/day)	EFFLUENT (ug/L) TPH-g	B	T	E	X	MTBE	INFLUENT (ug/L) TPH-g	B	T	E	X	MTBE
04/14/03	1,294,060	2,139,959	1,129	System shut down for QWS											
04/16/03	1,294,080	2,139,979	10	Restart	-	-	-	-	-	-	-	-	-	-	-
04/21/03	1,299,660	2,145,559	1,116	-	-	-	-	-	-	-	-	-	-	-	-
04/28/03	1,302,140	2,148,039	354	-	-	-	-	-	-	-	-	-	-	-	-
05/05/03	1,302,710	2,148,609	81	System shut down for carbon change											
05/07/03	1,302,710	2,148,609	-	Restart	-	-	-	-	-	-	-	-	-	-	-
05/12/03	1,303,230	2,149,129	104	-	-	-	-	-	-	-	-	-	-	-	-
05/19/03	1,318,460	2,164,359	2,176	-	-	-	-	-	-	-	-	-	-	-	-
05/30/03	1,321,830	2,167,729	306	-	-	-	-	-	-	-	-	-	-	-	-
06/02/03	1,327,490	2,173,389	1,887	-	-	-	-	-	-	-	-	-	-	-	-
06/09/03	1,336,370	2,182,269	1,269	-	-	-	-	-	-	-	-	-	-	-	-
06/16/03	1,347,480	2,193,379	1,587	-	-	-	-	-	-	-	-	-	-	-	-
06/23/03	1,359,690	2,205,589	1,744	-	-	-	-	-	-	-	-	-	-	-	-
07/01/03	1,366,090	2,211,989	800	-	-	-	-	-	-	-	-	-	-	-	-
07/07/03	1,369,730	2,215,629	607	System shut down for QWS											
07/15/03	1,369,730	2,215,629	-	Restart	-	-	-	-	-	-	-	-	-	-	-
07/21/03	1,382,630	2,228,529	2,150	<15	<0.04	1.0	<0.02	<0.06	<0.03	7,710	<0.04	<0.02	<0.02	<0.06	3,550
07/28/03	1,389,840	2,235,739	1,030	-	-	-	-	-	-	-	-	-	-	-	-
08/04/03	1,408,710	2,254,609	2,696	-	-	-	-	-	-	-	-	-	-	-	-
08/15/03	1,411,520	2,257,419	255	System shut down for carbon change											
08/29/03	1,411,530	2,257,459	3	Restart	-	-	-	-	-	-	-	-	-	-	-
09/03/03	1,419,210	2,265,109	1,530	-	-	-	-	-	-	-	-	-	-	-	-
09/12/03	1,423,520	2,269,419	479	-	-	-	-	-	-	-	-	-	-	-	-
09/15/03	1,427,810	2,273,709	1,430	-	-	-	-	-	-	-	-	-	-	-	-
09/22/03	1,429,700	2,275,599	270	System shut down for installation of new 24-hour timer											
09/26/03	1,429,700	2,275,599	-	Restart											
09/29/03	1,430,560	2,276,459	287							-	-	-	-	-	-
10/06/03	1,431,140	2,277,039	83	System shut down for QWS											
10/08/03	1,431,140	2,277,039	-	Restart	-	-	-	-	-	Outlet sampling results from EBMUD (sample collected by EBMUD inspector)					
10/10/03	-	2,278,189	-	-	< 0.50	< 0.70	< 0.80	< 3.30	-	16,200	<0.04	4.4	4.8	46	8,700
10/10/03	1,432,290	2,278,189	575	<15	<0.04	<0.02	<0.02	<0.06	<0.03	-	-	-	-	-	-
10/17/03	1,433,790	2,279,689	214	-	-	-	-	-	-	Outlet sampling results from EBMUD (sample collected by EBMUD inspector)					
10/22/03	-	2,280,489	-	-	< 0.50	< 0.70	< 0.80	< 3.30	-	Split-sample results (sample collected by us)					
10/22/03	1,434,590	2,280,489	160	<15	<0.04	<0.02	<0.02	<0.06	<0.03	-	-	-	-	-	-
10/27/03	1,435,610	2,281,509	204	-	-	-	-	-	-	-	-	-	-	-	-
11/03/03	1,438,740	2,284,639	447	-	-	-	-	-	-	-	-	-	-	-	-
11/11/03	1,443,620	2,289,519	444	-	-	-	-	-	-	-	-	-	-	-	-
11/21/03	1,447,510	2,293,409	556	-	-	-	-	-	-	-	-	-	-	-	-
12/05/03	1,452,410	2,298,309	350	-	-	-	-	-	-	-	-	-	-	-	-
12/09/03	1,459,220	2,304,219	1,478	-	-	-	-	-	-	-	-	-	-	-	-
12/17/03	1,462,410	2,308,309	511	-	-	-	-	-	-	-	-	-	-	-	-
12/26/03	1,468,630	2,314,529	691	-	-	-	-	-	-	-	-	-	-	-	-
12/31/03	1,469,710	2,315,609	216	-	-	-	-	-	-	-	-	-	-	-	-
01/06/04	1,472,000	2,317,899	382	<15	<0.04	<0.02	<0.02	<0.06	<0.03	7,900	658	1,560	62	1,090	2,170

TABLE 2
GROUNDWATER REMEDIATION SYSTEM MONITORING PROGRAM
Thrifty Oil Co. Station No 063, OAKLAND, CA

Date	Totalizer (gallons)	Total/Cum. Discharge (gallons)	Flow (gal/day)	EFFLUENT (ug/L)						INFLUENT (ug/L)					
				TPH-g	B	T	E	X	MTBE	TPH-g	B	T	E	X	MTBE
01/14/04	1,474,650	2,320,549	331	System shut down for QWS; Restarted 1/15/04											
01/28/04		2,331,689	-	-	< 0.50	< 0.70	< 0.80	< 3.30	-	Outlet sampling results from EBMUD (sample collected by EBMUD inspector)					
01/28/04	1,485,790	2,331,689	857	<15	<0.04	<0.02	<0.02	<0.06	<0.03	Split-sample results (sample collected by us)					
02/04/04	1,492,340	2,338,239	936	-	-	-	-	-	-	-	-	-	-	-	-
02/10/04	1,494,550	2,340,449	368	-	-	-	-	-	-	-	-	-	-	-	-
02/20/04	1,498,790	2,344,689	424	-	-	-	-	-	-	-	-	-	-	-	-
02/25/04	1,499,360	2,345,259	114	-	-	-	-	-	-	-	-	-	-	-	-
03/03/04	1,514,700	2,360,599	2,191	-	-	-	-	-	-	-	-	-	-	-	-
03/09/04	1,517,300	2,363,199	433	-	-	-	-	-	-	-	-	-	-	-	-
03/17/04	1,519,100	2,364,999	225	-	-	-	-	-	-	-	-	-	-	-	-
03/24/04	1,524,600	2,370,499	786	-	-	-	-	-	-	-	-	-	-	-	-
04/01/04	1,529,300	2,375,199	588	-	-	-	-	-	-	-	-	-	-	-	-
04/07/04	1,531,200	2,377,099	317	<15	<0.22	<0.32	<0.31	<0.4	<0.18	1,360	113	93	16	76	191
04/14/04	1,533,000	2,378,899	257	System shut down for QWS on 4/7; Restarted 4/14						-	-	-	-	-	-
04/22/04	1,576,400	2,422,299	5,425	-	-	-	-	-	-	-	-	-	-	-	-
04/28/04	1,623,500	2,469,399	7,850	-	-	-	-	-	-	-	-	-	-	-	-
05/06/04	1,668,920	2,514,819	5,678	-	-	-	-	-	-	-	-	-	-	-	-
05/13/04	1,691,100	2,536,999	3,169	-	-	-	-	-	-	-	-	-	-	-	-
05/20/04	1,726,500	2,572,399	5,057	-	-	-	-	-	-	-	-	-	-	-	-
05/28/04	1,748,910	2,594,809	2,801	-	-	-	-	-	-	-	-	-	-	-	-
06/04/04	1,749,320	2,595,219	59	Found system off; for replacement of on and off switch						-	-	-	-	-	-
06/11/04	1,749,320	2,595,219	-	Restarted						-	-	-	-	-	-
06/16/04	1,751,910	2,597,809	518	-	-	-	-	-	-	-	-	-	-	-	-
06/22/04	1,753,550	2,599,449	273	-	-	-	-	-	-	-	-	-	-	-	-
07/02/04	1,756,530	2,602,429	298	-	-	-	-	-	-	-	-	-	-	-	-
07/08/04	1,759,110	2,605,009	430	<15	<0.22	<0.32	<0.31	<0.4	<0.18	652	31	<0.32	<0.31	2.1J	383
07/15/04	1,759,260	2,605,159	21	-	-	-	-	-	-	-	-	-	-	-	-
07/22/04	1,760,630	2,606,529	196	-	-	-	-	-	-	-	-	-	-	-	-
07/28/04	1,762,810	2,608,709	363	Shut down system for carbon change						-	-	-	-	-	-
08/05/04	1,762,810	2,608,709	-	Restarted						-	-	-	-	-	-
08/12/04	1,765,370	2,611,269	366	-	-	-	-	-	-	-	-	-	-	-	-
08/20/04	1,767,950	2,613,849	323	-	-	-	-	-	-	-	-	-	-	-	-
08/27/04	1,771,100	2,616,999	450	-	-	-	-	-	-	-	-	-	-	-	-
09/03/04	1,773,750	2,619,649	379	-	-	-	-	-	-	-	-	-	-	-	-
09/07/04	1,777,590	2,623,489	960	-	-	-	-	-	-	-	-	-	-	-	-
09/10/04	1,778,460	2,624,359	290	Shut down system due to operator vacation						-	-	-	-	-	-
09/29/04	1,778,460	2,624,359	-	Restarted											
10/06/04	1,779,260	2,625,159	114	<15	<0.22	<0.32	<0.31	<0.4	<0.18	<15	<0.22	<0.32	<0.31	<0.4	20
10/12/04	1,782,540	2,628,439	547	Shut down system for QWS											
10/21/04	1,782,680	2,628,579	16	Restarted											
10/27/04	1,784,630	2,630,529	325	-	-	-	-	-	-	-	-	-	-	-	-
11/03/04	1,784,680	2,630,579	7	-	-	-	-	-	-	-	-	-	-	-	-
11/11/04	1,787,490	2,633,389	351	-	-	-	-	-	-	-	-	-	-	-	-
11/19/04	1,789,350	2,635,249	233	-	-	-	-	-	-	-	-	-	-	-	-

