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

• FREMONT • COSTA MESA • SACRAMENTO • HOUSTON

REPORT
INSTALLATION OF TEMPORARY RECOVERY WELL, PERIODIC MONITORING, AND REMEDIATION OF GROUND WATER
at
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

AGS Job No. 18034-2A
8-17-88

Report prepared for

Exxon Company, U.S.A.
P.O. Box 4415
Houston, Texas

by
Applied GeoSystems

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Project Geologist

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G.E. 2023

August 17, 1988

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For: Exxon Company, U.S.A.

INTRODUCTION

This report describes the activities performed during July and early August 1988 which are part of continuing work to monitor and remediate hydrocarbon contamination of ground water at the above-referenced site. The work is being conducted for Exxon Company U.S.A., to monitor the migration of gasoline hydrocarbon contaminants in ground water, treat the ground water, and monitor the gasoline hydrocarbon concentrations of treated water that is discharged into the sanitary sewer.

The work conducted includes 1) drilling one borehole at the site and installing a temporary ground-water recovery well in the borehole, 2) purging, sampling, and analyzing ground water from the existing wells, and 3) sampling and analyzing effluent from

the ground-water treatment system that is currently operating at the site. The report also presents the results of laboratory analyses of soil and water sampling, our interpretations of the chemical data, and our conclusions.

LOCATION AND BACKGROUND

Exxon Station No. 7-3399 is located at 2991 Hopyard Road in Pleasanton, California. The station is situated on the southeast corner of the intersection of Hopyard Road and Valley Avenue. The location of the site is shown on the Site Vicinity Map, Plate P-1. The station was temporarily closed on July 15, 1988, to remove underground gasoline storage tanks and remodel station facilities. The work also included excavating and treating hydrocarbon-contaminated soil. The former station facilities are described in Applied GeoSystems' previous reports (No. 018034-1, dated April 22, 1988, and No. 18034-2, dated July 15, 1988). The relative locations of these facilities are shown on the Generalized Site Plan, Plate P-2.

Applied GeoSystems conducted two previous investigations at the site to evaluate the extent and magnitude of hydrocarbon contamination in the ground water and the effect contamination might

have on nearby water-supply well No. 7 operated by the City of Pleasanton. During these investigations, we installed ground-water monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5d, MW-5s, and MW-6 for ground-water monitoring and recovery purposes. The locations of these wells are shown on the Generalized Site Plan.

SOIL BORING, WELL INSTALLATION, AND WELL DESTRUCTION

Location of Well

A temporary ground-water recovery well was installed at the request of Exxon because well MW-2, which was the preferred recovery well, was located in an area that was to be excavated. The location of the new well was selected to avoid drawing contaminated ground water toward municipal well No. 7 and potential damage to the well and remediation system from the planned excavation of the tank pit.

Drilling of Boring B-7

Drilling and well construction took place on July 11 and 12, 1988. Borehole B-7 was drilled with a Mobile B-57 truck-mounted drill rig operated by Datum Exploration, Inc., of Pittsburg,

California. Steam-cleaned, 7-1/4-inch-diameter, continuous-flight, hollow-stem augers were used to drill the borehole to a depth of 57 feet. The hole was then reamed with 10-inch-diameter augers to allow 4-inch-diameter casing to be installed. Drilling was terminated in a silty clay unit approximately 15 feet below the top of the zone of saturation. Ground water was noted at a depth of 36.5 feet during drilling and later was measured at a depth of approximately 41.47 feet.

Cuttings generated during drilling were stockpiled at the site. This soil will be combined and properly treated with soil excavated from the tank pit.

Sampling and Description of Soil

Soil samples for analysis and identification were collected at 5-foot intervals from the 5-foot depth to the total depth of the borehole. The augers were advanced to a point immediately above the sampling depth, and a California-modified, split-spoon sampler (2-1/2-inch inside diameter) containing three 6-inch-long brass sleeves was driven into the soil through the hollow center of the auger. The sampler was driven 18 inches with a standard 140-pound hammer repeatedly dropped 30 inches. The number of

blows to drive the sampler each 6-inch increment was counted and recorded to evaluate the relative consistency of soil materials.

The samples were removed from the sampler, and the soil in the brass sleeve from the maximum depth of each sample interval was tested with an organic vapor meter (OVM) to evaluate relative vapor concentrations of the samples. Readings were collected by placing the rubber cup that skirts the intake probe flush with the soil at the top of the sleeve. The OVM readings indicate relative organic vapor concentrations but cannot be used to measure the concentrations of hydrocarbon contaminants in the soil directly. One vapor reading of 450 parts per million (ppm) was encountered in the sample collected from the 20-foot depth, and may be from hydrocarbons that were concentrated in the organic material found in the sample (see Boring Log). No other samples measured contained a vapor concentration greater than 40 ppm.

Soil from each sample interval was removed from the two remaining sleeves and identified using the Unified Soil Classification System. A summary of this system is presented on Plate P-3. Descriptions of the earth materials encountered in the borehole are shown on the Logs of Boring (Plates P-4 and P-5). The number

of hammer blows required to drive the sampler a depth of 1 foot (the last two 6-inch increments) and the OVM readings are also indicated on these logs.

Sediments encountered during drilling were predominantly units of relatively impermeable, silty clay and clayey silt to an approximate depth of 36.5 feet. A lens of clayey gravel was found from 6 to 8 feet below the ground surface. The silty clay is underlain by sandy gravel and gravelly sand to a depth of approximately 53.5 feet, and silty clay was found from 53.5 feet to the total depth of the borehole at 57 feet.

Construction and Development of Monitoring Well MW-7

Ground-water monitoring well MW-7 was constructed in boring B-7. The well was constructed of 4-inch-diameter, Schedule 40 polyvinyl chloride (PVC) casing. The casing consists of perforated sections with 0.020-inch-wide slots which were set from approximately 53 to 28 feet below the ground surface. Blank casing was set from the top of the screen to a few inches below the ground surface. All casing joints are flush-threaded; no glues, chemical cements, or solvents were used in well construction. The top of the casing is not covered to allow

access to the recovery pump and discharge line. If not in use, the casing is plugged with a locked cap that contains an expandable rubber seal. The bottom of the casing has a threaded end plug.

The annular space of the well was backfilled with No. 3 sized sand from the total depth of the well to the 25-foot depth (3 feet above the top of the screened casing). A bentonite pellet plug, approximately 1 foot thick was placed above the sand as a seal against cement entering the sand pack. The remaining annulus of the well was backfilled with neat cement (mixed with approxi- mately 5 percent bentonite powder) to a few inches below grade. A graphic representation of the well construction is shown in the right columns of the boring logs, and a key to the symbols used to illustrate the well construction is shown on Plate P-3.

