EXXON COMPANY, U.S.A.

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MARKETING DEPARTMENT

ENVIRONMENTAL ENGINEERING

G. D. GIBSON
SENIOR ENVIRONMENTAL ENGINEER

January 31, 1990

Exxon RAS 7-3006
720 High Street
Oakland, California

Mr. Larry Seto
Alameda County Enviromental Health Department
Hazardous Materials Division
80 Swan Way, Suite 200
Oakland, California 94621

Dear Mr. Seto:

The attached report presents the results of a limited subsurface environmental investigation. This report by Applied GeoSystems, of Fremont, California, was conducted to further delineate the extent of diesel and gasoline hydrocarbons in the soil and groundwater at the above referenced site in Oakland. The report includes a limited research into previous uses of this site and possible offsite contributing sources of hydrocarbons. Most of the detected hydrocarbons appear to be diesel, and this site as an Exxon service station, has never stored and dispensed diesel fuel. Based on this report, a plan for further work will be promulgated in the near future. This work will include possibly one or more additional offsite soil borings and monitoring wells, an aquifer pump test program, and the design of water extraction and in-situ soil remediation systems.

Should you have any comments or concerns please contact me at (415) 246-8768. We would like to begin the phase of this work as soon as possible. Thank you.

Sincerely,

Gary D. Gibson

GDG:vv
0630E
Attachments

c - w/attachment:
Mr. J. K. Hunter
Mr. L. Feldman - San Francisco Bay Region Water Quality Control Board

w/o attachment:
Mr. J. R. Hastings
Ms. J. E. Kuszmaul - Applied GeoSystems
Mr. L. W. Lindeen

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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REPORT
LIMITED SUBSURFACE ENVIRONMENTAL INVESTIGATION

Jan '90

at

Exxon Station No. 7-3006
720 High Street
Oakland, California

BOEING Realty

AGS Job No. 87042-6R

Report prepared for

Exxon Company U.S.A.
P.O. Box 4032
2300 Clayton Road
Concord, California 94520

by
Applied GeoSystems

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January 30, 1990

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at
Exxon Station No. 7-3006
720 High Street
Oakland, California

for Exxon Company, U.S.A.

INTRODUCTION

At the request of Exxon Company, U.S.A. (Exxon), Applied GeoSystems conducted a limited environmental investigation at Exxon Station No. 7-3006 in November and December 1989 to evaluate the onsite impact of diesel fuel and gasoline hydrocarbons in soil and ground water. This report presents the results of the investigation, which included limited research into the previous uses of the site and into potential offsite sources of contamination, drilling of 11 soil borings, four of which were converted into ground-water monitoring wells, and sampling and analysis of soil and ground water. Our work at the site also included periodic monitoring of ground-water levels and floating product thicknesses in the seven existing onsite and one offsite monitoring wells.

SITE DESCRIPTION AND BACKGROUND

The site is at 720 High Street in Oakland, California, as shown on the Site Location Map, Plate P-1. The station is in a predominantly industrial area. It is bounded on the northwest by High Street, on the southwest by Coliseum Way, and on the south by Alameda Avenue. A freeway overpass for Interstate 880 is located across Coliseum Way. Plate P-2, the Site Vicinity Map, shows the businesses near the site.

First Phase of Investigation

In April 1987, three USTs that were situated on the southern portion of the site were removed by Exxon's contractor. The 6,000-, 8,000-, and 10,000-gallon tanks held super-unleaded, regular, and unleaded gasoline, respectively. A 1,000-gallon waste-oil UST that was located behind the station building was also removed (Plate P-3). Applied GeoSystems performed a first-phase soil contamination evaluation in April 1987 (AGS Report No. 87042-1, May 13, 1987). Five of the six soil samples collected from 5 feet below grade in the gasoline UST pit contained levels of total volatile hydrocarbons greater than 1,000 parts per million (ppm). Laboratory analysis of a soil sample collected from soil excavated from the waste-oil UST pit indicated no detectable concentrations of total extractable hydrocarbons (TEH).

As part of the first-phase soil evaluation, an Applied GeoSystems representative was present during excavation of the trenches by Exxon's contractor, Pacific Southwest Construction and Service, for removal of product piping. The locations of the trenches are shown on Plate P-3. Using an organic vapor analyzer to evaluate relative hydrocarbon-vapor concentrations, our representative found areas with hydrocarbon-vapor concentrations greater than 1,000 ppm. Further sampling and analyses of soil in the trenches was recommended. A black soil layer that appeared to contain petroleum product was exposed in the trenches and in the gasoline UST pit at a depth of approximately 3 feet. Analysis of a soil sample taken from this layer indicated 434 ppm TEH.

In June 1987, Exxon contracted EA Engineering, Science, and Technology, Inc., of Lafayette, California, to perform a soil-vapor contaminant survey. The results of the survey indicated that the highest vapor concentrations were between the former gasoline UST pit and the southern pump islands, and extended southwestward towards Coliseum Way.

Second Phase of Investigation

Applied GeoSystems performed a second phase of work at the site to evaluate the hydrocarbon contamination present in the backfill and native soil of the gasoline UST pit and beneath the former product piping. During excavation, a lens of black soil that appeared to contain petroleum was observed at approximately 14 feet below the ground surface in the southwestern wall of the tank pit, and free product was later observed

seeping into the pit from this lens. Further excavation to remove this material indicated that this lens became larger southwest of the tank pit (AGS Report No. 87042-2, July 10, 1987).

Third Phase of Investigation

In September 1987, ground-water monitoring wells MW-2 through MW-9 were installed. In May 1988 monitoring well MW-1 was installed (Plate P-3). Analyses of soil samples collected from the borings for wells MW-1 through MW-9 indicated up to 2,689 ppm of total petroleum hydrocarbons as gasoline (TPHg) and up to 4,261 ppm of TPHd. [redacted] after the wells were installed, floating product up to 30 inches thick was measured in wells MW-2, MW-4, and MW-5 in the area of the former gasoline USTs and in well MW-8 in the former area of the product piping. Ground-water levels measured in the wells without free product in May and July 1988 suggest that the direction of ground-water flow was to the southwest (AGS Report No. 87042-5, August 5, 1988).

Fourth Phase of Investigation

In May 1989, Exxon contracted Applied GeoSystems to excavate additional soil from the southern part of the existing gasoline UST pit (AGS Report No. 87042-6, October 16, 1989). On July 18, 1989, well MW-5 was properly destroyed to make way for the planned excavation. Excavation began on July 20, 1989. An Applied GeoSystems field

geologist instructed the excavation contractor, L & L Construction of Antioch, California, to excavate the soil that showed subjective evidence of hydrocarbon contamination.

Along the southern boundary of the existing pit, soil was excavated to a depth of about 10 feet, which was just above the ground-water level. Soil containing debris was found in the southern part of the pit and contained the most evidence of hydrocarbon contamination, including OVM readings greater than 1,000 ppm. Soil was excavated from the southern and southeastern sides of the pit as far towards Coliseum Way as possible.

On the western side of the pit, two exploratory trenches were excavated to evaluate the extent of contamination. Moderate OVM readings (200 to 500 ppm) were taken from the soil along both trenches. The geologist collected four samples for laboratory analysis from just above water (9 feet below grade) in the pit walls, and excavation was halted pending laboratory results. The laboratory results showed 3.8 to 290 ppm TPHg. One sample from 9 feet below grade in the southern part of the pit contained 4,200 ppm TPHd.

An estimated 300 cubic yards of soil were excavated and stockpiled on the site. The stockpiled soil was covered with plastic sheeting. Analytical results of six composite samples showed 63 to 330 ppm TPHg and 250 to 3,800 ppm TPHd.

In November 1989, Exxon authorized Applied GeoSystems to proceed with the drilling of 11 soil borings and installation of four additional monitoring wells to allow evaluation of the extent of soil and ground-water contamination.

HISTORY OF SITE AND ADJACENT PROPERTY

We researched prior uses of the Exxon site by reviewing aerial photographs (Pacific Aerial Surveys, 1934, 1953, 1969) and fire-insurance maps (Sanborn Map Company, 1912, 1925, 1946). From this information we estimate the following chronology:

- Between 1912 and 1934, the southwestern part of the site and what is now Coliseum Way was occupied by Standard Oil Company and was used as an oil-storage and distribution facility. Plate P-2 shows the approximate location of this facility with respect to the current Exxon facility. In 1912, there were five aboveground oil-storage tanks and a warehouse on the site. In 1925, there were six aboveground oil-storage tanks, a warehouse, and a loading area. The northeastern part of the property was occupied by greenhouses in 1912 and, in 1925, by a carpentry shop.

- Between 1934 and 1970, two residences occupied the southwestern part of the property. Between 1953 and 1969, the northeastern part of the site was part of an automobile wrecking yard. The wrecking yard also encompassed the adjacent property to the northeast.

- In 1970, the Exxon service station in its current configuration was built.

In addition, we identified and researched the following potential offsite sources of contamination:

- Former Dry-Cleaning Plant. The empty building just northeast of the Exxon property was occupied by Bell Cleaning and Dyeing Co. in the 1920s (Sanborn Map Company, 1925). From about 1950 to 1970, the site was used as an automobile

wrecking yard, and the building was occupied by Ed's Auto Parts. According to the Alameda County Health Care Services Agency (ACHCSA), underground solvent-storage tanks were removed from this property in the last year; the tanks contained benzene and Stoddard Solution (a petroleum distillate) while the cleaning plant operated during the 1920s. Applied GeoSystems field personnel observed two open excavations on the property (Plate P-2). No file was available for this site at the California Regional Water Quality Control Board (CRWQCB).

Applied GeoSystems submitted a written request to review the files of the ACHCSA; no response has been received yet. An addendum to this report will be issued containing any pertinent data found when we review the files.

- Former Foundry. Northeast of the former dry-cleaning plant is a former sheet-metal foundry owned by Southern Pacific Transit Company (see Plate P-2). The CRWQCB files contain an environmental assessment report that presents the findings from drilling of 12 borings and installation of three ground-water monitoring wells at the site (Ecology and Environment, Inc., 1989).

  Concentrations greater than 1,000 ppm of total petroleum hydrocarbons (TPH) were found in near-surface soil samples. Low levels of some metals, polychlorinated biphenols (PCBs), and volatile organics were also detected in near-surface soil samples. In ground water, levels of TPH and total oil and grease (TOG) ranged from 1.4 to 2.8 ppm, and levels of PCBs ranged nondetectable to 0.001 ppm.

- Southern Pacific Pipeline. According to a representative of Southern Pacific Pipeline, there are two underground gasoline pipelines west of the site. The pipelines are parallel to Alameda Avenue in an easement along a railroad spur owned by Southern Pacific Railroad. The exact location of the pipelines is unknown; Plate P-2 shows their approximate location. No information regarding the environmental condition of this property was found in the CRWQCB files.

- Norwalk Oil Sales Company. Four hundred feet to the east of the site is a former oil-distribution business, Norwalk Oil Sales Company, which operated between 1946 and 1970 (Sanborn Map Company, 1946; Pacific Aerial Surveys, 1969). Two aboveground gasoline tanks and an oil-storage warehouse were on the site. The site is now occupied by a building constructed in 1970; its use is unknown. No information regarding the condition of the property was found in the CRWQCB files.

- Shell Service Station and Shell Oil Pipeline. Approximately 500 feet southwest of the site is a Shell Service Station. Adjacent to the service station is a Shell Oil pipeline, according to the underground-utility plans of the City of Oakland Public Works Department (Plate P-2). The CRWQCB files contain the results of an

environmental assessment at the service station, which indicated that after removal of the USTs and remodeling work, eight ground-water monitoring wells were installed on the site (Converse Environmental West, 1989). Analyses of soil from the borings detected less than 100 ppm TPHg and less than 50 ppm TPHd. Analyses of ground water from the wells indicate dissolved TPHg concentrations up to 17 ppm and TPHd up to 7.2 ppm. The highest concentrations of both soil and ground-water contamination are in the vicinity of the former UST pit.

FIELD WORK

On November 1 and November 15, 1989, Applied GeoSystems personnel measured ground-water levels and product thicknesses, performed subjective evaluations on water samples, and bailed free product using the procedures outlined in Appendix A. The data are summarized in Table 1. In addition, the free product found in wells MW-3 and MW-8 was sampled to evaluate whether the product source is diesel or gasoline. The samples were analyzed by use of Environmental Protection Agency (EPA) Method 8015 as a fuel-fingerprint analysis at the State-certified Applied GeoSystems Laboratory (No. 153) in Fremont, California.

We acquired permits for the drilling of 11 soil borings and installation of four ground-water monitoring wells from Alameda County Flood Control and Water Conservation District (Zone 7). Copies of the permits are included in Appendix B. Applied GeoSystems notified Underground Service Alert before drilling began, to locate public underground utilities in the site vicinity. Before drilling began, a hand-auger was used to probe for subsurface

obstructions to a depth of at least 5 feet. Field work was performed in accordance with the Applied GeoSystems Site Safety Plan (AGS No. 87042-6S, dated July 8, 1989).

On November 27 through 30, 1989, Applied GeoSystems personnel observed drilling of the borings and installation of the monitoring wells. The borings for monitoring wells MW-10 through MW-13 were drilled to depths of 15 to 30 feet with 10-inch-inside-diameter augers; soil borings B-14 through B-20 were drilled to depths of 12 to 15 feet with 8-inch-inside-diameter augers. Appendix C contains the Logs of Borings.

Soil samples were collected at 2-1/2- to 5-foot intervals from the borings by the sampling procedures described in Appendix A. A photoionization detector (PID) headspace analysis was conducted on soil samples during drilling. Samples with relatively high PID readings were selected for analysis for TPHg and TPHd by EPA Method 8015 and for BTEX by EPA Method 8020. In addition, samples from borings near the former location of the waste-oil UST were selected for analysis for TOG by standard method 503E and for volatile organic compounds (VOCs) by EPA Method 8240. Four samples were collected from the soil cuttings, composited in the laboratory, and analyzed for TPHg, TPHd, and TOG. The samples selected for laboratory analyses, except those selected for VOC analysis, were delivered to the Applied GeoSystems Laboratory in Fremont, California. The samples selected for VOC analysis in addition to analysis for TOG, TPHg, and TPHd, were delivered to Anametrix, Inc., of San Jose, California (Certificate No. 151). Copies of

the Chain of Custody Records (CCRs) and Certified Analytical Reports (CARs) are included in Appendix D.

On November 30, 1989, borings B-14 through B-20 were grouted with neat cement. Before grouting began, subjective evaluations were performed on the ground water samples from the boreholes by use of the procedures described in Appendix A. Results of the subjective evaluations are summarized in Table 1. Monitoring wells were constructed by use of the procedures described in Appendix A. The Logs of Borings show the well construction (Appendix C). On December 1, 1989, the four wells were developed by alternately surging and pumping to remove accumulated sediment from the well and sand pack.

On December 6, 1989, Applied GeoSystems personnel measured the water levels in the wells and collected water samples for subjective evaluation using the procedures described in Appendix A. The results are presented on Table 1.

On December 6 and 7, 1989, the wells without free product were purged and sampled by use of the procedures described in Appendix A. Although product was observed initially only in well MW-2, product began to flow into wells MW-3 and MW-4 during purging. Water samples were not collected from these wells. Ground water in MW-6 recovered slowly after purging; the geologist returned to the site on December 8, 1989, to collect a sample from MW-6.

Ground-water samples were analyzed for TPHg and TPHd by EPA method 8015 and for BTEX by EPA Method 602. In addition, samples from MW-9 and MW-7 were analyzed for TOG by standard method 503E and for VOC by EPA Method 624. The samples selected for TPHg, TPHd, TOG, and BTEX analyses were delivered to the Applied GeoSystems laboratory in Fremont, California. The samples selected for VOC analyses were delivered to Anametrix, Inc., of San Jose, California. Copies of the CCRs and CARs are included in Appendix E.

On December 13, 1989, the casing elevation, ground-surface elevations, and location of each monitoring well were surveyed relative to mean sea level datum by Ron Archer Civil Engineer, Inc., of Pleasanton, California. The survey data is in Appendix F.

EVALUATION OF DATA

Site Geology

The site located on the western edge of an alluvial fan, less than 1/2 mile northwest of a tidal canal and 3/4 mile north of San Leandro Bay (Plate P-1). The materials encountered at the site are bay deposits of silt and clay with interbedded fluvial sand and gravel. Debris and fill material were encountered in the upper 5 to 10 feet in the area of the former gasoline UST pit and the southern pump islands.

We used the data from the boring logs to construct generalized geologic cross sections for this site (Plate P-4); the reference locations of the cross sections are shown on Plate P-3. Unconfined ground water was encountered at 10 to 12 feet below grade in a sand and gravel layer. This layer is thickest (up to 16 feet thick) beneath the area extending from the waste-oil UST pit to the gasoline UST pit. Clay layers were encountered in the southwest and northeast parts of the site that separate the gravel into two separate layers. In the northeast part of the site in MW-10, the upper layer is dry and the lower contains water that appears to be confined.

Ground-Water Monitoring and Gradient

In general, ground-water levels have been increasing since September 1989 (Table 1). The ground-water elevation for each well was calculated, and the data is summarized in Table 2. The data indicate that ground-water levels vary by as much as 2 feet across the site, with the lowest levels in wells MW-3, MW-4, and MW-6, which are near the open gasoline UST pit. The data suggests a sink in the area of the open pit, and that the pit is influencing ground-water movement on the site. We estimate the regional direction of ground-water flow is south towards San Leandro Bay (Plate P-1).

Free Product

Free product has been observed in wells MW-2, MW-3, MW-4, MW-6, and MW-8. Since September 1989, product thicknesses have fluctuated and, in general, have been decreasing

(Table 1). In December 1989 product was observed only in MW-2. However, product flowed into wells MW-3 and MW-4 during purging and about 0.01 foot of product accumulated in borings B-15 through B-18, which suggests that free product exists in the formation in the western part of the site.

The fuel-fingerprint analyses of the free product from MW-3 and MW-8 indicate that the free product in MW-3 is diesel fuel and that the free product in MW-8 is predominantly diesel fuel with some gasoline. The results were evaluated by comparing the chromatograms from the analyses of the product samples to the chromatograms from diesel fuel and gasoline standards. The chromatograms from the gasoline analysis are shown on Plate P-5; some gasoline peaks are evident in the sample from MW-8. The chromatograms from the diesel fuel analysis are shown in Plate P-6; the chromatograms for both samples have a characteristic diesel fuel pattern.

Hydrocarbons in Soil

Analytical results of soil from borings are summarized in Table 3, and copies of CCRs and CARs are in Appendix D. Plate P-7, Concentration of Gasoline in Soil, shows the distribution of TPHg in soil from a depth of 9 to 10 feet in the borings. The map shows that a plume of TPHg extends from the center of the northeastern property boundary to the southwestern corner of the station. The highest concentration of TPHg (3,400 ppm)

was detected in a soil sample from boring B-14, which is adjacent to the northeastern property line.

Plate P-8, Concentration of Diesel in Soil, shows the distribution of TPHd in soil from depths of 9 to 10 feet in the borings. The highest concentrations of TPHd (up to 4,261 ppm) are in the southwestern corner of the station, with a lesser plume north of the waste-oil UST pit. A concentration of 87 ppm acetone was detected in a sample from boring B-20, which is adjacent to the waste-oil UST pit.

Hydrocarbons in Ground Water

Concentrations of TPHd ranged from below detection levels to 40 ppm. Plate P-9, Concentration of Diesel in Ground Water, shows the estimated distribution of the dissolved diesel plume and the estimated extent of free product in the formation. In general, the highest dissolved TPHd concentrations were detected in the ground-water samples from wells in the western part of the site; the plume boundary appears to be defined in the northern part of the site by wells MW-10 and MW-11.

