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TO: MR. DENNIS BYRNE
ALAMEDA COUNTY DEPARTMENT OF HEALTH SERVICES
80 SWAN WAY, ROOM 200
OAKLAND, CALIFORNIA 94621

DATE: 2/15/91
PROJECT NUMBER: AGS 19014-5
SUBJECT: ARCO STATION 276 LOCATED AT 10600 MACARTHUR BOULEVARD, OAKLAND, CALIFORNIA.

FROM: JOAN TIERNAN, PH.D., P.E.
TITLE: ENGINEERING MANAGER

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REPORT
UNDERGROUND GASOLINE STORAGE TANK REMOVAL AND REPLACEMENT

at

ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

AGS Job 19014-5

Prepared for:

ARCO Products Company
2000 Alameda de Las Pulgas
San Mateo, California 94403

by
Applied GeoSystems

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Joan E. Tiernan
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Exp. 2-31-94
CIVIL
STATE OF CALIFORNIA

February 11, 1991

Applied GeoSystems 3315 Almaden Expressway, Suite 34, San Jose, CA 95118 (408) 264-7723

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February 11, 1991
AGS 19014-5

Mr. Charles Carmel
ARCO Products Company
2000 Alameda de Las Pulgas
San Mateo, California 94403

Subject: **Executive Summary of Report on Underground Gasoline Storage Tank Removal and Replacement at ARCO Station 276, 10600 MacArthur Boulevard, Oakland, California.**

Dear Mr. Carmel:

At the request of ARCO Products Company (ARCO), Applied GeoSystems (AGS) has conducted product storage tank removal and replacement at ARCO Station 276 in Oakland, California. The scope of work included the following:

- Drilling three soil borings in the proposed new tank pit area
- Collecting soil samples for analyses from these borings
- Observing removal of four underground gasoline storage tanks and associated product lines
- Sampling and analysis of the soil from the former tank pits and product line trenches
- Monitoring aeration of the soil from the former tank pits and former product line trenches in compliance with Regulation 8, Rule 40
- Observing excavation of a new tank pit
- Sampling and analysis of soil from the new tank pit and stockpiled soil
- Monitoring aeration of the stockpiled soil from the new tank pit
- Observing disposal of aerated, stockpiled soil once analytical results determined that
  petroleum hydrocarbon concentrations had been reduced to acceptable levels.

This report summarizes the work conducted at the project site, and presents the findings and conclusions of the investigation.

SUMMARY

Soil Borings

Three soil borings, TPB-1 through TPB-3, were drilled to depths of about twenty feet in the proposed new gasoline underground storage tank pit area. In boring TPB-1, concentrations of total petroleum hydrocarbons as gasoline (TPHg) of 290 parts per million (ppm) and 58 ppm were detected in two samples collected at depths of 15 feet and 18.5 feet respectively. The other nine samples taken in these three borings were at or below the detection limit (2 parts per million) for the analytical method.

Four stratigraphic units were present in the borings in the new tank pit excavation: starting at the ground surface, an approximately 10-foot thick silty clay layer; a 5-foot thick sandy gravel layer; below this was a 5-foot thick clayey sand layer which decreased in thickness until it was no longer present in the northeast end of the new tank pit; these three layers were underlain by another silty clay layer.

Excavation and Removal of Four Underground Product Storage Tanks and Piping

Four underground product storage tanks (USTs), designated T1, T2, T3, and T4, were excavated and removed from the site. Soil samples collected at the base of the tank pit, 13 feet below grade, contained TPHg ranging from nondetectable to 360 parts per million (ppm). Product piping and surrounding fill material associated with the USTs were also removed. Soil samples collected from the piping trench excavations contained TPHg concentrations ranging from nondetectable to 14 ppm. Stockpiled soil generated during tank removal was sampled for aeration and disposal characterization. The initial TPHg concentrations in the stockpiles ranged from 9.6 ppm to 110 ppm prior to aeration. The one stockpile exceeding 100 ppm of TPHg was aerated in compliance with Regulation 8, Rule 40. After soil aeration and after laboratory analyses determined that final soil TPHg concentrations were less than 100 ppm, the excavated soil was subsequently removed from the site for proper disposal.

New Tank Pit Excavation

A new tank pit was excavated on the north side of the property to a depth of 19 feet. Soil that was excavated from the new tank pit and which contained nondetectable concentrations of hydrocarbons was backfilled within the former tank pits, and soil containing hydrocarbons was stockpiled onsite on visquene liners and covered with visquene. Soil samples collected from the base of the new tank pit showed nondetectable concentrations of TPHg, but contained low levels of benzene and toluene ranging from 0.005 ppm to 0.035 ppm.

Samples were also collected from the excavated, stockpiled soils for aeration and disposal characterization. Concentrations of TPHg in these stockpiled soils ranged from nondetectable to 610 ppm. Benzene, toluene, ethylbenzene, and total xylenes were also present in some of the soil samples. One stockpile contained TPHg concentrations in excess of 100 ppm (610 ppm). This stockpile was aerated to nondetectable TPHg levels. Upon receipt of laboratory results indicating that soil TPHg concentrations were less than 100 ppm, the soil was removed from the site and disposed.

Three samples were also submitted for laboratory analysis of organic lead. Organic lead concentrations were nondetectable in these samples.

CONCLUSIONS

- No hazardous levels of TPHg (greater than 1000 ppm) were present in the soil samples submitted for laboratory analysis, but designated concentrations (greater than 100 ppm but less than 1000 ppm) were detected. No hazardous concentrations of BTEX were detected in the site soil.

- Soil samples taken at the base of former tank T4 at about 13 feet below grade showed nondetectable concentrations of TPHg, but concentrations over 100 ppm were found at the bases of former tanks T1 and T3. The vertical extent of hydrocarbon contamination at tanks T1 and T3 has not been delineated. This conclusion is based on the two samples taken at the bases of T1 and T3 at 13 feet below grade which contained 360 ppm and 210 ppm, respectively.

- The northwest end of the new tank pit area contained hydrocarbon concentrations greater than 100 ppm at a depth of 15 feet, which decreased to 58 ppm at 18.5 feet. This suggests that the vertical extent of hydrocarbon contamination in this area is not yet fully delineated.

- The results of laboratory analyses of soil samples collected during this investigation and previous investigations suggest that the majority of contaminated soil was not removed from this site during the work reported here.

RECOMMENDATIONS

It is recommended that the installation of a soil vapor extraction system in 1991 should proceed as planned by ARCO.

We recommend that copies of this report by sent to:

Mr. Don Dalke, Water Quality Control Engineer
Regional Water Quality Control Board
1800 Harrison Street, 7th Floor
Oakland, California 94612

Mr. Dennis Byrne
Alameda County Department of Health Services
80 Swan Way, Room 200
Oakland, California 94621

Please call if you have any questions regarding this report.

Very truly yours,
Applied GeoSystems

Joan E. Tiernan, Ph.D., P.E.
Engineering Manager

Encl: Report No. 19014-5

cc. Mr. Chris Windsor, ARCO Products Company

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Applied GeoSystems 3315 Almaden Expressway, Suite 34, San Jose, CA 95118 (408) 264-7723

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REPORT
UNDERGROUND GASOLINE STORAGE TANK REMOVAL AND REPLACEMENT
at
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

Prepared for
ARCO Products Company

1.0 INTRODUCTION

At the request of ARCO Products Company (ARCO), Applied GeoSystems (AGS) observed the removal and replacement of four underground gasoline storage tanks, soil aeration, and performed an investigation at ARCO Station 276, 10600 MacArthur Boulevard in Oakland, California.

The scope of work included the following:

- Drilling three soil borings in the proposed new tank pit area
- Collecting soil samples for analyses from these borings
- Observing removal of four underground gasoline storage tanks and associated product lines
- Sampling and analysis of the soil from the former tank pits and product line trenches
- Monitoring aeration of the soil from the former tank pits and former product line trenches in compliance with Regulation 8, Rule 40
- Observing excavation of a new tank pit
- Sampling and analysis of soil from the new tank pit and stockpiled soil
- Monitoring aeration of the stockpiled soil from the new tank pit
- Observing disposal of aerated, stockpiled soil once analytical results determined that petroleum hydrocarbon concentrations had been reduced to acceptable levels.

This report presents the results of this work, together with the field methods employed, the laboratory analyses, and other information related to gasoline tank removal and replacement.

2.0 BACKGROUND AND PREVIOUS WORK

2.1 Site Location

The site is located at the southeast corner of the intersection of MacArthur Boulevard and 106th Avenue in Oakland, California. The site location is shown in the Site Vicinity Map, Plate 1. The site layout, including tank pits and boring locations, can be seen in the Generalized Site Plan, Plate 2.

2.2 Previous Work

In 1988, Pacific Environmental Group, Inc. (Pacific) observed removal of an underground waste-oil storage tank (UST) from the site. Hydrocarbons in the soil in the vicinity of the tank pit were reportedly delineated and the soil was excavated and disposed (Pacific, February 6, 1989).

In 1989, AGS installed five ground-water monitoring wells and collected and analyzed soil and ground-water samples. Elevated hydrocarbon concentrations were not detected, except in monitoring well MW-2. Tetrachloroethene (PCE) was also detected in the water sample from well MW-4 (AGS, August 8, 1989).

In June 1989, Pacific conducted a soil-vapor survey at the station and the adjacent Foothill Shopping Center parking lot to the southeast of the station (Pacific, July 17, 1989). Based on the Pacific investigation, ARCO requested additional soil borings, and AGS drilled nine borings in the Shopping Center parking lot in August 1989 to assess the extent of hydrocarbons in the subsurface soils. Of the 43 soil samples analyzed for total petroleum hydrocarbons as gasoline (TPHg), all samples were near or below the detection limit, except for two samples which contained more than 100 ppm of TPHg. Total petroleum hydrocarbons as diesel (TPHd) in excess of 100 ppm were also detected in one sample collected from boring B-6 at 26-1/2 feet deep (AGS, October 4, 1990. Refer to this report for additional background.)

2.3 Regional Geology and Hydrogeology

The site is at an elevation of approximately 55 feet above mean sea level. Active traces of the Hayward Fault Zone are located approximately 3,500 feet from the site. The geology in the vicinity of the site consists of Pleistocene, a highly permeable alluvium composed of a series of poorly consolidated to unconsolidated clay, silt, sand, and gravel units. The alluvium was derived mainly from the Diablo Range and represents coalescing alluvial fans. (Alameda County Flood Control and Groundwater Conservation District, June 1988).

3.0 FIELD WORK

Field work conducted on behalf of ARCO during this investigation included drilling three soil borings; collecting soil samples from the borings for analysis; removal of four gasoline USTs and associated product lines; excavation of a new UST pit; aeration of the stockpiled soil; and collecting soil samples from the tank pit, product line excavations, and stockpiled soil for laboratory analyses.

The field work was conducted according to the procedures described in Appendix A, Field Procedures, and in conformance with the AGS Site Safety Plan (AGS, February 5, 1990).

3.1 Borehole Drilling

On January 31 and February 6, 1990, AGS personnel supervised Kvilhaug Well Drilling and Pump Co., Inc. of Concord, California, during the drilling of three soil borings (TPB-1 through TPB-3) to depths of approximately 20 feet in the proposed new gasoline UST pit area. The locations of borings TPB-1 through TPB-3 are shown on Plate 2. The groundwater table was encountered at about 18-1/2 feet below the ground surface.

An AGS geologist observed the drilling, and classified the soils according to the Unified Soil Classification System. Auger cuttings generated during drilling were placed on plastic liners and covered with plastic pending receipt of laboratory analyses of the soil samples. The borings were backfilled to grade with a bentonite and neat cement grout upon completion of the work.

3.1.1 Soil Sampling in Borings

Samples were collected from borings TPB-1, TPB-2, and TPB-3 at 5-foot intervals from the ground surface down to the total depth of the borings, and at or near stratigraphic changes.

A total of eleven soil samples (samples S-9.5-TPB1 through S-20-TPB3), under Chain of Custody Record, were collected according to the sampling procedures described in Appendix A. An organic vapor meter (OVM) was used to estimate concentrations of hydrocarbon vapors in-the-field prior to submitting samples for laboratory analysis.

3.2 Removal of Underground Tanks

On February 8, 1990, AGS personnel supervised Paradiso Construction Co. of Oakland, California, during the removal of four USTs. Two 6,000 gallon, one 4,000 gallon, and one 10,000 gallon gasoline USTs were removed from the site. These four tanks were designated as Tanks T-1 through T-4; their former locations are shown on Plate 2. AGS personnel visually inspected each tank after it was removed according to the Field Procedures in Appendix A, and observed that each tank subjectively appeared in good condition with no visible signs of puncture, leak, or corrosion.

During removal of the tanks, soil within the excavation was visually inspected for hydrocarbons and also evaluated with an OVM. Removal of the sand backfill material revealed hydrocarbons within the tank pit. The excavated soil was stockpiled onsite on a plastic liner, and covered with plastic to prevent uncontrolled emission of hydrocarbon vapors. Overexcavation of the tank pit area was not conducted because a soil vapor extraction system will be installed at the project site in 1991.

3.2.1 Soil Sampling in Former Tank Pits

After tank excavation, a total of nine soil samples (samples S-7-TP1SW-1 through S-13-TP2BN-9) were obtained from the walls and base of the excavation to assess the concentration of gasoline hydrocarbons in the surrounding soil. These soil sample locations are shown on the Sample Location Map on Plate 3 and are designated as numbers 1 through 9 for simplicity.

3.2.2 Soil Sampling of Stockpiled Soil from Former Tank Pits

Soil excavated from the former tank pits was stockpiled on site on plastic liners and covered. As required by Regulation 8, Rule 40 of the Bay Area Air Quality Management District (BAAQMD, 1986), samples were collected every 50 cubic yards of stockpiled soil for laboratory analyses for aeration and disposal characterization. Five composite samples were analyzed [Samples S-0322-1 (A-D) through S-0326-4 (A-D)]. Each of the five composite samples consisted of four combined samples A through D.

3.2.3 Soil Sampling from Product Line Trenches

The product supply pipelines associated with the USTs, and surrounding fill material were removed May 29 and 30, 1990. The excavated material was stockpiled onsite and covered with plastic to prevent uncontrolled vapor emissions. Eight soil samples (S-0529-SP1 through S-0613-SP8) were collected along the trench excavation at twenty foot intervals, and at selected joints and connections. Soil sample locations are illustrated on Plate 3, and are designated as SP1 through SP8 for simplicity.

