Mr Wang.

100 Pine Street, 10th Floor
San Francisco, CA 94111
(415) 434-9400 • FAX (415) 434-1365

GEOMATRIX

95 AUG 30

August 28, 1995
Project 2530.02

Mr. Peter Wang
Encinal Terminals
1521 Buena Vista Avenue
Alameda, California 94501-0251

Subject: Semi-Annual Monitoring Report, January–June 1995
and Site Characterization Report
2020 Sherman Avenue
Alameda, California

Dear Mr. Wang:

Enclosed are two copies of the subject report prepared by Geomatrix at your request to address Alameda County Health Care Services Agency (ACHCSA) concerns at the subject site. We are sending one copy each to Madhulla Logan at ACHCSA and Kevin Graves at the Regional Water Quality Control Board (RWQCB).

Thank you for this opportunity to be of service. Please call either of the undersigned if you require further information.

Sincerely yours,

GEOMATRIX CONSULTANTS, INC.

Cheri Y. Page, R. G.
Project Geologist

Thomas E. Graf, P.E.
Principal Engineer

CONTR/25302RPT.LTR
Enclosures

cc: Madhulla Logan - ACHCSA
Kevin Graves - RWQCB

GEOMATRIX

SEMI-ANNUAL MONITORING REPORT
JANUARY–JUNE 1995
and
SITE CHARACTERIZATION REPORT

Encinal Real Estate
2020 Sherman Avenue
Alameda, California

Prepared for

Encinal Terminals
1521 Buena Vista Avenue
Alameda, California

August 1995
Project No. 2530.02

Geomatrix Consultants

GEOMATRIX

TABLE OF CONTENTS

TABLES

GEOMATRIX

FIGURES

APPENDICES

GEOMATRIX

SEMI-ANNUAL MONITORING REPORT
JANUARY–JUNE 1995 and
SITE CHARACTERIZATION REPORT

Encinal Real Estate
2020 Sherman Avenue
Alameda, California

1.0 INTRODUCTION

This report has been prepared by Geomatrix Consultants, Inc. (Geomatrix) on behalf of Encinal Terminals to document soil and groundwater characterization, as well as the results of the first two quarterly monitoring events performed at 2020 Sherman Avenue, Alameda, California (the site) by Geomatrix. Quarterly monitoring was conducted in March and June 1995. The site location is shown on Figure 1.

The site characterization described in this report was initiated based on the presence of 1,1-dichloroethane (1,1-DCA) in a groundwater sample reported by a previous consultant, and was conducted to (1) obtain sufficient information regarding the presence of chemicals in soil and groundwater to assess requirements for groundwater monitoring or remediation; (2) fulfill Alameda County Health Care Services Agency (ACHCSA) requests for well installation and groundwater monitoring of volatile organic compounds (VOCs); (3) assess the potential health risk associated with volatilization of 1,1-DCA from groundwater; and (4) address ACHCSA concerns regarding petroleum hydrocarbons in soil and metals in groundwater.

The work described below was conducted in accordance with Geomatrix protocols and work plans approved by ACHCSA, dated 30 December 1993 (Geomatrix, 1993), 5 April 1994 (Geomatrix, 1994a), 9 September 1994 (Geomatrix, 1994b), 8 December 1994 (Geomatrix, 1994c), and 18 May 1995 (Geomatrix, 1995). The initial work plan proposed collection of grab groundwater samples from temporary direct-push borings; the following two work plans proposed expansion of the sampling area to the east. The last two work plans proposed

installation of a downgradient monitoring well and excavation of soil above the zone of highest concentrations of 1,1-DCA in groundwater (suspected source area).

The site is located adjacent to Alameda Harbor and the San Francisco Bay, west of Alaska Basin, at an elevation of approximately 10 to 14 feet relative to the National Geodetic Vertical Datum (NGVD) (Figure 1). The site is relatively flat, covered with asphalt, and contains a large warehouse that has been used to store primarily food goods unloaded from ships docked in Alaska Basin. According to Encinal Terminals, the site has been used for shipping operations since the 1920s. Encinal currently plans to develop the site for either commercial or residential use. The site is bordered on the east by an unpaved railroad easement held by Alameda Belt Line Railroad, shown on Figure 2, beyond which lies Encinal Terminals.

2.0 BACKGROUND

Three site investigations were completed by others in 1990, and are described below:

- A Phase I Environmental Survey by MSE Environmental, which included a site history, environmental setting discussion, regulatory records review, and aerial photograph review. The records reviewed did not indicate the presence of underground tanks on the property (MSE, 1990a).

- A Phase II Environmental Survey by MSE Environmental, which included a magnetics and radar search for underground tanks that did not locate any evidence of underground storage tanks, and sampling with analysis of two grab groundwater samples from the site. The groundwater samples were analyzed for petroleum hydrocarbons, and benzene, toluene, ethylbenzene, and xylenes (BTEX). No analyte compounds were detected (MSE, 1990b).

- A soil and groundwater investigation by Kaldveer Associates, which consisted of eight boring locations. One grab groundwater sample was collected and analyzed from two of the borings, and soil samples were collected from all borings at depths of 2 and 6 feet. Soil samples from each depth interval were composited into four samples representative of the northern and southern site areas for laboratory analysis. The groundwater and soil samples were analyzed for petroleum hydrocarbons, volatile and semivolatile organics, pesticides, and California Code of Regulations (CCR) 17 metals. In groundwater, 1,1-dichloroethane (1,1-DCA) and 1,1,1-trichloroethane (1,1,1-TCA) were detected in one sample, and low concentrations of motor oil were detected in both samples. Metal concentrations were below State of California Maximum Contaminant Levels (MCLs) with the exception of chromium, arsenic, lead, and thallium. In soil, 1,1-DCA, pyrenes, benzo(b)fluoranthene, and low concentrations of motor oil were detected in individual samples; metal concentrations were below 10 times the CCR Soluble Threshold Limit Concentration (STLC) except for chromium in one sample, which was 4 milligrams per kilogram (mg/kg) above this criterion (Kaldveer, 1990).

- An investigation, probably conducted by Kaldveer Associates between August 1990 and September 1990 and documented by Kaldveer on a September 1990 site plan, which included installation of shallow wells MW-1 through MW-8. Only wells MW-2, MW-4, MW-5, and MW-8 could be located on site by Geomatrix in January 1994, and are shown on Figure 2. Well

depths were measured on 20 January 1994, and ranged from 11.7 to 14.7 feet below the top of the well casings.

Analytical results for samples collected during previous investigations are presented in Tables 1 and 2, and the locations of borings and grab groundwater samples are shown on Figure 2.

3.0 GROUNDWATER AND SOIL CHARACTERIZATION METHODS

Geomatrix conducted exploration of soil and groundwater quality at the site in phases between January 1994 and June 1995. Exploration began near the southeast corner of the 2020 Sherman warehouse and extended to the east on Encinal Terminals property at 1521 Buena Vista, beyond an Alameda Belt Line Railroad Company easement. These sampling points are shown on Figure 2.

Groundwater at the site was characterized using samples collected by Geomatrix from 18 shallow grab-groundwater samples, four temporary piezometers, and one monitoring well. Water-level elevations were measured by Geomatrix using four monitoring wells installed by others and one monitoring well installed by Geomatrix. A total of 8 soil samples were collected from four borings and composited into two samples for analysis. A total of 13 borings were logged under the supervision of a Geomatrix geologist, and the boring logs are presented in Appendix A.

3.1 GROUNDWATER CHARACTERIZATION METHODS

Grab groundwater sampling, monitoring well installation and sampling, and water-level measurement methods are described below. Geomatrix collected grab groundwater samples as soon as possible after completing the boring, and transferred them directly from a clean bailer or polyethylene tube into laboratory-supplied bottles. A foaming reaction was observed during groundwater sampling using acidified containers in another portion of this site; therefore, groundwater samples collected for VOC analysis at the site were not acidified. These samples were analyzed within allowable holding times for samples without acid (7 days). The samples were labeled immediately after collection and placed in an ice-cooled chest for delivery under chain-of-custody procedures to a California-certified hazardous waste laboratory. Water purged from the well or used for cleaning equipment was placed in a drum on site for temporary storage until laboratory analytical results were received.

3.1.1 Grab Groundwater Sampling and Analysis

Grab groundwater samples were collected from temporary piezometers installed in January 1994 and shallow groundwater points advanced in January, April, and November 1994. Groundwater samples were collected from the shallowest depth yielding sufficient water for sampling, which ranged from approximately 6 to 16 feet below ground surface. This work is described below.

January 1994

Four temporary piezometers (P-1 through P-4) were installed by Powercore Soil Sampling, Inc. (Powercore), of Antioch, California, on 20 January 1994. The piezometers were installed in borings created by continuous sampling to a depth of 10 to 12 feet using a 2.5-inch-diameter sampler. A 1-inch-diameter screened PVC pipe was placed in the boring immediately after drilling. Groundwater samples were collected from the piezometers using a clean Teflon bailer. The piezometers were completed after sampling by placing filter sand around the PVC pipe. The samples were analyzed for BTEX; 1,1-dichloroethene (1,1-DCE); 1,2-dichloroethene (1,2-DCE); 1,1-DCA; 1,2-DCA; 1,1,1-TCA; trichloroethene (TCE); and tetrachloroethene (PCE). The sample from piezometer P-1 was analyzed in the field by Tracer Research Corporation (Tracer) of Tucson, Arizona, on 20 January 1994, using a modified Environmental Protection Agency (EPA) Method 8010 analysis. Groundwater samples from piezometers P-2, P-3, and P-4 were delivered to American Environmental Network (AEN) of Pleasant Hill, California, for analysis by EPA Method 8010.

Powercore also advanced two borings, B-1 and B-2, on 20 January 1994. Metals results reported by Kaldveer Associates for "EB-" samples were within background concentrations for soil; however, they were anomalously high for groundwater (Tables 1 and 2). Geomatrix proposed filtering samples prior to analysis to evaluate dissolved metals concentrations. These samples were obtained from boring B-1, as well as piezometer P-2, and were filtered with a 0.45 micron filter and acidified with nitric acid in the field before delivery to AEN Laboratory for analysis by EPA Method 6010 for chromium, thallium, and lead, and by EPA Method 7060 for arsenic. Boring B-2 did not produce water by the end of the drilling day, and a groundwater sample was not collected.

Tracer completed the shallow groundwater survey on 24 January 1994. Sample locations surrounded previous boring EB-1 on a 20-foot grid (Figure 2). Nine groundwater samples (GW-1 through GW-9) were collected by pushing a 1-inch-diameter rod 5 to 7 feet into the ground. The rod was then withdrawn several inches to allow groundwater to enter the hole, and samples were acquired by vacuum through a ¼-inch disposable polyethylene tube. Tracer analyzed the groundwater samples in the field, using modified EPA Method 8010 for the VOCs listed above.

April 1994

Based on 1,1-DCA concentrations reported in the January 1994 grab groundwater samples, the shallow groundwater survey was expanded on 8 April 1994 to the area downgradient of sample locations EB-1 and GW-3, and samples were collected from shallow groundwater survey points GW-18 through GW-21. These four borings were hand-augered to depths of 6 to 9 feet by Del-Tech Geotechnical Support Services, and grab groundwater samples were collected using a clean stainless-steel bailer. The samples were delivered to Onsite Environmental Labs, Inc., of Fremont, California, for analysis by EPA Method 8240.

November 1994

Because 1,1-DCA was reported in one of the grab groundwater samples collected in April 1994, the shallow groundwater survey was again expanded in a downgradient direction on 4 November 1994, and eight borings (GW-22 through GW-29) were advanced. OnSite Services, Inc. advanced these borings using a direct-push probe that continuously sampled the borehole to a depth of 16 feet below ground surface. The bottom 18 inches of the probe consisted of slotted screen. Grab groundwater samples were collected through the probe, using new 3/8-inch polyethylene tubing with a check valve. Groundwater samples were collected at the time of drilling from shallow groundwater survey points GW-22, GW-24, GW-25, GW-26, GW-27, and GW-28; borings GW-23 and GW-29 did not provide sufficient water to sample. Sample GW-24 was collected the following morning due to slow recharge of the borehole. The samples were delivered to Inchcape Testing Services, Inc., of San Jose, California, for analysis by EPA Method 8010. Groundwater sample GW-28 was held pending results of upgradient samples and was not analyzed.

3.1.2 Installation and Development of Monitoring Well MW-10

Well Installation

Based on analytical results from the November 1994 shallow groundwater survey, a monitoring well location was chosen to assess whether 1,1-DCA is migrating toward the Alameda Harbor. This well is designated MW-10 and is located downgradient (northeast) of sample locations where 1,1-DCA was detected (EB-1 and GW-3) and approximately 20 feet downgradient of the furthest downgradient sampling point (GW-21) reported with detectable 1,1-DCA. This well is considered the "trigger point" that will serve as the basis for future monitoring requirements.

Before field activities, Geomatrix obtained a well installation permit from the Alameda County Flood Control and Water Conservation District (ACFCWCD), Zone 7, a copy of which is presented in Appendix B. Drilling and well construction were performed by HEW Drilling Company of Palo Alto, California, on 16 March 1995 under the observation of a Geomatrix geologist. The well was drilled with a CME-75 hollow-stem rig. The boring was continuously sampled during drilling, and the Geomatrix geologist described the soil core on a well log, which is presented in Appendix A.

The monitoring well was constructed to a depth of 14.0 feet using new 2-inch-diameter Schedule 40 flush-threaded polyvinyl chloride (PVC) casing and factory-slotted PVC well screen. Well casing and annular fill materials were installed through the augers. The sand filter pack was placed from the bottom of the well screen, at a depth of 14.0 feet, to approximately 2 feet above the screen, at a depth of 3.0 feet below ground surface. A bentonite pellet seal approximately 2 feet thick was placed on top of the sand pack. Cement-bentonite grout was pumped into the remaining annular space. The well was capped with a waterproof expansion cap, and completed at grade level with a traffic-rated steel well cover. The well construction details are shown on the well log in Appendix A.

Augers and other down-hole equipment such as soil samplers, drill rods, and bits were steam-cleaned prior to use. Drill cuttings were stockpiled on site.

As required, Geomatrix filed a State Department of Water Resources Well Completion Report with the ACFCWCD following completion of the well. A copy of the Well Completion Report is included in Appendix B.

Well Development

After the well was completed, the cement-bentonite grout was allowed to cure for at least 24 hours before the well was developed. Geomatrix personnel developed the well using a combination of surging and bailing. The well was bailed using a stainless steel bailer until the sediment content decreased significantly. The well was then surged in the screened portion using a surge block for approximately 10 minutes, bailed dry, and allowed to recover. Development continued until the field parameters of temperature, pH, and specific conductance had stabilized and the produced water was clear. Approximately eight casing volumes (including filter pack volume) of water were bailed from the well. Development equipment was cleaned with Alconox and deionized water.

3.1.3 Quarterly Groundwater Monitoring

Geomatrix initiated quarterly monitoring of well MW-10 in March 1995 to meet ACHCSA requirements presented in their 5 January 1995 letter to Geomatrix. A groundwater sample was collected from well MW-10 following well development on 20 March 1995, and the second quarterly sampling event was conducted on 29 June 1995. For both events, the groundwater sample was collected in laboratory-supplied bottles using a new disposable bailer, transferred immediately to an ice-cooled chest, and delivered to AEN for analysis. The samples were analyzed for VOCs using EPA Method 8010. Total dissolved solids (TDS) using EPA Method 160.1 were also analyzed in March 1995, and general minerals were analyzed in June 1995, to evaluate water quality for comparison with drinking water standards.

3.1.4 Water-Level Measurements

Water levels were measured in monitoring wells MW-2, MW-4, MW-5, and MW-8 (installed by others) in January, March, and April 1994; water levels were measured in these wells and the new well, MW-10, in March and June 1995. Water levels were measured

twice in one day in April 1994 to determine if tidal cycles affected the water-level measurements. Depth to water in well casings was measured to the nearest 0.01 foot using an electric sounder, and measuring points on the well casing were surveyed for their vertical and horizontal location to the nearest 0.01 foot by Bates and Bailey of Berkeley, California, a licensed surveyor, before water-level elevations were calculated. Vertical location was tied to the NGVD.

3.2 SOIL CHARACTERIZATION METHODS

Soil samples were collected from temporary piezometers P-1 and P-3, and from borings B-1 and B-2 on 20 January 1994 to assess the extent of petroleum hydrocarbons in soil. These samples were collected during drilling in clean, brass liners that were capped with aluminum foil and plastic end-caps, taped, labeled, and placed in an ice-cooled chest before transport to AEN. Samples from all four borings were composited by the laboratory into two samples representing depth intervals of 2 and 6 feet, and were analyzed for gasoline, diesel, motor oil, and BTEX by modified EPA Method 8015.

4.0 FINDINGS

The hydrogeology of the site, as well as analytical results for soil and groundwater, are discussed below, based on work conducted by Geomatrix from January 1994 through June 1995.

4.1 HYDROGEOLOGY

Based on the boring logs for 13 borings from 6.5 to 16.0 feet deep, the stratigraphy throughout the exploration area is relatively consistent (Appendix A). Fill consisting of sand, sometimes with silt, gravel, or baserock, was observed in all the borings, and varied from at least 1 to 6 feet thick. A second asphalt layer was observed at a depth of 1.5 to 2.0 feet east of the Alameda Belt Line Railroad easement, and the fill thickness may increase in this direction. Below the fill was Bay Mud, which usually consisted of lean clay with a lense of medium to coarse sand, 2.0 to 5.5 feet thick, which was observed in most of the borings. The top of the sand was encountered at depths of from 3.5 to 9.5 feet below ground surface, and was not found in borings GW-22 and GW-23.

Water-level elevations in monitoring wells measured from January 1994 through June 1995 ranged from 6.85 to 12.70 feet NGVD. Depths to groundwater, calculated groundwater elevations, and gradients are presented on Table 3. Figures 3 through 7 present potentiometric maps for this time period. Groundwater flow direction ranged from northeast to east from January 1994 through June 1995, and the gradient ranged from 0.0058 to 0.0089. Based on groundwater elevations measured in both the morning and afternoon of 8 April 1994, it appears that tidal influence at this location does not significantly affect the gradient direction, which remained to the northeast, or gradient, which was 0.0060 in the morning, and 0.0058 in the afternoon.

Recharge rates in all the borings used for grab groundwater sampling were slow; in some cases, the borings could not be sampled the same day. Monitoring well MW-10 went dry several times during development in March 1995, as well as during purging in June 1995.

The recharge rate in this well is approximately 4.5 gallons per hour, which is considered to be a low potential yield.

4.2 ANALYTICAL RESULTS FOR GROUNDWATER

Groundwater analytical results for January 1994 through June 1995 are presented in Table 4 and are discussed below. The analytical laboratory reports and chain-of-custody records for grab groundwater samples are presented in Appendix D, and those for monitoring well MW-10 are presented in Appendix E.

Volatile Organic Compounds

Two of 13 grab groundwater samples collected from within the 2020 Sherman property boundary by Geomatrix were reported to contain detectable concentrations of 1,1-DCA. The maximum concentration of 1,1-DCA was 1800 μg/l in sample GW-3; no other sample had a concentration greater than 390 μg/l. 1,1-DCE; 1,1,1-TCA; PCE; and TCE were also reported at maximum concentrations of 160 μg/l, 74 μg/l, 2 μg/l, and 0.7 μg/l, respectively. Toluene was detected at 8 μg/l in sample GW-3; benzene, xylenes, and ethylbenzene were not detected in any of the other samples analyzed. The maximum concentrations of 1,1-DCE, TCA, and PCE were also reported in sample GW-3, and the maximum concentration of TCE was reported in sample GW-4. Off site, the only volatile organic compound detected was 1,1-DCA at a concentration of 22 μg/l in sample GW-21. VOCs were not detected in groundwater samples from MW-10 for the first two quarters of monitoring.

Metals

Chromium, lead, and thallium were not detected in either of the two filtered groundwater samples from the site. Arsenic was detected in one of the samples at a trace concentration of 0.009 μg/l, which is below the MCL value for arsenic of 0.05 μg/l.

General Minerals

The results of general mineral analysis of groundwater from well MW-10 indicate the groundwater exceeds California drinking water standards for sulphate, which was reported at a concentration of 1000 mg/l and has a California MCL of 250 mg/l to 600 mg/l. Total

dissolved solids (TDS) were reported at 3600 mg/l in March 1995, and 1800 mg/l in June 1995, indicating that the site groundwater is brackish and has exceeded the drinking water standard of 3000 mg/l for TDS.

4.3 ANALYTICAL RESULTS FOR SOIL

Results for the two composite soil samples collected by Geomatrix are presented in Table 5, and the sample locations are shown on Figure 2. The only detection in the 2-foot sample was oil at a concentration of 610 mg/kg. In the 6-foot sample, oil was detected at 20 mg/kg, and diesel was reported at 5 mg/kg. The analytical laboratory reports and chain-of-custody records are presented in Appendix F.

5.0 RISK ASSESSMENT

A screening-level health risk evaluation (screening evaluation) was conducted by Geomatrix to assess the potential health risks associated with volatilization of chemicals in groundwater and subsequent inhalation of vapors by a hypothetical future on-site resident. The chemical detected most frequently and at the highest concentrations (by more than an order of magnitude) is 1,1-DCA. The remaining VOCs detected infrequently and at low concentrations such that they should not contribute significantly to any risks posed by the site. Therefore, 1-1-DCA was the only chemical included in the screening evaluation. The methodology, equations, and input parameters used in the screening evaluation are presented in Appendix C.

Based on the maximum detected concentration of 1.8 milligrams per liter (mg/l) of 1,1-DCA in groundwater, the estimated lifetime excess cancer risk for the hypothetical future on-site resident is 3 in 10 million (3×10^{-7}), which is lower than the range of risks generally considered acceptable by regulatory agencies. Based on this screening evaluation, the presence of 1,1-DCA in groundwater should not pose an unacceptable risk to a hypothetical future on-site resident.

6.0 SUMMARY AND RECOMMENDATIONS

The following summary and recommendations regarding chemicals in groundwater and soil at the site are based on data collected by Geomatrix as well as the studies completed by previous consultants listed in Section 2.0.

6.1 GROUNDWATER

Evaluation of previous reports and the sampling results presented above indicates a localized source of 1,1-DCA and related compounds in the uppermost groundwater at the site near GW-3 and EB-1. Groundwater containing 1,1-DCA appears to be limited to within 60 to 80 feet of EB-1 on the site, and approximately 200 feet from EB-1 off site to the east-northeast. The extent of affected groundwater as well as the groundwater gradient appear to have been reasonably defined, and monitoring well MW-10 is located to detect future migration of 1,1-DCA toward the closest body of surface water, Alameda Harbor.

Screening-level risk calculations performed by Geomatrix indicate that 1,1-DCA in shallow groundwater does not present an unacceptable level of risk to public health, based on the future use scenario of residential development. The brackish nature of the water and its very low potential yield make this water-bearing zone unsuitable for municipal and domestic supply, agricultural supply, industrial process supply, and industrial service supply.

We recommend that quarterly sampling of monitoring well MW-10 continue for at least two more quarters to complete a full year of monitoring potential migration of 1,1-DCA in groundwater. At the end of the year, the results will be evaluated and a report that includes our conclusions and recommendations will be prepared.

6.2 SOIL

Volatile Organic Compounds

A composite soil sample collected by a previous consultant from four separate areas at the site at a depth of six feet, was reported with 0.4 mg/kg of 1,1-DCA. ACHCSA has indicated in a meeting on 6 March 1994 that further action to characterize the extent of

1,1-DCA in the vicinity of boring EB-1 is required. Encinal Real Estate has chosen to excavate soil that may be a potential source of 1,1-DCA near EB-1 and GW-3 as previously outlined in our 18 May 1995 work plan (Geomatrix, 1995). The proposed work is summarized below.

To address concerns regarding potential residual VOCs in soil, Encinal's earthwork contractor will conduct a limited excavation of soil in the vicinity of soil boring EB-1 (Figure 2). Approximately 150 to 200 cubic yards of soil (in situ) will be excavated using a backhoe and stockpiled on plastic sheeting. The proposed plan area of the excavation is 20 feet by 30 feet with sidewalls sloped, if necessary, to provide for a safe excavation. The excavation will be advanced to remove fill soil located above the native Bay Mud, but not deeper than static groundwater level, which is expected to be encountered at 6 to 8 feet below ground surface.

Geomatrix will collect soil samples of the excavation sidewalls and bottom. As many as six sidewall samples and two bottom soil samples will be collected using the backhoe bucket. Soil samples will be analyzed by a state-certified, analytical laboratory for VOCs by EPA Method 8010.

The excavation will be backfilled with suitable material borrowed from the site. Encinal's earthwork contractor will aerate the stockpiled soil for approximately one month by turning the stockpile weekly with earthwork equipment. Geomatrix will then collect a composite soil sample for analysis by a state-certified, analytical laboratory for VOCs by EPA Method 8010. After completion of aeration and approval of ACHCSA, the excavated soil will be reused as on-site fill material.

Petroleum Hydrocarbons

Our previous conversations with Dr. Ravi Arulananthum of the ACHCSA indicated that the concentrations of high-boiling petroleum hydrocarbons detected at the site do not pose a significant threat from a human exposure standpoint. As proposed in our 8 December 1994 letter to ACHCSA (Geomatrix, 1994c), additional soil samples will be collected during site

demolition to address the leaching potential of the near-surface petroleum-affected soil, and to document that the concentrations shown in previous sampling were representative of the soil underlying the paved portion of the site.

7.0 REFERENCES

Geomatrix, 1993, Amended Work Plan for Site Characterization, Proposed Encinal Marine Landing, 2020 Sherman Avenue, Alameda, California, 30 December.

Geomatrix, 1994a, Revised Work Plan for Additional Site Characterization, Proposed Encinal Marine Landing, 2020 Sherman Avenue, Alameda, California, 5 April.

Geomatrix, 1994b, Meeting Summary: 5 May 1994; Conceptual Approach for Proposed Encinal Marine Landing, 2020 Sherman Avenue, Alameda, California, 9 September.

Geomatrix, 1994c, Proposed Approach for Monitoring Environmental Conditions at 2020 Sherman Avenue and 1521 Buena Vista Avenue, Alameda, California, 8 December.

Geomatrix, 1995, Work Plan for Soil Excavation and Sampling, 2020 Sherman Avenue, Alameda, California, 18 May.

MSE Environmental, Inc., 1990a, Phase I Environmental Survey Regarding Alaska Basin, Alameda, California, 26 January.

MSE Environmental, Inc., 1990b, Phase II Environmental Survey Regarding Alaska Basin, Alameda, California, 16 March.

Kaldveer, 1990, Site plan and laboratory reports from Mid-Tox Associates, unpublished, August.

GEOMATRIX

TABLE 1

SUMMARY OF PREVIOUS SOIL SAMPLE RESULTS

Encinal Real Estate
2020 Sherman Avenue
Alameda, California

Compounds detected in milligrams per kilogram (mg/kg)

Boring Numbers	Sample Depth (feet)	EPA Method 8240	EPA Method 8270	EPA Method 8080	EPA Method 8015	Metals[1]	
EB-2 EB-3 EB-4 EB-8 (composite)	2	ND[2]	ND	ND	motor oil: 180/110[3]	Antimony Arsenic Barium Beryllium Cadmium Cobalt Chromium Copper Cyanide Mercury Molybdenum Nickel Lead Selenium Silver Thallium Vanadium Zinc	ND 8 59 0.3 ND 7.5 43 20 1.2 ND ND 39 31 ND ND 23 37 42
EB-2 EB-3 EB-4 EB-8 (composite)	6	ND	benzo(b)fluoranthene: 0.35 benzo(a)pyrene: 0.34 pyrene: 0.76	ND	motor oil: 40/70	Antimony Arsenic Barium Beryllium Cadmium Cobalt Chromium Copper Cyanide Mercury Molybdenum Nickel Lead Selenium Silver Thallium Vanadium Zinc	ND 20 52 0.6 ND 15 54 26 0.85 ND 0.6 74 4 ND ND 39 50 120

GEOMATRIX

TABLE 1

SUMMARY OF PREVIOUS SOIL SAMPLE RESULTS

Boring Numbers	Sample Depth (feet)	EPA Method 8240	EPA Method 8270	EPA Method 8080	EPA Method 8015	Metals[1]	
EB-1 EB-5 EB-6 EB-7 (composite)	2	ND	ND	ND	motor oil: 180/110	Antimony Arsenic Barium Beryllium Cadmium Cobalt Chromium Copper Cyanide Mercury Molybdenum Nickel Lead Selenium Silver Thallium Vanadium Zinc	ND 13 54 0.4 ND 7.7 43 54 0.5 0.3 ND 38 9 ND ND 49 37 51
EB-1 EB-5 EB-6 EB-7 (composite)	6	1,1-DCA: 0.4	ND	ND	motor oil: 40/70	Antimony Arsenic Barium Beryllium Cadmium Cobalt Chromium Copper Cyanide Mercury Molybdenum Nickel Lead Selenium Silver Thallium Vanadium Zinc	ND 9 24 0.3 ND 5.7 35 16 0.4 ND ND 29 2 ND ND 20 33 29

Notes:
[1] CCR 17 metals and cyanide
[2] ND = not detected
[3] Results are for duplicate samples

GEOMATRIX

TABLE 2

SUMMARY OF PREVIOUS GROUNDWATER SAMPLE RESULTS

Encinal Real Estate
2020 Sherman Avenue
Alameda, California

Compounds detected in micrograms per liter (µg/l)

Sample Location I.D.	EPA Method 602	EPA Method 8015	EPA Method 624	EPA Method 625	EPA Method 608	CAM 17 Metals	
TB-1[1]	ND[2]	ND	NA[3]	NA	NA	NA	
TB-2[1]	ND	ND	NA	NA	NA	NA	
EB-1[4]	NA	Motor oil: 300	1,1-DCA: 1500 1,1,1-TCA: 17	ND	ND	Antimony Arsenic Barium Beryllium Cadmium Cobalt Chromium Copper Mercury Molybdenum Nickel Lead Selenium Silver Thallium Vanadium Zinc	ND 170 540 3 ND 58 330 200 1.3 ND 280 50 ND ND 280 320 300

GEOMATRIX

TABLE 2

SUMMARY OF PREVIOUS GROUNDWATER SAMPLE RESULTS

Sample Location I.D.	EPA Method 602	EPA Method 8015	EPA Method 624	EPA Method 625	EPA Method 608	CAM 17 Metals	
EB-2[4]	NA	Motor oil: 200	ND	ND	ND	Antimony	ND
						Arsenic	150
						Barium	770
						Beryllium	4
						Cadmium	ND
						Cobalt	50
						Chromium	360
						Copper	200
						Mercury	ND
						Molybdenum	ND
						Nickel	330
						Lead	ND
						Selenium	ND
						Silver	ND
						Thallium	650
						Vanadium	420
						Zinc	310

Notes:

1 Work conducted by MSE Environmental, Inc., in 1990.
2 ND = not detected.
3 NA = not analyzed.
4 Work conducted by Kaldveer Associates in 1990.