The maximum contaminant level (MCL) established for benzene by Title 22 (paragraph 64444.5) of the California Administrative Code (effective February 25, 1989) is 0.001 ppm. Benzene concentrations ranged from 0.0018 to 6.7 ppm in the ground-water samples. The MCLs for ethylbenzene and xylenes are 0.680 and 1.750 ppm, respectively;

up to 1.8 ppm ethylbenzene and up to 7.8 ppm xylenes were detected in the ground-water samples. The action level for toluene in drinking water recommended by the California Department of Health Services is 0.100 ppm; up to 6.3 ppm toluene were detected in the ground-water samples. No VOC or TOG were detected in the ground-water samples from MW-7 and MW-9, the wells nearest the waste-oil UST pit.

Analytical results of ground water are summarized in Table 4, and copies of CCRs and CARs are in Appendix E. Concentrations of dissolved TPHg ranged from 0.1 to 85 ppm, with the highest concentrations of dissolved TPHg in samples from wells in the northwestern part of the site. Plate P-10, Concentration of Gasoline in Ground Water, shows the distribution of the dissolved gasoline plume. To construct the map, we assumed that the free product in wells MW-2, MW-3, and MW-4 is diesel, based on the results of the fuel-fingerprint analyses.

CONCLUSIONS

On the basis of this field investigation and data evaluation, we conclude that

- a former Standard Oil Company oil-storage facility that existed on the site is the most likely source of diesel hydrocarbons.
- the free product in the southern corner of the site is diesel, and that in the northwestern part of the site is mainly diesel with some gasoline.
- free product appears to exist in the formation in the western part of the site, from just north of the main pump islands to the southern corner of the site.
- the ground-water flow direction appears to be affected by the open gasoline UST excavation.
- the highest TPHd concentrations in soil are in the southwestern part of the site, from the main pump islands to the southern property boundary.
- the highest TPHg concentrations in soil are adjacent to the excavation on the former dry-cleaning plant property, near the waste-oil UST pit, and in the southwestern corner of the site.
- the highest TPHd and TPHg concentrations in ground water are in the northwestern part of the site.

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TABLE 1
RESULTS OF SUBJECTIVE EVALUATION OF WATER SAMPLES
(page 1 of 3)

Boring or Well Number	Depth to Water (ft)	Depth of Well (ft)	Floating Product (ft)	Sheen	Emulsion (ft)
April 25, 1989					
MW-1	7.55	28.71	NONE	NONE	NONE
MW-2	9.27	---	2.16	---	NONE
MW-3	7.57	---	0.08	---	NONE
MW-4	7.26	---	0.16	---	NONE
MW-5	8.06	---	0.32	---	NONE
MW-6	8.02	34.37	NONE	NONE	NONE
MW-7	8.66	34.23	NONE	NONE	NONE
MW-8	8.31	---	0.66	---	NONE
MW-9	8.25	30.63	NONE	NONE	NONE
July 19, 1989					
MW-2	10.81	---	1.56	---	NONE
MW-3	10.33	---	0.66	---	NONE
MW-4	10.32	---	0.72	---	NONE
MW-8	10.97	---	1.25	---	NONE
July 27, 1989					
MW-1	10.16	---	NONE	SLIGHT	NONE
MW-2	10.18	---	0.13	---	HEAVY
MW-3		(covered by soil)			
MW-4		(covered by soil)			
MW-8	10.34	---	0.08	---	HEAVY
September 6, 1989					
MW-1	10.88	---	NONE	V.SLIGHT	NONE
MW-2	10.89	---	0.09	---	SLIGHT
MW-3	11.22	---	0.07	---	SLIGHT
MW-4	11.40	---	0.07	---	SLIGHT
MW-6	13.64	---	0.08	---	SLIGHT
MW-7	11.72	---	NONE	SLIGHT	NONE
MW-8	11.09	---	0.17	---	SLIGHT
MW-9		(covered by soil)			

TABLE 1
RESULTS OF SUBJECTIVE EVALUATION OF WATER SAMPLES
(page 2 of 3)

Boring or Well Number	Depth to Water (ft)	Depth of Well (ft)	Floating Product (ft)	Sheen	Emulsion (ft)
September 22, 1989					
MW-1	11.06	---	NONE	NONE	NONE
MW-2	11.56	---	0.56	---	SLIGHT
MW-3	11.38	---	0.28	---	SLIGHT
MW-4	11.64	---	0.19	---	SLIGHT
MW-6	13.79	---	0.07	---	SLIGHT
MW-7	11.89	---	NONE	NONE	NONE
MW-8	11.58	---	0.36	---	SLIGHT
MW-9		(covered by soil)			
November 1, 1989					
MW-1	10.82	---	NONE	NONE	NONE
MW-2	10.85	---	0.09	NONE	NONE
MW-3	10.90	---	0.01	NONE	NONE
MW-4	11.00	---	NONE	SLIGHT	NONE
MW-6	12.78	---	NONE	SLIGHT	NONE
MW-8	11.03	---	NONE	NONE	NONE
November 15, 1989					
MW-1	11.07	---	NONE	NONE	NONE
MW-2	11.05	---	0.07	NONE	NONE
MW-3	11.18	---	0.11	NONE	NONE
MW-4	11.18	---	0.10	NONE	NONE
MW-6	12.91	---	NONE	SLIGHT	NONE
MW-8	11.25	---	0.01	NONE	NONE

TABLE 1
RESULTS OF SUBJECTIVE EVALUATION OF WATER SAMPLES
(page 3 of 3)

Boring or Well Number	Depth to Water (ft)	Depth of Well (ft)	Floating Product (ft)	Sheen	Emulsion (ft)
November 30, 1989					
B-14	11.27	---	NONE	NONE	NONE
B-15	9.67	---	0.01*	NONE	NONE
B-16	9.27	---	0.01*	NONE	NONE
B-17	9.86	---	0.01*	NONE	NONE
B-18	9.57	---	0.01*	NONE	NONE
B-19	10.65	---	NONE	NONE	NONE
B-20	10.75	---	NONE	NONE	NONE
December 1, 1989					
MW-10	9.37	24.9	NONE	NONE	NONE
MW-11	10.93	30.1	NONE	NONE	NONE
MW-12	7.99	14.7	NONE	NONE	NONE
MW-13	9.30	15.3	NONE	NONE	NONE
December 6, 1989					
MW-1	10.33	28.95	NONE	NONE	NONE
MW-2	10.23	---	0.13	NONE	NONE
MW-3	10.29	34.76	NONE	SLIGHT	NONE
MW-4	10.25	34.90	NONE	SLIGHT	NONE
MW-6	11.84	34.70	NONE	NONE	NONE
MW-7	10.46	34.52	NONE	NONE	NONE
MW-8	10.30	34.66	NONE	SLIGHT	NONE
MW-9	10.12	30.69	NONE	NONE	NONE
MW-10	10.46	34.52	NONE	NONE	NONE
MW-11	10.62	30.07	NONE	NONE	NONE
MW-12	8.00	14.64	NONE	NONE	NONE
MW-13	9.35	15.21	NONE	NONE	NONE

*: thickness estimated by visual inspection

TABLE 2
SUMMARY OF GROUND-WATER ELEVATIONS
December 7, 1989

Well Number	Depth to Water (ft)	Casing Elevation (ft)	Ground-Water Elevation (ft)
MW-1	10.33	12.87	2.54
MW-2*			
MW-3	10.29	12.94	2.65
MW-4	10.25	12.77	2.52
MW-6	11.84	14.27	2.43
MW-7	10.46	14.84	4.38
MW-8	10.30	13.45	3.15
MW-9	10.12	14.64	4.52
MW-10	9.39	14.05	4.66
MW-11	10.62	13.55	2.93
MW-12	8.00	12.01	4.01
MW-13	9.35	14.20	4.85

* Not calculated due to free product in well.

TABLE 3
SUMMARY OF ANALYTICAL RESULTS OF SOIL
(page 1 of 3)

Sample No.	TPHg ppm	Benzene ppm	Toluene ppm	Ethyl-benzene ppm	Xylenes ppm	TPHd ppm	TOG ppm	VOC ppm
September 10, 1987								
S-10-B2**	9.97	4.14	0.09	1.09	0.38	--	--	--
S-10-B3	2689	126.0	17.0	41.0	131.0	4261	--	--
S-10-B4	209.9	14.9	0.5	6.4	11.1	2938	--	--
S-10-B4	90.83	9.27	0.24	1.45	6.62	848	--	--
S-10-B6	448.0	5.7	3.7	14.1	63.2	--	--	--
S-10-B7	901.6	26.4	5.3	41.4	54.2	1338	--	--
S-10-B8	0.48	<0.05	<0.05	<0.05	<0.05	--	--	--
May 12, 1988								
S-9-B9	<2	<0.05	<0.05	<0.05	<0.05	--	--	--
May 21, 1988								
S-7.5-B1	<10	<0.05	<0.05	<0.15	<0.15	25	<10	--

See notes on page 3.

TABLE 3
SUMMARY OF ANALYTICAL RESULTS OF SOIL
(page 2 of 3)

Sample No.	TPHg ppm	Benzene ppm	Toluene ppm	Ethyl-benzene ppm	Xylenes ppm	TPHd ppm	TOG ppm	VOC ppm
November 27-28, 1989								
S-10-B10	<2	<0.05	<0.05	<0.05	<0.05	<10	--	--
S-10-B11	<2	0.064	0.11	<0.05	0.076	<10	--	--
S-7.5-B12	160	1.2	3.1	3.4	14	23	--	--
S-10-B12	3.1	0.86	0.090	0.18	0.17	16	--	--
S-7.5-B13	<2	<0.05	0.12	<0.05	0.10	<10	--	--
S-10-B13	17	<0.05	0.14	0.33	1.2	<10	--	--
S-10-B14	3400	<0.5*	<0.5*	1.2*	1.2*	1900	820	ND
S-5-B15	130	2.2	7.2	2.2	11	<10	--	--
S-7.5-B15	98	0.97	3.9	1.8	9.8	28	--	--
S-10-B15	180	1.4	4.4	3.6	16	82	--	--
S-5-B16	87	2.2	4.4	1.7	7.6	43	--	--
S-7.5-B16	1100	9.0	60	23	109	1500	--	--
S-10-B16	380	4.2	11	8.4	35	110	--	--

See notes on page 3.

TABLE 3
SUMMARY OF ANALYTICAL RESULTS OF SOIL
(page 3 of 3)

Sample No.	TPHg ppm	Benzene ppm	Toluene ppm	Ethyl-benzene ppm	Xylenes ppm	TPHd ppm	TOG ppm	VOC ppm
November 27-28, 1989								
S-5-B17	<2	<0.050	<0.050	<0.050	<0.050	<10	--	--
S-7.5-B17	8.1	0.085	<0.050	0.19	0.24	--	--	--
S-10-B17	7.1	0.091	<0.050	0.20	0.25	200	--	--
S-5-B18	210	1.6	0.71	3.9	12	46	--	--
S-7.5-B18	210	2.4	0.50	4.8	20	270	--	--
S-10-B18	130	0.93	0.36	2.8	11	2000	--	--
S-10-B19	210	<0.5*	<0.5*	1.7*	<0.5*	210	<300	ND
S-10-B20	3100	<5.0*	<5.0*	64.0*	120.0*	360	73	87▲
S-1128-ABCD**	160	--	--	--	--	160	<50	--

**: S-10-B2 = soil sample - depth - boring number
S-1128-ABCD = soil sample - date - samples composited
<: Not detected at method detection level
*: From VOC analysis
--: Not analyzed
ND: No VOC detected other than BTEX
▲: Acetone

TABLE 4
SUMMARY OF ANALYTICAL RESULTS OF GROUND WATER
(page 1 of 2)

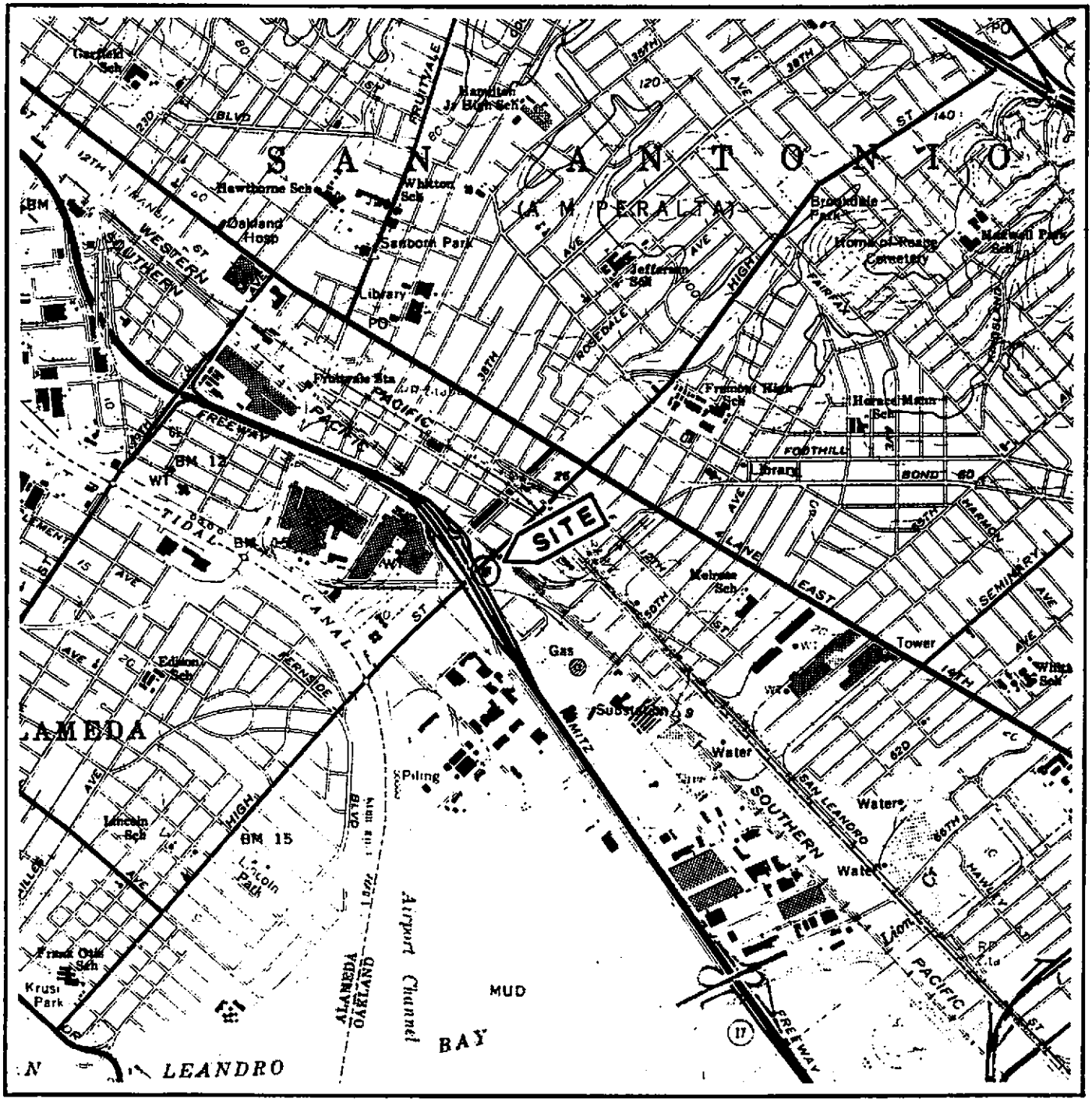
Sample No.	TPHg ppm	Benzene ppm	Toluene ppm	Ethyl-benzene ppm	Xylenes ppm	TPHd ppm	TOG ppm	VOC ppm
September 10, 1987								
W-25-MW2**	1.445	0.233	0.81	0.056	0.209	--	--	--
W-25-MW3	2.101	0.360	1.062	0.068	0.298	0.66	--	--
W-25-MW4	0.925	0.070	0.007	0.010	0.016	0.74	--	--
W-25-MW5	26.66	0.56	1.71	1.58	7.15	37.22	--	--
W-25-MW7	1.531	0.258	0.002	<0.002	0.042	2.79	--	ND
W-25-MW8	1.325	0.081	0.074	0.042	0.182	--	--	--
May 24, 1988								
W-11-MW1	0.240	0.090	0.005	0.015	0.025	--	--	ND
W-14-MW9	<0.05	<0.0005	0.001	<0.001	<0.001	--	--	ND
May 31, 1988								
W-14-MW3	8.7	3.98	0.28	0.24	0.65	--	--	--
W-15-MW6	29.3	12.82	0.55	1.44	5.50	--	--	--
W-15-MW7	--	0.300*	<0.010*	<0.010*	<0.010*	0.190	--	ND

See notes on page 2.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS OF GROUND WATER
(page 2 of 2)

Sample No.	TPHg ppm	Benzene ppm	Toluene ppm	Ethyl-benzene ppm	Xylenes ppm	TPHd ppm	TOG ppm	VOC ppm
December 7, 1989								
W-11-MW1	0.63	0.012	0.0056	0.0037	0.025	0.24	--	--
W-11-MW7	1.70	0.22	0.0053	0.0050	0.0086	2.5	<5	ND
W-11-MW8	42	2.6	0.63	0.21	3.7	34	--	--
W-14-MW9	0.1	0.0018	0.0037	0.0014	0.0088	0.11	<5	ND
W-12-MW10	0.32	0.0037	0.014	0.0056	0.032	<0.10	--	--
W-11-MW11	0.078	0.0059	0.00063	<0.0005	0.0048	<0.10	--	--
W-8-MW12	85	6.7	6.3	1.8	7.8	40	--	--
W-10-MW13	52	2.1	2.0	1.4	6.1	31	--	--
December 8, 1989								
W-18-MW6	9.0	0.37	0.013	0.0026	0.43	4.8	--	--

<: Not detected at method detection level
ND: No VOC detected other than BTEX
*: From VOC analysis
**: W-25-MW2 = water sample - depth - well number