3.3 New Tank Pit Excavation

On April 26, 1990 when the excavation for the installation for four new USTs was being performed, the excavated soil was visually inspected for any indication of petroleum hydrocarbons such as product, staining, odors; and the OVM was used to determine hydrocarbon vapor concentrations. Soil that contained TPHg concentrations less than 100 ppm was backfilled within the original UST pit. Excavated soil with OVM readings greater than 100 ppm was stockpiled on plastic liners onsite, and covered with plastic.

3.3.1 Soil Sampling at New Tank Pit

After excavation, the new tank pit measured approximately 45 feet by 30 feet by 19 feet deep. When obvious signs of hydrocarbons were no longer present, four soil samples (NW, NE, SW, and SE) were collected from each quadrant of the bottom of the tank pit at a depth of 19 feet. Locations of the samples are shown on Plate 3.

3.3.2 Soil Sampling of Stockpiles from New Tank Pit

Twenty-two soil samples for disposal and aeration characterization were also collected from every 50 cubic yards of stockpiled soil [samples S-0507-SP2(A-D) through S-0530-CP2(6A-D)]. Soil sampling procedures are described in Appendix A.

3.4 Soil Aeration

All excavated and stockpiled soils were placed on visquene plastic liners and covered with plastic until the results of laboratory analyses were obtained. Laboratory analysis was necessary prior to aeration in order to determine the allowable soil volume for aeration to comply with the requirements of Regulation 8, Rule 40 of the Bay Area Air Quality Management District (BAAQMD, 1986). When analytical results were obtained, stockpiles with TPHg concentrations greater than 100 ppm were uncovered and aerated during working hours. Only a few stockpiles required aeration. These are listed in the table below.

The table below presents the starting concentrations of the aerated soil, the total soil volume, and the Regulation 8, Rule 40 soil aeration volume permitted based on the TPHg concentration range found in each soil stockpile. The final aerated TPHg concentration for Boring TPB-1 was nondetectable, for the former tank pit stockpile it was 59 ppm, for the new tank pit excavation stockpile it was nondetectable. The analytical data is reported later in section 5.2 Analytical Results.

SOIL AERATION VOLUMES

STOCKPILES TPHg CONCENTRATIONS (ppm)	VOLUME AERATED (Total cy)	REG. 8, RULE 40 ALLOWABLE VOLUME (cy/day)
From Boring TPB-1:		
ND - 290	5	120
From Former Tank Pit Stockpile [Sample S-0322-3(A-D)]:		
110	50	120
From Product Lines Stockpiles:		
ND - 14	0	(exempt)
From New Tank Pit Excavation Stockpile [Sample S-0509-SP4(A-D)]:		
610	20	60

ppm = parts per million

cy = cubic yards

4.0 ANALYTICAL METHODS

4.1 Analytical Laboratories and Sample Summary

The eleven (11) soil samples (S-9.5-TPB1 through S-20-TPB3) collected from the three soil borings TPB-1 through TPB-3 were submitted under Chain of Custody Record to the Applied GeoSystems State Certified laboratory, Applied Analytical (State Hazardous Waste Testing Laboratory Certification No. 153). The Chain of Custody Records and the laboratory Analysis Reports are attached in Appendix C.

The nine (9) soil samples (S-7-TP1SW through S-13-TP2BN) collected from the walls and base of the former underground tank locations, were submitted under Chain of Custody Record to the AGS State Certified laboratory, Applied Analytical. The Chain of Custody Record and the laboratory Analysis Reports are attached in Appendix D.

The five (5) soil samples [S-0322-1(A-D) through S-0326-4(A-D)] collected from the stockpiled soil from the former tank pit were submitted to Applied Analytical under Chain of Custody protocol and composited from each of four samples (A through D). The Chain of Custody Records and the laboratory Analysis Reports are in Appendix E.

The eight (8) soil samples (S-0529-SP1 through S-0613-SP8) collected from the product supply line trenches, were submitted under Chain of Custody protocol to Anametrix Environmental Laboratories, Inc. in San Jose, California (State Certification No. 151). The Chain of Custody Records and the laboratory Analysis Reports are attached in Appendix F, with the exception of two samples which were part of the Chain of Custody Records for a separate set of samples, and these two samples are included in Appendix H.

The four (4) soil samples collected from the new tank pit (NW, NE, SW, and SE) were submitted under Chain of Custody Record to Anametrix, Inc. The Chain of Custody Record and laboratory Analysis Report are attached in Appendix G.

The twenty-two (22) soil samples taken at the stockpiles from the new tank pit excavation [S-0507-SP2(A-D) through S-0530-CP2(6A-D)] for determination of aeration volume and for disposal were submitted to Anametrix, Inc. In addition, three of the 22 soil samples were analyzed for organic lead. The Chain of Custody Records and laboratory Analysis Reports are attached in Appendix H.

4.2 Analytical Methods

All soil samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) by EPA Method 5030 and by modified EPA Method 8015; and for the purgeable gasoline constituents benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) by EPA Method 5030 and 8020/602.

Organic lead analyses were conducted according to the State of California LUFT Method.

5.0 LABORATORY AND GEOLOGIC RESULTS

5.1 Geologic Results

A geologist observed the drilling of Borings TPB-1, TPB-2, and TPB-3, and classified the soils according to the Unified Soil Classification System (USCS), which is briefly summarized on Plate B-1 in Appendix B, Logs of Borings. The boring logs are also presented in Appendix B in Plates B-2 through B-4.

Geologic materials encountered during drilling consisted primarily of silty clay with intermittent sand and gravel lenses. Descriptions of the types of materials encountered in the soil borings are presented in the boring logs, and graphically illustrated in Plate 4, Geologic Cross Section. The location of the cross section is shown on Plate 2. Silty clay was found to be present from immediately beneath the asphalt surface to depths of approximately 8-15 feet beneath the surface. A 3 to 5 foot thick clayey and sandy gravel lens was encountered between 10 and 20 feet below grade. Discontinuous lenses of silty and clayey sand were observed above and below the gravel layer. The sand and gravel lenses are underlain by silty clay extending to a depth of 21-1/2 feet, the bottom of the deepest boring.

An organic vapor meter (OVM) was used to estimate concentrations of hydrocarbon vapors in the soil samples as described in the Field Procedures in Appendix A. Hydrocarbon vapor concentrations in the samples ranged from 0 - 180 ppm. The individual OVM readings are listed in Appendix B on the boring logs under the column entitled "P.I.D." (photoionization detector). The OVM readings for boring TPB-1 to TPB-3 are summarized on Plate 4.

5.2 Analytical Results

5.2.1 Soil Boring Results

Table 1 presents the analytical results of eleven soil samples taken from borings TPB-1, TPB-2, and TPB-3. All samples showed non-detectable concentrations of TPHg except for three samples as discussed below. All samples showed non-detectable BTEX concentrations except four samples as seen in Table 1 and as discussed below.

Two samples collected from boring TPB-1 exhibited elevated TPHg concentrations of 290 ppm and 58 ppm at depths of 15 feet and 18.5 feet, respectively. BTEX were detected in the sample collected at 15 feet at concentrations ranging from 0.19 parts per million (ppm) to 6.6 ppm. Samples collected at depths of 9.5 feet and 21 feet, respectively, did not contain TPHg and BTEX.

Samples collected from boring TPB-2 had no detectable TPHg or BTEX. In boring TPB-3, the sample collected at a depth of 20 feet was the only sample found to contain TPHg (2.1 ppm) and this was at the limit of detection of 2 ppm in soil. Benzene was found in samples collected at ten feet (0.075 ppm) and at twenty feet (0.46 ppm) in TPB-3. Ethylbenzene was also present at 20 feet. TPHg analytical results are summarized on Plate 4, Geologic Cross Section.

5.2.2 Results at Walls and Bottoms of Former Tank Pits

After removal of the four USTs, nine soil samples were obtained from the walls and bottom of the tank pit excavations. The analytical results are reported in Table 2. Concentrations of TPHg ranged from non-detectable (< 2.0 ppm) to 360 ppm, and BTEX concentrations ranged from nondetectable to 43 ppm. BTEX concentrations were within regulatory limits. Soil was not overexcavated from the tank pit, since a soil gas recovery system is proposed to be installed within the tank pit area.

5.2.3 Results of Stockpiled Soils from Former Tank Pits

Soil samples for composite laboratory analyses were collected from the stockpiled soil excavated during tank removal and composited into five samples for analysis. These results are reported in Table 3 under the section labeled "Stockpile". Laboratory analyses showed concentrations of TPHg ranging from 9.6 ppm (Stockpile No.1) to 110 ppm (Stockpile No.3). A second sampling was performed on Stockpile No. 3 after a few days of aeration; laboratory analysis detected TPHg at a concentration of 59 ppm. This sample is noted by

an asterisk in Table 3. Benzene was not detected in any of the composite samples. Upon receipt of the laboratory results indicating that all stockpiles were less than 100 ppm TPHg, the stockpiled soils were removed from the site and properly disposed by Paradiso Construction Company under the direction of AGS.

5.2.4 Results at Former Product Lines

The product lines associated with the four former USTs were removed and properly disposed, and the fill material surrounding the piping was excavated and stockpiled on visquene and covered on site. Upon removal of the fill material, eight soil samples were collected from within the excavation trench at approximately every 20 feet and at selected piping connection locations. The analytical results are reported in the bottom half of Table 3 under the section labeled "Product Lines". All samples contained nondetectable concentrations of TPHg, except two. Laboratory analyses detected TPHg in samples S-0530-SP5 (14 ppm) and S-0530-SP6 (6.8 ppm), and BTEX ranging from 0.07 ppm to 1.1 ppm. Borings S-0529-SP2 and S-0613-SP8 contained total xylenes at the detection limit.

5.2.5 Results in New Tank Pit Excavation

Soil containing hydrocarbons in the new gasoline tank pit were excavated and stockpiled onsite. The visual inspection and vapor monitoring revealed hydrocarbons in the subsurface soil from a depth of approximately 9 to 16 feet. The OVM indicated concentrations greater than 500 ppm from saturated gravel lenses between 11 and 15 feet below ground surface. Clayey soil encountered at the bottom of the excavation, at 18 feet, revealed no subjective evidence of hydrocarbons.

When subjective evidence of hydrocarbons was no longer present, four samples were collected from the bottom of the excavation. These samples showed nondetectable concentrations of TPHg. All samples showed low levels of toluene. Three samples detected low levels of benzene, and one sample detected xylenes. Ethylbenzene was nondetectable in all samples. The laboratory results of these bottom samples are reported in Table 4.

5.2.6 Results of Stockpiles from New Tank Pit Excavation

Twenty-two samples for aeration and disposal characterization were collected from the stockpiled soils from the new tank pit. All samples were analyzed for TPHg and BTEX; three samples were analyzed for organic lead. TPHg and BTEX results are reported in Table 5, and organic lead results are reported in Table 6. TPHg was detected in most of the 22 samples and concentrations ranged from nondetectable (<1 ppm or <2 ppm) to 610 ppm in Stockpile No. 4. After aeration, stockpile No. 4 was subsequently sampled on two

later dates until the laboratory results confirmed a TPHg concentration less than 100 ppm. Upon receipt of all necessary laboratory results indicating TPHg concentrations less than 100 ppm, the stockpiled soils were removed from the site and properly disposed.

Organic lead concentrations in all samples were non-detectable as seen in Table 6.

6.0 SUMMARY

The results of the underground storage tank removal and replacement and associated work are summarized below.

- Four stratigraphic units were present in the new tank pit excavation as determined by borings TPB-1 through TPB-3: an approximately 10-foot thick silty clay layer starting at the ground surface; a 5-foot thick sandy gravel layer; below this was a 5-foot thick clayey sand layer which decreased in thickness until it was no longer present in the northeast end of the new tank pit; these three layers were underlain by another silty clay layer.

- TPHg was detected in 3 of the 11 samples collected from the tank pit borings TPB-1 and TPB-3 at the proposed location of the new tank pit. The soil contained TPHg, ranging from nondetectable (<2 ppm) to 290. About 5 cubic yards of soil containing TPHg concentrations from 58 to 290 ppm was stockpiled onsite. The 290 ppm soil was aerated to TPHg concentrations less than 100 ppm, and then all soil from the borings was disposed.

- Four former USTs were excavated and removed from the site. Soil samples collected from the base of the former tank pit excavations at depths of 13 feet contained TPHg ranging from nondetectable (<2 ppm) to 360 ppm. A visual inspection of the four former underground tanks could not detect any visible signs of puncture, leak, or significant corrosion.

- The four former tank pit areas were not overexcavated to remove soils containing hydrocarbons, since a soil vapor recovery system may be proposed to be installed in the tank pit area.

- Stockpiled soils generated during removal of the four former USTs were sampled every 50 cubic yards for aeration and disposal characterization. One soil stockpile had a TPHg concentration greater than 100 ppm (110 ppm), and was aerated in conformance with Regulation 8, Rule 40 of the BAAQMD. After soil

TPHg concentrations were determined by laboratory analysis to be less than 100 ppm, the stockpiles were removed from the site and properly disposed. quantity + location

- Product lines and surrounding fill material associated with the four former USTs were removed. The maximum soil TPHg concentration detected in this excavated soil was 14 ppm. None of this soil required aeration.

- The new tank pit on the north side of the property was excavated to a depth of 19 feet. Excavated soil containing hydrocarbon OVM concentrations greater than 100 ppm were stockpiled onsite. Soil samples were collected and submitted to a State certified laboratory for aeration and disposal characterization from every 50 cubic yards of material. One stockpile (SP4) contained TPHg concentrations exceeding 100 ppm (610 ppm) and required aeration. Stockpile 4 was aerated in compliance with Regulation 8, Rule 40. Upon receipt of laboratory results indicating all stockpiles contained TPHg concentrations less than 100 ppm, the stockpiled soil was removed from the site and properly disposed at an appropriate landfill facility.

- Soil samples collected at the base of the new tank pit excavation showed non-detectable TPHg concentrations, but contain some traces of benzene, toluene, and xylenes. Soil free of hydrocarbons or containing hydrocarbons in concentrations less than 100 ppm were backfilled within the former tank pits.

- No lead was detected in samples taken at the new tank pit excavation.