GROUNDWATER REMEDIATION SYSTEM MONITORING PROGRAM

Thrifty Oil Co. Station No 063, OAKLAND, CA

Date	Totalizer (gallons)	Total/Cum. Discharge (gallons)	Flow (gal/day)	EFFLUENT (ug/L)						INFLUENT (ug/L)					
				TPH-g	B	T	E	X	MTBE	TPH-g	B	T	E	X	MTBE
12/01/04	1,789,800	2,635,699	38	-	-	-	-	-	-	-	-	-	-	-	-
12/10/04	1,792,780	2,638,679	331	-	-	-	-	-	-	-	-	-	-	-	-
12/15/04	1,795,460	2,641,359	536	-	-	-	-	-	-	-	-	-	-	-	-
12/22/04	1,798,000	2,643,899	363	-	-	-	-	-	-	-	-	-	-	-	-
12/29/04	1,800,580	2,646,479	369	-	-	-	-	-	-	-	-	-	-	-	-
01/05/05	1,803,140	2,649,039	366	<15	<0.22	<0.32	<0.31	<0.4	<0.18	291	9.1	<0.32	1.2 J	<0.4	72
01/13/05	1,803,290	2,649,189	19	System turned off for QWS on 1/5/05; Restarted on 1/13/05						-	-	-	-	-	-
01/20/05	1,804,020	2,649,919	104	Shut down system for repair and upgrade						-	-	-	-	-	-
04/30/05	1,804,020	2,649,919	-	System still off pending repairs and upgrade						-	-	-	-	-	-
05/10/05	1,804,020	2,649,919	-	Restarted system with MW-3 only						-	-	-	-	-	-
05/20/05	1,805,010	2,650,909	99	Added MW-4 to the system						-	-	-	-	-	-
05/26/05	1,807,630	2,653,529	437	-	-	-	-	-	-	-	-	-	-	-	-
06/03/05	1,812,100	2,657,999	559	-	-	-	-	-	-	-	-	-	-	-	-
06/10/05	1,816,540	2,662,439	634	-	-	-	-	-	-	-	-	-	-	-	-
06/17/05	1,819,870	2,665,769	476	Compressor needs repair						-	-	-	-	-	-
06/24/05	1,823,140	2,669,039	467	Replace with new pump MW-3						-	-	-	-	-	-
06/29/05	1,827,540	2,673,439	880	-	-	-	-	-	-	-	-	-	-	-	-
07/08/05	1,829,830	2,675,729	254	-	-	-	-	-	-	-	-	-	-	-	-
07/14/05	1,829,970	2,675,869	23	<2.9	<0.17	<0.22	<0.14	<0.38	-	4,270	130	3.6 J	348	188	2,790
07/22/05	1,832,760	2,678,659	349	-	-	-	-	-	-	-	-	-	-	-	-
07/26/05	1,833,920	2,679,819	290	-	-	-	-	-	-	-	-	-	-	-	-
08/05/05	1,833,970	2,679,869	5	Restart sytem after QWS						-	-	-	-	-	-
08/09/05	1,836,930	2,682,829	740	-	-	-	-	-	-	-	-	-	-	-	-
08/19/05	1,837,[illegible]	2,683,459	63	-	<0.10	<0.15	<0.06	<0.40	-	-	-	-	-	-	-
08/25/05	1,837,920	2,683,819	90	Shut down system for carbon change						-	-	-	-	-	-
09/01/05	1,837,960	2,683,879	9	Restarted						-	-	-	-	-	-
09/09/05	1,838,530	2,684,429	69	-	-	-	-	-	-	-	-	-	-	-	-
WD PERMIT LIMITS:				*NE*	*5.0*	*5.0*	*5.0*	*5.0*	*NE*						

Note:

< = less than laboratory detection level indicated

- = no sample / not analyzed

NE = Permit Limit not established

TPH is analyzed by EPA Method 8015 M

BTEX is analyzed by EPA Method 602 or 8020/8021

*MTBE 8020/8260

In February 2000, the total cumulative discharge amount was corrected to reflect all system maintenance and flowmeter changeouts since the startup of the system. The total number may be different from previous versions of this table.

APPENDIX C

Historic Boring and Well Logs

GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number MW 1

Project Arco / Telegraph Owner Arco Petroleum

Location 6125 Telegraph Ave. Project Number 20-0651-301

Date Drilled 6/21/86 Total Depth of Hole 30 ft. Diameter 7.5 in.

Surface Elevation _____ Water Level, Initial 16.19 ft 24-hrs. _____

Screen: Dia. 2 in. Length 20 ft. Slot Size .020 in.

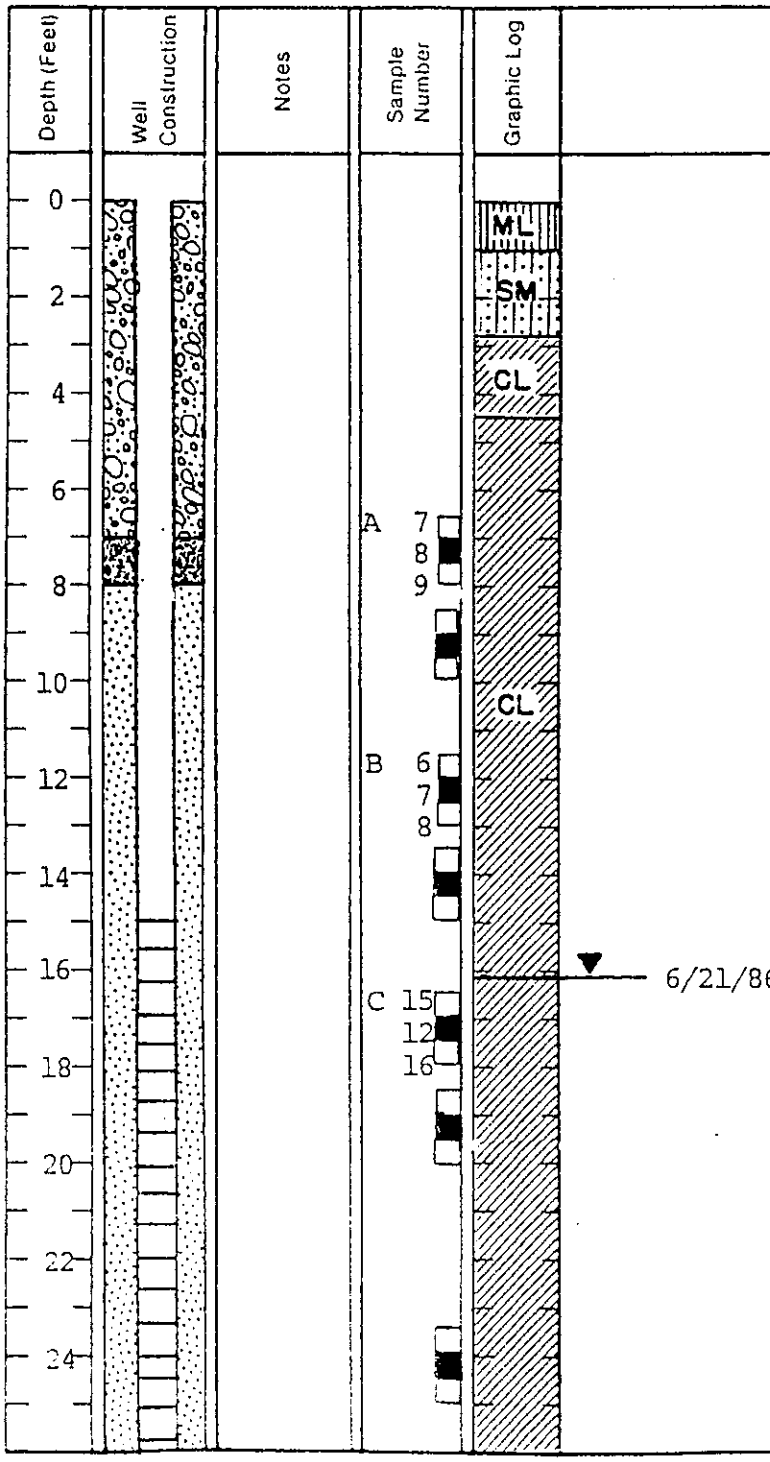
Casing: Dia. 2 in. Length 10 ft. Type PVC

Drilling Company Sierra Pacific Drilling Method h. s. auger

Driller L. Pera Log by B. Channell

Sketch Map

Notes



Description/Soil Classification (Color, Texture, Structures)

Brown clayey silt, dry, no odor

Light brown silty sand, damp, no odor

Black clay, moist, medium stiff, no odor

Brown clay, moist, medium stiff, no odor

Brown gray clay, dry, stiff, very slight odor

Blue gray gravelly clay, dry, stiff, moderate odor

Blue gray gravelly (coarse) clay, dry, very stiff, moderate odor

Note: Increase in gravel

Brown silty, gravelly clay, dry, very stiff, no odor

02:00:44

GROUNDWATER TECHNOLOGY
Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number MW 1

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
28				CL	Brown silty, gravelly clay, dry, very stiff, no odor
30					End of hole - 30 ft.

02100144

GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number MW 2

Project Arco / Telegraph Owner Arco Petroleum

Location 6125 Telegraph Ave. Project Number 20-0651-301

Date Drilled 6/21/86 Total Depth of Hole 30 ft. Diameter 7.5 in.

Surface Elevation ____ Water Level, Initial 15.01 ft 24-hrs. ____

Screen: Dia. 2 in. Length 15 ft. Slot Size .020 in.

Casing: Dia. 2 in. Length 15 ft. Type PVC

Drilling Company Sierra Pacific Drilling Method h. s. auger

Driller L. Pera Log by B. Channell

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					Asphalt
2					Gray sand (fine), moist, slight odor
4				SW	
6					Gray sand (fine), moist, slight odor
8			A 2 2 2		
10					Gray sand (fine), moist, loose, slight odor
12					Brown silty clay, damp, stiff, moderate odor
14			B 4 7 8	CL	Brown silty, gravelly (coarse) clay, wet, stiff, moderate odor
16					6/21/86
18				SC	Brown clayey sand, damp, moderate odor
20			C 5 8 15		Brown silty, gravelly clay, very stiff no odor
22				CL	
24					Brown silty, gravelly clay, very stiff no odor

GROUNDWATER TECHNOLOGY
Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number MW 2

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
28				CL	Brown silty, gravelly clay, very stiff, no odor
30					End of hole - 30 ft.

02100144

GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number MW 3

Project Arco / Telegraph Owner Arco Petroleum

Location 6125 Telegraph Ave. Project Number 20-0651-301

Date Drilled 6/21/86 Total Depth of Hole 30 ft. Diameter 7.5 in.

Surface Elevation _____ Water Level, Initial 16.3 ft. 24-hrs. _____

Screen: Dia. 2 in. Length 20 ft. Slot Size .020 in.

