Applied GeoSystems

3315 Almaden Expressway, Suite 34
San Jose, California 95118
(408) 264-7723 FAX (408) 264-2435

File

TRANSMITTAL

TO: MR. RAVI ARULANANTHAM
ALAMEDA COUNTY HEALTH AGENCY
80 SWAN WAY
ROOM 200
OAKLAND, CA 94621

DATE: 9/19/90
PROJECT NUMBER: 60006-1
SUBJECT: LETTER REPORT

FROM: MIKE BARMINSKI
TITLE: STAFF GEOLOGIST

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1	9/19/90	60006-1	LETTER REPORT LIMITED INVESTIGATION RELATED TO THE REMOVAL OF WASTE-OIL TANK AT ARCO STATION 6041, 7249 VILLAGE PARKWAY, DUBLIN, CALIFORNIA.

THESE ARE TRANSMITTED as checked below:

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LETTER REPORT
LIMITED INVESTIGATION RELATED TO THE REMOVAL OF WASTE-OIL TANK
at
ARCO Station 6041
7249 Village Parkway
Dublin, California

AGS Job No. 60006-1

Report prepared for

ARCO Products Company
P.O. Box 5811
San Mateo, California 94402

by
Applied GeoSystems

September 19, 1990

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

• FREMONT • IRVINE • HOUSTON • BOSTON • SACRAMENTO • CULVER CITY • SAN JOSE

September 19, 1990
AGS 60006-1

Mr. Kyle Christie
ARCO Products Company
P.O. Box 5811
San Mateo, California 94402

Subject: Letter Report on Limited Investigation Related to the Removal of Waste-Oil Tank at ARCO Station 6041, 7249 Village Parkway Street, Dublin, California.

Mr. Christie:

This letter report presents and describes the results of our limited investigation related to the excavation and removal of one waste-oil storage tank at ARCO Station 6041 in Dublin, California. The location of the site is shown on the Site Location Map (Plate 1). Applied GeoSystems performed the investigation at the request of ARCO Products Company (ARCO). Our work included the collection for laboratory analysis of ten soil samples from the walls and floor of the waste-oil tank pit, examination of the tank for signs of leakage, visual evaluation of soil in the tank pit, screening of excavated soil with an organic vapor meter (OVM), and the collection of four samples from the stockpiled soil for laboratory compositing and analysis.

W.F. Lewis Construction, Inc. (Lewis) (ARCO's subcontractor) of West Sacramento, California, was responsible for permit acquisition and notification of the appropriate authorities, excavation and removal of the tank, and transport of the tank. According to representatives of Lewis, the tank was transported to the Erickson Trucking yard in Richmond, California.

Field Activities

Field work was performed in accordance with Applied GeoSystems Site Safety Plan 60006-1S, dated February 15, 1990. On June 6 and 7, 1990, one 550-gallon waste-oil tank of single wall steel construction was excavated and removed from its location adjacent to the northern wall of the station building at the site. This location is shown on the Generalized Site Plan (Plate 2). Mr. Ravi Arulanantham of the Alameda County Health Agency was present during the excavation and removal of the tank.

An Applied GeoSystems geologist examined the outer surface of the tank for signs of leakage, holes, pitting, and areas of weakness. Particular attention was paid to seams and points directly below the fill-port of the tank. The tank appeared to be in very good condition; the geologist observed light localized rusting on the surface of the tank, but no pitting, holes or cracks were observed. No signs of overfill staining were observed on the top and sides of the tank. Information supplied by the station manager indicated that the tank was at least 13 years old.

Soil excavated from the tank pit was screened for evidence of volatile hydrocarbons compounds, both visually and with a portable OVM. Instruments such as the OVM are useful for measuring relative volatile hydrocarbon compound content, but cannot be used to measure hydrocarbon concentrations with the precision of laboratory analysis. Initial random screening of backfill material excavated from around the tank yielded OVM readings ranging from non-detectable to 0.8 parts per million (ppm). Upon removal of the tank, random grab samples of soil excavated from the tank cavity yielded OVM readings ranging from non-detectable to 8.5 ppm. Excavation proceeded beneath the former tank location to a final depth of approximately 10-1/2 feet. At the limits of the excavation, random grab samples yielded non-detectable OVM readings from the north, south, east and west walls and an OVM reading of 3.25 ppm from the center of the tank pit. No subjective evidence of hydrocarbons such as product odor or soil discoloration was noted in the backfill material or native soil during the excavation process.

Soil exposed in the tank pit consisted of brown silty clay to a depth of approximately one foot, black silty clay between depths of approximately one to eight feet, gray silty medium-grained sand from approximately eight to 10 feet, and black silty clay from about 10 feet to the limit of the excavation. The backfill material was brown silty sand to a depth of 9 feet. Ground water was not observed in the tank pit during excavation. Ground water has been reported to be at a depth of about 60 feet (Alameda County Flood Control and Water Conservation District, Spring 1990 Ground Water Level Report).