7.0 CONCLUSIONS

- No hazardous levels of TPHg (greater than 1000 ppm) were present in the soil samples submitted for laboratory analysis, but designated concentrations (greater than 100 ppm but less than 1000 ppm) were detected. No hazardous levels of BTEX were detected in the site soil.

- Soil samples taken at the base of former tank T4 at about 13 feet below grade showed nondetectable concentrations of TPHg, but concentrations over 100 ppm were found at the bases of former tanks T1 and T3. The vertical extent of gasoline hydrocarbons at tanks T1 and T3 has not been delineated. This conclusion is based on the two samples taken at the bases of T1 and T3 at 13 feet below grade which contained 360 ppm and 210 ppm, respectively.

- The northwest end of the new tank pit area contained gasoline hydrocarbon concentrations greater than 100 ppm at a depth of 15 feet, which decreased to 58 ppm at 18.5 feet. This suggests that the vertical extent of gasoline hydrocarbons in this area decreases with depth, but is not yet fully delineated.

- The results of laboratory analyses of soil samples collected during this investigation and previous investigations suggest that the majority of gasoline-impacted soil was not removed from this site during this work. It is understood that a soil vapor extraction system is proposed to be installed at this site in 1991 in order to remove and treat gasoline hydrocarbons remaining in the soil.

8.0 RECOMMENDATIONS

Applied GeoSystems recommends that the installation of a soil vapor extraction system at this site should proceed as planned.

It is recommended that copies of this report by sent to:

Mr. Don Dalke, Water Quality Control Engineer
Regional Water Quality Control Board
1800 Harrison Street, 7th Floor
Oakland, California 94612

Mr. Dennis Byrne
Alameda County Department of Health Services
80 Swan Way, Room 200
Oakland, California 94621

9.0 LIMITATIONS

This report was prepared in accordance with generally accepted standards of environmental geological practice in California at the time this investigation was performed. This investigation was conducted solely as a tool in evaluating environmental conditions of the soil with respect to gasoline related contamination at the site. No soil engineering or geotechnical recommendations are implied or should be inferred. Evaluation of the geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. Subsurface conditions distant from these data points may vary. Additional work, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of investigation.

10.0 REFERENCES

Applied GeoSystems. August 8, 1989. "Limited Subsurface Environmental Investigation, ARCO Station No. 276." Report No. 19014-1

Applied GeoSystems. February 5, 1990. "Site Safety Plan for ARCO Station No. 276, Oakland, California". Report No. 19014-5S.

Applied GeoSystems. October 4, 1990. Draft "Report on Limited Offsite Subsurface Environmental Investigation, ARCO Station 276". Report No. 19014-3.

Alameda County Flood Control and Water Conservation District. June 1988. "Geohydrology and Groundwater - Quality Overview, East Bay Plain Area, Alameda County, California". 205 (J) Report. pp. 22-65.

Bay Area Air Quality Management District. Adopted July 16, 1986. "Regulation 8, Rule 40, Aeration of Contaminated Soil and Removal of Underground Storage Tanks." San Francisco, California.

Pacific Environmental Group, Inc. July 17, 1989. "Soil Gas Investigation at ARCO Station No. 276".

Pacific Environmental Group, Inc. February 6, 1989. "Former Waste-Oil Tank Pit Analytical Results and Site Plan of ARCO Station No. 276". Copy of letter sent to Ms. Mary Meirs, Alameda County Environmental Health Department Hazardous Material Division.

United States Geological Survey. 1982. East Oakland-San Leandro Quadrangle. State of California Special Studies Zones, Revised Official 7.5-Minute Topographic Quadrangle Map.

TABLE 1
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM BORINGS TPB-1 THROUGH TPB-3 IN NEW TANK PIT
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

Sample	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes
S-9.5-TPB1	<2	<0.05	<0.05	<0.05	<0.05
S-15-TPB1	290	0.19	0.47	3.3	6.6
S-18.5-TPB1	58	<0.05	0.069	0.14	0.22
S-21-TPB1	<2	<0.05	<0.05	<0.05	<0.05
S-11-TPB2	<2	<0.05	<0.05	<0.05	<0.05
S-16-TPB2	<2	<0.05	<0.05	<0.05	<0.05
S-18.5-TPB2	<2	<0.05	<0.05	<0.05	<0.05
S-5-TPB3	<2	<0.05	<0.05	<0.05	<0.05
S-10-TPB3	<2	0.075	<0.05	<0.05	<0.05
S-15-TPB3	<2	<0.05	<0.05	<0.05	<0.05
S-20-TPB3	2.1	0.46	<0.05	0.086	<0.05

Results are in parts per million (ppm).
TPHg = Total petroleum hydrocarbons as gasoline.
< = Less than method detection limit.
Sample designation = S-9.5-TPB1

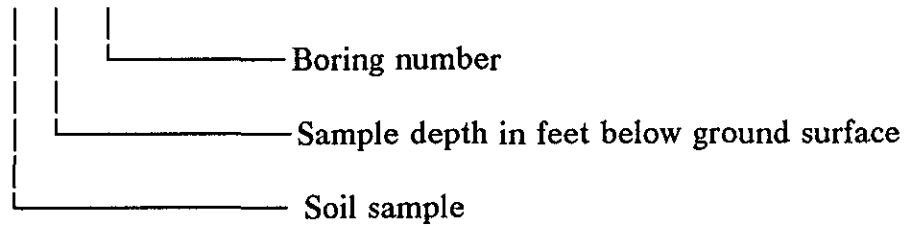


TABLE 2
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM FORMER TANK PITS T1, T2, T3, AND T4
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

Sample	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes
S-7-TP1SW-1	<2	0.13	<0.05	<0.05	0.15
S-8-TP1NE-2	<2	0.088	<0.05	<0.05	<0.05
S-13-TP2N-3	45	0.32	0.46	0.083	0.68
S-13-TP2W-4	3.9	0.24	0.15	0.094	0.67
S-13-TP2E-5	23	0.43	0.95	0.36	3.7
S-10-TP2S-6	2.5	0.13	0.10	<0.05	0.29
S-12-TP2S-7	210	1.8	14	3.4	29
S-12-TP2BM-8	42	0.33	1.2	0.77	6.1
S-13-TP2BN-9	360	0.86	5.5	6.7	43

Results are in parts per million (ppm).
TPHg = Total petroleum hydrocarbons as gasoline.
< = Less than method detection limit.
Sample designation = S-10 - TP2S-6
- S-10: Soil sample
- TP2S: Sample depth in feet below surface
- 6: Sample location

TABLE 3
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM STOCKPILED SOILS AND PRODUCT-LINE TRENCHES
FROM FORMER TANK PITS T1, T2, T3, T4
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

Sample	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes
Stockpile					
S-0322-1(A-D)	9.6	<0.05	<0.05	<0.05	0.054
S-0322-2(A-D)	67	<0.05	<0.05	<0.05	1.6
S-0322-3(A-D)	110	<0.05	<0.05	<0.05	0.071
S-0322-3(A-D)*	59	<0.05	<0.05	<0.05	<0.05
S-0326-4(A-D)	69	<0.05	<0.05	<0.05	0.13
Product Lines					
S-0529-SP1	<2	<0.05	<0.05	<0.05	<0.05
S-0529-SP2	<2	<0.05	<0.05	<0.05	0.076
S-0529-SP3	<2	<0.05	<0.05	<0.05	<0.05
S-0529-SP4	<2	<0.05	<0.05	<0.05	<0.05
S-0529-SP5	14	0.41	0.14	0.17	1.1
S-0530-SP6	6.8	0.19	0.17	0.07	0.24
S-0530-SP7	<1	<0.005	<0.005	<0.005	<0.005
S-0613-SP8	<2	<0.05	<0.05	<0.05	0.062

Results are in parts per million (ppm).
TPHg = Total petroleum hydrocarbons as gasoline.
< = Less than method detection limit.
* = Second sample collected after aeration for several days.
1(A-D) = Stockpile sample location.
SP4 = Product-line trench sample location.
Sample designation = S-0322-4-A-D)

- S = Soil
- 0322 = Sample date
- 4 = Sample location

TABLE 4
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM THE NEW TANK PIT EXCAVATION
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

Sample	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes
Tank Pit NE	<1.0	0.005	0.010	<0.005	<0.005
Tank Pit SE	<1.0	<0.005	0.022	<0.005	<0.005
Tank Pit NW	<1.0	0.029	0.014	<0.005	<0.005
Tank Pit SW	<1.0	0.035	0.013	<0.005	0.005

Results are in parts per million (ppm).
TPHg = Total petroleum hydrocarbons as gasoline.
< = Less than method detection limit.
Sample designation = TANK PIT NE
└——— Sample Location

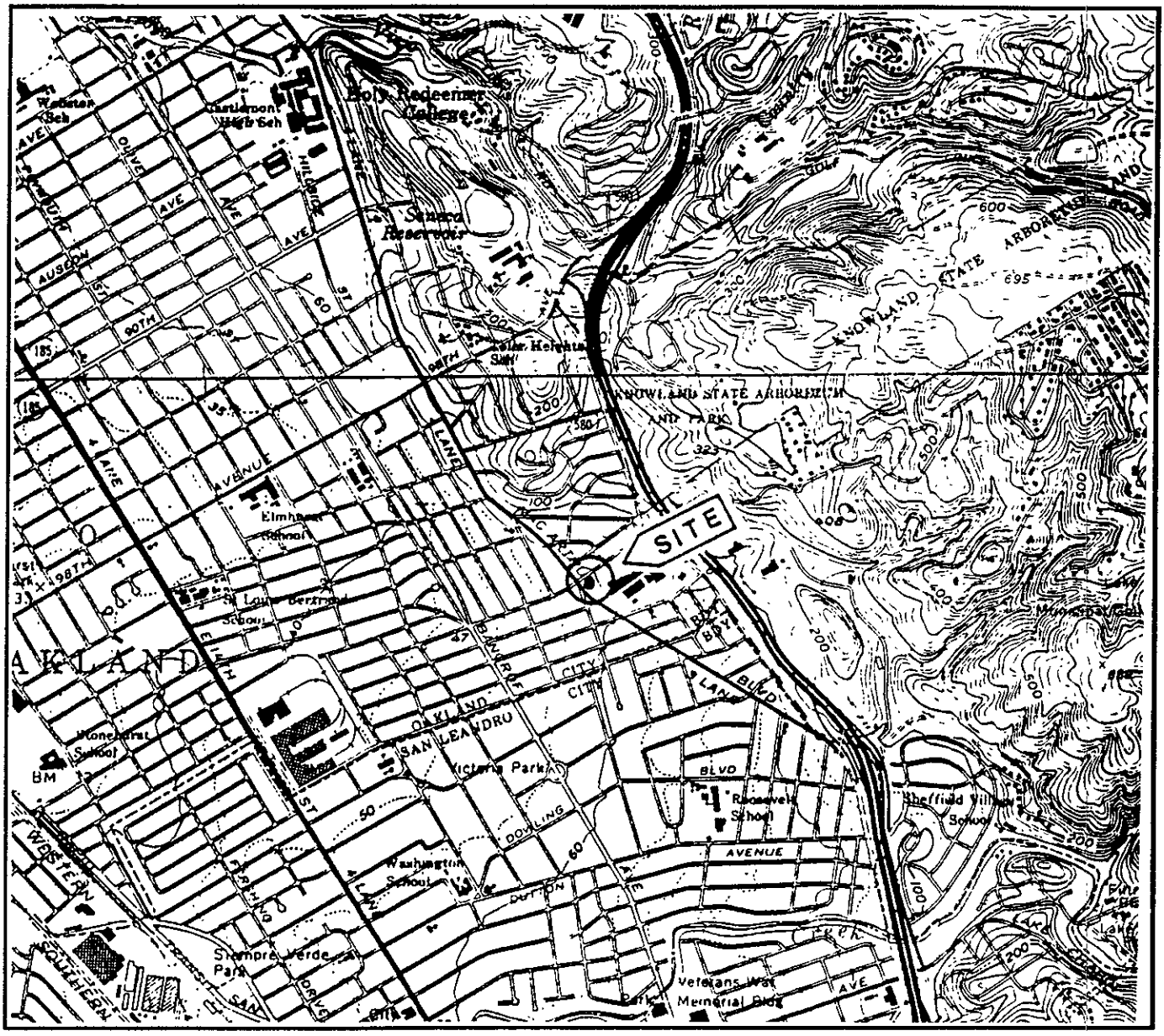
TABLE 5
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM NEW TANK PIT EXCAVATION STOCKPILED SOILS
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

Sample	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes
S-0507-SP2(A-D)	<1.0	<0.005	<0.005	<10.005	0.005
S-0507-SP5(A-D)	<1.0	<0.005	<0.005	<0.005	<0.005
S-0509-SP3(A-D)	16	<0.05	<0.05	<0.05	0.13
S-0509-SP4(A-D)	610	0.5	<0.5	3.1	25
S-0509-SP6(A-D)	<1.0	<0.005	<0.005	<0.005	<0.005
S-0509-SP6(E-H)	<1.0	<0.005	<0.005	<0.005	<0.005
S-0509-SP11(A-D)	49	<0.1	<0.1	<0.1	0.69
S-0509-SP12(A-D)	40	<0.1	<0.1	<0.1	0.69
S-0509-SP13(A-D)	9.0	<0.05	<0.05	<0.05	0.13
S-0509-SP14(A-D)	33	<0.1	<0.1	<0.1	0.45
S-0509-SP15(A-D)	25	<0.2	4.9	<0.2	0.34
S-0509-SP16(A-D)	13	<0.05	<0.05	<0.05	0.13
S-0517-SP4(A-D)	120	<0.2	1.8	0.7	6.7
S-0525-SP4(A-D)	<2.0	<0.05	<0.05	<0.05	<0.05
S-0525-SP7(A-D)	34	<0.05	0.16	0.082	2.4
S-0530-CP1(1-4)	66	0.20	1.1	0.54	3.2
S-0530-CP2(1A-D)	43	<0.05	0.093	0.095	0.39
S-0530-CP2(2A-D)	<1.0	<0.005	<0.005	<0.005	<0.005
S-0530-CP2(3A-D)	1.2	<0.005	<0.005	<0.005	0.021
S-0530-CP2(4A-D)	<1.0	<0.005	<0.005	<0.005	<0.005
S-0530-CP2(5A-D)	<1.0	<0.005	<0.005	<0.005	<0.005
S-0530-CP2(6A-D)	30	<0.05	<0.05	0.16	0.11

Results are in parts per million (ppm).
TPHg = Total petroleum hydrocarbons as gasoline.
< = Less than method detection limit.
Sample designation = S-0530-CP2(6A-D), where S = soil sample, 0530 = sample date, and CP2(A-D) = stockpile and sample location.