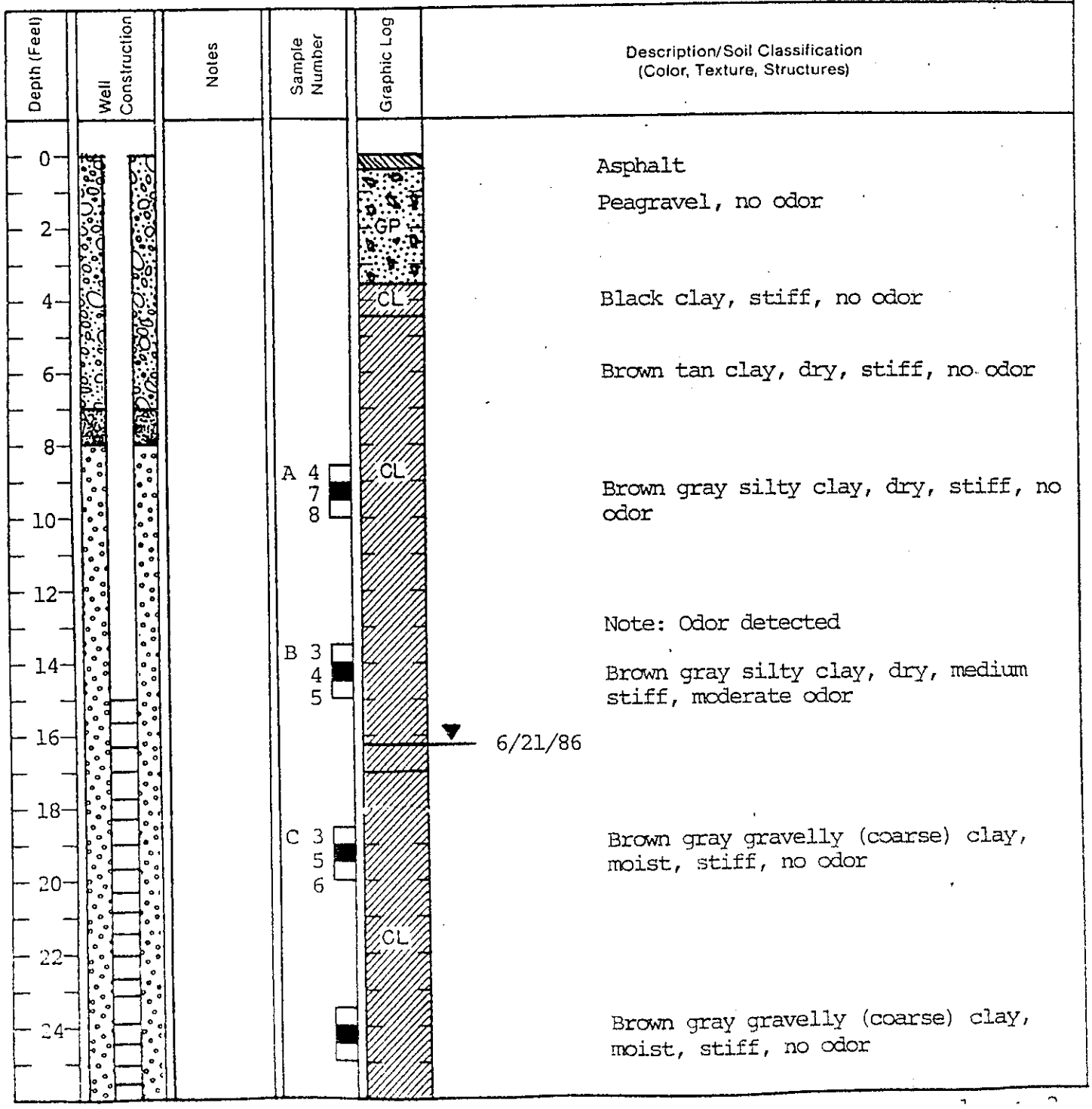
Casing: Dia. 2 in. Length 10 ft. Type PVC

Drilling Company Sierra Pacific Drilling Method h. s. auger

Driller L. Pera Log by B. Channell

Sketch Map

Notes



GROUNDWATER TECHNOLOGY
Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number MW 3

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
28				CL	Brown gray gravelly (coarse) clay, moist, stiff, no odor
30					End of hole - 30 ft.

02100144

Project No.: 90390A
Date: 11-13-86

Elevation.

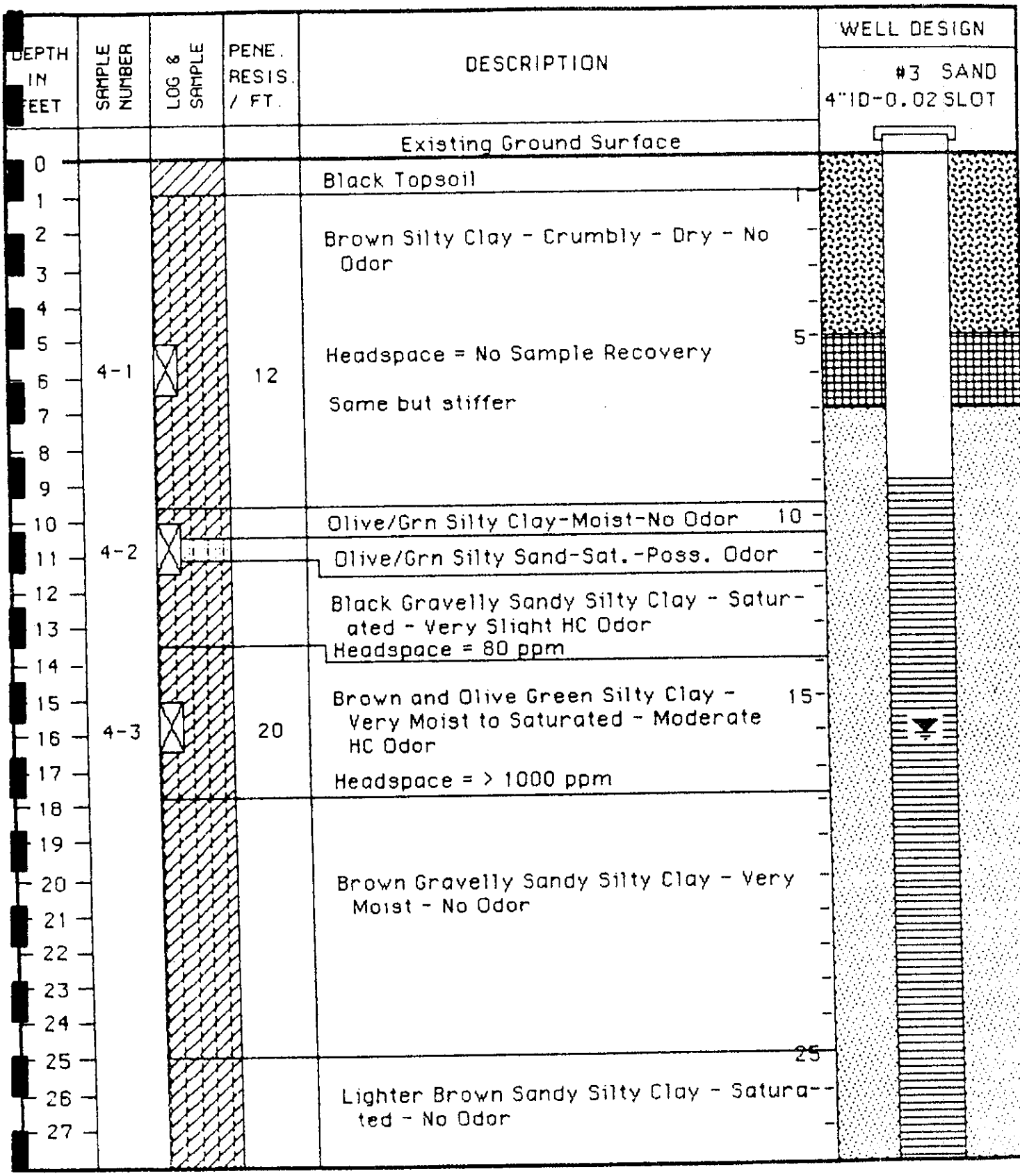


Figure 3A - Test Boring Log No. 1
- Monitoring Well No. MW-4

Woodward-Clyde Consultants

Project No.: 90390A

Date: 11-13-86

Elevation.

DEPTH IN FEET	SAMPLE NUMBER	LOG & SAMPLE	PENE. RESIS. / FT.	DESCRIPTION	WELL DESIGN: #3 SAND 4"ID-0.02 SLOT
				28 Feet Below Existing Ground Surface	
28				Light Brown Sandy Sandy Silty Clay - Saturated - No Odor	
29					
30				Bottom of Boring at 30 ft.	
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					

Figure 38 - Test Boring Log No. 1
- Monitoring Well No. MW-4

Woodward-Clyde Consultants

Project No.: 90390A

Date: 11-13-86

Elevation.

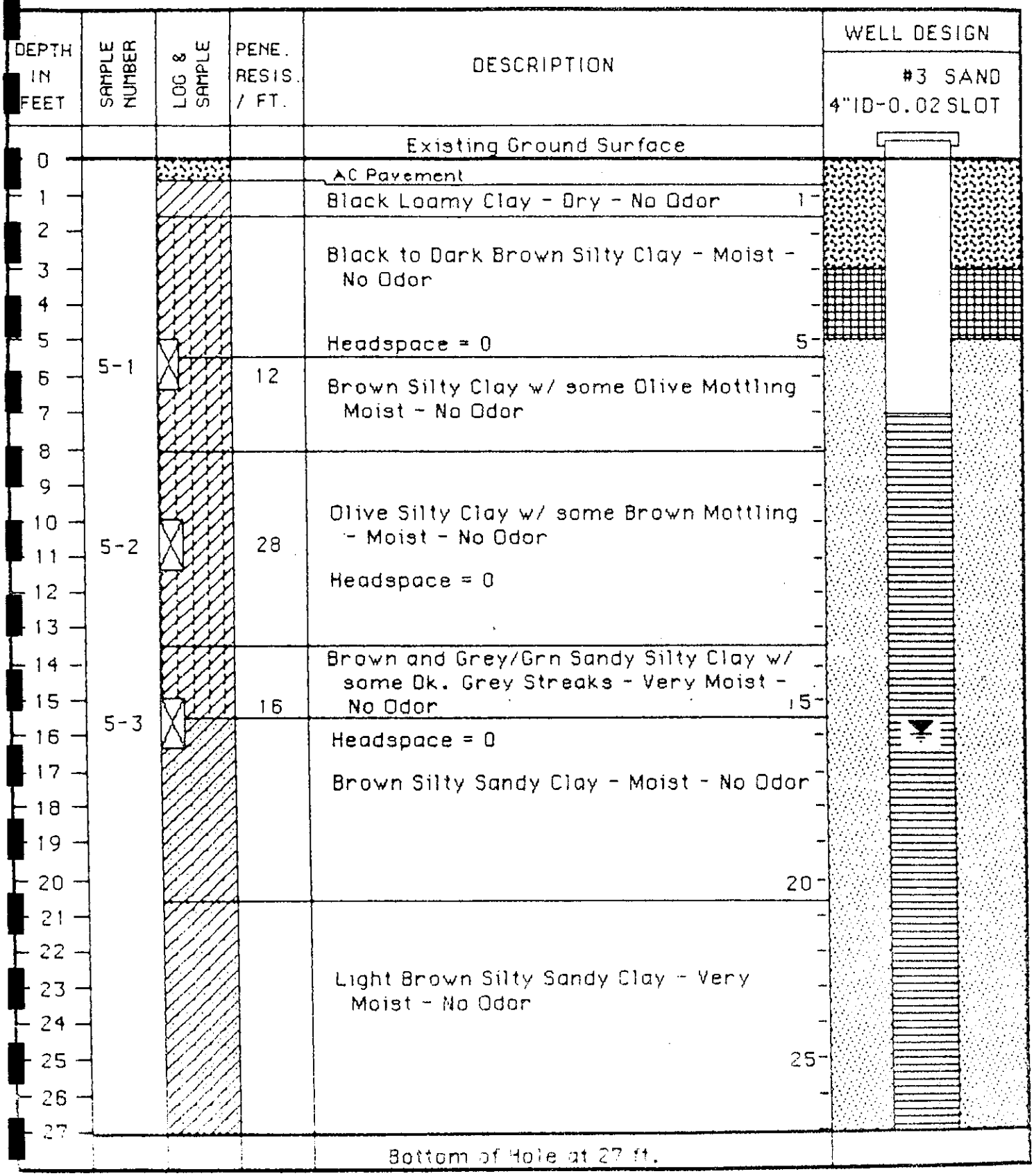


Figure 4 - Test Boring Log No. 2
- Monitoring Well No. MW-5

Woodward-Clyde Consultants

Project No.: 90390A

Date: 11-13-86

Elevation.

