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QUARTERLY SUMMARY REPORT
Alameda County
April 1989

**ARCO Service Station No. 276**
**10600 MacArthur Boulevard**
**Oakland, California** 94605

BRIEF HISTORY

- September 29, 1989, a waste-oil tank was removed from the site. Pacific Environmental Group, Inc collected soil samples from beneath the tank. Samples SP-1 and SP-2 were taken from the bottom of the excavation, as shown on the Generalized Site Plan Plate P-1. Laboratory analyses of the soil samples are summarized in Table 1, and indicated concentrations of total oil and grease (TOG) and high boiling point hydrocarbons (HBPH) between 3,300 to 7,300 parts per million (ppm).

- November 4, 1989, the waste-oil tank excavation was extended downward. Samples WO-A and WO-B were taken from the bottom of the excavation, and samples WO-C, WO-D, WO-E, and WO-F were taken from the excavation sidewalls. Laboratory analysis of these samples indicated TOG and HBPH at concentrations ranging from 10 to 21,000 ppm.

- December 6, 1988, the waste-oil tank excavation was extended further to the north and south. Samples WO-D2 and WO-F2 were taken from the excavation sidewalls. Laboratory results of these two samples indicated nondetectable concentrations of TOG and HBPH.

- March 20, 1989, a subsurface environmental investigation at the site was initiated by Applied GeoSystems. This investigation includes installation of four perimeter ground-water monitoring wells, and one ground-water monitoring well within 10 feet in the downgradient direction from the former waste-oil tank. Evaluation of the remediation of soil and ground water will be initiated, as necessary, after the extent of contamination is investigated.

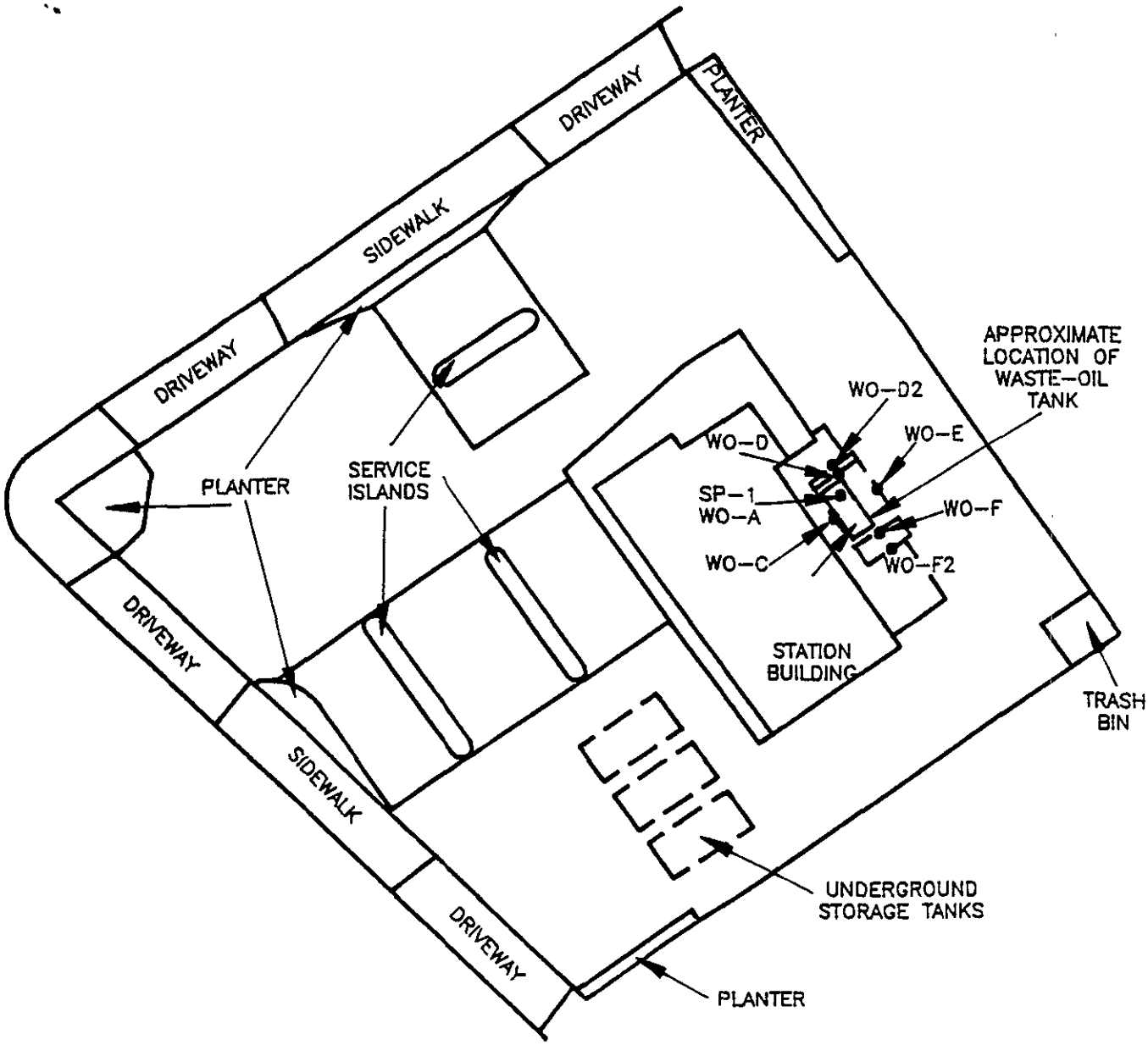
PROPOSED WORK

- Continue subsurface environmental investigation to evaluate potential hydrocarbon contamination of the ground-water beneath the site.

TABLE 1
ANALYTICAL RESULTS OF WASTE-OIL TANK SAMPLES
ARCO Station No. 276
Oakland, California

| Sample Number | TPHg | TPHd | B | T | E | X | Oil | Stoddard Solvent | TOG |
|---|---|---|---|---|---|---|---|---|---|
| SP-1 | 40 | ND | ND | ND | 0.2 | 1.7 | 7,300 | 160 | 5,600 |
| SP-2 | 50 | ND | ND | ND | 0.2 | 1.8 | 4,800 | 110 | 3,300 |
| WO-A | ND | ND | ND | ND | ND | ND | 30 | NR | 30 |
| WO-B | ND | 10 | ND | ND | ND | ND | 110 | NR | 220 |
| WO-C | NR | 60 | NR | NR | NR | NR | 500 | NR | 380 |
| WO-D | NR | 140 | NR | NR | NR | NR | 880 | NR | 880 |
| WO-E | NR | ND | NR | NR | NR | NR | 10 | NR | 10 |
| WO-F | NR | 2,500 | NR | NR | NR | NR | 21,000 | NR | 15,000 |
| WO-D2 | NR | ND | NR | NR | NR | NR | ND | NR | ND |
| WO-F2 | NR | ND | NR | NR | NR | NR | ND | NR | ND |

Notes:
Results are in parts per million (ppm)
TPHg = total petroleum hydrocarbons as gasoline
TPHd = total petroleum hydrocarbons as diesel
ND = Below the detection limits of the method used
NR = Analysis not performed
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total Xylene Isomers
Oil = High Boiling Hydrocarbons
TOG = Total oil and grease




SP-2 / WO-B • = Soil sample location

Source: Modified from plan supplied by ARCO

N

Approximate Scale

30 15 0 30 60

feet

Applied GeoSystems

**PROJECT NO. 19011-1**

**GENERALIZED SITE PLAN**
**ARCO Station No. 276**
**10600 MacArthur Boulevard**
**Oakland, California**

**PLATE**
**P - 1**

QUARTERLY SUMMARY REPORT
Alameda County
July 1989

**ARCO Service Station No. 276**
**10600 MacArthur Boulevard**
**Oakland, California**

Brief History

- September 29, 1989, a waste-oil tank was removed from the site. Pacific Environmental Group, Inc. (PEG) collected soil samples from beneath the tank. Samples SP-1 and SP-2 were taken from the bottom of the excavation, as shown on the Generalized Site Plan Plate P-1. Laboratory analyses of the soil samples are summarized in Table 1, and indicated concentrations of total oil and grease (TOG) and high boiling point hydrocarbons (HBPH) between 3,300 to 7,300 parts per million (ppm).

- November 4, 1989, the waste-oil tank excavation was extended downward. Samples WO-A and WO-B were taken from the bottom of the excavation, and samples WO-C, WO-D, WO-E, and WO-F were taken from the excavation sidewalls. Laboratory analysis of these samples indicated TOG and HBPH at concentrations ranging from 10 to 21,000 ppm (Table 1).

- December 6, 1988, the waste-oil tank excavation was extended further to the north and south. Samples WO-D2 and WO-F2 were taken from the excavation sidewalls. Laboratory results of these two samples indicated nondetectable concentrations of TOG and HBPH (Table 1).

Work Performed during Second Quarter 1989

- March 1989, a subsurface environmental investigation at the site was initiated by Applied GeoSystems. This investigation has to date included installation of four perimeter ground-water monitoring wells, and one ground-water monitoring well within 10 feet in the downgradient direction from the former waste-oil tank. Floating hydrocarbon product measured in a shallow well (MW-2 constructed in a perched zone) has ranged in thickness from 0.5 to 9 inches between June 8 and June 28, 1989. Report summarizing the results of this investigation will be submitted to the Alameda County Health Agency and Regional Water Quality Control Board in August 1989.

- June 21, 1989, PEG conducted a soil vapor survey onsite and in the immediate vicinity of the site to evaluate the extent of hydrocarbon vapor in the shallow soil. Report preparation is in progress.

- July 12, 1989, H & H Ship Service is contracted to evacuate floating product from well MW-2.

Proposed Work - Third Quarter 1989

- Pending results of the soil vapor survey conducted by PEG, continue the subsurface environmental investigation to define the extent hydrocarbon contamination of the soil and ground-water at and around the site.