A cast-aluminum utility box with a PVC apron was placed over the well head and secured in place with concrete set flush with the surrounding ground surface. The utility box has a watertight seal to protect the ground-water well from infiltration of surface water; the box requires a specially designed wrench to

open. The utility box is designed to discourage vandalism and reduce the possibility accidental disturbance of the well.

Well MW-7 was developed on July 12 by purging with a 9-foot-long, 3-1/2-inch-diameter bailer and a Smeal rig operated by Datum Exploration. Approximately 275 gallons of fluid were bailed from the well and placed in 55-gallon drums. Development was conducted to remove the fine-grained sediment from the well and pack the annular sand.

Destruction of Well MW-2

Well MW-2 was destroyed on July 12, 1988, because the planned excavation of the underground gasoline storage tanks and hydrocarbon-contaminated soil would include the area where well MW-2 was located. Datum Exploration was subcontracted to overdrill the well using 10-inch-diameter augers to the total depth of 57 feet and remove the casing. The sand and gravel of the uppermost aquifer was allowed to slough into the hole to the 42-foot depth, and a mixture of neat cement and bentonite was placed from this depth to the ground surface.

INSTALLATION OF TREATMENT SYSTEM

The treatment system used for the pump test of well MW-2 was disassembled, moved to the location of well MW-7, and reassembled on July 13 and 14, 1988. A trench was also dug between the fence surrounding the remediation system and the station building. A 4-inch-diameter plastic pipe containing the electrical and effluent discharge lines was placed in the trench to avoid damage to these lines from traffic related to the planned excavation and construction work at the site. The pump in well MW-7 was started at approximately 6:30 p.m. on July 14. Representatives of the City of Pleasanton and the Dublin-San Ramon Services District (DSRSD) were verbally notified at approximately 2:00 p.m. on July 14 that pumping would begin.

The remediation system is the same as used during a pump test of well MW-2 on June 23 and 24, 1988 (Applied GeoSystems Report No. 18034-2). This system includes a 250-gallon oil/water separator tank followed by two 1,000-pound carbon filtration units connected in series. The oil/water separator is intended to remove sediment and any free-floating product that may be pumped, and the carbon units are used to remove dissolved hydrocarbons to a level below the maximum concentrations allowed by the DSRSD for

discharge to the sanitary sewer. Two sump pumps are installed in the oil/water separator tank to pump fluids through the carbon filtration units. The treatment system also includes one flow meter and fluid sampling ports placed between the separator and first carbon unit, between the first and second carbon units, and after the second carbon unit.

Operation of the remediation system was interrupted from July 18 to 20, 1988, when shoring being driven to allow deeper excavation in the tank pit broke the onsite sewer line near the gasoline dispenser island. An additional trench, plastic pipe, sewer fittings, and a concrete utility box were installed to redirect effluent into the sewer beyond the point where the sewer line was damaged. The sewer line was broken a second time when removing the shoring on August 5, 1988. Approximately 45 feet of 2-inch-diameter PVC pipe were attached to the discharge hose and run through the onsite sewer line to the junction with the sewer line beneath Hopyard Road. The location of the current remediation system and effluent line is shown on the Generalized Site Plan.

The DSRSD renewed the Wastewater Discharge Permit (No. 5541-001) issued on June 15, 1988. This permit was renewed for July and August by letters to Exxon dated July 1 and 29, 1988,

respectively. Copies of these renewal letters are included in Appendix A to this report.

PERIODIC SAMPLING OF GROUND WATER

A program of monitoring, sampling, and analyzing ground water from the onsite and offsite wells has been performed since early April 1988. The sampling has been conducted for both subjective inspection of fluids in the field and laboratory analysis of water collected from wells after installation. A program of periodic sampling and analysis of water from the wells commenced in July 1988. In addition, a program of sampling and analyzing effluent from the remediation system was begun to evaluate the effectiveness of the treatment process.

Sampling of Wells

Exxon indicated in a letter dated June 17, 1988, to the California Regional Water Quality Control Board that periodic sampling of ground water for analytical testing would be conducted every week for 4 weeks. Subsequent sampling intervals will be selected based on the results of this weekly sampling.

Sampling events were conducted on July 6, 13, 22, and August 5, 1988.

The July 6 and 13 sampling events were performed before the recovery pump was installed in well MW-7, whereas the July 20 and August 5 sampling events were performed after the pump began operating. Sampling was not conducted during the last week of July because the intensive construction activities taking place to excavate the tank pit did not allow access to any onsite monitoring wells. Wells MW-1, MW-3, and MW-4 were not sampled on July 22 because the wells were buried under stockpiled soil, and well MW-6 was not sampled because this well was in a hazardous location relative to moving construction equipment. On August 5, 1988, wells MW-1, MW-3, and MW-4 were buried under the stockpiled soil, and were, likewise, not sampled.

Each visit included sampling for subjective inspection of fluids and purging and sampling the ground water in the wells for laboratory testing. The depth to water in each well was measured to the nearest 0.01-foot with a Solinst electric water-level indicator. Samples were then collected from each well by gently lowering approximately half the length of a Teflon bailer past the air/liquid interface. The bailer was washed with Alconox (a

commercial laboratory soap) and rinsed with deionized water before use in each well. The samples were retrieved and examined for floating product and sheen. None was encountered in water of any well during the July and August sampling events. Cumulative results of these and previous subjective inspections conducted since April 1988 are presented in Table 1 at the end of this report.

The wells were then purged by pumping until temperature, pH, and conductivity (as measured with a thermometer and pH/conductivity meter) were stabilized. These measurements were made to allow sampling of water that was representative of the formation. Purge water was directed into 55-gallon drums (Department of Transportation Type 17E) that are designed to contain liquids. After purging, the water in each well was allowed to recharge to near static level before sampling for laboratory analysis. The water sample from well MW-7 was collected in this manner on July 13, 1988. Water samples were collected from the oil/water separator tank on July 22 and August 5, 1988, because the recovery pump was installed in the well. These last two samples represent fluid exiting the separator tank.

Water samples were collected with a Teflon bailer that was either washed with Alconox and rinsed with deionized water or steam cleaned before use. The bailer was lowered to a point just below the air/water interface in each well to retrieve a sample of the water. The samples were slowly transferred to laboratory-cleaned, 40-milliliter, volatile organic analysis glass sample vials; hydrochloric acid was added to minimize bacterial degradation of any hydrocarbons. The samples were immediately sealed in the vials with Teflon-lined caps, labeled, and placed in iced storage for transport to Applied GeoSystems' laboratory for testing.

Sampling of Effluent

Effluent samples that had passed through the treatment system were collected on July 15, 20, 21, 25, and 26, and August 5, 1988. The July 15 sample was collected from the end of the discharge hose at the sewer cleanout, and the remaining samples were collected from the sampling port located immediately downstream of the second carbon filtration unit.