GEOMATRIX

TABLE 3
SUMMARY OF WATER-LEVEL ELEVATIONS[1]
January 1994 through June 1995
Encinal Real Estate
2020 Sherman Avenue
Alameda, California

Date	Well I.D.	Elevation of Measuring Point (ft)	Depth to Water (ft)	Groundwater Elevation (ft)	Gradient
1/20/94	MW-2	9.97	1.74	8.23	0.0079
	MW-4	14.14	4.99	9.15	
	MW-5	13.51	3.60	9.91	
	MW-8	13.11	3.56	9.55	
1/24/94	MW-2	9.97	0.30[2]	9.67	----[2]
	MW-4	14.14	4.52[2]	9.62	
	MW-5	13.51	2.53[2]	10.98	
	MW-8	13.11	0.40[2]	12.71	
3/29/94	MW-2	9.97	0.73	9.24	0.0067
	MW-4	14.14	4.40	9.74	
	MW-5	13.51	2.86	10.65	
	MW-8	13.11	2.55	10.56	
4/08/94[3]	MW-2	9.97	0.89	9.08	0.0060
	MW-4	14.14	4.45	9.69	
	MW-5	13.51	3.16	10.35	
	MW-8	13.11	2.93	10.18	
4/08/94[4]	MW-2	9.97	0.80	9.17	0.0058
	MW-4	14.14	4.40	9.74	
	MW-5	13.51	3.10	10.41	
	MW-8	13.11	2.95	10.16	
3/20/95	MW-2	9.97	NA[5]	NA[5]	----[2]
	MW-4	14.14	3.43[2]	10.71	
	MW-5	13.51	NA[5]	NA[5]	
	MW-8	13.11	0.45[2]	12.66	
	MW-10	11.92	2.72[2]	9.20	
6/29/95	MW-2	9.97	NA[6]	NA[6]	0.0089
	MW-4	14.14	3.94	10.16	
	MW-5	13.51	3.15	10.56	
	MW-8	13.11	2.40	10.47	
	MW-10	11.92	4.67	6.85	

Notes:
1. Measuring points are marked on the north rim of the well casing, and were surveyed by Bates and Bailey of Berkeley, California, on 26 January 1994 and 20 March 1995 relative to NGVD.
2. Water levels measured during period of heavy rain, and may not represent equilibrium conditions.
3. Water levels measured in the morning.
4. Water levels measured in the afternoon.
5. Measurement not available due to flooding.
6. Well inaccessible due to placement of fill over wellhead.

GEOMATRIX

TABLE 4

GROUNDWATER SAMPLE RESULTS[1]
JANUARY 1994 THROUGH JUNE 1995
Encinal Real Estate
2020 Sherman Avenue
Alameda, California

Sample	1,1-DCE µg/l	1,1-DCA µg/l	1,2-DCE µg/l	1,2-DCA µg/l	1,1,1-TCA µg/l	TCE µg/l	PCE µg/l	Benzene µg/l	Toluene µg/l	Ethylbenzene µg/l	Xylenes µg/l	Arsenic[2] µg/l	Chromium[2] µg/l	Lead[2] µg/l	Thallium[2] µg/l
January 1994															
GW-1	3	54	<6	<0.9	<0.02	<0.07	<0.02	<0.5	<0.8	<1	<3	NA	NA	NA	NA
GW-2	<0.07	<0.2	<3	<0.4	<0.01	<0.03	<0.01	<0.2	<0.4	<0.7	<2	NA	NA	NA	NA
GW-3	160	1800	<14	<2	74	<0.6	2	<1	8	<3	<8	NA	NA	NA	NA
GW-4	2	110	<3	<0.4	6	0.7	0.05	<0.2	<0.4	<0.7	<2	NA	NA	NA	NA
GW-5	4	240	<3	<0.4	<0.01	<0.03	<0.01	<0.2	<0.4	<0.7	<2	NA	NA	NA	NA
GW-6	1	230	<6	<0.9	<0.02	<0.07	<0.02	<0.5	<0.8	<1	<3	NA	NA	NA	NA
GW-7	1	200	<6	<0.9	<0.02	<0.07	<0.02	<0.5	<0.8	<1	<3	NA	NA	NA	NA
GW-8	11	140	<3	<0.4	<0.01	<0.03	<0.01	<0.2	<0.4	<0.7	<2	NA	NA	NA	NA
GW-9	<0.07	20	<3	<0.4	<0.01	<0.03	<0.01	<0.2	<0.4	<0.7	<2	NA	NA	NA	NA
P-1	4	390	<6	<0.9	<0.02	<0.07	<0.02	<0.5	<0.8	<1	<3	NA	NA	NA	NA
P-2	<0.5	4	0.6	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	0.009	<0.01	<0.04	<0.1
P-3	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	NA
P-4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	NA
B-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.002	<0.01	<0.04	<0.1
April 1994															
GW-18[3]	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA
GW-19[3]	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA
GW-20[3]	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA
GW-21[3]	<5	22	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA

GEOMATRIX

TABLE 4

GROUNDWATER SAMPLE RESULTS[1]
JANUARY 1994 THROUGH JUNE 1995

Sample	1,1-DCE µg/l	1,1-DCA µg/l	1,2-DCE µg/l	1,2-DCA µg/l	1,1,1-TCA µg/l	TCE µg/l	PCE µg/l	Benzene µg/l	Toluene µg/l	Ethylbenzene µg/l	Xylenes µg/l	Arsenic[2] µg/l	Chromium[2] µg/l	Lead[2] µg/l	Thallium[2] µg/l
November 1994															
GW-22	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA
GW-23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GW-24	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA
GW-25	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	NA	NA	NA	NA	NA	NA	NA	NA
GW-26	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA
GW-27	<5	<5	<5	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA
GW-28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March 1995															
MW-10[3,4]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	NA
June 1995															
MW-10[3,4,5]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - not analyzed
DCA - dichloroethane
TCA - trichloroethane
DCE - dichloroethene; 1,2-DCE results are total for cis-1,2-DCE and trans-1,2-DCE
TCE - trichloroethene
PCE - tetrachloroethene

1 All samples are groundwater grab samples except for samples from monitoring well MW-10. Volatile organic analysis for samples P-1 and GW-1 through GW-9 were performed in the field by Tracer Research Corporation. Analyses for samples GW-18 through GW-21 were performed by Onsite Environmental Laboratories, Inc. Analyses for samples GW-22 through GW-28 were performed by Inchcape Testing Services. All other analyses were performed by AEN Laboratory.

2 Metals samples were filtered in the field.

3 Vinyl chloride results for these samples were not detected.

4 This sample was also analyzed for total dissolved solids by EPA Method 160.1, with a reported result of 3,600 mg/l in March 1995 and 1,800 mg/l in June 1995.

5 This sample was also analyzed for general minerals with the following results:

Bicarbonate Alkalinity, 110 mg $CaCO_3$/l;
Carbonate Alkalinity, <2 mg $CaCO_3$/l;
Hydroxide Alkalinity, <2 mg $CaCO_3$/l
Calcium, 110 mg/l;
Chloride, 130 mg/l;
Copper, <0.01 mg/l;
Iron, 150 mg/l;
Magnesium, 92 mg/l;
Manganese, 7.3 mg/l;
pH, 5.9;
Sodium, 160 mg/l;
Sulfate, 1000 mg/l;
Conductivity, 2300 µmhos/cm;
Hardness, 650 mg $CaCO_3$/l; and
Zinc, 0.05 mg/l.

GEOMATRIX

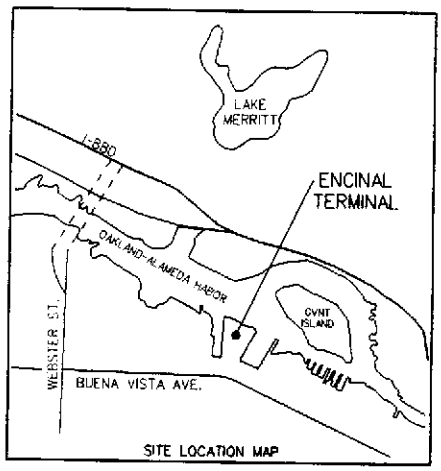
TABLE 5

SOIL SAMPLE RESULTS
JANUARY 1994
Encinal Real Estate
2020 Sherman Avenue
Alameda, California

Composite Sample Identification[1]	Benzene µg/l	Toluene µg/l	Ethylbenzene µg/l	Xylene µg/l	Gasoline mg/kg	Diesel mg/kg	Oil mg/kg
P-1-2.5, P-3-2.0, B-1-2.0, B-2-2.0	<5	<5	<5	<5	<0.2	<10	610
P-1-6.0, P-3-4.5, B-1-6.0, B-2-6.0	<5	<5	<5	<5	<0.2	5	20

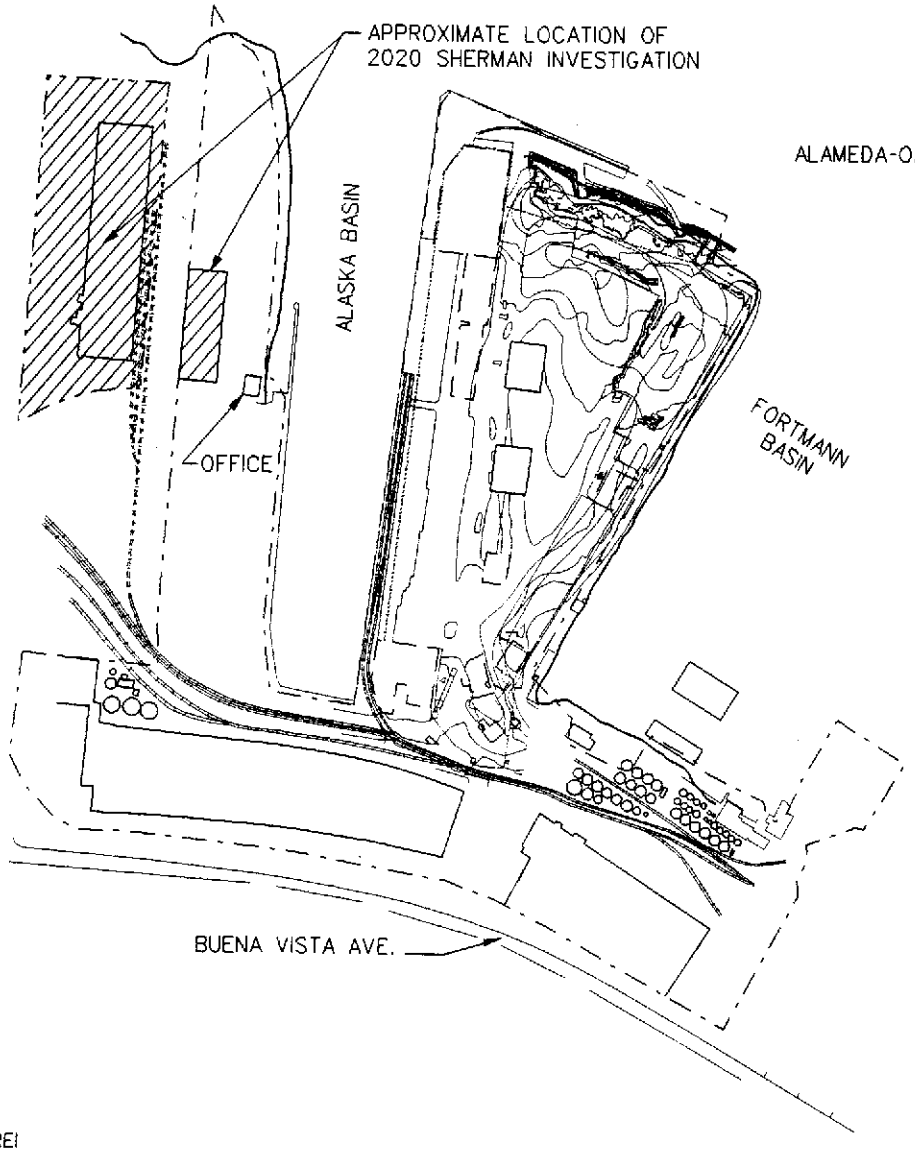
Note:

[1] Composite sample identification is comprised of the boring number and its depth below ground surface.



EXPLANATION

- FENCE
- RAILROAD
- PROPERTY BOUNDARY- ENCINAL TERMINALS
- PROPERTY BOUNDARY- ENCINAL REAL ESTATE (2020 SHERMAN AVENUE)



BASEMAP SOURCE:
KISTER, SAVIO, AND REI
PROPERTY MAP OF MARCH 1987 WITH APRIL 1994 REVISIONS;
AND FUGRO - McCLELLAND, PHASE IENVIRONMENTAL SITE
ASSESSMENT FOR CAPITAL HOLDING COMPANY
5 JANUARY 1994

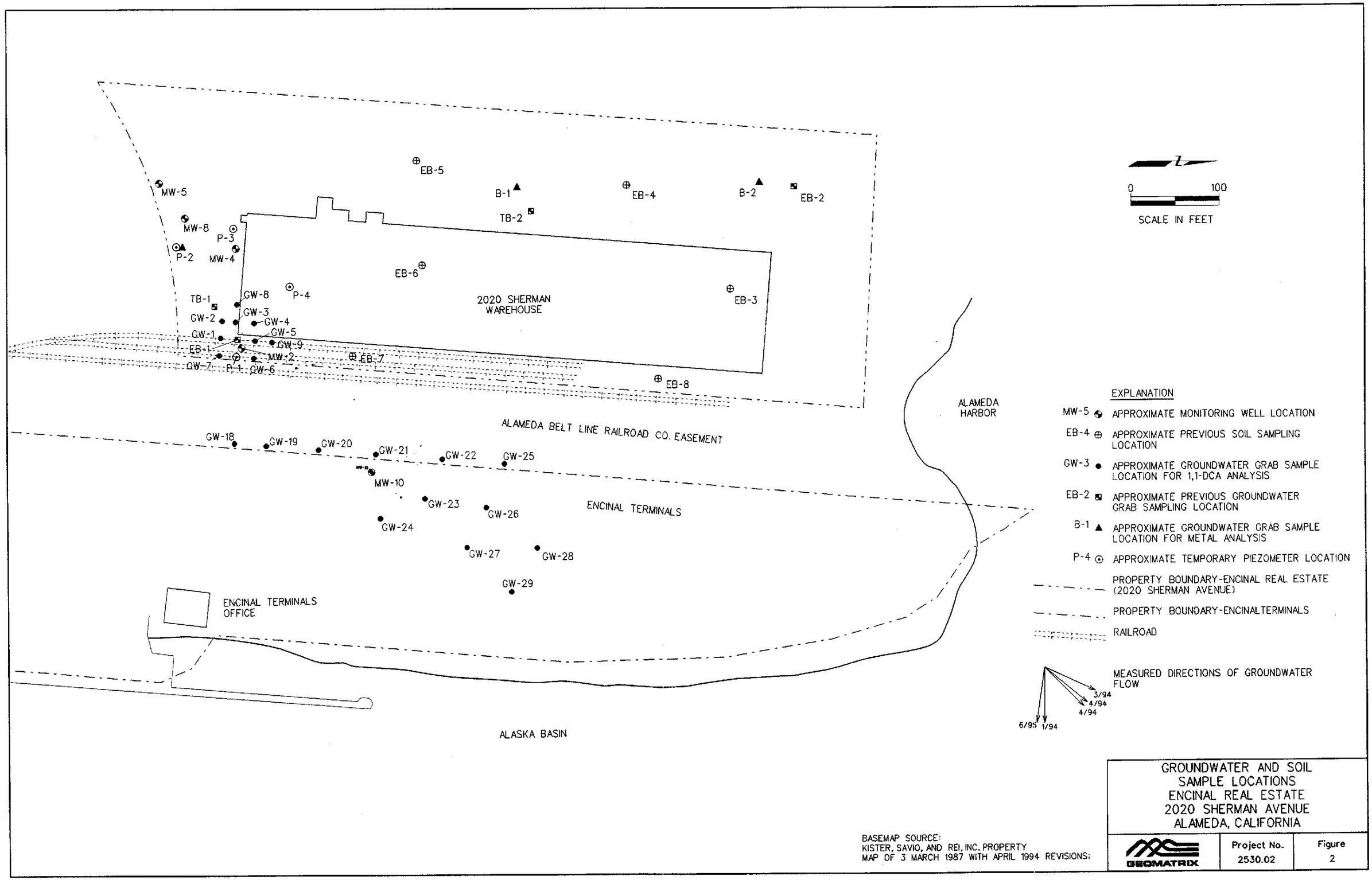
GEOMATRIX

SITE LOCATION MAP
ENCINAL REAL ESTATE - 2020 SHERMAN AVENUE
ALAMEDA, CALIFORNIA

Figure 1

Project No. 2530.02

ENCL795q/Encl_01.dgn: Rev: 07-05-95



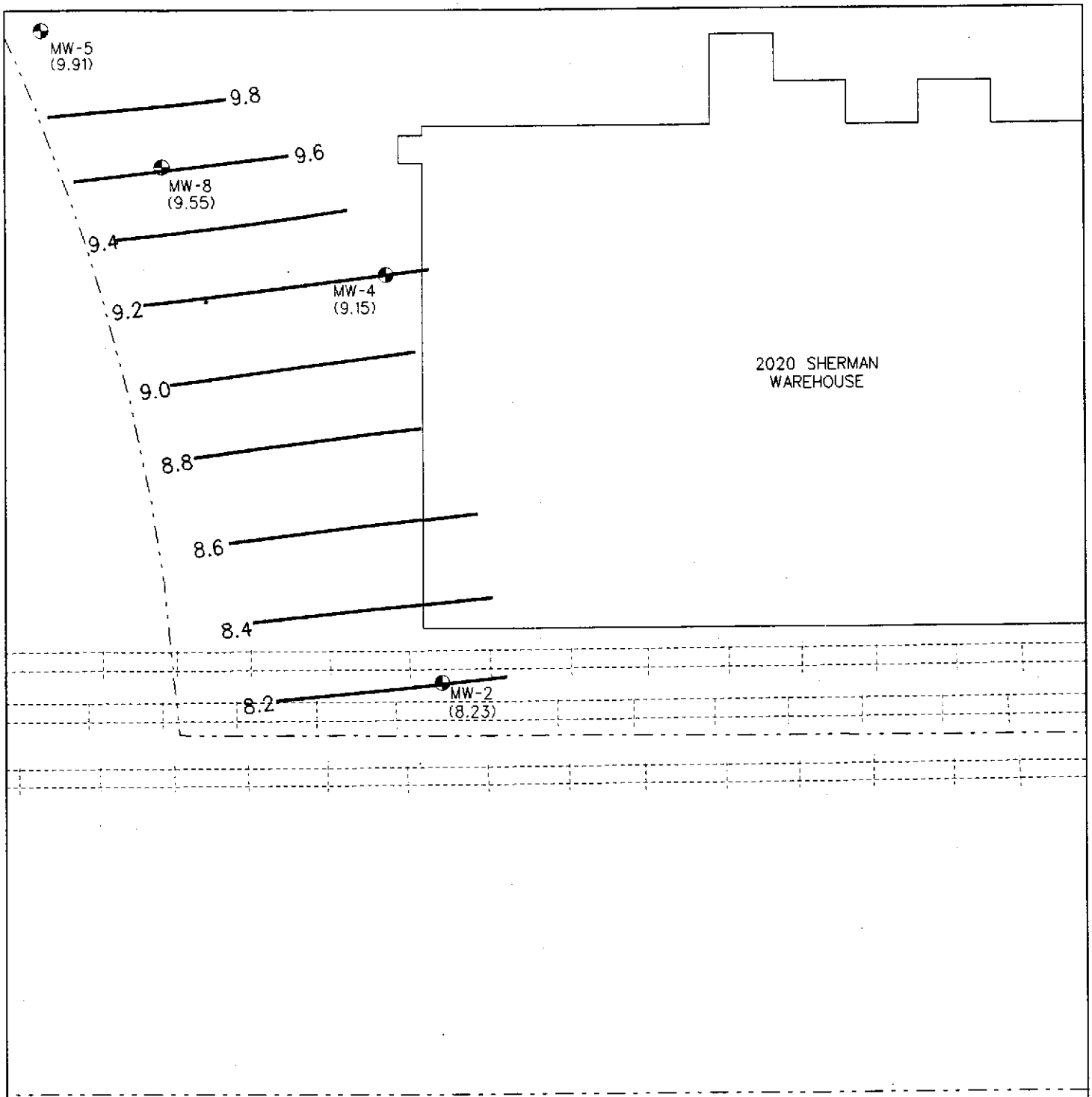
BASEMAP SOURCE:
KISTER, SAVIO, AND REI, INC. PROPERTY
MAP OF 3 MARCH 1987 WITH APRIL 1994 REVISIONS;