Status of Delineation of Hydrocarbon-Contaminated Soil

- Extent of soil contamination at the site has not been delineated. The extent of soil contamination will be assessed during the continuing investigation.

Status of Delineation of Hydrocarbon-Contaminated Ground Water

- The extent of hydrocarbon contamination in ground water has not been defined. The extent of ground-water contamination will be assessed during the continuing investigation.

Status of Remediation of Floating Hydrocarbon Product

- Floating hydrocarbon product in well MW-2 is being bailed or evacuated by use of a vacuum truck. An evaluation of continuous floating product recovery is presently under way.

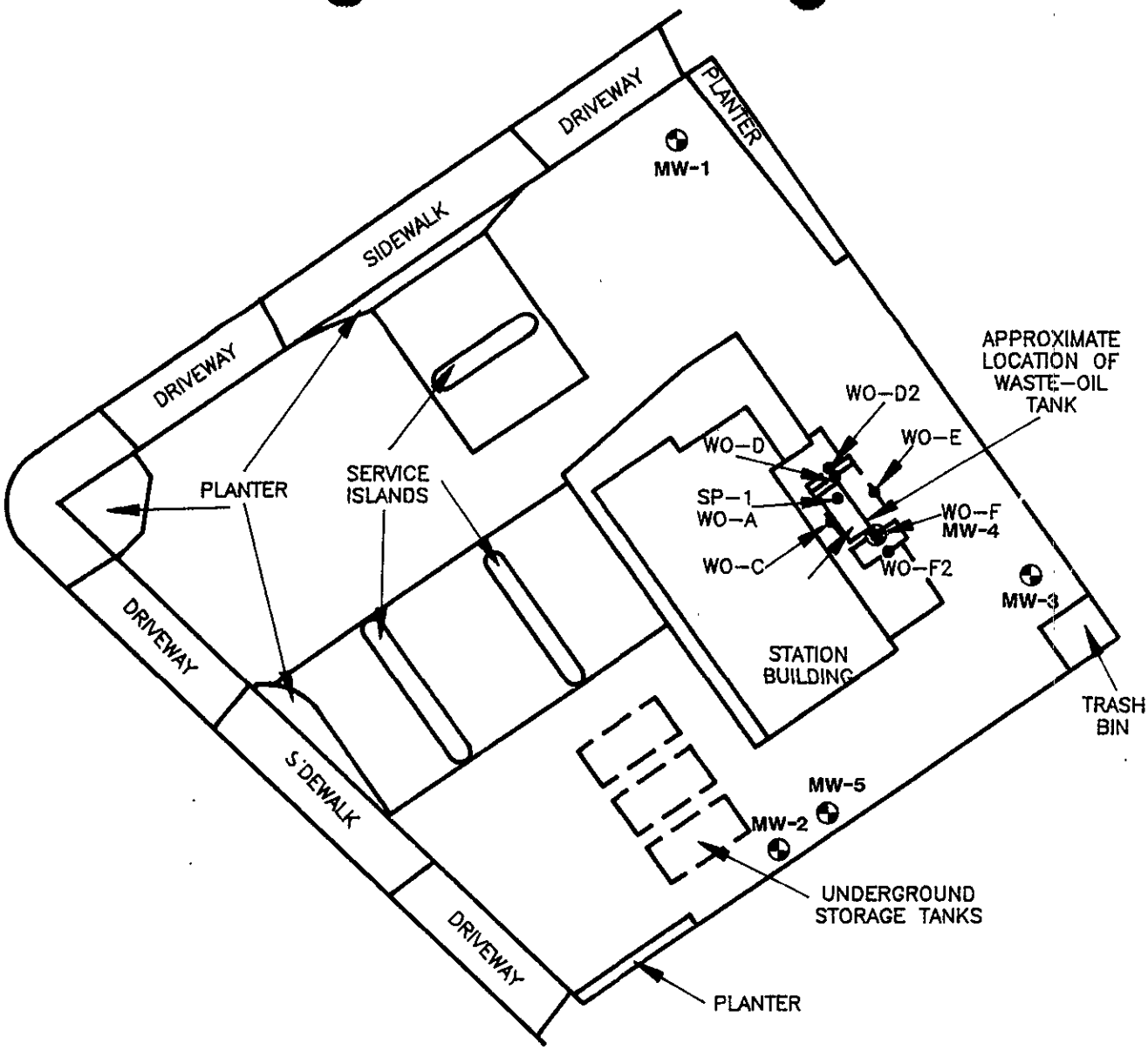
Status of Remediation of Hydrocarbon-Contaminated Ground Water and Soil

- Alternatives for remediation of hydrocarbon-contaminated soil and ground water will be evaluated upon completion of the ongoing environmental investigation.

TABLE 1
ANALYTICAL RESULTS OF WASTE-OIL TANK SAMPLES
ARCO Station No. 276
Oakland, California

| Sample Number | TPHg | TPHd | B | T | E | X | Oil | Stoddard Solvent | TOG |
|---|---|---|---|---|---|---|---|---|---|
| SP-1 | 40 | ND | ND | ND | 0.2 | 1.7 | 7,300 | 160 | 5,600 |
| SP-2 | 50 | ND | ND | ND | 0.2 | 1.8 | 4,800 | 110 | 3,300 |
| WO-A | ND | ND | ND | ND | ND | ND | 30 | NR | 30 |
| WO-B | ND | 10 | ND | ND | ND | ND | 110 | NR | 220 |
| WO-C | NR | 60 | NR | NR | NR | NR | 500 | NR | 380 |
| WO-D | NR | 140 | NR | NR | NR | NR | 880 | NR | 880 |
| WO-E | NR | ND | NR | NR | NR | NR | 10 | NR | 10 |
| WO-F | NR | 2,500 | NR | NR | NR | NR | 21,000 | NR | 15,000 |
| WO-D2 | NR | ND | NR | NR | NR | NR | ND | NR | ND |
| WO-F2 | NR | ND | NR | NR | NR | NR | ND | NR | ND |

Notes:
Results are in parts per million (ppm)
TPHg = total petroleum hydrocarbons as gasoline
TPHd = total petroleum hydrocarbons as diesel
ND = Below the detection limits of the method used
NR = Analysis not performed
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total Xylene Isomers
Oil = High Boiling Hydrocarbons
TOG = Total oil and grease




MW-5 = **Monitoring well location**

SP-2 / WO-B = Soil sample location

Source: Modified from plan supplied by ARCO

N

Approximate Scale

30 15 0 30 60

feet

Applied GeoSystems

**PROJECT NO. 19011-1**

**GENERALIZED SITE PLAN**
**ARCO Station No. 276**
**10600 MacArthur Boulevard**
**Oakland, California**

**PLATE**

**P - 1**

QUARTERLY SUMMARY REPORT
Alameda County
September 1989

**ARCO Service Station No. 276**
**10600 MacArthur Boulevard**
**Oakland, California** 610

Brief History

- September 29, 1988, a waste-oil tank was removed from the site. Pacific Environmental Group, Inc. (PEG) collected soil samples from beneath the tank. Laboratory analyses of the soil samples indicated concentrations of total oil and grease (TOG) and high boiling point hydrocarbons (HBPH) between 3,300 to 7,300 parts per million (ppm).

- November 4, 1988, the waste-oil tank excavation was extended downward. PEG collected samples from the bottom of the excavation and from the excavation sidewalls. Laboratory analysis of these samples indicated TOG and HBPH at concentrations ranging from 10 to 21,000 ppm.

- December 6, 1988, the waste-oil tank excavation was extended further to the north and south. PEG collected samples from the excavation sidewalls. Laboratory results of these two samples indicated nondetectable concentrations of TOG and HBPH.

- March 20, 1989, Applied GeoSystems initiated a subsurface environmental investigation at the site involving installation of 5 onsite monitoring wells. Soil contamination found from 16 to 25 feet below the ground surface in boring B-2, located adjacent to the station's underground storage tanks in a shallow perched zone, and at 16 feet below the surface in boring B-5 located 10 feet from B-2 (Table 1 and Plate P-1). Ground-water samples collected in April 1989 suggested hydrocarbon contamination in wells MW-2 through MW-5 (Table 2 and 3). Nine inches of free product was subsequently measured in well MW-2. Repeated bailing by Applied GeoSystems has reduced product thickness in well MW-2 to a sheen.

- June 21, 1989, PEG performed a soil vapor survey at the offsite property south of site. PEG reported an offsite contaminant plume in the shallow subsurface soil.

- August 3, 1989, based on PEG survey, Applied GeoSystems drilled 9 soil borings on the offsite property south of site to confirm and assess lateral and vertical extent of soil contamination (Plate P-1). The majority of soil contamination appears to be laterally confined to an elliptical area encompassing MW-2, MW-5, and borings

B-4, B-5, B-6, and B-8. The highest levels of soil contamination were found in the area of MW-2, MW-5, B-6, and B-7. The vertical extent of soil contamination appears to be between approximately 21 and 31 feet below the ground surface. The results are shown on Table 4.

Future Work - Fourth Quarter 1989

- Prepare a report describing the results of the subsurface environmental investigation at the site for submittal to the regulatory agencies.

- Evaluate soil vapor extraction system to remediate offsite soil contamination. Continue monthly monitoring of well MW-2, and bailing of floating product as necessary.

Status of Delineation of Hydrocarbon-Contaminated Soil

- The extent of the majority of soil contamination in the shallow soil at the site has been defined.

Status of Delineation of Hydrocarbon-Contaminated Ground Water

- The extent of hydrocarbon contamination in ground water has not been defined. The extent of ground-water contamination will be assessed during the continuing investigation.

Status of Remediation of Floating Hydrocarbon Product

- Floating hydrocarbon product in well MW-2 will be bailed on a monthly basis, as necessary.