LABORATORY ANALYSES AND RESULTS

Chain of Custody Records for the water samples were initiated during sample collection and accompanied the samples to Applied GeoSystems' laboratory. Copies of these forms for samples from the ground-water monitoring wells are included in Appendix B and copies for the effluent samples are included in Appendix C.

The water samples were analyzed for total petroleum hydrocarbons by Environmental Protection Agency (EPA) Method 8015, (modified for gasoline) and the hydrocarbon constituents benzene, toluene, ethylbenzene, and total xylene isomers by EPA Method 602. The cumulative analytical results for the ground-water samples are presented in Table 2, and the laboratory reports for the July 13 and 22, and August 5 sampling events are included in Appendix B. The analytical results for the effluent samples are shown in Table 3, and the laboratory reports are included in Appendix C. Tables 2 and 3 are included at the end of this report.

SUMMARY AND CONCLUSIONS

The sediments encountered during drilling boring B-7 are similar to those encountered in the previous eight borings drilled on and

off the site. The information from boring B-7 further supports the conclusion stated in Applied GeoSystems' Report No. 18034-2 that the silty clay units both overlying and underlying the uppermost aquifer are continuous in the area of our investigations.

Floating hydrocarbon product was found in former well MW-2 when the well was installed in April 1988 (see Table 1). As a result of pumping and bailing this well, no product was found after the pump test of June 23 and 24, 1988. Floating product has also not been found in any other of the ground-water monitoring wells installed thus far. In our opinion, floating product probably no longer exists on the ground water beneath the site.

Laboratory analytical results show that no detectable hydrocarbon concentrations were found in water from wells MW-1, MW-3, MW-4, MW-5s, and MW-5d on July 6 and 13. Very low concentrations (less than 0.01 ppm) of the hydrocarbon constituents were found in the water collected from well MW-5s on July 22, 1988. The analytical results, however, show no detectable concentrations of hydrocarbons from water collected during the August 5 sampling event. In our opinion, the hydrocarbons detected in the water sampled on July 22 were a result of introduction by either the

purge pump or sampling equipment and not from vapor or ground-water migration of the contamination found in the area of the tank pit.

The hydrocarbon concentrations in water from well MW-6 have increased since May 1988, but only benzene exists in a concentration that is greater than the maximum concentration for drinking water recommended by the California Department of Health Services. The relatively high ratio of benzene to other constituents in the water samples collected on June 28, July 13, and August 5, 1988, indicates the contamination is probably the result of hydrocarbon vapor transport rather than liquid transport.

Concentrations of hydrocarbons detected in recovery well MW-7 decreased approximately one to two orders of magnitude (for example, TPH decreased from 16.7 to 0.27 ppm) since ground-water recovery started on July 14, 1988. The concentration of total petroleum hydrocarbons in the water was less than 1 ppm on July 22 and August 5, 1988. The magnitude of the decrease was much less from July 22 to August 5 than from July 13 to July 22.

Laboratory analytical results in Table 3 show that no detectable concentrations of hydrocarbons in the effluent samples have been found except on two occasions. On July 22, benzene was found at a concentration equal to the laboratory detection limit (0.0005 ppm), and toluene (0.0010 ppm) and total xylene isomers (0.0036 ppm) were found at concentrations slightly above the laboratory detection limits for those constituents in the water sample collected on July 15, 1988. No detectable hydrocarbons were found in water at the August 5 sampling event. The concentrations of total petroleum hydrocarbons in the effluent have been well below the maximum concentration of 2 ppm stated in the DSRSD Wastewater Discharge Permit.

TABLES

TABLE 1
CUMULATIVE SUBJECTIVE ANALYTICAL RESULTS OF WATER IN WELLS
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 1 of 3)

Well/Boring	Date	Depth to Water	Floating Product	Sheen
MW-1	4/6/88	36.34	None	None
	4/8/88	36.29	None	None
	4/19/88	36.36	None	None
	6/6/88	38.16	None	None
	6/23/88	38.71	None	None
	6/28/88	39.16	--	--
	7/6/88	39.73	None	None
	7/13/88	40.22	None	None
MW-2	4/2/88	--	3.0	Heavy
	4/4/88	--	18.0	Heavy
	4/5/88	--	18.0	Heavy
	4/6/88	39.31	38.4	Heavy
	4/8/88	--*	--*	--*
	4/19/88	38.90	29.76**	Heavy
	6/6/88	38.78	3.12	Heavy
	6/23/88	39.23	1.50	Heavy
	6/28/88	39.72	--	--
	7/6/88	40.31	None	Slight
	7/12/88	Well destroyed due to excavation		
MW-3	4/6/88	37.19	None	None
	4/8/88	37.14	None	None
	4/19/88	37.22	None	None
	6/6/88	39.02	None	None
	6/23/88	39.58	None	None
	6/28/88	40.04	--	--
	7/6/88	40.60	None	None
	7/13/88	41.09	None	None

See notes on page 3 of 3.

TABLE 1
CUMULATIVE SUBJECTIVE ANALYTICAL RESULTS OF WATER IN WELLS
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 2 of 3)

Well/Boring	Date	Depth to Water	Floating Product	Sheen
MW-4	4/8/88	36.41	None	None
	4/19/88	36.51	None	None
	6/6/88	38.26	None	None
	6/23/88	38.83	None	None
	6/28/88	39.28	--	--
	7/6/88	39.85	None	None
	7/13/88	40.31	None	None
B-4	4/2/88	--	None	None
MW-5d	5/25/88	38.55	None	None
	6/6/88	38.90	None	None
	6/23/88	39.56	None	None
	6/28/88	40.23	--	--
	7/6/88	40.69	None	None
	7/13/88	41.22	None	None
MW-5s	5/25/88	38.46	None	None
	6/6/88	38.86	None	None
	6/23/88	39.52	None	None
	6/28/88	39.84	--	--
	7/6/88	40.45	None	None
	7/13/88	40.90	None	None
	7/22/88	41.30	None	None
	8/5/88	23.84▼	None	None
MW-6	5/11/88	37.71	None	None
	6/6/88	38.70	None	None
	6/23/88	39.23	None	None
	6/28/88	39.74	None	None
	7/13/88	40.78	None	None
	8/5/88	41.72	None	None

See notes on page 3 of 3.