Ten soil samples were collected from the tank pit excavation. Two samples were collected from each of the four sidewalls of the tank pit, and two samples were collected from the center of the tank pit floor at the limits of the excavation. The sample locations are shown on Plate 3, Tank Pit Sampling Locations. OVM readings were non-detectable at the sample locations at the north, south, east, and west walls, and 3.25 ppm at the sample in the center of the pit. The samples were divided into two sets, A and B, each set consisting of five samples; one from each of the four sidewalls and one from the floor of the pit. Soil samples were collected by driving laboratory-cleaned brass sample containers into the soil in the backhoe bucket. The sample containers were promptly sealed with aluminum foil, plastic caps, and aluminized tape, then labeled and placed in iced storage for transport to the

analytical laboratory. A Chain of Custody Record was initiated in the field and accompanied the samples to the analytical laboratory. A copy of the Chain of Custody Record is included in Appendix A.

Approximately 15 to 20 cubic yards of soil was excavated from the tank pit and placed on and covered with plastic. No discoloration or product odor was evident in the stockpiled soil. Four soil samples were collected from the stockpiled soil for compositing and laboratory analysis following collection procedures and Chain of Custody protocol as described above. OVM readings from the four composite soil sample locations were non-detectable.

We understand from Lewis that the waste-oil tank pit was covered with steel plates and the area barricaded. We also understand that on July 6, 1990 Lewis backfilled the tank pit with 25 tons of 3/4 inch A-B roadbase, and then the area was repaved.

Laboratory Analyses

The soil samples were submitted to Applied Analytical Environmental Laboratories (Applied Analytical) of Fremont, California (certified testing laboratory no. 153). The samples in set A were analyzed for total oil and grease (TOG) using Standard Method 503D/E and halogenated volatile organic compounds (HVOC's) using EPA Method 601/8010. The samples from set B were analyzed for total petroleum hydrocarbons as gasoline (TPHg), total petroleum hydrocarbons as diesel (TPHd), and the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 5030/8015/8020. Results of the laboratory analysis of the waste-oil tank pit soil samples are presented in Table 1.

The samples from the soil stockpile were submitted to Applied Analytical for compositing and analysis of TPHg, TPHd, BTEX, TOG, and organic lead. Laboratory analytical results of the stockpile soil samples are presented in Table 2. Copies of the laboratory certificates of analysis for the samples are included in Appendix A.

Disposal of Soil

It is our understanding from ARCO that the soil stockpile was removed from the site on June 12, 1990, by Dillard Trucking, Inc. of Hayward, California. We also understand that the soil stockpile was admitted to Chem-Waste Management's facility in Kettleman City on June 12, 1990.

Results and Conclusions

The analysis of the soil samples collected from the waste-oil tank pit reported nondetectable levels of HVOC's, TOG, TPHg, TPHd, and BTEX. Results of the laboratory analysis of the composite sample collected from the stockpiled soil indicated TOG at 110 ppm, TPHd at 180 ppm, TPHg at 10 ppm, total xylenes at 0.25 ppm, and non-detectable concentrations of organic lead, benzene, toluene and ethylbenzene.

On the basis of field observations and the results of analysis of tank pit soil samples, it is our opinion that no further excavation in the vicinity of the former waste-oil tank is necessary.

A copy of this report should be forwarded to the Mr. Ravi Arulanantham, Alameda County Health Agency, 80 Swan Way, Room 200, Oakland, CA 94621 and a copy should also be forwarded to the Mr. Tom Hathcox, Dougherty Regional Fire Authority, 9399 Fircrest Lane, San Ramon, CA 94583.

Limitations

This letter report was prepared in accordance with standards of environmental geologic practice generally accepted in California at the time of this investigation. This investigation was conducted solely for the purpose of evaluating subsurface environmental conditions of the soil with respect to waste-oil in the vicinity of the former waste-oil tank. No soil engineering or geotechnical references, conclusions, or recommendations are implied or should be inferred. Evaluation of the geologic and environmental conditions at the site for the purposes of this investigation is made from a limited number of observation points. Subsurface conditions may vary away from the data points available.

Please call if you have questions regarding the contents of this letter report.