Source: U.S. Geological Survey
Oakland East
7.5-Minute Quadrangle

N

Approximate Scale

2000 1000 0 2000 4000

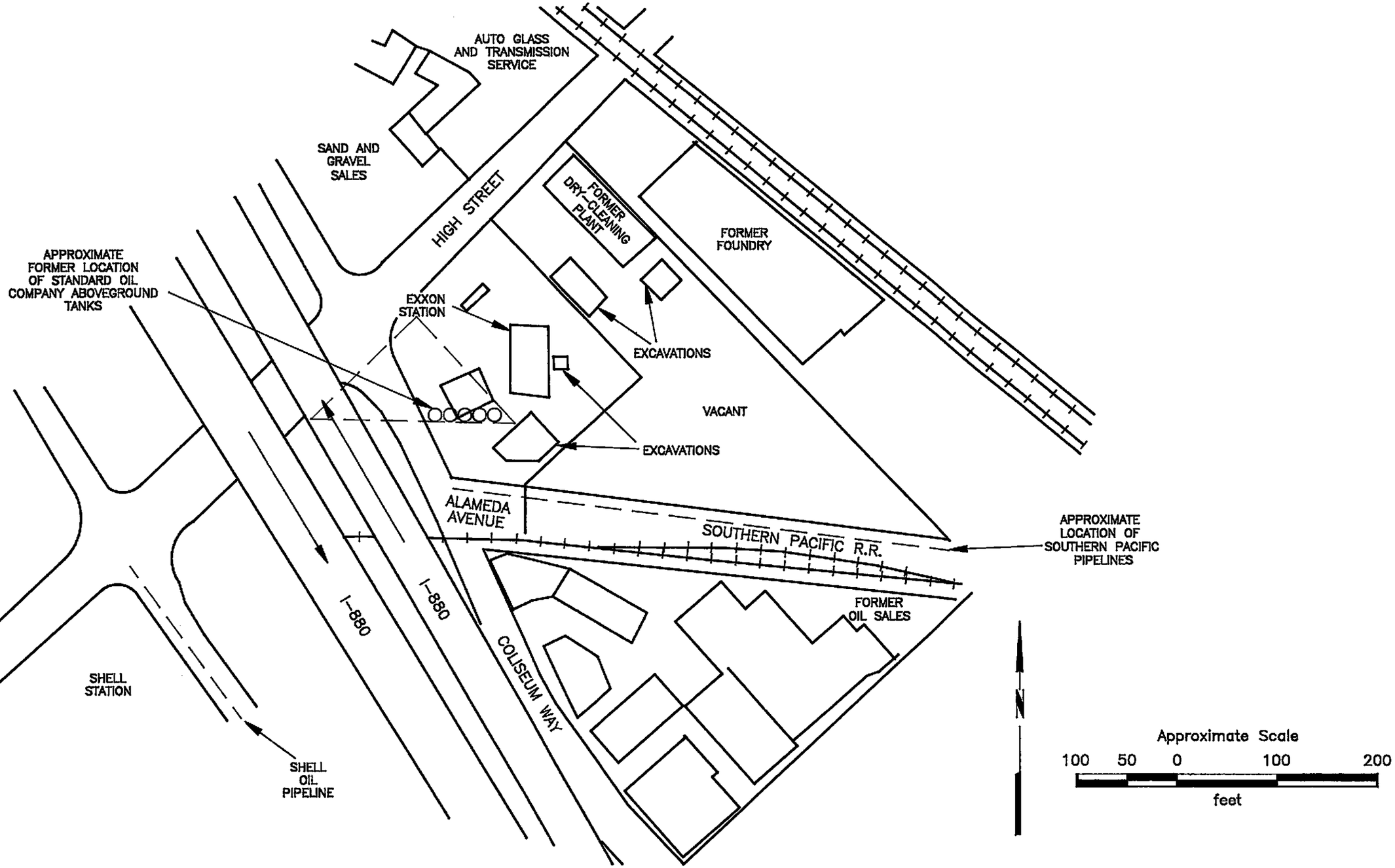
feet

Applied GeoSystems

PROJECT NO. 87042-6

SITE LOCATION MAP
Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE
P - 1



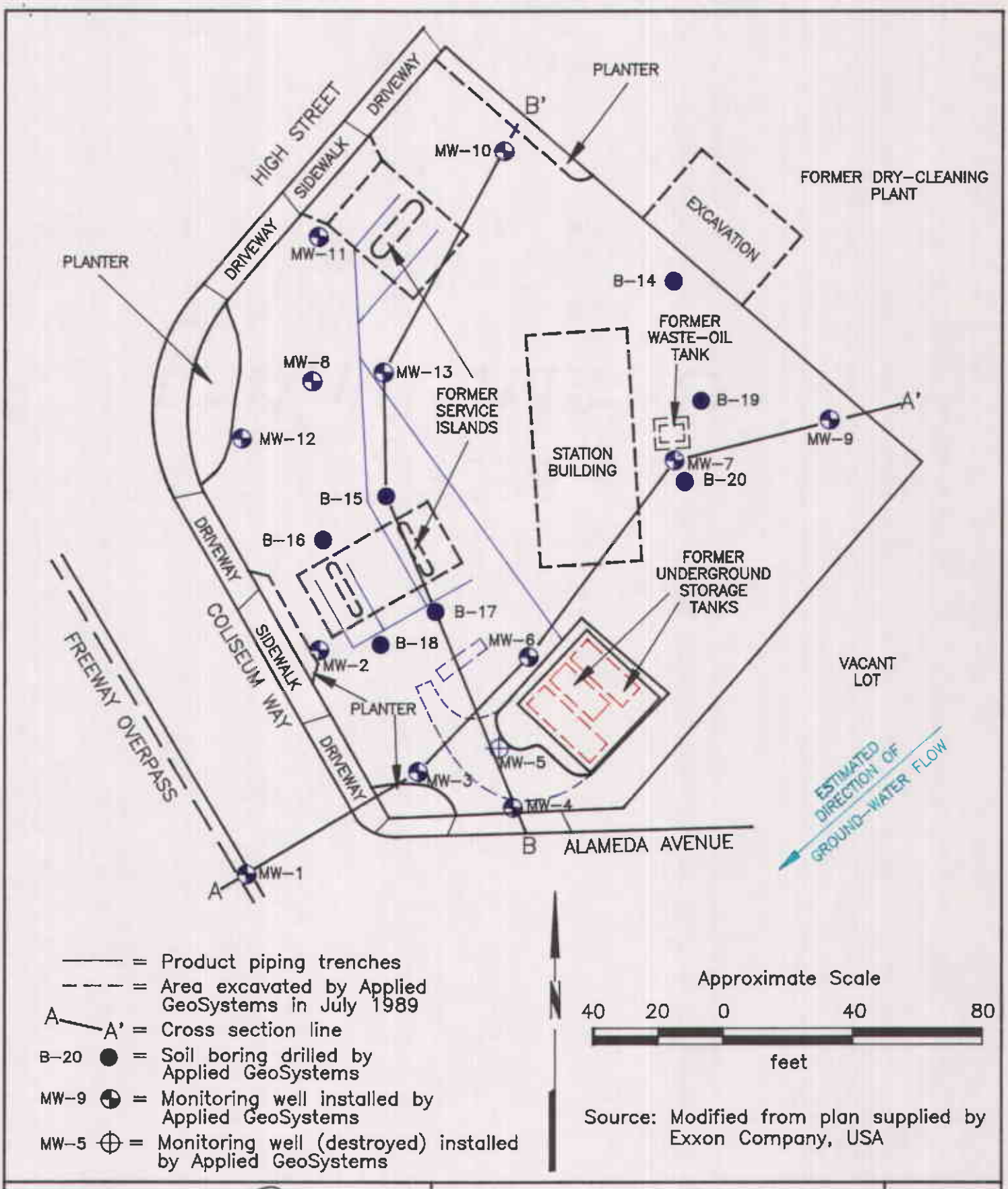
Applied GeoSystems

PROJECT NO. 87042-6

SITE VICINITY MAP
Exxon Service Station No. 7-3006
720 High Street
Oakland, California

PLATE

P - 2

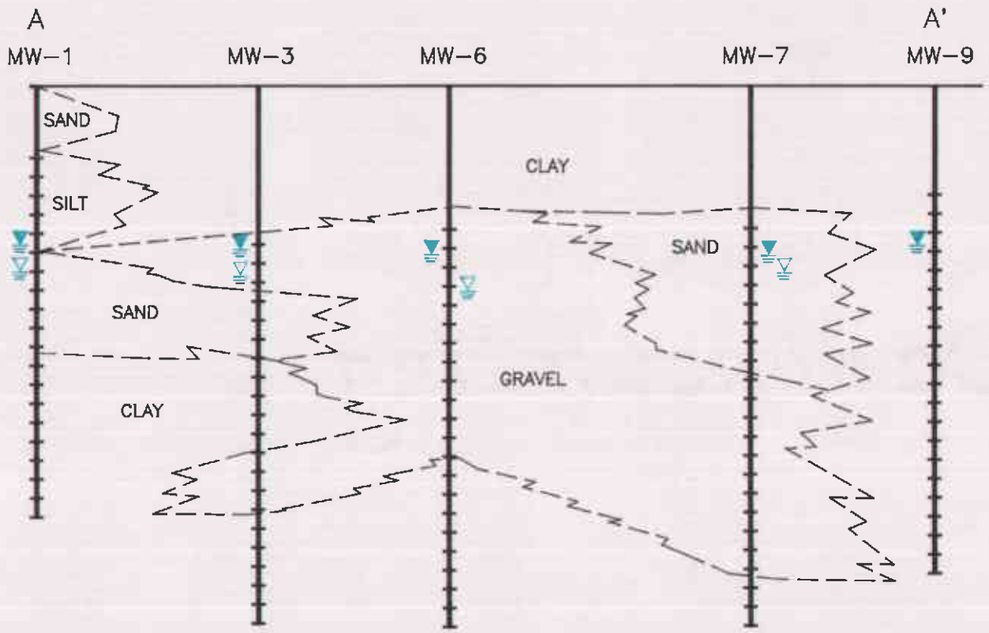


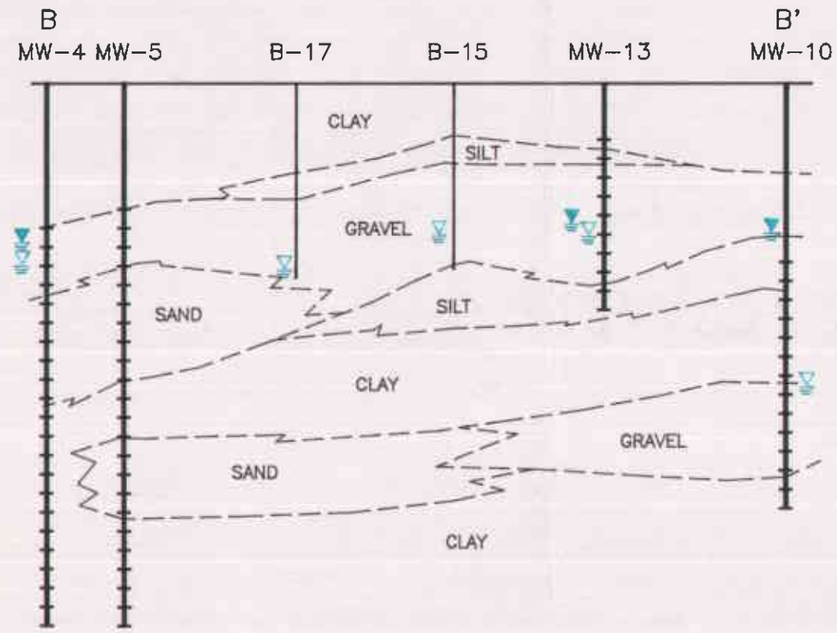
Applied GeoSystems

PROJECT NO. 87042-6

SITE MAP
Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE
P - 3





= Approximate limits

= Well casing

= Well screen

= Boring

= Initial water level

= Static water level on December 6, 1989

Approximate Horizontal Scale

40 20 0 40 80

feet

Approximate Vertical Scale

10 5 0 10 20

feet

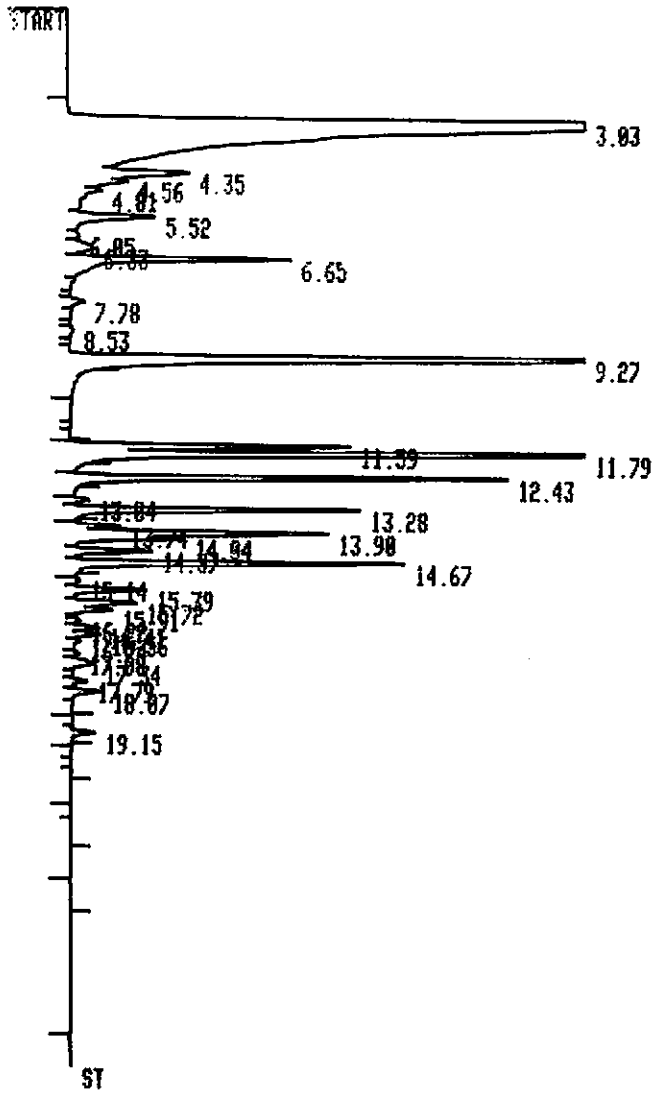
Applied GeoSystems

PROJECT NO. 87042-6

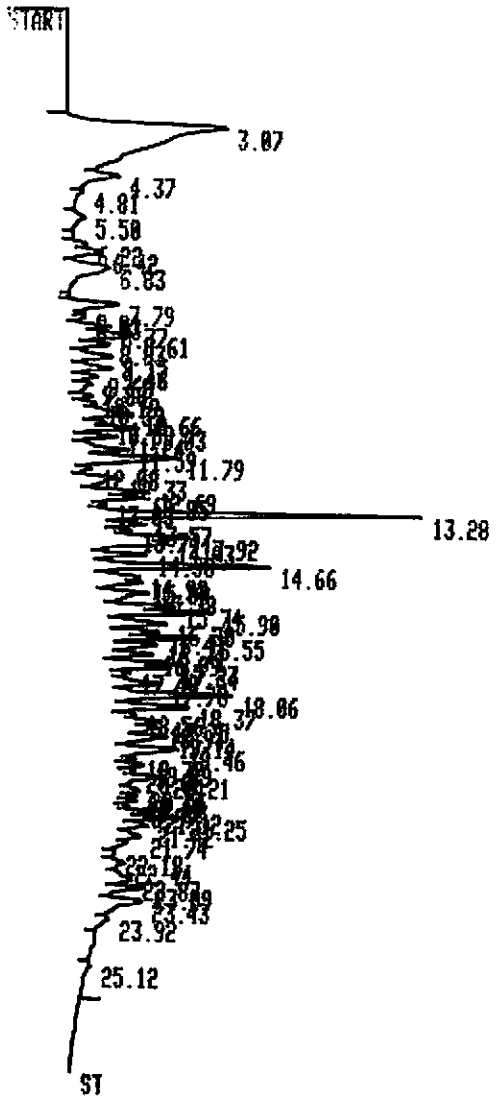
CROSS SECTIONS A - A' AND B - B'
Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