TABLE 1
CUMULATIVE SUBJECTIVE ANALYTICAL RESULTS OF WATER IN WELLS
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 3 of 3)

Well/Boring	Date	Depth to Water	Floating Product	Sheen
MW-7	7/13/88	40.50	None	None
	7/22/88	41.85#	None##	None##
	8/5/88	41.45#	None##	None##

Depth to water is in feet below top of casing.
Thickness of floating product is in inches.
-- = Not measured
* = Not measured because of installed product-skimmer pump
** = Thickness of floating product after the well was allowed to recharge for approximately 3 hours.
▾ = Anomalous water level possibly due to recharge from a perched water zone.
= Pumping-water level.
= Water inspected in oil/water separator tank.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 1 of 2)

Date	Sample	B	T	E	X	TPH
Well MW-1:						
4/2/88	W-38-MW1	<0.0005	0.0017	<0.0005	<0.0005	<0.02
7/6/88	W-40-MW1	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-42-MW1	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
Well MW-2:						
7/6/88*	W-41-MW2	5.7	18.5	2.9	21.4	62
Well MW-3:						
4/6/88	W-39-MW3	<0.0005	<0.0005	<0.0005	<0.0005	0.02
7/6/88	W-41-MW3	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-43-MW3	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
Well MW-4:						
4/11/88	W-37-MW4	0.0018	0.0163	0.0006	0.0071	0.08
7/6/88	W-41-MW4	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-42-MW4	<0.0005	0.0009	<0.0005	<0.0005	<0.02
Well MW-5d:						
5/25/88	W-39-MW5a#	<0.0005	0.0031	<0.0005	<0.0005	<0.02
7/6/88	W-41-MW5d	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-43-MW5d	<0.0005	<0.0005	<0.0005	<0.0005	0.04
Well MW-5s:						
5/25/88	W-41-MW5b#	<0.0005	0.0009	<0.0005	<0.0005	<0.02
7/6/88	W-41-MW5s	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/13/88	W-44-MW5s	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/22/88	W-42-MW5s	0.0009	0.0041	0.0013	0.0087	0.05
8/5/88	W-25-MW5s	<0.0005	<0.0005	<0.0005	<0.0005	<0.02

See notes on page 2 of 2.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California
(page 2 of 2)

Date	Sample	B	T	E	X	TPH
Well MW-6:						
5/17/88	W-40-MW6	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
6/28/88	W-38-MW6	0.0318	0.0075	0.0054	0.0067	0.44
7/13/88	W-42-MW6	0.1623	0.0077	0.0225	0.0141	0.29
8/5/88	W-42-MW6	0.2450	0.0052	0.0471	0.0237	1.18
Well MW-7:						
7/13/88	W-34-MW7	0.86	1.91	0.71	4.42	16.7
7/22/88	W-50-MW7	0.136	0.085	0.005	0.058	0.46
8/5/88	W-45-MW7	0.0733	0.0528	0.0023	0.0281	0.27

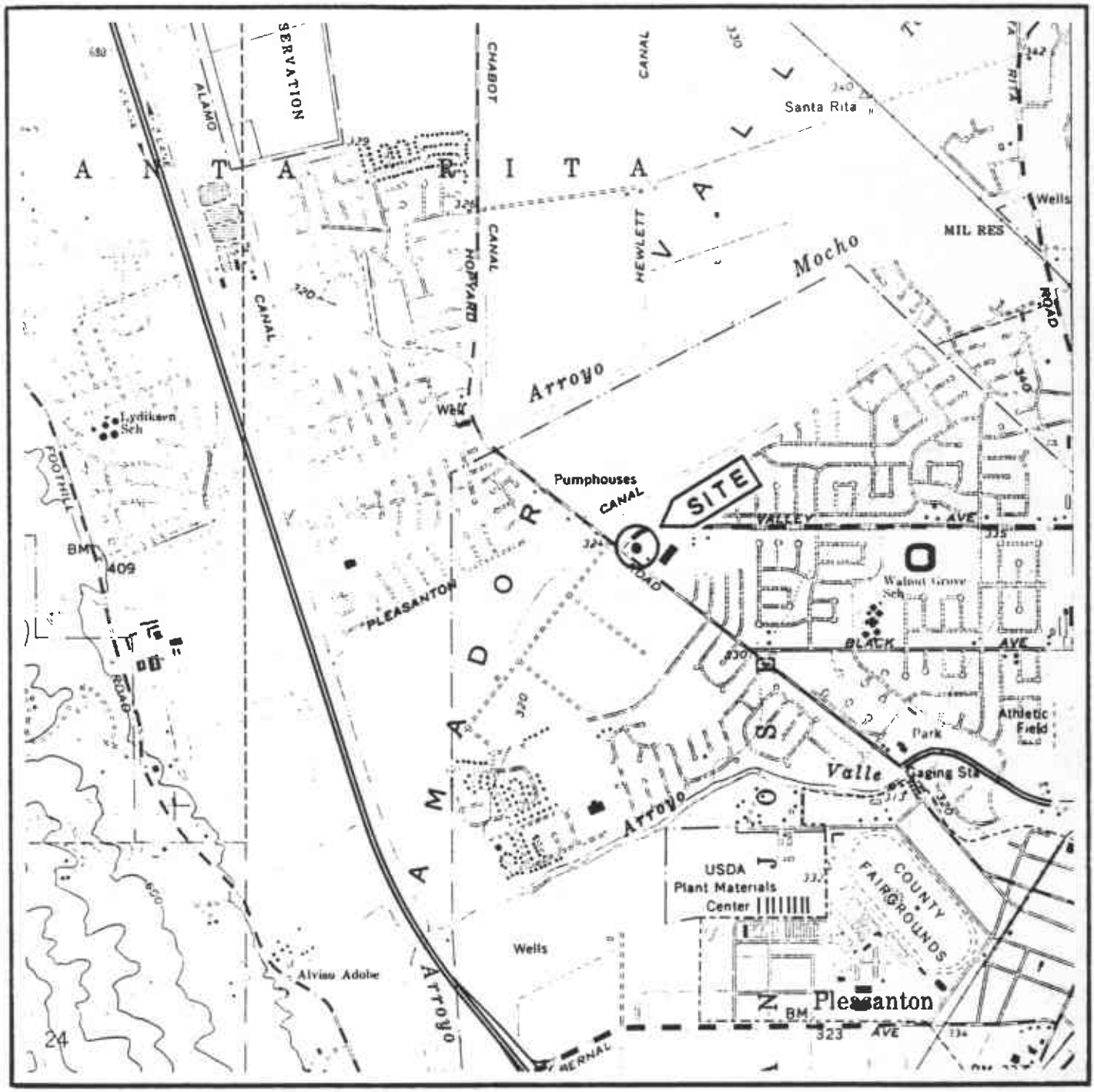
Results in milligrams per liter (mg/L) = parts per million (ppm)
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total xylene isomers
TPH = Total petroleum hydrocarbons (as gasoline)
< = less than the method detection limit of the laboratory
* Well MW-2 was sampled only on July 6, 1988, because this well contained floating product before this date and the well was destroyed on July 12, 1988, due to tank-pit excavation.
# Indicates original designation of wells; MW-5a and MW-5b later changed to MW-5d and MW-5s, respectively.