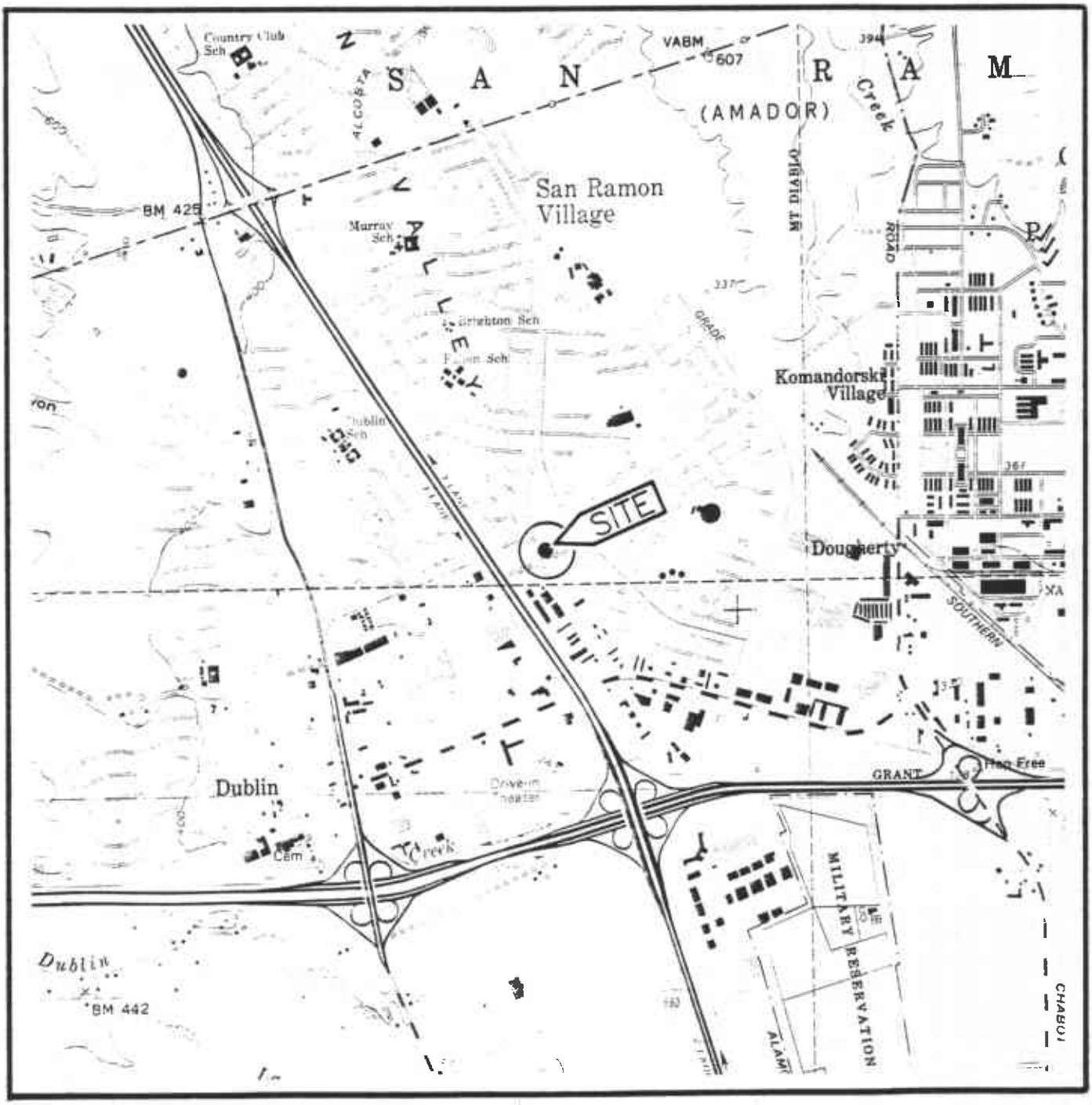
Sincerely,
Applied GeoSystems

Michael J. Barminski
Staff Geologist

REGISTERED GEOLOGIST
DIANE M. BARCLAY
No. EG1366
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Diane M. Barclay
C.E.G. 1366

Attachments:
Site Location Map, Plate 1
Generalized Site Plan, Plate 2
Tank Pit Sampling Locations, Plate 3
Laboratory Certificates of Analysis, and
Chain of Custody Records, Appendix A



Source: U.S. Geological Survey
7.5-Minute Quadrangle
Dublin, California
Photorevised 1980

N

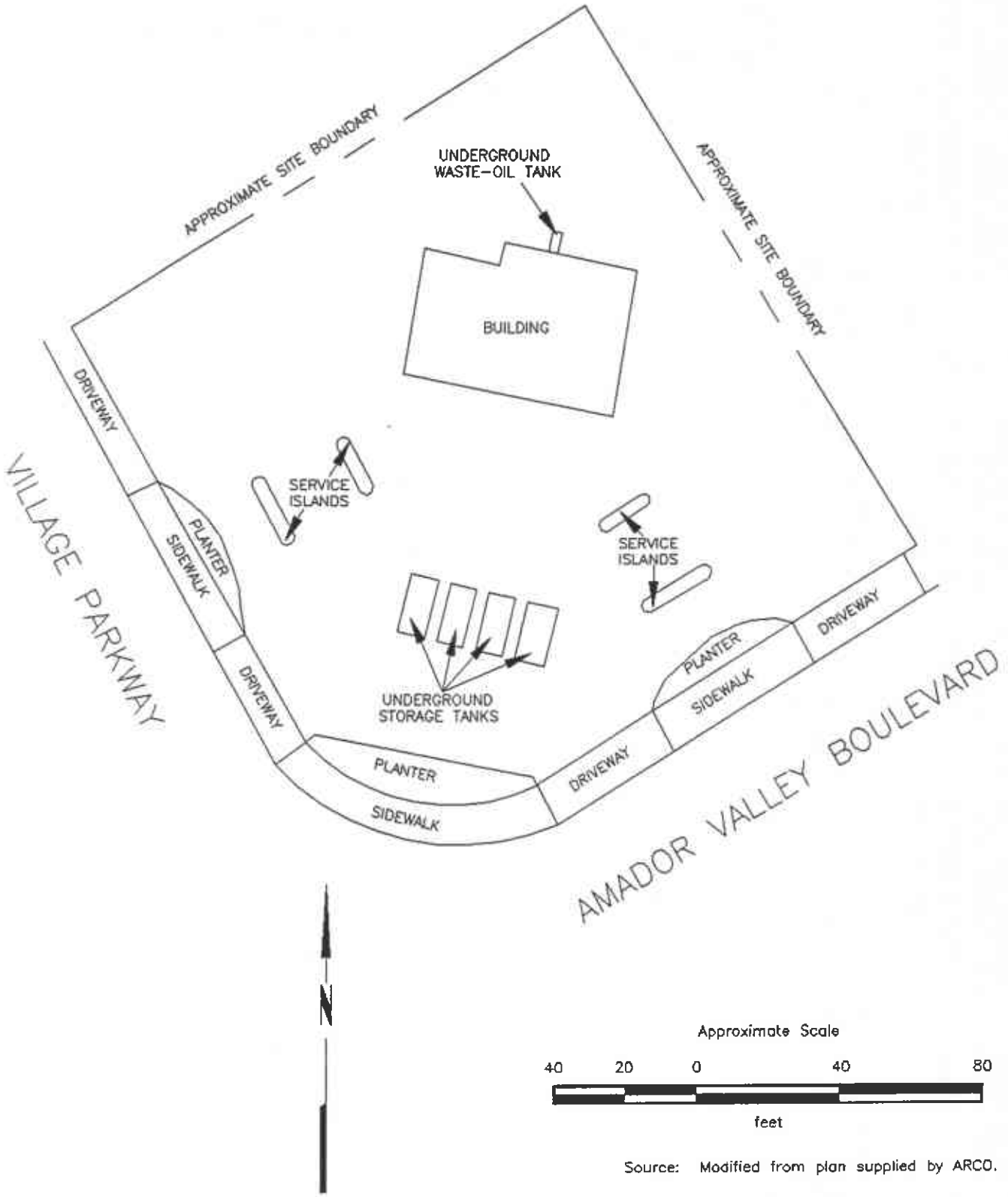
Approximate Scale
2000 1000 0 2000 4000
feet