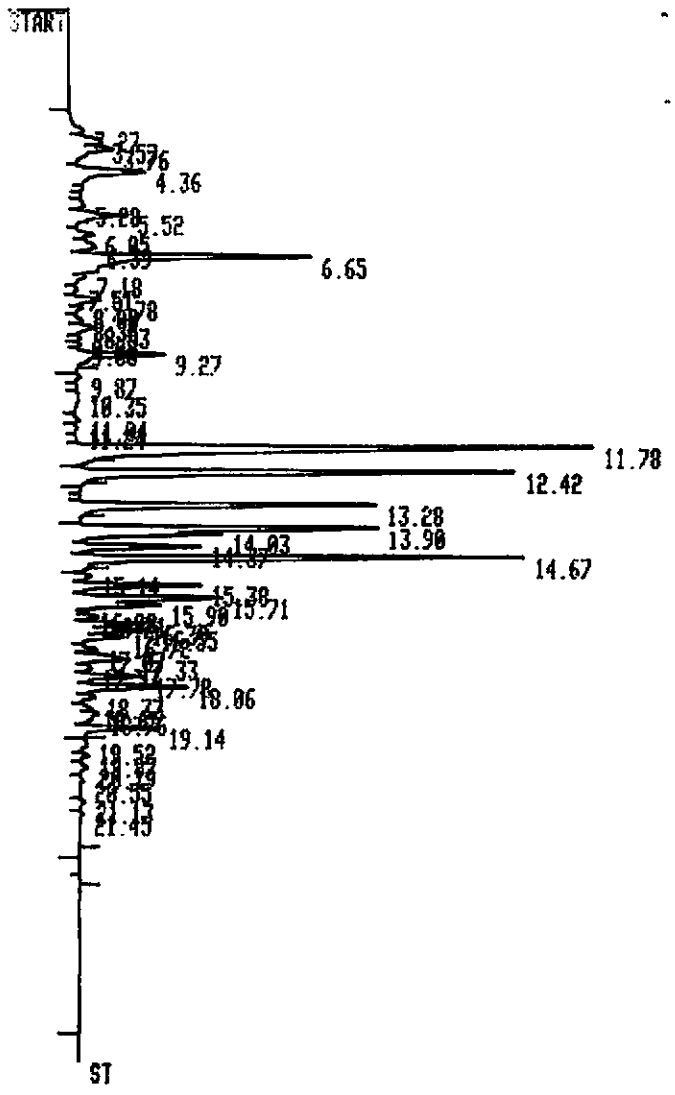
P - 4



CHROMATOGRAM OF
GASOLINE STANDARD

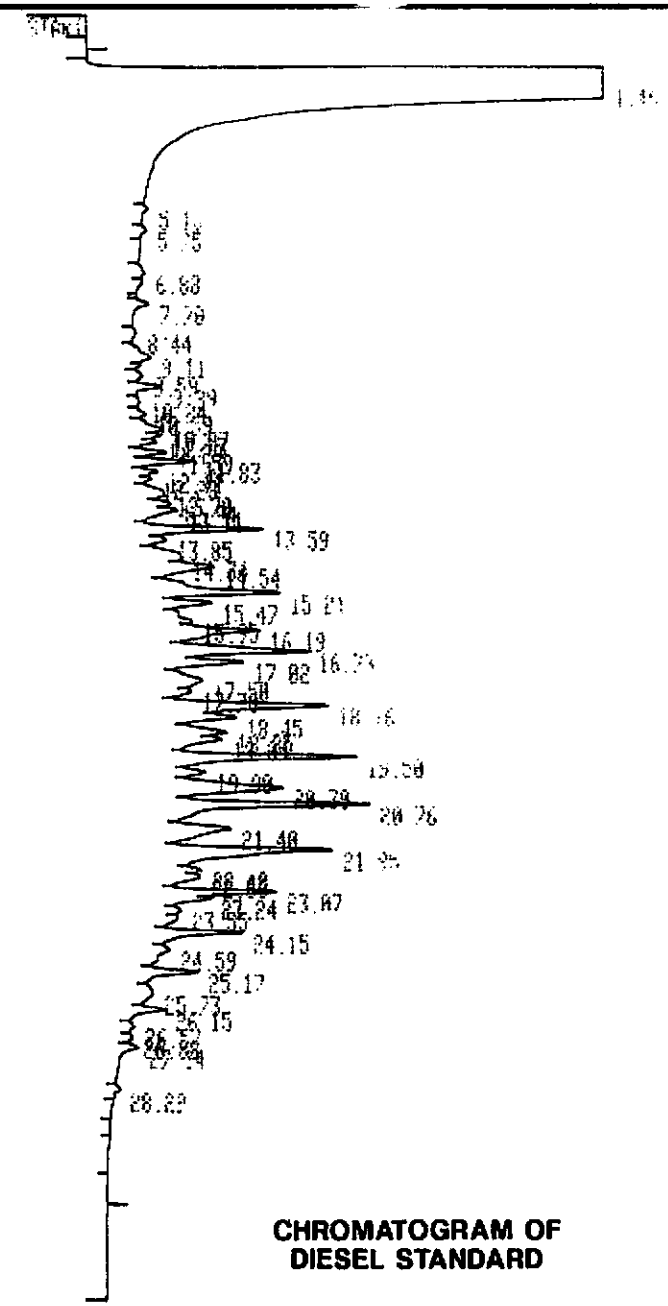


CHROMATOGRAM OF
W-1107-MW3

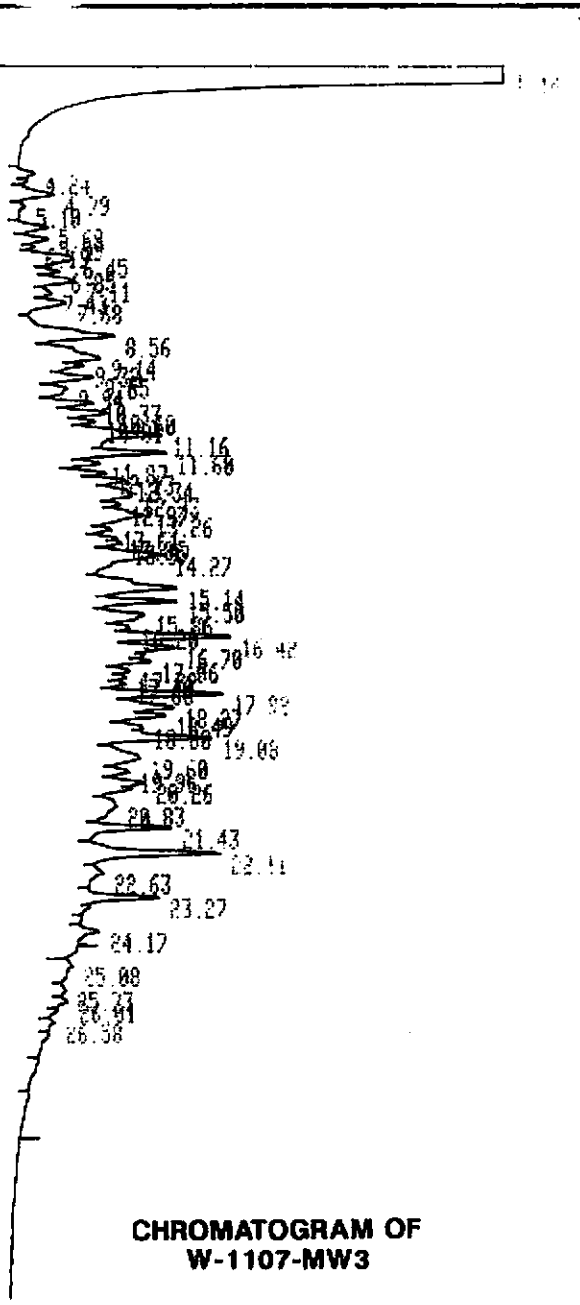


CHROMATOGRAM OF
W-1124-MW8

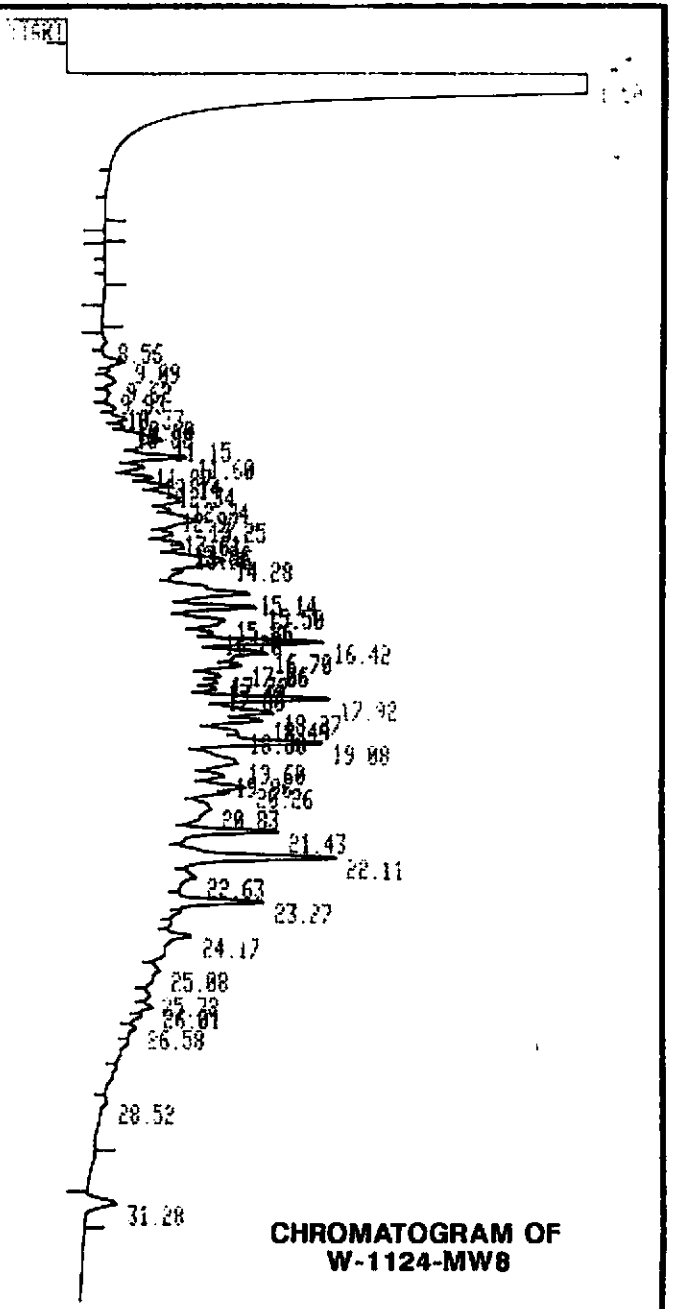
PLATE	CHROMATOGRAMS FROM GASOLINE ANALYSES	
P - 5	Exxon Station No. 7-3006 720 High Street Oakland, California	Applied GeoSystems PROJECT NO. 87042-6



CHROMATOGRAM OF
DIESEL STANDARD



CHROMATOGRAM OF
W-1107-MW3



CHROMATOGRAM OF
W-1124-MW8

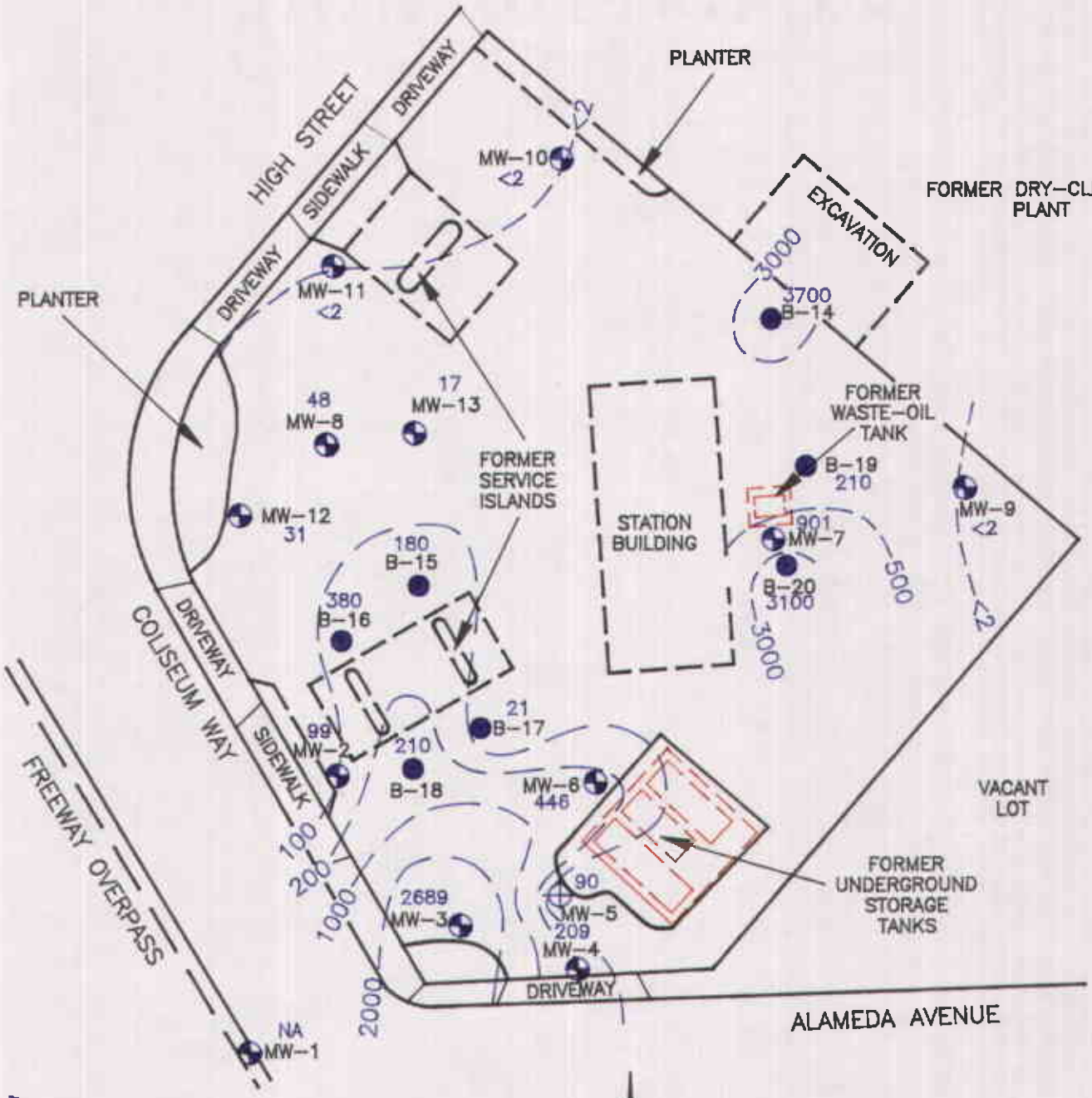
PLATE

P - 6

CHROMATOGRAMS FROM DIESEL ANALYSES
Exxon Station No. 7-3006
720 High Street
Oakland, California

Applied GeoSystems

PROJECT NO. 87042-6



3000 = Line of equal concentration in parts per million (ppm)

2689 = Concentration of TPH in parts per million (ppm) in soil sample from 10' below grade

NA = Not available

MW-9 = Monitoring well installed by Applied GeoSystems

B-20 = Soil boring drilled by Applied GeoSystems

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by Exxon Company, USA

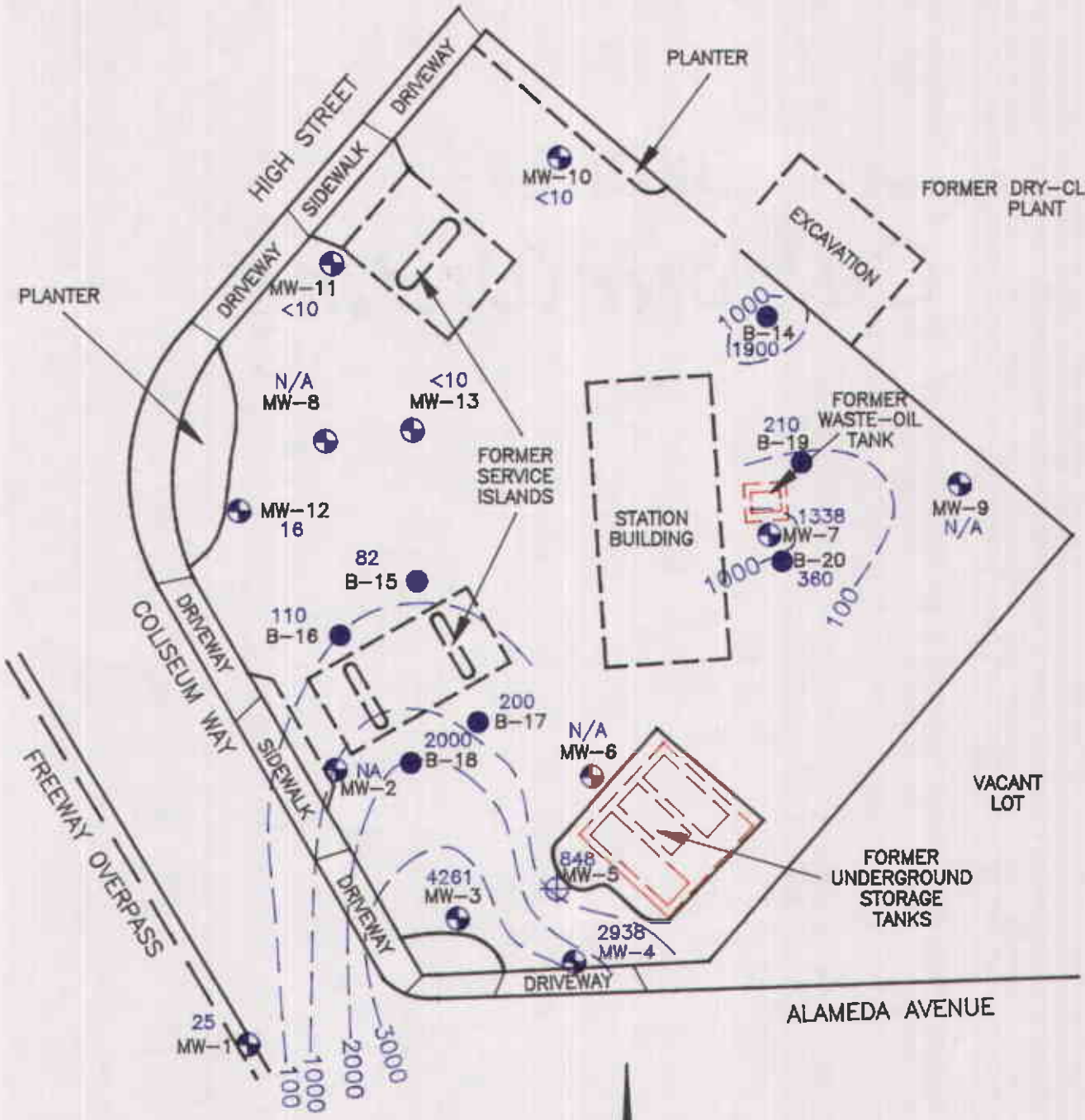
Applied GeoSystems

PROJECT NO. 87042-6

CONCENTRATION OF GASOLINE IN SOIL
Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

P - 7



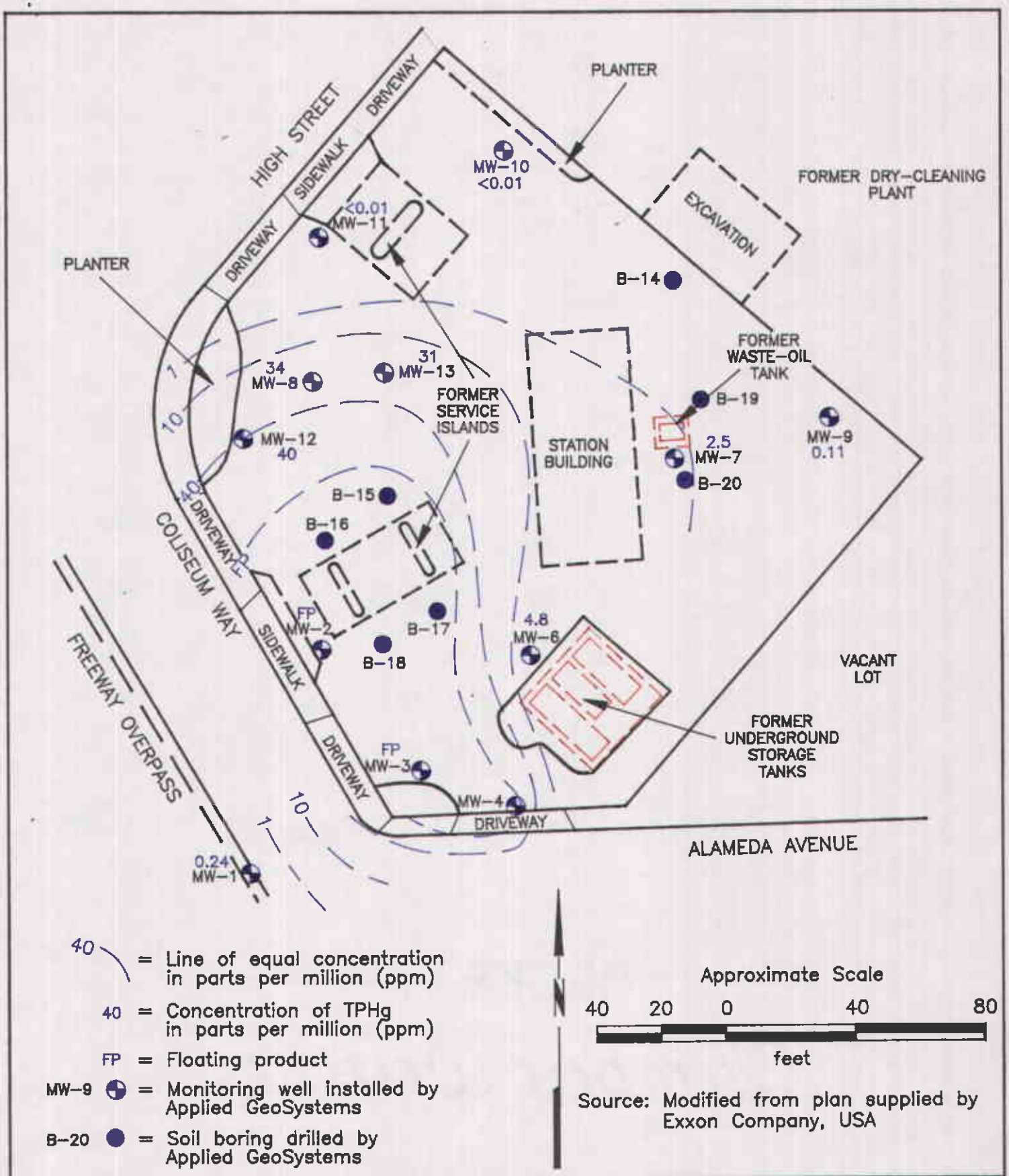
Source: Modified from plan supplied by Exxon Company, USA

Applied GeoSystems

PROJECT NO. 87042-6

CONCENTRATION OF DIESEL IN SOIL
Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE
P - 8



Source: Modified from plan supplied by Exxon Company, USA

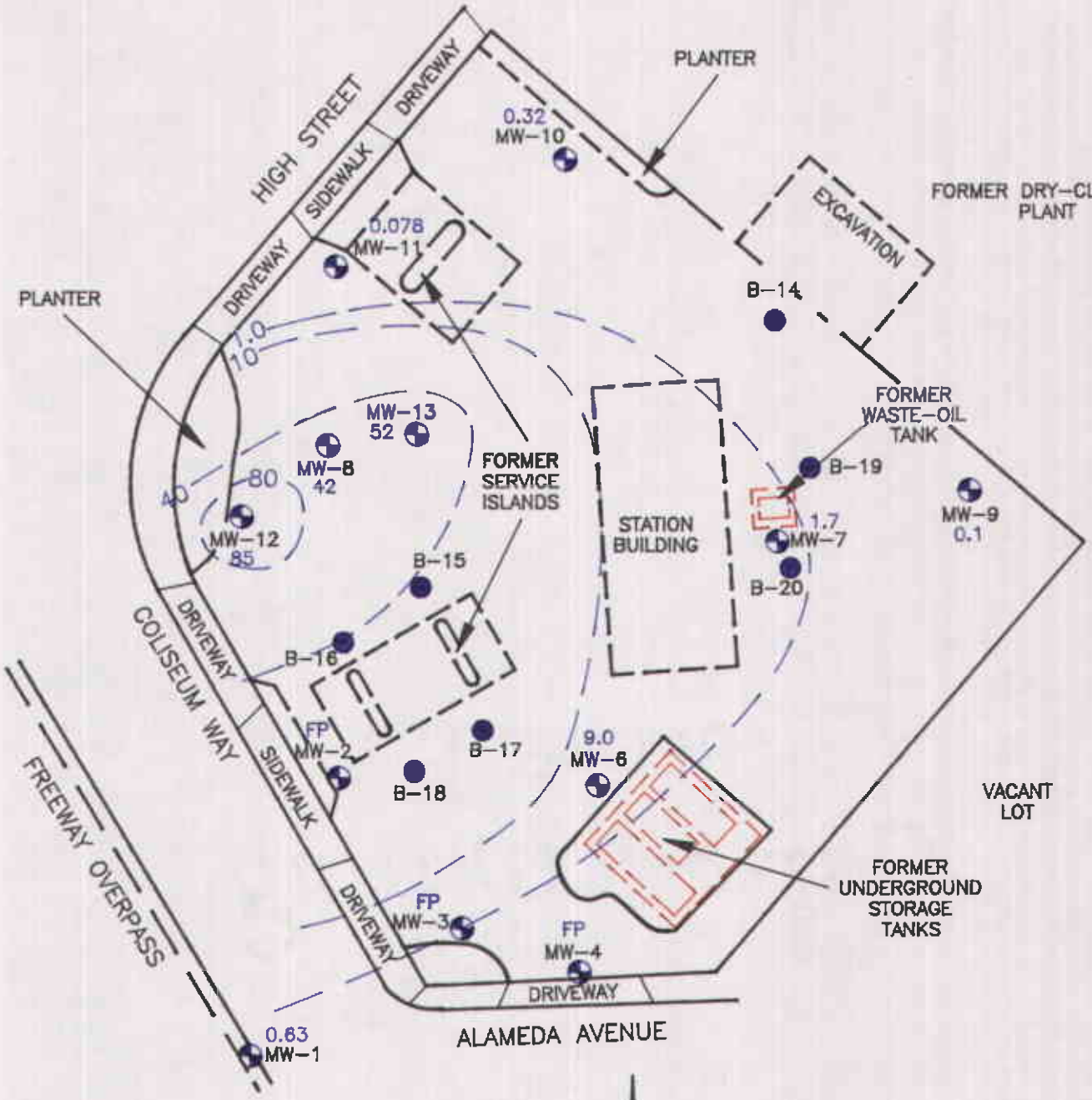
Applied GeoSystems

PROJECT NO. 87042-6

CONCENTRATION OF DIESEL IN GROUND WATER
Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

P - 9



80 = Line of equal concentration in parts per million (ppm)

85 = Concentration of TPHg in parts per million (ppm) sample from 10' below grade

FP = Floating product

MW-9 = Monitoring well installed by Applied GeoSystems

B-20 = Soil boring drilled by Applied GeoSystems

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by Exxon Company, USA

Applied GeoSystems

PROJECT NO. 87042-6

CONCENTRATION OF GASOLINE IN GROUND WATER
Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

P - 10

APPENDIX A

PROCEDURES

PROCEDURES

Site Safety Plan

Field work performed at the site by Applied GeoSystems on behalf of Exxon was conducted in accordance with Applied GeoSystems' Site Safety Plan No. 87042-6S (dated July 8, 1989). This plan describes the basic safety requirements for the subsurface environmental investigation and drilling of soil borings at the site. Personnel and subcontractors of Applied GeoSystems scheduled to perform work at the site were briefed on the contents of the Site Safety Plan before work began. A copy of the Site Safety Plan was kept at the site and was available for reference by appropriate parties during work.