TABLE 3
ANALYTICAL RESULTS OF TREATED EFFLUENT SAMPLES
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

Date	Sample	B	T	E	X	TPH
7/15/88	W-Effluent	<0.0005	0.0010	<0.0005	0.0036	0.02
7/20/88	W-Effluent20	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/21/88	W-Effluent21	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/25/88	W-Effluent25	<0.0005	<0.0005	<0.0005	<0.0005	<0.02
7/26/88	W-Effluent26	0.0005	<0.0005	<0.0005	<0.0005	<0.02
8/5/88	W-Effluent05	<0.0005	<0.0005	<0.0005	<0.0005	<0.02

Results in milligrams per liter (mg/L) = parts per million (ppm)
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total xylene isomers
TPH = Total petroleum hydrocarbons (as gasoline)
< = less than the method detection limit of the laboratory

PLATES



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

N

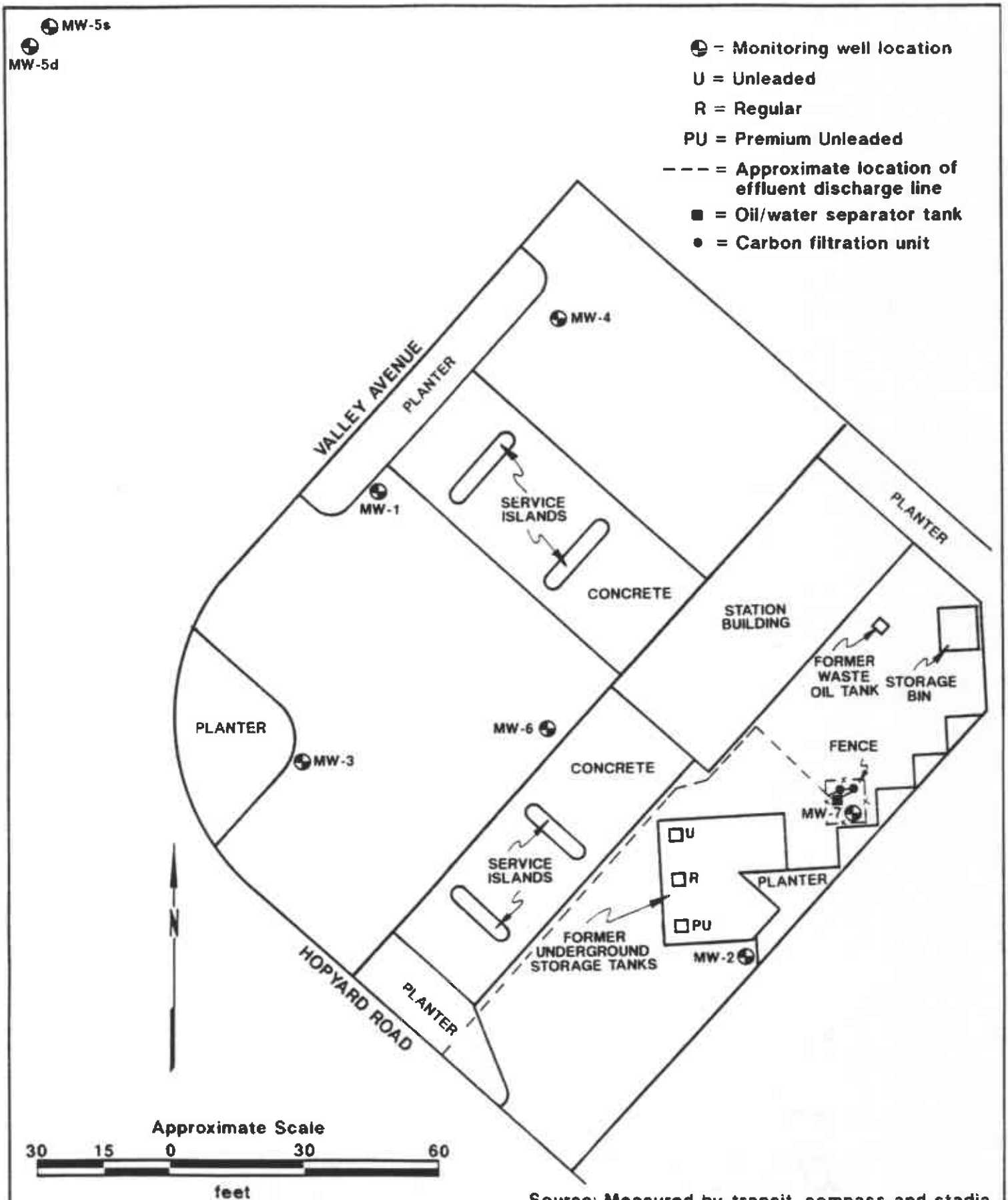
Approximate Scale

2000 1000 0 2000 4000

feet

Applied GeoSystems

PROJECT NO. 18034-2A	**SITE VICINITY MAP** **Exxon Station No. 7-3399** **2991 Hopyard Road** **Pleasanton, California**	PLATE **P - 1**



Source: Measured by transit, compass and stadia

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PROJECT NO. 18034-2A

GENERALIZED SITE PLAN
Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE
P - 2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		LTR	DESCRIPTION	MAJOR DIVISIONS		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 mixture, 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-clay mixtures.			OL	Organic silts and organic silt-clays of low plasticity.
		GC	Clayey gravels, gravel-sand-clay mixtures.		SILTS AND CLAYS LL<50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	SAND AND SANDY SOILS	SW	Well-graded sands 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.
		SM	Silty sands, sand-silt mixtures.	HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils.
		SC	Clayey sands, sand-clay mixtures.				