Status of Remediation of Hydrocarbon-Contaminated Ground Water and Soil

- Alternatives for remediation of hydrocarbon-contaminated soil and ground water will be evaluated upon completion of the ongoing environmental investigation.

TABLE 1
ANALYTICAL RESULTS OF WASTE-OIL TANK SAMPLES
ARCO Station No. 276
Oakland, California

| Sample Number | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes |
|---|---|---|---|---|---|
| S-26-B1 | <2 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-31-B1 | <2 | <0.05 | <0.05 | <0.05 | <0.078 |
| S-5.5-B2 | <2 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-11-B2 | <2 | <0.05 | <0.066 | <0.05 | 0.079 |
| S-16-B2 | 38 | 0.30 | 0.91 | 0.38 | 2.4 |
| S-20-B2 | 690 | 7.4 | 36 | 10 | 62 |
| S-24.5-B2 | 4.2 | <0.05 | 0.10 | <0.05 | 0.18 |
| S-28-B2 | <2 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-30.5-B3 | <2 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-21-B4* | <5.0 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-31-B4 | <5.0 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-11-B5 | <5.0 | 0.13 | <0.05 | <0.05 | <0.05 |
| S-16-B5 | 220.0 | 0.83 | 3.4 | 2.2 | 14 |
| S-18-B5 | <5.0 | 0.23 | 0.11 | <0.05 | <0.05 |
| S-24-B5 | <5.0 | 0.086 | <0.05 | <0.05 | <0.05 |
| S-31-B5 | <5.0 | <0.05 | <0.05 | <0.05 | <0.05 |

Results are in parts per million (ppm)
TPHg = total petroleum hydrocarbons as gasoline
< = below the reporting limits of the analysis
* = sample S-21-B4 also analyzed for TOG. (Not found)

Sample designation: S-31-B5

- S = Soil sample
- 31 = Sample depth in feet
- B5 = Boring number

TABLE 2
ANALYTICAL RESULTS OF WATER SAMPLES
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California

| Sample Number | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes |
|---|---|---|---|---|---|
| W-35-MW1 | <0.050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| W-19-MW2 | 165 | 13 | 21 | 2.1 | 12.7 |
| W-35-MW3 | 0.56 | 0.00054 | 0.00075 | <0.00050 | <0.00050 |
| W-34-MW4 | 2.5 | 0.27 | 0.0014 | <0.05 | 0.079 |
| W-34-MW5 | 0.13 | 0.00067 | <0.00050 | <0.00050 | <0.00050 |

Results are in parts per million (ppm)
TPHg = total petroleum hydrocarbons as gasoline
< = below the reporting limits of the analysis
Sample designation: W-34-MW5
W = Water sample
34 = Sample depth in feet
MW5 = Well number

TABLE 3
RESULTS OF EPA 624 WATER SAMPLE ANALYSIS
COLLECTED FROM MONITORING WELL MW-4
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
(April 24, 1989)

| Sample Number | Benzene | Total Xylenes | Tetra-chloro-ethene | Total Oil& Grease | 1-ethyl-2-methyl-benzene | 1,3,5-trimethyl-benzene |
|---|---|---|---|---|---|---|
| W-34-MW4 | 0.780 | 0.130 | 1.50 | <5.0 | ** | ** |

Results are in parts per million (ppm)
< = below the reporting limits of the analysis
** = compound identified at concentrations below the reporting limits of the method used.

Sample designation: W-34-MW4
- W = Water sample
- 34 = Sample depth in feet
- MW4 = Well number

TABLE 4
ANALYTICAL RESULTS OF OFFSITE INVESTIGATION
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
Page 1 of 3
(August 1989)

| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|
| S-16.5-B1 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B1 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24.0-B1 | <1 | <10 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-29.0-B1 | 2.3 | NA | 0.27 | 0.087 | 0.054 | 0.15 |
| S-06.5-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24.0-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24/26.5-B2 | NA | <10 | NA | NA | NA | NA |
| S-29.0-B2 | <1 | NA | <0.005 | <0.005 | <0.005 | <0.005 |
| S-11.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-29.0-B3 | <1 | NA | <0.005 | <0.005 | <0.005 | <0.005 |
| S-06.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B4 | 4 | <10 | 0.41 | 0.07 | 0.08 | 0.16 |
| S-29.0-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |

See notes on Page 3 of 3.

TABLE 4
ANALYTICAL RESULTS OF OFFSITE INVESTIGATION
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
Page 2 of 3
(August 1989)

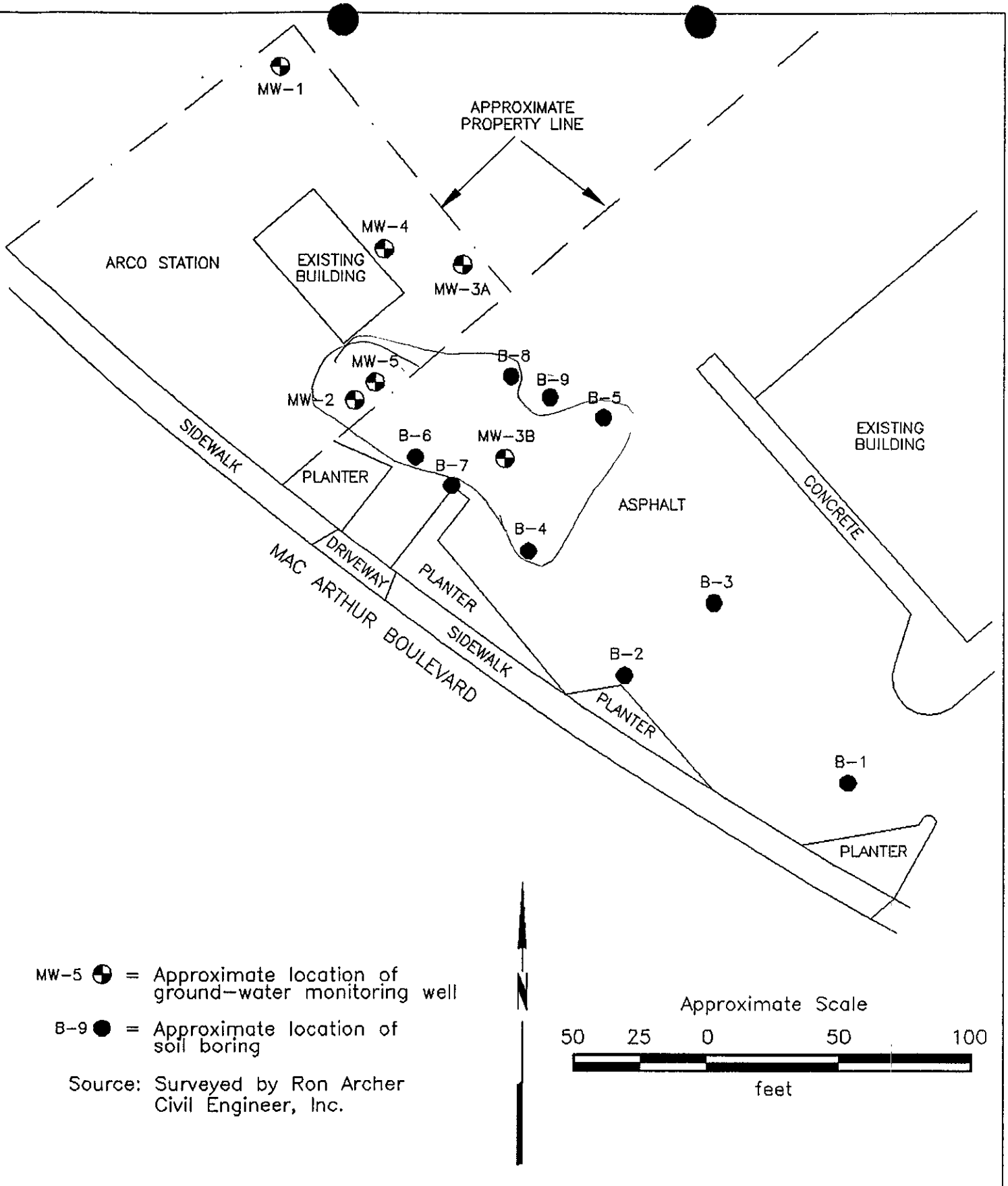
| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|
| S-06.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B5 | <1 | NA | 0.032 | <0.005 | <0.005 | <0.005 |
| S-29.0-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-06.5-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B6 | <2.0 | NA | 0.22 | 0.14 | 0.13 | 0.56 |
| S-26.5-B6 | 1400 | 320 | <2 | 19 | 12 | 63 |
| S-31.5-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.0-B7 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B7 | 530 | NA | 1.1 | 5.8 | 5.8 | 30 |
| S-26.0-B7 | <2.0 | NA | 0.084 | <0.050 | <0.050 | <0.050 |
| S-31.0-B7 | 15 | NA | 0.61 | 0.57 | 0.24 | 0.92 |
| S-36.0-B7 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B8 | <2.0 | NA | 0.18 | <0.050 | 0.72 | <0.050 |
| S-23.0-B8 | <2.0 | NA | 0.11 | <0.050 | <0.050 | 0.075 |
| S-26.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-31.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |

See notes page 3 of 3.