GROUNDWATER AND SOIL SAMPLE LOCATIONS ENCINAL REAL ESTATE 2020 SHERMAN AVENUE ALAMEDA, CALIFORNIA

GEOMATRIX

Project No.	Figure
2530.02	2

ENCL795Q/encl_02.dgn; Rev: 08-28-95



EXPLANATION

APPROXIMATE PROPERTY LINE

MW-4 (9.15) MONITORING WELL WITH GROUNDWATER ELEVATION IN FEET

MW-10 MONITORING WELL INSTALLED AT A LATER DATE

8.4 LINE OF EQUAL GROUNDWATER ELEVATION WITH ELEVATION NOTED IN FEET

MW-10

0 40

SCALE IN FEET

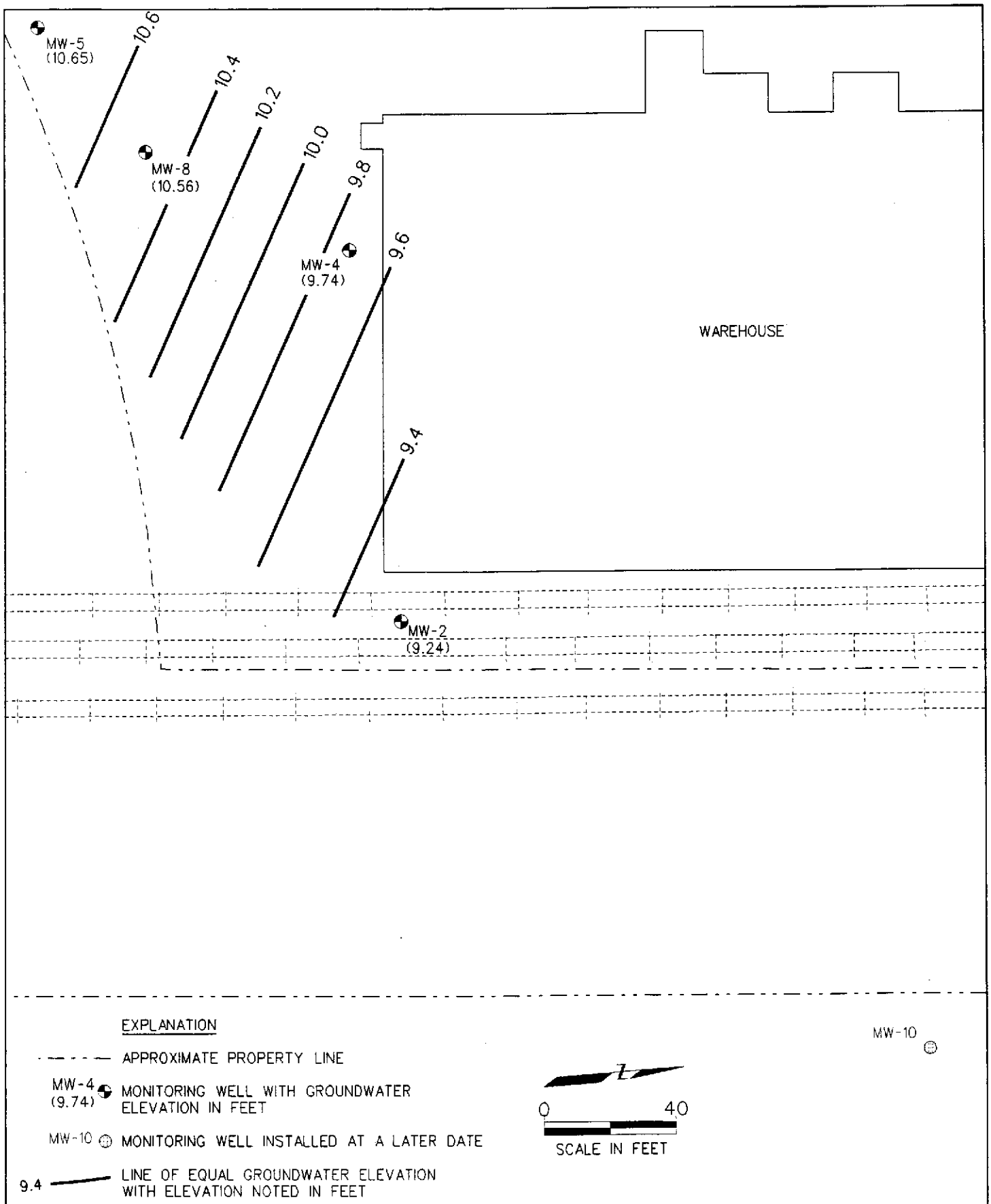
GEOMATRIX

GROUNDWATER ELEVATION MAP - 20 JANUARY 1994
ENCINAL REAL ESTATE
2020 SHERMAN AVENUE
ALAMEDA, CALIFORNIA

Figure 3

Project No. 2530.02

Encl795a\Encl_03.dgn: Rev: 07-19-95



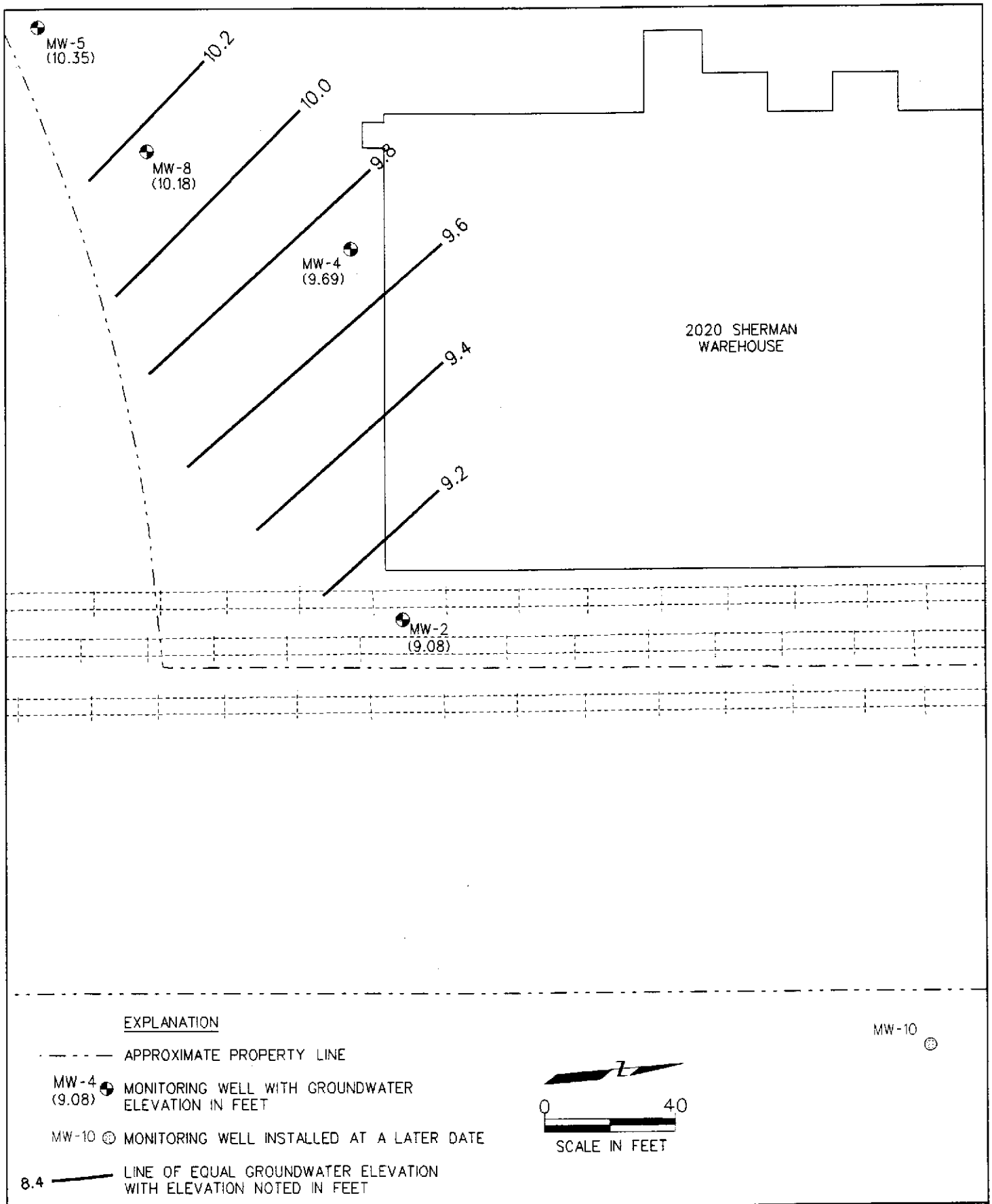
GEOMATRIX

GROUNDWATER ELEVATION MAP - 29 MARCH 1994
ENCINAL REAL ESTATE
2020 SHERMAN AVENUE
ALAMEDA, CALIFORNIA

Figure
4

Project No.
2530.02

Encl795q\Encl_04.dgn: Rev: 07-19-95



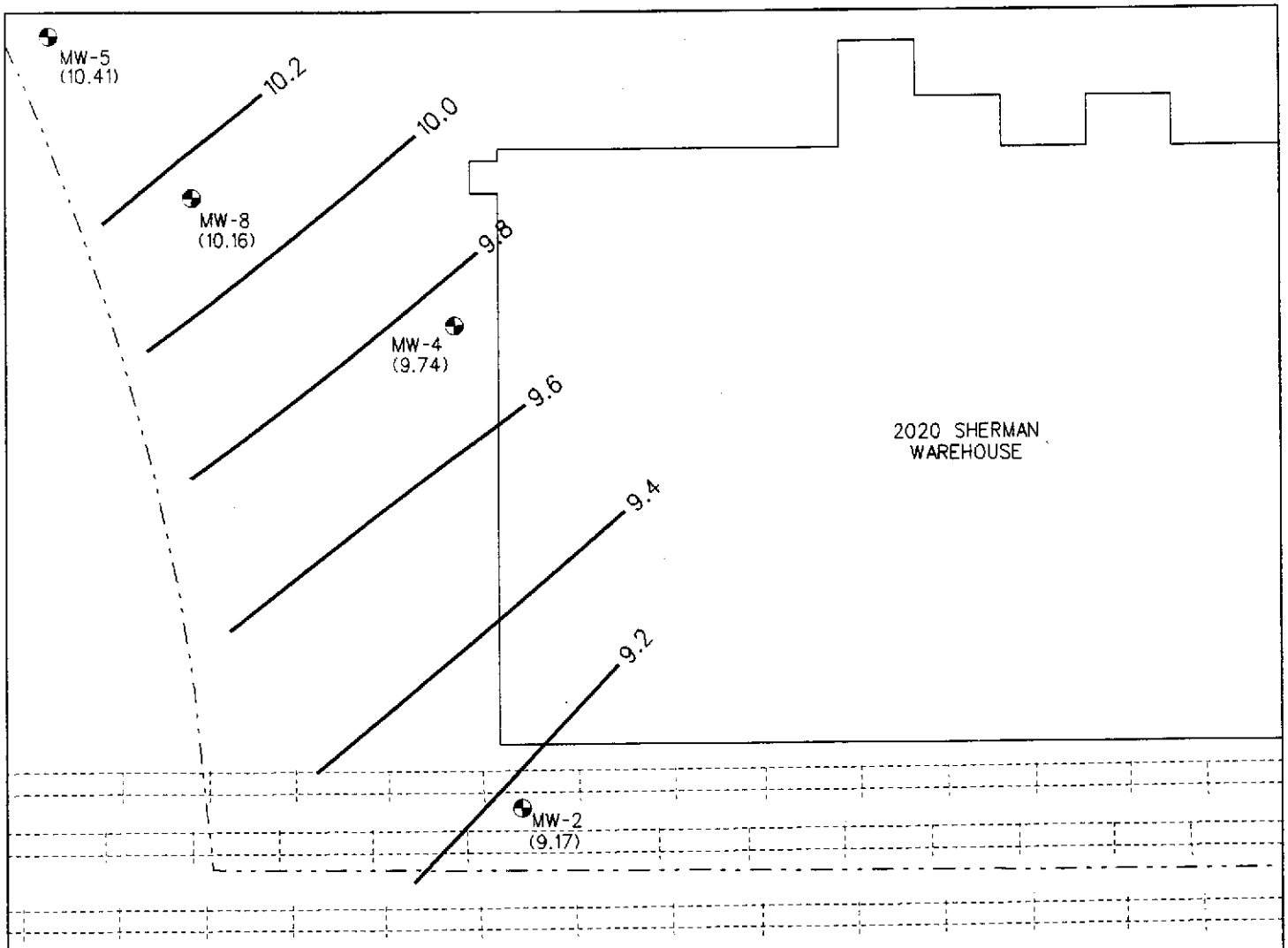
GEOMATRIX

GROUNDWATER ELEVATION MAP - 8 APRIL 1994 (AM)
ENCINAL REAL ESTATE
2020 SHERMAN AVENUE
ALAMEDA, CALIFORNIA

Figure
5

Project No.
2530.02

Encl795q\Encl_05.dgn: Rev: 07-19-95



EXPLANATION

APPROXIMATE PROPERTY LINE

MW-4 (9.74) MONITORING WELL WITH GROUNDWATER ELEVATION IN FEET

MW-10 MONITORING WELL INSTALLED AT A LATER DATE

8.4 LINE OF EQUAL GROUNDWATER ELEVATION WITH ELEVATION NOTED IN FEET

MW-10

0 40

SCALE IN FEET

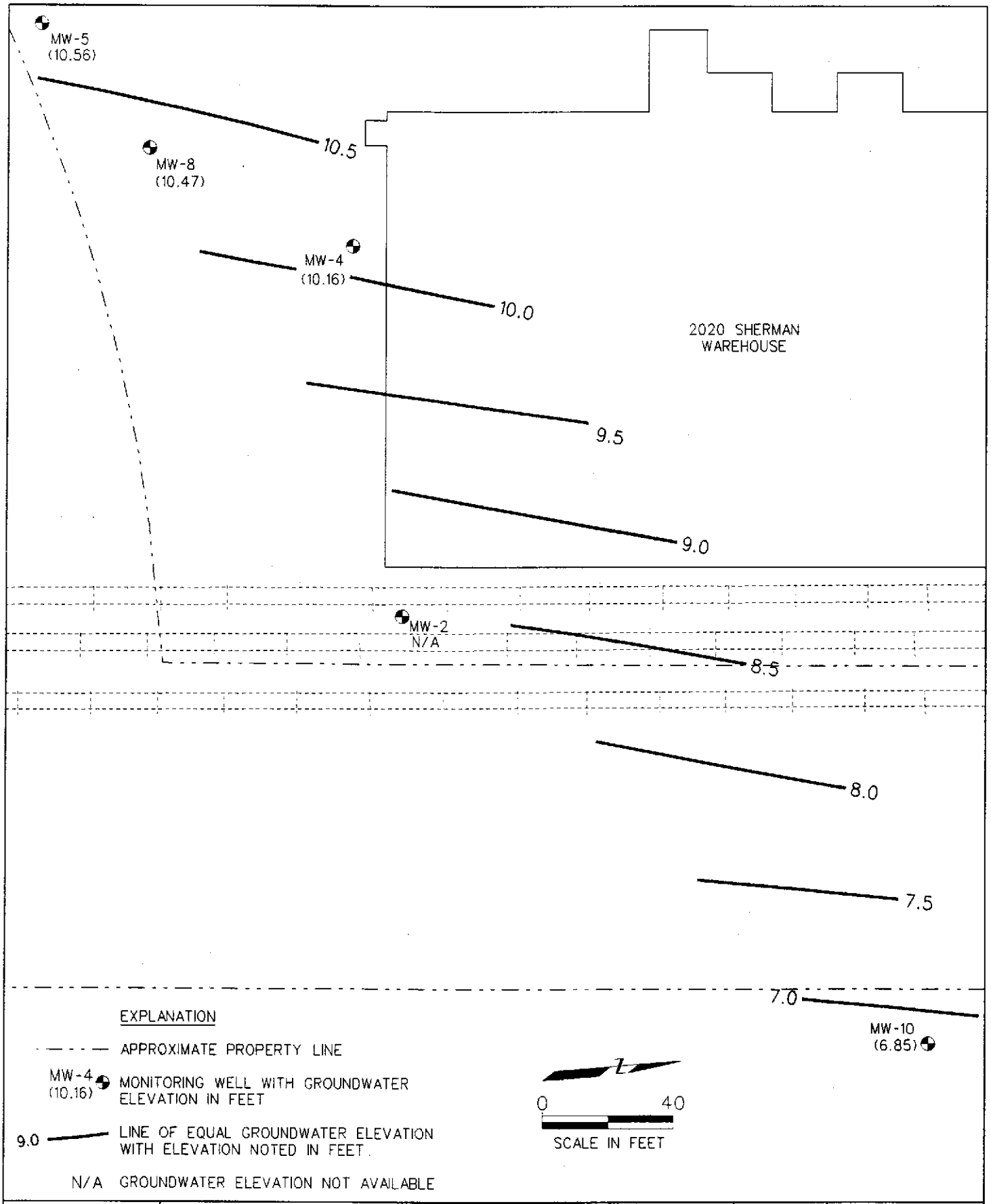
GEOMATRIX

GROUNDWATER ELEVATION MAP - 8 APRIL 1994 (PM)
ENCINAL REAL ESTATE
2020 SHERMAN AVENUE
ALAMEDA, CALIFORNIA

Figure 6

Project No. 2530.02

Encl795a/06.dgn: Rev: 07-19-95



GEOMATRIX

GROUNDWATER ELEVATION MAP - 29 JUNE 1995
ENCINAL REAL ESTATE
2020 SHERMAN AVENUE
ALAMEDA, CALIFORNIA

Figure
7

Project No.
2530.02

Encl795q\Encl_08.dgn: Rev: 08-25-95

GEOMATRIX

APPENDIX A

BORING LOGS
P-1, P-2, P-3, P-4, B-1, B-2, GW-18, GW-19, GW-20, GW-21, GW-22, GW-23, MW-10

PROJECT: ENCINAL REAL ESTATE
Alameda, California

Log of Boring No. P-1

BORING LOCATION: Southeast corner of warehouse, on railroad tracks

ELEVATION AND DATUM: Ground surface

DRILLING CONTRACTOR: Powercore

DATE STARTED: 1/20/94

DATE FINISHED: 1/20/94

DRILLING METHOD: Hydraulic punch

TOTAL DEPTH: 10'

MEASURING POINT: ---

DRILLING EQUIPMENT: ---

DEPTH TO WATER: FIRST 4.5' | COMPL. 2.8' | 24 HRS. ---

SAMPLING METHOD: 24" split spoon

LOGGED BY: C. H. Crocker

HAMMER WEIGHT: --- DROP: ---

RESPONSIBLE PROFESSIONAL: C. Page REG. NO. 5288

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
					Surface Elevation:	
1					SILTY SAND with GRAVEL (SM) Dark brown (10YR 3.3), moist, 60% fine to coarse sand, 20% gravel, 20% low plasticity fines	
2	P-1 2.5			0	LEAN CLAY (CL) Dark greenish gray (5GY 4/7), moist, 100% fines, trace fine sand, medium plasticity, soft, patches of dark brown clay and small lenses of sand	
3					Zone of silty sand	
4					▽	
5					POORLY-GRADED SAND (SP) Dark greenish gray (5GY 4/1), wet, 90 - 95% medium sand, 5 - 10% medium plasticity fines	
6	P-1 6.0			0		
7					LEAN CLAY (CL) Dark greenish gray (5GY 4/1), wet, 10 - 95% fines, 5 - 10% medium sand, low plasticity, soft	
8					Increase in hardness to firm, becomes moist and spotted with black, organic non-chemical odor	
9				0		
10					Bottom of boring at 10.0 feet.	
11						
12						
13						
14						

2530.02.003

B-1 (11/92)

Geomatrix Consultants | Project No. 2530.02 | Figure A-1

PROJECT: ENCINAL REAL ESTATE
Alameda, California

Log of Boring No. P-2

BORING LOCATION: South end of site		ELEVATION AND DATUM: Ground surface		
DRILLING CONTRACTOR: Powercore		DATE STARTED: 1/20/94	DATE FINISHED: 1/20/94	
DRILLING METHOD: Hydraulic punch		TOTAL DEPTH: 12'	MEASURING POINT: TOC	
DRILLING EQUIPMENT: ---		DEPTH TO WATER: FIRST 7'	COMPL. 4.5'	24 HRS. ---
SAMPLING METHOD: 24" split spoon		LOGGED BY: C. H. Crocker		
HAMMER WEIGHT: ---	DROP: ---	RESPONSIBLE PROFESSIONAL: C. Page		REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
					Surface Elevation:	
0				0	SILTY SAND with GRAVEL (SM) Yellowish brown (10YR 5/6), moist, 60% fine to coarse sand, 20% gravel, 20% low plastic fines [Fill]	
2				0	LEAN CLAY (CL) Very dark (5Y 3/1), moist, mottled with yellow stringer and black spots, 100% fines, trace sand, medium plasticity, soft, some black, grassy layers	
7				0	Wet	
8					Poorly graded SAND (SP) Very dark gray (5Y 3/1), wet, 95% medium to coarse sand, 5% subrounded gravels in upper 2 feet, trace medium plastic fines	
12					Bottom of boring at 12 feet.	

2530.02.005

B-1 (11/92)

PROJECT: ENCINAL REAL ESTATE
Alameda, California

Log of Boring No. P-3

BORING LOCATION: Next to southern door of warehouse

ELEVATION AND DATUM: Ground surface

DRILLING CONTRACTOR: Powercore

DATE STARTED: 1/20/94 | DATE FINISHED: 1/20/94

DRILLING METHOD: Hydraulic punch

TOTAL DEPTH: 10.5' | MEASURING POINT: TOC

DRILLING EQUIPMENT: ---

DEPTH TO WATER | FIRST: 7' | COMPL.: --- | 24 HRS.: ---

SAMPLING METHOD: 24" split spoon

LOGGED BY: C. H. Crocker

HAMMER WEIGHT: --- | DROP: ---

RESPONSIBLE PROFESSIONAL: C. Page | REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. Inter.)	REMARKS
					Surface Elevation:	
1					Well graded SAND with SILT and GRAVEL (SW - SM) Light olive brown (2.5Y 5/6), moist, 70% fine to coarse sand, 20% gravel, 10% low plasticity fines [Fill]	
2	P-3 2.0			0		
					Lens of pea gravel	
3					LEAN CLAY (CL) Very dark (5Y 3/1), moist, 100% fines, trace sand, medium plasticity, soft	
4	P-3 4.5					
5						
6						
7					▽	
					POORLY-GRADED SAND (SP) Very dark gray (5Y 3/1), wet, 90% medium sand, 10% fine gravel, trace medium plasticity fines	
8						
9						
10						
					Bottom of boring at 10.5 feet.	
11						
12						
13						
14						

2530.02.006

B-1 (11/92)

Geomatrix Consultants | Project No. 2530.02 | Figure A-3

PROJECT: ENCINAL REAL ESTATE
Alameda, California

Log of Boring No. P-4

BORING LOCATION: Inside south end of warehouse

ELEVATION AND DATUM: Ground surface

DRILLING CONTRACTOR: Powercore

DATE STARTED: 1/20/94

DATE FINISHED: 1/20/94

DRILLING METHOD: Hydraulic punch

TOTAL DEPTH: 12'

MEASURING POINT: TOC

DRILLING EQUIPMENT: ---

DEPTH TO WATER: FIRST 6.5' | COMPL. --- | 24 HRS. ---

SAMPLING METHOD: 24" split spoon

LOGGED BY: C. H. Crocker

HAMMER WEIGHT: --- | DROP: ---

RESPONSIBLE PROFESSIONAL: C. Page | REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
1				0	Well graded SAND with SILT and GRAVEL (SW - SM) Olive brown (2.5Y 4/4), moist, 70% fine to coarse sand, 20% fine gravel, 10% low plasticity fines [Fill]	
2						
3						
4					Lens of pea gravel	
				0		
5					LEAN CLAY (CL) Dark greenish brown (2.5Y 4/2), moist, 95% fines, 5% medium sand, medium plasticity, firm, some layers of medium sand near top of unit, mottled with orange	
6				0	Wet, color change to dark gray (N /4), decreasing sand content ▽	
7						
8				0		
9						
10					Poorly graded SAND (SP) Dark gray (N /4), wet, 100% medium sand, trace medium plasticity fines	
11						
12					Bottom of boring at 12 feet	
13						
14						

2530.02.007

B-1 (11/92)

Log of Boring No. B-1

PROJECT: ENCINAL REAL ESTATE Alameda, California	
BORING LOCATION: West of warehouse in center of parking area	ELEVATION AND DATUM: Ground surface
DRILLING CONTRACTOR: Powercore	DATE STARTED: 1/20/94 / DATE FINISHED: 1/20/94
DRILLING METHOD: Hydraulic punch	TOTAL DEPTH: 12' / MEASURING POINT: TOC
DRILLING EQUIPMENT: ---	DEPTH TO WATER: FIRST 7.0' / COMPL. --- / 24 HRS. ---
SAMPLING METHOD: 24" split spoon	LOGGED BY: C. H. Crocker
HAMMER WEIGHT: --- / DROP: ---	RESPONSIBLE PROFESSIONAL: C. Page / REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	REMARKS
1					Well graded SAND with SILT and GRAVEL (SW - SM) Olive gray (5Y 5/2), moist, 70% medium to coarse sand, 20% fine gravel, 10% low plasticity fines [Fill]	
2	B-1 2.0			0	LEAN CLAY (CL) Very dark gray (5Y 3/1), moist, 100% fines, trace medium sand, low plasticity, firm, some poorly graded medium sand layers in upper 2 feet	
3						
4					Hardness decreases to soft	
5						
6	B-1 6.0			0		
7					Poorly graded SAND (SP) Very dark gray (5Y 3/1), wet, 100% medium sand, trace medium plasticity fines	
8				0		
9						
10						
11				0	LEAN CLAY (CL) Very dark gray (5Y 3/1), moist, 100% fines, medium plasticity, firm, spotted with black	
12					Bottom of boring at 12 feet.	
13						
14						

PROJECT: ENCINAL REAL ESTATE
Alameda, California

Log of Boring No. B-2

BORING LOCATION: Northwest corner of site

ELEVATION AND DATUM: Ground surface

DRILLING CONTRACTOR: Powercore

DATE STARTED: 1/20/94 | DATE FINISHED: 1/20/94

DRILLING METHOD: Hydraulic punch

TOTAL DEPTH: 10' | MEASURING POINT: TOC

DRILLING EQUIPMENT: ---

DEPTH TO WATER: FIRST 6.0' | COMPL. --- | 24 HRS. ---

SAMPLING METHOD: 24" split spoon

LOGGED BY: C. H. Crocker

HAMMER WEIGHT: --- | DROP: ---

RESPONSIBLE PROFESSIONAL: C. Page | REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
1				0	Well graded SAND with SILT and GRAVEL (SP - SM) Yellowish brown (10YR 5/6), 60% fine to coarse sand, 30% gravel, 10% low plasticity fines [Fill]	
2	B-2 2.0					
3				0	LEAN CLAY (CL) Very dark gray (5Y 3/1), moist, 100% fines, trace sand, medium plasticity, firm	
4					POORLY-GRADED SAND (SP) Dark greenish gray (5G 4/1), wet, 95% medium sand, 5% medium plastic fines	
5						
6	B-2 6.0			0	Wet Zone of lean clay with shell fragments	
7						
8				0		
9					LEAN CLAY (CL) Dark greenish gray (5G 4/1), wet, 100% fines, trace medium sand, low plasticity, soft	
10					Bottom of boring at 10.0 feet.	
11						
12						
13						
14						

2530.02.003

B-1 (11/92)

Geomatrix Consultants | Project No. 2530.02 | Figure A-6

PROJECT: ENCINAL REAL ESTATE Alameda, California	**Log of Boring No. GW-18**
BORING LOCATION: Just inside railroad easement fence	ELEVATION AND DATUM:
DRILLING CONTRACTOR: Del-Tech	DATE STARTED: 4/8/94 / DATE FINISHED: 4/8/94
DRILLING METHOD: Hand auger	TOTAL DEPTH: 6.5' / MEASURING POINT:
DRILLING EQUIPMENT: Hand auger	DEPTH TO WATER: FIRST 5' / COMPL. --- / 24 HRS. ---
SAMPLING METHOD: Hand auger	LOGGED BY: C.Y. Page
HAMMER WEIGHT: --- / DROP: ---	RESPONSIBLE PROFESSIONAL: C.Y. Page / REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	REMARKS
0					POORLY-GRADED SAND (SP) Yellowish red (5YR 4/6), dry, medium sand	
2					ORGANIC SOIL (OH) Black (10YR 2/1), moist, clay, high plasticity	
3					CLAYEY SAND (SC) Gray (N5/), moist, medium sand, 40% clay in stringers	
4					POORLY-GRADED SAND (SP) Yellowish red (5YR 4/6), moist, medium sand	
5					FAT CLAY (CH) Gray (N5/), moist, clay, high plasticity, soft ▽	
6					POORLY-GRADED SAND (SP) Gray (N5/), wet, medium and fine sand	
7					Bottom of boring at 6.5 feet.	

2530.02.008

B-1 (11/92)

Geomatrix Consultants	Project No. 2530.02	Figure A-7

PROJECT: ENCINAL REAL ESTATE Alameda, California				**Log of Boring No. GW-19**
BORING LOCATION: Just inside railroad easement fence			ELEVATION AND DATUM:	
DRILLING CONTRACTOR: Del-Tech			DATE STARTED: 4/8/94	DATE FINISHED: 4/8/94
DRILLING METHOD: Hand auger			TOTAL DEPTH: 7.5'	MEASURING POINT:
DRILLING EQUIPMENT: Hand auger			DEPTH TO WATER / FIRST: 6'	COMPL.: --- / 24 HRS.: ---
SAMPLING METHOD: Hand auger			LOGGED BY: C.Y. Page	
HAMMER WEIGHT: ---	DROP: ---		RESPONSIBLE PROFESSIONAL: C.Y. Page	REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	REMARKS
1					POORLY-GRADED SAND (SP) Light yellowish brown (10YR 6/4), dry, medium sand	
2						
3						
4					CLAYEY SAND (SC) Light yellowish brown (10YR 6/4), moist, medium sand, 30% gray clay	
5						
6					▽	
7					FAT CLAY with SAND (CH) Dark gray (N4/), wet, clay and silt, 15% fine to medium sand, high plasticity, soft	
8					Bottom of boring at 7.5 feet.	
9						
10						
11						
12						
13						
14						

2530.02.009

B-1 (11/92)

PROJECT: ENCINAL REAL ESTATE Alameda, California				**Log of Boring No. GW-20**
BORING LOCATION: Just inside easement fence east of warehouse				ELEVATION AND DATUM:
DRILLING CONTRACTOR: Del-Tech				DATE STARTED: 4/8/94 / DATE FINISHED: 4/8/94
DRILLING METHOD: Hand auger				TOTAL DEPTH: 9' / MEASURING POINT:
DRILLING EQUIPMENT: 3 1/4" diameter hand auger				DEPTH TO WATER / FIRST 7' / COMPL. --- / 24 HRS. ---
SAMPLING METHOD: Hand auger				LOGGED BY: C.Y. Page
HAMMER WEIGHT: ---	DROP: ---			RESPONSIBLE PROFESSIONAL: C.Y. Page / REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	REMARKS
0					POORLY-GRADED SAND (SP) Yellowish red (5YR 4/6), dry, medium sand [FILL]	
1					FAT CLAY (CH) Gray (N5Y), moist, clay, 10% reddish-brown medium sand, high plasticity, firm, sand in cross-cutting zones	
2						
3						
4						
5						
6						
7					ELASTIC SILT (MH) Gray (N5Y), wet, silt, high plasticity, very soft, shell fragments, laminated with black organic layers	
8						
9					Bottom of boring at 9.0 feet.	
10						
11						
12						
13						
14						

2530.02.010

B-1 (11/92)

PROJECT: ENCINAL REAL ESTATE
Alameda, California

Log of Boring No. GW-21

BORING LOCATION: Just inside easement fence	ELEVATION AND DATUM:		
DRILLING CONTRACTOR: Del-Tech	DATE STARTED: 4/8/94	DATE FINISHED: 4/8/94	
DRILLING METHOD: Hand auger	TOTAL DEPTH: 6'	MEASURING POINT:	
DRILLING EQUIPMENT: 3 1/4" diameter hand auger	DEPTH TO WATER	FIRST 5'	COMPL. --- / 24 HRS. ---
SAMPLING METHOD: Hand auger	LOGGED BY: C.Y. Page		
HAMMER WEIGHT: --- / DROP: ---	RESPONSIBLE PROFESSIONAL: C.Y. Page	REG. NO. 5288	

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
1					POORLY-GRADED GRAVEL with SAND (GP) Yellowish red (5YR 4/6), dry, 60% angular gravel, 40% medium sand, trace clay [FILL]	
2					FAT CLAY (CH) Gray (N5/), moist, clay, 10% reddish-brown medium sand, high plasticity, firm	
3						
4						
5					▽	
6					FAT CLAY with SAND (CH) Gray (N5/), wet, clay, 30% medium sand, high plasticity, firm	
7					Bottom of boring at 6.0 feet.	
8						
9						
10						
11						
12						
13						
14						

2530.02.011

B-1 (11/92)

PROJECT: ENCINAL REAL ESTATE Alameda, California			**Log of Boring No. GW-22**
BORING LOCATION: East of 2020 Sherman Avenue		ELEVATION AND DATUM:	
DRILLING CONTRACTOR: OnSite Services, Inc.		DATE STARTED: 11/4/94	DATE FINISHED: 11/4/94
DRILLING METHOD: 2" continuous core		TOTAL DEPTH: 16'	MEASURING POINT:
DRILLING EQUIPMENT: Hydraulic Percussion Soil Probe		DEPTH TO WATER / FIRST: 10.0'	COMPL.: --- / 24 HRS.: ---
SAMPLING METHOD: 4' of core retained in plastic liners		LOGGED BY: C.Y. Page	
HAMMER WEIGHT: ---	DROP: ---	RESPONSIBLE PROFESSIONAL: C.Y. Page	REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation:	REMARKS
0					8 inches ASPHALT	
1–5					Well graded SAND with GRAVEL (SW) Black (7.5YR N2/), strong brown (7.5YR 5/6), and light olive brown (2.5Y 5/6), dry, medium to coarse sand, 40% angular gravel to 1 inch diameter [FILL]	
6–9				0	FAT CLAY (CH) Dark gray (2.5Y N4/), moist, clay, high plasticity, soft, trace of shell fragments [NATIVE BAY MUD]	
10					Wet	
12					Odor of rotten eggs	
16					Bottom of boring at 16.0 feet.	
17						

2530.02.012

B-1 (11/92)

Geomatrix Consultants	Project No. 2530.02	Figure A-11

PROJECT: ENCINAL REAL ESTATE
Alameda, California

Log of Boring No. GW-23

BORING LOCATION: East of 2020 Sherman Avenue

ELEVATION AND DATUM:

DRILLING CONTRACTOR: OnSite Services, Inc.