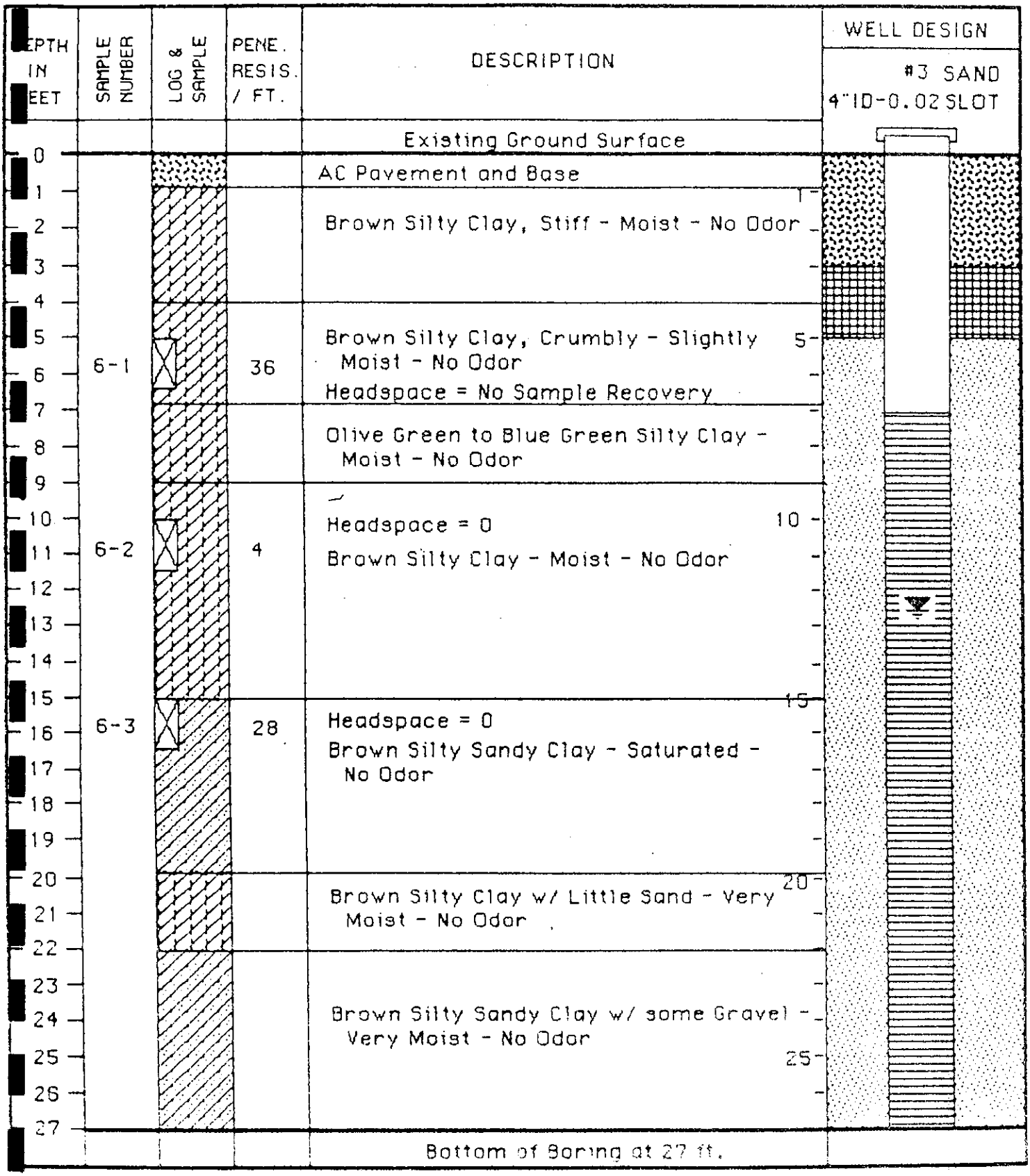


Figure 5 - Test Boring Log No. 5
- Monitoring Well No. MW-6

Woodward-Clyde Consultants

DATE OBSERVED: 9-11-87 METHOD OF DRILLING: HOLLOW STEM AUGER

LOGGED BY: SAW GROUND ELEVATION: 145' LOCATION: SEE PLOT PLAN FIGURE B-1

BORING NO. B-1

DEPTH (FEET)	CLASSIFICATION	BLOWS/FOOT	UNDISTURBED SAMPLE	BULK SAMPLE	MOISTURE CONTENT (%)	IN PLACE DRY DENSITY (PCF)	DESCRIPTION	SOIL TEST GASTECHTOR READING in ppm
0							ASPHALT COVER	
							FILL: Brown, fine SAND, damp, No petroleum odor	
5	SP	12					@ 5' color change to green-gray, becomes medium dense	70 ppm
10		5					@ 10' strong petroleum odor noted	500 ppm
15	Ss	29					NATURAL GROUND: BEDROCK: Green, weathered SILTSTONE with Reddish brown siltstone fragments wet, very stiff, strong petroleum odor noted	500 ppm
20		14					@ 20' strong petroleum odor noted	500 ppm
25							TOTAL DEPTH: 21 FEET NO GROUNDWATER	
30								
35								
40								

JOB NO.: [illegible] LOG OF BORING FIGURE: B-3

DATE OBSERVED: 9-11-87 METHOD OF DRILLING: HOLLOW STEM AUGER

LOGGED BY: SAW GROUND ELEVATION: 150' LOCATION: SEE PLOT PLAN FIGURE B-1

BORING NO. B-2

DEPTH (FEET)	CLASSIFICATION	BLOWS/FOOT	UNDISTURBED SAMPLE	BULK SAMPLE	MOISTURE CONTENT (%)	IN PLACE DRY DENSITY (PCF)	DESCRIPTION	SOIL TEST GASTECHTOR READING in ppm
0							ASPHALT COVER	
							FILL: Brown CLAY with silt, damp stiff, no petroleum odor	
5	CL	13					@ 5' drive sample not recovered	250 ppm
							NATURAL GROUND: BEDROCK: Green-gray weathered SILTSTONE with reddish brown siltstone fragments, damp to moist, very stiff, slight petroleum odor	220 ppm
10		28						
15	Ss	32					@ 15' slight petroleum odor noted	200 ppm
20		38					@ 19' Groundwater noted	-
							TOTAL DEPTH: 21 FEET	
							GROUNDWATER @ 19'	
25								
30								
35								
40								

JOB NO: [illegible]-018-00-00 LOG OF BORING FIGURE: B-4

DATE OBSERVED: 9-11-87 METHOD OF DRILLING: HOLLOW STEM AUGER

LOGGED BY: SAW GROUND ELEVATION: 150' LOCATION: SEE PLOT PLAN FIGURE B-1

BORING NO. B-3

DEPTH (FEET)	CLASSIFICATION	BLOWS/FOOT	UNDISTURBED SAMPLE	BULK SAMPLE	MOISTURE CONTENT (%)	IN PLACE DRY DENSITY (PCF)	DESCRIPTION	SOIL TEST GASTECHTOR READING in ppm
0							ASPHALT COVER	
	CL						FILL: Dark brown to black CLAY with silt, damp, stiff, no petroleum odor	
5		13					NATURAL GROUND: WEATHERED BEDROCK Brown CLAY with silt, damp, stiff slight petroleum odor	40 ppm
10	CL	14					@ 10' becomes moist, slight petroleum odor noted	60 ppm
15		10					@ 15' drive sample not recovered slight petroleum odor noted	160 ppm
20		15					@ 20' drive sample not recovered slight petroleum odor noted	170 ppm
25							TOTAL DEPTH: 21 FEET NO GROUNDWATER	
30								
35								
40								

JOB NO.: [illegible] LOG OF BORING FIGURE: B-3

DATE OBSERVED: 9-11-87 METHOD OF DRILLING: HOLLOW STEM AUGER

LOGGED BY: SAW GROUND ELEVATION: 150 LOCATION: SEE PLOT PLAN FIGURE B-1

BORING NO. B-4

DEPTH (FEET)	CLASSIFICATION	BLOWS/FOOT	UNDISTURBED SAMPLE	BULK SAMPLE	MOISTURE CONTENT (%)	IN PLACE DRY DENSITY (PCF)	DESCRIPTION	SOIL TEST GASTECHTOR READING in ppm
0							ASPHALT COVER	
5	CL	12	■				FILL: Dark brown-black CLAY with SILT, damp, stiff, construction debris. Noted, no petroleum odor	50 ppm
10		15	■				NATURAL GROUND: WEATHERED BEDROCK Grey mottled Red-Brown, silty CLAY, damp, stiff, no petroleum odor	100 ppm
15		12	■					150 ppm
20		36	■				BEDROCK: Reddish brown weathered SILTSTONE wet, hard, no petroleum odor	50 ppm
25							TOTAL DEPTH: 21 FEET NO GROUNDWATER	
30								
35								
40								

JOB NO: 13-6782-023-00-00 LOG OF BORING FIGURE: B-6

LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-1
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-11-97
LOCATION: 6125 Telegraph Road
HOLE DIAMETER: 8"
HOLE DEPTH: 20.5'

MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
			0		ASPHALT 3"; FILL MATERIAL 2'
			2	CL	SILTY CLAY: yellowish brown; no product odor.
Dp	0	36	4		
			6	CL	GRAVELLY CLAY: olive brown; moderate plasticity; very stiff; no product odor.
			8	ML	CLAYEY SILT: dark greenish gray; moderate plasticity; very stiff; faint product odor.
Mst	27	34	10	GC	CLAYEY GRAVEL: dark greenish gray; medium dense; faint product odor.
			12		
			14		
Wt-Sat	1,271	39	16		@15': as above; moderate product odor.
			18		
Sat	10	40	20	GP	SANDY GRAVEL: reddish brown; dense; no product odor.
			22		BOTTOM OF BORING AT 20.5'
			24		
			26		
			28		
			30		
			32		
			34		
			36		
			38		
			40		
			42		
			44		

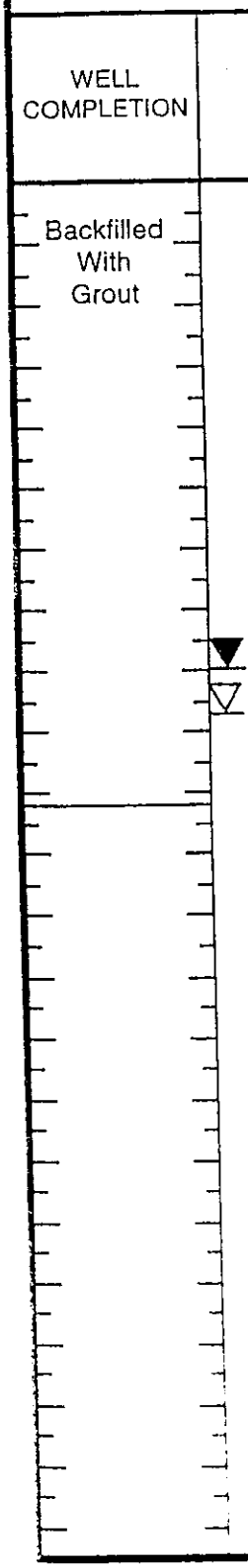
LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-2
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-11-97
LOCATION: 6125 Telegraph Road
HOLE DIAMETER: 8"
HOLE DEPTH: 20.5'



MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
			0	FL	ASPHALT 3"
					SAND - FILL MATERIAL: no product odor.
Dp	0	13	2		
			4		
			6		
			8		
Mst	101	24	10	SM	SILTY SAND: dark olvie gray; medium dense; faint to moderate product odor.
			12		
			14		
Wt	705	35	16	CL	GRAVELLY CLAY: dark greenish gray; moderate plasticity; moderate product odor.
			18		
Sat	23	38	20	GP	SANDY GRAVEL: yellowish brown; dense; faint product odor.
					BOTTOM OF BORING AT 20.5'
			22		
			24		
			26		
			28		
			30		
			32		
			34		
			36		
			38		
			40		
			42		
			44		

LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-3
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-11-97
LOCATION: 6125 Telegraph Road
HOLE DIAMETER: 8"
HOLE DEPTH: 20.5'