Depth through which sampler is driven


Relatively undisturbed sample


Missed sample


Ground water level observed in boring

S-10 Sample number

OVM Organic vapor meter


Sand pack


Bentonite annular seal

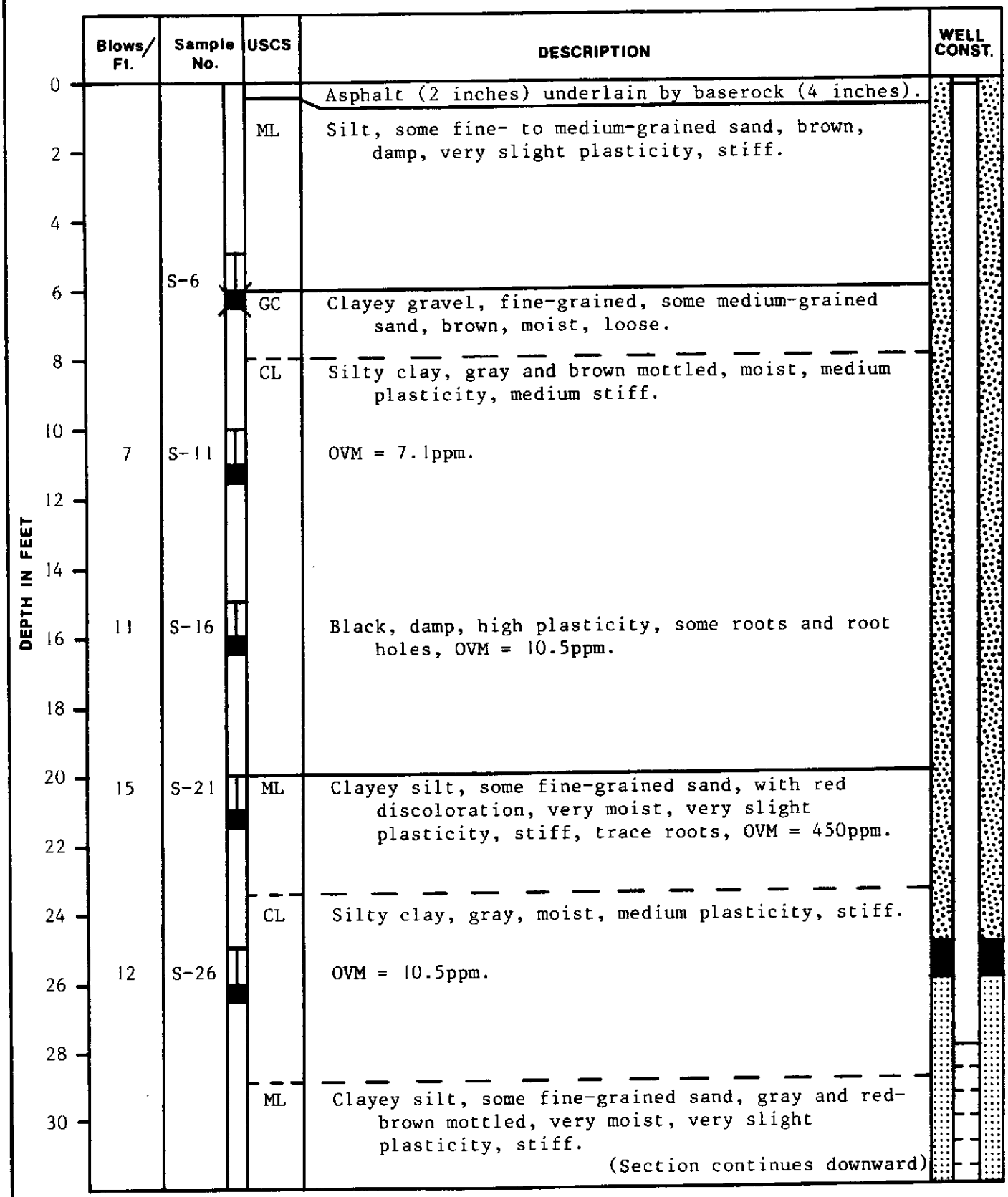

Neat cement annular seal


Blank PVC


Machine-slotted PVC

BLOW/FT. REPRESENTS THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH THE LAST 12 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.



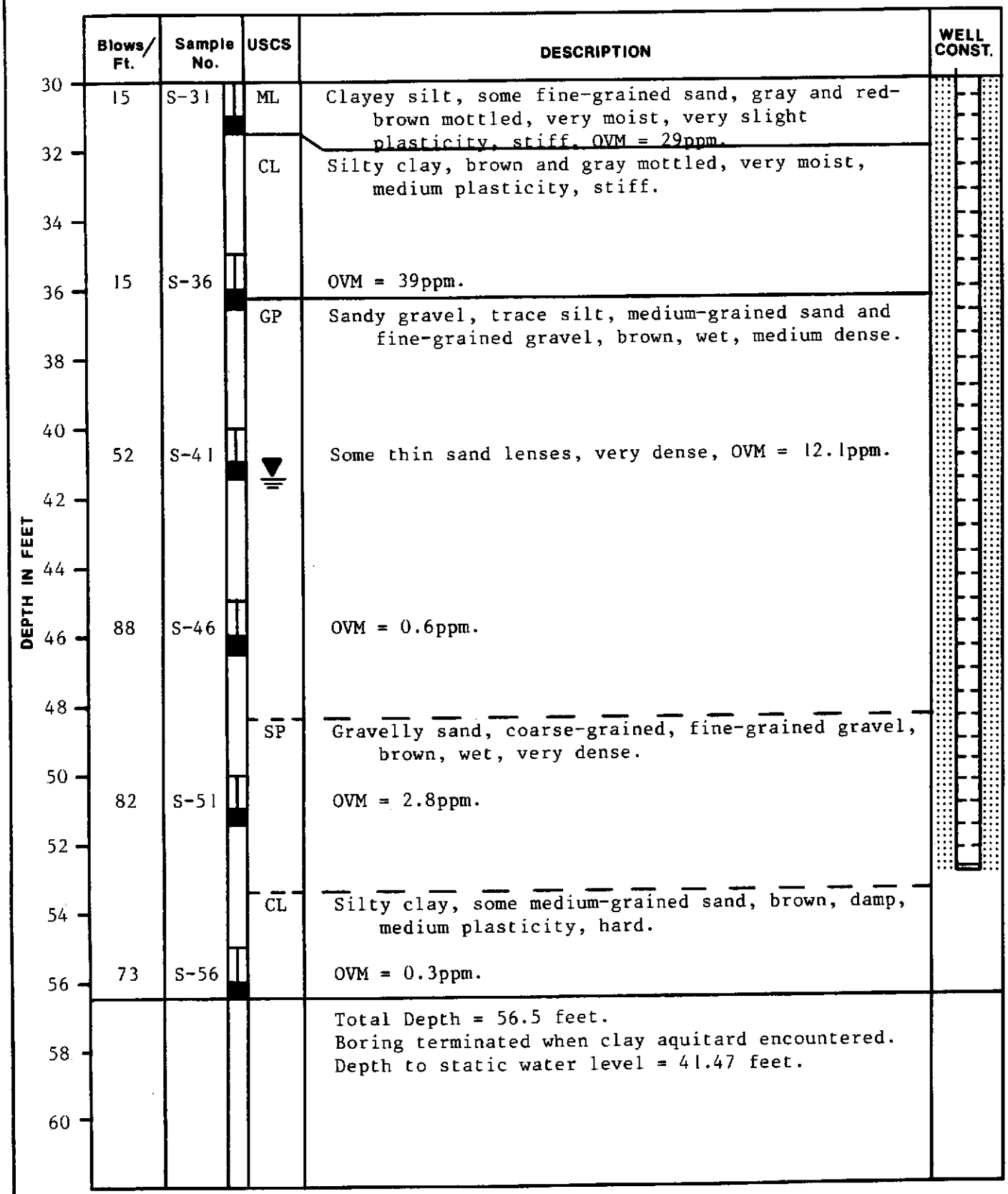
Applied GeoSystems
43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