DATE STARTED: 11/4/94 | DATE FINISHED: 11/4/94

DRILLING METHOD: 2" continuous core

TOTAL DEPTH: 16' | MEASURING POINT:

DRILLING EQUIPMENT: Hydraulic Percussion Soil Probe

DEPTH TO WATER | FIRST 8.0' | COMPL. --- | 24 HRS. ---

SAMPLING METHOD: 4' of core retained in plastic liners

LOGGED BY: C.Y. Page

HAMMER WEIGHT: --- | DROP: ---

RESPONSIBLE PROFESSIONAL: C.Y. Page | REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	REMARKS
					Surface Elevation:	
0					4 inches ASPHALT	
1				0	Well graded SAND with GRAVEL (SW) Black (7.5YR N2/), strong brown (7.5YR 5/6), and light olive brown (2.5Y 5/6), dry, medium to coarse sand, 40% angular gravel to 1 inch diameter [FILL]	
2						
3				0		
4					FAT CLAY (CH) Dark gray (2.5Y N4/), moist, clay, high plasticity, soft, trace of shell fragments [NATIVE BAY MUD]	
5				0		
6						
7				0		
8					Wet	
9				0		
10					Firm	
11						
12				1		
16					Bottom of boring at 16.0 feet.	
17						

2530.02.013

B-1 (11/92)

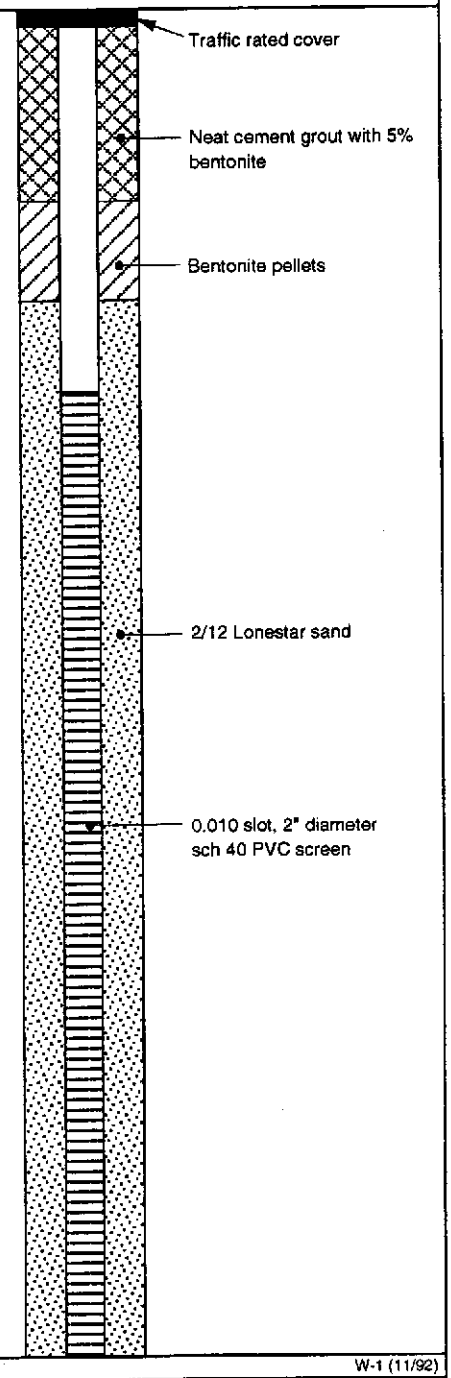
Geomatrix Consultants | Project No. 2530.02 | Figure A-12

PROJECT: ENCINAL TERMINALS	**Log of Well No. MW-10**
BORING LOCATION: Near 2020 Sherman on 1521 Buena Vista	ELEVATION AND DATUM: ELEV/DATUM
DRILLING CONTRACTOR: HEW Drilling Company, Inc.	DATE STARTED: 3/16/95 / DATE FINISHED: 3/16/95
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH: 14 Feet / SCREEN INTERVAL: 4-14 feet
DRILLING EQUIPMENT: CME-75	DEPTH TO WATER ATD: 4.5 feet / CASING: 2" diameter, 0.010 Slot
SAMPLING METHOD: 2.5 inch diameter split spoon	LOGGED BY: C. Y. Page/Nathanial Taylor
HAMMER WEIGHT: 140 lb / DROP: 30 inch	RESPONSIBLE PROFESSIONAL: C. Y. Page / REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)
					Surface Elevation:
0					4" ASPHALT
1					CLAY GRAVEL with SAND (GC) Dark yellowish brown (10YR 4/6), wet, gravel to 1.5 inch diameter, 30% clay, 20% coarse sand. Bottom 6" medium sand (BASEROCK)
2					ASPHALT
3					FAT CLAY with SAND (CH) Olive gray (5Y 5/2), dry, clay, 25% coarse sand
4			11		FAT CLAY (CH) Dark grey (2.5Y 4/0), moist, clay, high plasticity, hard. Top 4" mostly coarse to medium sand
5			7		POORLY GRADED SAND (SP) Dark grey (5Y 4/1), wet, medium sand
6					
7			2		
8			7		FAT CLAY (CH) Very dark grey (5Y 3/1) wet, clay, high plasticity, hard, upper 6" very soft, motteled black and olive green
9					
10			2		Several 1" layers of shells
11			2		
12					Very soft
13			0		Medium to very hard
14					Very soft

14.0 Bottom of boring

WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS



W-1 (11/92)

2530.02.001

Geomatrix Consultants	Project No. 2530.02	Figure A-13

GEOMATRIX

APPENDIX B

MONITORING WELL MW-10: INSTALLATION PERMIT AND DWR REPORT

fle 2530.02 05
me 2530.03 05

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94588 • (510) 484-2600

TELEFAX TRANSMITTAL

DATE: 10 Mar 95

DELIVER TO: Cheri Page

NAME OF FIRM: Geomatrix

FAX PHONE #: (415) 434-1365

FROM: Wyman Hong

NUMBER OF PAGES: 2
(Including transmittal)

FOR VOICE CONTACT CALL: (510) 484-2600

FOR RETURN FAX: (510) 462-3914

REMARKS: Drilling permit 95128 for a monitoring well construction project at 1521 Buena Vista Avenue in Alameda.

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Encinal Terminals
1521 Buena Vista
Alameda, CA 94501

CLIENT
Name same as above
Address _____ Phone _____
City _____ Zip _____

APPLICANT
Name Geomatrix Consultants
100 First Street
Address Suite 1000 Phone (415) 434-9400
City San Francisco Zip 94111

TYPE OF PROJECT Job # 2530.03 and 2530.02
Well Construction
Cathodic Protection ____
Water Supply ____
Monitoring X
Geotechnical Investigation
General ____
Contamination ____
Well Destruction ____

PROPOSED WATER SUPPLY WELL USE
Domestic ____ Industrial ____ Other _____
Municipal ____ Irrigation ____

DRILLING METHOD:
Mud Rotary ____ Air Rotary ____ Auger X
Cable ____ Other _____

DRILLER'S LICENSE NO. New Drilling - # 384167

WELL PROJECTS Well MW-10
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 12 ft.
Surface Seal Depth 4 ft. Number 1

GEOTECHNICAL PROJECTS
Number of Borings 4 Maximum
Hole Diameter 8 in. Depth 9 ft.

ESTIMATED STARTING DATE 3/9/95
ESTIMATED COMPLETION DATE 3/10/95

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S

FOR OFFICE USE

PERMIT NUMBER 95128
LOCATION NUMBER _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

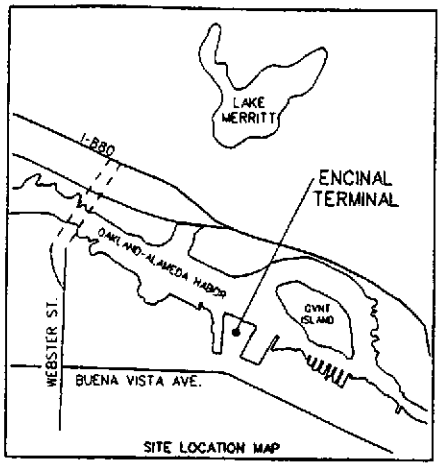
E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 10 Mar 95
Wyman Hong

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED



EXPLANATION

MW-10 ✦ MONITORING WELL

■ FORMER UNDERGROUND DIESEL TANK

FENCE

RAILROAD

PROPERTY BOUNDARY

ALAMEDA-OAKLAND ESTUARY

ALASKA BASIN

MW-10

2020 SHERMAN ST.

OFFICE

FORTMANN BASIN

APPROXIMATE LOCATION OF FORMER GASOLINE AND WASTE OIL TANKS

FORMER UNDERGROUND DIESEL TANK "A"

FORMER UNDERGROUND DIESEL TANK "B"

BUENA VISTA AVE.

N

0 500

SCALE IN FEET

BASEMAP SOURCE:
KISTER, SAVIO, AND REI
PROPERTY MAP OF MARCH 1987 WITH APRIL 1994 REVISIONS;
AND FUGRO - McCLELLAND, PHASE I ENVIRONMENTAL SITE
ASSESSMENT FOR CAPITAL HOLDING COMPANY
5 JANUARY 1994

ENCL495/Encl_1.dgn: Rev: 05-04-95

GEOMATRIX

LOCATION OF MONITORING WELL
ENCINAL TERMINALS
ALAMEDA, CALIFORNIA

Figure
1

Project No.
2530.02

PROJECT: ENCINAL TERMINALS	Log of Well No. MW-10	
BORING LOCATION: Near 2020 Sherman on 1521 Buena Vista	ELEVATION AND DATUM: ELEV/DATUM	
DRILLING CONTRACTOR: HEW Drilling Company, Inc.	DATE STARTED: 3/16/95	DATE FINISHED: 3/16/95
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH: 14 Feet	SCREEN INTERVAL: 4-14 feet
DRILLING EQUIPMENT: CME-75	DEPTH TO WATER ATD: 4.5 feet	CASING: 2" diameter, 0.010 Slot
SAMPLING METHOD: 2.5 inch diameter split spoon	LOGGED BY: C. Y. Page/Nathanial Taylor	
HAMMER WEIGHT: 140 lb / DROP: 30 inch	RESPONSIBLE PROFESSIONAL: C. Y. Page	REG. NO. 5288

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM Reading	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
					Surface Elevation:	
					4" ASPHALT	Traffic rated cover
1					CLAY GRAVEL with SAND (GC) Dark yellowish brown (10YR 4/6), wet, gravel to 1.5 inch diameter, 30% clay, 20% coarse sand. Bottom 6" medium sand (BASEROCK)	Neat cement grout with 5% bentonite
2					ASPHALT	
3					FAT CLAY with SAND (CH) Olive gray (5Y 5/2), dry, clay, 25% coarse sand	Bentonite pellets
4			2 4 7		FAT CLAY (CH) Dark grey (2.5Y 4/0), moist, clay, high plasticity, hard. Top 4" mostly coarse to medium sand	
5			4 3 4		POORLY GRADED SAND (SP) Dark grey (5Y 4/1), wet, medium sand	
6			1 1 1			2/12 Lonestar sand
7					FAT CLAY (CH) Very dark grey (5Y 3/1) wet, clay, high plasticity, hard, upper 6" very soft, motteled black and olive green	
8			2 3 4			
9						0.010 slot, 2" diameter sch 40 PVC screen
10			1 1 1		Several 1" layers of shells	
11			1 1 1			
12					Very soft	
13			0 0 0 0		Medium to very hard	
14					Very soft	
					14.0 Bottom of boring	

2530.02.001

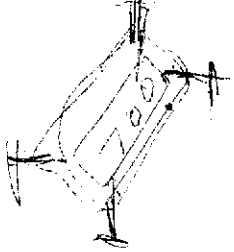
W-1 (11/92)

Geomatrix Consultants	Project No. 2530.02	Figure ---

GEOMATRIX

APPENDIX C

SCREENING HEALTH EVALUATION



GEOMATRIX

SCREENING HEALTH EVALUATION

A screening-level evaluation was conducted to assess the potential health risks associated with the volatilization of 1,1-dichloroethane (1,1-DCA) from groundwater and subsequent inhalation of vapors by a hypothetical future on-site resident. The screening evaluation was composed of the following steps:

- Estimating vapor flux from groundwater,
- Estimating ambient air concentration,
- Estimating lifetime average daily dose, and
- Estimating lifetime excess cancer risk.

A brief description of each step is provided below; detailed calculations are presented in Attachment 1.

ESTIMATING VAPOR FLUX FROM GROUNDWATER

The vapor flux of 1,1-DCA from groundwater was estimated using the Farmer Model, a simple screening tool recommended by the U.S. EPA as a first step in estimating vapor flux from soil or groundwater (EPA, 1992). The Farmer model assumes that the chemical's concentration in groundwater can be used to estimate the chemical's concentration in soil gas. Once in the vapor phase, the model assumes that the chemical diffuses through the soil at a rate dependent on a number of chemical and physical properties, including the soil porosity and the chemical's air diffusion coefficient. The Farmer model likely overestimates vapor flux from groundwater, because it does not take into account reduction in the source over time or the effect of the capillary fringe on vapor phase diffusion. The vapor flux estimated by the Farmer model is expressed in units of milligrams chemical per square meter per second (mg/m^2-sec).

ESTIMATING AMBIENT AIR CONCENTRATION

The ambient concentration of 1,1-DCA in air was estimated using a box model, which is used by the U.S. EPA to calculate preliminary remediation goals (EPA, 1991a). A box model is a simple mass-balance equation that uses the concept of a theoretically enclosed space or box over the area of interest. The model assumes that compounds enter the box via vapor flux and are removed by wind or ventilation. The box model fails to fully take into account the various processes of dispersion and may predict relatively high ambient air

concentrations even at relatively low vapor flux rates. The ambient air concentration estimated by the box model is expressed in units of milligrams chemical per cubic meters of air (mg/m^3).

ESTIMATING LIFETIME AVERAGE DAILY DOSE

The lifetime average daily dose (LADD) of 1,1-DCA was estimated using standard default assumptions that take into account the amount of air inhaled per day, body weight, and the frequency and duration of exposure. The default assumptions used in this evaluation are recommended by the Department of Toxic Substances Control (DTSC) of the California EPA and the U.S. EPA (DTSC, 1992; EPA, 1991b). The (LADD) is expressed in units of milligrams chemical per kilogram body weight per day (mg/kg-day).

ESTIMATING LIFETIME EXCESS CANCER RISK

The lifetime excess cancer risk was estimated for the hypothetical future on-site resident by multiplying the LADD by the carcinogenic potency slope factor (SF). The SF, which is expressed in units of risk per milligrams chemical per kilogram body weight per day $[(mg/kg\text{-}day)^{-1}]$, is the 95 percent upper confidence limit of the probability of a carcinogenic response per unit daily intake over a lifetime. By using the 95 percent upper confidence limit, the estimate of carcinogenic response is conservative and usually overestimates the risk posed by the chemical.

CONCLUSIONS

Based on the maximum detected concentration of 1.8 milligrams per liter (mg/l), the estimated lifetime excess cancer risk for the hypothetical future on-site resident is 3 in 10 million (3×10^{-7}), which is lower than the range of risks generally considered acceptable by regulatory agencies. Based on this screening evaluation, the presence of 1,1-DCA in groundwater at the Encinal Terminal site should not pose an unacceptable health risk to a hypothetical future on-site resident. It should also be noted that the U.S. EPA does not agree with the California EPA that 1,1-DCA is a possible human carcinogen. As discussed in a memorandum presented in Attachment 2, the potential noncarcinogenic health risks also could be evaluated; however, it is likely that the above evaluation based on carcinogenic health risks is more health conservative.

REFERENCES

Department of Toxic Substances Control (DTSC), 1992, Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted

Facilities: California EPA, Department of Toxic Substances Control, Sacramento, California

United States Environmental Protection Agency (EPA), 1991a, Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals), Interim: Publication 9285.7-01B, Office of Emergency and Remedial Response, Washington, D.C.

EPA, 1991b, Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors:" OSWER Directive 9285.6-03, Washington, D.C.

EPA, 1992, Air/Superfund National Technical Guidance Study Series, Assessing Potential Indoor Air Impacts for Superfund Sites: EPA-451/R-92-002, Office of air Quality Planning and Standards, Triangle Park, North Carolina

GEOMATRIX

ATTACHMENT 1

SCREENING CALCULATION OF VOLATILIZATION OF 1,1-DICHLOROETHANE VAPORS FROM GROUNDWATER AND ESTIMATED EXCESS CANCER RISK TO A HYPOTHETICAL FUTURE ON-SITE RESIDENT

Step 1 Estimate of Vapor Flux from Groundwater using the Farmer Model

$$\text{Vapor Flux } (mg/cm^2\text{-sec}) = \frac{Dg \times (C_2 - C_1)}{L}$$

where:

D_g = Soil-gas diffusion coefficient (cm^3/cm-sec)
= D_g^{air} (cm^3/cm-sec) × $[(P_a)^{10/3} \div (P_t)^2]$
C_2 = Vapor concentration of contaminant at bottom of soil layer (mg/cm^3)
C_1 = Vapor concentration of contaminant at surface (assumed to be 0)
L = Thickness of clean soil layer

Inputs - Soil

P_t = 0.35 (average value of 0.50 for clay, 0.20 for silty sand; default value for compacted soil; EPA, 1988)
P_a = 0.20 (assumes 15% moisture content; professional judgment)
L = 6 ft or 180 cm (site-specific)

Inputs - 1,1-Dichloroethane (1,1-DCA)

$$C_2 = C_w \times 1\ell/1000\ cm^3 \times \frac{K_{henry}}{R \times T}$$

where:

C_w = 1,1-DCA concentration in groundwater (1.8 mg/ℓ; maximum value)
K_{henry} = 5.2×10^{-3} atm-m^3/mol (average of values from Montgomery and Welkom, 1989)
R = Universal gas constant (8.21×10^{-5} atm-m^3/mol-°K)
T = Temperature of soil (298°K)

therefore:

$$C_2 = 1.8\ mg/\ell \times 1\ell/1000\ cm^3 \times \frac{5.2 \times 10^{-3}\ atm\text{-}m^3/mol}{8.21 \times 10^{-5}\ atm\text{-}m^3/mol\text{-}°K \times 298°K}$$

$$= 3.9 \times 10^{-4}\ mg/cm^3$$

$$D_g = D_g^{air} \times (P_a^{10/3} \div P_t^2)$$

where:

D_g^{air} = 0.094 cm^3/cm-sec (Shen, 1981; non-specific dichloroethanes)

therefore:

$$D_g^{air} = 0.094\ cm^3/cm\text{-}sec \times (0.2^{10/3} \div 0.35^2)$$
$$= 0.094\ cm^3/cm\text{-}sec \times (4.7 \times 10^{-3} \div 1.2 \times 10^{-1})$$
$$= 3.6 \times 10^{-3}\ cm^3/cm\text{-}sec$$

therefore:

$$\text{Vapor Flux} = \frac{3.6 \times 10^{-3}\ cm^3/cm\text{-}sec \times 3.9 \times 10^{-4}\ mg/cm^3}{180\ cm}$$

$$= 7.8 \times 10^{-9}\ mg/cm^2\text{-}sec \quad \text{or} \quad 7.8 \times 10^{-5}\ mg/m^2\text{-}sec$$

Step 2 Estimating Ambient Air Concentration using the Box Model

$$\text{Air } (mg/m^3) = \frac{\text{Flux } (mg/m^2\text{-}sec) \times \text{EA } (m^2)}{\text{WS } (m/sec) \times \text{Height } (m) \times \text{Width } (m)}$$

where:

Flux = Vapor flux (7.8 × 10^{-5} mg/m^2-sec; calculated above)
EA = Emissions area (5000 ft^2 or 460 m^2; default residential lot, DTSC, 1994)
WS = Wind speed (2 m/sec; professional judgment)
Height = Height of box (2 m; professional judgment)
Width = Width of box (21 m; square root of emissions area)

therefore:

$$\text{Air} = \frac{7.8 \times 10^{-5}\ \text{mg/m}^2\text{-sec} \times 460\ \text{m}^2}{2\ \text{m/sec} \times 2\ \text{m} \times 21\ \text{m}}$$

$$= 4.2 \times 10^{-4}\ \text{mg/m}^3$$

Step 3 Estimating Lifetime Average Daily Dose (LADD)

$$\text{LADD (mg/kg-day)} = \frac{\text{Air (mg/m}^3) \times \text{BR (m}^3\text{/day)} \times \text{B (\%)} \times \text{EF (days/yr)} \times \text{ED (yr)}}{\text{BW (kg)} \times \text{AT (days)}}$$

where:

- Air = Air concentration (4.2×10^{-4} mg/m^3; calculated above)
- BR = Breathing rate (20 m^3/day; DTSC, 1992; EPA, 1991)
- B = Bioavailability (100%; maximum)
- EF = Exposure frequency (350 days/yr; DTSC, 1992; EPA, 1991)
- ED = Exposure duration (30 yrs; DTSC, 1992; EPA, 1991)
- BW = Body weight (70 kg; DTSC, 1992; EPA, 1991)
- AT = Averaging time (70 yrs × 365 days/yr or 25550 days; DTSC, 1992; EPA, 1991)

therefore:

$$\text{LADD} = \frac{4.2 \times 10^{-4}\ \text{mg/m}^3 \times 20\ \text{m}^3\text{/day} \times 100\% \times 350\ \text{days/yr} \times 30\ \text{yrs}}{70\ \text{kg} \times 25550\ \text{days}}$$

$$= 5.0 \times 10^{-5}\ \text{mg/kg-day}$$

Step 4 Estimating Lifetime Excess Cancer Risk

$$\text{Risk} = \text{LADD} \times \text{SF}$$

where:

- LADD = Lifetime average daily dose (5.0×10^{-5} mg/kg-day; calculated above)
- SF = Slope factor [0.0057 (mg/kg-day)$^{-1}$; OEHHA, 1992]

therefore:

$$\text{Risk} = 5.0 \times 10^{-5}\ \text{mg/kg-day} \times 0.0057\ (\text{mg/kg-day})^1$$
$$= 3 \times 10^{-7}$$

REFERENCES

Department of Toxic Substances Control (DTSC), 1992, Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities: California EPA, Department of Toxic Substances Control, Sacramento, California

DTSC, 1994, Preliminary Endangerment Assessment Guidance Manual: California EPA, Department of Toxic Substances Control, Sacramento, California

Montgomery, J.H. and L.M. Welkom, 1989, Groundwater Chemicals Desk Reference, Lewis Publishers, Chelsea, Michigan.

Office of Environmental Health Hazard Assessment (OEHHA), Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens: California EPA, Office of Environmental Health Hazard Assessment, Reproductive and Cancer Hazard Assessment Section, Sacramento, California.

Shen, T.T., 1981, Estimating Hazardous Air Emissions from Disposal Sites: Pollution Engineering, 13(8):31-34.

United States Environmental Protection Agency (EPA), Superfund Exposure Assessment Manual: EPA/540/1-88/001, Office of Remedial Response, Washington, D.C.

EPA, 1991, Human Health Evaluation Manual, Supplemental Guidance "Standard Default Exposure Factors:" OSWER Directive 9285.6-03, Washington, D.C.

GEOMATRIX

MEMORANDUM

TO: Elizabeth Nixon **DATE:** 12 May 1994

FROM: Greg Brorby

SUBJECT: Toxicity Criteria Available for Evaluating Exposures to 1,1-Dichloroethane
Encinal Terminals
Project #2530

Following our conversation of your meeting with the Alameda County Department of Environmental Health and the Regional Water Quality Control Board (RWQCB) on the Encinal Terminals site, I wanted to summarize the availability of toxicity criteria for evaluating exposure to 1,1-dichloroethane (1,1-DCA).

Currently, there are no toxicity criteria for 1,1-DCA listed on EPA's Integrated Risk Information System (IRIS). According to IRIS, a risk assessment is currently under review by an EPA work group to establish oral and inhalation reference doses (RfDs). RfDs are used to evaluate noncarcinogenic health effects. No such assessment is under review to establish oral or inhalation slope factors, which are used to evaluate carcinogenic health risks.

My original calculations from January of this year were based on a oral slope factor developed by the Office of Environmental Health Hazard Assessment (OEHHA) of the California EPA for the purposes of developing an Acceptable Daily Intake (ADI) under Proposition 65. I do not know why the State of California and EPA do not agree as to the carcinogenicity of 1,1-DCA; however, the State has taken a more conservative view than EPA for several chemicals, most notably hexavalent chromium.

EPA Region IX issues Preliminary Remediation Goals (PRGs) for numerous chemicals on a quarterly basis. PRGs for 1,1-DCA are listed in their most recent table, dated 1 February 1994, based on noncarcinogenic health effects. Region IX cites EPA's Health Effects Assessment Summary Tables (HEAST) as the source of the RfDs used in their calculations. Toxicity criteria listed in HEAST are provisional, having undergone review and having the concurrence of individual Agency Program Offices. These provisional criteria could be used to evaluate the potential noncarcinogenic health effects associated with inhalation exposure to 1,1-DCA vapors being released by groundwater at the Site, but it is likely that the evaluation based on carcinogenic health risks is more health conservative.

Please let me know if I can be of any additional assistance.

APPENDIX D

GRAB GROUNDWATER SAMPLE ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS: JANUARY, APRIL, AND NOVEMBER 1994

2530A 0130

American Environmental Network

Certificate of Analysis

CDOHS Certification: 1172 AIHA Accreditation: 11134

GEOMATRIX CONSULTANTS
100 PINE ST., 10TH FLOOR
SAN FRANCISCO, CA 94111

ATTN: CHERI PAGE

CLIENT PROJ. ID: 2530A
C.O.C. NO: 4185

REPORT DATE: 02/04/94

DATE SAMPLED: 01/20/94

DATE RECEIVED: 01/24/94

ANALYSIS REQUESTED: 01/25-28/94

AEN JOB NO: 9401226

PROJECT SUMMARY:

On January 24, 1994, this laboratory received four (4) water samples.

On January 25, 1994, client requested two (2) samples be analyzed for organic parameters. On January 28, 1994, client requested one (1) sample be taken off hold and be analyzed for organic parameters. One (1) sample remains on hold. Sample identification, methodologies, results and dates analyzed are summarized on the following pages.