Drilling of Borings

Kvilhaug Well Drilling of Concord, California, drilled the borings with a B-53 truck-mounted drill rig and steam-cleaned, continuous-flight, hollow-stem augers. The cuttings from the borings were stored onsite on plastic sheeting.

Soil Sampling

Soil samples were collected from the borings with a 2-1/2-inch-inside-diameter, California-modified, split-spoon sampler lined with clean brass sleeves. Soil was sampled at 2-1/2 to 5-foot intervals from the ground surface to total depth. Samples were collected by advancing the augers to a point just above the sampling depth and then driving the sampler into the earth material through the hollow center of the auger. The sampler was driven a maximum of 18 inches with a standard 140-pound hammer repeatedly dropped 30 inches. The sampler was retrieved and the soil samples removed. The samples were sealed in their brass sleeves with aluminum foil, plastic caps, and duct tape. The samples were labeled and promptly placed into iced storage for transport to an analytical laboratory for testing.

The geologist initiated a Chain of Custody Record for the soil samples and Applied GeoSystems personnel observed chain-of-custody protocol throughout subsequent handling of the soil samples.

The Unified Soil Classification System was used to identify soil encountered in the boreholes. A copy of this classification system is presented as Plate C-1 in Appendix C. Descriptions of the earth materials encountered in the borings are presented on the Logs of Borings (see Appendix C).

The relative consistency of the earth material encountered in the soil borings at 5-foot intervals was evaluated during sampling. The sampler was driven 18 inches with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows required to drive the soil sampler each 6-inch increment was counted and is shown on the Logs of Borings.

Head-Space Analysis of Soil Samples

The geologist conducted a photoionization detector (PID) headspace analysis on samples recovered from the boreholes, using an organic vapor meter (OVM) to analyze organic vapor concentrations. To take the readings, the geologist placed the rubber cup skirting the intake probe of the OVM flush against the end of the brass tube containing the soil sample just after the tube was removed from the sampler. Field instruments such as the OVM indicate relative organic vapor concentrations in soil but cannot assess the concentrations of hydrocarbon contaminants in the soil with the precision of laboratory analyses. Results of the headspace analysis are shown on the Logs of Borings (Appendix C).

Installation of Monitoring Wells

The monitoring wells were completed with 4-inch-inside-diameter, Schedule 40, polyvinyl chloride (PVC) casing. The slotted interval consists of machine-slotted PVC with 0.010-inch-wide slots. Blank PVC casing was set from the top of the screened casing to a few inches below the ground surface. All casing joints are flush threaded, and no glues, chemical cements, or solvents were used in well construction. The top of the well casing is covered with a locking cap and the bottom has a threaded end-plug.

The annular space of the well was backfilled with No. 2 sorted sand from the total depth to approximately 1 foot above the top of the screened casing. A bentonite plug, approximately 1 foot thick, was placed above the sand as a seal against cement entering the sand pack. The remaining annulus was backfilled with a slurry of neat cement to a few inches below the ground surface. A graphic representation of the well construction is shown in the right column of the Logs of Borings (see Appendix C). A key to symbols used to illustrate well construction is also shown in Appendix C.

An aluminum utility box with a PVC apron was placed over the wellhead and set in place with concrete flush with the surrounding ground surface. The utility box has a watertight seal to prevent surface-water infiltration and, to discourage unauthorized entry, must be opened with a special wrench.

Monitoring and Subjective Evaluation of Ground Water

The depth to static water level was measured to the nearest 0.01 foot with a Solinst electronic water-level indicator. In wells with free product, the geologist used an Oil Recovery Systems oil-water interface probe to measure the depth of the product and the depth of the product-water interface. The geologist then collected ground-water samples for subjective evaluation from each well by gently lowering approximately half the length of a Teflon bailer past the air-water interface. The bailer was washed with Alconox (a commercial biodegradable detergent) and rinsed with deionized water before each use. The samples were retrieved and examined for evidence of floating product, sheen, and emulsion.

Water and Product Sampling for Laboratory Analyses

Before collecting ground-water samples, the geologist purged the wells of approximately 3 well volumes of water. A water sample was collected from each well after the well had recharged to more than 80 percent of the static level. A disposable bailer certified clean by the manufacturer was used for collecting each water sample. Half the length of the bailer was lowered past the air-water interface to retrieve the water sample. The bailer was retrieved and the water samples slowly decanted into laboratory-cleaned sample containers. For TPHg, BTEX, and VOC analyses, 40-milliliter, volatile organic analysis glass sample vials with Teflon-lined caps were used. Hydrochloric acid was added to the samples as a preservative. For TOG and TPHd analyses, 1-liter glass bottles were used. The sample vials were promptly capped, labeled, and placed in iced storage for transport to a State-certified analytical laboratory for testing. The field geologist initiated a Chain of Custody Record and Applied GeoSystems personnel observed chain-of-custody protocol throughout subsequent handling of the samples.

The geologist collected product samples during bailing of the free product. The water from the bottom of the bailer was drained into a drum, and the product was decanted into glass sample vials.

The purged ground water and product was stored onsite in sealed, properly labeled, 17E, 55-gallon, liquid-waste drums approved for this use by the Department of Transportation.

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94566 • (415) 484-2600

30 November 1989

Applied Geosystems
43255 Mission Boulevard, Suite B
Fremont, CA 94539

Gentlemen:

Enclosed is Groundwater Protection Ordinance permit 89692 for a monitoring well construction project at 720 High Street in Oakland for Exxon Company USA.

Please note that permit condition A-2 requires that a well construction report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, and permit number.

If you have any questions, please contact Wyman Hong or Craig Mayfield at 484-2600.

Very truly yours,

Mun J. Mar
General Manager

By J. Killingstad
J. Killingstad, Chief
Water Resources Engineering

WH:mm
Enc.

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94566 ♦ (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

PERMIT NUMBER 89692
LOCATION NUMBER

(1) LOCATION OF PROJECT Exxon Station
720 High Street
Oakland, CA

(2) CLIENT
Name Exxon Co. U.S.A.
Address P.O. Box 4415 Phone (713) 656-7755
City Houston, TX Zip 77210-4415

(3) APPLICANT
Name JoEllen Kuszmaul
Applied GeoSystems
Address 43255 Mission Phone 657-1906
City Fremont, CA Zip 94539

(4) DESCRIPTION OF PROJECT
Water Well Construction X Geotechnical Investigation
Cathodic Protection ___ General ___
Well Destruction ___ Contamination ___

(5) PROPOSED WATER WELL USE
Domestic ___ Industrial ___ Irrigation ___
Municipal ___ Monitoring X Other ___

(6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. 432390

WELL PROJECTS
Drill Hole Diameter 10 in. Maximum
Casing Diameter 4 in. Depth 30 ft.
Surface Seal Depth 10 ft. Number 5

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

(7) ESTIMATED STARTING DATE 11/27/89
ESTIMATED COMPLETION DATE 11/30/89

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

APPLICANT'S SIGNATURE JoEllen Kuszmaul Date 11/12/89

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, irrigation, and monitoring wells unless a lesser depth is specially approved.

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 22 Nov 8
Wyman Hong

21989

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94566 (415) 484-2600

20 October 1989

Applied Geosystems
43255 Mission Boulevard, Suite B
Fremont, CA 94539

Gentlemen:

Enclosed is Groundwater Protection Ordinance permit 89611 for a contamination investigation at 720 High Street in Oakland for Exxon.

Please note that permit condition A-1 requests that an application be submitted five days prior to your proposed start of work.

If you have any questions, please contact Wyman Hong or Craig Mayfield at 484-2600.

Very truly yours,

Mun J. Mar
General Manager

By Craig A. Mayfield
Craig A. Mayfield
Water Resources Engineer III

TW:bkm
Enc.

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94566 • (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

PERMIT NUMBER 89611

LOCATION NUMBER

(1) LOCATION OF PROJECT Exxon Station 7-3006
720 High Street
Oakland, CA

(2) CLIENT
Name Exxon Company U.S.A
Address P.O. Box 4415 Phone (713) 656-7755
City Houston, TX Zip 77002

(3) APPLICANT
Name JoEllen Kuszmaul
Applied Geo Systems
Address 43255 Mission Phone 651-1906
City Fremont, CA Zip 94539

(4) DESCRIPTION OF PROJECT
Water Well Construction ___ Geotechnical Investigation
Cathodic Protection ___ General
Well Destruction ___ Contamination X

(5) PROPOSED WATER WELL USE
Domestic ___ Industrial ___ Irrigation ___
Municipal ___ Monitoring ___ Other N/A

(6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. 384167

WELL PROJECTS N/A
Drill Hole Diameter ___ in. Maximum
Casing Diameter ___ in. Depth ___ ft.
Surface Seal Depth ___ ft. Number ___

GEOTECHNICAL PROJECTS
Number of Borings 10 Maximum
Hole Diameter 8 in. Depth 15 ft.

(7) ESTIMATED STARTING DATE 10/25/89
ESTIMATED COMPLETION DATE 10/27/89

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

APPLICANT'S SIGNATURE JoEllen Kuszmaul Date 10/16/89

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, irrigation, and monitoring wells unless a lesser depth is specially approved.

(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 Todd N. Wendler Date 17 Oct 89
Todd N. Wendler

21989

APPENDIX C

LOGS OF BORINGS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		LTR	DESCRIPTION	MAJOR DIVISIONS		LTR	DESCRIPTION
Coarse-grained soils	Gravel and gravelly soils	GW	Well-graded gravels of gravel-sand mixtures, little or no fines	Fine-grained soils	Silts and clays LL<50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		GP	Poorly-graded gravels or gravel-sand mixtures, little or no fines			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		GM	Silty gravels, gravel-sand-silt mixtures			OL	Organic silts and organic silt-clays of low plasticity
		GC	Clayey gravels, gravel-sand-clay mixtures		Silts and clays LL>50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils. Elastic silts
	Sand and sandy soils	SW	Well-graded sand of gravelly sands, little or no fines			CH	Inorganic clays of high plasticity, fat clays
		SP	Poorly-graded sands or gravelly sands, little or no fines			OH	Organic clays of medium to high plasticity, organic silts
		SM	Silty sands, sand-silt mixtures	Highly organic soils		PT	Peat and other highly organic soils
		SC	Clayey sands, sand-clay mixtures				


Depth through which sampler is driven


Relatively undisturbed sample


No sample recovered


Static water level observed in well


Initial water level observed in boring

S-10 Sample number


Sand pack


Bentonite annular seal


Neat cement annular seal


Caved native soil


Blank PVC


Machine-slotted PVC

P.I.D. Photoionization detector

BLOWS REPRESENT THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH EACH 6 INCHES OF AN 18-INCH PENETRATION.

DASHED LINES SEPARATING UNITS ON THE LOG REPRESENT APPROXIMATE BOUNDARIES ONLY. ACTUAL BOUNDARIES MAY BE GRADUAL. LOGS REPRESENT SUBSURFACE CONDITIONS AT THE BORING LOCATION AT THE TIME OF DRILLING ONLY.

Applied GeoSystems

UNIFIED SOIL CLASSIFICATION SYSTEM AND SYMBOL KEY

PLATE C - 1

PROJECT NO. 87042-6

Total depth of boring: 25-1/2 feet **Diameter of boring:** 10 inches **Date drilled:** 11-27-89

Casing diameter: 4 inches **Length:** 25 feet **Slot size:** 0.010-inch

Screen diameter: 4 inches **Length:** 10 feet **Material type:** Sch 40 PVC

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional: _____

Registration No.: _____ **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (3 inches) over base rock (3 feet).	
2						
4		3 8		CL	Clay, with trace gravel, gray-brown, moist, high plasticity, very stiff.	
	S-5	20	0.4			
6		8 16		GC	Gravel with clay inclusions, brown and gray with red and yellow staining, damp, hard.	
	S-7	25	0.8			
8						
		12			Grades coarse with little clay.	
10		6		ML	Silt with trace coarse sand, tan, damp, medium plasticity.	
	S-10	6	0.4			
12						
14		9 6		CL	Clay, gray-tan, damp, medium plasticity, stiff.	
	S-15	6	0.1		Grades with increasing sand.	
16						
18						
		4 6				
20	S-20	6	0.4	GC	Medium gravel, gray-brown with yellow staining, damp, medium dense.	
					(Section continues downward)	

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B-10/MW-10

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 2

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GC	Medium gravel, gray–brown with yellow staining, damp, medium dense.	
					Wet.	
24		15		CL	Clay, tan–brown, damp, medium to high plasticity, very stiff.	
	S–25	17 12	1.4			
26					Total Depth = 25–1/2 feet.	
28						
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B-10/MW-10

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 3

Total depth of boring: 30-1/2 feet **Diameter of boring:** 10 inches **Date drilled:** 11-27-89

Casing diameter: 4 inches **Length:** 30 feet **Slot size:** 0.010-inch

Screen diameter: 4 inches **Length:** 15 feet **Material type:** Sch 40 PVC

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional: _____

Registration No.: _____ **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (3 inches) over base rock (3 feet).	
4		6, 10		CL	Silty clay, gray, damp, medium plasticity, very stiff.	
	S-5	12	0	SW	Fine to coarse sand, brown with yellow and green staining, damp.	
6		3, 4		CL	Silty clay, tan, damp, medium to high plasticity, stiff.	
	S-7	5	0	SP	Fine to medium sand, gray with red-brown and orange mottling, damp.	
8		5, 10		GM	Gravel, gray, wet, noticeable odor.	
10	S-9.5	12	0			
12				CL	Clay, dark gray, damp, high plasticity, very stiff.	
14		4, 8				
	S-15	10	1.1			
16						
18						
		5, 7		▼ GC	Fine to medium gravel with clay and fine to coarse sand, tan with gray-brown mottling, wet, dense.	
20	S-20	16	2.4			

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PROJECT NO. 87042-6

LOG OF BORING B-11/MW-11

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 4

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GC	Fine to medium gravel with clay and fine to coarse sand, tan with gray–brown mottling, wet, dense.	
24		20				
		30				
	S–25	40	0.4	SP	Medium to coarse sand, tan–brown, wet, very dense.	
26						
28						
		5		ML	Silt with trace sand, gray–tan, moist, low plasticity, stiff.	
30		7				
	S–30	15	0	CL	Clay, gray–brown, damp, high plasticity, stiff.	
					Total Depth = 30–1/2 feet.	
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B-11/MW-11

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 5

Total depth of boring: 15-1/2 feet **Diameter of boring:** 10 inches **Date drilled:** 11-27-89

Casing diameter: 4 inches **Length:** 15 feet **Slot size:** 0.010-inch

Screen diameter: 4 inches **Length:** 10 feet **Material type:** Sch 40 PVC

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional: _____

Registration No.: _____ **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches) over base rock (1 foot).	
2				CL	Clay, dark gray, damp, medium plasticity, medium stiff.	
4		5		ML	Sandy silt, tan-gray, damp, low plasticity, very stiff.	
	S-5	11 17	0			
6		7				
	S-7	15 25	17.1	GC	Sandy clay, medium gravel, gray-brown with yellow staining, damp, very dense, noticeable odor.	
8		7			▼	
10	S-10	17 15	28.7	SP	Medium to coarse sand, dark gray, wet, dense, noticeable odor.	
12						
14		6		ML	Sandy silt, tan-gray, damp, low to medium plasticity, very stiff.	
	S-15	21 12	0.8			
16					Total Depth = 15-1/2 feet.	
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B-12/MW-12

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE
C - 6

Total depth of boring: 15-1/2 feet **Diameter of boring:** 10 inches **Date drilled:** 11-28-89

Casing diameter: 4 inches **Length:** 15 feet **Slot size:** 0.010-inch

Screen diameter: 4 inches **Length:** 10 feet **Material type:** Sch 40 PVC

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional: _____

Registration No.: _____ **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (3 inches) over base rock (6 inches).	
				CL	Clay, dark gray, damp, medium plasticity, stiff.	
2						
4		3 7		ML	Sandy silt, light and medium gray mottled, slightly damp, low plasticity, stiff.	
	S-5	11	0.8			
6		3 12				
	S-7	36	14	GM	Sandy, silty gravel, light gray with yellow staining, damp, dense, noticeable odor.	
8		6 30		▼		
10	S-10	30	48	GW	Coarse gravel, dark gray-green with yellow staining, wet, dense, noticeable odor.	
12						
				ML	Sandy silt with trace fine gravel, tan-brown, damp, low plasticity, very stiff.	
14		4 11				
	S-15	17	0.4			
16					Total Depth = 15-1/2 feet.	
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B-13/MW-13

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 7

Total depth of boring: 13 feet **Diameter of boring:** 8 inches **Date drilled:** 11-29-89

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches) over base rock (6 inches).	
2				CL	Clay, dark gray-brown, slightly damp, medium plasticity.	
4		5 9		ML	Silt, green-gray, damp, low plasticity, stiff.	
6	S-5	13	0.1	CL	Clay with trace silt, gray and green, damp, medium plasticity, stiff.	
8	S-7.5	8 17 19	0.1	GC	Sandy, silty gravel, brown with green-gray, moist, very dense.	
10	S-10	10 16 45	432	GP	With little fines, wet, noticeable odor.	
12	S-12.5	15 20 17	1.2	CL	Clay, tan with orange-brown mottling, moist, medium plasticity, hard.	
14					Total Depth = 13 feet.	
16						
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B - 14

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 8

Total depth of boring: 12-1/2 feet **Diameter of boring:** 8 inches **Date drilled:** 11-28-89