TABLE 4
ANALYTICAL RESULTS OF OFFSITE INVESTIGATION
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
Page 3 of 3
(August 1989)

| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|
| S-16.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-31.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |

Results are in parts per million (ppm)
TPHg(d) = total petroleum hydrocarbons as gasoline (diesel)
B = benzene; T = toluene; E = ethylbenzene; X = total xylenes
NA = not analyzed;
< = below the reporting limits of the analysis
Sample designation: S-31.0-B9
| | └ Boring number
| └ Sample depth in feet
└ Soil sample




Applied GeoSystems

**PROJECT NO. 19014-3**

**GENERALIZED SITE PLAN**
**ARCO Station No. 276**
**10600 Mac Arthur Boulevard**
**Oakland, California**

**PLATE**

**P - 2**

No page 2

QUARTERLY SUMMARY REPORT
Alameda County
January 1990

**ARCO Service Station No. 276**
**10600 MacArthur Boulevard**
**Oakland, California** 94605

Brief History

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- March 20, 1989, Applied GeoSystems initiated a subsurface environmental investigation at the site involving installation of 5 onsite monitoring wells. Soil contamination found from 16 to 25 feet below the ground surface in boring B-2, located adjacent to the station's underground storage tanks in a shallow perched zone, and at 16 feet below the surface in boring B-5 located 10 feet from B-2 (Table 1 and Plate P-1). Ground-water samples collected in April 1989 suggested hydrocarbon contamination in wells MW-2 through MW-5 (Table 2 and 3). Nine inches of free product was subsequently measured in well MW-2. Repeated bailing by Applied GeoSystems has reduced product thickness in well MW-2 to a sheen.

- June 21, 1989, PEG performed a soil vapor survey at the offsite property south of site. PEG reported an offsite contaminant plume in the shallow subsurface soil.

- August 3, 1989, based on PEG survey, Applied GeoSystems drilled 9 soil borings on the offsite property south of site to confirm and assess lateral and vertical extent of soil contamination (Plate P-1). The majority of soil contamination appears to be laterally confined to an elliptical area encompassing MW-2, MW-5, and borings

TABLE 1
ANALYTICAL RESULTS OF WASTE-OIL TANK SAMPLES
ARCO Station No. 276
Oakland, California

| Sample Number | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes |
|---|---|---|---|---|---|
| S-26-B1 | <2 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-31-B1 | <2 | <0.05 | <0.05 | <0.05 | <0.078 |
| S-5.5-B2 | <2 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-11-B2 | <2 | <0.05 | <0.066 | <0.05 | 0.079 |
| S-16-B2 | 38 | 0.30 | 0.91 | 0.38 | 2.4 |
| S-20-B2 | 690 | 7.4 | 36 | 10 | 62 |
| S-24.5-B2 | 4.2 | <0.05 | 0.10 | <0.05 | 0.18 |
| S-28-B2 | <2 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-30.5-B3 | <2 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-21-B4* | <5.0 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-31-B4 | <5.0 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-11-B5 | <5.0 | 0.13 | <0.05 | <0.05 | <0.05 |
| S-16-B5 | 220.0 | 0.83 | 3.4 | 2.2 | 14 |
| S-18-B5 | <5.0 | 0.23 | 0.11 | <0.05 | <0.05 |
| S-24-B5 | <5.0 | 0.086 | <0.05 | <0.05 | <0.05 |
| S-31-B5 | <5.0 | <0.05 | <0.05 | <0.05 | <0.05 |

Results are in parts per million (ppm)
TPHg = total petroleum hydrocarbons as gasoline
< = below the reporting limits of the analysis
* = sample S-21-B4 also analyzed for TOG. (Not found)

Sample designation: S-31-B5

- S = Soil sample
- 31 = Sample depth in feet
- B5 = Boring number

TABLE 2
ANALYTICAL RESULTS OF WATER SAMPLES
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California

| Sample Number | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes |
|---|---|---|---|---|---|
| W-35-MW1 | <0.050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| W-19-MW2 | 165 | 13 | 21 | 2.1 | 12.7 |
| W-35-MW3 | 0.56 | 0.00054 | 0.00075 | <0.00050 | <0.00050 |
| W-34-MW4 | 2.5 | 0.27 | 0.0014 | <0.05 | 0.079 |
| W-34-MW5 | 0.13 | 0.00067 | <0.00050 | <0.00050 | <0.00050 |

Results are in parts per million (ppm)
TPHg = total petroleum hydrocarbons as gasoline
< = below the reporting limits of the analysis
Sample designation: W-34-MW5
W = Water sample
34 = Sample depth in feet
MW5 = Well number

TABLE 3
RESULTS OF EPA 624 WATER SAMPLE ANALYSIS
COLLECTED FROM MONITORING WELL MW-4
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
(April 24, 1989)

| Sample Number | Benzene | Total Xylenes | Tetra-chloro-ethene | Total Oil& Grease | 1-ethyl-2-methyl-benzene | 1,3,5-trimethyl-benzene |
|---|---|---|---|---|---|---|
| W-34-MW4 | 0.780 | 0.130 | 1.50 | <5.0 | ** | ** |

Results are in parts per million (ppm)
< = below the reporting limits of the analysis
** = compound identified at concentrations below the reporting limits of the method used.

Sample designation: W-34-MW4
- W = Water sample
- 34 = Sample depth in feet
- MW4 = Well number

TABLE 4
ANALYTICAL RESULTS OF OFFSITE INVESTIGATION
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
Page 1 of 3
(August 1989)

| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|
| S-16.5-B1 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B1 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24.0-B1 | <1 | <10 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-29.0-B1 | 2.3 | NA | 0.27 | 0.087 | 0.054 | 0.15 |
| S-06.5-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24.0-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24/26.5-B2 | NA | <10 | NA | NA | NA | NA |
| S-29.0-B2 | <1 | NA | <0.005 | <0.005 | <0.005 | <0.005 |
| S-11.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-29.0-B3 | <1 | NA | <0.005 | <0.005 | <0.005 | <0.005 |
| S-06.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B4 | 4 | <10 | 0.41 | 0.07 | 0.08 | 0.16 |
| S-29.0-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |

See notes on Page 3 of 3.

TABLE 4
ANALYTICAL RESULTS OF OFFSITE INVESTIGATION
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
Page 2 of 3
(August 1989)

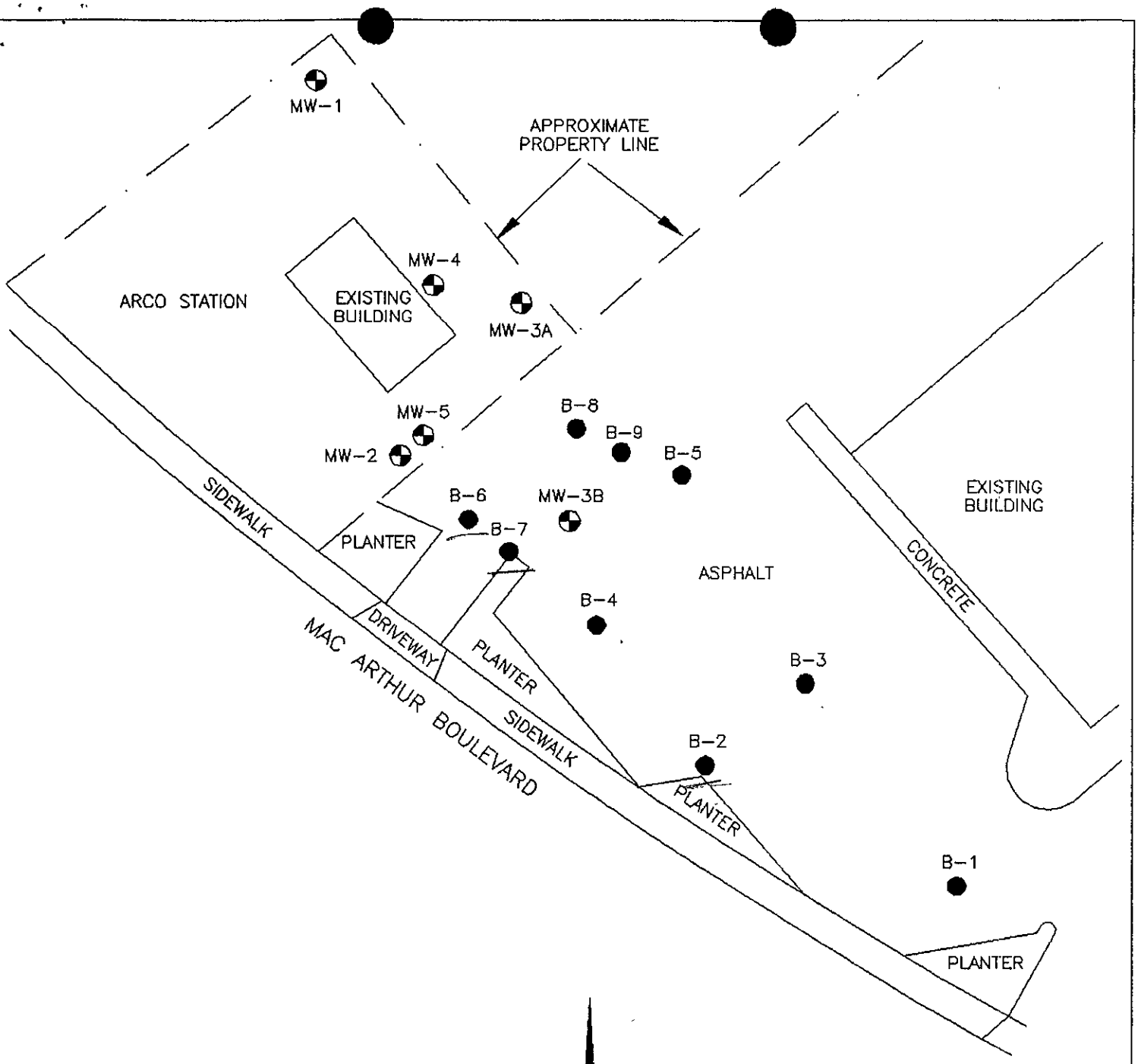
| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|
| S-06.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B5 | <1 | NA | 0.032 | <0.005 | <0.005 | <0.005 |
| S-29.0-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-06.5-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B6 | <2.0 | NA | 0.22 | 0.14 | 0.13 | 0.56 |
| S-26.5-B6 | 1400 | 320 | <2 | 19 | 12 | 63 |
| S-31.5-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.0-B7 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B7 | 530 | NA | 1.1 | 5.8 | 5.8 | 30 |
| S-26.0-B7 | <2.0 | NA | 0.084 | <0.050 | <0.050 | <0.050 |
| S-31.0-B7 | 15 | NA | 0.61 | 0.57 | 0.24 | 0.92 |
| S-36.0-B7 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B8 | <2.0 | NA | 0.18 | <0.050 | 0.72 | <0.050 |
| S-23.0-B8 | <2.0 | NA | 0.11 | <0.050 | <0.050 | 0.075 |
| S-26.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-31.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |

See notes page 3 of 3.