PROJECT NO. 18034-2A

LOG OF BORING B-7/MW-7

Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE
P - 4



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

PROJECT NO. 18034-2A

LOG OF BORING B-7/MW-7

Exxon Station No. 7-3399
2991 Hopyard Road
Pleasanton, California

PLATE
P - 5

APPENDIX A

DUBLIN SAN RAMON SERVICES DISTRICT

General Offices: 7051 Dublin Boulevard • Dublin, California 94568 • (415) 828-0515

July 1, 1988

Mr. Bob Owens
Exxon Co. U.S.A.
P. O. Box 4415
Houston, Texas 77210-4415

Dear Mr. Owens:

Per your verbal request, a time extension is hereby granted to your Wastewater Discharge Permit No. 5541-001 to be in effect from July 1, 1988 to July 31, 1988.

All conditions of the existing permit shall continue to remain in effect.

Very truly yours,

Robert D. Whitley
District Engineer

RDW:ahn

cc: Greg Zintner, R.W.Q.C.B.
Roger Witham, Applied GeoSystems
Joe Elliott, City of Pleasanton
Bob Swanson, D.S.R.S.D.

DUBLIN SAN RAMON SERVICES DISTRICT

General Offices: 7051 Dublin Boulevard • Dublin, California 94568 • (415) 828-0515

July 29, 1988

Mr. Jim Kerr
Exxon Co. U.S.A.
P.O. Box 4415
Houston, Texas 77210-4415

Dear Mr. Kerr:

Per your verbal request, a time extension is hereby granted to your Wastewater Discharge Permit No. 5541-001 to be in effect from August 1, 1988 to August 31, 1988.

All Conditions of the existing permit shall continue to remain in effect.

Very truly yours,

Barbara Daley for

Robert D. Whitley
District Engineer

RDW:ahn

cc: Mr. Greg Zintner, R.W.Q.C.B.
Mr. Roger Witham, Applied Geosystems
Mr. Joe Elliott, City of Pleasanton
Mr. Bob Swanson, D.S.R.S.D.

APPENDIX B

CHAIN OF CUSTODY RECORD

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

SAMPLER (signature): James Orr
Phone: (415) 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 48 hr.

Project Leader: Rodger Witham
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
James Orr	Rodger C. Witham	7/13/88	6:45 p.m.
	Received for laboratory by:	7/13/89	6:50 pm

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-34-MW7	18034-7	7-12-88	BTEX (602)	Iced + HCl
W-43-MW5d			TPH (8015) as gasoline	
W-44-MW5s				
W-42-MW4				
W-42-MW1				
W-43-MW3				
W-42-MW6				

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-13-88
Laboratory Number: 07022W01
Project: 18034-2
Sample: W-42-MW1
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	07-14-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-14-88	
Toluene		ND		0.0005	07-14-88	
Ethylbenzene		ND		0.0005	07-14-88	
Total Xylenes		ND		0.0005	07-14-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

7-19-88
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-13-88
Laboratory Number: 07022W02
Project: 18034-2
Sample: W-43-MW3
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	07-14-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-14-88	
Toluene		ND		0.0005	07-14-88	
Ethylbenzene		ND		0.0005	07-14-88	
Total Xylenes		ND		0.0005	07-14-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

7-19-88
Date Reported

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ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-13-88
Laboratory Number: 07022W03
Project: 18034-2
Sample: W-42-MW4
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	07-14-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-14-88	
Toluene		0.0009		0.0005	07-14-88	
Ethylbenzene		ND		0.0005	07-14-88	
Total Xylenes		ND		0.0005	07-14-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

7-19-88
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-13-88
Laboratory Number: 07022W04
Project: 18034-2
Sample: W-43-MW5D
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.04		0.02	07-14-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-14-88	
Toluene		ND		0.0005	07-14-88	
Ethylbenzene		ND		0.0005	07-14-88	
Total Xylenes		ND		0.0005	07-14-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

7-19-88
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-13-88
Laboratory Number: 07022W05
Project: 18034-2
Sample: W-43-MW5S
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	07-14-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-14-88	
Toluene		ND		0.0005	07-14-88	
Ethylbenzene		ND		0.0005	07-14-88	
Total Xylenes		ND		0.0005	07-14-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

7-19-88
Date Reported

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ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-13-88
Laboratory Number: 07022W06
Project: 18034-2
Sample: W-42-MW6
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.29		0.02	07-14-88	
TEH as Diesel						NR
Benzene		0.1623		0.0005	07-14-88	
Toluene		0.0077		0.0005	07-14-88	
Ethylbenzene		0.0225		0.0005	07-14-88	
Total Xylenes		0.0141		0.0005	07-14-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

7-19-88
Date Reported

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-13-88
Laboratory Number: 07022W07
Project: 18034-2
Sample: W-34-MW7
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		16.7		0.5	07-14-88	
TEH as Diesel						NR
Benzene		0.86		0.02	07-14-88	
Toluene		1.91		0.02	07-14-88	
Ethylbenzene		0.71		0.02	07-14-88	
Total Xylenes		4.42		0.02	07-14-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

7-19-88
Date Reported

CHAIN OF CUSTODY RECORD

Applied GeoSystems

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

SAMPLER (signature): Tim O'Brien

Phone: 415 651 1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 1 week

Project Leader: Rodger Witham

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
Tim O'Brien	Rodger C. Witham	7/26/88	8:30a.m.
Rodger C. Witham	Received for laboratory by: [illegible]	7-26-88	0900

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-42-MW5S	018034-Z	7-22-88	TPH & BTEX	iced + HCl
W-50-MW7	018034-Z	7-22-88	TPH & BTEX	iced + HCl

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ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-26-88
Laboratory Number: 07055W01
Project: 018034-2
Sample: W-42-MW5S
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.05		0.02	07-27-88	
TEH as Diesel						NR
Benzene		0.0009		0.0005	07-27-88	
Toluene		0.0041		0.0005	07-27-88	
Ethylbenzene		0.0013		0.0005	07-27-88	
Total Xylenes		0.0087		0.0005	07-27-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

8-03-88
Date Reported

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

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-26-88
Laboratory Number: 07055W02
Project: 018034-2
Sample: W-50-MW7
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.46		0.02	07-27-88	
TEH as Diesel						NR
Benzene		0.136		0.002	07-27-88	
Toluene		0.085		0.002	07-27-88	
Ethylbenzene		0.005		0.002	07-27-88	
Total Xylenes		0.058		0.002	07-27-88	