TABLE 6
ANALYTICAL RESULTS OF ORGANIC LEAD IN SOIL
FROM NEW TANK PIT EXCAVATION STOCKPILED SOILS
ARCO Station No. 276
10600 MacArthur Boulevard
Oakland, California

Sample	Organic Lead (ppm)	Detection Limit (ppm)
S-0530-CP2	ND	0.08
S-0530-CP2	ND	0.08
(Control sample ID# 9005347-02, 88.7 % recovery)		
S-0509-SP6	ND	0.08
(Control sample ID# 9005094-01, 103.8 % recovery)		



Source: U.S. Geological Survey
7.5–Minute Quadrangles
Oakland East/San Leandro,
California.
Photorevised 1980

N

Approximate Scale

2000 1000 0 2000 4000

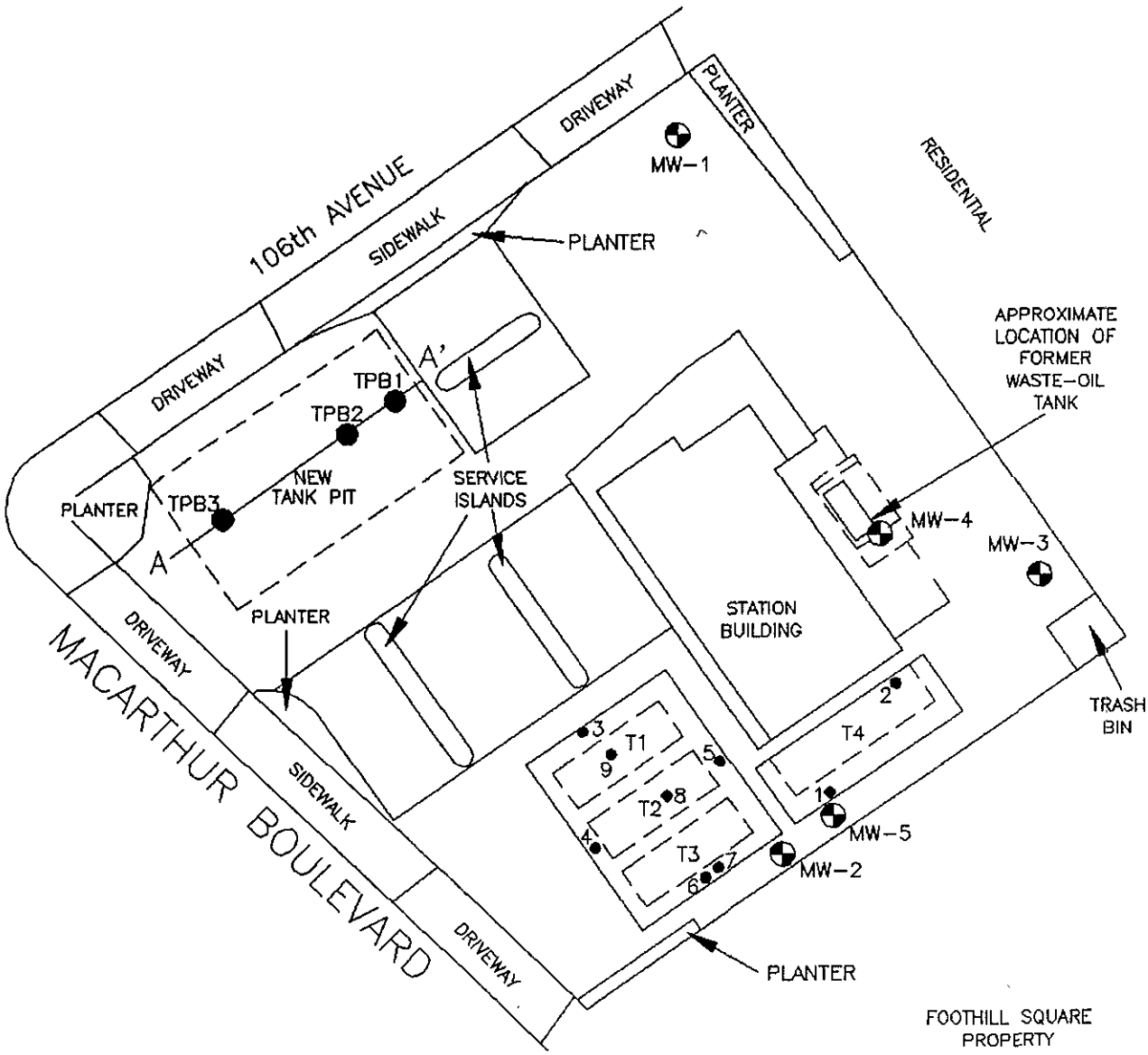
feet

Applied GeoSystems

PROJECT 19014-5

SITE VICINITY MAP
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 1



EXPLANATION

A — A' = Geologic cross section

MW-5 = Monitoring well (Applied GeoSystems, 1989)

TPB3 = Boring in proposed tank pit

9 = Former tank pit sample location (S-7-TP1SW-1 through S-13-TP-2BN-9)

T4 = Former tank pits

N

Approximate Scale

30 15 0 30 60

feet

Source: Modified from plan supplied by ARCO and surveyed by Ron Archer Civil Engineer, Inc.

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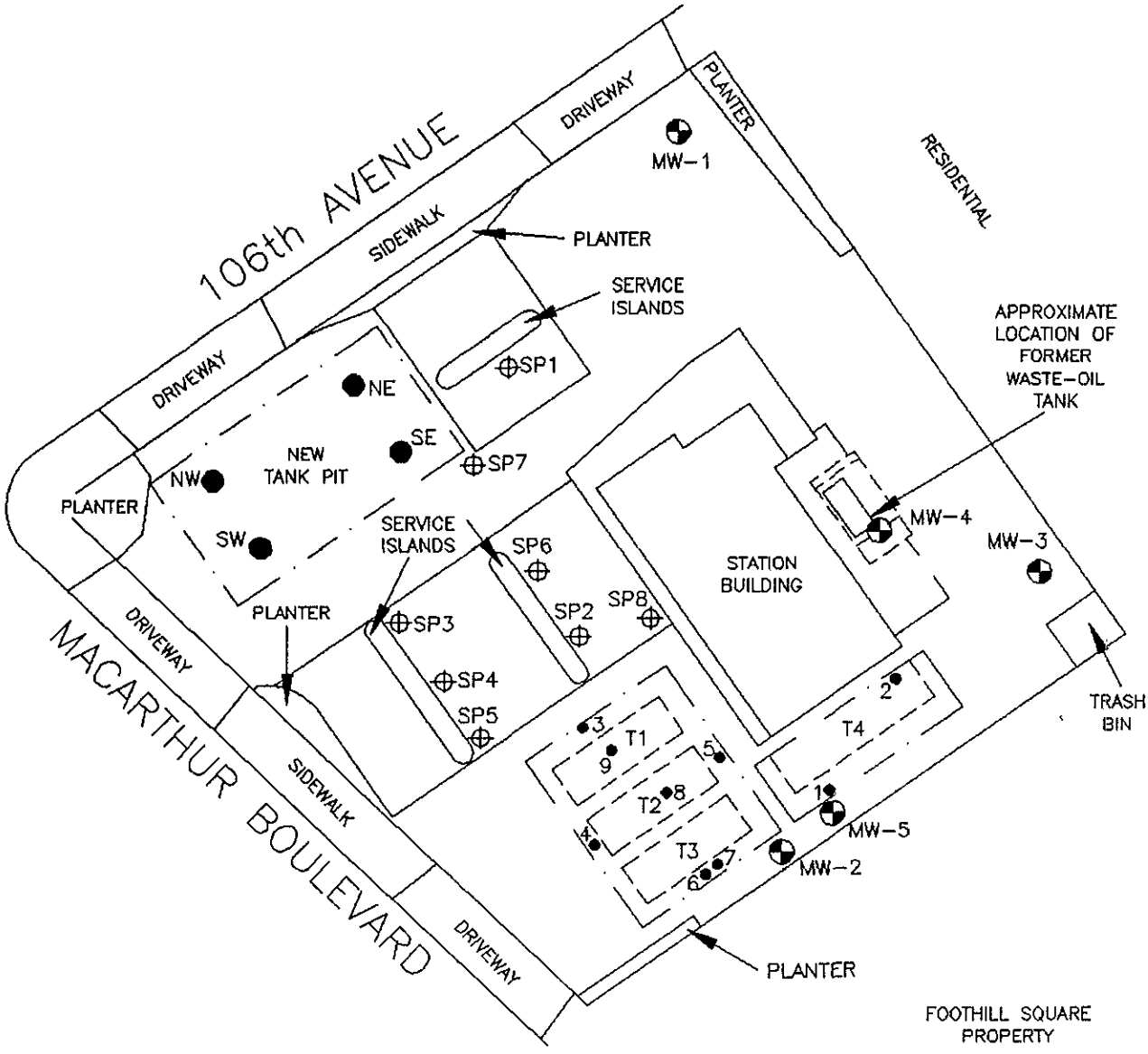
PROJECT 19014-5

GENERALIZED SITE PLAN
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 2



EXPLANATION

T4 = Former tank pits

MW-5 = Monitoring well (Applied GeoSystems, 1989)

NW = New tank pit excavation bottom sample location

9 = Former tank pit sample location (S7-TP1SW-1 through S-13-TP2BN-9)

SP8 = Product line trench sample location (S-0529-SP1 through S-0613-SP8)

Approximate Scale

30 15 0 30 60

feet

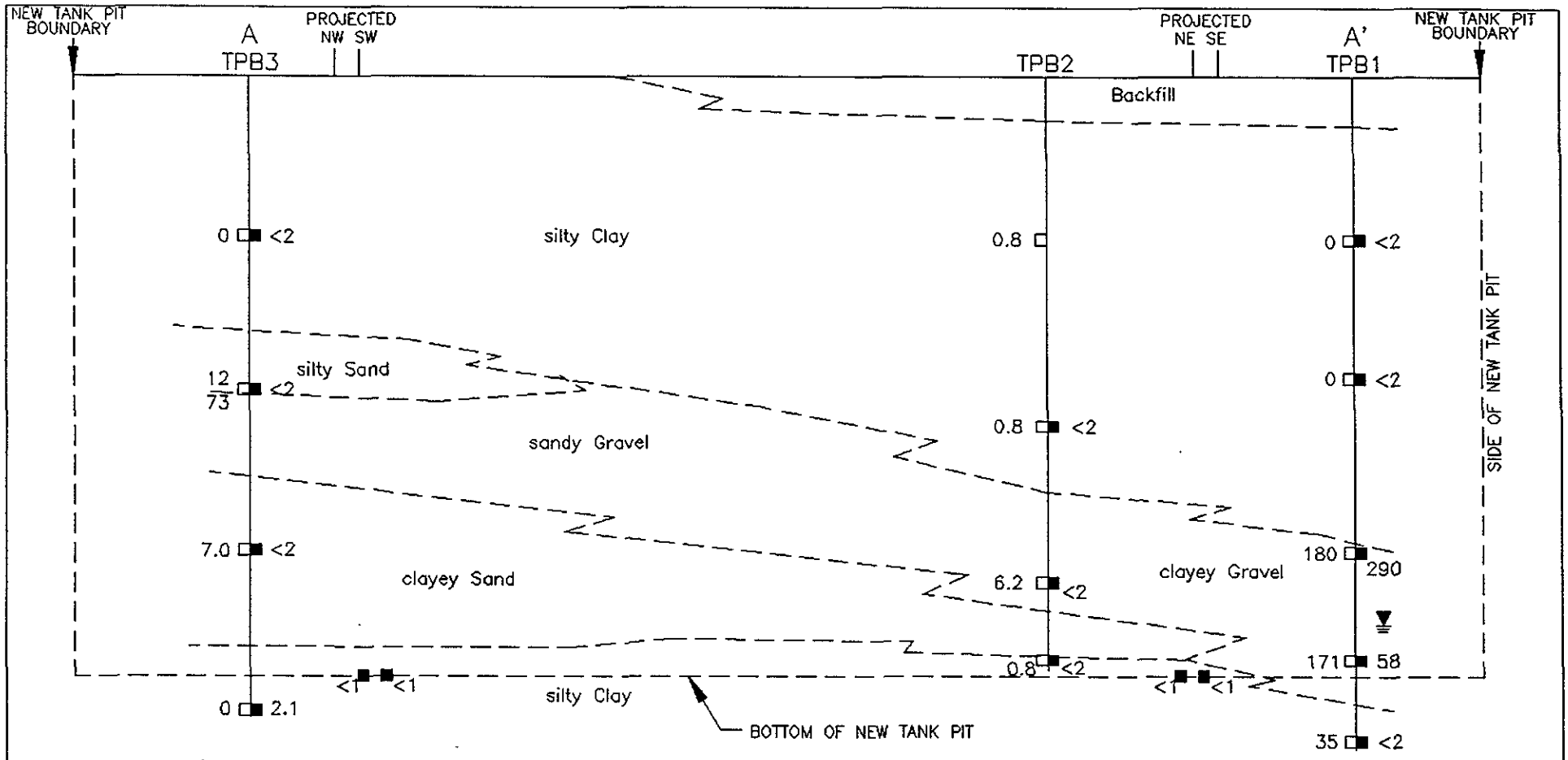
Source: Modified from plan supplied by ARCO and surveyed by Ron Archer Civil Engineer, Inc.

Applied GeoSystems

PROJECT 19014-5

SOIL SAMPLE LOCATION MAP
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 3



EXPLANATION

180 = Organic vapor meter reading field (ppm)

290 = Analytical result of (TPH) as gasoline (ppm)

= Boring

<2 = Less than detection limit

= Static water level

Approximate Horizontal Scale

5 0 5 10

feet

Approximate Vertical Scale

5 0 5 10

feet

PLATE 4

GEOLOGIC CROSS SECTION A-A'
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

Applied GeoSystems

PROJECT 19014-5

APPENDIX A

FIELD PROCEDURES

FIELD INVESTIGATION PROCEDURES

Site Safety Plan

Prior to beginning field work, a Job Site Safety Plan was prepared by AGS. The Site Safety Plan described the safety requirements for the worked to be performed at the site. The Site Safety Plan was applicable to personnel of Applied GeoSystems and its subcontractors. Applied GeoSystems personnel and subcontractors of Applied GeoSystems scheduled to perform the work at the site were briefed on the contents of the Site Safety Plan before work begins. A copy of the Site Safety Plan was available for reference by appropriate parties during the work. A Site Safety Officer was assigned to the project.