TABLE 4
ANALYTICAL RESULTS OF OFFSITE INVESTIGATION
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
Page 3 of 3
(August 1989)

| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|
| S-16.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-31.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |

Results are in parts per million (ppm)
TPHg(d) = total petroleum hydrocarbons as gasoline (diesel)
B = benzene; T = toluene; E = ethylbenzene; X = total xylenes
NA = not analyzed;
< = below the reporting limits of the analysis
Sample designation: S-31.0-B9
| | └ Boring number
| └ Sample depth in feet
└ Soil sample




MW-5 ⊕ = Approximate location of ground-water monitoring well

B-9 ● = Approximate location of soil boring

Source: Surveyed by Ron Archer Civil Engineer, Inc.

N

Approximate Scale

50 25 0 50 100

feet

Applied GeoSystems

**PROJECT NO. 19014-3**

**GENERALIZED SITE PLAN**
**ARCO Station No. 276**
**10600 Mac Arthur Boulevard**
**Oakland, California**

**PLATE**

**P - 2**

SUMMARY REPORT
Second Quarter 1990

**ARCO Service Station 276**
**10600 MacArthur Boulevard**
**Oakland, California**
**Alameda County**

## BACKGROUND

For site history prior to 1990 refer to the October-December 1989 Quarterly Summary Report issued in January 1990.

- o Tank removal and tank pit soil sampling was performed in February 1990.
- o Applied GeoSystems drilled three exploratory soil borings in the area of the new tank pit in February 1990 (Plate 1) and collected soil samples from the borings.
- o Aeration of soil excavated from the former tank pit was performed in February 1990.
- o A pilot study and initial design of a soil vapor extraction system to be used for removing onsite and offsite hydrocarbon compounds from the unsaturated zone was performed by Pacific Environmental Group during the first quarter of 1990.
- o Applied GeoSystems has prepared a draft report summarizing tank removal and soil aeration activities at the site.

## SOIL CONDITIONS

No change from last quarter. Refer to Tables 1 and 2 for results of laboratory analysis of samples collected at the site.

## QUARTERLY GROUND-WATER MONITORING

No change from last quarter. Refer to Tables 3, 4, and 5 for results of laboratory analyses of water samples collected from wells MW-1 through MW-5 at the site.

## STATUS SUMMARY: REMEDIATION

Contaminated soil excavated from the former tank pit was aerated and then removed to a Class III landfill.

## ANTICIPATED WORK FOR THE NEXT QUARTER

- Submit report summarizing tank removal and soil aeration activities at the site to Regional Water Quality Control Board and Alameda County Health Agency.
- Offsite soil vapor extraction.
- Following completion of the offsite vapor extraction, the system will be installed to address onsite hydrocarbon vapors in the unsaturated zone.

TABLE 1
SOIL SAMPLE ANALYSES FROM FORMER TANK PIT
ARCO Station 276
10600 MacArthru Boulevard
Oakland, California
(collected February 8, 1990)

| Sample Number | Data Point | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes |
|---|---|---|---|---|---|---|
| S-7-TP1SW | 1 | <2.0 | 0.13 | <0.050 | <0.050 | 0.15 |
| S-8-TP1NE | 2 | <2.0 | 0.088 | <0.050 | <0.050 | <0.050 |
| 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 | <0.050 | 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 in parts per million (ppm).
TPHg: Total petroluem hydrocarbons as gasoline.

Sample identification:

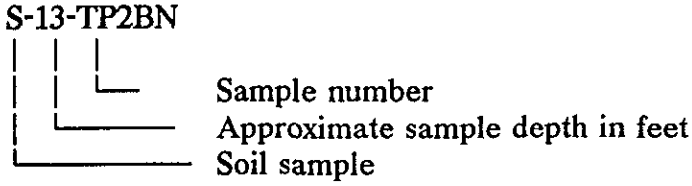


TABLE 2
SOIL SAMPLE ANALYSES FROM PROPOSED TANK PIT
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(collected February 9, 1990)

| Sample Number | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes |
|---|---|---|---|---|---|
| Boring 1 | | | | | |
| S-9.5-TPB1 | <2.0 | <0.050 | <0.050 | <0.050 | <0.050 |
| S-15-TPB1 | 290 | 0.19 | 0.47 | 3.3 | 6.6 |
| S-18-TPB1 | 58 | <0.050 | 0.069 | 0.14 | 0.22 |
| S-21-TPB1 | <2.0 | <0.050 | <0.050 | <0.050 | <0.050 |
| Boring 2 | | | | | |
| S-11-TPB2 | <2.0 | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16-TPB2 | <2.0 | <0.050 | <0.050 | <0.050 | <0.050 |
| S-18.5-TPB2 | <2.0 | <0.050 | <0.050 | <0.050 | <0.050 |
| Boring 3 | | | | | |
| S-5-TPB3 | <2.0 | <0.050 | <0.050 | <0.050 | <0.050 |
| S-10-TPB3 | <2.0 | <0.075 | <0.050 | <0.050 | <0.050 |
| S-13-TPB3 | <2.0 | <0.050 | <0.050 | <0.050 | <0.050 |
| S-20-TPB3 | <2.1 | <0.46 | <0.050 | <0.086 | <0.050 |

*Results in parts per million (ppm).*
TPHg: Total petroluem hydrocarbons as gasoline.

Sample identification:

S-20-TPB3

- S: Soil sample
- 20: Approximate sample depth in feet
- TPB3: Tank pit borehole number

TABLE 3
ANALYTICAL RESULTS OF WATER SAMPLES
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

| Well/ Date | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes |
|---|---|---|---|---|---|
| MW-1 | | | | | |
| 4/24/89 | <50 | <0.50 | <0.50 | <0.50 | <0.50 |
| 10/13/89 | <20 | <0.50 | <0.50 | <0.50 | <0.50 |
| 2/1/90 | 91 | <0.30 | <0.30 | <0.30 | 0.36 |
| MW-2 | | | | | |
| 4/24/89 | 16500 | 13000 | 21000 | 2100 | 12700 |
| 13/13/89 | | -floating product/heavy sheen present- | | | |
| 2/1/90 | | -sheen present- | | | |
| MW-3 | | | | | |
| 4/24/89 | 560 | 0.54 | 0.75 | <0.50 | <0.50 |
| 10/13/89 | 450 | <0.50 | <0.50 | <0.50 | <0.50 |
| 2/1/90 | 360 | <0.30 | <0.30 | <0.30 | 0.85 |
| MW-4 | | | | | |
| 4/24/89 | 2500 | 270 | 1.4 | <0.50 | 85 |
| 10/13/89 | 760 | 0.86 | 0.50 | <0.12 | <0.50 |
| 2/1/90 | 680 | <0.30 | <0.30 | <0.30 | 1.6 |
| MW-5 | | | | | |
| 4/24/89 | 130 | 0.67 | <0.50 | <0.50 | <0.50 |
| 10/13/89 | 75 | <0.50 | <0.50 | <0.50 | <0.50 |
| 2/1/90 | 81 | 0.94 | 0.88 | <0.30 | 1.8 |

Results in parts per billion (ppb). TPHg: Total petroluem hydrocarbons as gasoline.
<: below the reporting limits of the analysis.

TABLE 4
RESULTS OF EPA 624 WATER SAMPLE ANALYSIS
ARCO Service Station 276
10600 MacArthur Boulevard
Oakland, California
(February 1, 1990)

| Well | Tetrachloroethene |
|---|---|
| MW-1 | <2.0 |
| MW-3 | 2000 |
| MW-4 | 3900 |
| MW-5 | 180 |

Results are in parts per billion (ppb)
Only positive results reported.
<: below the reporting limits of the analysis

TABLE 5
RESULTS OF MINERAL ANALYSES (October 10, 1989)
ARCO Service Station 276
Oakland, California

| Constituent | MW-1 | MCL | COS | |
|---|---|---|---|---|
| Bicarbonate Alkalinity | 330 | * | 150-200 | + |
| Calcium | 320 | * | 25-50 | + |
| Carbonate Alkalinity | <0.5 | * | 150-200 | |
| Chloride | 1,900 | 250 | NA | + |
| Copper | 0.11 | 1.0 | NA | |
| Hardness | 1,500 | * | >180=Vv.hard | + |
| Hydroxide Alkalinity | <0.001 | * | NA | |
| Iron | 33 | 0.3 | NA | + |
| Magnesium170 | * | na | | |
| Manganes | 3.0 | 0.05 | NA | + |
| pH | 7.1 | 6.5-8.5 | NA | |
| Sodium | 130 | * | 20-170 | + |
| Specific Conductance (SP) | 3,800 | 900 | NA | + |
| Sulfate | 410 | 250 | NA | + |
| Surfactants | <0.02 | 0.05 | NA | |
| Total Dissolved Solids | 3,000 | 500-1,000 | NA | + |
| Zincs | 0.33 | 5.0 | 5.0 | |

Results and Values in parts per million. SP in micromhos.