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional: _____

Registration No.: _____ **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (3 inches) over base rock (6 inches).	
				CL	Clay, black, damp.	
2						
				ML	Clayey sandy silt, brown-tan, very moist, low plasticity, stiff.	
4		3 6				
	S-5	11	116			
6				SC	Clayey fine sand, brown-tan, moist, medium dense.	
		4 6		GW	Gravel with some silt and sand, brown-gray, damp, dense, noticeable odor.	
8	S-7.5	13	237			
		7 17		GP	Gravel, dark gray with red and yellow-brown staining, wet, dense, noticeable odor.	
10	S-10	19	336			
		7 16		SP	Coarse sand, wet, dense.	
12	S-12	13	24	ML	Silt, tan-brown, damp, low to medium plasticity, stiff.	
					Total Depth = 12-1/2 feet.	
14						
16						
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B - 15

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 9

Total depth of boring: 12-1/2 feet **Diameter of boring:** 8 inches **Date drilled:** 11-28-89

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional: _____

Registration No.: _____ **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (3 inches) over base rock (6 inches).	
				CL	Silty clay, black, damp.	
2						
				ML	Sandy silt, tan-brown, slightly damp, low to medium plasticity, stiff.	
4		5				
		10				
	S-5	11	94		Grades with trace gravel.	
6		10		GM	Sandy silty medium gravel, dark gray, brown with yellow brown and red mottling, very moist, dense, noticeable odor.	
		16				
	S-7	26	1043			
8						
		9		▼		
		15			Grades with no fines and coarse sand.	
10	S-10	12	18.7		Medium to coarse sand, tan-brown, wet, dense.	
		3		SM	Sandy silt, tan-brown, damp, low to moderate plasticity, stiff.	
		3		ML		
12	S-12	4	27		Total Depth = 12-1/2 feet.	
14						
16						
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B - 16

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 10

Total depth of boring: 13 feet **Diameter of boring:** 8 inches **Date drilled:** 11-29-89

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional: _____

Registration No.: _____ **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (3 inches) over base rock (1 foot).	
2				CL	Clay with wood fragments, dark gray-brown, damp, medium plasticity, stiff.	
4		4			Abundant wood fragments.	
		4		CL	Clay, tan-gray mottled, damp, medium plasticity, stiff.	
	S-5	8	0.4			
6		4		ML	Sandy silt, tan, damp, low plasticity, very stiff.	
		11				
	S-7.5	18	12.8	GM	Sandy silty medium gravel, gray-green with yellow-brown staining, damp, dense, noticeable odor.	
8		10				
		23				
10	S-10	2	692			
				▼		
12		11				
		14			Wet.	
	S-12.5	32	268			
					Total Depth = 13 feet.	
14						
16						
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B - 17

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 11

Total depth of boring: feet **Diameter of boring:** 8 inches **Date drilled:** 11-29-89

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches) over base rock (1foot).	
2				CL	Silty clay, black, damp, noticeable odor.	
				CL	Clay, dark gray, slightly damp, medium plasticity, stiff.	
4		4				
	S-5	10 13	30.6	ML	Silt, green-gray with trace tan mottling, very damp, low plasticity, very stiff, noticeable odor.	
6		15				
		19		GC	Medium gravel with some sand and clay, gray and tan-brown, moist, very dense, noticeable odor.	
8	S-7.5	21	141.6			
		12				
10		14		▼		
	S-10	8	520		Medium to coarse gravel, wet.	
		9		SC	Clayey sand, gray and tan-brown, wet.	
12		11				
	S-12.5	9	3.8	ML	Clayey silt, tan, moist, low platicity, dense.	
14					Total Depth = 13 feet.	
16						
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B - 18

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 12

Total depth of boring: 12-1/2 feet **Diameter of boring:** 8 inches **Date drilled:** 11-29-89

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (3 inches) over base rock (6 inches).	
2				CL	Silty clay, dark brown, damp.	
4		2 5		CL	Clay, gray-brown, damp, medium plasticity.	
6	S-5	11	0.4	ML	Silt with trace sand and gravel, tan-brown, damp, low plasticity, stiff.	
8	S-7	9 13 14	1.4	SP	Silty sand, orange-tan, damp, very dense.	
10	S-10	7 14 10	192	GM	Sandy silty gravel, orange-tan with red-brown staining, moist, dense.	
12	S-12	7 20 21	69	▼	Wet.	
14					Total Depth = 12-1/2 feet.	
16						
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B - 19

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 13

Total depth of boring: 12-1/2 feet **Diameter of boring:** 8 inches **Date drilled:** 11-29-89

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Kvilhaug Well Drilling, Inc. **Driller:** Rod and Mike

Method Used: Hollow-Stem Auger **Field Geologist:** Russell Bak

Signature of Registered Professional: _____

Registration No.: _____ **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (3 inches) over base rock (6 inches).	
2				CL	Silty clay, dark brown, damp.	
4		3 7		CL	Clay with trace silt and gravel, tan-brown, damp, high plasticity, stiff.	
	S-5	9	0.1			
6		5 7		ML	Silt, tan-brown, damp, stiff.	
	S-7	13	0.1	SM	Fine silty sand, yellow-brown and orange, damp, dense.	
8		4 8				
10	S-10	12	30.6	SW	Medium to coarse sand, green-gray, moist, dense, noticeable odor.	
		12 14		GP	Coarse sand and gravel, dark green-gray, wet, very dense, noticeable odor.	
12	S-12	17	20.3			
					Total Depth = 12-1/2 feet.	
14						
16						
18						
20						

Applied GeoSystems

PROJECT NO. 87042-6

LOG OF BORING B - 20

Exxon Station No. 7-3006
720 High Street
Oakland, California

PLATE

C - 14

APPENDIX D

CHAIN OF CUSTODY RECORDS

AND CERTIFIED ANALYTICAL REPORTS

FOR SOIL

CHAIN OF CUSTODY RECORD

Applied GeoSystems
43255 Mission Blvd Suite B Fremont, CA 94539 415/65

SAMPLER (signature): Russell Bark

Phone: _____

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 2 weeks

Project Leader: JoEllen Kuszmaul

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper _____

Address _____

Date Shipped _____

Service Used _____

Airbill No. _____ Cooler No. _____

Relinquished by: (signatures)	Received by: (signatures)	Date
	JoEllen Kuszmaul	11/28/89
JoEllen Kuszmaul		
	Received for laboratory by:	11-29-89

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Conditio Upon Receipt
S-10-B10	87042-6	11/27/89	TPHd/TPHg/BTEX	iced
S-10-B11		11/27/89		
S-7½-B12		11/28/89		
S-10-B12				
S-7½-B13				
S-10-B13				
S-5-B15				
S-7½-B15				
S-10-B15				
S-5-B16				
S-7½-B16				
S-10-B16	↓	↓	↓	↓

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S01
Project #: 87042-6
Sample #: S-10-B10
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	ND		2.0		12-04-89	
TEH as Diesel	ND		10		12-05-89	
Benzene	ND		0.050		12-04-89	
Toluene	ND		0.050		12-04-89	
Ethylbenzene	ND		0.050		12-04-89	
Total Xylenes	ND		0.050		12-04-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

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12-08-89
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S02
Project #: 87042-6
Sample #: S-10-B11
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	ND		2.0		12-04-89	
TEH as Diesel	ND		10		12-06-89	
Benzene	0.064		0.050		12-04-89	
Toluene	0.11		0.050		12-04-89	
Ethylbenzene	ND		0.050		12-04-89	
Total Xylenes	0.076		0.050		12-04-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

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Date Reported

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S03
Project #: 87042-6
Sample #: S-7.5-B12
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	160		5.0		12-04-89	
TEH as Diesel	23		10		12-06-89	
Benzene	1.2		0.10		12-04-89	
Toluene	3.1		0.10		12-04-89	
Ethylbenzene	3.4		0.10		12-04-89	
Total Xylenes	14		0.10		12-04-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

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Date Reported

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S04
Project #: 87042-6
Sample #: S-10-B12
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	3.1		2.0		12-04-89	
TEH as Diesel	16		10		12-06-89	
Benzene	0.86		0.050		12-04-89	
Toluene	0.090		0.050		12-04-89	
Ethylbenzene	0.18		0.050		12-04-89	
Total Xylenes	0.17		0.050		12-04-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

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Report Prepared for:
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43255 Misson Boulevard
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Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S05
Project #: 87042-6
Sample #: S-7.5-B13
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	ND		2.0		12-04-89	
TEH as Diesel	ND		10		12-07-89	
Benzene	ND		0.050		12-04-89	
Toluene	0.12		0.050		12-04-89	
Ethylbenzene	ND		0.050		12-04-89	
Total Xylenes	0.10		0.050		12-04-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

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Report Prepared for:
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43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S06
Project #: 87042-6
Sample #: S-10-B13
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	17		2.0		12-05-89	
TEH as Diesel	ND		10		12-07-89	
Benzene	ND		0.050		12-05-89	
Toluene	0.14		0.050		12-05-89	
Ethylbenzene	0.33		0.050		12-05-89	
Total Xylenes	1.2		0.050		12-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

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Report Prepared for:
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43255 Misson Boulevard
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Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S07
Project #: 87042-6
Sample #: S-5-B15
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	130		5.0		12-05-89	
TEH as Diesel	ND		10		12-07-89	
Benzene	2.2		0.050		12-05-89	
Toluene	7.2		0.050		12-05-89	
Ethylbenzene	2.2		0.050		12-05-89	
Total Xylenes	11		0.050		12-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S08
Project #: 87042-6
Sample #: S-7.5-B15
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	98		2.0		12-05-89	
TEH as Diesel	28		10		12-07-89	
Benzene	0.97		0.050		12-05-89	
Toluene	3.9		0.050		12-05-89	
Ethylbenzene	1.8		0.050		12-05-89	
Total Xylenes	9.8		0.050		12-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-08-89
Date Reported

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Report Prepared for:
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43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S09
Project #: 87042-6
Sample #: S-10-B15
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	180		5.0		12-05-89	
TEH as Diesel	82		10		12-07-89	
Benzene	1.4		0.050		12-05-89	
Toluene	4.4		0.050		12-05-89	
Ethylbenzene	3.6		0.050		12-05-89	
Total Xylenes	16		0.050		12-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-08-89
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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S10
Project #: 87042-6
Sample #: S-5-B16
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	87		2.0		12-05-89	
TEH as Diesel	43		10		12-07-89	
Benzene	2.2		0.050		12-05-89	
Toluene	4.4		0.050		12-05-89	
Ethylbenzene	1.7		0.050		12-05-89	
Total Xylenes	7.6		0.050		12-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-08-89
Date Reported

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S11
Project #: 87042-6
Sample #: S-7.5-B16
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	1100		50		12-05-89	
TEH as Diesel	1500		50		12-07-89	
Benzene	9.0		0.25		12-05-89	
Toluene	60		0.25		12-05-89	
Ethylbenzene	23		0.25		12-05-89	
Total Xylenes	109		0.25		12-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91136S12
Project #: 87042-6
Sample #: S-10-B16
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	380		10		12-05-89	
TEH as Diesel	110		10		12-08-89	
Benzene	4.2		0.10		12-05-89	
Toluene	11		0.10		12-05-89	
Ethylbenzene	8.4		0.10		12-05-89	
Total Xylenes	35		0.10		12-05-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-08-89
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CHAIN OF CUSTODY RECORD

Applied GeoSystems

43255 Mission Blvd Suite B Fremont, CA 94539

SAMPLER (signature): Russell Bell

Phone:

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 2 weeks

Project Leader: JoEllen Kuszmaul

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date
	Jo Ellen Kuszmaul	11/29/150
JoEllen Kuszmaul		
	Received for laboratory by:	11-29-8 18:00

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH TH LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Cond Upon Recei
S-5-B18	B7042-6	11/29/89	TPHd / TPHg / BTEX	iced
S-7½-B18				
S-10-B18				
S-5-B17				
S-7½-B17				
S-10-B17				

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91137S01
Project #: 87042-6
Sample #: S-5-B17
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	ND		2.0		12-11-89	
TEH as Diesel	ND		10		12-13-89	
Benzene	ND		0.050		12-11-89	
Toluene	ND		0.050		12-11-89	
Ethylbenzene	ND		0.050		12-11-89	
Total Xylenes	ND		0.050		12-11-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-15-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91137S02
Project #: 87042-6
Sample #: S-7.5-B17
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	8.1		2.0		12-11-89	
TEH as Diesel	ND		10		12-13-89	
Benzene	0.085		0.050		12-11-89	
Toluene	ND		0.050		12-11-89	
Ethylbenzene	0.19		0.050		12-11-89	
Total Xylenes	0.24		0.050		12-11-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-15-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91137S03
Project #: 87042-6
Sample #: S-10-B17
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	7.1		2.0		12-11-89	
TEH as Diesel	200		10		12-13-89	
Benzene	0.091		0.050		12-11-89	
Toluene	ND		0.050		12-11-89	
Ethylbenzene	0.20		0.050		12-11-89	
Total Xylenes	0.25		0.050		12-11-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-15-89
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91137S04
Project #: 87042-6
Sample #: S-5-B18
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	210		10		12-11-89	
TEH as Diesel	46		10		12-13-89	
Benzene	1.6		0.050		12-11-89	
Toluene	0.71		0.050		12-11-89	
Ethylbenzene	3.9		0.050		12-11-89	
Total Xylenes	12		0.050		12-11-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-15-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91137S05
Project #: 87042-6
Sample #: S-7.5-B18
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	210		10		12-11-89	
TEH as Diesel	270		10		12-13-89	
Benzene	2.4		0.050		12-11-89	
Toluene	0.50		0.050		12-11-89	
Ethylbenzene	4.8		0.050		12-11-89	
Total Xylenes	20		0.050		12-11-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-15-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-29-89
Laboratory Number: 91137S06
Project #: 87042-6
Sample #: S-10-B18
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	130		2.0		12-11-89	
TEH as Diesel	2000		50		12-13-89	
Benzene	0.93		0.050		12-11-89	
Toluene	0.36		0.050		12-11-89	
Ethylbenzene	2.8		0.050		12-11-89	
Total Xylenes	11		0.050		12-11-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-15-89
Date Reported

CHAIN OF CUSTODY RECORD

Applied GeoSystems

43255 Mission Blvd. Suite B Fremont, CA 94539 415

SAMPLER (signature): Russell Blk

Phone.

LABORATORY: Anametrix

TURNAROUND TIME: 2 weeks

Project Leader: JoEllen Kuszmaul

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No.

Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date
JoEllen Kuszmaul	JoEllen Kuszmaul	11/29/ 1500
Tighi Memelunt	Tighi Memelunt	11/30/8 12:4
	Received for laboratory by.	

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
S-10-B14	87042-6	11/29/89	8240, TPHg, 503E and TPHd	iced
S-10-B20	↓	↓	↓	↓
S-10-B19	↓	↓	↓	↓

ANAMETRIX INC
Environmental & Analytical Chemistry
[illegible]

REPORT

JoEllen Kuszmaul
Applied GeoSystems
43255 Mission Boulevard
Suite B
Fremont, CA 94539

December 13, 1989
Anametrix W.O.#: 8911256
Date Received : 11/30/89
Project Number : 87042-6

Dear Ms. Kuszmaul:

Your samples have been received for analysis. The REPORT SUMMARY lists your sample identifications and the analytical methods you requested. The following sections are included in this report: RESULTS and QUALITY ASSURANCE.

NOTE: 1) Amounts reported are net values, i.e. corrected for method blank contamination.
2) The following footnotes are applicable to Methods 624/8240:

- * A Method 624 priority pollutant compound (Federal Register, 10/26/84)
- ** A compound on the U.S. EPA CLP Hazardous Substance List (HSL)
- # An additional compound analyzed for by Anametrix, Inc.
- ND: Not detected at or above the practical quantitation limit for the method.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

ANAMETRIX, INC.

Burt Sutherland

Burt Sutherland
Laboratory Director

BWS/dag

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

Client	: Applied GeoSystems	Anametrix W.O.#:	8911256
Address	: 43255 Mission Boulevard	Date Received :	11/30/89
	Suite B	Purchase Order#:	N/A
City	: Fremont, CA 94539	Project No. :	87042-6
Attn.	: JoEllen Kuszmaul	Date Released :	12/13/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8911256-01	S-10-B14	SOIL	11/29/89	8240		12/07/89	F1
8911256-02	S-10-B20	SOIL	11/29/89	8240		12/07/89	F1
8911256-03	S-10-B19	SOIL	11/29/89	8240		12/07/89	F1
8911256-01	S-10-B14	SOIL	11/29/89	TPH	12/04/89	12/12/89	N/A
8911256-02	S-10-B20	SOIL	11/29/89	TPH	12/04/89	12/12/89	N/A
8911256-03	S-10-B19	SOIL	11/29/89	TPH	12/04/89	12/12/89	N/A
QUALITY ASSURANCE (QA)							
1CB1207V00	METHOD BLANK	SOIL	N/A	8240		12/07/89	F1

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 87042-6 S-10-B14
Matrix : SOIL
Date sampled : 11/29/89
Date analyzed: 12/07/89
Dilut. factor: 100

Anametrix I.D. : 8911256-01
Analyst : [illegible]
Supervisor : PG
Date released : 12/13/89
Instrument ID : F1

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	1000	ND
75-01-4	* Vinyl Chloride	1000	ND
74-83-9	* Bromomethane	1000	ND
75-00-3	* Chloroethane	1000	ND
75-69-4	* Trichlorofluoromethane	500	ND
75-35-4	* 1,1-Dichloroethene	500	ND
76-13-1	# Trichlorotrifluoroethane	500	ND
67-64-1	**Acetone	2000	ND
75-15-0	**Carbondisulfide	500	ND
75-09-2	* Methylene Chloride	500	ND
156-60-5	* Trans-1,2-Dichloroethene	500	ND
75-34-3	* 1,1-Dichloroethane	500	ND
78-93-3	**2-Butanone	2000	ND
156-59-2	* Cis-1,2-Dichloroethene	500	ND
67-66-3	* Chloroform	500	ND
71-55-6	* 1,1,1-Trichloroethane	500	ND
56-23-5	* Carbon Tetrachloride	500	ND
71-43-2	* Benzene	500	ND
107-06-2	* 1,2-Dichloroethane	500	ND
79-01-6	* Trichloroethene	500	ND
78-87-5	* 1,2-Dichloropropane	500	ND
75-27-4	* Bromodichloromethane	500	ND
110-75-8	* 2-Chloroethylvinylether	500	ND
108-05-4	**Vinyl Acetate	1000	ND
10061-02-6	* Trans-1,3-Dichloropropene	500	ND
108-10-1	**4-Methyl-2-Pentanone	1000	ND
108-88-3	* Toluene	500	ND
10061-01-5	* cis-1,3-Dichloropropene	500	ND
79-00-5	* 1,1,2-Trichloroethane	500	ND
127-18-4	* Tetrachloroethene	500	ND
591-78-6	**2-Hexanone	1000	ND
124-48-1	* Dibromochloromethane	500	ND
108-90-7	* Chlorobenzene	500	ND
100-41-4	* Ethylbenzene	500	1200
1330-20-7	**Total Xylenes	500	1800
100-42-5	**Styrene	500	ND
75-25-2	* Bromoform	500	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	500	ND
541-73-1	* 1,3-Dichlorobenzene	500	ND
106-46-7	* 1,4-Dichlorobenzene	500	ND
95-50-1	* 1,2-Dichlorobenzene	500	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	73-130%	108%
2037-26-5	Toluene-d8	74-121%	102%
460-00-4	p-Bromofluorobenzene	70-124%	95%

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 87042-6 S-10-B20
Matrix : SOIL
Date sampled : 11/29/89
Date analyzed: 12/07/89
Dilut. factor: 1000

Anametrix I.D. : 8911256-02
Analyst : GH
Supervisor : FG
Date released : 12/13/89
Instrument ID : F1