Applied GeoSystems

PROJECT 60006-1

SITE VICINITY MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
1



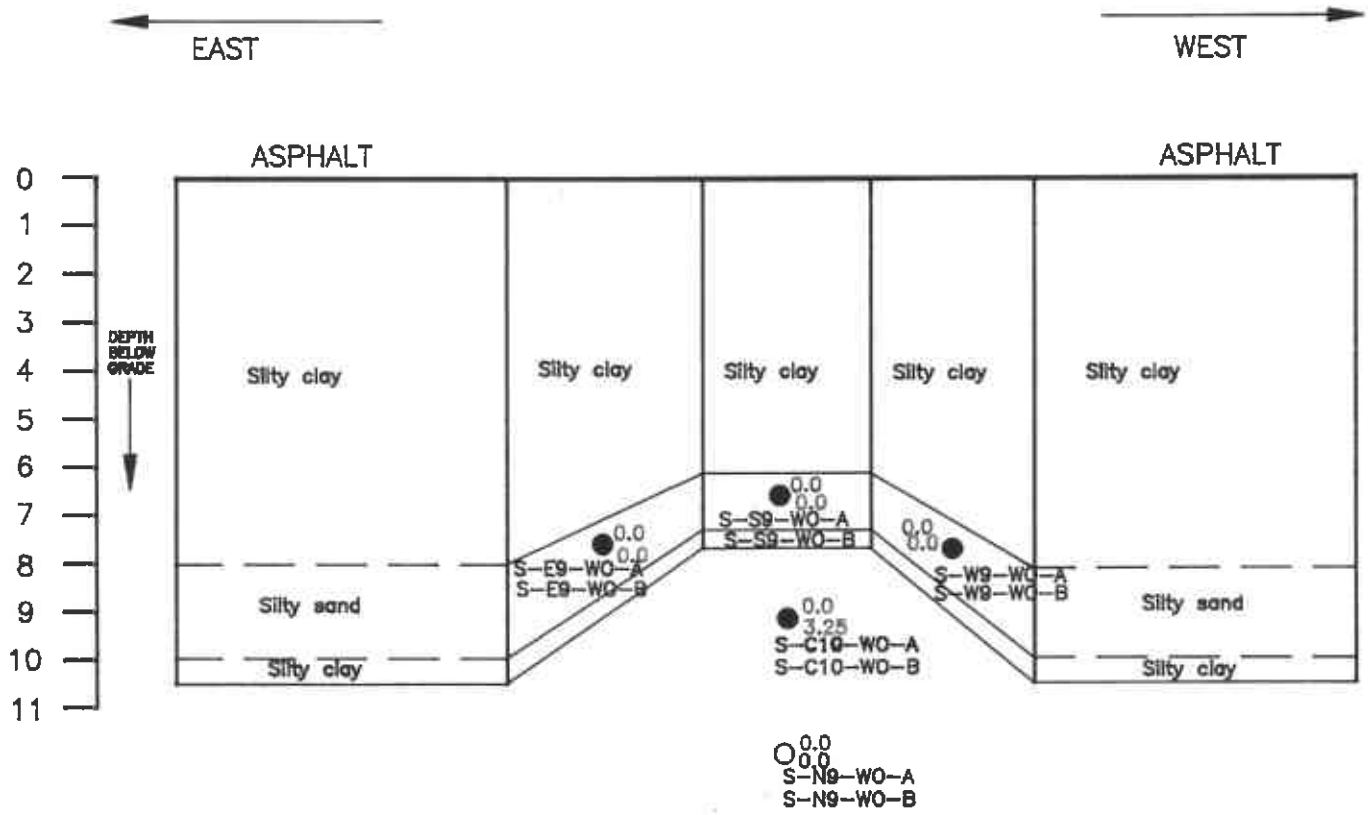
Source: Modified from plan supplied by ARCO.