Tank Removal

Permits were acquired prior to the commencement of work at the site. Excavated soil was evaluated using an Organic Vapor Meter (OVM). This evaluation was done by removing the top portion of soil from the bucket, and then placing the intake probe of the OVM against the surface of the soil in the bucket. Field instruments such as the OVM are useful for measuring relative concentrations of vapor content, but cannot be used to measure levels of contamination with the confidence of laboratory analysis. After removal of the tank, it was placed on its side for inspection. The underside of the tank was scraped with a flat nose shovel, and the tank inspected for points of corrosion, pitting, throughholes, and other indications of weakness. Soil was excavated from below the former position of the tank bottom, and evaluated using the OVM upon arrival of the soil at the ground surface in the excavator bucket. Samples were taken from the soil in the bucket by driving laboratory-cleaned brass sleeves into the soil. The samples were sealed in the sleeves using aluminum foil, plastic caps, and aluminized duct tape; labeled; and promptly placed in iced storage. If field subjective analyses suggest the presence of hydrocarbons in the soil, additional excavation and soil sampling below the former position of the tank bottom may be performed, using similar methods. The excavation was backfilled as described in the report.

Sampling of Stockpiled Soil

One composite soil sample was collected for each 50 cubic yards of stockpiled soil, and for each individual stockpile composed of less than 50 cubic yards. Composite soil samples should be obtained by first evaluating relatively high, average, and low areas of hydrocarbon concentration by digging approximately 1 to 2 feet into the stockpile and placing the intake probe of an OVM against the surface of the soil; and then collecting one sample from the

"high" reading area, and three samples from the "average" areas. Samples should be collected by removing the top one to two feet of soil, then driving laboratory-cleaned brass sleeves into the soil. The samples should be sealed in the sleeves using aluminum foil, plastic caps, and aluminized duct tape; labeled; and promptly placed in iced storage for transport to the laboratory, where compositing will be performed.

Soil Borings

Prior to the drilling of borings, permits were acquired from the appropriate regulatory agency. In addition, Underground Services Alert was notified of our intent to drill, and known underground utility lines and structures were approximately marked.

The borings were drilled by a Mobile B-61 (or equivalent) truck-mounted drill rig equipped with 8- or 10-inch-diameter, hollow-stem augers. The augers were steam-cleaned prior to drilling each boring to minimize the possibility of cross-contamination. After drilling the borings, neat-cement grout with bentonite was used to backfill the borings to the ground surface.

Drill Cuttings

Drill cuttings evaluated as having hydrocarbon contamination at levels greater than 100 parts per million (ppm) were separated from those evaluated as having hydrocarbon contamination levels less than 100 ppm. Evaluation was based on measurements made using an OVM. Readings were taken by placing the intake probe of the OVM against the soil in the brass sleeve promptly after opening the sampler. The drill cuttings from the borings were placed on plastic liners at the site, and covered with plastic.

Soil Sampling in Borings

Soil samples were collected at 5-foot intervals from the ground surface to the total depth of the borings. The soil samples were collected by advancing the boring to a point immediately above the sampling depth, and then driving a California-modified, split-spoon sampler containing brass sleeves through the hollow center of the auger into the soil. The sampler and brass sleeves were laboratory-cleaned, steam-cleaned, or washed thoroughly with Alconox and water, prior to each use. The sampler was driven with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each successive 6 inches should be counted and recorded to evaluate the relative consistency of the soil.

The samples selected for laboratory analysis were removed from the sampler and quickly sealed in their brass sleeves with aluminum foil, plastic caps, and aluminized duct tape. The samples were then labeled, promptly placed in iced storage, and delivered to a laboratory certified by the State of California to perform the analyses requested.

One of the samples in brass sleeves not selected for laboratory analysis at each sampling interval was tested in the field using an OVM. This testing is performed by placing the intake probe of the OVM against the soil in the brass sleeve promptly after opening the sampler. The OVM readings are presented in logs of borings included in the project report.

Logging of Borings

An experienced geologist was present to log the soil cuttings and samples using the Unified Soil Classification System. Samples not selected for chemical analysis, and the soil in the sampler shoe, were extruded in the field for inspection. Logs include texture, color, moisture, plasticity, consistency, blow counts, and any other characteristics noted. Logs also include subjective evidence for the presence of hydrocarbons, such as soil staining, obvious product odor, and OVM readings.

APPENDIX B

LOGS OF SOIL BORINGS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISION		LTR	DESCRIPTION	MAJOR DIVISION		LTR	DESCRIPTION
COARSE-GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded Gravels or 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 Gravel, 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 or 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.				
		SC	Clayey Sands, Sand-Clay mixtures.	HIGHLY ORGANIC SOILS		PT	Peat and other highly Organic Soils.


Depth through which sampler is driven


Relatively undisturbed sample


No sample recovered


Static water level observed in well/boring


Initial water level observed in boring

S-10 Sample number


Sand pack


Bentonite


Neat cement


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

PROJECT 19014-5

UNIFIED SOIL CLASSIFICATION SYSTEM AND SYMBOL KEY
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE
B-1

Total depth of boring: 21-1/2 feet Diameter of boring: 8 inches Date drilled: 1-31-90

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: Mike and Brian

Method Used: Hollow-Stem Auger Field Geologist: Steve Johnston

Signature of Registered Professional: _____

Registration No.: _____ State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches).	
					Gravel and sand backfill.	
2				CL	Silty clay, dark gray and brown, damp, medium plasticity, very stiff.	
4		12 15		CL	Silty clay with sand, brown, damp, medium plasticity, hard.	
	S-5	20	0			
6						
8						
		5				
10	S-9.5	8 9	0		Grades less silt, green-gray, very stiff.	
12						
14		5 12			Grades to gravelly clay.	
	S-15	26	180	GC	Clayey gravel with fine to coarse-grained sand, medium-grained gravel, brown with orange discoloration, very moist, dense, noticeable odor.	
16						
		10 12		▼		
18	S-18.5	9	171		Grades less clay and sand, wet.	
20		7				
		10		CL	Sandy clay, fine-grained, brown, very moist, medium plasticity, very stiff.	
	S-21	12	35		Total Depth = 21-1/2 feet.	

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PROJECT 19014-5

LOG OF BORING TPB-1

ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE B - 2

Total depth of boring: 19 feet Diameter of boring: 8 inches Date drilled: 1-31-90

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: Mike and Brian

Method Used: Hollow-Stem Auger Field Geologist: Steve Johnston

Signature of Registered Professional:

Registration No.: State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches).	
					Gravel and sand backfill.	
2				CH	Silty clay, dark gray and brown, damp, medium plasticity, very stiff.	
4				CL	Silty clay with sand, brown, damp, medium plasticity, hard.	
6	S-5.5	9 15 23	0.8			
8						
10		7				
	S-11	9 12	0.8		Trace small gravel, with green colored vertical rootlets.	
12						
14		7 12		GC	Clayey gravel with fine-grained sand, brown and red-brown, damp, dense, slight odor.	
16	S-15	15	6.2			
		17		SC	Grades to clayey coarse-grained sand with gravel, moist.	
18		23				
	S-18.5	23	0.8	CL	Silty clay, brown, damp, medium plasticity, hard.	
20					Total Depth = 19 feet.	

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PROJECT 19014-5

LOG OF BORING TPB-2

ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE

B - 3

Total depth of boring: 21-1/2 feet Diameter of boring: 8 inches Date drilled: 1-31-90

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: Mike and Brian

Method Used: Hollow-Stem Auger Field Geologist: Mark Armstrong

Signature of Registered Professional: _____

Registration No.: _____ State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (6 inches).	
				CL	Silty clay with trace sand, dark brown with green mottling, damp, medium plasticity, very stiff.	
2						
4		7				
	S-5	12				
6		18	0			
8					Trace gravel.	
				SM	Silty sand with clay.	
		8				
10		12	12			
	S-10	15	73	GP	Sandy gravel, medium to fine-grained, damp, medium dense, slight odor.	
12						
				SC	Clayey sand with silt, brown and green mottling, damp, medium plasticity, loose, slight odor.	
14		2				
		4				
	S-15	5	7.0			
16						
18						
		9		CL	Silty clay, brown with black mottling, wet, medium plasticity.	
20		10				
	S-20	15	0			
					Total Depth = 20-1/2 feet.	

Applied GeoSystems

PROJECT 19014-5

LOG OF BORING TPB-3

ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE B - 4

APPENDIX C

CHAIN OF CUSTODY RECORDS AND LABORATORY ANALYSIS REPORTS

FOR

BORINGS TPB-1 THROUGH TPB-3

(Reported in Table 1)

CHAIN OF CUSTODY RECORD

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

SAMPLER (signature): Stephen F Johnston
Phone: 415-651-1906

LABORATORY: AGS

TURNAROUND TIME: 24 hr.

Project Leader: Bill Howell
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
Stephen F Johnston	Bill Howell	1/31/90	14:0
Bill Howell			
	Received for laboratory by:	1-31-90	1430

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-4.5-TPB1	19014-5	1/31/90		iced
S-15-TPB1	19014-5	1/31/90		iced
S-18.5-TPB1	19014-5	1/31/90		
S-21-TPB1	19014-5	1/31/90		
S-11-TPB2				
S-16-TPB2				
S-18.5-TPB2				

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

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Bill Howell	Date Sampled:	01-31-90
	Applied GeoSystems	Date Received:	01-31-90
	43255 Mission Boulevard	BETX Analyzed:	01-31-90
	Fremont, CA 94539	TPHg Analyzed:	01-31-90
Project:	AGS 19014-5	TPHd Analyzed:	NR
		Matrix	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-9.5-TPB1 S1001201	ND	ND	ND	ND	ND	NR
S-15-TPB1 S1001202	0.19	0.47	3.3	6.6	290	NR
S-18.5-TPB1 S1001203	ND	0.069	0.14	0.22	58	NR
S-21-TPB1 S1001204	ND	ND	ND	ND	ND	NR
S-11-TPB2 S1001205	ND	ND	ND	ND	ND	NR
S-16-TPB2 S1001206	ND	ND	ND	ND	ND	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

02-01-90
Date Reported

APPLIED GEOSYSTEMS IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 153)

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

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Bill Howell	Date Sampled:	01-31-90
	Applied GeoSystems	Date Received:	01-31-90
	43255 Mission Boulevard	BETX Analyzed:	01-31-90
	Fremont, CA 94539	TPHg Analyzed:	01-31-90
Project:	AGS 19014-5	TPHd Analyzed:	NR
		Matrix	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-18.5-TPB2 S1001207	ND	ND	ND	ND	ND	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

02-01-90
Date Reported

CHAIN OF CUSTODY RECORD

Applied GeoSystems

41255 Mission Blvd Suite B Fremont CA 94539 (415) 651-19

SAMPLER (signature): R. Mark Hunter

Phone: 651-1906

LABORATORY: AGS Lab.

TURNAROUND TIME: 24 hr

Project Leader: Bill Howell

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Tir
R. Mark Hunter	Bill Howell	2/6/90	12
Bill Howell			
	Received for laboratory by.	2-6-90	12

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-5-TPB5				
S-10-TPB5				
S-15-TPB3				
S-20-TPB3				

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

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Bill Howell	Date Sampled:	02-06-90
	Applied GeoSystems	Date Received:	02-06-90
	43255 Mission Boulevard	BETX Analyzed:	02-06-90
	Fremont, CA 94539	TPHg Analyzed:	02-06-90
Project:	AGS 19014-5	TPHd Analyzed:	NR
		Matrix	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-5-TPB3 S1002032	ND	ND	ND	ND	ND	NR
S-10-TPB3 S1002033	0.075	ND	ND	ND	ND	NR
S-15-TPB3 S1002034	ND	ND	ND	ND	ND	NR
S-20-TPB3 S1002035	0.46	ND	0.086	ND	2.1	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

02-07-90
Date Reported

APPLIED GEOSYSTEMS IS CERTIFIED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY (Certification No. 153)

APPENDIX D

CHAIN OF CUSTODY RECORDS AND LABORATORY ANALYSIS REPORTS

FOR FORMER TANK PITS

(Reported in Table 2)

CHAIN OF CUSTODY RECORD

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

SAMPLER (signature):

Phone: 415-651-1906

LABORATORY: AGS

TURNAROUND TIME: 1 week

Project Leader: Bill Howell

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
	Received for laboratory by:	2-9-90	0800

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

Sample No.	Sample Pt.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
S-7-TP1SW	(1)	SFJ	SFJ	SFJ	SFJ
S-4-TP1NE	(2)			TPH-g/BTEX	
S 15 TP2N	(3)				
S 15 TP2W	(4)				
S-13 TP2E	(5)				
S 10-TP2S	(6)				
S-12-TP2S	(7)				
S 12-TP2BM	(8)				
S-13 TP2BN	(9)	SFJ	SFJ	SFJ	SFJ

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

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Bill Howell
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Project: AGS 19014-5

Date Sampled: 02-08-90
Date Received: 02-09-90
BETX Analyzed: 02-15-90
TPHg Analyzed: 02-15-90
TPHd Analyzed: NR
Matrix Soil

	Benzene ppm	Toluene ppm	Ethyl-benzene ppm	Total Xylenes ppm	TPHg ppm	TPHd ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
Data Point 1 S-7-TP1SW S1002058	0.13	ND	ND	0.15	ND	NR
2 S-8-TP1NE S1002059	0.088	ND	ND	ND	ND	NR
3 S-13-TP2N S1002060	0.32	0.46	0.083	0.68	45	NR
4 S-13-TP2W S1002061	0.24	0.15	0.094	0.67	3.9	NR
5 S-13-TP2E S1002062	0.43	0.95	0.36	3.7	23	NR
6 S-10-TP2S S1002063	0.13	0.10	ND	0.29	2.5	NR