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
Backfilled With Grout				2			FL	ASPHALT 4"
								SAND - FILL MATERIAL: no product odor.
	Dp	0	4	4				
				6				@5': as above; no product odor.
				8				
	Mst	93	8	10				@10': as above; faint product odor.
				12				
				14				
	Wt-Sat	671	27	16			CL	SANDY CLAY: olive; moderate plasticity; very stiff; faint to moderate product odor.
				18				
	Sat	32	16	20			GP	SILTY GRAVEL: dark reddish brown; medium dense; no product odor.
				22				BOTTOM OF BORING AT 20.5'
				24				
				26				
				28				
				30				
				32				
				34				
				36				
				38				
				40				
				42				
				44				

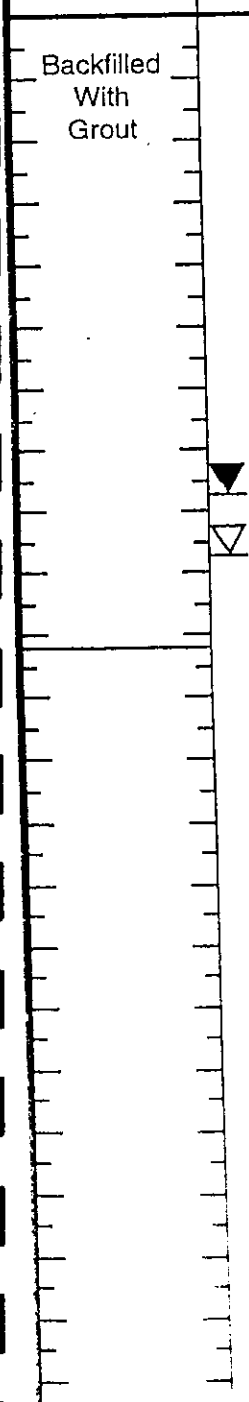
LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-4
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-11-97
LOCATION: 6125 Telegraph Road
HOLE DIAMETER: 8"
HOLE DEPTH: 20.5'



MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
			0	CL	ASPHALT SILTY CLAY: yellowish brown with greenish gray mottling; very stiff; faint product odor.
Dp	15	22	2–6		
			8	CL	SANDY CLAY: olive brown; moderate plasticity; very stiff; moderate product odor.
Mst	127	30	10–12		
Wt-Sat	832	38	14–16	SC	CLAYEY SAND: olive; medium dense; moderate product odor.
			18	SM	SILTY SAND: strong brown; medium dense; no product odor.
Sat	10	29	20		BOTTOM OF BORING AT 20.5'
			22–44		

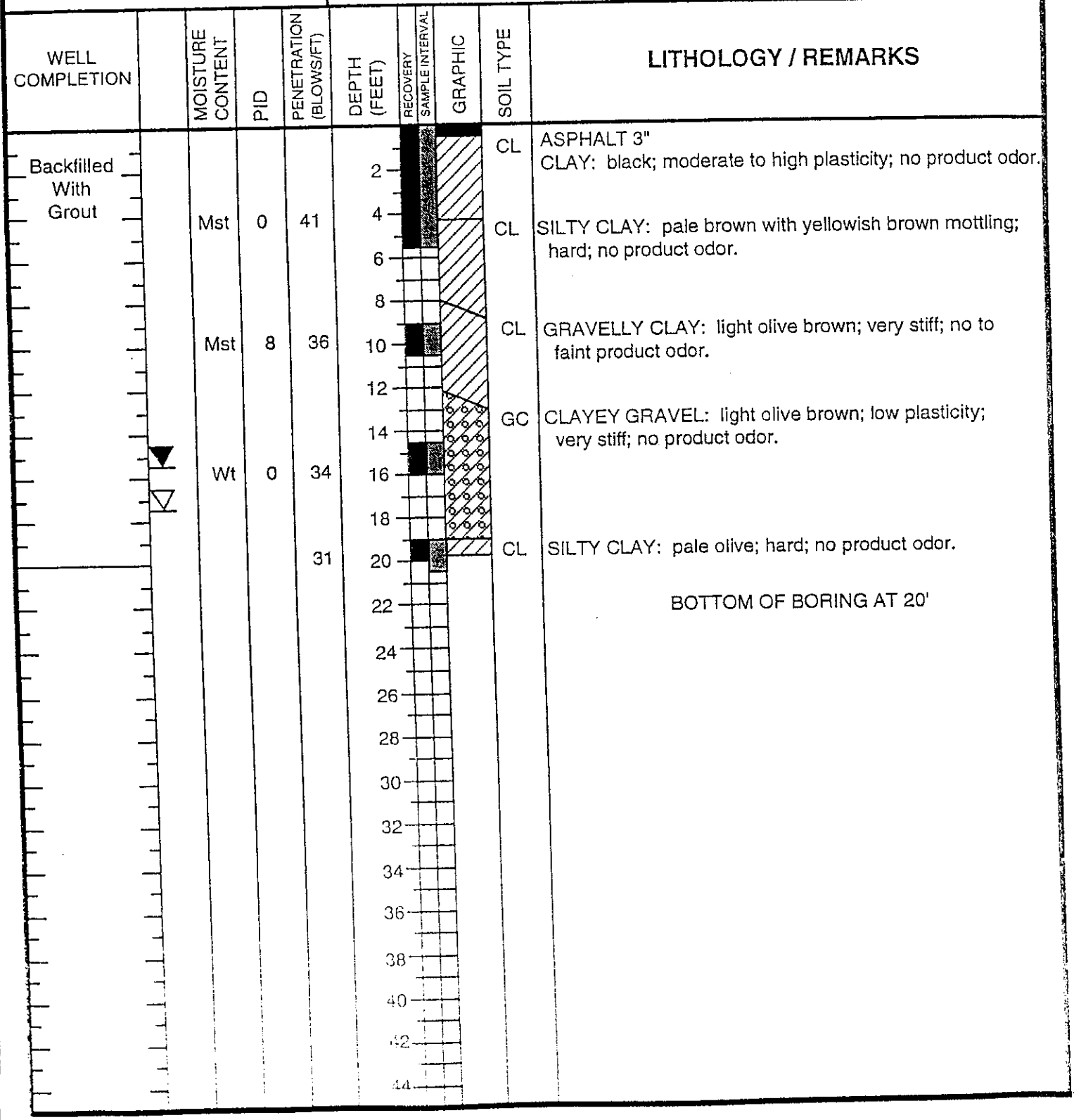
LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-5
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-11-97
LOCATION: 6125 Telegraph Road
HOLE DIAMETER: 8"
HOLE DEPTH: 20'



LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-6
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-11-97
LOCATION: 6125 Telegraph Road
HOLE DIAMETER: 8"
HOLE DEPTH: 10'

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
Backfilled With Grout				0					CONCRETE 5"
	Dp	721		2				CL	CLAY: black; high plasticity; moderate product odor.
				4				CL	GRAVELLY CLAY: light yellowish brown with gray staining; low to moderate plasticity; moderate product odor.
				6					
				8				CL	SILTY CLAY: dark olive with gray mottling; moderate plasticity; no product odor.
	Mst	0		10					BOTTOM OF BORING AT 10'
				12					
				14					
				16					
				18					
				20					
				22					
				24					
				26					
				28					
				30					
				32					
				34					
				36					
				38					
				40					
				42					
				44					

LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-7
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-11-97
LOCATION: 3400 San Pablo AVe.
HOLE DIAMETER: 8"
HOLE DEPTH: 10'

MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
			0					CONCRETE 5"; FILL MATERIAL 1'
Mst	27		2				CL	CLAY: black; high plasticity; faint product odor.
			4					
			6				CL	SILTY CLAY: light olive brown with gray staining along rootholes; no product odor.
			8					
Mst	0		10					@10': as above; no product odor.
			12					BOTTOM OF BORING AT 10'
			14					
			16					
			18					
			20					
			22					
			24					
			26					
			28					
			30					
			32					
			34					
			36					
			38					
			40					
			42					
			44					

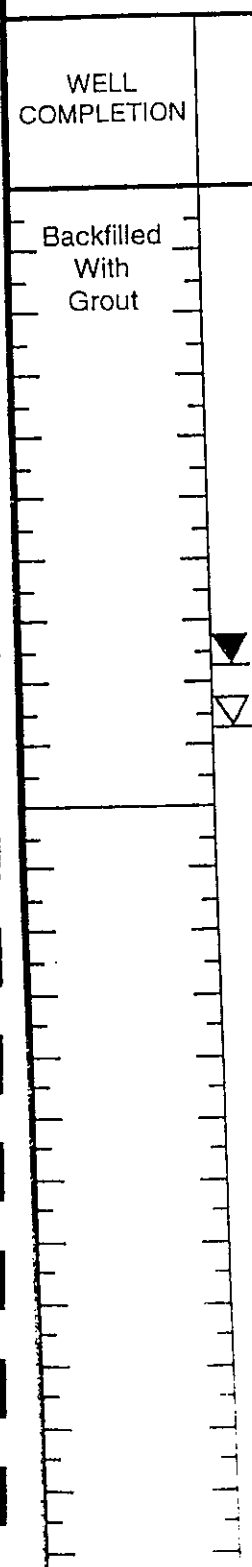
LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-8
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-11-97
LOCATION: 6125 Telegraph Road
HOLE DIAMETER: 8"
HOLE DEPTH: 20'



MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
			0		CONCRETE 4"; FILL MATERIAL 8"
			2	CL	CLAY: black; high plasticity; no product odor.
Mst	0	24	4	CL	SILTY CLAY: dark yellowish brown with gray mottling; no product odor.
			6		
			8	CL	GRAVELLY CLAY: olive; very stiff; faint product odor.
Mst	32	29	10		
			12		
			14		@15': as above; medium dense; no product odor.
Wt	0	41	16		
			18	CL	SILTY CLAY WITH GRAVEL: pale olive with strong brown mottling; low plasticity; very stiff; no product odor.
Mst	0	30	20		BOTTOM OF BORING AT 20'
			22		
			24		
			26		
			28		
			30		
			32		
			34		
			36		
			38		
			40		
			42		
			44		

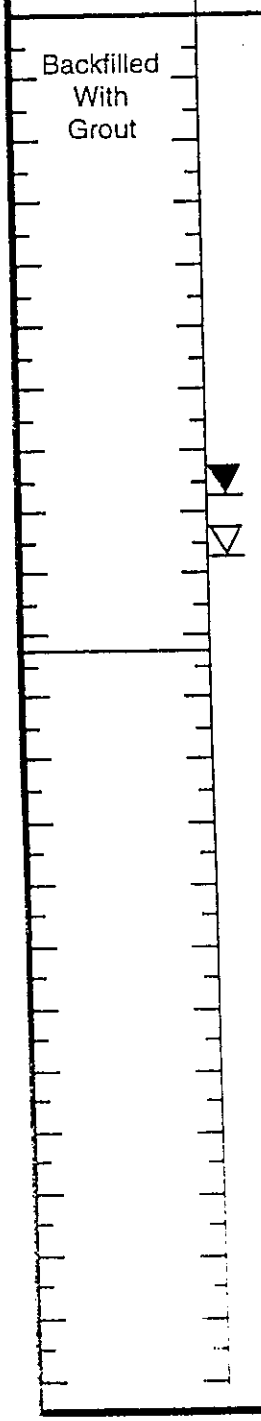
LOCATION MAP

PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. TDD-9
PAGE 1 OF 1

PROJECT NO. 331-008.1A
LOGGED BY: D.A.
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CALMOD