All laboratory quality control parameters were found to be within established limits. Batch QC data is included at the end of this report.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
General Manager

GEOMATRIX CONSULTANTS

SAMPLE ID: P-2
AEN LAB NO: 9401226-02
AEN WORK ORDER: 9401226
CLIENT PROJ. ID: 2530A

DATE SAMPLED: 01/20/94
DATE RECEIVED: 01/24/94
REPORT DATE: 02/04/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	02/01/94
Bromoform	75-25-2	ND	0.5	ug/L	02/01/94
Bromomethane	74-83-9	ND	0.5	ug/L	02/01/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	02/01/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	02/01/94
Chloroethane	75-00-3	ND	0.5	ug/L	02/01/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	02/01/94
Chloroform	67-66-3	ND	0.5	ug/L	02/01/94
Chloromethane	74-87-3	ND	0.5	ug/L	02/01/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	02/01/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	02/01/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	02/01/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	02/01/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	02/01/94
1,1-Dichloroethane	75-34-3	4 *	0.5	ug/L	02/01/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	02/01/94
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	02/01/94
cis-1,2-Dichloroethene	156-59-2	0.6 *	0.5	ug/L	02/01/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	02/01/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	02/01/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	02/01/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	02/01/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	02/01/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	02/01/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	02/01/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	02/01/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	02/01/94
Trichloroethene	79-01-6	ND	0.5	ug/L	02/01/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	02/01/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	02/01/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	02/01/94

ND = Not detected
* = Indicates value above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: P-3
AEN LAB NO: 9401226-03
AEN WORK ORDER: 9401226
CLIENT PROJ. ID: 2530A

DATE SAMPLED: 01/20/94
DATE RECEIVED: 01/24/94
REPORT DATE: 02/04/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	02/01/94
Bromoform	75-25-2	ND	0.5	ug/L	02/01/94
Bromomethane	74-83-9	ND	0.5	ug/L	02/01/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	02/01/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	02/01/94
Chloroethane	75-00-3	ND	0.5	ug/L	02/01/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	02/01/94
Chloroform	67-66-3	ND	0.5	ug/L	02/01/94
Chloromethane	74-87-3	ND	0.5	ug/L	02/01/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	02/01/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	02/01/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	02/01/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	02/01/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	02/01/94
1,1-Dichloroethane	75-34-3	0.6 *	0.5	ug/L	02/01/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	02/01/94
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	02/01/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	02/01/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	02/01/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	02/01/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	02/01/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	02/01/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	02/01/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	02/01/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	02/01/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	02/01/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	02/01/94
Trichloroethene	79-01-6	ND	0.5	ug/L	02/01/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	02/01/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	02/01/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	02/01/94

ND = Not detected
* = Indicates value above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: P-4
AEN LAB NO: 9401226-04
AEN WORK ORDER: 9401226
CLIENT PROJ. ID: 2530A

DATE SAMPLED: 01/20/94
DATE RECEIVED: 01/24/94
REPORT DATE: 02/04/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	**EPA 8010**				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	02/01/94
Bromoform	75-25-2	ND	0.5	ug/L	02/01/94
Bromomethane	74-83-9	ND	0.5	ug/L	02/01/94
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	02/01/94
Chlorobenzene	108-90-7	ND	0.5	ug/L	02/01/94
Chloroethane	75-00-3	ND	0.5	ug/L	02/01/94
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	02/01/94
Chloroform	67-66-3	ND	0.5	ug/L	02/01/94
Chloromethane	74-87-3	ND	0.5	ug/L	02/01/94
Dibromochloromethane	124-48-1	ND	0.5	ug/L	02/01/94
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	02/01/94
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	02/01/94
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	02/01/94
Dichlorodifluoromethane	75-71-8	ND	0.5	ug/L	02/01/94
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	02/01/94
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	02/01/94
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	02/01/94
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	02/01/94
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	02/01/94
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	02/01/94
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	02/01/94
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	02/01/94
Methylene Chloride	75-09-2	ND	0.5	ug/L	02/01/94
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	02/01/94
Tetrachloroethene	127-18-4	ND	0.5	ug/L	02/01/94
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	02/01/94
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	02/01/94
Trichloroethene	79-01-6	ND	0.5	ug/L	02/01/94
Trichlorofluoromethane	75-69-4	ND	0.5	ug/L	02/01/94
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	02/01/94
Vinyl Chloride	75-01-4	ND	0.5	ug/L	02/01/94

ND = Not detected
* = Indicates value above reporting limit

QUALITY CONTROL DATA

INSTRUMENT: G

AEN JOB NO: 9401226

CLIENT PROJ. ID: 2530A

SURROGATE STANDARD RECOVERY SUMMARY
METHOD: EPA 8010
(WATER MATRIX)

SAMPLE IDENTIFICATION			SURROGATE RECOVERY (PERCENT)	
Date Analyzed	Client Id.	Lab Id.	Bromochloro-methane	1-Bromo-2-chloro-propane
02/01/94	P-2	02	70	69
02/01/94	P-3	03	97	104
02/01/94	P-4	04	66	67

CURRENT QC LIMITS

ANALYTE	PERCENT RECOVERY
Bromochloromethane	(65-138)
1-Bromo-2-chloropropane	(61-141)

QUALITY CONTROL DATA

DATE ANALYZED: 01/31/94
SAMPLE SPIKED: 9401200-01
CLIENT PROJ. ID: 2530A

AEN JOB NO: 9401226
INSTRUMENT: G

MATRIX SPIKE RECOVERY SUMMARY
METHOD: EPA 8010
(WATER MATRIX)

ANALYTE	Spike Added (ug/L)	Average Percent Recovery	RPD
1,1-Dichloroethene	50.0	70	6
Trichloroethene	50.0	83	2
Chlorobenzene	50.0	68	2

CURRENT QC LIMITS

Analyte	Percent Recovery	RPD
1,1-Dichloroethene	(45-120)	20
Trichloroethene	(60-120)	20
Chlorobenzene	(50-120)	20

RPD = Relative Percent Difference

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

*** END OF REPORT ***

9401226

Chain-of-Custody Record

№ 4185

Date: 1/24/95

Page 1 of 1

Project No.: 2530A

Samplers (Signatures): [signature]

ANALYSES

	Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	Hold	Cooled	Soil (S) or water (W)	Acidified	Number of containers	Additional comments
01A-C	1/20	1045	P-1	X							X	X	W	X		Hold indefinitely
02A-C	1/20	1200	P-2	X								X	W	X		wait for final authorization to analyze.
03A-C	1/20	1340	P-3	X								X	W	X		
04A-C	1/20	1540	P-4	X							X Off Hold RB	X	W	X		

REMARKS

P-3 [illegible]

1/25/95 Per Chris Page, analyze P-2 + P-3. Sample P-1 + P-4 on hold. RB

Turnaround time: STD

Results to: Chris Page

Total No. of containers:

Relinquished by: [signature]	Date: 1/24/95	Relinquished by:	Date:	Relinquished by:	Date:	Method of shipment: PICK UP
Signature: Charles Crocker		Signature:		Signature:		Laboratory comments and Log No.: 9401226
Printed name:		Printed name:		Printed name:		1/26/94 Take P-4 off hold and analyze Standard TAT. RB
Company: Geomatrix		Company:		Company:		
Received by: [signature]	Time: 930	Received by: Lori L Pruitt	Time: 1730	Received by:	Time:	
Signature: [illegible]		Signature: Lori L. Pruitt		Signature:		
Printed name: A H		Printed name: ALEN		Printed name:		
Company:		Company:		Company:		

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400

2530A 0150

American Environmental Network

Certificate of Analysis

CAHS Certification: 1172 AIHA Accreditation: 11134

GEOMATRIX CONSULTANTS
100 PINE STREET, 10TH FLOOR
SAN FRANCISCO, CA 94111

ATTN: CHERI PAGE

CLIENT PROJ. ID: 2530A
C.O.C. NO: 5787

REPORT DATE: 02/04/94

DATE SAMPLED: 01/20/94

DATE RECEIVED: 01/21/94

AEN JOB NO: 9401205

PROJECT SUMMARY:

On January 21, 1994, this laboratory received one (1) water sample.

Client requested the sample be analyzed for inorganic parameters. Sample identification, methodologies, results and dates analyzed are summarized on the following pages.

All laboratory quality control parameters were found to be within established limits. Batch QC data is included at the end of this report.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
General Manager

GEOMATRIX CONSULTANTS

SAMPLE ID: B1-M
AEN LAB NO: 9401205-01
AEN WORK ORDER: 9401205
CLIENT PROJ. ID: 2530A

DATE SAMPLED: 01/20/94
DATE RECEIVED: 01/21/94
REPORT DATE: 02/04/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Digestion, Metals by GFAA	EPA 3020	-		Prep Date	01/27/94
Arsenic	EPA 7060	ND	0.002	mg/L	02/01/94
#Digestion, Metals by ICP	EPA 3010	-		Prep Date	01/27/94
Chromium	EPA 6010	ND	0.01	mg/L	01/28/94
Lead	EPA 6010	ND	0.04	mg/L	01/28/94
Thallium	EPA 6010	ND	0.1	mg/L	01/28/94

ND = Not detected
* = Indicates value above reporting limit

QUALITY CONTROL DATA

MATRIX: WATER

AEN JOB NO: 9401205

CLIENT PROJ. ID: 2530A

DATE DIGESTED: 01/27/94

METHOD SPIKE RECOVERY SUMMARY

Compound	Inst./ Method	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits % Rec. Limit	QC Limits RPD Limit
As, Arsenic	4000/7060	0.04	98	<1	90-115	12
Cr, Chromium	ICP/6010	0.2	102	<1	85-114	6
Pb, Lead	ICP/6010	0.5	107	<1	87-115	6
Tl, Thallium	ICP/6010	0.5	101	6	77-118	6

RPD = Relative Percent Difference
< = Less Than

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

*** END OF REPORT ***

9401205

Chain-of-Custody Record

№ 5787

Date: 1/21/94

Page 1 of 1

Project No.: 2530A

Samplers (Signatures):

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX		Cr (6010)	As (6010) 7060	Pb (6010)	Ti (6010)									REMARKS: Cooled	Soil (S) or water (W)	Acidified	Number of containers	Additional comments
01A 1/20	1620	B1-M									X	X	X	X									X	W	X	1	

Turnaround time: STD

Results to: Chris Page

Total No. of containers: 1

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:	Method of shipment:
Signature:	1/21/94	Signature: Ron Stellings	1/21/94	Signature:		pick up
Printed name: Charlie Crocker		Printed name: AEN		Printed name:		Laboratory comments and Log No.: 9401205
Company: Geomatrix		Company:		Company:		
Received by: Ron Stellings	Time: 1815	Received by: Denise Harrington	Time: 1/21/94 1900	Received by:	Time:	
Signature: Ron Stellings		Signature: DENISE HARRINGTON		Signature:		
Printed name: AEN		Printed name: AEN		Printed name:		
Company:		Company:		Company:		

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

GEOMATRIX CONSULTANTS
100 PINE STREET, 10TH FLOOR
SAN FRANCISCO, CA 94111

ATTN: CHERI PAGE

CLIENT PROJ. ID: 2530A
C.O.C. NO: 3889

REPORT DATE: 02/03/94

DATE SAMPLED: 01/20/94

DATE RECEIVED: 01/20/94

AEN JOB NO: 9401171

PROJECT SUMMARY:

On January 20, 1994, this laboratory received one (1) water sample.

Client requested the sample be analyzed for inorganic parameters. Sample identification, methodologies, results and dates analyzed are summarized on the following pages.

All laboratory quality control parameters were found to be within established limits. Batch QC data is included at the end of this report.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
General Manager

C-1, S-1

9401171

Chain-of-Custody Record

No 3889

Date: 1/20/94

Page 1 of 1

Project No: 2530.7

Samplers (Signatures):

Chris

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	Cr (6010)	As (7060)	Pb (6010)	Ti (6010)	Cooled	Soil (S) or water (W)	Acidified	Number of containers
1/20	1210	P2-M								X	X	X	X	X	W	X	1

ANALYSES

REMARKS

Additional comments

call Cheri Page before beginning analyses

1/25/94 Process per COC per Chris Page.

Turnaround time: STD

Results to: Cheri Page

Total No. of containers: 1

Relinquished by	Date	Relinquished by	Date	Relinquished by	Date	Method of shipment
Charlie Crowley	1/20 1499	Ron Stallings AEN	1/21/94 450			pickup
Signature:		Signature: Ron Stallings		Signature:		Laboratory comments and Log No:
Printed name:		Printed name: AEN		Printed name:		9401171
Company: Geomatrix		Company:		Company:		
Received by	**Time**	**Received by**	**Time**	**Received by**	**Time**	
Ron Stallings	1545	Gina Gillespie				
Signature: Ron Stallings		Signature: Gina Gillespie		Signature:		
Printed name: AEN		Printed name: AEN		Printed name:		
Company:		Company: [redacted] 65		Company:		

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA 94111
(415) 434-9400

Tracer Research Corporation

Shallow Groundwater Investigation

2020 SHERMAN
Alameda, California

January 24, 1994

Shallow Groundwater Investigation

2020 SHERMAN
Alameda, California

January 24, 1994

Prepared for:

GEOMATRIX CONSULTANTS
100 Pine Street
San Francisco, California 94111

Telephone: (415) 434-9400
FAX: (415) 434-1365

Prepared by:

TRACER RESEARCH CORPORATION
3755 North Business Center Drive
Tucson, Arizona 85705-2944

Telephone: (602) 888-9400
FAX: (602) 293-1306

Submitted by:

Marjorie D. Shiver

114-0025-S

TABLE OF CONTENTS

TABLES

1.0 2020 SHERMAN SITE INVESTIGATION

Tracer Research Corporation (Tracer Research) performed a shallow groundwater investigation at 2020 Sherman in Alameda, California. The investigation was conducted January 24, 1994 for Geomatrix Consultants of San Francisco, California.

1.1 Objective

The purpose of the investigation was to evaluate and delineate possible subsurface contamination by screening shallow groundwater for the presence of volatile organic compounds (VOCs). Groundwater samples were collected and analyzed for the following analyte classes and compounds:

Analyte Class: Hydrocarbon

benzene, toluene, ethylbenzene, and xylenes (BTEX)

Analyte Class: Halocarbon

1,1 dichloroethene (1,1 DCE)
1,1, dichloroethane (1,1 DCA)
total 1,2 dichloroethene (1,2 DCE)
1,2 dichloroethane (1,2 DCA)
1,1,1 trichloroethane (TCA)
trichloroethene (TCE)
tetrachloroethene (PCE)

1.2 Overview of Results

For this investigation, nine groundwater samples were collected from nine locations. Also, one water sample was collected by the client from a monitoring well and analyzed on site by Tracer Research. Samples were collected at depths of 5 to 7 feet below ground surface (bgs). A summary of the results of the investigation is presented in Table 1.

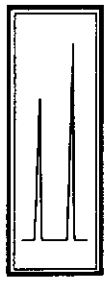
Table 1. Water Sample Summary

Compound	# of samples in which compound was detected	Low conc. µg/L	High conc. µg/L	Sample(s) with high conc.
Benzene	0	NA	NA	NA
Toluene	1	NA	8	GW-3-6'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
1,1 DCE	8	1	160	GW-3-6'
1,1 DCA	9	20	1,800	GW-3-6'
1,2 DCE	0	NA	NA	NA
1,2 DCA	0	NA	NA	NA
TCA	2	6	74	GW-3-6'
TCE	1	NA	0.7	GW-4-7'
PCE	2	0.05	2	GW-3-6'

NA = Not Applicable

2.0 SITE DESCRIPTION

Samples were collected near the southwest corner of the warehouse. Sample GW-4 was collected inside the building. Samples were collected through asphalt and grass cover. The geologic setting at this site was not reported. The depth to groundwater was 5 to 7 feet bgs. The direction of groundwater flow was not reported.



3.0 GROUNDWATER SAMPLING PROCEDURES

Sampling probes consisted of 7-foot lengths of 3/4-inch diameter hollow steel pipe. Groundwater samples were collected at depths of approximately 5 to 7 feet bgs.

The hollow probes with detachable drive points were advanced below the water table by hydraulically pushing and/or pounding the probes to the desired depths. Probes were hand pounded to depth in areas which were not accessible with the van. An electric rotary hammer was used to drill through the asphalt.

Once at the desired depth, the probes were withdrawn several inches to permit water to flow into the resulting hole. The aboveground end of the sampling probes were fitted with a vacuum adaptor (metal reducer) and a length of polyethylene tubing leading to a vacuum pump. A vacuum of up to 22 inches Hg was applied to the interior of the probe for 10 to 15 minutes or until water was drawn up the probe. The water accumulated in the hole was removed by vacuum through a 1/4-inch polyethylene tube inserted down into the probe to the bottom of the hole. Because the water is induced to flow into a very narrow hole, it can be sampled with little exposure to air and, consequently, the loss of volatile compounds by evaporation is reduced. The polyethylene tubing was used only once and discarded to avoid cross contamination.

Groundwater samples were collected in 40 milliliter (mL) VOA vials that were filled to exclude air and capped with Teflon-lined septa caps. Approximately half of the liquid in the bottle was decanted, the vials were shaken vigorously, and a sample of the headspace from the container was injected into the gas chromatograph (GC).

Indirect (headspace) analysis is the preferred technique when a large number of water samples are to be performed daily. The method is more time efficient for the measurement of volatile organics than direct injection of the water sample into the GC because there is less chance of semi-volatile and non-volatile organics contaminating the system. Depending upon the partitioning coefficient of a given compound, the indirect analysis method may be more sensitive than the direct injection method. The precision and accuracy of both methods are similar.

4.0 ANALYTICAL PARAMETERS

During this investigation, 40 milliliters (mL) of groundwater were collected for each sample and immediately analyzed in the Tracer Research analytical van. Groundwater samples were injected into the gas chromatograph (GC) in volumes of 200 to 1,000 microliters (µL).

Analytical instruments were calibrated daily using fresh working standards made from National Institute of Sciences and Technology traceable standards and reagent blanked solvents.

The GC was calibrated for indirect analysis by decanting 20 ml of the known standard, leaving approximately the same amount of headspace as in the water headspace samples. The standard bottle was resealed and shaken vigorously for 30 seconds. An analysis of the headspace in the vial determined the Response Factor (RF) which was then used to calculate the sample concentrations.

4.1 Chromatographic System

A Varian 3300 gas chromatograph, equipped with a flame ionization detector (FID), electron capture detector (ECD) and two computing integrators, was used for the groundwater analyses. The hydrocarbon compounds, detected on the FID, were separated in the GC on a 4 foot by 1/8 inch outer diameter (OD) packed analytical column (10% TCEP stationary phase bonded to 80/100 mesh Chromosorb PAW support). The halocarbons, detected on the ECD, were separated in the GC on a 6 foot by 1/8 inch OD packed analytical column (1% SP1000 stationary phase bonded to 60/80 mesh Carbopack B support). Both columns were in a temperature controlled oven. Nitrogen was used as the carrier gas. The following paragraphs explain the GC, FID, and ECD processes.

GC Process

The sample is injected into the GC where it is swept through the analytical column by the carrier gas. The detector senses the presence of a component different from the carrier gas and converts that information to an electrical signal. The components of the sample pass through the column at different rates, according to their individual properties, and are detected by the detector. Compounds are identified by the time it takes them to pass through the column (retention time).

FID Process

The FID utilizes a flame produced by the combustion of hydrogen and air. When a component, which has been separated on the GC analytical column, is introduced into the flame, a large increase in ions occurs. A collector with a polarizing voltage is applied near the flame and the ions are attracted and produce a current, which is proportional to the amount of the sample compound in the flame. The electrical current causes the computing integrator to record a peak on a chromatogram. By measuring the area of the peak and comparing that area to the integrator response of a known aqueous standard, the concentration of the analyte in the sample is determined.

ECD Process

The ECD captures low energy thermal electrons that have been ionized by beta particles. The flow of these captured electrons into an electrode produces a small current, which is collected and measured. When the halogen atoms (halocarbons) are introduced into the detector, electrons that would otherwise be collected at the electrode are captured by the sample, resulting in decreased current. The current causes the computing integrator to record a peak on a chromatogram. The area of the peak is compared to the peak generated by a known standard to determine the concentration of the analyte.

4.2 Analyses

The detection limits for target compounds depend on the sensitivity of the detector to the individual compound as well as the volume of the injection. The detection limits of the target compounds were calculated from the response factor, the sample size, and the calculated minimum peak size (area) observed under the conditions of the analyses. If any compound was not detected in an analysis, the detection limit is given as a "less than" value, e.g., <0.1 micrograms per liter (µg/L). The approximate detection limits for the target compounds are presented in Table 2.

Table 2. Detection Limits for Groundwater Compounds

Compound	Detection Limits (µg/L)
Benzene	0.2
Toluene	0.4
Ethyl benzene	0.7
Xylenes	2
1,1 DCE	0.07
1,1 DCA	0.2
1,2 DCE	3
1,2 DCA	0.4
TCA	0.01
TCE	0.03
PCE	0.01

5.0 QUALITY ASSURANCE AND QUALITY CONTROL

Tracer Research's Quality Assurance (QA) and Quality Control (QC) program was followed to maintain data that was reproducible through the investigation. An overview presenting the significant aspects of this program is presented below.

Groundwater Sampling Quality Assurance

To ensure consistent collection of samples, the following procedures are performed:

-Sampling Probes

Steel probes are used only once each day. To eliminate the possibility of cross contamination, they are washed with high pressure soap and hot water spray, or steam-cleaned. Enough sampling probes are carried on each van to avoid the need to re-use any during the day.

-Glass Syringes

Glass syringes are used for only one sample a day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.

- Polyethylene Tubing and VOA Vials

Polyethylene tubing and VOA vials used for the collection of groundwater samples are used only once and then discarded to avoid cross contamination.

Analytical Quality Assurance Samples

Quality assurance samples are performed at the minimum frequencies listed in Table 3. The actual frequency depends on the number of samples analyzed each day and the length of time of the survey.

Table 3. Quality Assurance Samples

Sample type	Frequency
Ambient Air Samples	3 per day or 1 per site
Analytical Method Blanks	5% (1 per 20 samples or 1 a day)
Continuing Calibration Check	20% (1 every 5 samples)
Field System Blank	1 per day
Reagent Blank	1 per set of working standards
Replicate Samples	10 to 100 % of all samples

The ambient air samples are obtained on site by sampling the air immediately outside the mobile analytical van and directly injecting it into the GC. Analytical method blanks are taken to demonstrate that the analytical instrumentation is not contaminated. These are performed by injecting carrier gas (nitrogen) into the GC with the sampling syringe. Subsampling syringes are also checked in this fashion.

The injector port septa through which samples are injected into the GC are replaced daily to prevent possible gas leaks from the chromatographic column. All sampling and subsampling syringes are decontaminated after use and are not used again until they have been decontaminated by washing in anionic detergent and baking at 90°C.

Continuing calibration checks are analyzed to verify the detector response for the target VOCs. If the response changes by more than twenty percent, the GC is recalibrated and new response factors are calculated.

Field system blanks are analyzed to check for contamination of the sampling apparatus, e.g., probe and sampling syringe. A sample is collected using standard soil gas sampling procedures, but without putting the probe into the ground. The results are compared to those obtained from a concurrently sampled ambient air analysis.

If the blanks detect compounds of interest at concentrations that indicate equipment contamination or concentrations that exceed normal background levels (ambient air analysis), corrective actions are performed. If the problem cannot be corrected, an out-of-control event is documented and reported.

A reagent blank is performed to ensure the solvent used to dilute the stock standards is not contaminated. Analytical instruments are calibrated daily using fresh working standards made from National Institute of Sciences and Technology (NIST) traceable standards and reagent blanked solvents.

Quantitative precision is assured by replicating analysis of 10 to 100 percent of the groundwater samples. Replicate analyses are performed by subsampling groundwater from the original VOA.

6.0 RESULTS

The analytical results from this groundwater investigation are condensed in Appendix A. The data are presented by location and by analyte concentration. When the compound was not detected, the detection limit is presented as a "less than" value, e.g., <0.1 ug/L.

Samples are identified by sample location and sampling depth. For example, GW-7-6.5' represents a groundwater sample collected from location 7 at a depth of 6.5 feet bgs. Sample HSP-1 was collected from the monitoring well located at this site.

APPENDIX A Condensed Data

TRACER RESEARCH CORPORATION - ANALYTICAL RESULTS
GEOMATRIX/ 2020 SHERMAN/ ALAMEDA, CALIFORNIA/ 114-0025-S
01/24/94

SAMPLE	1,1 DCE µg/L	1,1 DCA µg/L	1,2 DCE µg/L	1,2 DCA µg/L	TCA µg/L	TCE µg/L	PCE µg/L
HSP-1	4	390	<6	<0.9	<0.02	<0.07	<0.02
GW-7-6.5'	1	200	<6	<0.9	<0.02	<0.07	<0.02
GW-6-5.5'	1	230	<6	<0.9	<0.02	<0.07	<0.02
GS-1-6.5'	3	54	<6	<0.9	<0.02	<0.07	<0.02
GW-2-7.5'	<0.07	<0.2	<3	<0.4	<0.01	<0.03	<0.01
GW-3-6'	160	1800	<14	<2	74	<0.6	2
GW-5-6'	4	240	<3	<0.4	<0.01	<0.03	<0.01
GW-4-7'	2	110	<3	<0.4	6	0.7	0.05
GW-8-6'	11	140	<3	<0.4	<0.01	<0.03	<0.01
GW-9-5'	<0.07	20	<3	<0.4	<0.01	<0.03	<0.01

Analyzed by: A. Koch
Proofed by: J. Maisch (MS)

Tracer Research Corporation

TRACER RESEARCH CORPORATION - ANALYTICAL RESULTS
GEOMATRIX/ 2020 SHERMAN/ ALAMEDA, CALIFORNIA/ 114-0025-S
01/24/94

SAMPLE	BENZENE µg/L	TOLUENE µg/L	ETHYL BENZENE µg/L	XYLENES µg/L
HSP-1	<0.5	<0.8	<1	<3
GW-7-6.5'	<0.5	<0.8	<1	<3
GW-6-5.5'	<0.5	<0.8	<1	<3
GW-1-6.5'	<0.5	<0.8	<1	<3
GW-2-7.5'	<0.2	<0.4	<0.7	<2
GW-3-6'	<1	8	<3	<8
GW-5-6'	<0.2	<0.4	<0.7	<2
GW-4-7'	<0.2	<0.4	<0.7	<2
GW-8-6'	<0.2	<0.4	<0.7	<2
GW-9-5'	<0.2	<0.4	<0.7	<2

Analyzed by: A. Koch
Proofed by: J. Maisch (MS)

Tracer Research Corporation appreciates the opportunity of being of service to your organization. Because we are constantly striving to improve our service to you, we welcome any comments or suggestions you may have about how we can be more responsive to the needs of your organization. If you have any questions about the field work, analytical results, or this report, please give Marty Favero a call at (602) 888-9400.

ONSITE
ENVIRONMENTAL
LABORATORIES, INC.

Analytical Laboratory Report
Halogenated Volatile Hydrocarbons
EPA Method 8010

Date Sampled:	4/8/94	**Project Manager:**	Cheri Page
Date Received:	4/8/94	**Client:**	Geomatrix
Date Analyzed:	4/8/94	**Project:**	2530A
Date Reported:	4/8/94	**Matrix:**	Water
Report #:	404013.hal	**COC #:**	5910
Lab ID #:	2A036	**Units:**	ug/L
Resubmitted:	7/3/95		

Field ID #:		GW-18	GW-19	GW-20	GW-21		
Sample ID #:		01	02	03	04		
COMPOUND	**PQL**						
Vinyl chloride	10	ND	ND	ND	ND		
1,1-Dichloroethene	5	ND	ND	ND	ND		
trans-1,2-Dichloroethene	5	ND	ND	ND	ND		
1,1-Dichloroethane	5	ND	ND	ND	**22**		
cis-1,2-Dichloroethene	5	ND	ND	ND	ND		
Trichloroethene	5	ND	ND	ND	ND		
Tetrachloroethene	5	ND	ND	ND	ND		
1,2 Dichloroethane	5	ND	ND	ND	ND		
1,1,1 Trichloroethane	5	ND	ND	ND	ND		
Dilution Factors		1	1	1	1		

PQL: Practical Quantitation Limit

PROCEDURES:

This analysis was performed using EPA Method 8010, EPA Method 8020, and EPA Method 5030.

CERTIFICATION:

Califronia Department of Health Services, ELAP Certificate #1842.

Onsite Environmental Laboratories, Inc., 5500 Boscell Common, Fremont, CA 94538

Tel. (510) 490-8571, Fax (510) 490-8572.

James Porter
Laboratory Director

7/3/95
Date

Chain-of-Custody Record

PID 5910

Date: 4/8/94

Page 1 of 1

Project No.: 2530A

Samplers (Signatures): Cheri Page

Date	Time	Sample Number
4/8	3:20	GW-18
	2:50	GW-19
	1:55	GW-20
	12:55	GW-21

ANALYSES

EPA Method 8010	EPA Method 8020	EPA Method 8240 *	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	Cooled	Soil (S) or water (W)	Acidified	Number of containers
		X					Y	W	N	2
		X					Y	W	N	2
		X					Y	W	N	3
		X					Y	W	N	2

REMARKS

Additional comments

* select compounds including 1,1-DCA; ~~DCA~~ ~~DCE~~ DCE, TCE, TCA, PCE, VC.

Turnaround time: 2 days

Results to: Cheri Page

Total No. of containers: 9

Relinquished by: CHERI PAGE	Date: 4/8	Relinquished by:	Date:	Relinquished by:	Date:
Signature: Cheri Page		Signature:		Signature:	
Printed name: Geomatrix		Printed name:		Printed name:	
Company:		Company:		Company:	
Received by:	Time:	Received by:	Time:	Received by:	Time:
Signature: Michael Yurovsky	4:20	Signature:		Signature:	
Printed name: Michael Yurovsky		Printed name:		Printed name:	
Company: ONSITE		Company:		Company:	

Method of shipment: lab P/U

Laboratory comments and Log No.:

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400

415 434-1365 FAX

Inchcape Testing Services
Anametrix Laboratories

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

MS. CHERI PAGE
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9411067
Date Received : 11/04/94
Project ID : 2530.02
Purchase Order: N/A

The following samples were received at Anametrix for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9411067- 1	GW-25
9411067- 2	GW-27
9411067- 3	GW-28
9411067- 4	GW-26

This report is organized in sections according to the specific Anametrix laboratory group which performed the analysis(es) and generated the data.

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

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

If you have any further questions or comments on this report, please call your project manager as soon as possible. Thank you for using Incape Testing Services.

Susan Kraska Yeager for
Susan Kraska Yeager
Laboratory Director

11-11-94
Date

Kilma Desai
Project Manager

This report consists of 10 pages.

ANAMETRIX REPORT DESCRIPTION
GC

Organic Analysis Data Sheets (OADS)

OADS forms contain tabulated results for target compounds. The OADS are grouped by method and, within each method, organized sequentially in order of increasing Anametrix ID number.

Surrogate Recovery Summary (SRS)

SRS forms contain quality assurance data. An SRS form will be printed for each method, if the method requires surrogate compounds. They will list surrogate percent recoveries for all samples and any method blanks. Any surrogate recovery outside the established limits will be flagged with an "*", and the total number of surrogates outside the limits will be listed in the column labelled "Total Out".

Matrix Spike Recovery Form (MSR)

MSR forms contain quality assurance data. They summarize percent recovery and relative percent difference information for matrix spikes and matrix spike duplicates. This information is a statement of both accuracy and precision. Any percent recovery or relative percent difference outside established limits will be flagged with an "*", and the total number outside the limits will be listed at the bottom of the page. Not all reports will contain an MSR form.

Qualifiers

Anametrix uses several data qualifiers (Q) in its report forms. These qualifiers give additional information on the compounds reported. They should help a data reviewer to verify the integrity of the analytical results. The following is a list of qualifiers and their meanings:

- U - Indicates that the compound was analyzed for, but was not detected at or above the specified reporting limit.
- B - Indicates that the compound was detected in the associated method blank.
- J - Indicates that the compound was detected at an amount below the specified reporting limit. Consequently, the amount should be considered an approximate value. Tentatively identified compounds will always have a "J" qualifier because they are not included in the instrument calibration.
- E - Indicates that the reported amount exceeded the linear range of the instrument calibration.
- D - Indicates that the compound was detected in an analysis performed at a secondary dilution.

Absence of a qualifier indicates that the compound was detected at a concentration at or above the specified reporting limit.

REPORTING CONVENTIONS

- Due to a size limitation in our data processing step, only the first eight (8) characters of your project ID and sample ID will be printed on the report forms. However, the report cover letter and report summary pages display up to twenty (20) characters of your project and sample IDs.
- Amounts reported are gross values, i.e., not corrected for method blank contamination.