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

ANALYTICAL PROCEDURES

BTEX-- Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg--Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd--Total petroleum hydrocarbons as diesel (high boiling points) are measured by ~~extraction using EPA Method 3550~~ for ~~soils and~~ EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

02-17-90
Date Reported

APPLIED GEOSYSTEMS IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 153)

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

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Bill Howell	Date Sampled:	02-08-90
	Applied GeoSystems	Date Received:	02-09-90
	43255 Mission Boulevard	BETX Analyzed:	02-15-90
	Fremont, CA 94539	TPHg Analyzed:	02-15-90
Project:	AGS 19014-5	TPHd Analyzed:	NR
		Matrix	Soil

	Benzene ppm	Toluene ppm	Ethyl-benzene ppm	Total Xylenes ppm	TPHg ppm	TPHd ppm
Detection Limit:	0.050	0.050	0.050	0.050	10	10
Data Point — SAMPLE Laboratory Identification						
7 S-12-TP2S S1002064	1.8	14	3.4	29	210	NR
9 S-13-TP2BN S1002066	0.86	5.5	6.7	43	360	NR
8 S-12-TP2B~~N~~M S1002065	0.33	1.2	0.77	6.1	42	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

02-17-90
Date Reported

APPENDIX E

CHAIN OF CUSTODY RECORDS AND LABORATORY ANALYSIS REPORTS

FOR FORMER TANK PITS STOCKPILED SOIL

(Reported at top of Table 3)

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

O.J. NO.	PROJECT NAME
20175	Arco [illegible] Station
O. NO.	SAMPLERS (Signature)
	L Mark Hunter

DATE M/DD/YY	TIME		No. of Cont-ainers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)						Preserved?	REMARKS	LABORATORY I.D. NUMBER
3/19/90	2:10	S-0322-1A	1	C	C									
		S-0322-1B Comp	1	C	C									
		S-0322-1C	1	C	C									
		S-0322-1D	1	C	C									
		S-0322-2A	1	C	C									
		S-0322-2B	1	C	C									
		S-0322-2C Comp	1	C	C									
		S-0322-2D	1	C	C									
		S-0322-3A	1	C	C									
		S-0322-3B Comp	1	C	C									
		S-0322-3C	1	C	C									
		S-0322-3D	1	C	C									
		S-0322-4A	1	C	C								Hold	
		S-0322-4B Comp	1	C	C									
		S-0322-4C	1	C	C									
		S-0322-4D	1	C	C									

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
L Mark Hunter	3/19 5:00	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature): 3-19-90 17:20

Laboratory: Applied GeoSystems

Turn Around: 24 hr

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906

Proj. Mgr.: Bill Howell

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

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Bill Howell
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Project: AGS 19014-5

Date Sampled: 03-19-90
Date Received: 03-19-90
BTEX Analyzed: 03-20-90
TPHg Analyzed: 03-20-90
TPHd Analyzed: NR
Matrix: Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-0322-1(ABCD) S1003205	ND	ND	ND	0.054	9.6	NR
S-0322-2(ABCD) S1003206	ND	ND	ND	1.6	67	NR
S-0322-3(ABCD) S1003207	ND	ND	ND	0.071	110	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

03-21-90
Date Reported

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

J. NO.	PROJECT NAME
1014.3	Arco/Oakland
. NO.	SAMPLERS (Signature)
	[signature]

ATE (M/DD/YY)	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)						Preserved?	REMARKS	LABORATORY I.D. NUMBER
				ANALYSIS										
3/22/90	8:00	S-0322-3A	Composite	✓	✓									
		S-0322-3B		✓	✓									
		S-0322-3C		✓	✓									
		S-0322-3D		✓	✓									

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
[signature]	3-22 09:40	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature): 3-22-90 0940
		[signature]

Laboratory: Applied GeoSystems

Turn Around: 24hr

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906

Proj. Mgr.: Bill Howell

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

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Bill Howell
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Project: AGS 19014-5

Date Sampled: 03-22-90
Date Received: 03-22-90
BTEX Analyzed: 03-22-90
TPHg Analyzed: 03-22-90
TPHd Analyzed: NR
Matrix: Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-0322-3(ABCD) S1003253	ND	ND	ND	ND	59	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

03-23-90
Date Reported

APPLIED GEOSYSTEMS IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 153)

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO: 1901
PROJECT NAME: Nico Gas Station
P.O. NO:
SAMPLERS (Signature): R. Mark Hamilton

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)					Preserved?	REMARKS	LABORATORY I.D. NUMBER
						ANALYSIS							
03/26/90	7:00 am	S-0326-4A	1	✓	✓								
		S-0326-4B	1	✓	✓								
		S-0326-4C	1	✓	✓								
		S-0326-4D	1	✓	✓								
		Comp											

RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
R. Mark Hamilton	3/27 8:30	Bill Howell
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
Bill Howell	3/27 9:00	
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature)

Laboratory: Applied GeoSystems

Turn Around: 24 hr

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906

Proj. Mgr.: Bill Howell

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

ANALYSIS REPORT

1020lab.frm

Attention: Mr. Bill Howell
Applied GeoSystems
43255 Mission Boulevard
Fremont, CA 94539
Project: AGS 19014-5

Date Sampled: 03-26-90
Date Received: 03-27-90
BTEX Analyzed: 03-27-90
TPHg Analyzed: 03-27-90
TPHd Analyzed: NR
Matrix: Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-0326-4(ABCD) S1003270	ND	ND	ND	0.13	69	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

03-28-90
Date Reported

APPENDIX F

CHAIN OF CUSTODY RECORDS AND LABORATORY ANALYSIS REPORTS

FOR

SOIL STOCKPILES FROM FORMER TANK PITS PRODUCT LINES

(Reported at bottom of Table 3, except for samples S-0530-SP6 and S-0530-SP7 which were part of the Chain of Custody Records included in Appendix H.)

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

JOB NO: 9014-5

PROJECT NAME: Product Line Sampling

SAMPLERS (Signature): Pablo A. M. Lano

DATE (MM/DD/YY)	TIME		No of Containers	ANALYSIS: TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	Preserved?	REMARKS	LABORATORY I.D. NUMBER
5/29/90		S-0529-SP1	1	X	X		Ice		
		S-0529-SP2	1	X	X		Ice		
5/29/90		S-0529-SP3	1	X	X		Ice		
		S-0529-SP4	1	X	X		Ice		
		S-0529-SP5	1	X	X		Ice		

RELINQUISHED BY (Signature): Pablo A. M. Lano — DATE / TIME

RELINQUISHED BY (Signature) — DATE / TIME

RELINQUISHED BY (Signature) — DATE / TIME

RECEIVED BY (Signature)

RECEIVED BY (Signature)

RECEIVED BY (Signature): M. Meehan

Laboratory: Applied GeoSystems

Turn Around: 24 Hrs

SEND RESULTS TO:
Applied GeoSystems
42501 Albrae Street
Suite 100
Fremont, California 94639
(415) 651-1906

Proj. Mgr.: Pablo M. Lano

APPLIED ANALYTICAL

Environmental Laboratories

3459 Edison Way
Fremont, CA 94538
(415) 623-0775

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Pablo McLoud	Date Sampled:	05-29-90
	Applied GeoSystems	Date Received:	05-29-90
	43255 Mission Boulevard	BTEX Analyzed:	05-29-90
	Fremont, CA 94539	TPHg Analyzed:	05-29-90
Project:	AGS 19014-5	TPHd Analyzed:	NR
		Matrix:	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-0529-SP1 S1005381	ND	ND	ND	ND	ND	NR
S-0529-SP2 S1005382	ND	ND	ND	0.076	ND	NR
S-0529-SP3 S1005383	ND	ND	ND	ND	ND	NR
S-0529-SP4 S1005384	ND	ND	ND	ND	ND	NR
S-0529-SP5 S1005385	0.41	0.14	0.17	1.1	14	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

05-30-90
Date Reported

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

JOB NO	PROJECT NAME
9014-5	Product Line Sampling
PO NO	SAMPLERS (Signature)

DATE (MM/DD/YY)	TIME		No of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)					Preserved?	REMARKS	LABORATORY I.D. NUMBER
6/13/90		S-0613-SP8 (A-C)	3	X	X							Composite	
6/13/90													
6/13/90													

RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
[signature]	6/18	
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
	6-19-90 1720	[signature]

Laboratory: ABS

Turn Around: 24 hr

SEND RESULTS TO:
Applied GeoSystems
42501 Albrae Street
Suite 100
Fremont, California 94639
(415) 651-1906

Proj. Mgr.: Pablo McLoud

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Pablo Mcloud	Date Sampled:	06-13-90
	Applied GeoSystems	Date Received:	06-19-90
	42501 Albrae Street	BTEX Analyzed:	06-19-90
	Fremont, CA 94538	TPHg Analyzed:	06-19-90
Project:	AGS 19014-5	TPHd Analyzed:	NR
		Matrix:	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-0613-SP8(ABC) S1006735	ND	ND	ND	0.062	ND	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an ~~FID~~.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

06-22-90
Date Reported

APPENDIX G

CHAIN OF CUSTODY RECORDS AND LABORATORY ANALYSIS REPORTS

FOR

BOTTOM OF NEW TANK PIT

(Reported in Table 4)

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

Sample I.D. : 19014-5 TANK PIT NE
Matrix : SOIL
Date sampled : 05/04/90
Date anl.TPHg: 05/10/90

Anametrix I.D. : 9005065-01
Analyst : CB
Supervisor : TL
Date released : 05/15/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	10
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD 9005065

PROJ NO	PROJECT NAME
19014-5	TANK PIT Inspection
P.O. NO	SAMPLERS (Signature)
	Pablo A. McLoud

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	Preserved?	REMARKS	LABORATORY I.D. NUMBER
5/4/90		TANK PIT - NE 1/4 Bottom	1	X	X				
5/4/90		TANK PIT - SE 1/4 Bottom	1	X	X				
5/4/90		TANK PIT - NW 1/4 Bottom	1	X	X				
5/4/90		TANK PIT - SW 1/4 Bottom	1	X	X				

RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
Pablo A. McLoud	5/4/90 12:30	Leigh Meredith
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature)
	5/6/90 1350	

Laboratory: ANALYMETRIK

Turn Around: 2 weeks

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906

Proj. Mgr.: Pablo McLoud

ANAMETRIX INC
Environmental & Analytical Chemistry
961 Concourse Drive, Suite E, San Jose, CA 95131
(408) 432-8192 • Fax (408) 432-8198

REPORT

Pablo McLoud
Applied GeoSystems
43255 Mission Boulevard
Suite B
Fremont, CA 94539

May 15, 1990
Anametrix W.O.#: 9005065
Date Received : 05/07/90
Project Number : 19014-5

Dear Mr. McLoud:

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.

NOTE: Amounts reported are net values, i.e. corrected for method blank contamination.

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

Sincerely,

ANAMETRIX, INC.

Terry Cooke
TPH Supervisor

TC/dmt

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

Client	: Applied GeoSystems	Anametrix W.O.#:	9005065
Address	: 43255 Mission Boulevard	Date Received :	05/07/90
	Suite B	Purchase Order#:	N/A
City	: Fremont, CA 94539	Project No. :	19014-5
Attn.	: Pablo McLoud	Date Released :	05/15/90

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
9005065-01	TANK PIT NE	SOIL	05/04/90	TPHg		05/10/90	N/A
9005065-02	TANK PIT SE	SOIL	05/04/90	TPHg		05/09/90	N/A
9005065-03	TANK PIT NW	SOIL	05/04/90	TPHg		05/09/90	N/A
9005065-04	TANK PIT SW	SOIL	05/04/90	TPHg		05/09/90	N/A

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

Sample I.D. : 19014-5 TANK PIT SE
Matrix : SOIL
Date sampled : 05/04/90
Date anl.TPHg: 05/09/90

Anametrix I.D. : 9005065-02
Analyst : CB
Supervisor : JC
Date released : 05/15/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	22
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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. : 19014-5 TANK PIT NW
Matrix : SOIL
Date sampled : 05/04/90
Date anl.TPHg: 05/09/90

Anametrix I.D. : 9005065-03
Analyst : CB
Supervisor : TC
Date released : 05/15/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	29
108-88-3	Toluene	5	14
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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. : 19014-5 TANK PIT SW
Matrix : SOIL
Date sampled : 05/04/90
Date anl.TPHg: 05/09/90

Anametrix I.D. : 9005065-04
Analyst : CB
Supervisor : TC
Date released : 05/15/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	35
108-88-3	Toluene	5	13
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	5
	TPH as Gasoline	1000	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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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

APPENDIX H

CHAIN OF CUSTODY RECORDS AND LABORATORY ANALYSIS REPORTS

FOR

STOCKPILES FROM NEW TANK PIT EXCAVATION

(Reported in Tables 5 and 6)

9005114

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
19014-5	ARCO OAKLAND
P.O. NO.	SAMPLERS (Signature)

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	Preserved?	REMARKS	LABORATORY I.D. NUMBER
5/9/90	11:00	S-0509-SP11(A,B,C,D)	4	X	X	X	ICE	COMPOSITE	
	11:20	S-0509-SP12(A,B,C,D)	4	X	X	X			
	11:40	S-0509-SP13(A,B,C,D)		X	X	X			
	12:00	S-0509-SP14(A,B,C,D)		X	X	X			
	12:20	S-0509-SP15(A,B,C,D)		X	X	X			
	12:40	S-0509-SP16(A,B,C,D)		X	X	X			

6 SAMPLES RUN 24HRS
RUSH FOR BTEX
PER PABLO McLOUD
5-18-90 @ 9:15

RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
	5/9/90	
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
	5/10/90 17:00	
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature)

Laboratory: ANALYTRAX

Turn Around: 24 HR

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906

Proj. Mgr.: PABLO McLOUD

ANAMETRIX INC
Environmental & Analytical Chemistry
761 Concourse Drive, Suite E, San Jose CA 95131
(408) 432-8192 • Fax (408) 432-8198

REPORT

Pablo McLoud
Applied GeoSystems
43255 Mission Boulevard
Suite B
Fremont, CA 94539

May 14, 1990
Anametrix W.O.#: 9005119
Date Received : 05/11/90
Project Number : 19014-5

Dear Mr. McLoud:

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.

NOTE: Amounts reported are net values, i.e. corrected for method blank contamination.

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

Sincerely,

ANAMETRIX, INC.