CLIENT: Thrifty Station No. 063
DATE DRILLED: 6-12-97
LOCATION: 6125 Telegraph Road
HOLE DIAMETER: 8"
HOLE DEPTH: 20.5'



MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
			0		CONCRETE 5"
			2	CL	CLAY: black; moderate to high plasticity; faint product odor.
Mst	132	24	4	CL	SILTY CLAY: olive gray with light bluish gray staining; very stiff; faint to moderate product odor.
			6		
			8	GC	CLAYEY GRAVEL: dark olive gray; medium dense; moderate product odor.
Mst	237	32	10		
			12		
			14	SC	CLAYEY SAND: yellowish brown; medium dense; no product odor.
Wt	0	35	16		
			18	GP	SANDY GRAVEL: strong brown; medium dense; no product odor.
Sat	0	22	20	CL	SILTY CLAY: pale olive; very stiff; no product odor.
			22		
			24		BOTTOM OF BORING AT 20.5'
			26		
			28		
			30		
			32		
			34		
			36		
			38		
			40		
			42		
			44		

APPENDIX D

Soil and Groundwater ESLs

TABLE A. ENVIRONMENTAL SCREENING LEVELS (ESLs)
Shallow Soils (≤3m bgs)
Groundwater IS Current or Potential Source of Drinking Water

	[1]Shallow Soil		
CHEMICAL PARAMETER	[2]Residential Land Use (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	[3]Groundwater (ug/L)
ACENAPHTHENE	1.6E+01	1.6E+01	2.0E+01
ACENAPHTHYLENE	1.3E+01	1.3E+01	3.0E+01
ACETONE	5.0E-01	5.0E-01	1.5E+03
ALDRIN	3.2E-02	1.3E-01	2.0E-03
ANTHRACENE	2.8E+00	2.8E+00	7.3E-01
ANTIMONY	6.1E+00	4.0E+01	6.0E+00
ARSENIC	5.5E+00	5.5E+00	3.6E+01
BARIUM	7.5E+02	1.5E+03	1.0E+03
BENZENE	4.4E-02	4.4E-02	1.0E+00
BENZO(a)ANTHRACENE	3.8E-01	1.3E+00	2.7E-02
BENZO(b)FLUORANTHENE	3.8E-01	1.3E+00	2.9E-02
BENZO(k)FLUORANTHENE	3.8E-01	1.3E+00	2.9E-02
BENZO(g,h,i)PERYLENE	2.7E+01	2.7E+01	1.0E-01
BENZO(a)PYRENE	3.8E-02	1.3E-01	1.4E-02
BERYLLIUM	4.0E+00	8.0E+00	2.7E+00
BIPHENYL, 1,1-	6.5E-01	6.5E-01	5.0E-01
BIS(2-CHLOROETHYL)ETHER	1.8E-04	1.8E-04	1.4E-02
BIS(2-CHLOROISOPROPYL)ETHER	5.4E-03	5.4E-03	5.0E-01
BIS(2-ETHYLHEXYL)PHTHALATE	6.6E+01	6.6E+01	4.0E+00
BORON	1.6E+00	2.0E+00	1.6E+00
BROMODICHLOROMETHANE	1.4E-02	3.9E-02	1.0E+02
BROMOFORM	2.2E+00	2.2E+00	1.0E+02
BROMOMETHANE	2.2E-01	3.9E-01	9.8E+00
CADMIUM	1.7E+00	7.4E+00	1.1E+00
CARBON TETRACHLORIDE	1.2E-02	3.4E-02	5.0E-01
CHLORDANE	4.4E-01	1.7E+00	4.0E-03
CHLOROANILINE, p-	5.3E-02	5.3E-02	5.0E+00
CHLOROBENZENE	1.5E+00	1.5E+00	2.5E+01
CHLOROETHANE	6.3E-01	8.5E-01	1.2E+01
CHLOROFORM	8.8E-01	1.9E+00	7.0E+01
CHLOROMETHANE	7.0E-02	2.0E-01	1.3E+00
CHLOROPHENOL, 2-	1.2E-02	1.2E-02	1.8E-01
CHROMIUM (Total)	5.8E+01	5.8E+01	5.0E+01
CHROMIUM III	7.5E+02	7.5E+02	1.8E+02
CHROMIUM VI	1.8E+00	1.8E+00	1.1E+01
CHRYSENE	3.8E+00	1.3E+01	2.9E-01
COBALT	1.0E+01	1.0E+01	3.0E+00
COPPER	2.3E+02	2.3E+02	3.1E+00
CYANIDE (Free)	3.6E-03	3.6E-03	1.0E+00
DIBENZO(a,h)ANTHTRACENE	1.1E-01	3.8E-01	8.5E-03
DIBROMOCHLOROMETHANE	1.9E-02	5.4E-02	1.0E+02
1,2-DIBROMO-3-CHLOROPROPANE	4.5E-03	4.5E-03	2.0E-01
DIBROMOETHANE, 1,2-	3.3E-04	3.3E-04	5.0E-02
DICHLOROBENZENE, 1,2-	1.1E+00	1.1E+00	1.0E+01

TABLE A. ENVIRONMENTAL SCREENING LEVELS (ESLs)
Shallow Soils (≤3m bgs)
Groundwater IS Current or Potential Source of Drinking Water

CHEMICAL PARAMETER	[1]Shallow Soil		[3]Groundwater (ug/L)
	[2]Residential Land Use (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	
DICHLOROBENZENE, 1,3-	7.4E+00	7.4E+00	6.5E+01
DICHLOROBENZENE, 1,4-	4.6E-02	1.3E-01	5.0E+00
DICHLOROBENZIDINE, 3,3-	7.7E-03	7.7E-03	2.9E-02
DICHLORODIPHENYLDICHLOROETHANE (DDD)	2.3E+00	9.0E+00	1.0E-03
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	1.6E+00	4.0E+00	1.0E-03
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	1.6E+00	4.0E+00	1.0E-03
DICHLOROETHANE, 1,1-	2.0E-01	2.0E-01	5.0E+00
DICHLOROETHANE, 1,2-	4.5E-03	4.5E-03	5.0E-01
DICHLOROETHYLENE, 1,1-	1.0E+00	1.0E+00	6.0E+00
DICHLOROETHYLENE, Cis 1,2-	1.9E-01	1.9E-01	6.0E+00
DICHLOROETHYLENE, Trans 1,2-	6.7E-01	6.7E-01	1.0E+01
DICHLOROPHENOL, 2,4-	3.0E-01	3.0E-01	3.0E-01
DICHLOROPROPANE, 1,2-	5.1E-02	1.2E-01	5.0E+00
DICHLOROPROPENE, 1,3-	3.3E-02	5.9E-02	5.0E-01
DIELDRIN	2.3E-03	2.3E-03	1.9E-03
DIETHYLPHTHALATE	3.5E-02	3.5E-02	1.5E+00
DIMETHYLPHTHALATE	3.5E-02	3.5E-02	1.5E+00
DIMETHYLPHENOL, 2,4-	6.7E-01	6.7E-01	1.0E+02
DINITROPHENOL, 2,4-	4.0E-02	4.0E-02	1.4E+01
DINITROTOLUENE, 2,4-	8.5E-04	8.5E-04	1.1E-01
1,4 DIOXANE	1.8E-03	1.8E-03	3.0E+00
DIOXIN (2,3,7,8-TCDD)	4.6E-06	1.9E-05	5.0E-06
ENDOSULFAN	4.6E-03	4.6E-03	8.7E-03
ENDRIN	6.5E-04	6.5E-04	2.3E-03
ETHANOL	4.5E+01	4.5E+01	5.0E+04
ETHYLBENZENE	3.3E+00	3.3E+00	3.0E+01
FLUORANTHENE	4.0E+01	4.0E+01	8.0E+00
FLUORENE	8.9E+00	8.9E+00	3.9E+00
HEPTACHLOR	1.4E-02	1.4E-02	3.8E-03
HEPTACHLOR EPOXIDE	1.5E-02	1.5E-02	3.8E-03
HEXACHLOROBENZENE	2.7E-01	9.6E-01	1.0E+00
HEXACHLOROBUTADIENE	1.0E+00	1.0E+00	2.1E-01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	4.9E-02	4.9E-02	8.0E-02
HEXACHLOROETHANE	2.4E+00	2.4E+00	7.0E-01
INDENO(1,2,3-cd)PYRENE	3.8E-01	1.3E+00	2.9E-02
LEAD	1.5E+02	7.5E+02	2.5E+00
MERCURY	3.7E+00	1.0E+01	1.2E-02
METHOXYCHLOR	1.9E+01	1.9E+01	1.9E-02
METHYLENE CHLORIDE	7.7E-02	7.7E-02	5.0E+00
METHYL ETHYL KETONE	3.9E+00	3.9E+00	4.2E+03
METHYL ISOBUTYL KETONE	2.8E+00	2.8E+00	1.2E+02
METHYL MERCURY	1.2E+00	1.0E+01	3.0E-03
METHYLNAPHTHALENE (total 1- & 2-)	2.5E-01	2.5E-01	2.1E+00
METHYL TERT BUTYL ETHER	2.3E-02	2.3E-02	5.0E+00

TABLE A. ENVIRONMENTAL SCREENING LEVELS (ESLs)
Shallow Soils (≤3m bgs)
Groundwater IS Current or Potential Source of Drinking Water

CHEMICAL PARAMETER	[1]Shallow Soil		[3]Groundwater (ug/L)
	[2]Residential Land Use (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	
MOLYBDENUM	4.0E+01	4.0E+01	3.5E+01
NAPHTHALENE	4.6E-01	1.5E+00	1.7E+01
NICKEL	1.5E+02	1.5E+02	8.2E+00
PENTACHLOROPHENOL	4.4E+00	5.0E+00	1.0E+00
PERCHLORATE	1.0E-02	1.0E-02	6.0E+00
PHENANTHRENE	1.1E+01	1.1E+01	4.6E+00
PHENOL	7.6E-02	7.6E-02	5.0E+00
POLYCHLORINATED BIPHENYLS (PCBs)	2.2E-01	7.4E-01	1.4E-02
PYRENE	8.5E+01	8.5E+01	2.0E+00
SELENIUM	1.0E+01	1.0E+01	5.0E+00
SILVER	2.0E+01	4.0E+01	1.9E-01
STYRENE	1.5E+00	1.5E+00	1.0E+01
tert-BUTYL ALCOHOL	7.3E-02	7.3E-02	1.2E+01
TETRACHLOROETHANE, 1,1,1,2-	2.4E-02	2.4E-02	1.3E+00
TETRACHLOROETHANE, 1,1,2,2-	9.1E-03	1.8E-02	1.0E+00
TETRACHLOROETHYLENE	8.7E-02	2.4E-01	5.0E+00
THALLIUM	1.0E+00	1.3E+01	2.0E+00
TOLUENE	2.9E+00	2.9E+00	4.0E+01
TOXAPHENE	4.2E-04	4.2E-04	2.0E-04
TPH (gasolines)	1.0E+02	1.0E+02	1.0E+02
TPH (middle distillates)	1.0E+02	1.0E+02	1.0E+02
TPH (residual fuels)	5.0E+02	1.0E+03	1.0E+02
TRICHLOROBENZENE, 1,2,4-	3.8E-01	1.0E+00	2.5E+01
TRICHLOROETHANE, 1,1,1-	7.8E+00	7.8E+00	6.2E+01
TRICHLOROETHANE, 1,1,2-	3.2E-02	7.0E-02	5.0E+00
TRICHLOROETHYLENE	2.6E-01	4.6E-01	5.0E+00
TRICHLOROPHENOL, 2,4,5-	1.8E-01	1.8E-01	1.1E+01
TRICHLOROPHENOL, 2,4,6-	1.7E-01	1.7E-01	5.0E-01
VANADIUM	1.1E+02	2.0E+02	1.5E+01
VINYL CHLORIDE	6.7E-03	1.9E-02	5.0E-01
XYLENES	2.3E+00	2.3E+00	2.0E+01
ZINC	6.0E+02	6.0E+02	8.1E+01

TABLE A. ENVIRONMENTAL SCREENING LEVELS (ESLs)
Shallow Soils (≤3m bgs)
Groundwater IS Current or Potential Source of Drinking Water

CHEMICAL PARAMETER	[1]Shallow Soil		[3]Groundwater (ug/L)
	[2]Residential Land Use (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	2.0	4.0	not applicable
Sodium Adsorption Ratio	5.0	12	not applicable

Red: Updated with respect to ESLs presented in July 2003 document.