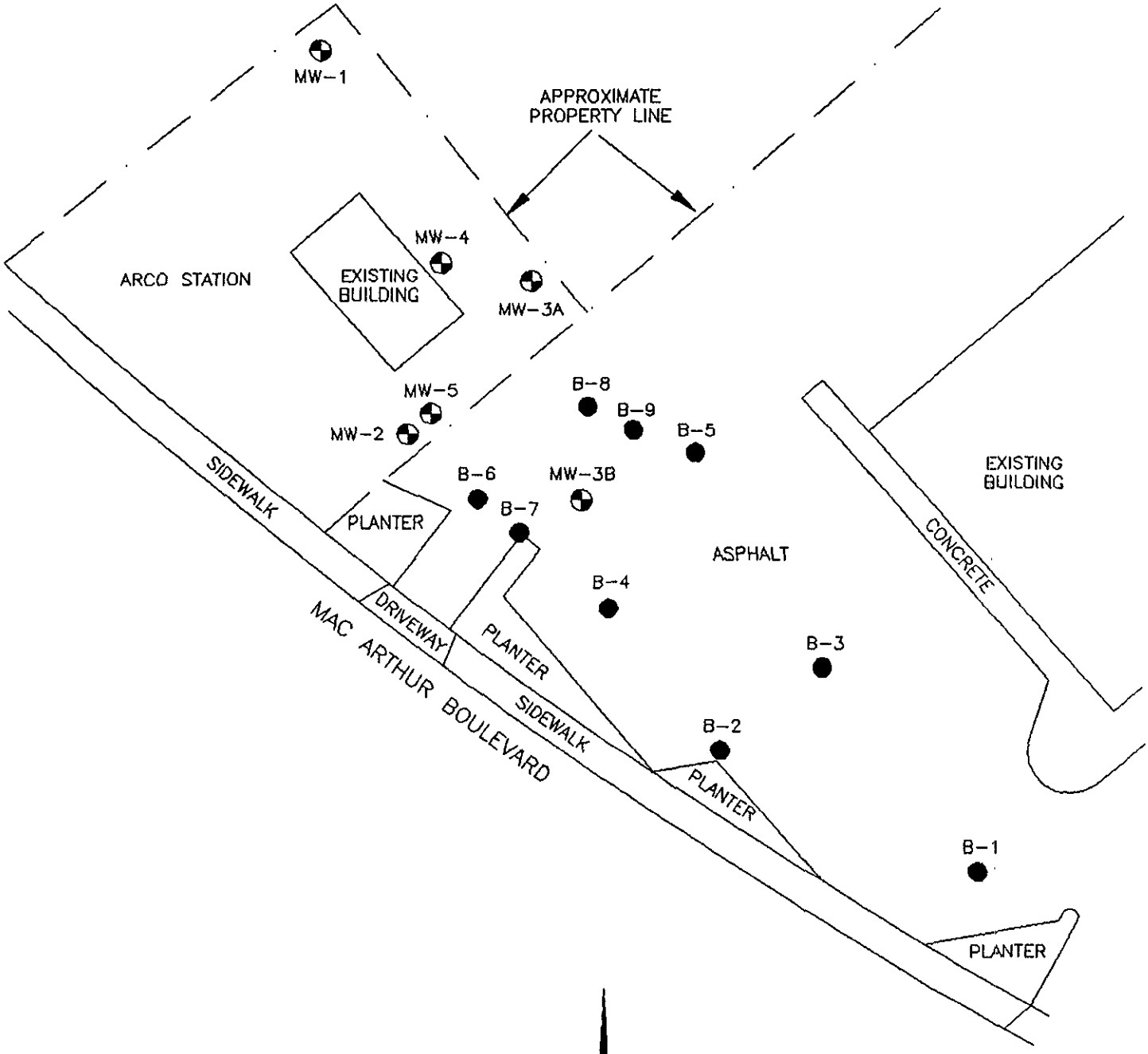
MCL: Maximum Contamination Level for Secondary Drinking Water Standards established under Titel 40, Code of Federal Regulations Part 143 and Title 22, California Administrative Code Ssection 6445.1.

COS: Range of Concentration Of Significant as reported in United States Geological Survey Water-Supply Paper 2220, page 65, 1983.

*: No maximum contaminat level value established for this constituent.

+: Signifies mineral constituent which exceeds or is within the range of maximum contaminant levels established for secondary drinking water standards, or the concentration considered significant by USGS Water-Supply Paper 2220.

NA: Regulatory information not applicable/available.




MW-5 ⊕ = Approximate location of ground-water monitoring well

B-9 ● = Approximate location of soil boring

Source: Surveyed by Ron Archer Civil Engineer, Inc.

N

Approximate Scale

50 25 0 50 100

feet

Applied GeoSystems

PROJECT NO. 19011-1

**GENERALIZED SITE PLAN**
**ARCO Station No. 276**
**10600 Mac Arthur Boulevard**
**Oakland, California**

**PLATE**
**1**

**SUMMARY REPORT**
Third Quarter 1990

**ARCO Service Station 276**
**10600 MacArthur Boulevard**
**Oakland, California**
**Alameda County**

## BACKGROUND

For site history prior to 1990 refer to the October-December 1989 Quarterly Summary Report issued in January 1990.

- February 1990 - tank removal and tank pit soil sampling was performed. Applied GeoSystems drilled three exploratory soil borings in the area of the new tank pit (Plate 1) and collected soil samples from the borings. Aeration of soil excavated from the former tank pit was also performed in February 1990.

- A pilot study and initial design of a soil vapor extraction system to be used for removing onsite and offsite hydrocarbon compounds from the unsaturated zone was performed by Pacific Environmental Group during the first quarter of 1990.

- August 1990 - the draft report for quarterly monitoring for the fourth quarter 1989 and the first and second quarters 1990 were submitted to ARCO for their review and comment.

- October 1990 - the draft report of the offsite subsurface investigation in the Foothill Square Shopping Center parking lot was submitted to ARCO for their review and comment.

- A draft report summarizing tank removal and soil aeration activities at the site is currently going through AGS in-house technical review and will be sent to ARCO shortly.

- The draft report for quarterly monitoring for the third quarter 1990 has been written and is currently undergoing AGS in-house technical review.

## SOIL CONDITIONS

Offsite Soil Sampling Results Summary. Plate 1 shows the locations of the nine offsite soil borings B-1 through B-9. Refer to Tables 1 and 2 for results of laboratory analysis of soil samples collected offsite at the Foothill Square Shopping Center parking lot. A total of 43 samples were analyzed, and 10 of these samples showed detectable concentrations of petroleum hydrocarbons. Petroleum hydrocarbons were found to be present 20 feet or more below ground surface in six of the nine soil borings; but no contamination was detected above 20 feet. Two borings B-6 and B-7, located about 50 feet and 65 feet southeast of the ARCO station building respectively, showed elevated levels of TPHg, TPHd, and BTEX. Elevated TPHg concentrations were detected in boring B-6 at 1,400 ppm and at a depth of 26-1/2 feet; and in boring B-7 at 530 ppm at a depth of 21 feet. TPHd of 320 ppm was also present in the B-6 sample taken at 26-1/2 feet. BTEX in soil samples from B-6 and B-7 ranged from ND to 63 ppm.

Onsite Soil Sampling Results Summary. Plate 2 shows the locations of the onsite soil sampling locations. Samples were taken in soil borings, at the walls and bottoms of the excavated tank pits, in stockpiled soil from the excavated UST pit, beneath the product lines, in the new tank pit, and from soil stockpiles from the new tank pit. Tables 3 through 8 report the results of onsite soil sampling. TPHg in soil samples ranged from nondetectable to 610 ppm. Soil samples having TPH concentrations greater than 100 ppm were aerated on plastic liners until concentrations were less than 100 ppm, and then disposed to a Class III landfill.

## QUARTERLY GROUND-WATER MONITORING

No change from last quarter. Monitoring well MW-2 continues to collect free product which is removed on a regular basis. Refer to Table 9 for results of laboratory analyses of water samples collected from wells MW-1 through MW-5 at the site.

## STATUS SUMMARY: REMEDIATION

Contaminated soil excavated from the former tank pit was aerated and then removed to a Class III landfill.

## ANTICIPATED WORK FOR THE NEXT QUARTER

- Submit report summarizing tank removal and soil aeration activities at the site to Regional Water Quality Control Board and Alameda County Health Agency (ACHA).

- Preliminary design of offsite soil vapor extraction system. Following completion of the offsite vapor extraction, the system will be installed to address onsite hydrocarbon vapors in the unsaturated zone.

- Continue quarterly monitoring and reporting.

TABLE 1
ANALYTICAL RESULTS OF SOIL SAMPLES
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(Page 1 of 3)

| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|
| S-16.5-B1 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B1 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24.0-B1 | <1 | <10 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-29.0-B1 | 2.3 | NA | 0.27 | 0.087 | 0.054 | 0.15 |
| S-06.5-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24.0-B2 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-24/26-B2 | NA | <10 | NA | NA | NA | NA |
| S-29.0-B2 | <1 | NA | <0.005 | <0.005 | <0.005 | <0.005 |
| S-11.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B3 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-29.0-B3 | <1 | NA | <0.005 | <0.005 | <0.005 | <0.005 |
| S-06.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B4 | 4 | <10 | 0.41 | 0.07 | 0.08 | 0.16 |
| S-29.0-B4 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-06.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.5-B5 | <1 | NA | 0.032 | <0.005 | <0.005 | <0.005 |
| S-29.0-B5 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |

See notes on page 3 of 3.

TABLE 1
ANALYTICAL RESULTS OF SOIL SAMPLES
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(Page 2 of 3)

| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|
| S-06.5-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.5-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.5-B6 | <2.0 | NA | 0.22 | 0.14 | 0.13 | 0.56 |
| S-26.5-B6 | 1400 | 320 | <2 | 19 | 12 | 63 |
| S-29.0-B6 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.0-B7 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B7 | 530 | NA | 1.1 | 5.8 | 5.8 | 30 |
| S-26.0-B7 | <2.0 | NA | 0.084 | <0.050 | <0.050 | <0.050 |
| S-31.0-B7 | 15 | NA | 0.61 | 0.57 | 0.24 | 0.92 |
| S-36.0-B7 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B8 | <2.0 | NA | 0.18 | <0.050 | 0.72 | <0.050 |
| S-23.0-B8 | <2.0 | NA | 0.11 | <0.050 | <0.050 | 0.075 |
| S-26.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-31.0-B8 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-16.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-21.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-26.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |
| S-31.0-B9 | <2.0 | NA | <0.050 | <0.050 | <0.050 | <0.050 |

See Notes on Page 3 of 3.