Terry Cooke
TPH Supervisor

TC/dmt

ANAMETRIX INC
Environmental & Analytical Chemistry
1261 Concourse Drive Suite E. San Jose. CA 95131
(408)432-8192 • Fax (408)432-8198

REPORT

Pablo McLoud
Applied GeoSystems
43255 Mission Blvd. Suite B
Fremont, CA 94539

May 21, 1990
Anametrix W.O.#: 9005220
Date Received : 05/18/90
Project No. : 19014-5

Dear Mr. McLoud:

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.

NOTE: 1) Amounts reported are net values, i.e. corrected for method blank contamination.

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

Sincerely,

ANAMETRIX, INC.

Terry Cooke
TPH Supervisor

TC/kd

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

Client : Applied GeoSystems
Address : 43255 Mission Blvd. Suite B
City : Fremont, CA 94539
Attn. : Pablo McLoud

Anametrix W.O.#: 9005220
Date Received : 05/18/90
Purchase Order#: N/A
Project No. : 19014-5
Date Released : 05/21/90

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
9005220-01	SP11 (A,B,C,D)	SOIL	05/09/90	TPH		05/10/90	N/A
9005220-02	SP12 (A,B,C,D)	SOIL	05/09/90	TPH		05/11/90	N/A
9005220-03	SP13 (A,B,C,D)	SOIL	05/09/90	TPH		05/11/90	N/A
9005220-04	SP14 (A,B,C,D)	SOIL	05/09/90	TPH		05/11/90	N/A
9005220-05	SP15 (A,B,C,D)	SOIL	05/09/90	TPH		05/11/90	N/A
9005220-06	SP16 (A,B,C,D)	SOIL	05/09/90	TPH		05/11/90	N/A

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

Client	: Applied GeoSystems	Anametrix W.O.#:	9005119
Address	: 43255 Mission Boulevard Suite B	Date Received :	05/11/90
		Purchase Order#:	N/A
City	: Fremont, CA 94539	Project No. :	19014-5
Attn.	: Pablo McLoud	Date Released :	05/14/90

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
9005119-01	S-0509-SP11(A,B,C	SOIL	05/09/90	TPHg		05/10/90	N/A
9005119-02	S-0509-SP12(A,B,C	SOIL	05/09/90	TPHg		05/11/90	N/A
9005119-03	S-0509-SP13(A,B,C	SOIL	05/09/90	TPHg		05/11/90	N/A
9005119-04	S-0509-SP14(A,B,C	SOIL	05/09/90	TPHg		05/11/90	N/A
9005119-05	S-0509-SP15(A,B,C	SOIL	05/09/90	TPHg		05/11/90	N/A
9005119-06	S-0509-SP16(A,B,C	SOIL	05/09/90	TPHg		05/11/90	N/A

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

Sample I.D.	: 19014-5 S-0509-SP11(A,B,C)	Anametrix I.D.	: 9005119-01
Matrix	: SOIL	Analyst	: CB
Date sampled	: 05/09/90	Supervisor	: [illegible]
Date anl.TPHg	: 05/10/90	Date released	: 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	2000	49000

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.

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.	: 19014-5 SP11 (A,B,C,D)	Anametrix I.D.	: 9005220-01
Matrix	: SOIL	Analyst	: DOG
Date sampled	: 05/09/90	Supervisor	: SMJ
Date anl.BTEX	: 05/10/90	Date released	: 05/21/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.1	ND
108-88-3	Toluene	0.1	ND
100-41-4	Ethylbenzene	0.1	ND
1330-20-7	Total Xylenes	0.1	0.69

ND - Not detected at or above the practical quantitation limit for the method.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0509-SP12(A,B,C,D)	Anametrix I.D.	: 9005119-02
Matrix	: SOIL	Analyst	:
Date sampled	: 05/09/90	Supervisor	:
Date anl.TPHg	: 05/11/90	Date released	: 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	2000	40000

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.

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.	: 19014-5 SP12 (A,B,C,D)	Anametrix I.D.	: 9005220-02
Matrix	: SOIL	Analyst	: DDG
Date sampled	: 05/09/90	Supervisor	: [illegible]
Date anl.BTEX	: 05/11/90	Date released	: 05/21/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.1	ND
108-88-3	Toluene	0.1	ND
100-41-4	Ethylbenzene	0.1	ND
1330-20-7	Total Xylenes	0.1	0.69

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

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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. : 19014-5 S-0509-SP13(A,B,C,D)
Matrix : SOIL
Date sampled : 05/09/90
Date anl.TPHg: 05/11/90

Anametrix I.D. : 9005119-03
Analyst : CB
Supervisor : JL
Date released : 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	1000	9000

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.

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.	: 19014-5 SP13 (A,B,C,D)	Anametrix I.D.	: 9005220-03
Matrix	: SOIL	Analyst	: ODG
Date sampled	: 05/09/90	Supervisor	: fis
Date anl.BTEX	: 05/11/90	Date released	: 05/21/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.05	ND
108-88-3	Toluene	0.05	ND
100-41-4	Ethylbenzene	0.05	ND
1330-20-7	Total Xylenes	0.05	0.13

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

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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. : 19014-5 S-0509-SP14(A,B,C,D)
Matrix : SOIL
Date sampled : 05/09/90
Date anl.TPHg: 05/11/90

Anametrix I.D. : 9005119-04
Analyst : DDG
Supervisor : TC
Date released : 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	2000	33000

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.

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.	: 19014-5 SP14 (A,B,C,D)	Anametrix I.D.	: 9005220-04
Matrix	: SOIL	Analyst	: DOG
Date sampled	: 05/09/90	Supervisor	: RMJ
Date anl.BTEX	: 05/11/90	Date released	: 05/21/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.1	ND
108-88-3	Toluene	0.1	ND
100-41-4	Ethylbenzene	0.1	ND
1330-20-7	Total Xylenes	0.1	0.45

ND - Not detected at or above the practical quantitation limit for the method.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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. : 19014-5 S-0509-SP15(A,B,C,D)
Matrix : SOIL
Date sampled : 05/09/90
Date anl.TPHg: 05/11/90

Anametrix I.D. : 9005119-05
Analyst : CB
Supervisor : JM
Date released : 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	4000	25000

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.

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.	: 19014-5 SP15 (A,B,C,D)	Anametrix I.D.	: 9005220-05
Matrix	: SOIL	Analyst	: DDG
Date sampled	: 05/09/90	Supervisor	: MJ
Date anl.BTEX	: 05/11/90	Date released	: 05/21/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.2	ND
108-88-3	Toluene	0.2	4.9
100-41-4	Ethylbenzene	0.2	ND
1330-20-7	Total Xylenes	0.2	0.34

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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 SP16 (A,B,C,D)	Anametrix I.D.	: 9005220-06
Matrix	: SOIL	Analyst	: DDG
Date sampled	: 05/09/90	Supervisor	: RJS
Date anl.BTEX	: 05/11/90	Date released	: 05/21/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.05	ND
108-88-3	Toluene	0.05	ND
100-41-4	Ethylbenzene	0.05	ND
1330-20-7	Total Xylenes	0.05	0.13

ND - Not detected at or above the practical quantitation limit for the method.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0509-SP16(A,B,C,D)	Anametrix I.D.	: 9005119-06
Matrix	: SOIL	Analyst	: CB
Date sampled	: 05/09/90	Supervisor	: JS
Date anl.TPHg	: 05/11/90	Date released	: 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
	TPH as Gasoline	1000	13000

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.

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

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

9005:81 (2)

PROJ. NO.	PROJECT NAME
19014-5	ARCO - OAKLAND
P.O. NO.	SAMPLERS (Signature)

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)						Preserved?	REMARKS	LABORATORY I.D. NUMBER
				ANALYSIS										
5/7/90	11:30	S-0507-SP2[A,B,C,D]	4	X	X							ICE	COMPOSITE	
5/7/90	12:00	S-0507-SP5[A,B,C,D]	4	X	X							ICE	COMPOSITE	

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
[signature]	5/7/90 4:30	[signature]
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
[signature]	5/8/90 [illegible]	[signature]
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):
	05/8/90 12:30	[signature]

Laboratory: ANAMETRIX

Turn Around: 2 WEEKS

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906

Proj. Mgr.: PABLO MCLOUD

JG 5/10/90

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

Client	: Applied GeoSystems - Fremont	Anametrix W.O.#:	9005081
Address	: 43255 Mission Boulevard Suite B	Date Received :	05/08/90
		Purchase Order#:	N/A
City	: Fremont, CA 94539	Project No. :	19014-5
Attn.	: Pablo McLoud	Date Released :	05/10/90

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
9005081-01	S-0507-SP2A,B,C,D	SOIL	05/07/90	TPHg		05/09/90	N/A
9005081-02	S-0507-SP5A,B,C,D	SOIL	05/07/90	TPHg		05/09/90	N/A

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

Sample I.D.	: 19014-5 S-0507-SP2A,B,C,D	Anametrix I.D.	: 9005081-01
Matrix	: SOIL	Analyst	: DOG
Date sampled	: 05/07/90	Supervisor	: TC
Date anl.TPHg	: 05/09/90	Date released	: 05/10/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	ND
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	5
	TPH as Gasoline	1000	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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0507-SP5A,B,C,D	Anametrix I.D.	: 9005081-02
Matrix	: SOIL	Analyst	: [illegible]
Date sampled	: 05/07/90	Supervisor	: TC
Date anl.TPHg	: 05/09/90	Date released	: 05/10/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	ND
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

4/09/01 (2)

PROJ. NO: 19014-5

PROJECT NAME: TANK PIT INSPECTION

P.O. NO:

SAMPLERS (Signature): Pablo A. McLoud

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	organic lead				Preserved?	REMARKS	LABORATORY I.D. NUMBER
5/9/00	01	S-0509-SP6 (A,B,C,D)	4	X	X	X						composite	
5/9/00	02	S-0509-SP6 (E,F,G,H)	4	X	X							composite	
5/9/00	03	S-0509-SP4 (A,B,C,D)	4	X	X							composite	
5/9/00	04	S-0509-SP3 (A,B,C,D)	4	X	X							composite	

RELINQUISHED BY (Signature): Pablo A. McLoud — DATE / TIME: 5/10/00 13:00 — RECEIVED BY (Signature): Ighi Hemmaleh

RELINQUISHED BY (Signature): — DATE / TIME: — RECEIVED BY (Signature):

RELINQUISHED BY (Signature): — DATE / TIME: 05/10/00 13:50 — RECEIVED BY (Signature): Warren Shin

Laboratory: ANAMETRIX

Turn Around: 24 Hrs

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906

Proj. Mgr.: Pablo McLoud

ANAMETRIX INC
Environmental & Analytical Chemistry
1261 Oakmead Parkway Suite E. San Jose CA 95131
(408)432-8192 • Fax (408)432-8198

REPORT

Pablo McLoud
Applied GeoSystems
43255 Mission Boulevard
Suite B
Fremont, CA 94539

May 14, 1990
Anametrix W.O.#: 9005109
Date Received : 05/10/90
Project Number : 19014-5

Dear Mr. McLoud:

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: Amounts reported are net values, i.e. corrected for method blank contamination.

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
Laboratory Director

BWS/dmt

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

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

Anametrix W.O.#: 9005109
Date Received : 05/10/90
Purchase Order#: N/A
Project No. : 19014-5
Date Released : 05/14/90

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
9005109-01	S-0509-SP6(A,B,C,D	SOIL	05/09/90	TPHg		05/11/90	N/A
9005019-02	S-0509-SP6(E,F,G,H	SOIL	05/09/90	TPHg		05/10/90	N/A
9005019-03	S-0509-SP4(A,B,C,D	SOIL	05/09/90	TPHg		05/11/90	N/A
9005019-04	S-0509-SP3(A,B,C,D	SOIL	05/09/90	TPHg		05/11/90	N/A
9005109-01	S-0509-SP6(A,B,C,D	SOIL	05/09/90	ORGPB		05/11/90	AA1
QUALITY ASSURANCE (QA)							
OMB051090S	METHOD BLANK	SOIL	N/A	ORGPB		05/11/90	AA1
OSP051090A	MATRIX SPIKE	SOIL	N/A	ORGPB		05/11/90	AA1

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

Sample I.D. : 19014-5 S-0509-SP6(A,B,C,D)
Matrix : SOIL
Date sampled : 05/09/90
Date anl.TPHg: 05/11/90

Anametrix I.D. : 9005109-01
Analyst : SV
Supervisor : TC
Date released : 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	ND
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0509-SP6(E,F,G,H)	Anametrix I.D.	: 9005109-02
Matrix	: SOIL	Analyst	: CV
Date sampled	: 05/09/90	Supervisor	: JC
Date anl.TPHg	: 05/10/90	Date released	: 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	5	ND
108-88-3	Toluene	5	ND
100-41-4	Ethylbenzene	5	ND
1330-20-7	Total Xylenes	5	ND
	TPH as Gasoline	1000	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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0509-SP4(A,B,C,D)	Anametrix I.D.	: 9005109-03
Matrix	: SOIL	Analyst	: GV
Date sampled	: 05/09/90	Supervisor	: TC
Date anl.TPHg:	05/11/90	Date released	: 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	500	ND
108-88-3	Toluene	500	ND
100-41-4	Ethylbenzene	500	3100
1330-20-7	Total Xylenes	500	25000
	TPH as Gasoline	10000	610000

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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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. : 19014-5 S-0509-SP3(A,B,C,D)
Matrix : SOIL
Date sampled : 05/09/90
Date anl.TPHg: 05/11/90

Anametrix I.D. : 9005109-04
Analyst : GV
Supervisor : TC
Date released : 05/14/90

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	50	ND
108-88-3	Toluene	50	ND
100-41-4	Ethylbenzene	50	ND
1330-20-7	Total Xylenes	50	130
	TPH as Gasoline	1000	16000

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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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

ANALYSIS DATA SHEET - ORGANIC LEAD
ANAMETRIX, INC. - (408) 432-8192

Anametrix I.D.: 9005109
Matrix : SOIL
Date Sampled : 05/09/90
Project Number: 19014-5

Date Prepared : 05/10/90
Date Analyzed : 05/11/90
Instrument I.D.: AA1
Date Released : 05/14/90

	EPA Method#	Reporting Limit	Sample I.D.# S-0509-SP6 (A,B,C,D)		Sample I.D.# METHOD BLANK		
ELEMENTS		(mg/Kg)	-01		OMB0510		
Organic Lead	LUFT	0.08	ND		ND		

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

Organic Lead by Leaking Underground Fuel Tank (LUFT) Manual, 1987 California State Water Resources Control Board.