Applied GeoSystems

PROJECT 60006-1

GENERALIZED SITE PLAN
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
2



SIDE VIEW

EXPLANATION

● = Soil sample
S-S9-WO-A (AGS, June 1990)

3.5 = OVM reading in ppm

0.0 = Laboratory results (TPHg, TOG, BTEX) in ppm

Approximate Horizontal Scale

6 3 0 6 12

feet

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PROJECT 60006-1

TANK PIT SAMPLING LOCATIONS
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
3

Applied GeoSystems

TABLE 1
RESULTS OF CHEMICAL ANALYSES OF SOIL SAMPLES
WASTE-OIL TANK PIT
ARCO Station 6041
7249 Village Parkway Street
Dublin, California
June 7, 1990
(Page 1 of 2)

ANALYSIS	S-N9-WOA	S-S9-WOA	S-E9-WOA	S-W9-WOA	S-C10-WOA	MDL
Total Oil and Grease	<50	<50	<50	<50	<50	50
Halogenated Volatile Organics	<.005	<.005	<.005	<.005	<.005	.005

Results in milligrams per kilogram (mg/kg) = parts per million (ppm).
MDL: Method detection limit.
<: Less than the laboratory detection limit used for the analysis.
Sample designation: S-N9-WOA
- S: Soil sample.
- N9: Sample location (i.e., N=north wall of pit; C=center of pit) and depth in feet below grade.
- WOA: Waste-oil tank pit, sample set A.

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TABLE 1
RESULTS OF CHEMICAL ANALYSES OF SOIL SAMPLES
WASTE-OIL TANK PIT
ARCO Station 6041
7249 Village Parkway Street
Dublin, California
June 7, 1990
(Page 2 of 2)

ANALYSIS	S-N9-WOB	S-S9-WOB	S-E9-WOB	S-W9-WOB	S-C10-WOB	MDL
Total Petroleum Hydrocarbons						
Gasoline	<2.0	<2.0	<2.0	<2.0	<2.0	2.0
Diesel	<10	<10	<10	<10	<10	10
Gasoline Constituents						
Benzene	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Toluene	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Ethylbenzene	<0.050	<0.050	<0.050	<0.050	<0.050	0.050
Total Xylenes	<0.050	<0.050	<0.050	<0.050	<0.050	0.050

Results in milligrams per kilogram (mg/kg) = parts per million (ppm).
MDL: Method detection limit.
<: Less than the laboratory detection limit used for the analysis.
Sample designation: S-N9-WOB

- S-N9-WOB — Waste-oil tank pit, sample set B.
- S-N9-WOB — Sample location (i.e., N=north wall of pit; C=center of pit) and depth in feet below grade.
- S-N9-WOB — Soil sample.

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TABLE 2
RESULTS OF CHEMICAL ANALYSES OF SOIL SAMPLES
WASTE-OIL TANK PIT STOCKPILE
ARCO Station 6041
7249 Village Parkway Street
Dublin, California
June 7, 1990

ANALYSIS	S-0607-SP(ABCD)	MDL
Total Petroleum Oil and Grease	110	50
Total Petroleum Hydrocarbons		
Gasoline	10	2.0
Diesel	180	10
Gasoline Constituents		
Benzene	<0.050	0.050
Toluene	<0.050	0.050
Ethylbenzene	<0.050	0.050
Total Xylenes	0.25	0.050
Organic Lead	<0.08	0.08

Results in milligrams per kilogram (mg/kg) = parts per million (ppm).
MDL: Method detection limit.
<: Less than the laboratory detection limit used for the analysis.
Sample designation: S-0607-SP(ABCD)
- S- Soil sample.
- 0607- Sample collection date.
- SP(ABCD) Composite designation (waste-oil stockpile))

APPENDIX A

LABORATORY CERTIFICATES OF ANALYSIS
AND
CHAIN OF CUSTODY RECORDS

APPLIED ANALYTICAL

Environmental Laboratories

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

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Bill Dugan

Date Received: 06-07-90
Laboratory #: S1006237
Project #: 60006-1
Sample #: S-N9-WO-A
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	06-07-90

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

PROCEDURES

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

Laboratory Representative

06-11-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

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

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Bill Dugan

Date Received: 06-07-90
Laboratory #: S1006238
Project #: 60006-1
Sample #: S-S9-WO-A
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	06-07-90

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

PROCEDURES

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

Laboratory Representative

06-11-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

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

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Bill Dugan

Date Received: 06-07-90
Laboratory #: S1006239
Project #: 60006-1
Sample #: S-E9-WO-A
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	06-07-90

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

PROCEDURES

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

Laboratory Representative

06-11-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

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

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:		Date Received:	06-07-90
Applied GeoSystems		Laboratory #:	S1006240
3315 Almaden Expressway		Project #:	60006-1
San Jose, CA 95118		Sample #:	S-W9-WO-A
Attention: Bill Dugan		Matrix:	Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	06-07-90