TABLE 1
ANALYTICAL RESULTS OF SOIL SAMPLES
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(Page 3 of 3)

| Sample ID | TPHg | TPHd | B | T | E | X |
|---|---|---|---|---|---|---|

Results are in parts per million (ppm).
TPHg = Total petroleum hydrocarbons as gasoline.
TPHd = Total petroleum hydrocarbons as diesel.
B = Benzene T = Toluene E = Ethylbenzene X = Total xylenes
NA = Not analyzed
< = Below the reporting limits of the analysis.
Sample designation: S-31.0-B9
- S = Soil sample
- 31.0 = Sample depth in feet
- B9 = Boring number

TABLE 2
COMPOUNDS DETECTED IN SOIL SAMPLES
FOR VOC ANALYSIS
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(August 1989)

| Sample | Compound | Amount Detected | |
|---|---|---|---|
| B-4 | Benzene | 0.220 | |
| | Toluene | 0.040 | |
| | Ethylbenzene | 0.043 | |
| | Total Xylenes | 0.100 | |
| | * unknown | 0.070 | |
| | * 2,3-dimethylbutane | 0.070 | compound of gasoline |
| | * unknown | 0.060 | |
| | * 1-ethyl-2-methylbenzene | 0.030 | " |
| | * 1,3,5-trimethylbenzene | 0.040 | |
| B-5 | Benzene | 0.007 | |
| B-6 | Benzene | 5 | |
| | Toluene | 20 | |
| | Ethylbenzene | 16 | |
| | Total Xylenes | 88 | |
| | * unknown | 110 | |
| | * unknown | 100 | |
| | * methylcyclohexane | 30 | |
| | * 1-ethyl-2-methylbenzene | 40 | |
| | * 1,3,5-trimethylbenzene | 60 | |

Results are in parts per million (ppm).
* = Tentatively Identified Compounds (TICs).
All samples obtained at 26-1/2 feet below surface grade.

TABLE 3
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM BORINGS TPB-1 THROUGH TPB-3
ARCO Station 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.
< = Below the reporting limits of the analysis.
Sample designation: S-20-TPB3
- S: Soil sample
- 20: Sample depth in feet
- TPB3: Boring number

TABLE 4
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM ORIGINAL UST PIT
ARCO Station 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.
< = Below the reporting limits of the analysis.
Sample designation: S-13-TP2BN-9
- S = Soil sample
- 13 = Sample depth in feet
- TP2BN-9 = Sample location

TABLE 5
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM STOCKPILED SOILS AND PRODUCT-LINE TRENCHES
DURING UST REMOVAL
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

| Sample | TPHg | Benzene | Toluene | Ethylbenzene | Xylenes |
|---|---|---|---|---|---|
| Stockpile | | | | | |
| S-0319-1(A-D) | 9.6 | <0.05 | <0.05 | <0.05 | 0.054 |
| S-0319-2(A-D) | 67 | <0.05 | <0.05 | <0.05 | 1.6 |
| S-0319-3(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.
< = Below the reporting limits of the analysis.
* = Second sample collected due to TPHg concentration >100 ppm.
1(A-D) = Stockpile sample location.
SP4 = Product-line trench sample location.

Sample designation: S-0313-SP8
- S- — Soil sample
- 0313- — Date of sampling
- SP8 — Sample location

TABLE 6
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM THE NEW TANK PIT EXCAVATION
ARCO Station 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 NE | <1.0 | 0.035 | 0.013 | <0.005 | 0.005 |

Results are in parts per million (ppm).
TPHg = Total petroleum hydrocarbons as gasoline.
< = Below the reporting limits of the analysis.

Sample designation: Tank Pit NE
└── Sample location

TABLE 7
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM NEW TANK PIT EXCAVATION STOCKPILED SOILS
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(Page 1 of 2)

| Sample | TPHg | Benzene | Toluene | Ethylbenzene | Xylenes |
|---|---|---|---|---|---|
| S-SP1-1(A-D) | 49 | <0.1 | <0.1 | <0.1 | 0.69 |
| S-SP1-2(A-D) | 40 | <0.1 | <0.1 | <0.1 | 0.69 |
| S-SP1-3(A-D) | 9.0 | <0.05 | <0.05 | <0.05 | 0.13 |
| S-SP1-4(A-D) | 33 | <0.1 | <0.1 | <0.1 | 0.45 |
| S-SP1-5(A-D) | 25 | <0.2 | 4.9 | <0.2 | 0.34 |
| S-SP1-6(A-D) | 13 | <0.05 | <0.05 | <0.05 | 0.13 |
| S-SP1-7(A-D) | 43 | <0.05 | 0.093 | 0.095 | 0.39 |
| S-SP1-8(A-D) | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-SP1-9(A-D) | 1.2 | <0.005 | <0.005 | <0.005 | <0.021 |
| S-SP1-10(A-D) | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-SP1-11(A-D) | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-SP1-12(A-D) | 30 | <0.05 | <0.05 | 0.16 | 0.11 |
| S-SP2(A-D) | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-SP3(A-D) | 16 | <0.05 | <0.05 | <0.05 | 0.13 |
| S-SP4(A-D) * | 610 | <0.5 | <0.5 | 3.1 | 25 |
| S-SP4(A-D) * | 120 | <0.2 | 1.8 | 0.7 | 6.7 |
| S-SP4(A-D) * | <2.0 | <0.05 | <0.05 | <0.05 | <0.05 |
| S-SP5(A-D) | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-SP6(A-D) | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-SP6(E-H) | <1.0 | <0.005 | <0.005 | <0.005 | <0.005 |
| S-SP7(A-D) | 34 | <0.05 | 0.16 | 0.082 | 2.4 |
| S-SP8(A-D) | 66 | 0.20 | 1.1 | 0.54 | 3.2 |

See notes on Page 2 of 2.

TABLE 7
ANALYTICAL RESULTS OF SOIL SAMPLES
FROM NEW TANK PIT EXCAVATION STOCKPILED SOILS
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(Page 2 of 2)

| Sample | TPHg | Benzene | Toluene | Ethylbenzene | Xylenes |
|---|---|---|---|---|---|

Results are in parts per million (ppm).
TPHg = Total petroleum hydrocarbons as gasoline.
< = Below the reporting limits of the analysis.
* = Samples collected on later dtes (5/9, 5/17, and 5/25) due to TPHg concentration > 100 ppm.

Sample designation: S-SP8(A-D)
- S = Soil sample
- SP8 = Stockpile location
- A-D = Sample location

TABLE 8
ANALYTICAL RESULTS OF ORGANIC LEAD IN SOIL
FROM NEW TANK PIT EXCAVATION STOCKPILED SOILS
ARCO Station 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) | | |

TABLE 9
CUMULATIVE RESULTS OF LABORATORY ANALYSIS OF WATER SAMPLES
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(Page 2 of 3)

| Date/Well | TPHg | TPHd | B | T | E | X | TOG |
|---|---|---|---|---|---|---|---|
| MW-1 | | | | | | | |
| 04/24/89 | <50 | NA | <0.50 | <0.50 | <0.50 | <0.50 | NA |
| 10/13/89 | <20 | NA | <0.50 | <0.50 | <0.50 | <0.50 | NA |
| 02/01/90 | 91 | NA | <0.30 | <0.30 | <0.30 | 0.36 | NA |
| 07/31/90 | <20 | NA | <0.50 | <0.50 | <0.50 | <0.50 | NA |
| MW-2 | | | | | | | |
| 04/24/89 | 165,000 | NA | 13,000 | 21,000 | 2,100 | 12,700 | NA |
| 10/13/89 | | FLOATING PRODUCT | | | | | |
| 02/01/90 | | SHEEN PRESENT | | | | | |
| 07/31/90 | 240,000 | NA | 14,000 | 24,000 | 3,000 | 17,000 | NA |
| MW-3 | | | | | | | |
| 04/24/89 | 560 | NA | 0.54 | 0.75 | <0.50 | <0.50 | NA |
| 10/13/89 | 450 | NA | <0.50 | <0.50 | <0.50 | <0.50 | NA |
| 02/01/90 | 360 | NA | <0.30 | <0.30 | <0.30 | 0.85 | NA |
| 07/31/90 | 440 | NA | <0.50 | <0.50 | <0.50 | <0.50 | NA |
| MW-4 | | | | | | | |
| 04/24/89 | 2,500 | NA | 270 | 1.4 | <0.50 | 85 | NA |
| 10/13/89 | 760 | NA | 0.86 | <0.50 | 1.2 | <0.50 | NA |
| 02/01/90 | 680 | NA | <0.30 | <0.30 | <0.30 | 1.6 | NA |
| 07/31/90 | 470 | 240 | <0.50 | <0.50 | <0.50 | <0.50 | <5,000 |
| MW-5 | | | | | | | |
| 04/24/89 | 130 | NA | 0.67 | <0.50 | <0.50 | <0.50 | NA |
| 10/13/89 | 75 | NA | <0.50 | <0.50 | <0.50 | <0.50 | NA |
| 02/01/90 | 81 | NA | 0.94 | 0.88 | <0.30 | 1.8 | NA |
| 07/31/90 | 110 | NA | <0.50 | <0.50 | <0.50 | <0.50 | NA |

See Notes on Page 2 of 3.