Notes:

1. Shallow soils defined as soils less than or equal to 3 meters (approximately 10 feet) below ground surface.
2. Category "Residential Land Use" generally considered adequate for other sensitive uses (e.g., day-care centers, hospitals, etc.)
3. Assumes potential discharge of groundwater into a freshwater, marine or estuary surface water system.

Source of soil ESLs: Refer to Appendix 1, Tables A-1 and A-2.

Source of groundwater ESLs: Refer to Appendix 1, Table F-1a.

Soil data should be reported on dry-weight basis (see Appendix 1, Section 6.2).

Soil ESLs intended to address direct-exposure, groundwater protection, ecologic (urban areas) and nuisance concerns under noted land-use scenarios. **Soil gas data should be collected for additional evaluation of potential indoor-air impacts at sites with significant areas of VOC-impacted soil. See Section 2.6 and Table E.**

Groundwater ESLs intended to be address drinking water, surface water, indoor-air and nuisance concerns. **Use in conjunction with soil gas screening levels to more closely evaluate potential impacts to indoor-air if groundwater screening levels for this concern approached or exceeded (refer to Section 2.6 and Appendix 1, Table F-1a).**

Aquatic habitat goals for bioaccumulation concerns not considered in selection of groundwater goals (refer to Section 2.7).

Refer to appendices for summary of ESL components.

Soil and water ESLs for ethanol based on gross contamination concerns (see Appendix 1, Chapter 5 and related tables).

TPH -Total Petroleum Hydrocarbons. TPH ESLs must be used in conjunction with ESLs for related chemicals (e.g., BTEX, PAHs, oxidizers, etc.). See Volume 1, Section 2.2 and Appendix 1, Chapter 5.

TABLE C. ENVIRONMENTAL SCREENING LEVELS (ESLs)
Deep Soils (>3m bgs)
Groundwater IS a Current or Potential Source of Drinking Water

CHEMICAL PARAMETER	[1]Deep Soil		[3]Groundwater (ug/L)
	[2]Residential Land Use (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	
ACENAPHTHENE	1.6E+01	1.6E+01	2.0E+01
ACENAPHTHYLENE	1.3E+01	1.3E+01	3.0E+01
ACETONE	5.0E-01	5.0E-01	1.5E+03
ALDRIN	1.5E+00	1.5E+00	2.0E-03
ANTHRACENE	2.8E+00	2.8E+00	7.3E-01
ANTIMONY	2.8E+02	2.8E+02	6.0E+00
ARSENIC	5.5E+00	5.5E+00	3.6E+01
BARIUM	2.5E+03	2.5E+03	1.0E+03
BENZENE	4.4E-02	4.4E-02	1.0E+00
BENZO(a)ANTHRACENE	1.2E+01	1.2E+01	2.7E-02
BENZO(b)FLUORANTHENE	1.5E+01	1.5E+01	2.9E-02
BENZO(k)FLUORANTHENE	2.7E+00	2.7E+00	2.9E-02
BENZO(g,h,i)PERYLENE	2.7E+01	2.7E+01	1.0E-01
BENZO(a)PYRENE	1.5E+00	1.5E+00	1.4E-02
BERYLLIUM	3.6E+01	3.6E+01	2.7E+00
BIPHENYL, 1,1-	6.5E-01	6.5E-01	5.0E-01
BIS(2-CHLOROETHYL)ETHER	1.8E-04	1.8E-04	1.4E-02
BIS(2-CHLOROISOPROPYL)ETHER	5.4E-03	5.4E-03	5.0E-01
BIS(2-ETHYLHEXYL)PHTHALATE	6.6E+01	6.6E+01	4.0E+00
BORON	4.6E+04	4.6E+04	1.6E+00
BROMODICHLOROMETHANE	1.4E-02	3.9E-02	1.0E+02
BROMOFORM	2.2E+00	2.2E+00	1.0E+02
BROMOMETHANE	2.2E-01	3.9E-01	9.8E+00
CADMIUM	3.8E+01	3.8E+01	1.1E+00
CARBON TETRACHLORIDE	1.2E-02	3.4E-02	5.0E-01
CHLORDANE	1.5E+01	1.5E+01	4.0E-03
CHLOROANILINE, p-	5.3E-02	5.3E-02	5.0E+00
CHLOROBENZENE	1.5E+00	1.5E+00	2.5E+01
CHLOROETHANE	6.3E-01	8.5E-01	1.2E+01
CHLOROFORM	2.1E+00	2.1E+00	7.0E+01
CHLOROMETHANE	7.0E-02	2.0E-01	1.3E+00
CHLOROPHENOL, 2-	1.2E-02	1.2E-02	1.8E-01
CHROMIUM (Total)	5.8E+01	5.8E+01	5.0E+01
CHROMIUM III	2.5E+03	5.0E+03	1.8E+02
CHROMIUM VI	1.8E+00	1.8E+00	1.1E+01
CHRYSENE	1.9E+01	1.9E+01	2.9E-01
COBALT	1.0E+01	1.0E+01	3.0E+00
COPPER	2.5E+03	5.0E+03	3.1E+00
CYANIDE (Free)	3.6E-03	3.6E-03	1.0E+00
DIBENZO(a,h)ANTHTRACENE	4.3E+00	4.3E+00	8.5E-03
DIBROMOCHLOROMETHANE	1.9E-02	5.4E-02	1.0E+02
1,2-DIBROMO-3-CHLOROPROPANE	4.5E-03	4.5E-03	2.0E-01
DIBROMOETHANE, 1,2-	3.3E-04	3.3E-04	5.0E-02
DICHLOROBENZENE, 1,2-	1.1E+00	1.1E+00	1.0E+01

TABLE C. ENVIRONMENTAL SCREENING LEVELS (ESLs)
Deep Soils (>3m bgs)
Groundwater IS a Current or Potential Source of Drinking Water

CHEMICAL PARAMETER	[1]Deep Soil		[3]Groundwater (ug/L)
	[2]Residential Land Use (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	
DICHLOROBENZENE, 1,3-	7.4E+00	7.4E+00	6.5E+01
DICHLOROBENZENE, 1,4-	4.6E-02	1.3E-01	5.0E+00
DICHLOROBENZIDINE, 3,3-	7.7E-03	7.7E-03	2.9E-02
DICHLORODIPHENYLDICHLOROETHANE (DDD)	1.1E+02	1.1E+02	1.0E-03
DICHLORODIPHENYLDICHLOROETHYLENE (DDE)	7.6E+01	7.6E+01	1.0E-03
DICHLORODIPHENYLTRICHLOROETHANE (DDT)	4.3E+00	4.3E+00	1.0E-03
DICHLOROETHANE, 1,1-	2.0E-01	2.0E-01	5.0E+00
DICHLOROETHANE, 1,2-	4.5E-03	4.5E-03	5.0E-01
DICHLOROETHYLENE, 1,1-	1.0E+00	1.0E+00	6.0E+00
DICHLOROETHYLENE, Cis 1,2-	1.9E-01	1.9E-01	6.0E+00
DICHLOROETHYLENE, Trans 1,2-	6.7E-01	6.7E-01	1.0E+01
DICHLOROPHENOL, 2,4-	3.0E-01	3.0E-01	3.0E-01
DICHLOROPROPANE, 1,2-	5.1E-02	1.2E-01	5.0E+00
DICHLOROPROPENE, 1,3-	3.3E-02	5.9E-02	5.0E-01
DIELDRIN	2.3E-03	2.3E-03	1.9E-03
DIETHYLPHTHALATE	3.5E-02	3.5E-02	1.5E+00
DIMETHYLPHTHALATE	3.5E-02	3.5E-02	1.5E+00
DIMETHYLPHENOL, 2,4-	6.7E-01	6.7E-01	1.0E+02
DINITROPHENOL, 2,4-	4.0E-02	4.0E-02	1.4E+01
DINITROTOLUENE, 2,4-	8.5E-04	8.5E-04	1.1E-01
1,4 DIOXANE	1.8E-03	1.8E-03	3.0E+00
DIOXIN (2,3,7,8-TCDD)	2.4E-04	2.4E-04	5.0E-06
ENDOSULFAN	4.6E-03	4.6E-03	8.7E-03
ENDRIN	6.5E-04	6.5E-04	2.3E-03
ETHANOL	4.5E+01	4.5E+01	5.0E+04
ETHYLBENZENE	3.3E+00	3.3E+00	3.0E+01
FLUORANTHENE	6.0E+01	6.0E+01	8.0E+00
FLUORENE	8.9E+00	8.9E+00	3.9E+00
HEPTACHLOR	1.4E-02	1.4E-02	3.8E-03
HEPTACHLOR EPOXIDE	1.5E-02	1.5E-02	3.8E-03
HEXACHLOROBENZENE	1.1E+01	1.1E+01	1.0E+00
HEXACHLOROBUTADIENE	1.0E+00	1.0E+00	2.1E-01
HEXACHLOROCYCLOHEXANE (gamma) LINDANE	4.9E-02	4.9E-02	8.0E-02
HEXACHLOROETHANE	2.4E+00	2.4E+00	7.0E-01
INDENO(1,2,3-cd)PYRENE	7.7E+00	7.7E+00	2.9E-02
LEAD	7.5E+02	7.5E+02	2.5E+00
MERCURY	9.8E+01	9.8E+01	1.2E-02
METHOXYCHLOR	1.9E+01	1.9E+01	1.9E-02
METHYLENE CHLORIDE	7.7E-02	7.7E-02	5.0E+00
METHYL ETHYL KETONE	3.9E+00	3.9E+00	4.2E+03
METHYL ISOBUTYL KETONE	2.8E+00	2.8E+00	1.2E+02
METHYL MERCURY	4.1E+01	4.1E+01	3.0E-03
METHYLNAPHTHALENE (total 1- & 2-)	2.5E-01	2.5E-01	2.1E+00
METHYL TERT BUTYL ETHER	2.3E-02	2.3E-02	5.0E+00

TABLE C. ENVIRONMENTAL SCREENING LEVELS (ESLs)
Deep Soils (>3m bgs)
Groundwater IS a Current or Potential Source of Drinking Water