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

MS. CHERI PAGE
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9411067
Date Received : 11/04/94
Project ID : 2530.02
Purchase Order: N/A
Department : GC
Sub-Department: VOA

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9411067- 1	GW-25	WATER	11/04/94	8010

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

MS. CHERI PAGE
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9411067
Date Received : 11/04/94
Project ID : 2530.02
Purchase Order: N/A
Department : GC
Sub-Department: VOA

QA/QC SUMMARY :

- Sample was analyzed at a dilution due to foaminess.

M. Hassanein 11/11/94
Department Supervisor Date

Kamel G. Kamel 11/11/94
Chemist Date

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 8010
ANAMETRIX, INC. (408)432-8192

bject ID : 2530.02
ample ID : GW-25
atrix : WATER
te Sampled :11/ 4/94
te Analyzed :11/11/94
nstrument ID : HP24

Anametrix ID : 9411067-01
Analyst : KK
Supervisor : AL

Dilution Factor : 5.0
Conc. Units : ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
75-71-8	Dichlorodifluoromethane	5.0	ND	U
74-87-3	Chloromethane	5.0	ND	U
75-01-4	Vinyl chloride	2.5	ND	U
74-83-9	Bromomethane	2.5	ND	U
75-00-3	Chloroethane	2.5	ND	U
75-69-4	Trichlorofluoromethane	2.5	ND	U
76-13-1	Trichlorotrifluoroethane	2.5	ND	U
75-35-4	1,1-Dichloroethene	2.5	ND	U
75-09-2	Methylene chloride	5.0	ND	U
156-60-5	trans-1,2-Dichloroethene	2.5	ND	U
75-34-3	1,1-Dichloroethane	2.5	ND	U
156-59-2	cis-1,2-Dichloroethene	2.5	ND	U
67-66-3	Chloroform	2.5	ND	U
71-55-6	1,1,1-Trichloroethane	2.5	ND	U
56-23-5	Carbon tetrachloride	2.5	ND	U
107-06-2	1,2-Dichloroethane	2.5	ND	U
79-01-6	Trichloroethene	2.5	ND	U
78-87-5	1,2-Dichloropropane	2.5	ND	U
75-27-4	Bromodichloromethane	2.5	ND	U
110-75-8	2-Chloroethylvinylether	5.0	ND	U
10061-01-5	cis-1,3-Dichloropropene	2.5	ND	U
10061-02-6	trans-1,3-Dichloropropene	2.5	ND	U
79-00-5	1,1,2-Trichloroethane	2.5	ND	U
127-18-4	Tetrachloroethene	2.5	ND	U
124-48-1	Dibromochloromethane	2.5	ND	U
108-90-7	Chlorobenzene	2.5	ND	U
75-25-2	Bromoform	2.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	2.5	ND	U
541-73-1	1,3-Dichlorobenzene	2.5	ND	U
106-46-7	1,4-Dichlorobenzene	2.5	ND	U
95-50-1	1,2-Dichlorobenzene	2.5	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 8010
ANAMETRIX, INC. (408)432-8192

roject ID : 2530.0
ample ID : VBLKB1
atrix : WATER
ate Sampled : 0/ 0/ 0
ate Analyzed :11/10/94
nstrument ID : HP24

Anametrix ID : BN1003I1
Analyst : KK
Supervisor : SR

Dilution Factor : 1.0
Conc. Units : ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
75-71-8	Dichlorodifluoromethane	1.0	ND	U
74-87-3	Chloromethane	1.0	ND	U
75-01-4	Vinyl chloride	.50	ND	U
74-83-9	Bromomethane	.50	ND	U
75-00-3	Chloroethane	.50	ND	U
75-69-4	Trichlorofluoromethane	.50	ND	U
76-13-1	Trichlorotrifluoroethane	.50	ND	U
75-35-4	1,1-Dichloroethene	.50	ND	U
75-09-2	Methylene chloride	1.0	ND	U
156-60-5	trans-1,2-Dichloroethene	.50	ND	U
75-34-3	1,1-Dichloroethane	.50	ND	U
156-59-2	cis-1,2-Dichloroethene	.50	ND	U
67-66-3	Chloroform	.50	ND	U
71-55-6	1,1,1-Trichloroethane	.50	ND	U
56-23-5	Carbon tetrachloride	.50	ND	U
107-06-2	1,2-Dichloroethane	.50	ND	U
79-01-6	Trichloroethene	.50	ND	U
78-87-5	1,2-Dichloropropane	.50	ND	U
75-27-4	Bromodichloromethane	.50	ND	U
110-75-8	2-Chloroethylvinylether	1.0	ND	U
10061-01-5	cis-1,3-Dichloropropene	.50	ND	U
10061-02-6	trans-1,3-Dichloropropene	.50	ND	U
79-00-5	1,1,2-Trichloroethane	.50	ND	U
127-18-4	Tetrachloroethene	.50	ND	U
124-48-1	Dibromochloromethane	.50	ND	U
108-90-7	Chlorobenzene	.50	ND	U
75-25-2	Bromoform	.50	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	.50	ND	U
541-73-1	1,3-Dichlorobenzene	.50	ND	U
106-46-7	1,4-Dichlorobenzene	.50	ND	U
95-50-1	1,2-Dichlorobenzene	.50	ND	U

SURROGATE RECOVERY SUMMARY -- EPA METHOD 8010
ANAMETRIX, INC. (408)432-8192

Project ID : 2530.02
Matrix : LIQUID

Anametrix ID : 9411067
Analyst :
Supervisor : sk KK

	SAMPLE ID	SU1	SU2	SU3
1	VBLKB1	74	88	89
2	GW-25	76	84	88
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

	QC LIMITS
SU1 = Bromochloromethane	(56- 99)
SU2 = 1-Chloro-2-fluorobenze	(73-110)
SU3 = 2-Bromochlorobenzene	(65-108)

* Values outside of Anametrix QC limits

EPA METHOD 601/8010
INCHCAPE TESTING SERVICES - ANAMETRIX
(408) 432-8192

LABORATORY CONTROL SAMPLE

Sample ID: LAB CONTROL SAMPLE
Batch: 11067
Matrix: WATER
Date Analyzed: 11/10/94

Laboratory ID: MN1001I1
Instrument ID: HP24
Concentration Units: ug/L
Analyst: KL
Supervisor:

COMPOUND NAME	SPIKE AMOUNT	LCS REC	%REC LCS	%RECOVERY LIMITS
Trichlorotrifluoroethane	10	9.1	91%	65-116
1,1-Dichloroethene	10	9.8	98%	64-125
trans-1,2-Dichloroethene	10	10.6	106%	77-113
1,1-Dichloroethane	10	10.6	106%	85-129
cis-1,2-Dichloroethene	10	12.2	122%	78-130
1,1,1-Trichloroethane	10	10.8	108%	83-125
Trichloroethene	10	10.7	107%	76-124
Tetrachloroethene	10	9.0	90%	80-118
Chlorobenzene	10	9.5	95%	81-130
1,3-Dichlorobenzene	10	10.3	103%	82-115
1,4-Dichlorobenzene	10	10.5	105%	85-122
1,2-Dichlorobenzene	10	10.5	105%	86-122

Quality control limits are based on data generated by ITS-Anametrix Laboratories.

Inchcape Testing Services
Anametrix Laboratories

SAMPLE RECEIVING CHECKLIST

WORKORDER NUMBER: 9411067 CLIENT PROJECT ID: 2530.02

COOLER

Shipping slip (airbill, etc.) present?	YES	NO	(N/A)
If YES, enter carrier name and airbill # : _____			
Custody Seal on the outside of cooler?	YES	NO	(N/A)
Condition: INTACT ____ BROKEN ____			
Temperature of sample (s) within range?	(YES)	NO	N/A
List temperature of cooler (s): 5°c			

SAMPLES

Chain of custody seal present for each container?	YES	NO	(N/A)
Condition: INTACT ____ BROKEN ____			
Samples arrived within holding time?	(YES)	NO	N/A
Samples in proper containers for methods requested?	(YES)	NO	
Condition of containers: INTACT ✓ BROKEN ____			
If NO, were samples transferred to proper container? ____			
Were VOA containers received with zero headspace?	(YES)	NO	N/A
If NO, was it noted on the chain of custody? ____			
Were container labels complete? (ID, date, time preservative, etc.)	(YES)	NO	
Were samples preserved with the proper preservative?	YES	NO	(N/A)
If NO, was the proper preservative added at time of receipt? ____			
pH check of samples required at time of receipt?	YES	(NO)	
If YES, pH checked and recorded by: ____			
Sufficient amount of sample received for methods requested?	(YES)	NO	
If NO, has the client or lab project manager been notified? ____			
Field blanks received with sample batch? # of Sets: ____	YES	NO	(N/A)
Trip blanks received with sample batch? # of Sets: ____	YES	NO	(N/A)

CHAIN OF CUSTODY

Chain of custody received with samples?	(YES)	NO
Has it been filled out completely and in ink?	(YES)	NO
Sample ID's on chain of custody agree with container labels?	(YES)	NO
Number of containers indicated on chain of custody agree with number received?	(YES)	NO
Analysis methods clearly specified?	YES	(NO)
Sampling date and time indicated?	(YES)	NO
Proper signatures of sampler, courier, sample custodian in appropriate place? with time and date?	(YES)	NO
Turnaround time? REGULAR ✓ RUSH ____		

Any NO response and/or any "BROKEN" that was checked must be detailed in the Corrective Action Form.

Sample Custodian: CM Date: 11-4-94 Project Manager: KD Date: 11/7/94

941106 1

Chain-of-Custody Record

№ 5161

Date: 11/4/94

Page 1 of 1

Project No.: 2530

Samplers (Signatures): Cheri Page

	Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	HOLD	8010	Cooled	Soil (S) or water (W)	Acidified	Number of containers
(1)	11/4	3:00	GW-25								X	X	X			2
(2)	11/4	1:50	GW-27								X		X			2
(3)	11/4	~~3:25~~	GW-28								X		X			2
(4)	11/4	4:00	GW-26								X		X			2

REMARKS — Additional comments:

Hold all samples — not acidified. 7 day holding time!

Sample #2 (GW-27) taken off Hold by Cheri 11/7/94 (KD)

Sample #4 (GW-26) also taken off Hold (KD) 11-7-94

Turnaround time:

Results to: Cheri Page

Total No. of containers: 8

Relinquished by: CHERI PAGE	Date: 11/4	Relinquished by:	Date:	Relinquished by:	Date:
Signature: Cheri Page		Signature: Eddie Wehr		Signature:	
Printed name:		Printed name: Eddie Wehr		Printed name:	
Company: Geomatrix		Company: Anametrix		Company:	
Received by: Eddie Wehr	Time: 4:20	Received by: CALVIN ROBINSON	Time:	Received by:	Time:
Signature: Eddie Wehr		Signature: Calvin Robinson		Signature:	
Printed name:		Printed name:		Printed name:	
Company: Anametrix		Company: ANAMETRIX		Company:	

Method of shipment: Lab P/U

Laboratory comments and Log No.:

ALL SAMPLES COLD
PROPER CONTAINER
NO BUBBLES.

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400

Inchcape Testing Services
Anametrix Laboratories

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

MS. CHERI PAGE
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9411071
Date Received : 11/05/94
Project ID : 2530.02
Purchase Order: N/A

The following samples were received at Anametrix for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9411071- 1	GW-22
9411071- 2	GW-24
9411071- 3	GW-27
9411071- 4	GW-26

This report is organized in sections according to the specific Anametrix laboratory group which performed the analysis(es) and generated the data.

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

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

If you have any further questions or comments on this report, please call your project manager as soon as possible. Thank you for using Incape Testing Services.

Todd Stringer for
Susan Kraska Yeager
Laboratory Director

11-8-94
Date

Kilma Desai
Project Manager

This report consists of 16 pages.

ANAMETRIX REPORT DESCRIPTION
GC

Organic Analysis Data Sheets (OADS)

OADS forms contain tabulated results for target compounds. The OADS are grouped by method and, within each method, organized sequentially in order of increasing Anametrix ID number.

Surrogate Recovery Summary (SRS)

SRS forms contain quality assurance data. An SRS form will be printed for each method, if the method requires surrogate compounds. They will list surrogate percent recoveries for all samples and any method blanks. Any surrogate recovery outside the established limits will be flagged with an "*", and the total number of surrogates outside the limits will be listed in the column labelled "Total Out".

Matrix Spike Recovery Form (MSR)

MSR forms contain quality assurance data. They summarize percent recovery and relative percent difference information for matrix spikes and matrix spike duplicates. This information is a statement of both accuracy and precision. Any percent recovery or relative percent difference outside established limits will be flagged with an "*", and the total number outside the limits will be listed at the bottom of the page. Not all reports will contain an MSR form.

Qualifiers

Anametrix uses several data qualifiers (Q) in its report forms. These qualifiers give additional information on the compounds reported. They should help a data reviewer to verify the integrity of the analytical results. The following is a list of qualifiers and their meanings:

- U - Indicates that the compound was analyzed for, but was not detected at or above the specified reporting limit.
- B - Indicates that the compound was detected in the associated method blank.
- J - Indicates that the compound was detected at an amount below the specified reporting limit. Consequently, the amount should be considered an approximate value. Tentatively identified compounds will always have a "J" qualifier because they are not included in the instrument calibration.
- E - Indicates that the reported amount exceeded the linear range of the instrument calibration.
- D - Indicates that the compound was detected in an analysis performed at a secondary dilution.

Absence of a qualifier indicates that the compound was detected at a concentration at or above the specified reporting limit.

REPORTING CONVENTIONS

- Due to a size limitation in our data processing step, only the first eight (8) characters of your project ID and sample ID will be printed on the report forms. However, the report cover letter and report summary pages display up to twenty (20) characters of your project and sample IDs.
- Amounts reported are gross values, i.e., not corrected for method blank contamination.

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

MS. CHERI PAGE
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9411071
Date Received : 11/05/94
Project ID : 2530.02
Purchase Order: N/A
Department : GC
Sub-Department: VOA

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9411071- 1	GW-22	WATER	11/04/94	8010
9411071- 2	GW-24	WATER	11/05/94	8010
9411071- 3	GW-27	WATER	11/04/94	8010
9411071- 4	GW-26	WATER	11/04/94	8010

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

MS. CHERI PAGE
GEOMATRIX CONSULTANTS INC.
100 PINE STREET, SUITE 1000
SAN FRANCISCO, CA 94111

Workorder # : 9411071
Date Received : 11/05/94
Project ID : 2530.02
Purchase Order: N/A
Department : GC
Sub-Department: VOA

QA/QC SUMMARY :

- The amount of methylene chloride reported for sample GW-22 is artificially magnified by the dilution factor and is within normal laboratory background levels in the diluted sample.
- Samples were analyzed at a dilution due to foaminess.

M. Hairston 11/8/94
Department Supervisor Date

Chemist 11/8/94
Date

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 8010
ANAMETRIX, INC. (408)432-8192

bject ID : 2530.02
ample ID : GW-22
atrix : WATER
te Sampled :11/ 4/94
te Analyzed :11/ 7/94
nstrument ID : AD15

Anametrix ID : 9411071-01
Analyst : [illegible]
Supervisor : [illegible]

Dilution Factor : 10.0
Conc. Units : ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
75-71-8	Dichlorodifluoromethane	10.	ND	U
74-87-3	Chloromethane	10.	ND	U
75-01-4	Vinyl chloride	5.0	ND	U
74-83-9	Bromomethane	5.0	ND	U
75-00-3	Chloroethane	5.0	ND	U
75-69-4	Trichlorofluoromethane	5.0	ND	U
76-13-1	Trichlorotrifluoroethane	5.0	ND	U
75-35-4	1,1-Dichloroethene	5.0	ND	U
75-09-2	Methylene chloride	10.	17.	
156-60-5	trans-1,2-Dichloroethene	5.0	ND	U
75-34-3	1,1-Dichloroethane	5.0	ND	U
156-59-2	cis-1,2-Dichloroethene	5.0	ND	U
67-66-3	Chloroform	5.0	ND	U
71-55-6	1,1,1-Trichloroethane	5.0	ND	U
56-23-5	Carbon tetrachloride	5.0	ND	U
107-06-2	1,2-Dichloroethane	5.0	ND	U
79-01-6	Trichloroethene	5.0	ND	U
78-87-5	1,2-Dichloropropane	5.0	ND	U
75-27-4	Bromodichloromethane	5.0	ND	U
110-75-8	2-Chloroethylvinylether	10.	ND	U
10061-01-5	cis-1,3-Dichloropropene	5.0	ND	U
10061-02-6	trans-1,3-Dichloropropene	5.0	ND	U
79-00-5	1,1,2-Trichloroethane	5.0	ND	U
127-18-4	Tetrachloroethene	5.0	ND	U
124-48-1	Dibromochloromethane	5.0	ND	U
108-90-7	Chlorobenzene	5.0	ND	U
75-25-2	Bromoform	5.0	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	ND	U
541-73-1	1,3-Dichlorobenzene	5.0	ND	U
106-46-7	1,4-Dichlorobenzene	5.0	ND	U
95-50-1	1,2-Dichlorobenzene	5.0	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 8010
ANAMETRIX, INC. (408)432-8192

roject ID : 2530.02
ample ID : GW-24
atrix : WATER
ate Sampled :11/ 5/94
ate Analyzed :11/ 7/94
nstrument ID : AD15

Anametrix ID : 9411071-02
Analyst : [illegible]
Supervisor : [illegible]

Dilution Factor : 10.0
Conc. Units : ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
75-71-8	Dichlorodifluoromethane	10.	ND	U
74-87-3	Chloromethane	10.	ND	U
75-01-4	Vinyl chloride	5.0	ND	U
74-83-9	Bromomethane	5.0	ND	U
75-00-3	Chloroethane	5.0	ND	U
75-69-4	Trichlorofluoromethane	5.0	ND	U
76-13-1	Trichlorotrifluoroethane	5.0	ND	U
75-35-4	1,1-Dichloroethene	5.0	ND	U
75-09-2	Methylene chloride	10.	ND	U
156-60-5	trans-1,2-Dichloroethene	5.0	ND	U
75-34-3	1,1-Dichloroethane	5.0	ND	U
156-59-2	cis-1,2-Dichloroethene	5.0	ND	U
67-66-3	Chloroform	5.0	ND	U
71-55-6	1,1,1-Trichloroethane	5.0	ND	U
56-23-5	Carbon tetrachloride	5.0	ND	U
107-06-2	1,2-Dichloroethane	5.0	ND	U
79-01-6	Trichloroethene	5.0	ND	U
78-87-5	1,2-Dichloropropane	5.0	ND	U
75-27-4	Bromodichloromethane	5.0	ND	U
110-75-8	2-Chloroethylvinylether	10.	ND	U
10061-01-5	cis-1,3-Dichloropropene	5.0	ND	U
10061-02-6	trans-1,3-Dichloropropene	5.0	ND	U
79-00-5	1,1,2-Trichloroethane	5.0	ND	U
127-18-4	Tetrachloroethene	5.0	ND	U
124-48-1	Dibromochloromethane	5.0	ND	U
108-90-7	Chlorobenzene	5.0	ND	U
75-25-2	Bromoform	5.0	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	ND	U
541-73-1	1,3-Dichlorobenzene	5.0	ND	U
106-46-7	1,4-Dichlorobenzene	5.0	ND	U
95-50-1	1,2-Dichlorobenzene	5.0	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 8010
ANAMETRIX, INC. (408)432-8192

oject ID : 2530.02
ample ID : GW-27
atrix : WATER
te Sampled :11/ 4/94
te Analyzed :11/ 7/94
nstrument ID : AD15

Anametrix ID : 9411071-03
Analyst :
Supervisor :

Dilution Factor : 10.0
Conc. Units : ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
75-71-8	Dichlorodifluoromethane	10.	ND	U
74-87-3	Chloromethane	10.	ND	U
75-01-4	Vinyl chloride	5.0	ND	U
74-83-9	Bromomethane	5.0	ND	U
75-00-3	Chloroethane	5.0	ND	U
75-69-4	Trichlorofluoromethane	5.0	ND	U
76-13-1	Trichlorotrifluoroethane	5.0	ND	U
75-35-4	1,1-Dichloroethene	5.0	ND	U
75-09-2	Methylene chloride	10.	ND	U
156-60-5	trans-1,2-Dichloroethene	5.0	ND	U
75-34-3	1,1-Dichloroethane	5.0	ND	U
156-59-2	cis-1,2-Dichloroethene	5.0	ND	U
67-66-3	Chloroform	5.0	ND	U
71-55-6	1,1,1-Trichloroethane	5.0	ND	U
56-23-5	Carbon tetrachloride	5.0	ND	U
107-06-2	1,2-Dichloroethane	5.0	ND	U
79-01-6	Trichloroethene	5.0	ND	U
78-87-5	1,2-Dichloropropane	5.0	ND	U
75-27-4	Bromodichloromethane	5.0	ND	U
110-75-8	2-Chloroethylvinylether	10.	ND	U
10061-01-5	cis-1,3-Dichloropropene	5.0	ND	U
10061-02-6	trans-1,3-Dichloropropene	5.0	ND	U
79-00-5	1,1,2-Trichloroethane	5.0	ND	U
127-18-4	Tetrachloroethene	5.0	ND	U
124-48-1	Dibromochloromethane	5.0	ND	U
108-90-7	Chlorobenzene	5.0	ND	U
75-25-2	Bromoform	5.0	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	ND	U
541-73-1	1,3-Dichlorobenzene	5.0	ND	U
106-46-7	1,4-Dichlorobenzene	5.0	ND	U
95-50-1	1,2-Dichlorobenzene	5.0	ND	U

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 8010
ANAMETRIX, INC. (408)432-8192

Project ID	: 2530.0	Anametrix ID	: BN0703I1
Sample ID	: VBLKA2	Analyst	: TS
Matrix	: WATER	Supervisor	:
Date Sampled	: 0/ 0/ 0		
Date Analyzed	:11/ 7/94	Dilution Factor	: 1.0
Instrument ID	: AD15	Conc. Units	: ug/L

CAS No.	COMPOUND NAME	REPORTING LIMIT	AMOUNT DETECTED	Q
75-71-8	Dichlorodifluoromethane	1.0	ND	U
74-87-3	Chloromethane	1.0	ND	U
75-01-4	Vinyl chloride	.50	ND	U
74-83-9	Bromomethane	.50	ND	U
75-00-3	Chloroethane	.50	ND	U
75-69-4	Trichlorofluoromethane	.50	ND	U
76-13-1	Trichlorotrifluoroethane	.50	ND	U
75-35-4	1,1-Dichloroethene	.50	ND	U
75-09-2	Methylene chloride	1.0	ND	U
156-60-5	trans-1,2-Dichloroethene	.50	ND	U
75-34-3	1,1-Dichloroethane	.50	ND	U
156-59-2	cis-1,2-Dichloroethene	.50	ND	U
67-66-3	Chloroform	.50	ND	U
71-55-6	1,1,1-Trichloroethane	.50	ND	U
56-23-5	Carbon tetrachloride	.50	ND	U
107-06-2	1,2-Dichloroethane	.50	ND	U
79-01-6	Trichloroethene	.50	ND	U
78-87-5	1,2-Dichloropropane	.50	ND	U
75-27-4	Bromodichloromethane	.50	ND	U
110-75-8	2-Chloroethylvinylether	1.0	ND	U
10061-01-5	cis-1,3-Dichloropropene	.50	ND	U
10061-02-6	trans-1,3-Dichloropropene	.50	ND	U
79-00-5	1,1,2-Trichloroethane	.50	ND	U
127-18-4	Tetrachloroethene	.50	ND	U
124-48-1	Dibromochloromethane	.50	ND	U
108-90-7	Chlorobenzene	.50	ND	U
75-25-2	Bromoform	.50	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	.50	ND	U
541-73-1	1,3-Dichlorobenzene	.50	ND	U
106-46-7	1,4-Dichlorobenzene	.50	ND	U
95-50-1	1,2-Dichlorobenzene	.50	ND	U

SURROGATE RECOVERY SUMMARY -- EPA METHOD 8010
ANAMETRIX, INC. (408)432-8192

Project ID : 2530.02
Matrix : LIQUID

Anametrix ID : 9411071
Analyst : VJ
Supervisor : sl

	SAMPLE ID	SU1	SU2	SU3
1	VBLKA1	80	81	80
2	GW-22	84	85	86
3	GW-24	84	82	84
4	GW-27	86	84	88
5	VBLKA2	84	85	78
6	GW-26	85	86	85
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

	QC LIMITS
SU1 = Bromochloromethane	(56- 99)
SU2 = 1-Chloro-2-fluorobenze	(73-110)
SU3 = 2-Bromochlorobenzene	(65-108)

* Values outside of Anametrix QC limits

EPA METHOD 601/8010
INCHCAPE TESTING SERVICES - ANAMETRIX
(408) 432-8192

LABORATORY CONTROL SAMPLE

Sample ID: LAB CONTROL SAMPLE
Batch: 11071
Matrix: WATER
Date Analyzed: 11/7/94

Laboratory ID: MN070111
Instrument ID: AD15
Concentration Units: ug/L
Analyst: TS
Supervisor: DL

COMPOUND NAME	SPIKE AMOUNT	LCS REC	%REC LCS	%RECOVERY LIMITS
Trichlorotrifluoroethane	10	10.8	108%	65-116
1,1-Dichloroethene	10	11.1	111%	64-125
trans-1,2-Dichloroethene	10	11.2	112%	77-113
1,1-Dichloroethane	10	11.5	115%	85-129
cis-1,2-Dichloroethene	10	12.3	123%	78-130
1,1,1-Trichloroethane	10	11.3	113%	83-125
Trichloroethene	10	11.3	113%	76-124
Tetrachloroethene	10	10.9	109%	80-118
Chlorobenzene	10	9.8	98%	81-130
1,3-Dichlorobenzene	10	10.6	106%	82-115
1,4-Dichlorobenzene	10	10.6	106%	85-122
1,2-Dichlorobenzene	10	10.5	105%	86-122

Quality control limits are based on data generated by ITS-Anametrix Laboratories.

Inchcape Testing Services
Anametrix Laboratories

SAMPLE RECEIVING CHECKLIST

WORKORDER NUMBER: 9411071 CLIENT PROJECT ID: 2530.02

COOLER

Shipping slip (airbill, etc.) present?	YES	NO	(N/A)
If YES, enter carrier name and airbill # : _____			
Custody Seal on the outside of cooler?	YES	NO	(N/A)
Condition: INTACT ____ BROKEN ____			
Temperature of sample (s) within range?	(YES)	NO	N/A
List temperature of cooler (s): 4°C			

SAMPLES

Chain of custody seal present for each container?	YES	NO	(N/A)
Condition: INTACT ____ BROKEN ____			
Samples arrived within holding time?	(YES)	NO	N/A
Samples in proper containers for methods requested?	(YES)	NO	
Condition of containers: INTACT ✓ BROKEN ____			
If NO, were samples transferred to proper container? ____			
Were VOA containers received with zero headspace?	(YES)	NO	N/A
If NO, was it noted on the chain of custody? ____			
Were container labels complete? (ID, date, time preservative, etc.)	(YES)	NO	
Were samples preserved with the proper preservative?	YES	NO	(N/A)
If NO, was the proper preservative added at time of receipt? ____			
pH check of samples required at time of receipt?	YES	(NO)	
If YES, pH checked and recorded by: ____			
Sufficient amount of sample received for methods requested?	(YES)	NO	
If NO, has the client or lab project manager been notified? ____			
Field blanks received with sample batch? # of Sets: ____	YES	NO	(N/A)
Trip blanks received with sample batch? # of Sets: ____	YES	NO	(N/A)

CHAIN OF CUSTODY

Chain of custody received with samples?	(YES)	NO
Has it been filled out completely and in ink?	(YES)	NO
Sample ID's on chain of custody agree with container labels?	(YES)	NO
Number of containers indicated on chain of custody agree with number received?	(YES)	NO
Analysis methods clearly specified?	(YES)	NO
Sampling date and time indicated?	(YES)	NO
Proper signatures of sampler, courier, sample custodian in appropriate place? with time and date?	(YES)	NO
Turnaround time? REGULAR ____ RUSH ✓		

Any NO response and/or any "BROKEN" that was checked must be detailed in the Corrective Action Form.