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

PROCEDURES

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

Laboratory Representative

06-11-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

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

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Bill Dugan

Date Received: 06-07-90
Laboratory #: S1006236
Project #: 60006-1
Sample #: S-C10-WO-A
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	ND	50	06-07-90

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

PROCEDURES

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

Laboratory Representative

06-11-90
Date Reported

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 21, 1990
APPLIED GEO SYSTEMS
Project No.: 60006-1
Date Sampled: June 7, 1990
Date of Analysis: June 20, 1990
Sample No.: S-N9-WOA

ChromaLab File No.: 0690132B
Attn: Bill Dugan
Project Name: ARCO #6041
Date Submitted: June 14, 1990
DetectionLimit: 5 µg/Kg

601/8010	µg/Kg
Dchlorodifluoromethane	N.D.
Chloromethane	N.D.
Vinyl Chloride	N.D.
Bbromomethane	N.D.
Chlorethane	N.D.
Trichlorofluoromethane	N.D.
1,1-Dichloroethene	N.D.
Methylene Chloride	N.D.
t-1,2-Dichloroethene	N.D.
c-1,2-Dichloroethene	N.D.
1,1-Dichloroethane	N.D.
Chloroform	N.D.
1,1,1-Trichloroethane	N.D.
Carbon Tetrachloride	N.D.
1,2-Dichloroethane	N.D.
Trichloroethene	N.D.
1,2-Dichloropropane	N.D.
Bromodichloromethane	N.D.
2-Chloroethylvinyl ether	N.D.
t-1,3-Dichloropropene	N.D.
Cis-1,3-Dichloropropene	N.D.
1,1,2-Trichloroethane	N.D.
1,1,2-Trichlorotrifluorethane	N.D.
Tetrachloroethene	N.D.
Dibromochloromethene	N.D.
Chlorobenzene	N.D.
Bromoform	N.D.
1,1,2,2-Tetrachloroethane	N.D.
1,3-Dichlorobenzene	N.D.
1,4-Dichlorobenzene	N.D.
1,2-Dichlorobenzene	N.D.

QA/QC:

*Sample blank concentration is none detected.

*Spiked recovery for 1,1-Dichloroethenane 94.1% and 91.4%, for Carbon Tetrachloride 107.5% and 115.0%, for 1,2-Dichlorobenzene 115.9% and 103.6%

CHROMALAB, INC.

David Duong, Sr. Chemist

Eric Tam, Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 21, 1990
APPLIED GEO SYSTEMS
Project No.: 60006-1
Date Sampled: June 7, 1990
Date of Analysis: June 20, 1990
Sample No.: S-S9-WOA

ChromaLab File No.: 0690132C
Attn: Bill Dugan
Project Name: ARCO #6041
Date Submitted: June 14, 1990
DetectionLimit: 5 µg/Kg

601/8010	µg/Kg
Dchlorodifluoromethane	N.D.
Chloromethane	N.D.
Vinyl Chloride	N.D.
Bbromomethane	N.D.
Chlorethane	N.D.
Trichlorofluoromethane	N.D.
1,1-Dichloroethene	N.D.
Methylene Chloride	N.D.
t-1,2-Dichloroethene	N.D.
c-1,2-Dichloroethene	N.D.
1,1-Dichloroethane	N.D.
Chloroform	N.D.
1,1,1-Trichloroethane	N.D.
Carbon Tetrachloride	N.D.
1,2-Dichloroethane	N.D.
Trichloroethene	N.D.
1,2-Dichloropropane	N.D.
Bromodichloromethane	N.D.
2-Chloroethylvinyl ether	N.D.
t-1,3-Dichloropropene	N.D.
Cis-1,3-Dichloropropene	N.D.
1,1,2-Trichloroethane	N.D.
1,1,2-Trichlorotrifluorethane	N.D.
Tetrachloroethene	N.D.
Dibromochloromethene	N.D.
Chlorobenzene	N.D.
Bromoform	N.D.
1,1,2,2-Tetrachloroethane	N.D.
1,3-Dichlorobenzene	N.D.
1,4-Dichlorobenzene	N.D.
1,2-Dichlorobenzene	N.D.

QA/QC:

*Sample blank concentration is none detected.

*Spiked recovery for 1,1-Dichloroethenane 94.1% and 91.4%, for Carbon Tetrachloride 107.5% and 115.0%, for 1,2-Dichlorobenzene 115.9% and 103.6%

CHROMALAB, INC.

David Duong, Sr. Chemist

Eric Tam, Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 21, 1990
APPLIED GEO SYSTEMS
Project No.: 60006-1
Date Sampled: June 7, 1990
Date of Analysis: June 20, 1990
Sample No.: S-E9-WOA

ChromaLab File No.: 0690132D
Attn: Bill Dugan
Project Name: ARCO #6041
Date Submitted: June 14, 1990
DetectionLimit: 5 µg/Kg