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	10000	ND
75-01-4	* Vinyl Chloride	10000	ND
74-83-9	* Bromomethane	10000	ND
75-00-3	* Chloroethane	10000	ND
75-69-4	* Trichlorofluoromethane	5000	ND
75-35-4	* 1,1-Dichloroethene	5000	ND
76-13-1	# Trichlorotrifluoroethane	5000	ND
67-64-1	**Acetone	20000	87000
75-15-0	**Carbondisulfide	5000	ND
75-09-2	* Methylene Chloride	5000	ND
156-60-5	* Trans-1,2-Dichloroethene	5000	ND
75-34-3	* 1,1-Dichloroethane	5000	ND
78-93-3	**2-Butanone	20000	ND
156-59-2	* Cis-1,2-Dichloroethene	5000	ND
67-66-3	* Chloroform	5000	ND
71-55-6	* 1,1,1-Trichloroethane	5000	ND
56-23-5	* Carbon Tetrachloride	5000	ND
71-43-2	* Benzene	5000	ND
107-06-2	* 1,2-Dichloroethane	5000	ND
79-01-6	* Trichloroethene	5000	ND
78-87-5	* 1,2-Dichloropropane	5000	ND
75-27-4	* Bromodichloromethane	5000	ND
110-75-8	* 2-Chloroethylvinylether	5000	ND
108-05-4	**Vinyl Acetate	10000	ND
10061-02-6	* Trans-1,3-Dichloropropene	5000	ND
108-10-1	**4-Methyl-2-Pentanone	10000	ND
108-88-3	* Toluene	5000	ND
10061-01-5	* cis-1,3-Dichloropropene	5000	ND
79-00-5	* 1,1,2-Trichloroethane	5000	ND
127-18-4	* Tetrachloroethene	5000	ND
591-78-6	**2-Hexanone	10000	ND
124-48-1	* Dibromochloromethane	5000	ND
108-90-7	* Chlorobenzene	5000	ND
100-41-4	* Ethylbenzene	5000	64000
1330-20-7	**Total Xylenes	5000	120000
100-42-5	**Styrene	5000	ND
75-25-2	* Bromoform	5000	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	5000	ND
541-73-1	* 1,3-Dichlorobenzene	5000	ND
106-46-7	* 1,4-Dichlorobenzene	5000	ND
95-50-1	* 1,2-Dichlorobenzene	5000	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	73-130%	81%
2037-26-5	Toluene-d8	74-121%	102%
460-00-4	p-Bromofluorobenzene	70-124%	92%

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 87042-6 S-10-B19
Matrix : SOIL
Date sampled : 11/29/89
Date analyzed: 12/07/89
Dilut. factor: 100

Anametrix I.D. : 8911256-03
Analyst : UM
Supervisor : PG
Date released : 12/13/89
Instrument ID : F1

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	1000	ND
75-01-4	* Vinyl Chloride	1000	ND
74-83-9	* Bromomethane	1000	ND
75-00-3	* Chloroethane	1000	ND
75-69-4	* Trichlorofluoromethane	500	ND
75-35-4	* 1,1-Dichloroethene	500	ND
76-13-1	# Trichlorotrifluoroethane	500	ND
67-64-1	**Acetone	2000	ND
75-15-0	**Carbondisulfide	500	ND
75-09-2	* Methylene Chloride	500	ND
156-60-5	* Trans-1,2-Dichloroethene	500	ND
75-34-3	* 1,1-Dichloroethane	500	ND
78-93-3	**2-Butanone	2000	ND
156-59-2	* Cis-1,2-Dichloroethene	500	ND
67-66-3	* Chloroform	500	ND
71-55-6	* 1,1,1-Trichloroethane	500	ND
56-23-5	* Carbon Tetrachloride	500	ND
71-43-2	* Benzene	500	ND
107-06-2	* 1,2-Dichloroethane	500	ND
79-01-6	* Trichloroethene	500	ND
78-87-5	* 1,2-Dichloropropane	500	ND
75-27-4	* Bromodichloromethane	500	ND
110-75-8	* 2-Chloroethylvinylether	500	ND
108-05-4	**Vinyl Acetate	1000	ND
10061-02-6	* Trans-1,3-Dichloropropene	500	ND
108-10-1	**4-Methyl-2-Pentanone	1000	ND
108-88-3	* Toluene	500	ND
10061-01-5	* cis-1,3-Dichloropropene	500	ND
79-00-5	* 1,1,2-Trichloroethane	500	ND
127-18-4	* Tetrachloroethene	500	ND
591-78-6	**2-Hexanone	1000	ND
124-48-1	* Dibromochloromethane	500	ND
108-90-7	* Chlorobenzene	500	ND
100-41-4	* Ethylbenzene	500	ND
1330-20-7	**Total Xylenes	500	1700
100-42-5	**Styrene	500	ND
75-25-2	* Bromoform	500	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	500	ND
541-73-1	* 1,3-Dichlorobenzene	500	ND
106-46-7	* 1,4-Dichlorobenzene	500	ND
95-50-1	* 1,2-Dichlorobenzene	500	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	73-130%	98%
2037-26-5	Toluene-d8	74-121%	96%
460-00-4	p-Bromofluorobenzene	70-124%	100%

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 87042-6 S-10-B14	Anametrix I.D.	: 8911256-01
Matrix	: SOIL	Analyst	:
Date sampled	: 11/29/89	Supervisor	:
Date anl.TPHg	: 12/06/89	Date released	: 12/13/89
Date ext.TPHd	: 12/05/89	Date ext. TOG	: 12/04/89
Date anl.TPHd	: 12/12/89	Date anl. TOG	: 12/05/89

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	100000	3400000
	TPH as Diesel	10000	1900000
	Total Oil & Grease	30000	820000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.

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

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 87042-6 S-10-B20	Anametrix I.D.	: 8911256-02
Matrix	: SOIL	Analyst	:
Date sampled	: 11/29/89	Supervisor	:
Date anl.TPHg	: 12/06/89	Date released	: 12/13/89
Date ext.TPHd	: 12/05/89	Date ext. TOG	: 12/04/89
Date anl.TPHd	: 12/12/89	Date anl. TOG	: 12/05/89

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	100000	3100000
	TPH as Diesel	10000	360000
	Total Oil & Grease	30000	73000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.

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

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 87042-6 S-10-B19	Anametrix I.D.	: 8911256-03
Matrix	: SOIL	Analyst	:
Date sampled	: 11/29/89	Supervisor	:
Date anl.TPHg	: 12/06/89	Date released	: 12/13/89
Date ext.TPHd	: 12/05/89	Date ext. TOG	: 12/04/89
Date anl.TPHd	: 12/12/89	Date anl. TOG	: 12/05/89

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	4000	21000
	TPH as Diesel	10000	21000
	Total Oil & Grease	30000	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following either EPA Method 3510 or 3550.
TOG - Total Oil & Grease is determined by Standard Method 503E.

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

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240

ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: METHOD BLANK	Anametrix I.D.	: 1CB1207V00
Matrix	: SOIL	Analyst	: UH
Date sampled	: N/A	Supervisor	: PG
Date analyzed	: 12/07/89	Date released	: 12/13/89
Dilut. factor	: NONE	Instrument ID	: F1

CAS #	Compound Name	Reporting Limit (ug/Kg)	Amount Found (ug/Kg)
74-87-3	* Chloromethane	10	ND
75-01-4	* Vinyl Chloride	10	ND
74-83-9	* Bromomethane	10	ND
75-00-3	* Chloroethane	10	ND
75-69-4	* Trichlorofluoromethane	5	ND
75-35-4	* 1,1-Dichloroethene	5	ND
76-13-1	# Trichlorotrifluoroethane	5	ND
67-64-1	**Acetone	20	ND
75-15-0	**Carbondisulfide	5	ND
75-09-2	* Methylene Chloride	5	ND
156-60-5	* Trans-1,2-Dichloroethene	5	ND
75-34-3	* 1,1-Dichloroethane	5	ND
78-93-3	**2-Butanone	20	ND
156-59-2	* Cis-1,2-Dichloroethene	5	ND
67-66-3	* Chloroform	5	ND
71-55-6	* 1,1,1-Trichloroethane	5	ND
56-23-5	* Carbon Tetrachloride	5	ND
71-43-2	* Benzene	5	ND
107-06-2	* 1,2-Dichloroethane	5	ND
79-01-6	* Trichloroethene	5	ND
78-87-5	* 1,2-Dichloropropane	5	ND
75-27-4	* Bromodichloromethane	5	ND
110-75-8	* 2-Chloroethylvinylether	5	ND
108-05-4	**Vinyl Acetate	10	ND
10061-02-6	* Trans-1,3-Dichloropropene	5	ND
108-10-1	**4-Methyl-2-Pentanone	10	ND
108-88-3	* Toluene	5	ND
10061-01-5	* cis-1,3-Dichloropropene	5	ND
79-00-5	* 1,1,2-Trichloroethane	5	ND
127-18-4	* Tetrachloroethene	5	ND
591-78-6	**2-Hexanone	10	ND
124-48-1	* Dibromochloromethane	5	ND
108-90-7	* Chlorobenzene	5	ND
100-41-4	* Ethylbenzene	5	ND
1330-20-7	**Total Xylenes	5	ND
100-42-5	**Styrene	5	ND
75-25-2	* Bromoform	5	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	5	ND
541-73-1	* 1,3-Dichlorobenzene	5	ND
106-46-7	* 1,4-Dichlorobenzene	5	ND
95-50-1	* 1,2-Dichlorobenzene	5	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	73-130%	86%
2037-26-5	Toluene-d8	74-121%	96%
460-00-4	p-Bromofluorobenzene	70-124%	91%

CHAIN OF CUSTODY RECORD

Applied GeoSystems

41255 Mission Blvd Suite B Fremont, CA 94539 415

SAMPLER (signature): Russell Bak

Phone: _____

LABORATORY: Applied Geo Systems

TURNAROUND TIME: 2 week

Project Leader: JoEllen Kuszmaul

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper _____

Address _____

Date Shipped _____

Service Used _____

Airbill No. _____ Cooler No. _____

Relinquished by: (signatures)	Received by: (signatures)	Date
	JoEllen Kuszmaul	11/28
Jo Ellen Kuszmaul		
	Received for laboratory by:	11-30-89

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH TH LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condi Upon Recei
S-1128-A (composite)	87042-6	11/28/89	TPH$_g$ / TPH$_d$, TOG	iced
S-1128-B (composite)		↓		
S-1129-C (composite)		11/29/89		
S-1129-D (composite)	↓	↓	↓	↓

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Misson Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 11-30-89
Laboratory Number: 91141S01
Project #: 87042-6
Sample #: 1128(AB),1129(CD)
Matrix: Soil

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline	160		10		12-11-89	
TEH as Diesel	160		10		12-13-89	
Benzene						NR
Toluene						NR
Ethylbenzene						NR
Total Xylenes						NR

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-15-89
Date Reported

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ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA, 94539
Attention: Jo Ellen Kuszmaul

Date Received: 11-30-89
Laboratory Number: 91141S01
Project #: 87042-6
Sample #: S-1128(AB)
S-1129(CD)
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	12-11-89

mg/kg = milligrams per kilogram = ppm
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Petroleum Hydrocarbons as Oil and Grease are measured by extraction and gravimetric analysis according to Standard Method 503D/E.

Laura Kuck, Laboratory Manager

12-12-89
Date Reported

APPENDIX E

CHAIN OF CUSTODY RECORDS

AND CERTIFIED ANALYTICAL REPORTS

FOR GROUND WATER

CHAIN OF CUSTODY RECORD

Applied GeoSystems
43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): Keith McVeigh
Phone: (415) 651-1906

LABORATORY: AGS FREMONT

TURNAROUND TIME: 2 WEEKS

Project Leader: JO ELLEN
Phone No. (415) 651-1906

SHIPPING INFORMATION:
Shipper
Address
Date Shipped
Service Used
Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
Keith McVeigh			
	Received for laboratory by: Raj Mahar	12/7/89	19°

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-14-MW9	87042-6	12-06-89	TPHg, TPHd, ~~VOC~~ J.K. TOG	ICED & HCl
W-11-MW7			TPHg, TPHd, ~~VOC~~ J.K. TOG	
W-12-MW10		"	TPHg, BTEX, TPHd	
W-10-MW13		12-07-89	TPHg, BTEX, TPHd	
W-8-MW12			TPHg, BTEX, TPHd	
W-11-MW11			TPHg, BTEX, TPHd	
W-11-MW1			TPHg, BTEX, TPHd	
W-11-MW8	"	"	TPHg, BTEX, TPHd	"

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W01
Project #: 87042-6
Sample #: W-11-MW1
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.63		0.020	12-14-89	
TPH as Diesel		0.24		0.10	12-18-89	
Benzene		0.012		0.00050	12-14-89	
Toluene		0.0056		0.00050	12-14-89	
Ethylbenzene		0.0037		0.00050	12-14-89	
Total Xylenes		0.025		0.00050	12-14-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

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ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mi on Boulevard
Fremont, , 94539
Attention: Joellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W02
Project #: 87042-6
Sample #: W-11-MW7
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		1.7		0.10	12-14-89	
TPH as Diesel		2.5		0.10	12-18-89	
Benzene		0.22		0.00050	12-14-89	
Toluene		0.0053		0.00050	12-14-89	
Ethylbenzene		0.0050		0.00050	12-14-89	
Total Xylenes		0.0086		0.00050	12-14-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W03
Project #: 87042-6
Sample #: W-11-MW8
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		42		2.0	12-14-89	
TPH as Diesel		34		0.50	12-18-89	
Benzene		2.6		0.050	12-14-89	
Toluene		0.63		0.050	12-14-89	
Ethylbenzene		0.21		0.050	12-14-89	
Total Xylenes		3.7		0.050	12-14-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W04
Project #: 87042-6
Sample #: W-14-MW9
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.10		0.020	12-14-89	
TPH as Diesel		0.11		0.10	12-18-89	
Benzene		0.0018		0.00050	12-14-89	
Toluene		0.0037		0.00050	12-14-89	
Ethylbenzene		0.0014		0.00050	12-14-89	
Total Xylenes		0.0088		0.00050	12-14-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W05
Project #: 87042-6
Sample #: W-12-MW10
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.32		0.020	12-14-89	
TPH as Diesel		ND		0.10	12-18-89	
Benzene		0.0037		0.00050	12-14-89	
Toluene		0.014		0.00050	12-14-89	
Ethylbenzene		0.0056		0.00050	12-14-89	
Total Xylenes		0.032		0.00050	12-14-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W06
Project #: 87042-6
Sample #: W-11-MW11
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.078		0.020	12-14-89	
TPH as Diesel		ND		0.10	12-18-89	
Benzene		0.0059		0.00050	12-14-89	
Toluene		0.00063		0.00050	12-14-89	
Ethylbenzene		ND		0.00050	12-14-89	
Total Xylenes		0.0048		0.00050	12-14-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W07
Project #: 87042-6
Sample #: W-8-MW12
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		85		2.0	12-14-89	
TPH as Diesel		40		1.0	12-19-89	
Benzene		6.7		0.025	12-14-89	
Toluene		6.3		0.025	12-14-89	
Ethylbenzene		1.8		0.025	12-14-89	
Total Xylenes		7.8		0.025	12-14-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W08
Project #: 87042-6
Sample #: W-10-MW13
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		52		2.0	12-14-89	
TPH as Diesel		31		0.50	12-19-89	
Benzene		2.1		0.050	12-14-89	
Toluene		2.0		0.050	12-14-89	
Ethylbenzene		1.4		0.050	12-14-89	
Total Xylenes		6.1		0.050	12-14-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Jo Ellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W02
Project #: 87042-6
Sample #: W-11-MW7
Matrix: Water

Parameter	Result (mg/L)	Detection Limit (mg/L)	Date Analyzed
TPH as Oil and Grease	ND	5	12-14-89

mg/L = milligrams per liter = ppm
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Petroleum Hydrocarbons as Oil and Grease are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck, Laboratory Manager

12-19-89
Date Reported

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

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ANALYSIS REPORT

togwater.rpt

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Jo Ellen Kuszmaul

Date Received: 12-07-89
Laboratory Number: 91211W04
Project #: 87042-6
Sample #: W-14-MW9
Matrix: Water

Parameter	Result (mg/L)	Detection Limit (mg/L)	Date Analyzed
TPH as Oil and Grease	ND	5	12-14-89

mg/L = milligrams per liter = ppm
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.

PROCEDURES

TPH as Oil and Grease: Total Petroleum Hydrocarbons as Oil and Grease are measured by extraction and gravimetric analysis according to Standard Method 503A/E.

Laura Kuck
Laura Kuck, Laboratory Manager

12-19-89
Date Reported

CHAIN OF CUSTODY RECORD

Applied GeoSystems

43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-190

SAMPLER (signature): Keith McVeigh

Phone: (415) 651-1906

LABORATORY: Anametrix

TURNAROUND TIME: 2 weeks

Project Leader: JoEllen Kuszmaul

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Tim
Keith McVeigh	JoEllen Kuszmaul	12/8/89	080
JoEllen Kuszmaul	[illegible]	12/8/89	10
	Received for laboratory by:		

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-14-MW9	87042-6	12/6/89	EPA 624	iced + HCl
W-11-MW7	✓	✓	✓	✓

ANAMETRIX INC
Environmental & Analytical Chemistry
541 Concourse Drive, Suite B, Sunnyvale, CA 94086
(408) 432-8192 / Fax: (408) 432-3498

REPORT

JoEllen Kuszmaul
Applied GeoSystems
43255 Mission Boulevard
Suite B
Fremont, CA 94539

December 14, 1989
Anametrix W.O.#: 8912090
Date Received : 12/08/89
Project Number#: 87042-6

Dear Ms. Kuszmaul:

Your samples have been received for analysis. The REPORT SUMMARY lists your sample identifications and the analytical methods you requested. The following sections are included in this report: RESULTS and QUALITY ASSURANCE.

NOTE: 1) Amounts reported are net values, i.e. corrected for method blank contamination.
2) The following footnotes are applicable to Methods 624/8240:

* A Method 624 priority pollutant compound (Federal Register, 10/26/84)
** A compound on the U.S. EPA CLP Hazardous Substance List (HSL)
\# An additional compound analyzed for by Anametrix, Inc.
ND: Not detected at or above the practical quantitation limit for the method.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

ANAMETRIX, INC.