Sample Custodian: CN Date: 11-05-94 Project Manager: KD Date: 11/7/94

9411071

Chain-of-Custody Record

№ 5162

Date: 11/4/94

Page 1 of 1

Project No.: 2530.02

Samplers (Signatures): Cheri Page

	Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	Cooled	Soil (S) or water (W)	Acidified	Number of containers
1)	11/4	4.35	GW-22	X							X	W		2

ANALYSES

REMARKS

Additional comments

no acid - 7 day holding

Turnaround time: 48-hour

Results to: Cheri Page

Total No. of containers: 2

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:
Signature: Cheri Page	11/4	Received Signature: Calvin Robinson	11/5/94 11:45	Signature:	
Printed name: Cheri Page	5:55	Printed name: CALVIN ROBINSON		Printed name:	
Company: Geomatrix		Company: HRAMETRIX		Company:	
Received by:	Time:	Received by:	Time:	Received by:	Time:
Signature:		Signature:		Signature:	
Printed name:		Printed name:		Printed name:	
Company:		Company:		Company:	

Method of shipment: lab P/U

Laboratory comments and Log No.:

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400

Chain-of-Custody Record

№ 6231

Date: 11/5/94

Page 1 of 1

Project No.: 2530.02

Samplers (Signatures): R. David Pearson

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	Cooled	Soil (S) or water (W)	Acidified	Number of containers
(2) 11/5	0830	GW 24	X							X	W		2

ANALYSES

REMARKS

Additional comments

no acid - 7 day holding

Turnaround time: 48 hours

Results to: Cheri Page

Total No. of containers: 2

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:
RDP	11/5/94				
Signature: R David Pearson		Signature:		Signature:	
Printed name: R David Pearson		Printed name:		Printed name:	
Company: Geomatrix		Company:		Company:	
Received by:	**Time:**	**Received by:**	**Time:**	**Received by:**	**Time:**
Calvin Robinson	1147				
Signature: CALVIN ROBINSON		Signature:		Signature:	
Printed name: GEOMATRIX		Printed name:		Printed name:	
Company:		Company:		Company:	

Method of shipment: hand

Laboratory comments and Log No.:

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA 94111
(415) 434-9400

9411061

Chain-of-Custody Record

№ 5161

Date: 11/4/94

Page 1 of 1

Project No.: 2530.02

Samplers (Signatures): Cheri Page

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	HOLD	Cooled	Soil (S) or water (W)	Acidified	Number of containers
① 11/4	3:00	GW-25								X	X			2
② 11/4	4:50	GW-27	X							X	X			2
③ 11/4	~~3:35~~	GW-28								X	X			2
④ 11/4	4:00	GW-26	X							X	X			2

REMARKS

Additional comments

Hold all samples — not acidified. 7 day holding time!

sample #2 (GW-27) taken off Hold by Cheri 11/7/94 (WD)

sample #4 (GW-26) also taken off Hold (KD) 11-7-94

Turnaround time:

Results to: Cheri Page

Total No. of containers: 8

Relinquished by: CHERI PAGE	Date: 11/4	Relinquished by:	Date:	Relinquished by:	Date:
Signature: Cheri Page		Signature: [signature]		Signature:	
Printed name:		Printed name: Eddie Wehri		Printed name:	
Company: Geomatrix		Company: Anametrix		Company:	
Received by: Eddie Wehri	Time: 4:20	Received by: CALVIN ROBINSON	Time:	Received by:	Time:
Signature: [signature]		Signature: Calvin Robinson		Signature:	
Printed name:		Printed name:		Printed name:	
Company: Anametrix		Company: ANAMETRIX		Company:	

Method of shipment: Lab P/U

Laboratory comments and Log No.:

ALL SAMPLES COLD
PROPER CONTAINER
NO BUBBLES.

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400

GEOMATRIX

APPENDIX E

WELL MW-10 GROUNDWATER SAMPLES– ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS: MARCH AND JUNE 1995

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

GEOMATRIX CONSULTANTS
100 PINE ST., SUITE 1000
SAN FRANCISCO, CA 94111

ATTN: CHERI PAGE
CLIENT PROJ. ID: 2530

C.O.C. NUMBER: 6251

REPORT DATE: 04/05/95

DATE(S) SAMPLED: 03/20/95

DATE RECEIVED: 03/20/95

AEN WORK ORDER: 9503326

PROJECT SUMMARY:

On March 20, 1995, this laboratory received 2 water sample(s).

Client requested sample(s) be analyzed for inorganic and organic parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

GEOMATRIX CONSULTANTS

SAMPLE ID: MW-10
AEN LAB NO: 9503326-01
AEN WORK ORDER: 9503326
CLIENT PROJ. ID: 2530

DATE SAMPLED: 03/20/95
DATE RECEIVED: 03/20/95
REPORT DATE: 04/05/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	**EPA 8010**				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	03/29/95
Bromoform	75-25-2	ND	0.5	ug/L	03/29/95
Bromomethane	74-83-9	ND	2	ug/L	03/29/95
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	03/29/95
Chlorobenzene	108-90-7	ND	0.5	ug/L	03/29/95
Chloroethane	75-00-3	ND	2	ug/L	03/29/95
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	03/29/95
Chloroform	67-66-3	ND	0.5	ug/L	03/29/95
Chloromethane	74-87-3	ND	2	ug/L	03/29/95
Dibromochloromethane	124-48-1	ND	0.5	ug/L	03/29/95
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	03/29/95
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	03/29/95
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	03/29/95
Dichlorodifluoromethane	75-71-8	ND	2	ug/L	03/29/95
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	03/29/95
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	03/29/95
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	03/29/95
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	03/29/95
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	03/29/95
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	03/29/95
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	03/29/95
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	03/29/95
Methylene Chloride	75-09-2	ND	2	ug/L	03/29/95
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	03/29/95
Tetrachloroethene	127-18-4	ND	0.5	ug/L	03/29/95
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	03/29/95
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	03/29/95
Trichloroethene	79-01-6	ND	0.5	ug/L	03/29/95
Trichlorofluoromethane	75-69-4	ND	2	ug/L	03/29/95
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	03/29/95
Vinyl Chloride	75-01-4	ND	2	ug/L	03/29/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: MW-10
AEN LAB NO: 9503326-02
AEN WORK ORDER: 9503326
CLIENT PROJ. ID: 2530

DATE SAMPLED: 03/20/95
DATE RECEIVED: 03/20/95
REPORT DATE: 04/05/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
Total Dissolved Solids	EPA 160.1	3,600 *	10	mg/L	03/27/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9503326

CLIENT PROJECT ID: 2530

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 8010

AEN JOB NO: 9503326
AEN LAB NO: 0329-BLANK
DATE ANALYZED: 03/29/95
FILE#: G032828
INSTRUMENT: G

Method Blank

Analyte	CAS #	Results (ug/L)	Reporting Limit (ug/L)
Bromodichloromethane	75-27-4	ND	0.5
Bromoform	75-25-2	ND	0.5
Bromomethane	74-83-9	ND	2
Carbon Tetrachloride	56-23-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.5
Chloroethane	75-00-3	ND	2
2-Chloroethyl Vinyl Ether	100-75-8	ND	0.5
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	2
Dibromochloromethane	124-48-1	ND	0.5
1,2-Dichlorobenzene	95-50-1	ND	0.5
1,3-Dichlorobenzene	541-73-1	ND	0.5
1,4-Dichlorobenzene	106-46-7	ND	0.5
Dichlorodifluoromethane	75-71-8	ND	2
1,1-Dichloroethane	75-34-3	ND	0.5
1,2-Dichloroethane	107-06-2	ND	0.5
1,1-Dichloroethene	75-35-4	ND	0.5
cis-1,2-Dichloroethene	156-59-2	ND	0.5
trans-1,2-Dichloroethene	156-60-5	ND	0.5
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-Dichloropropene	10061-02-6	ND	0.5
Methylene Chloride	75-09-2	ND	2
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.5
Trichloroethene	79-01-6	ND	0.5
Trichlorofluoromethane	75-69-4	ND	2
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ND	0.5
Vinyl Chloride	75-01-4	ND	2

QUALITY CONTROL DATA

METHOD: EPA 8010

AEN JOB NO: 9503326
INSTRUMENT: G
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery: Bromochloro-methane	Percent Recovery: 1-Bromo-3-chloro-propane
03/29/95	MW-10	01	98	102
QC Limits:			78-153	74-143

DATE ANALYZED: 03/31/95
SAMPLE SPIKED: 9503326-01
INSTRUMENT: G

Matrix Spike Recovery Summary

Analyte	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD	QC Limits: Percent Recovery	QC Limits: RPD
1,1-Dichloroethene	50.0	ND	51.7	54.5	106	5	40-130	18
Trichloroethene	50.0	ND	55.2	58.1	113	5	67-136	17
Chlorobenzene	50.0	ND	47.1	50.1	97	6	59-123	15

QUALITY CONTROL DATA

METHOD: EPA 8010

AEN JOB NO: 9503326
DATE ANALYZED: 03/28/95
INSTRUMENT: G
MATRIX: WATER

Laboratory Control Sample

Analyte	Spike Added (ug/L)	LCS Result (ug/L)	Percent Recovery	QC Limits Percent Recovery
1,1-Dichloroethene	50.0	39.9	80	60-115
Trichloroethene	50.0	44.6	89	64-137
Chlorobenzene	50.0	38.8	78	54-122

*** END OF REPORT ***

R3-3

9505526

Chain-of-Custody Record

6251

Date: 3/20/95

Page 1 of 1

Project No.: 2530

Samplers (Signatures): Charles Rome, Nathaniel Taylor

Date	Time	Sample Number
3/20/95	1355	MW-10
3/20/95	1415	MW-#10

ANALYSES

EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX		MS/MSD	TDC
X								X	
X									✓

REMARKS

Cooled	Soil (S) or water (W)	Acidified	Number of containers
Y	W	N	6
Y	W	N	3

Additional comments

Run a matrix spike/matrix spike duplicate on sample MW-10

COC Seal present upon arrival LLP

Turnaround time: Standard

Results to: Cheri Page

Total No. of containers: 9

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:
Signature: Charles Rome	3/20/95	Signature:	3/20/95	Signature:	
Printed name: Charles Rome		Printed name:		Printed name:	
Company: Geomatrix		Company:		Company:	
Received by:	**Time:**	**Received by:**	**Time:**	**Received by:**	**Time:**
Signature:	1500	Signature: Lori L. Pruitt	1805	Signature:	
Printed name:		Printed name: ALOV		Printed name:	
Company:		Company:		Company:	

Method of shipment: Pick up

Laboratory comments and Log No.:

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

GEOMATRIX CONSULTANTS
100 PINE ST., SUITE 1000
SAN FRANCISCO, CA 94111

ATTN: CHERI PAGE
CLIENT PROJ. ID: 2530.02

C.O.C. NUMBER: 5492

REPORT DATE: 07/13/95

DATE(S) SAMPLED: 06/29/95

DATE RECEIVED: 06/29/95

AEN WORK ORDER: 9506406

PROJECT SUMMARY:

On June 29, 1995, this laboratory received 4 water sample(s).

Client requested 2 sample(s) be analyzed for inorganic and organic parameters; two samples were placed on hold. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

GEOMATRIX CONSULTANTS

SAMPLE ID: MW-10
AEN LAB NO: 9506406-02
AEN WORK ORDER: 9506406
CLIENT PROJ. ID: 2530.02

DATE SAMPLED: 06/29/95
DATE RECEIVED: 06/29/95
REPORT DATE: 07/13/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
General Minerals					
Bicarbonate Alkalinity	EPA 310.1	110 *	2	mg CaCO3/L	07/11/95
Carbonate Alkalinity	EPA 310.1	ND	2	mg CaCO3/L	07/11/95
Hydroxide Alkalinity	EPA 310.1	ND	2	mg CaCO3/L	07/11/95
Calcium	EPA 6010	110 *	0.05	mg/L	07/03/95
Chloride	EPA 300	130 *	0.5	mg/L	07/11/95
Copper	EPA 6010	ND	0.01	mg/L	07/03/95
Iron	EPA 6010	150 *	0.05	mg/L	07/11/95
Magnesium	EPA 6010	92 *	0.04	mg/L	07/03/95
Manganese	EPA 6010	7.3 *	0.005	mg/L	07/03/95
pH	EPA 9040	5.9	NA	std. units	06/29/95
Sodium	EPA 6010	160 *	0.1	mg/L	07/03/95
Sulfate	EPA 300	1,000 *	0.5	mg/L	07/11/95
Conductivity	EPA 120.1	2,300 *	20	umhos/cm	07/10/95
Total Dissolved Solids	EPA 160.1	1,800 *	10	mg/L	06/30/95
Hardness	SM 2340B	650 *	1	mg CaCO3/L	07/03/95
Zinc	EPA 6010	0.05 *	0.01	mg/L	07/03/95
EPA 8010 - Water matrix	**EPA 8010**				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	07/07/95
Bromoform	75-25-2	ND	0.5	ug/L	07/07/95
Bromomethane	74-83-9	ND	2	ug/L	07/07/95
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	07/07/95
Chlorobenzene	108-90-7	ND	0.5	ug/L	07/07/95
Chloroethane	75-00-3	ND	2	ug/L	07/07/95
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	07/07/95
Chloroform	67-66-3	ND	0.5	ug/L	07/07/95
Chloromethane	74-87-3	ND	2	ug/L	07/07/95
Dibromochloromethane	124-48-1	ND	0.5	ug/L	07/07/95
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	07/07/95
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	07/07/95
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	07/07/95
Dichlorodifluoromethane	75-71-8	ND	2	ug/L	07/07/95
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	07/07/95
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	07/07/95
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	07/07/95
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	07/07/95
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	07/07/95
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	07/07/95
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	07/07/95
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	07/07/95
Methylene Chloride	75-09-2	ND	2	ug/L	07/07/95

GEOMATRIX CONSULTANTS

SAMPLE ID: MW-10
AEN LAB NO: 9506406-02
AEN WORK ORDER: 9506406
CLIENT PROJ. ID: 2530.02

DATE SAMPLED: 06/29/95
DATE RECEIVED: 06/29/95
REPORT DATE: 07/13/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	07/07/95
Tetrachloroethene	127-18-4	ND	0.5	ug/L	07/07/95
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	07/07/95
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	07/07/95
Trichloroethene	79-01-6	ND	0.5	ug/L	07/07/95
Trichlorofluoromethane	75-69-4	ND	2	ug/L	07/07/95
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	07/07/95
Vinyl Chloride	75-01-4	ND	2	ug/L	07/07/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: J-1 (mw-10 duplicate) cyp
AEN LAB NO: 9506406-03
AEN WORK ORDER: 9506406
CLIENT PROJ. ID: 2530.02

DATE SAMPLED: 06/29/95
DATE RECEIVED: 06/29/95
REPORT DATE: 07/13/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8010 - Water matrix	EPA 8010				
Bromodichloromethane	75-27-4	ND	0.5	ug/L	07/07/95
Bromoform	75-25-2	ND	0.5	ug/L	07/07/95
Bromomethane	74-83-9	ND	2	ug/L	07/07/95
Carbon Tetrachloride	56-23-5	ND	0.5	ug/L	07/07/95
Chlorobenzene	108-90-7	ND	0.5	ug/L	07/07/95
Chloroethane	75-00-3	ND	2	ug/L	07/07/95
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5	ug/L	07/07/95
Chloroform	67-66-3	ND	0.5	ug/L	07/07/95
Chloromethane	74-87-3	ND	2	ug/L	07/07/95
Dibromochloromethane	124-48-1	ND	0.5	ug/L	07/07/95
1,2-Dichlorobenzene	95-50-1	ND	0.5	ug/L	07/07/95
1,3-Dichlorobenzene	541-73-1	ND	0.5	ug/L	07/07/95
1,4-Dichlorobenzene	106-46-7	ND	0.5	ug/L	07/07/95
Dichlorodifluoromethane	75-71-8	ND	2	ug/L	07/07/95
1,1-Dichloroethane	75-34-3	ND	0.5	ug/L	07/07/95
1,2-Dichloroethane	107-06-2	ND	0.5	ug/L	07/07/95
1,1-Dichloroethene	75-35-4	ND	0.5	ug/L	07/07/95
cis-1,2-Dichloroethene	156-59-2	ND	0.5	ug/L	07/07/95
trans-1,2-Dichloroethene	156-60-5	ND	0.5	ug/L	07/07/95
1,2-Dichloropropane	78-87-5	ND	0.5	ug/L	07/07/95
cis-1,3-Dichloropropene	10061-01-5	ND	0.5	ug/L	07/07/95
trans-1,3-Dichloropropene	10061-02-6	ND	0.5	ug/L	07/07/95
Methylene Chloride	75-09-2	ND	2	ug/L	07/07/95
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5	ug/L	07/07/95
Tetrachloroethene	127-18-4	ND	0.5	ug/L	07/07/95
1,1,1-Trichloroethane	71-55-6	ND	0.5	ug/L	07/07/95
1,1,2-Trichloroethane	79-00-5	ND	0.5	ug/L	07/07/95
Trichloroethene	79-01-6	ND	0.5	ug/L	07/07/95
Trichlorofluoromethane	75-69-4	ND	2	ug/L	07/07/95
1,1,2Trichlorotrifluoroethane	76-13-1	ND	0.5	ug/L	07/07/95
Vinyl Chloride	75-01-4	ND	2	ug/L	07/07/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9506406

CLIENT PROJECT ID: 2530.02

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 8010

AEN JOB NO: 9506406
AEN LAB NO: 0706-BLANK
DATE ANALYZED: 07/06/95
INSTRUMENT: I

Method Blank

Analyte	CAS #	Result (ug/L)	Reporting Limit (ug/L)
Bromodichloromethane	75-27-4	ND	0.5
Bromoform	75-25-2	ND	0.5
Bromomethane	74-83-9	ND	2
Carbon Tetrachloride	56-23-5	ND	0.5
Chlorobenzene	108-90-7	ND	0.5
Chloroethane	75-00-3	ND	2
2-Chloroethyl Vinyl Ether	110-75-8	ND	0.5
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	2
Dibromochloromethane	124-48-1	ND	0.5
1,2-Dichlorobenzene	95-50-1	ND	0.5
1,3-Dichlorobenzene	541-73-1	ND	0.5
1,4-Dichlorobenzene	106-46-7	ND	0.5
Dichlorodifluoromethane	75-71-8	ND	2
1,1-Dichloroethane	75-34-3	ND	0.5
1,2-Dichloroethane	107-06-2	ND	0.5
1,1-Dichloroethene	75-35-4	ND	0.5
cis-1,2-Dichloroethene	156-59-2	ND	0.5
trans-1,2-Dichloroethene	156-60-5	ND	0.5
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-Dichloropropene	10061-02-6	ND	0.5
Methylene Chloride	75-09-2	ND	2
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.5
Trichloroethene	79-01-6	ND	0.5
Trichlorofluoromethane	75-69-4	ND	2
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ND	0.5
Vinyl Chloride	75-01-4	ND	2

QUALITY CONTROL DATA

METHOD: EPA 8010

AEN JOB NO: 9506406
INSTRUMENT: I
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery: Bromochloro-methane	Percent Recovery: 1-Bromo-3-chloro-propane
07/07/95	MW-10	02	98	88
07/07/95	J-1	03	110	98
QC Limits:			70-130	70-130

DATE ANALYZED: 07/06/95
SAMPLE SPIKED: LCS
INSTRUMENT: I

Laboratory Control Sample

Analyte	Spike Added (ug/L)	LCS Result (ug/L)	Percent Recovery	QC Limits Percent Recovery
1,1-Dichloroethene	50.0	53.8	107	37-156
Trichloroethene	50.0	54.9	111	54-122
Chlorobenzene	50.0	42.8	86	54-141

QUALITY CONTROL DATA

AEN JOB NO: 9506406
SAMPLE SPIKED: DI WATER
DATE(S) ANALYZED: 07/03-11/95
MATRIX: WATER

Method Spike Recovery Summary

Analyte	Inst./ Method	Spike Conc. (mg/L)	Blank Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Al, Aluminum	ICP/6010	1.0	ND	1.103	1.119	111	1	93-112	5
Ca, Calcium	ICP/6010	10.0	ND	10.46	10.54	105	1	94-110	5
Cu, Copper	ICP/6010	0.125	ND	0.133	0.136	108	2	83-114	5
Fe, Iron	ICP/6010	0.1	ND	0.1209	0.1225	122	1	91-126	9
Mg, Magnesium	ICP/6010	10.0	ND	10.25	10.34	103	1	92-109	5
Mn, Manganese	ICP/6010	0.25	ND	0.281	0.277	112	2	93-114	5
Na, Sodium	ICP/6010	10.0	ND	10.58	10.64	106	1	90-111	6
Zn, Zinc	ICP/6010	0.25	ND	0.2696	0.2721	108	1	92-113	5
Chloride	DIONEX/300	5.0	ND	5.15	5.36	105	4	80-120	15
Sulfate	DIONEX/300	10.0	ND	10.04	9.83	99	2	80-120	15

*** END OF REPORT ***

C-3.5-3
R-3.5-2
9506406

Chain-of-Custody Record

No. 5492

Date: 6/29/95

Page 1 of 1

Project No.: 2530.02

Samplers (Signatures): Nathaniel A. Taylor

	Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	GEN. MINERAL		Hold	Cooled	Soil (S) or water (W)	Acidified	Number of containers
01AC	6/29/95	1300	J-2	X										Y	W	N	3
02AC	6/29/95	1312	MW-10	X							X			Y	W	N	3
03AC	6/29/95	1325	J-1	X										Y	W	N	3
04AB			Trip Blank										✓				

ANALYSES

REMARKS

Additional comments

PLEASE HOLD ~~J-1 AND~~ J-2. NO PRESERVATIVE → 7 DAY HOLDING TIME. Rec but not Listed on COC. LLP.

Turnaround time: STANDARD

Results to: CHERI PAGE

Total No. of containers: 11

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:	Method of shipment:
Signature: Nathaniel A. Taylor	6/29/95	Signature: Michael E. McKellen	6-29-95	Signature:		Laboratory comments and Log No.:
Printed name: NATHANIEL TAYLOR		Printed name:		Printed name:		
Company: GEOMATRIX		Company:		Company:		
Received by:	**Time:**	**Received by:**	**Time:**	**Received by:**	**Time:**	
Signature: Michael E. McKellen	5:15	Signature: Lori L. Pruitt	16:55	Signature:		
Printed name: Michael McKellen		Printed name: AEN		Printed name:		
Company: AEN		Company:		Company:		

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA 94111
(415) 434-9400

NONCONFORMANCE REPORT

COPY

Please record today's DATE: 6-29-95

Circle your DEPT: CS EX GC IN MS QA (SC) Other_____

Please provide ALL the following information:

AEN Proj. # 9506406 Company Geomatrix

Sample ID 04AB Project 2530.02

Analysis 3 Contact Cheri Page

Indicate the REASON for this Nonconformance Report

__Documents incomplete __Missing sample __Sample mislabeled

__Improper preservation __Sample warm __Wrong container

__Sample damaged __Leaking sample __Headspace in VOA

__Insufficient sample __QC recovery out __Positive blank

__Holding time expired X Other (explain):_____

Describe the SITUATION leading to this Nonconformance

* Trip Blank not Listed on COC.

* Client thinks holding time for 8010W is only 7 days - please inform otherwise - DSH

Is it necessary to inform the Client? (Y/N) If so, in the space below write the full name of person contacted:

Cheri Page was notified (verbally/by fax) on

Date/time 6-30-95 11:45 by Robin Byas from AEN.

Describe the CORRECTIVE ACTIONS taken and when.

Sample on HOLD:___ Processed AS IS:___ Sample RERUN:___ RESAMPLED:___

DATE: ./ /1995

- Trip Blank on hold - Let org. know
- Let Client know 14 days for 8010

___Continued on Corrective Action Form.

Please DATE: 6-29-95 and SIGN here: Lisa L. Pruett

The Date: 6-30-95 when the Dept. Manager Robin Byas signed.

The Date: Jun 30 1995 when the QA Manager _____ signed.

Indicate where the NCR is to be routed: CS GM IN OR (QA) SC

NCRFORM.V3 Effective: April 17, 1995

GEOMATRIX

APPENDIX F

SOIL SAMPLE ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS: JANUARY 1994

American Environmental Network

Certificate of Analysis

CDHS Certification: 1172 AIHA Accreditation: 11134

GEOMATRIX CONSULTANTS
100 PINE ST., 10TH FLOOR
SAN FRANCISCO, CA 94111

ATTN: CHERI PAGE

CLIENT PROJ. ID: 2530
C.O.C. NO: 5786

REPORT DATE: 02/01/94

DATE SAMPLED: 01/20/94

DATE RECEIVED: 01/21/94

AEN JOB NO: 9401204

PROJECT SUMMARY:

On January 21, 1994, this laboratory received eight (8) soil samples.

Client requested samples be composited into two (2) samples and be analyzed for organic parameters. Sample chromatograms are included with this report. Sample identification, methodologies, results and dates analyzed are summarized on the following pages.

All laboratory quality control parameters were found to be within established limits. Batch QC data is included at the end of this report.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
General Manager

GEOMATRIX CONSULTANTS

SAMPLE ID: P1-2.5,P3-2,B1-2,B2-2
AEN LAB NO: 9401204-09
AEN WORK ORDER: 9401204
CLIENT PROJ. ID: 2530

DATE SAMPLED: 01/20/94
DATE RECEIVED: 01/21/94
REPORT DATE: 02/01/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	5	ug/kg	01/25/94
Toluene	108-88-3	ND	5	ug/kg	01/25/94
Ethylbenzene	100-41-4	ND	5	ug/kg	01/25/94
Xylenes, Total	1330-20-7	ND	5	ug/kg	01/25/94
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	01/25/94
#Extraction for Diesel/Oil	**EPA 3550**	-		Extrn Date	01/24/94
TPH as Diesel	**GC-FID**	ND	10	mg/kg	01/28/94
TPH as Oil	**GC-FID**	610 *	5	mg/kg	01/28/94

ND = Not detected
* = Indicates value above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: P1-6,P3-4.5,B1-6,B2-6
AEN LAB NO: 9401204-10
AEN WORK ORDER: 9401204
CLIENT PROJ. ID: 2530

DATE SAMPLED: 01/20/94
DATE RECEIVED: 01/21/94
REPORT DATE: 02/01/94

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	5	ug/kg	01/25/94
Toluene	108-88-3	ND	5	ug/kg	01/25/94
Ethylbenzene	100-41-4	ND	5	ug/kg	01/25/94
Xylenes, Total	1330-20-7	ND	5	ug/kg	01/25/94
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	01/25/94
#Extraction for Diesel/Oil	**EPA 3550**	-		Extrn Date	01/24/94
TPH as Diesel	**GC-FID**	5 *	1	mg/kg	01/25/94
TPH as Oil	**GC-FID**	20 *	5	mg/kg	01/25/94

ND = Not detected
* = Indicates value above reporting limit

QUALITY CONTROL DATA

DATE EXTRACTED: 01/21/94
DATE ANALYZED: 01/22/94
CLIENT PROJ. ID: 2530

AEN JOB NO: 9401204
SAMPLE SPIKED: LCS
INSTRUMENT: C

LABORATORY CONTROL SAMPLE
TPH EXTRACTABLE SOILS
METHOD: EPA 3550 GCFID

ANALYTE	Spike Added (mg/kg)	Percent Recovery
Diesel	40.4	98

CURRENT QC LIMITS

Analyte	Percent Recovery
Diesel	(44-105)

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

QUALITY CONTROL DATA

CLIENT PROJ. ID: 2530

AEN JOB NO: 9401204

INSTRUMENT: H

SURROGATE STANDARD RECOVERY SUMMARY
METHOD: EPA 8020, 5030 GCFID
(SOIL MATRIX)

Date Analyzed	SAMPLE IDENTIFICATION Client Id.	Lab Id.	SURROGATE RECOVERY (PERCENT) Fluorobenzene
01/25/94	P1-2.5,P3-2.0,B1-2.0,B2-2.0	01	107
01/25/94	P1-6.0,P3-4.5,B1-6.0,B2-6.0	02	110

CURRENT QC LIMITS

ANALYTE	PERCENT RECOVERY
Fluorobenzene	(70-115)

QUALITY CONTROL DATA

DATE ANALYZED: 01/25/94
SAMPLE SPIKED: 9401242-03
CLIENT PROJ. ID: 2530

AEN JOB NO: 9401204
INSTRUMENT: H

MATRIX SPIKE RECOVERY SUMMARY
METHOD: EPA 8020, 5030 GCFID
(SOIL MATRIX)

ANALYTE	Spike Added (ug/kg)	Average Percent Recovery	RPD
Benzene	19.1	95	9
Toluene	60.1	113	7
Hydrocarbons as Gasoline	1000	79	10

CURRENT QC LIMITS

Analyte	Percent Recovery	RPD
Benzene	(79-125)	10
Toluene	(84-117)	10
Gasoline	(54-124)	15