TABLE 9
CUMULATIVE RESULTS OF LABORATORY ANALYSIS OF WATER SAMPLES
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(Page 2 of 3)

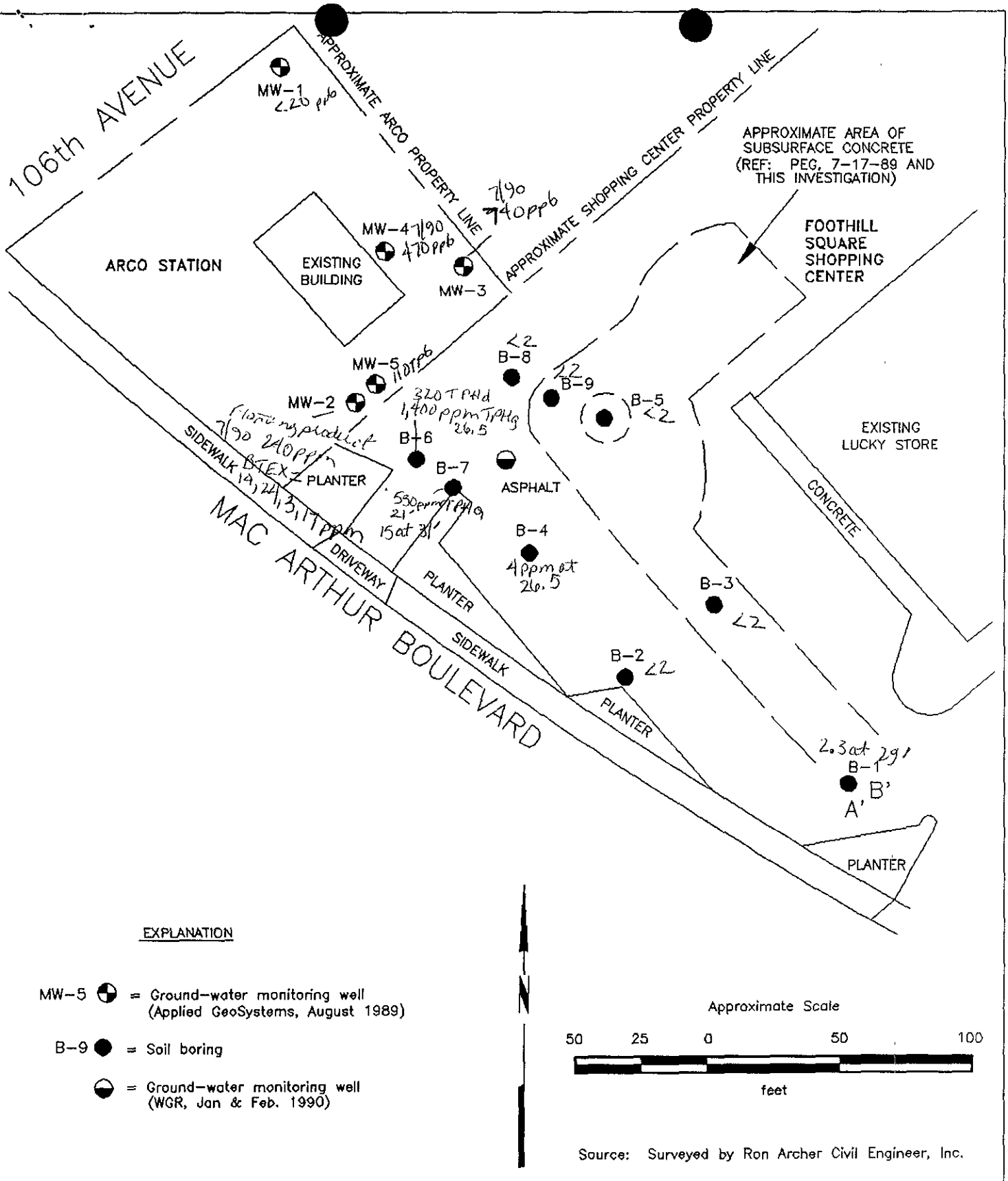
| Date/Well | TPHg | TPHd | B | T | E | X | TOG |
|---|---|---|---|---|---|---|---|

Results in micrograms per liter (ug/L) = parts per billion (ppb).
TPHg: Total petroleum hydrocarbons as gasoline by EPA method 8015.
TPHd: Total petroleum hydrocarbons as diesel by EPA method 3550/3510.
B: Benzene, T: Toluene, E: Ethlybenzene, T: Total Xylene isomers
BTEX: Measured by EPA method 8020/602.
TOG: Measured by Standard Method 503A/E.
<: Results reported as less than the detection limit.
NA: Not analyzed

TABLE 9
CUMULATIVE RESULTS OF LABORATORY ANALYSIS OF WATER SAMPLES
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California
(Page 3 of 3)

| Date/Well | HALOGENATED VOLATILE ORGANICS | Amount Detected |
|---|---|---|
| MW-4 | | |
| 07/31/90 | Trichloroethene | 7.5 |
| | Tetrachloroethene | 1600 |

Results in micrograms per liter (ug/L) = parts per billion (ppb).
Halogenated Volatile Organics: Measured by EPA method 601/8010.
Compounds not shown not detected.
NA: Not analyzed




EXPLANATION

MW-5 = Ground-water monitoring well (Applied GeoSystems, August 1989)

B-9 = Soil boring

= Ground-water monitoring well (WGR, Jan & Feb. 1990)

N

Approximate Scale

50 25 0 50 100

feet

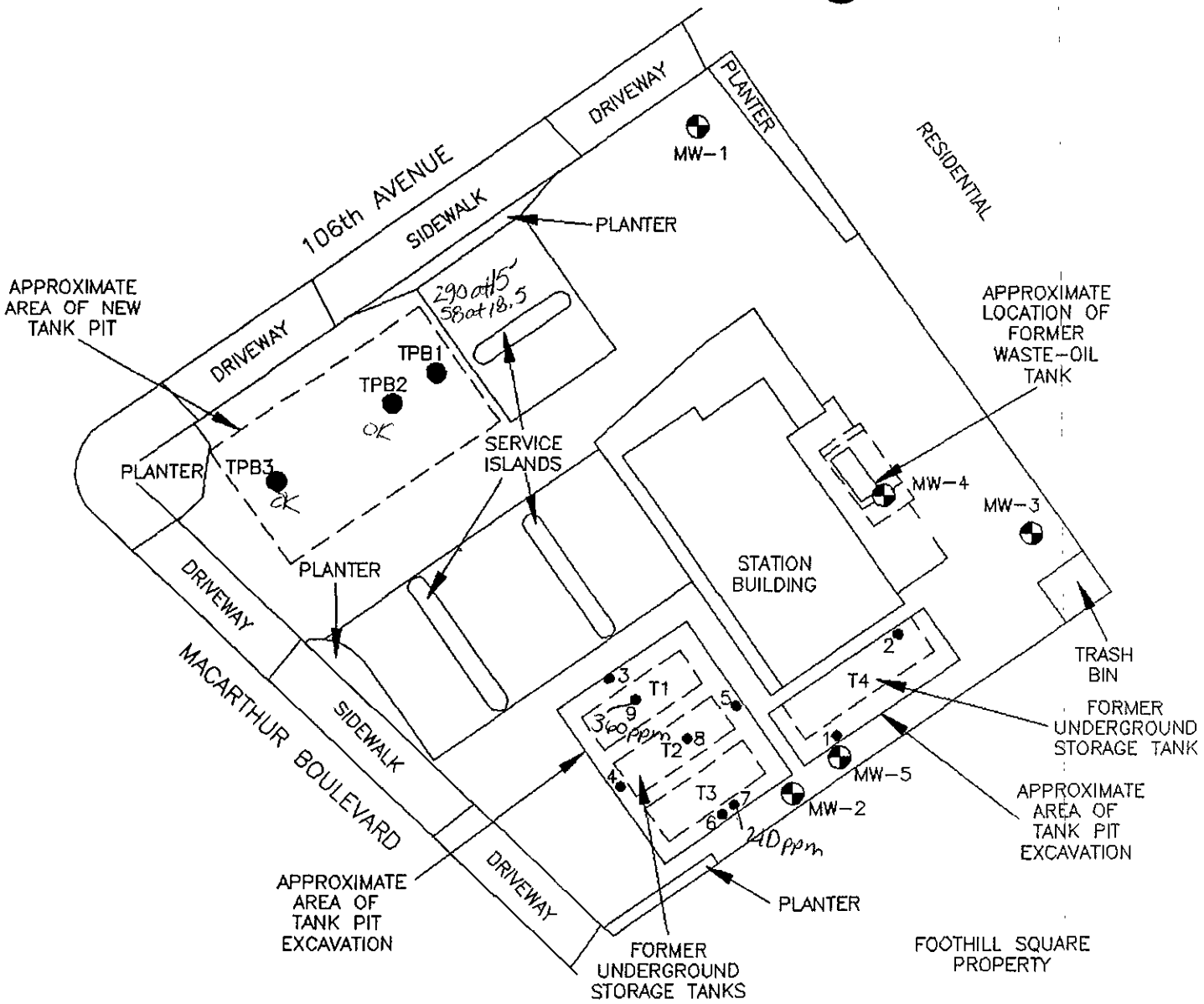
Source: Surveyed by Ron Archer Civil Engineer, Inc.

Applied GeoSystems

PROJECT 19011-1

**GENERALIZED SITE PLAN**
**ARCO Station 276**
**10600 Mac Arthur Boulevard**
**Oakland, California**

**PLATE**
**1**




EXPLANATION

MW-5 ⊕ = Monitoring well

TPB3 ● = Proposed tank pit location

9 • = Former tank pit soil sampling point

N

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 19011-1

**GENERALIZED SITE PLAN**
**ARCO Station No. 276**
**10600 MacArthur Boulevard**
**Oakland, California**

**PLATE 2**