Paul Gowan

Paul Gowan
GC/MS Supervisor

PG/dm

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

Client : Applied GeoSystems
Address : 43255 Mission Boulevard
Suite B
City : Fremont, CA 94539
Attn. : JoEllen Kuszmaul

Anametrix W.O.#: 8912090
Date Received : 12/08/89
Purchase Order#: N/A
Project No. : 87042-6
Date Released : 12/14/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8912090-01	W-14-MW9	WATER	12/06/89	624		12/13/89	F3
8912090-02	W-11-MW7	WATER	12/06/89	624		12/13/89	F3
QUALITY ASSURANCE (QA)							
3CB1213V00	METHOD BLANK	WATER	N/A	624		12/13/89	F3

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 87042-6 W-14-MW9
Matrix : WATER
Date sampled : 12/06/89
Date analyzed: 12/13/89
Dilut. factor: NONE

Anametrix I.D. : 8912090-01
Analyst : MCT
Supervisor : PG
Date released : 12/14/89
Instrument ID : F3

CAS #	Compound Name	Reporting Limit (ug/l)	Amount Found (ug/l)
74-87-3	* Chloromethane	10	ND
75-01-4	* Vinyl Chloride	10	ND
74-83-9	* Bromomethane	10	ND
75-00-3	* Chloroethane	10	ND
75-69-4	* Trichlorofluoromethane	5	ND
75-35-4	* 1,1-Dichloroethene	5	ND
76-13-1	# Trichlorotrifluoroethane	5	ND
67-64-1	**Acetone	20	ND
75-15-0	**Carbondisulfide	5	ND
75-09-2	* Methylene Chloride	5	ND
156-60-5	* Trans-1,2-Dichloroethene	5	ND
75-34-3	* 1,1-Dichloroethane	5	ND
78-93-3	**2-Butanone	20	ND
156-59-2	* Cis-1,2-Dichloroethene	5	ND
67-66-3	* Chloroform	5	ND
71-55-6	* 1,1,1-Trichloroethane	5	ND
56-23-5	* Carbon Tetrachloride	5	ND
71-43-2	* Benzene	5	ND
107-06-2	* 1,2-Dichloroethane	5	ND
79-01-6	* Trichloroethene	5	ND
78-87-5	* 1,2-Dichloropropane	5	ND
75-27-4	* Bromodichloromethane	5	ND
110-75-8	* 2-Chloroethylvinylether	5	ND
108-05-4	**Vinyl Acetate	10	ND
10061-02-6	* Trans-1,3-Dichloropropene	5	ND
108-10-1	**4-Methyl-2-Pentanone	10	ND
108-88-3	* Toluene	5	11
10061-01-5	* cis-1,3-Dichloropropene	5	ND
79-00-5	* 1,1,2-Trichloroethane	5	ND
127-18-4	* Tetrachloroethene	5	ND
591-78-6	**2-Hexanone	10	ND
124-48-1	* Dibromochloromethane	5	ND
108-90-7	* Chlorobenzene	5	ND
100-41-4	* Ethylbenzene	5	ND
1330-20-7	**Total Xylenes	5	18
100-42-5	**Styrene	5	ND
75-25-2	* Bromoform	5	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	5	ND
541-73-1	* 1,3-Dichlorobenzene	5	ND
106-46-7	* 1,4-Dichlorobenzene	5	ND
95-50-1	* 1,2-Dichlorobenzene	5	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	75-113%	100%
2037-26-5	Toluene-d8	83-110%	100%
460-00-4	p-Bromofluorobenzene	82-114%	97%

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 87042-6 W-11-MW7
Matrix : WATER
Date sampled : 12/06/89
Date analyzed: 12/13/89
Dilut. factor: NONE

Anametrix I.D. : 8912090-02
Analyst : MCT
Supervisor : PG
Date released : 12/14/89
Instrument ID : F3

CAS #	Compound Name	Reporting Limit (ug/l)	Amount Found (ug/l)
74-87-3	* Chloromethane	10	ND
75-01-4	* Vinyl Chloride	10	ND
74-83-9	* Bromomethane	10	ND
75-00-3	* Chloroethane	10	ND
75-69-4	* Trichlorofluoromethane	5	ND
75-35-4	* 1,1-Dichloroethene	5	ND
76-13-1	# Trichlorotrifluoroethane	5	ND
67-64-1	**Acetone	20	ND
75-15-0	**Carbondisulfide	5	ND
75-09-2	* Methylene Chloride	5	ND
156-60-5	* Trans-1,2-Dichloroethene	5	ND
75-34-3	* 1,1-Dichloroethane	5	ND
78-93-3	**2-Butanone	20	ND
156-59-2	* Cis-1,2-Dichloroethene	5	ND
67-66-3	* Chloroform	5	ND
71-55-6	* 1,1,1-Trichloroethane	5	ND
56-23-5	* Carbon Tetrachloride	5	ND
71-43-2	* Benzene	5	470
107-06-2	* 1,2-Dichloroethane	5	ND
79-01-6	* Trichloroethene	5	ND
78-87-5	* 1,2-Dichloropropane	5	ND
75-27-4	* Bromodichloromethane	5	ND
110-75-8	* 2-Chloroethylvinylether	5	ND
108-05-4	**Vinyl Acetate	10	ND
10061-02-6	* Trans-1,3-Dichloropropene	5	ND
108-10-1	**4-Methyl-2-Pentanone	10	ND
108-88-3	* Toluene	5	9
10061-01-5	* cis-1,3-Dichloropropene	5	ND
79-00-5	* 1,1,2-Trichloroethane	5	ND
127-18-4	* Tetrachloroethene	5	ND
591-78-6	**2-Hexanone	10	ND
124-48-1	* Dibromochloromethane	5	ND
108-90-7	* Chlorobenzene	5	ND
100-41-4	* Ethylbenzene	5	5
1330-20-7	**Total Xylenes	5	7
100-42-5	**Styrene	5	ND
75-25-2	* Bromoform	5	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	5	ND
541-73-1	* 1,3-Dichlorobenzene	5	ND
106-46-7	* 1,4-Dichlorobenzene	5	ND
95-50-1	* 1,2-Dichlorobenzene	5	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	75-113%	100%
2037-26-5	Toluene-d8	83-110%	107%
460-00-4	p-Bromofluorobenzene	82-114%	106%

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 624/8240
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : METHOD BLANK
Matrix : WATER
Date sampled : N/A
Date analyzed: 12/13/89
Dilut. factor: NONE

Anametrix I.D. : 3CB1213V00
Analyst : MG
Supervisor : PG
Date released : 12/14/89
Instrument ID : F3

CAS #	Compound Name	Reporting Limit (ug/l)	Amount Found (ug/l)
74-87-3	* Chloromethane	10	ND
75-01-4	* Vinyl Chloride	10	ND
74-83-9	* Bromomethane	10	ND
75-00-3	* Chloroethane	10	ND
75-69-4	* Trichlorofluoromethane	5	ND
75-35-4	* 1,1-Dichloroethene	5	ND
76-13-1	# Trichlorotrifluoroethane	5	ND
67-64-1	**Acetone	20	ND
75-15-0	**Carbondisulfide	5	ND
75-09-2	* Methylene Chloride	5	ND
156-60-5	* Trans-1,2-Dichloroethene	5	ND
75-34-3	* 1,1-Dichloroethane	5	ND
78-93-3	**2-Butanone	20	ND
156-59-2	* Cis-1,2-Dichloroethene	5	ND
67-66-3	* Chloroform	5	ND
71-55-6	* 1,1,1-Trichloroethane	5	ND
56-23-5	* Carbon Tetrachloride	5	ND
71-43-2	* Benzene	5	ND
107-06-2	* 1,2-Dichloroethane	5	ND
79-01-6	* Trichloroethene	5	ND
78-87-5	* 1,2-Dichloropropane	5	ND
75-27-4	* Bromodichloromethane	5	ND
110-75-8	* 2-Chloroethylvinylether	5	ND
108-05-4	**Vinyl Acetate	10	ND
10061-02-6	* Trans-1,3-Dichloropropene	5	ND
108-10-1	**4-Methyl-2-Pentanone	10	ND
108-88-3	* Toluene	5	ND
10061-01-5	* cis-1,3-Dichloropropene	5	ND
79-00-5	* 1,1,2-Trichloroethane	5	ND
127-18-4	* Tetrachloroethene	5	ND
591-78-6	**2-Hexanone	10	ND
124-48-1	* Dibromochloromethane	5	ND
108-90-7	* Chlorobenzene	5	ND
100-41-4	* Ethylbenzene	5	ND
1330-20-7	**Total Xylenes	5	ND
100-42-5	**Styrene	5	ND
75-25-2	* Bromoform	5	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	5	ND
541-73-1	* 1,3-Dichlorobenzene	5	ND
106-46-7	* 1,4-Dichlorobenzene	5	ND
95-50-1	* 1,2-Dichlorobenzene	5	ND

CAS #	Surrogate Compounds	Limits	% Recovery
17060-07-0	1,2-Dichloroethane-d4	75-113%	100%
2037-26-5	Toluene-d8	83-110%	106%
460-00-4	p-Bromofluorobenzene	82-114%	106%

CHAIN OF CUSTODY RECORD

Applied GeoSystems
43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): Jon DeLon

Phone: 415 651 1906

LABORATORY:
Applied GeoSystems
32955 Mission Blvd
Fremont CA 94539

TURNAROUND TIME: 2 weeks

Project Leader: Jo Elen

Phone No. 415 651 1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
Jon DeLon			
	Received for laboratory by:	12-8-89	1350

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-18-MW6	87042-6	12/8/89	TPHg 20 ~~TPHd~~ BTEX	Iced / HCl 4eA(40ml
W-18-MW6	87042-6	12/8/89	TPHd	Iced (2 liter)

Applied GeoSystems 43255 Mission Boulevard, Fremont, CA 94539 (415) 651-1906

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Attention: Joellen Kuszmaul

Date Received: 12-08-89
Laboratory Number: 91213W01
Project #: 87042-6
Sample #: W-18-MW6
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		9.0		0.20	12-15-89	
TPH as Diesel		4.8		0.10	12-19-89	
Benzene		0.37		0.00050	12-15-89	
Toluene		0.013		0.00050	12-15-89	
Ethylbenzene		0.0026		0.00050	12-15-89	
Total Xylenes		0.43		0.00050	12-15-89	

mg/kg = milligrams per kilogram = parts per million (ppm).
mg/L = milligrams per liter = ppm.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not required.

PROCEDURES

TVH/BTEX--Total volatile hydrocarbons (TVH) and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction according to EPA Method 5030 followed by analysis by a EPA Method 8020/602 (modified for TVH) which uses a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and a flame-ionization detector (FID) in series. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHg--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

TPHd--Total petroleum hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

12-20-89
Date Reported

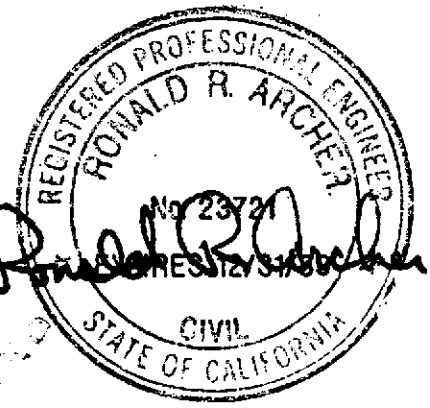
APPENDIX F

SURVEY REPORT FROM RON ARCHER, CIVIL ENGINEER, INC.

RON ARCHER
CIVIL ENGINEER, INC.

CONSULTING • PLANNING • DESIGN • SURVEYING

4133 Mohr Ave., Suite E • Pleasanton, CA 94566
(415) 462-9372



DECEMBER 13, 1989 JOB NO. 1632

ELEVATIONS OF EXISTING MONITOR WELLS AT THE EXXON SERVICE STATION NO. 7-3006, LOCATED AT 720 HIGH STREET AT COLISEUM WAY, CITY OF OAKLAND, ALAMEDA COUNTY, CALIFORNIA.

FOR: APPLIED GEOSYSTEMS
PROJECT NO. 87042-8

BENCHMARK: # 20-G

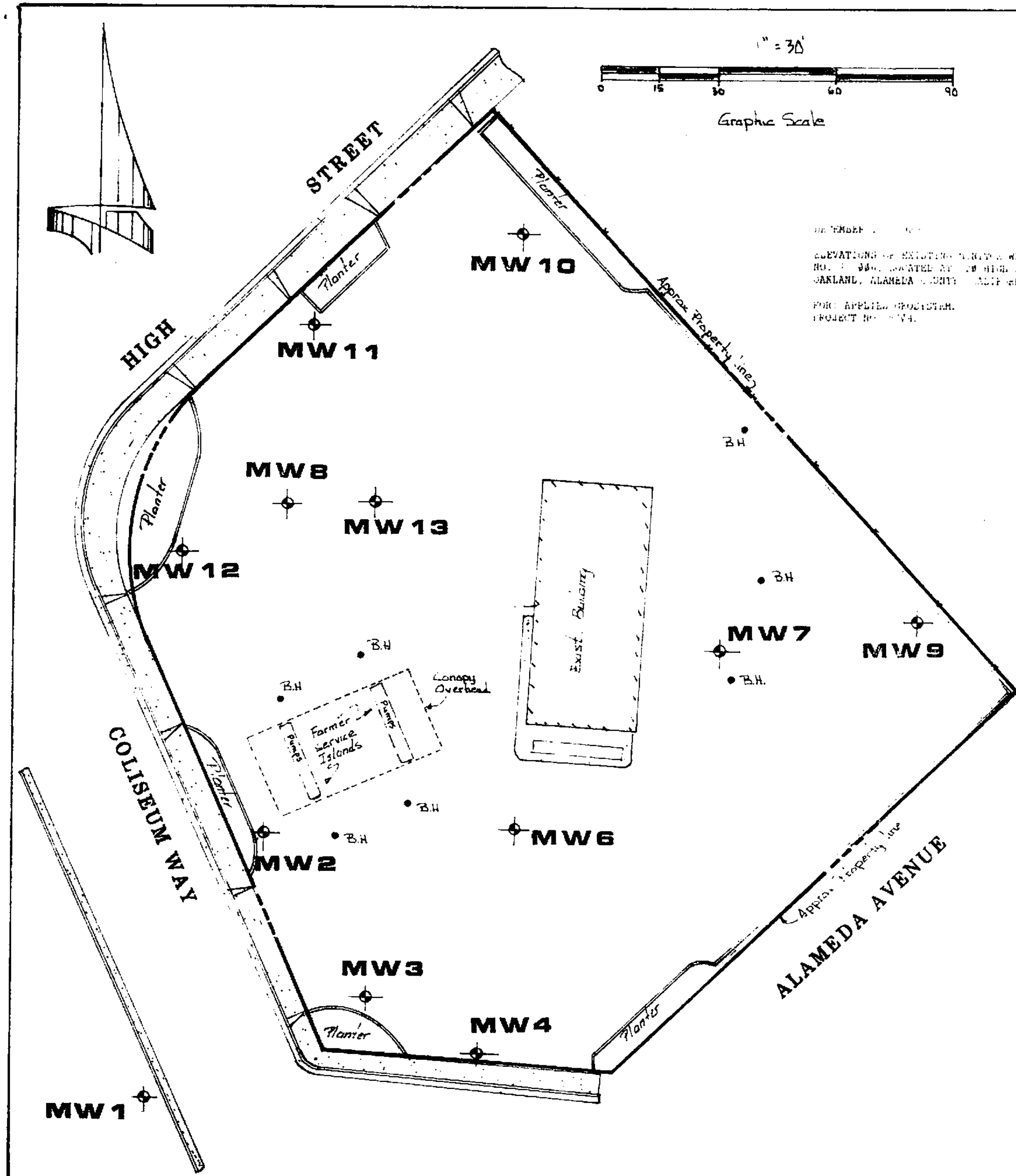
TOP OF A BRASS DISK SET ON CONCRETE IN A STD MONUMENT CASING AT THE EASTERLY EDGE OF A.C. WALKWAY OF HIGH STREET ABOUT 12 FEET SOUTHERLY OF SOUTHERN MOST RAIL OF THE SOUTHERN PACIFIC RAILROAD TRACKS, 9.8 FEET EAST OF EASTERLY CURBLINE ON HIGH STREET . ELEVATION TAKEN AS 16.757 M.S.L., CITY OF OAKLAND DATUM.

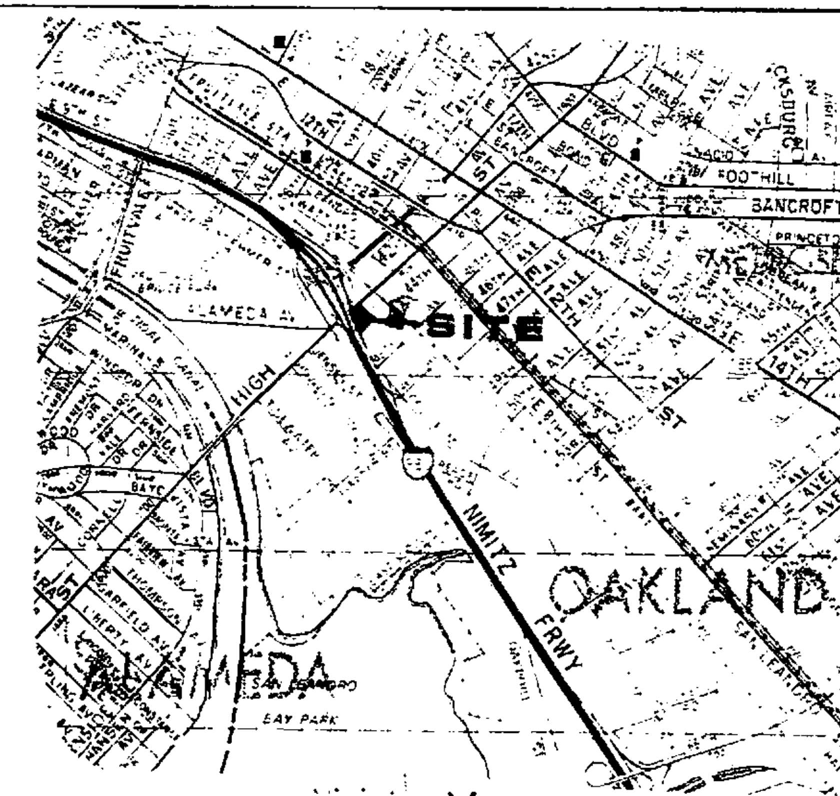
MONITOR WELL DATA TABLE

WELL DESIGNATION	ELEV	DESCRIPTION
MW1	12.87	TOP OF PVC CASING
	13.05	TOP OF BOX
MW2	12.98	TOP OF PVC CASING
	13.58	TOP OF BOX
MW3	12.94	TOP OF PVC CASING
	13.37	TOP OF BOX
MW4	12.77	TOP OF PVC CASING
	13.22	TOP OF BOX
MW5	-----	DESTROYED
MW6	14.27	TOP OF PVC CASING
	14.76	TOP OF BOX

MONITOR WELL DATA TABLE

WELL DESIGNATION	ELEV	DESCRIPTION
MW7	14.84	TOP OF PVC CASING
	15.40	TOP OF BOX
MW8	13.45	TOP OF PVC CASING
	13.99	TOP OF BOX
MW9	14.64	TOP OF PVC CASING
	15.07	TOP OF BOX
MW10	14.05	TOP OF PVC CASING
	14.66	TOP OF BOX
MW11	13.55	TOP OF PVC CASING
	13.91	TOP OF BOX
MW12	12.61	TOP OF PVC CASING
	13.17	TOP OF BOX
MW13	14.20	TOP OF PVC CASING
	14.55	TOP OF BOX





Vicinity Map
No Scale

[illegible]

ELEVATIONS [illegible] WELLS AT THE EXXON SERVICE STATION NO. [illegible] LOCATED AT [illegible] HIGH STREET AT COLISEUM WAY, CITY OF OAKLAND, ALAMEDA COUNTY, CALIFORNIA.

FOR: APPLIED GEOSYSTEM.
PROJECT NO. [illegible]

BENCHMARK [illegible]
[illegible] MONUMENT [illegible] AT THE EASTERLY [illegible] WALKWAY OF HIGH STREET ABOUT [illegible] FEET SOUTHERLY OF SOUTHERN MOST RAIL OF THE SOUTHERN PACIFIC RAILROAD TRACKS, [illegible] FEET EAST [illegible] EASTERLY [illegible] ON HIGH STREET. ELEVATION TAKEN [illegible] CITY OF OAKLAND DATUM.

[illegible] WELL DATA TABLE

WELL DESIGNATION	[illegible]	DESCRIPTION
[illegible]	[illegible]	[illegible] PVC CASING TOP OF BOX
[illegible]	[illegible]	[illegible] CASING TOP OF BOX
[illegible]	[illegible]	[illegible] PVC CASING [illegible]
[illegible]	[illegible]	[illegible] CASING [illegible]
[illegible]	[illegible]	DESTROYED
[illegible]	[illegible]	[illegible] PVC CASING [illegible]
[illegible]	[illegible] 34 [illegible]	TOP OF PVC CASING TOP OF BOX
[illegible]	[illegible]	[illegible] OF PVC CASING TOP OF BOX
[illegible]	[illegible]	[illegible] OF PVC CASING TOP OF BOX
MW10	1.85 [illegible]	TOP OF PVC CASING TOP OF BOX
MW11	[illegible]	[illegible] PVC CASING TOP OF BOX
MW12	[illegible]	[illegible] PVC CASING TOP OF BOX
[illegible]	[illegible]	[illegible] PVC CASING TOP OF BOX

REGISTERED PROFESSIONAL ENGINEER
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STATE OF CALIFORNIA

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