RPD = Relative Percent Difference

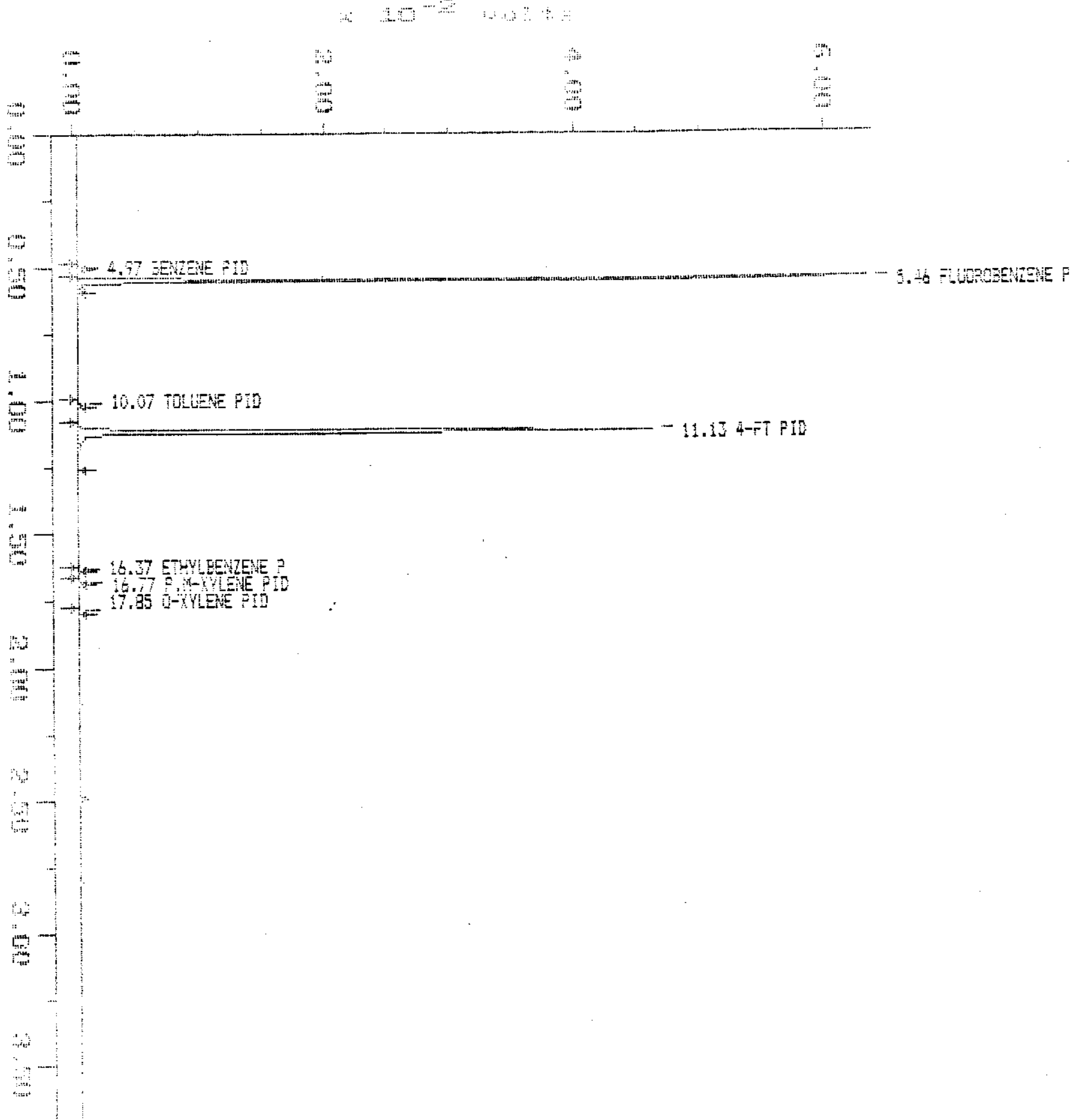
Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

*** END OF REPORT ***

Sample: 01204-94 5cm
Acquired: 05-JAN-94 11:09

Channel: PID DB-5
Method: C:\M4X\DATA9\DBWAX_5

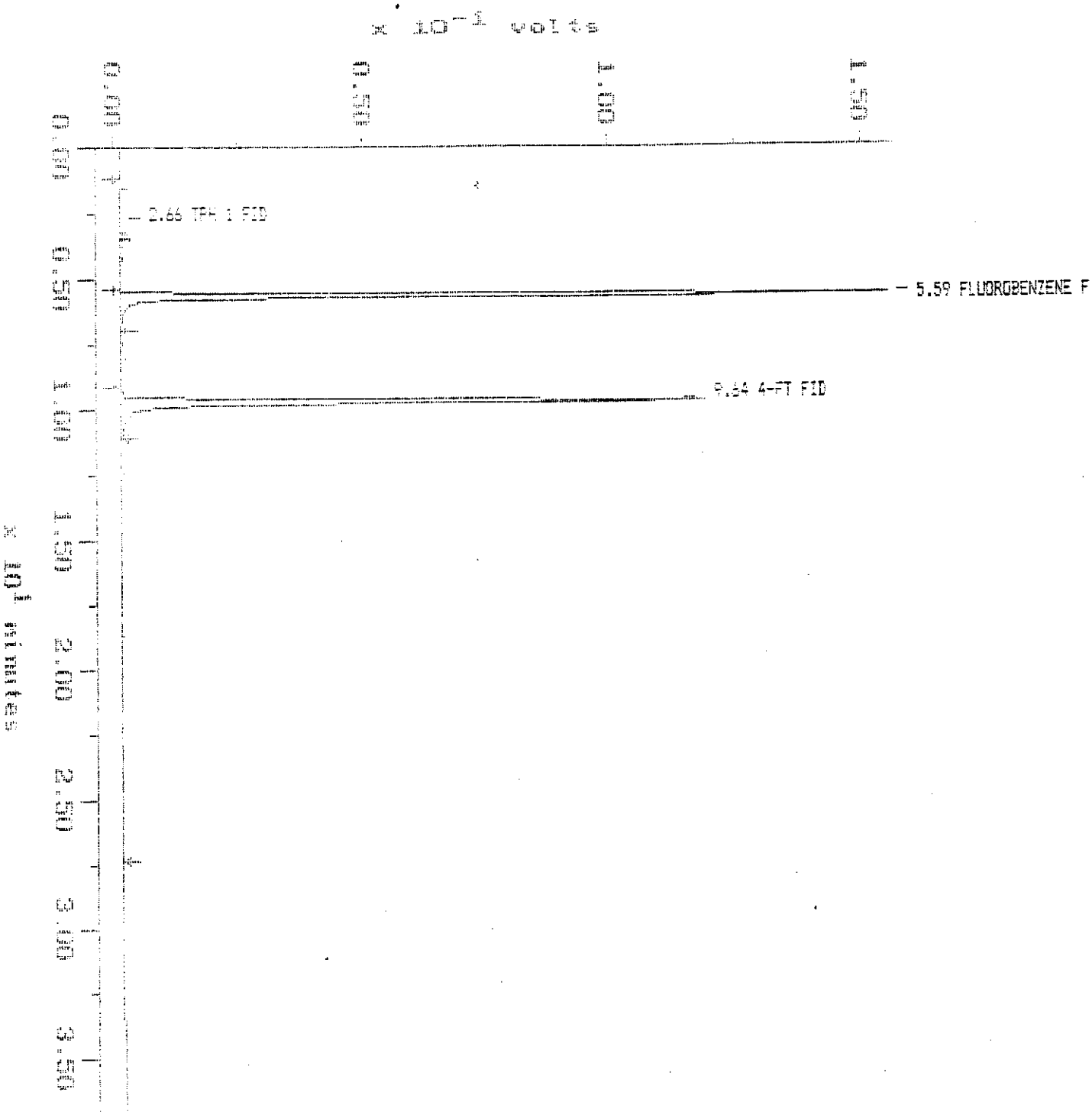
Filename: P01253
Operator: ML



Sample: 01204-94 Spk
Acquired: 25-JAN-94 11:39

Channel: FID DB-WAX
Method: C:\MAX\DATA9\DBWAX_5

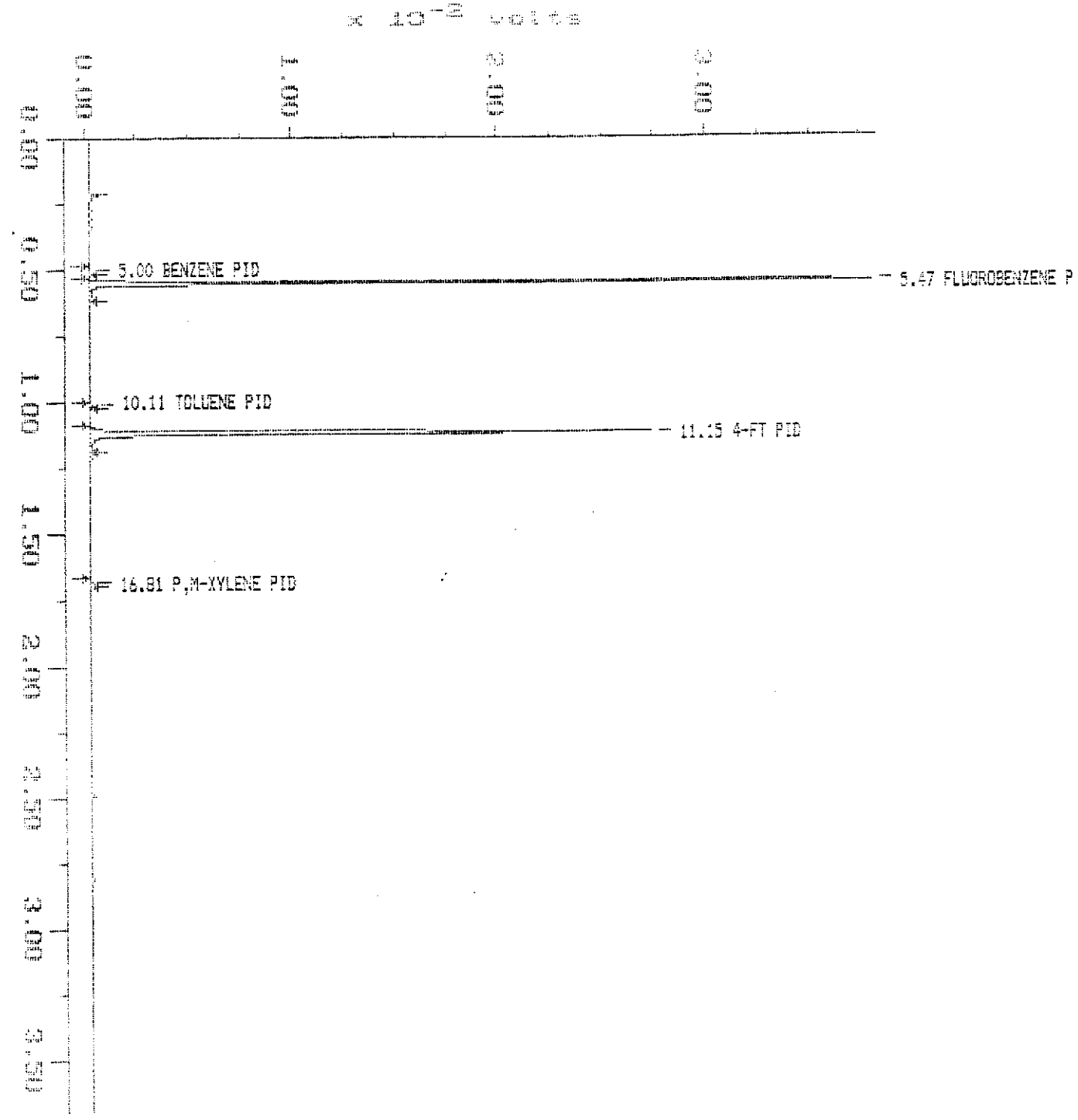
Filename: H01253
Operator: ML



Sample: 01234-10A Spa
Acquired: 25-JAN-94 12:05

Channel: PID DB-5
Method: C:\MAX\DATA\BENMAX_5

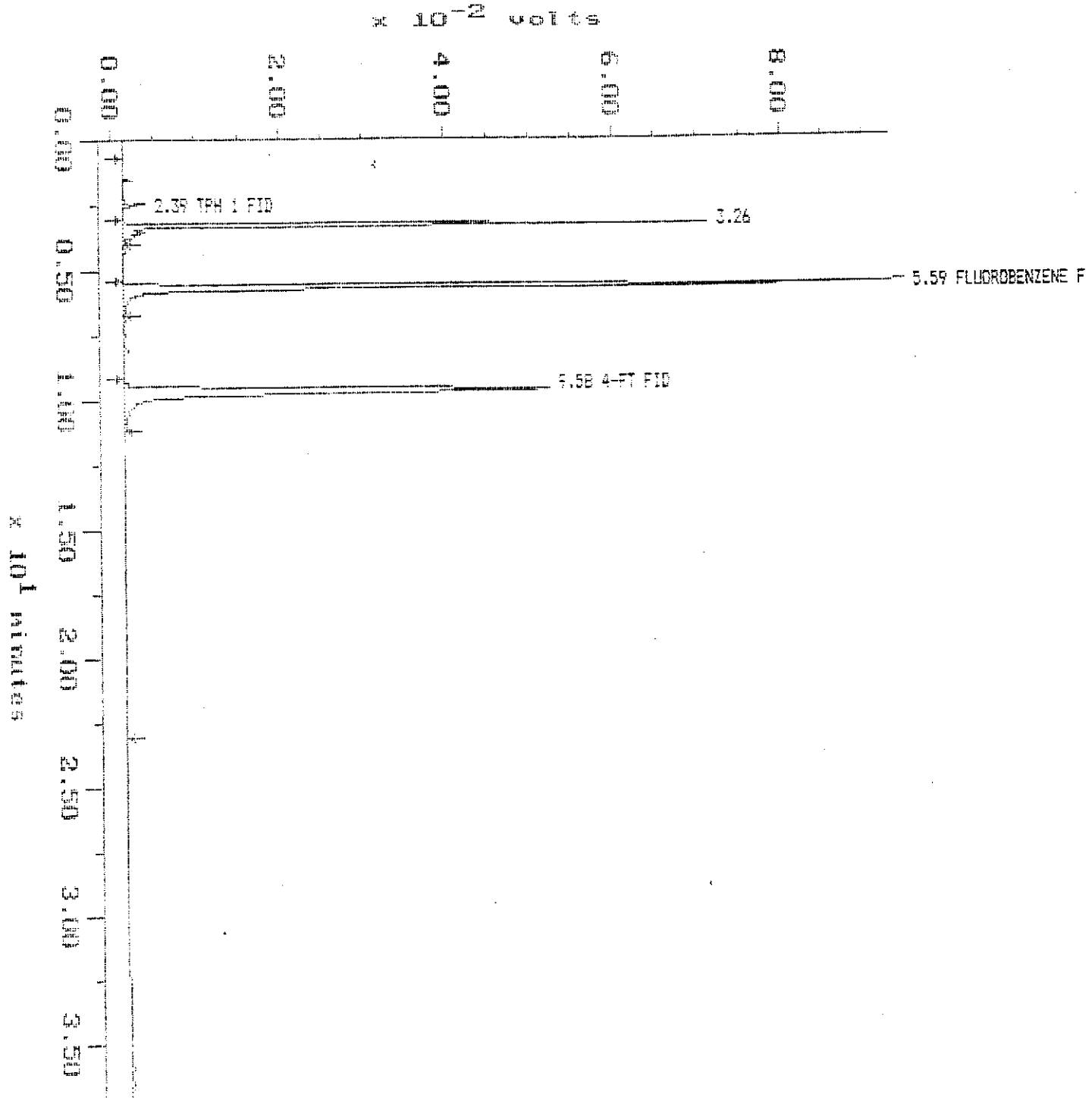
Filename: H01254
Operator: ML



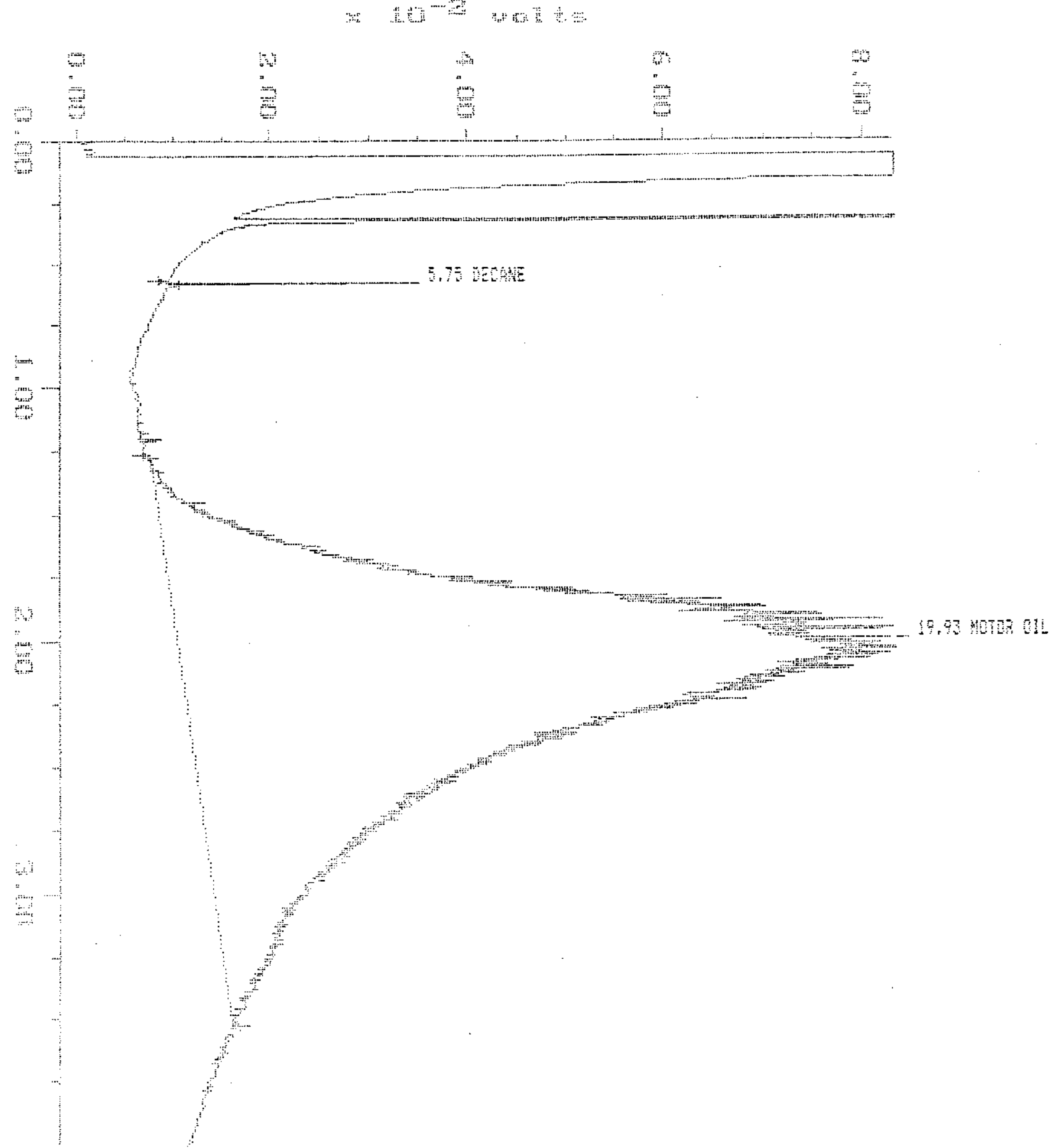
Sample: 01204-10A 5gm
Acquired: 28-JAN-94 12:25

Channel: FID DB-WAX
Method: C:\MAX\DATA9\DBWAX_5

Filename: H01254
Operator: ML



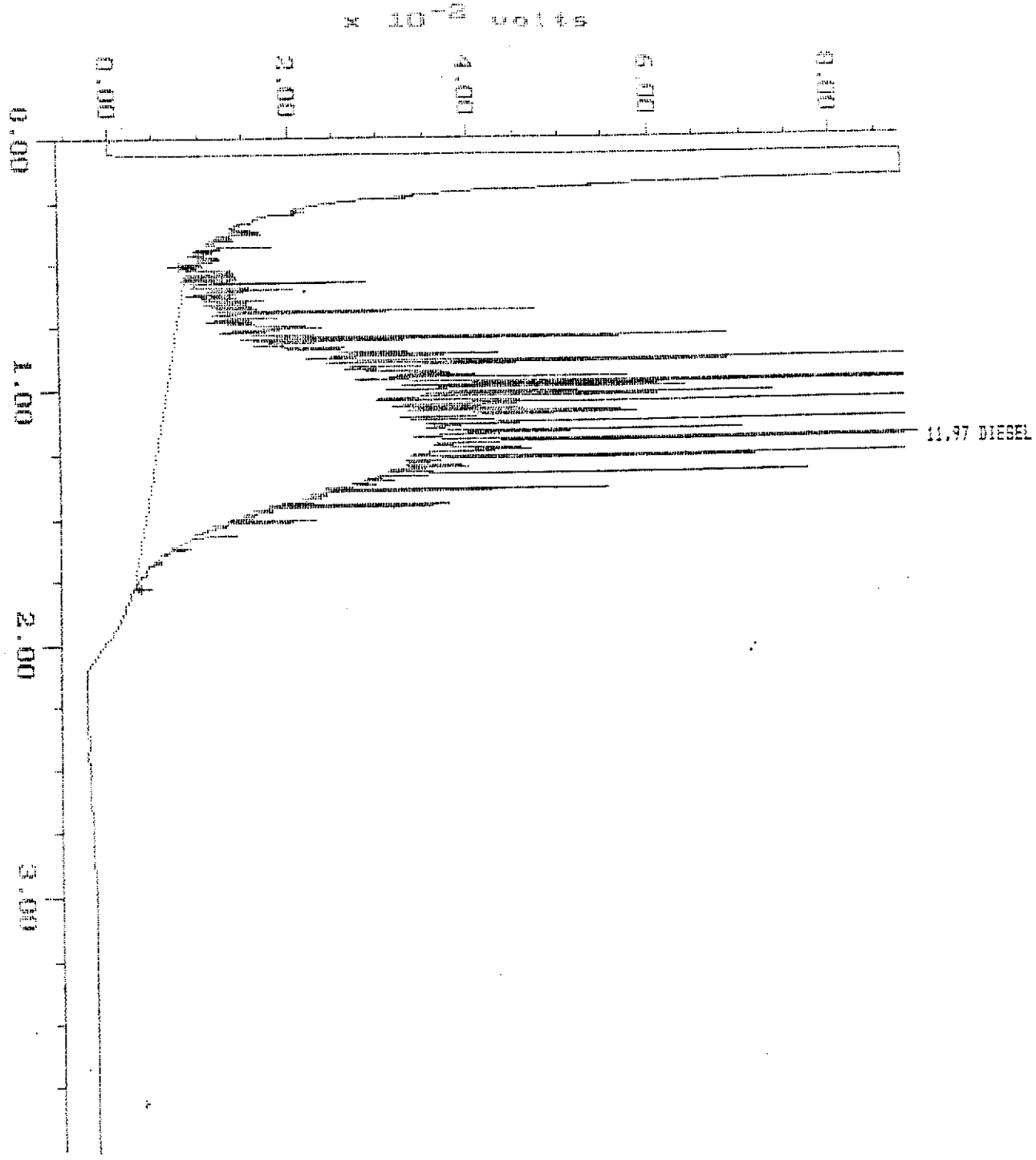
Sample: 01204-9A 1/5 Channel: FID 1 INST CA Filename: CA012636
Acquired: 28-JAN-94 11:12 Method: C:\MAX\DATACA\DIE2 Operator:
Dilution: 1 : 25.000 Amount: 50.000



Sample: 500PPM DIE
Acquired: 25-JAN-94 16:22
Dilution: 1 : 100.000

Channel: FID 1 INST CA
Method: C:\MAX\DATA2A\DIE
Amount: 500.000

Filename: CA012422
Operator:



Sample: 500PPM OIL
Acquired: 25-JAN-94 15:27
Dilution: 1 : 100.000

Channel: FID 1 INST DA
Method: C:\MAX\DATA3A\DIE
Amount: 500.000

Filename: DA012421
Operator:

x 10^{-2} volts

00'0
00'1
00'2
00'3

00'0
00'1
00'2
00'3

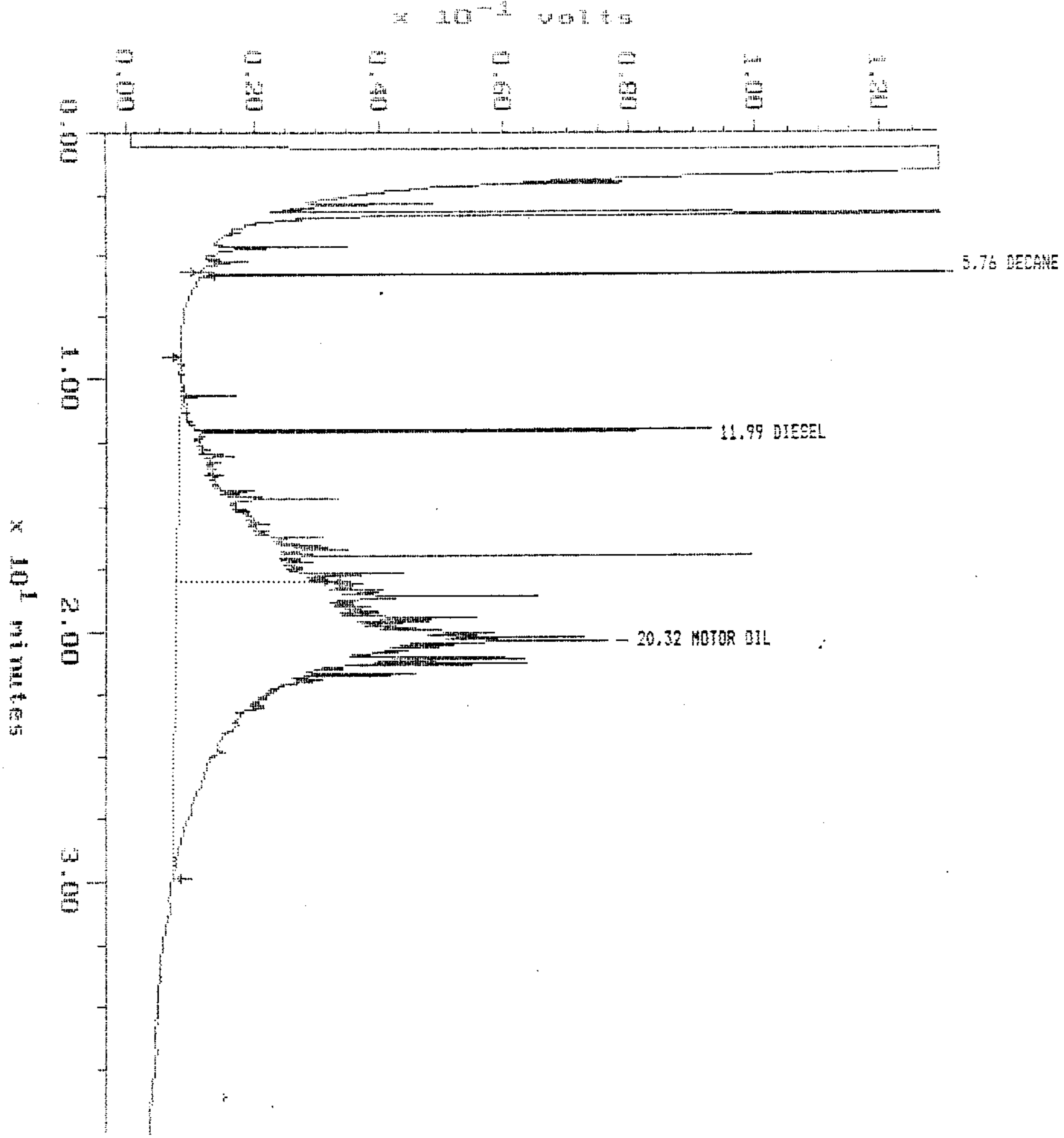
17.81 MOTOR OIL

Minutes

Sample: 1204-10A
Acquired: 25-JAN-94 23:26
Dilution: 1 : 2.000

Channel: FID 1 INST CA
Method: C:\MAX\DATA3A\DIE
Amount: 50.000

Filename: CA012427
Operator:



R-515-G

9401204

Chain-of-Custody Record

№ 5786

Date: 1/21/94

Page 1 of 1

Project No: 2530

Samplers (Signatures): Charlie Cracker

	Date	Time	Sample Number		EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	Gas (8015)	Diesel (8015)	Motor Oil (8015)	BTEX (8015)	Cooled	Soil (S) or water (W)	Acidified	Number of containers
01A	1/20	1015	P1-2.5	09A								X	X	X	X	X	S		1
02A	1/20	1330	P3-2.0									X	X	X	X	X	S		1
03A	1/20	1600	B1-2.0									X	X	X	X	X	S		1
04A	1/20	1700	B2-2.0									X	X	X	X	X	S		1
05A	1/20	1015	P1-6.0	10A								X	X	X	X	X	S		1
06A	1/20	1330	P3-4.5									X	X	X	X	X	S		1
07A	1/20	1600	B1-6.0									X	X	X	X	X	S		1
08A	1/20	1700	B2-6.0									X	X	X	X	X	S		1

COMPOSITE → ONE ANALYSIS

COMPOSITE → ONE ANALYSIS

REMARKS

Additional comments

Call Cheri Page if there are any questions

composite equal portions of samples 1 through 4 and run one analysis

composite equal portions of samples 5 through 8 and run one analysis

SAVE REMAINING PORTION OF EACH INDIVIDUAL SAMPLE

Turnaround time: 7 working / 1 week days

Results to: Cheri Page

Total No. of containers: 8

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:	Method of shipment: pick up		
Signature: Charlie Cracker	1/21/94	Signature: Ron Stallings	1/21/94	Signature:		Laboratory comments and Log No.: 9401204		
Printed name: Charlie Cracker		Printed name: AEN.		Printed name:				
Company: Geomatrix		Company:		Company:				
Received by: Ron Stallings	Time: 1815	Received by: Denise Harrington	Time: 1/21/94 1900	Received by:	Time:			
Signature: Ron Stallings		Signature: DENISE HARRINGTON		Signature:				
Printed name: AEN		Printed name: AEN		Printed name:				
Company:		Company:		Company:				

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400