CHEMICAL PARAMETER	[1]Deep Soil		[3]Groundwater (ug/L)
	[2]Residential Land Use (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	
MOLYBDENUM	2.5E+03	3.6E+03	3.5E+01
NAPHTHALENE	4.6E-01	1.5E+00	1.7E+01
NICKEL	1.0E+03	1.0E+03	8.2E+00
PENTACHLOROPHENOL	5.3E+00	5.3E+00	1.0E+00
PERCHLORATE	1.0E-02	1.0E-02	6.0E+00
PHENANTHRENE	1.1E+01	1.1E+01	4.6E+00
PHENOL	7.6E-02	7.6E-02	5.0E+00
POLYCHLORINATED BIPHENYLS (PCBs)	6.3E+00	6.3E+00	1.4E-02
PYRENE	8.5E+01	8.5E+01	2.0E+00
SELENIUM	2.5E+03	3.4E+03	5.0E+00
SILVER	2.5E+03	3.6E+03	1.9E-01
STYRENE	1.5E+00	1.5E+00	1.0E+01
tert-BUTYL ALCOHOL	7.3E-02	7.3E-02	1.2E+01
TETRACHLOROETHANE, 1,1,1,2-	2.4E-02	2.4E-02	1.3E+00
TETRACHLOROETHANE, 1,1,2,2-	9.1E-03	1.8E-02	1.0E+00
TETRACHLOROETHYLENE	8.7E-02	2.4E-01	5.0E+00
THALLIUM	4.7E+01	4.7E+01	2.0E+00
TOLUENE	2.9E+00	2.9E+00	4.0E+01
TOXAPHENE	4.2E-04	4.2E-04	2.0E-04
TPH (gasolines)	1.0E+02	1.0E+02	1.0E+02
TPH (middle distillates)	1.0E+02	1.0E+02	1.0E+02
TPH (residual fuels)	1.0E+03	1.0E+03	1.0E+02
TRICHLOROBENZENE, 1,2,4-	3.8E-01	1.0E+00	2.5E+01
TRICHLOROETHANE, 1,1,1-	7.8E+00	7.8E+00	6.2E+01
TRICHLOROETHANE, 1,1,2-	3.2E-02	7.0E-02	5.0E+00
TRICHLOROETHYLENE	2.6E-01	4.6E-01	5.0E+00
TRICHLOROPHENOL, 2,4,5-	1.8E-01	1.8E-01	1.1E+01
TRICHLOROPHENOL, 2,4,6-	1.7E-01	1.7E-01	5.0E-01
VANADIUM	2.5E+03	5.0E+03	1.5E+01

TABLE C. ENVIRONMENTAL SCREENING LEVELS (ESLs)
Deep Soils (>3m bgs)
Groundwater IS a Current or Potential Source of Drinking Water

CHEMICAL PARAMETER	[1]Deep Soil		[3]Groundwater (ug/L)
	[2]Residential Land Use (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	
VINYL CHLORIDE	6.7E-03	1.9E-02	5.0E-01
XYLENES	2.3E+00	2.3E+00	2.0E+01
ZINC	2.5E+03	5.0E+03	8.1E+01
Electrical Conductivity (mS/cm, USEPA Method 120.1 MOD)	not applicable	not applicable	not applicable
Sodium Adsorption Ratio	not applicable	not applicable	not applicable

Red: Updated with respect to ESLs presented in July 2003 document.

Notes:

1. Deep soils defined as soils greater than 3 meters (approximately 10 feet) below ground surface.
2. Category "Residential Land Use" generally considered adequate for other sensitive uses (e.g., day-care centers, hospitals, etc.)
3. Assumes potential discharge of groundwater into a freshwater, marine or estuary surface water system.

Source of soil ESLs: Refer to Appendix 1, Tables C-1 and C-2.

Source of groundwater ESLs: Refer to Appendix 1, Table F-1a.

Soil data should be reported on dry-weight basis (see Appendix 1, Section 6.2).

Soil ESLs intended to address human health, groundwater protection and nuisance concerns under a construction/trench worker exposure scenario and noted land-use scenarios. **Soil gas data should be collected for additional evaluation of potential indoor-air impacts at sites with significant areas of VOC-impacted soil. See Section 2.6 and Table E.**

Groundwater ESLs intended to be address drinking water, surface water, indoor-air and nuisance concerns. **Use in conjunction with soil gas screening levels to more closely evaluate potential impacts to indoor-air if groundwater screening levels for this concern approached or exceeded (refer to Section 2.6 and Appendix 1, Table F-1a).**

Aquatic habitat goals for bioaccumulation concerns not considered in selection of groundwater goals (refer to Section 2.7).

Refer to appendices for summary of ESL components.

Soil and water ESLs for ethanol based on gross contamination concerns (see Appendix 1, Chapter 5 and related tables).

TPH -Total Petroleum Hydrocarbons. TPH ESLs must be used in conjunction with ESLs for related chemicals (e.g., BTEX, PAHs, oxidizers, etc.). See Volume 1, Section 2.2 and Appendix 1, Chapter 5.

APPENDIX E

Production Well Location Map

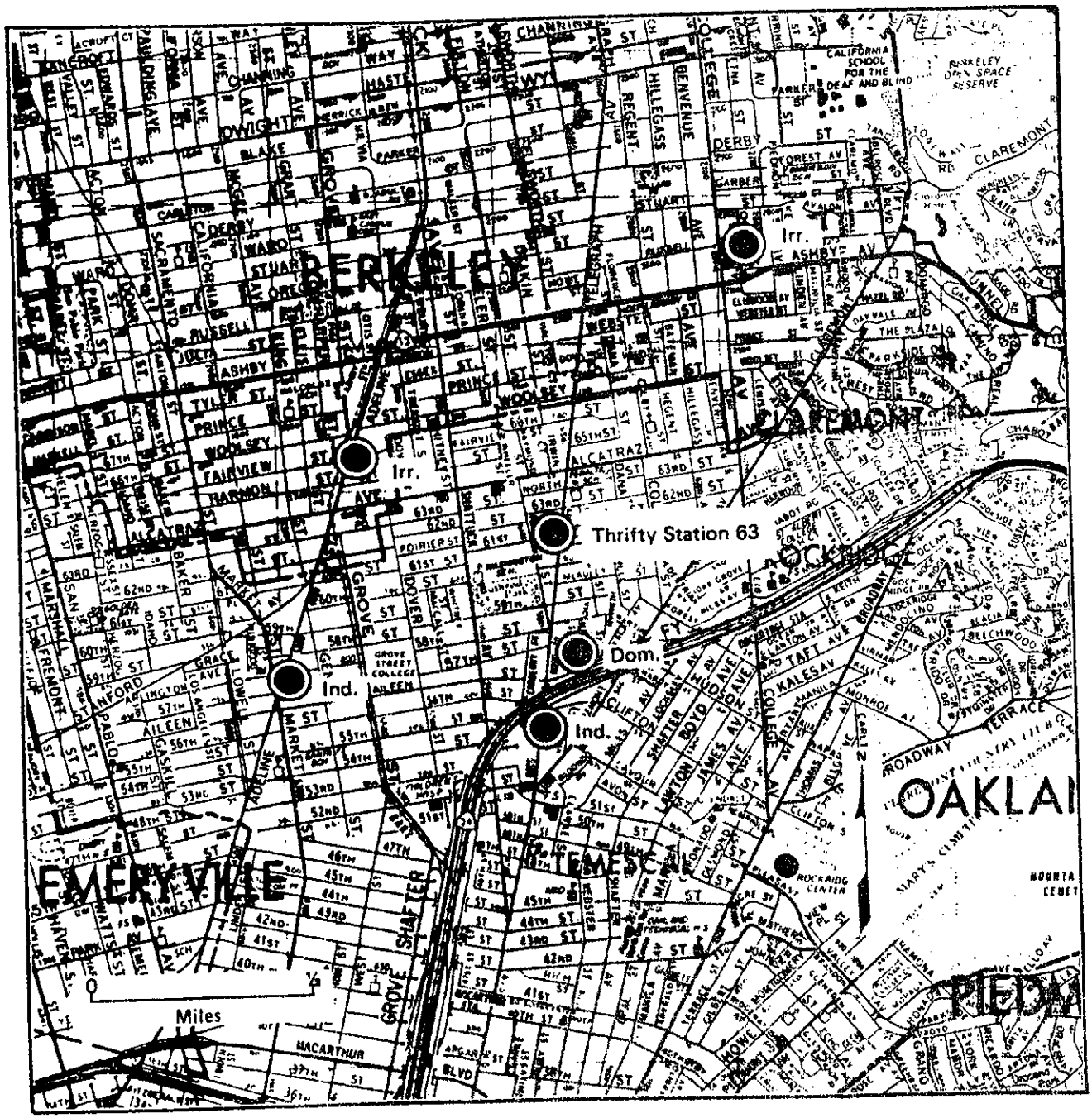


Figure 2. LOCAL WATER WELL LOCATIONS

APPENDIX F

Existing and Potential Beneficial Uses of Groundwater in Identified Basins

TABLE 2-9 EXISTING AND POTENTIAL BENEFICIAL USES OF GROUNDWATER IN IDENTIFIED BASINS

GROUNDWATER BASIN	COUNTY	DWR BASIN NO.	MUN[1]	PROC[2]	IND[3]	AGR[4]	FRESH[5]
Alameda Creek (Niles Cone)	Alameda	2 - 9.01	E[6]	E	E	E	
Castro Valley	Alameda	2 - 8	P[7]	P	P	P	
East Bay Plain	Alameda	2 - 9.01	E	E	E	E	
Livermore Valley	Alameda	2 - 10	E	E	E	E	
Sunol Valley	Alameda	2 - 11	E	E	E	E	
Arroyo Del Hambre Valley	Contra Costa	2 - 31	P	P	P	P	
Clayton Valley	Contra Costa	2 - 5	E	P	P	P	
Pittsburg Plain	Contra Costa	2 - 4	P	P	P	P	
San Ramon Valley	Contra Costa	2 - 7	E	P	P	E	
Ygnacio Valley	Contra Costa	2 - 6	P	P	P	P	
Novato Valley	Marin	2 - 30	P	P	P	P	
Sand Point Area	Marin	2 - 27	E	P	P	P	
San Rafael	Marin	2 - 29	P	P	P	P	
Ross Valley	Marin	2 - 28	E	P	P	E	
Napa Valley	Napa	2.2 & 2 - 2.01	E	E	E	E	
Islais Valley	San Francisco	2 - 33	P	E	E	P	
Merced Valley (North)	San Francisco	2 - 35	P	P	P	E	
San Francisco Sands	San Francisco	2 - 34	E	P	P	E	
Visitation Valley	San Francisco	2 - 32	P	E	E	P	
Half Moon Bay Terrace	San Mateo	2 - 22	E	P	P	E	
Merced Valley (South)	San Mateo	2 - 35A	E	P	P	E	
Pescadero Valley	San Mateo	2 - 26	E	P	P	E	
San Gregorio Valley	San Mateo	2 - 24	E	P	P	E	
San Mateo Plain	San Mateo	2 - 9A	E	E	E	P	
San Pedro Valley	San Mateo	2 - 36	P	P	P	P	
Santa Clara Valley (& Coyote)	Santa Clara	2 - 9B	E	E	E	E	
Suisun/Fairfield Valley	Solano	2 - 3	E	E	E	E	
Kenwood Valley	Sonoma	2 - 19	E	P	P	E	
Petaluma Valley	Sonoma	2 - 1	E	P	P	E	
Sebastopol-Merced Fm. Highlands	Sonoma	2 - 25	E	P	P	E	
Sonoma Valley	Sonoma	2 - 2.022	E	P	P	E	

NOTES:
(1) MUN = Municipal and domestic water supply.
(2) PROC = Industrial process water supply.
(3) IND = Industrial service water supply.
(4) AGR = Agricultural water supply.
(5) FRESH = Freshwater replenishment to surface water. (Designation will be determined at a later date; for the interim, a site-by-site determination will be made).
(6) E = Existing beneficial use; based on available information (see references listed in Table 2-8).
(7) P = Potential beneficial use; based on available information. There is no known use of the basin for this category; however, the basin could be used for this purpose (see references listed in Table 2-8).