601/8010	µg/Kg
Dchlorodifluoromethane	N.D.
Chloromethane	N.D.
Vinyl Chloride	N.D.
Bbromomethane	N.D.
Chlorethane	N.D.
Trichlorofluoromethane	N.D.
1,1-Dichloroethene	N.D.
Methylene Chloride	N.D.
t-1,2-Dichloroethene	N.D.
c-1,2-Dichloroethene	N.D.
1,1-Dichloroethane	N.D.
Chloroform	N.D.
1,1,1-Trichloroethane	N.D.
Carbon Tetrachloride	N.D.
1,2-Dichloroethane	N.D.
Trichloroethene	N.D.
1,2-Dichloropropane	N.D.
Bromodichloromethane	N.D.
2-Chloroethylvinyl ether	N.D.
t-1,3-Dichloropropene	N.D.
Cis-1,3-Dichloropropene	N.D.
1,1,2-Trichloroethane	N.D.
1,1,2-Trichlorotrifluorethane	N.D.
Tetrachloroethene	N.D.
Dibromochloromethene	N.D.
Chlorobenzene	N.D.
Bromoform	N.D.
1,1,2,2-Tetrachloroethane	N.D.
1,3-Dichlorobenzene	N.D.
1,4-Dichlorobenzene	N.D.
1,2-Dichlorobenzene	N.D.

QA/QC:
*Sample blank concentration is none detected.
*Spiked recovery for 1,1-Dichloroethenane 94.1% and 91.4%, for Carbon Tetrachloride 107.5% and 115.0%, for 1,2-Dichlorobenzene 115.9% and 103.6%

CHROMALAB, INC.

David Duong, Sr. Chemist

Eric Tam, Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 21, 1990
APPLIED GEO SYSTEMS
Project No.: 60006-1
Date Sampled: June 7, 1990
Date of Analysis: June 20, 1990
Sample No.: S-W9-WOA

ChromaLab File No.: 0690132E
Attn: Bill Dugan
Project Name: ARCO #6041
Date Submitted: June 14, 1990
DetectionLimit: 5 µg/Kg

601/8010	µg/Kg
Dchlorodifluoromethane	N.D.
Chloromethane	N.D.
Vinyl Chloride	N.D.
Bbromomethane	N.D.
Chlorethane	N.D.
Trichlorofluoromethane	N.D.
1,1-Dichloroethene	N.D.
Methylene Chloride	N.D.
t-1,2-Dichloroethene	N.D.
c-1,2-Dichloroethene	N.D.
1,1-Dichloroethane	N.D.
Chloroform	N.D.
1,1,1-Trichloroethane	N.D.
Carbon Tetrachloride	N.D.
1,2-Dichloroethane	N.D.
Trichloroethene	N.D.
1,2-Dichloropropane	N.D.
Bromodichloromethane	N.D.
2-Chloroethylvinyl ether	N.D.
t-1,3-Dichloropropene	N.D.
Cis-1,3-Dichloropropene	N.D.
1,1,2-Trichloroethane	N.D.
1,1,2-Trichlorotrifluorethane	N.D.
Tetrachloroethene	N.D.
Dibromochloromethene	N.D.
Chlorobenzene	N.D.
Bromoform	N.D.
1,1,2,2-Tetrachloroethane	N.D.
1,3-Dichlorobenzene	N.D.
1,4-Dichlorobenzene	N.D.
1,2-Dichlorobenzene	N.D.

QA/QC:
*Sample blank concentration is none detected.
*Spiked recovery for 1,1-Dichloroethenane 94.1% and 91.4%, for Carbon Tetrachloride 107.5% and 115.0%, for 1,2-Dichlorobenzene 115.9% and 103.6%

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Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

June 21, 1990
APPLIED GEO SYSTEMS
Project No.: 60006-1
Date Sampled: June 7, 1990
Date of Analysis: June 20, 1990
Sample No.: S-C10-WOA

ChromaLab File No.: 0690132A
Attn: Bill Dugan
Project Name: ARCO #6041
Date Submitted: June 14, 1990
DetectionLimit: 5 µg/Kg

601/8010	µg/Kg
Dchlorodifluoromethane	N.D.
Chloromethane	N.D.
Vinyl Chloride	N.D.
Bbromomethane	N.D.
Chlorethane	N.D.
Trichlorofluoromethane	N.D.
1,1-Dichloroethene	N.D.
Methylene Chloride	N.D.
t-1,2-Dichloroethene	N.D.
c-1,2-Dichloroethene	N.D.
1,1-Dichloroethane	N.D.
Chloroform	N.D.
1,1,1-Trichloroethane	N.D.
Carbon Tetrachloride	N.D.
1,2-Dichloroethane	N.D.
Trichloroethene	N.D.
1,2-Dichloropropane	N.D.
Bromodichloromethane	N.D.
2-Chloroethylvinyl ether	N.D.
t-1,3-Dichloropropene	N.D.
Cis-1,3-Dichloropropene	N.D.
1,1,2-Trichloroethane	N.D.
1,1,2-Trichlorotrifluorethane	N.D.
Tetrachloroethene	N.D.
Dibromochloromethene	N.D.
Chlorobenzene	N.D.
Bromoform	N.D.
1,1,2,2-Tetrachloroethane	N.D.
1,3-Dichlorobenzene	N.D.
1,4-Dichlorobenzene	N.D.
1,2-Dichlorobenzene	N.D.

QA/QC:

*Sample blank concentration is none detected.