MN 5/14/90
Analyst Date

R^ 5-15-90
Supervisor Date

ANAMETRIX, INC.
1961 CONCOURSE DRIVE, SUITE E
SAN JOSE, CA 95131, (408) 432-8192

ORGANIC LEAD MATRIX SPIKE REPORT

Spike I.D. : OSP051090A,B
Assoc. WO # : 9005109
Date Analyzed: 05/11/90
Conc. Units : mg/Kg

Inst. ID: AA1
Date : 05/11/90
Matrix : SOIL

ELEMENTS	METHOD	SPIKE AMOUNT	SAMPLE CONC.	M S CONC.	% REC	M S D CONC.	% REC	R P D
Pb	LUFT	0.51	0.000	0.524	103.8	0.550	108.9	4.8

COMMENT: SPIKED WITH 9005094-01.

MN 5/14/90
Analyst Date

PM 5-14-90
Supervisor Date

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
19045	ARCO OAKLAND
P.O. NO	SAMPLERS (Signature)

DATE MM/DD/YY	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)						Preserved?	REMARKS	LABORATORY I.D. NUMBER
				ANALYSIS										
5/17/90	1200	SOIL SAMPLE [ABCD]	4	X	X							ICE	COMPOSITE	

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
	5/17/90 16:30	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):

Laboratory: ANAMETRIX

Turn Around: 24 HR

SEND RESULTS TO:
Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826
(415) 651-1906

Proj. Mgr.: PABLO McLOUD

ANAMETRIX INC
...mental & Analytical Chemistry
...Course Drive Suite E, San Jose CA ...
...408) 432-8198

REPC

Pablo McLoud
Applied GeoSystems
43255 Mission Boulevard
Suite B
Fremont, CA 94539

May 21, 1990
Anametrix W.O.#: 9005217
Date Received : 05/17/90
Project Number : 19014-S

Dear Mr. McLoud:

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.

NOTE: Amounts reported are net values, i.e. corrected for method blank contamination.

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

Sincerely,

ANAMETRIX, INC.

Terry Cooke
TPH Supervisor

TC/dmt

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

Client	: Applied GeoSystems	Anametrix W.O.#:	9005217
Address	: 43255 Mission Boulevard Suite B	Date Received :	05/17/90
		Purchase Order#:	N/A
City	: Fremont, CA 94539	Project No. :	19014-S
Attn.	: Pablo McLoud	Date Released :	05/21/90

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
9005217-01	S0517SP4(A,B,C,D)	SOIL	05/17/90	TPHg		05/18/90	N/A

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

Sample I.D.	: 19014-S S0517SP4(A,B,C,D)	Anametrix I.D.	: 9005217-01
Matrix	: SOIL	Analyst	: DDG
Date sampled	: 05/17/90	Supervisor	: DMJ
Date anl.TPHg	: 05/18/90	Date released	: 05/21/90

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.2	ND
108-88-3	Toluene	0.2	1.8
100-41-4	Ethylbenzene	0.2	0.7
1330-20-7	Total Xylenes	0.2	6.7
	TPH as Gasoline	4	120

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.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJECT NO: 19014-5

PROJECT NAME: Product Line Sampling

P.O. NO:

SAMPLERS (Signature): Pablo A. McLoud

DATE (MM/DD/YY)	TIME		No. of Containers	ANALYSIS: TPHgasoline (8015)	ANALYSIS: BTEX (602/8020)	ANALYSIS: TPHdiesel (3515)	Preserved?	REMARKS	LABORATORY I.D. NUMBER
5/25/90	1300	S-0525-SP7 (A,B,C,D)	4	X	X			composite into one sample for analysis	
5/25/90	1400	S-0525-SP4 (A,B,C,D)	4	X	X				

RELINQUISHED BY (Signature): Pablo A. McLoud — DATE / TIME: 5/29

RECEIVED BY (Signature):

RELINQUISHED BY (Signature):

DATE / TIME:

RECEIVED BY (Signature):

RELINQUISHED BY (Signature):

DATE / TIME: 5/29 10AM

RECEIVED BY (Signature): Laura Kuck

Laboratory:

Turn Around: 24 hr

SEND RESULTS TO

Applied GeoSystems
43255 Mission Boulevard
Fremont, California 95826

(415) 651-1906

Proj. Mgr.: Pablo McLoud

APPLIED ANALYTICAL

Environmental Laboratories

3459 Edison Way
Fremont, CA 94538
(415) 623-0775

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Pablo McLoud	Date Sampled:	05-25-90
	Applied GeoSystems	Date Received:	05-29-90
	43255 Mission Boulevard	BTEX Analyzed:	05-29-90
	Fremont, CA 94539	TPHg Analyzed:	05-29-90
Project:	AGS 19014-5	TPHd Analyzed:	NR
		Matrix:	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.050	0.050	0.050	0.050	2.0	10
SAMPLE Laboratory Identification						
S-0525-SP4(ABCD) S1005379	ND	ND	ND	ND	ND	NR
S-0525-SP7(ABCD) S1005380	ND	0.16	0.082	2.4	34	NR

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

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

05-30-90
Date Reported

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

7005347

JOB NO.	PROJECT NAME
19014-5	Product Line Sampling
P.O. NO.	SAMPLING (Signature) Pablo A. McLoud

DATE (MM/DD/YY)	TIME		No. of Containers	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	Organic Lead	Preserved?	REMARKS	LABORATORY I.D. NUMBER
5/30/90		S-0530-CP1 (1,2,3,4) composite	4	X	X			ice	needs to be composited	
		S-0530-CP2 (1A-D)	1	X	X		X	ice		
		S-0530-CP2 (2A-D)	1	X	X			ice		
		S-0530-CP2 (3A-D)	1	X	X			ice		
		S-0530-CP2 (4A-D)	1	X	X			ice		
		S-0530-CP2 (5A-D)	1	X	X			ice		
		S-0530-CP2 (6A-D)	1	X	X			ice		
	TABLE 3	S-0530-SP6	1	X	X			ice	clean	
	TABLE 3	S-0530-SP7	1	X	X			ice	clean	

RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
Pablo A. McLoud	5/30/90 18:40	Taghi Hamidi
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED BY (Signature)
RELINQUISHED BY (Signature)	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature) Nan Gh 05/31/90 10:00

Laboratory: Anametrix

Turn Around: ~~48~~ Hrs

SEND RESULTS TO:
Applied GeoSystems
42501 Albrae Street
Suite 100
Fremont, California 94639
(415) 651-1906

Proj. Mgr.: PABLO McLOUD

ANAMETRIX INC
Environmental & Analytical Chemistry
561 Concourse Drive Suite E San Jose, CA 95131
(408) 432-8192 • Fax (408) 432-8198

REPORT

Pablo McLoud
Applied GeoSystems - Fremont
42501 Albrae Street
Suite 100
Fremont, CA 94639

June 04, 1990
Anametrix W.O.#: 9005347
Date Received : 05/31/90
Project Number : 19014-5

Dear Mr. McLoud:

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: Amounts reported are net values, i.e. corrected for method blank contamination.

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

Sincerely,

ANAMETRIX, INC.

Sarah Schoen, Ph.D.
Laboratory Manager

SRS/dag

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

Client : Applied GeoSystems - Fremont
Address : 42501 Albrae Street
Suite 100
City : Fremont, CA 94639
Attn. : Pablo McLoud

Anametrix W.O.#: 9005347
Date Received : 05/31/90
Purchase Order#: N/A
Project No. : 19014-5
Date Released : 06/04/90

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
9005347-01	S-0530-CP1(1-4)	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-02	S-0530-CP2(1A-D)	SOIL	05/30/90	TPHg		06/01/90	N/A
9005347-03	S-0530-CP2(2A-D)	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-04	S-0530-CP2(3A-D)	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-05	S-0530-CP2(4A-D)	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-06	S-0530-CP2(5A-D)	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-07	S-0530-CP2(6A-D)	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-08	S-0530-SP6	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-09	S-0530-SP7	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-02	S-0530-CP2(1A-D)	SOIL	05/30/90	ORG Pb		06/01/90	AA1
9005347-02	S-0530-CP2(1A-D)	SOIL	05/30/90	ORG Pb		06/01/90	AA1
QUALITY ASSURANCE (QA)							
OMB060190	S-0530-CP1(1-4)	SOIL	05/30/90	TPHg		05/31/90	N/A
9005347-02	S-0530-CP2(1A-D)	SOIL	05/30/90	SPIKE		06/01/90	AA1

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

Sample I.D.	: 19014-5 S-0530-CP1(1-4)	Anametrix I.D.	: 9005347-01
Matrix	: SOIL	Analyst	: CB
Date sampled	: 05/30/90	Supervisor	: [illegible]
Date anl.TPHg	: 05/31/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.125	0.20
108-88-3	Toluene	0.125	1.1
100-41-4	Ethylbenzene	0.125	0.54
1330-20-7	Total Xylenes	0.125	3.2
	TPH as Gasoline	25	66

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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0530-CP2(1A-D)	Anametrix I.D.	: 9005347-02
Matrix	: SOIL	Analyst	: CB
Date sampled	: 05/30/90	Supervisor	: RS
Date anl.TPHg	: 06/01/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.05	ND
108-88-3	Toluene	0.05	0.093
100-41-4	Ethylbenzene	0.05	0.095
1330-20-7	Total Xylenes	0.05	0.39
	TPH as Gasoline	1	43

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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0530-CP2(2A-D)	Anametrix I.D.	: 9005347-03
Matrix	: SOIL	Analyst	: CB
Date sampled	: 05/30/90	Supervisor	: RJ
Date anl.TPHg	: 05/31/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.005	ND
108-88-3	Toluene	0.005	ND
100-41-4	Ethylbenzene	0.005	ND
1330-20-7	Total Xylenes	0.005	ND
	TPH as Gasoline	1	ND

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

TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GC/FID using EPA Method 5030.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0530-CP2(3A-D)	Anametrix I.D.	: 9005347-04
Matrix	: SOIL	Analyst	: cm
Date sampled	: 05/30/90	Supervisor	: MJ
Date anl.TPHg	: 05/31/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.005	ND
108-88-3	Toluene	0.005	ND
100-41-4	Ethylbenzene	0.005	ND
1330-20-7	Total Xylenes	0.005	0.021
	TPH as Gasoline	1	1.2

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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0530-CP2(4A-D)	Anametrix I.D.	: 9005347-05
Matrix	: SOIL	Analyst	: CB
Date sampled	: 05/30/90	Supervisor	: [illegible]
Date anl.TPHg	: 05/31/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.005	ND
108-88-3	Toluene	0.005	ND
100-41-4	Ethylbenzene	0.005	ND
1330-20-7	Total Xylenes	0.005	ND
	TPH as Gasoline	1	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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0530-CP2(5A-D)	Anametrix I.D.	: 9005347-06
Matrix	: SOIL	Analyst	: CB
Date sampled	: 05/30/90	Supervisor	: [illegible]
Date anl.TPHg	: 05/31/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.005	ND
108-88-3	Toluene	0.005	ND
100-41-4	Ethylbenzene	0.005	ND
1330-20-7	Total Xylenes	0.005	ND
	TPH as Gasoline	1	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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0530-CP2(6A-D)	Anametrix I.D.	: 9005347-07
Matrix	: SOIL	Analyst	:
Date sampled	: 05/30/90	Supervisor	:
Date anl.TPHg	: 05/31/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.05	ND
108-88-3	Toluene	0.05	ND
100-41-4	Ethylbenzene	0.05	0.16
1330-20-7	Total Xylenes	0.05	0.11
	TPH as Gasoline	1	30

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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0530-SP6	Anametrix I.D.	: 9005347-08
Matrix	: SOIL	Analyst	: CG
Date sampled	: 05/30/90	Supervisor	: JRJ
Date anl.TPHg	: 05/31/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.01	0.19
108-88-3	Toluene	0.01	0.17
100-41-4	Ethylbenzene	0.01	0.070
1330-20-7	Total Xylenes	0.01	0.24
	TPH as Gasoline	1	6.8

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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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.	: 19014-5 S-0530-SP7	Anametrix I.D.	: 9005347-09
Matrix	: SOIL	Analyst	:
Date sampled	: 05/30/90	Supervisor	:
Date anl.TPHg	: 05/31/90	Date released	: 06/04/90
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
71-43-2	Benzene	0.005	ND
108-88-3	Toluene	0.005	ND
100-41-4	Ethylbenzene	0.005	ND
1330-20-7	Total Xylenes	0.005	ND
	TPH as Gasoline	1	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.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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

ANALYSIS DATA SHEET - ORGANIC LEAD
ANAMETRIX, INC. - (408) 432-8192

Anametrix I.D.: 9005347
Matrix : SOIL
Date Sampled : 05/30/90
Project Number: 19014-5

Date Prepared : 06/01/90
Date Analyzed : 06/01/90
Instrument I.D.: AA1
Date Released : 06/04/90

	EPA Method#	Reporting Limit	Sample I.D.# S-0530- CP2 (1A-D)	Sample I.D.# S-0530- CP2 (1A-D)	Sample I.D.# METHOD BLANK		
ELEMENTS		(mg/Kg)	-02	-02D	OMB0601		
Organic Lead	LUFT	0.08	ND	ND	ND		

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

D : Duplicated sample.

Organic Lead by Leaking Underground Fuel Tank (LUFT) Manual, 1987 California State Water Resources Control Board.

Money Kamel 6/4/90
Analyst Date

Robert Marcum 6/4/90
Supervisor Date

ANAMETRIX, INC.
1961 CONCOURSE DRIVE, SUITE E
SAN JOSE, CA 95131, (408) 432-8192

ORGANIC LEAD MATRIX SPIKE REPORT

Spike I.D. : 9005347-02S
Assoc. WO # : 9005347
Date Analyzed: 06/01/90
Conc. Units : mg/Kg

Inst. ID: AA1
Date : 06/04/90
Matrix : SOIL

ELEMENTS	METHOD	SPIKE AMOUNT	SAMPLE CONC.	M S CONC.	% REC
Pb	LUFT	0.51	0.00	0.45	88.7

COMMENT: Spiked with sample ID# 9005347-02.

mona Kamel 6/4/90
Analyst Date

Stefan Manicarim 6/4/90
Supervisor Date