*Spiked recovery for 1,1-Dichloroethenane 94.1% and 91.4%, for Carbon Tetrachloride 107.5% and 115.0%, for 1,2-Dichlorobenzene 115.9% and 103.6%

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415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

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. Bill Dugan	Date Sampled:	06-07-90
	Applied GeoSystems	Date Received:	06-07-90
	3315 Almaden Expressway	BTEX Analyzed:	06-16-90
	San Jose, CA 95118	TPHg Analyzed:	06-16-90
Project:	AGS 60006-1	TPHd Analyzed:	06-20-90
		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-C10-W0-B S1006241	ND	ND	ND	ND	ND	ND
S-N9-W0-B S1006242	ND	ND	ND	ND	ND	ND
S-S9-W0-B S1006243	ND	ND	ND	ND	ND	ND
S-E9-W0-B S1006244	ND	ND	ND	ND	ND	ND
S-W9-W0-B S1006245	ND	ND	ND	ND	ND	ND

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

06-21-90
Date Reported

APPLIED ANALYTICAL

Environmental Laboratories

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

ANALYSIS REPORT

togsoil.rpt

Report Prepared for:
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Attention: Bill Dugan

Date Received: 06-07-90
Laboratory #: S1006246
Project #: 60006-1
Sample #: S-0607-SP(ABCD)
Matrix: Soil

Parameter	Result (mg/kg)	Detection Limit (mg/kg)	Date Analyzed
TPH as Oil and Grease	110	50	06-12-90

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

PROCEDURES

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

Laboratory Representative

06-14-90
Date Reported

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. Bill Dugan
Applied GeoSystems
3315 Almaden Expressway
San Jose, CA 95118
Project: AGS 60006-1

Date Sampled: 06-07-90
Date Received: 06-07-90
BTEX Analyzed: 06-15-90
TPHg Analyzed: 06-15-90
TPHd Analyzed: 06-16-90
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-0607-SP(ABCD) S1006246	ND	ND	ND	0.25	10	180

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

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

Anametrix W.O.: 9006209
Matrix : SOIL
Date Sampled : 06/07/90
Project Number: 60006-1

Date Prepared : 06/19/90
Date Analyzed : 06/20/90
Date Released : 06/22/90
Instrument I.D.: AA1

		ELEMENTS	Org. Lead		
		EPA METHOD	LUFT		
		REPORTING LIMIT	0.08		
ANAMETRIX ID	CLIENT ID		(mg/Kg)		
9006209-01	S0607SPA,SPB,SPC,SPD		ND		
OMB061990	METHOD BLANK		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.

Analyst Date

Supervisor Date

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

PROJ. NO.	PROJECT NAME
60006-1	ARCO #6041 Dublin CA
P.O. NO.	SAMPLERS (Signature)
	Mike Bauniosh

RUN SAMPLE set "A" on "RUSH" 24 hour.
Hold ~~sample~~ set B. 2 weeks
RUN composite sample

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	24Hour TOG	ORGANIC lead	VOC 5 Volatile Organics				Preserved? Iced	LABORATORY I.D. NUMBER
6/7/90	9:30	S-C10-WO-A	1				✓						✓	
	9:30	S-CH0-WO-B	1	✓	✓	✓							✓	
	10:00	S-N9-WO-A	1				✓						✓	
	10:00	S-N9-WO-B	1	✓	✓	✓							✓	
	10:30	S-S9-WO-A	1				✓						✓	
	10:30	S-S9-WO-B	1	✓	✓	✓							✓	
	11:00	S-E9-WO-A	1				✓						✓	
	11:00	S-E9-WO-B	1	✓	✓	✓							✓	
	11:30	S-W9-WO-A	1				✓						✓	
	11:30	S-W9-WO-B	1	✓	✓	✓							✓	
	11:45	S-0607-SPA	1	✓	✓	✓	✓	✓					✓	
	12:00	S-0607-SPB	1	✓	✓	✓	✓	✓					✓	
	12:15	S-0607-SPC	1	✓	✓	✓	✓	✓					✓	
MB	12:30	S-0607-SPD	1	✓	✓	✓	✓	✓					✓	

Composite

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
Mike Bauniosh	6/7/90 2:16	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):
	6-7-90 1420	

REMARKS:
2 weeks.

SEND RESULTS TO:
Applied GeoSystems
3315 Almaden Expressway
Suite 34
San Jose, California 95118
(408) 264-7723

Proj. Mgr.: Bill Dungan.

Applied GeoSystems

CHAIN-OF-CUSTODY RECORD

CHROMALAB FILE # 690132

PROJ. NO.	PROJECT NAME
60006-1	Arco #6041
P.O. NO.	SAMPLERS (Signature)

DATE MM/DD/YY	TIME	SAMPLE I.D.	No. of Containers	TPHg	BTEX	TPHd	EIA 8010 chlorinated					Preserved?	LABORATORY I.D. NUMBER
				ANALYSIS									
6-7-90		S-C10-W0A	1				✓					✓	
		S-N9-W0A	1				✓					✓	
		S-S9-W0A	1				✓					✓	
		S-E9-W0A	1				✓					✓	
		S-W9-W0A	1				✓					✓	

RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
[signature]	6-14-90 1230	G. Marriott
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED BY (Signature):
G. Marriott	6-14 1350	
RELINQUISHED BY (Signature):	DATE / TIME	RECEIVED FOR LABORATORY BY (Signature):

REMARKS:

Chromalab.

Normal turnaround

SEND RESULTS TO:

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

Proj. Mgr.: Bill Dugan.