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

PROCEDURES

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

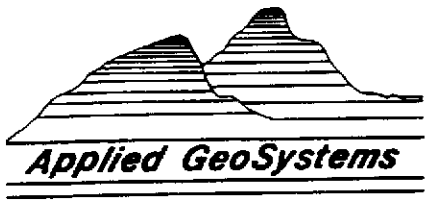
TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

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

Tia Tran, Laboratory Supervisor

8-03-88
Date Reported

CHAIN OF CUSTODY RECORD



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

SAMPLER (signature): _____

Phone: (415) 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 1 Week

Project Leader: Rodger Witham

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
	Rodger C. Witham	8/6/88	2:00 p.m.
Rodger C. Witham	Received for laboratory by:	8-8-88	0930

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-25-MW5s	18034-2	8/5/88	TPH (gasoline) + BTEX	Iced + HCl
W-42-MW6	18034-2	8/5/88	TPH (gasoline) + BTEX	Iced + HCl
W-45-MW7	18034-2	8/5/88	TPH (gasoline) + BTEX	Iced + HCl
W-Effluent 05	18034-2	8/5/88	TPH (gasoline) + BTEX	Iced + HCl

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 8-08-88
Laboratory Number: 08015W02
Project: 018034-2
Sample: W-25-MW5S
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	08-10-88	
TEH as Diesel						NR
Benzene		ND		0.0005	08-10-88	
Toluene		ND		0.0005	08-10-88	
Ethylbenzene		ND		0.0005	08-10-88	
Total Xylenes		ND		0.0005	08-10-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

8-12-88
Date Reported

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 8-08-88
Laboratory Number: 08015W03
Project: 018034-2
Sample: W-42-MW6
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		1.18		0.02	08-10-88	
TEH as Diesel						NR
Benzene		0.2450		0.0005	08-10-88	
Toluene		0.0052		0.0005	08-10-88	
Ethylbenzene		0.0471		0.0005	08-10-88	
Total Xylenes		0.0237		0.0005	08-10-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

8-12-88
Date Reported

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ANALYSIS REPORT

02121ab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 8-08-88
Laboratory Number: 08015W04
Project: 018034-2
Sample: W-45-MW7
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.27		0.02	08-10-88	
TEH as Diesel						NR
Benzene		0.0733		0.0005	08-10-88	
Toluene		0.0528		0.0005	08-10-88	
Ethylbenzene		0.0023		0.0005	08-10-88	
Total Xylenes		0.0281		0.0005	08-10-88	

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

PROCEDURES

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

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

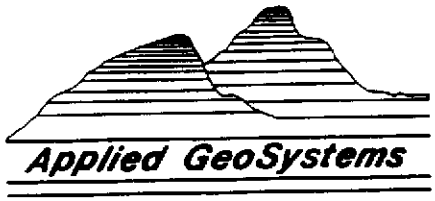
TEH--Total extractable hydrocarbons (high boiling points) are measured by extraction according to EPA Method 3550 for soils or EPA Method 3510 for water followed by a modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Tia Tran, Laboratory Supervisor

8-12-88
Date Reported

APPENDIX C

CHAIN OF CUSTODY RECORD



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

SAMPLER (signature): James Orr

Phone: (415) 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 24 Hour

Project Leader: Rodger Witham

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
James Orr			
	Received for laboratory by:	7-18-88	830

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-Effluent	18034-2	7-15-88	TPH + BTEX	Iced + HCL

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-18-88
Laboratory Number: 07032W01
Project: 18034-3
Sample: W-EFFLUENT
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		0.02		0.02	07-18-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-18-88	
Toluene		0.0010		0.0005	07-18-88	
Ethylbenzene		ND		0.0005	07-18-88	
Total Xylenes		0.0036		0.0005	07-18-88	

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

PROCEDURES

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

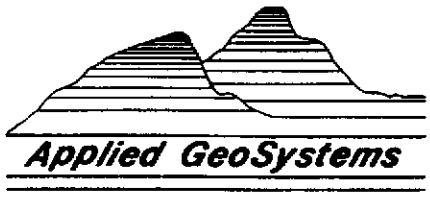
TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

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

Tia Tran, Laboratory Supervisor

7-21-88
Date Reported

CHAIN OF CUSTODY RECORD



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

SAMPLER (signature): Tim O'Brien

Phone: 415 651 1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 1 week

Project Leader: Rodger Witham

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
Tim O'Brien	Rodger C. Witham	7/21/88	9:45 a.m.
Rodger C. Witham	Received for laboratory by:	7/21/88	2:00 pm

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-Effluent	018034-2	7-20-88	TPH & BTEX	iced
W-BLANK	018034-2	7-20-88	TPH & BTEX	iced

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-21-88
Laboratory Number: 07047W01
Project: 018034-2
Sample: W-EFFLUENT20
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	07-25-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-25-88	
Toluene		ND		0.0005	07-25-88	
Ethylbenzene		ND		0.0005	07-25-88	
Total Xylenes		ND		0.0005	07-25-88	

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

PROCEDURES

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

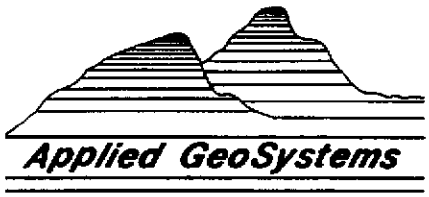
TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

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

Tia Tran, Laboratory Supervisor

7-29-88
Date Reported

CHAIN OF CUSTODY RECORD



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

SAMPLER (signature): Tim O'Brien

Phone: 415 651 1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 1 week

Project Leader: Rodger Witham

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
Tim O'Brien	Rodger C. Witham	7/22/88	9:00 a.m.
Rodger C. Witham	Received for laboratory by:	7-22-88	1000

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-Effluent	018034-2	7-21-88	TPH & BTEX	iced

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-22-88
Laboratory Number: 07048W01
Project: 018034-2
Sample: W-EFFLUENT21
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	07-25-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-25-88	
Toluene		ND		0.0005	07-25-88	
Ethylbenzene		ND		0.0005	07-25-88	
Total Xylenes		ND		0.0005	07-25-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

7-29-88
Date Reported

CHAIN OF CUSTODY RECORD

Applied GeoSystems

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

SAMPLER (signature): Tim O'Brien

Phone: 415 651 1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 1 week

Project Leader: Rodger Witham

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
Tim O'Brien	Rodger C. Witham	7/26/88	8:15 a.m.
Rodger C. Witham	Received for laboratory by: [signature]	7-26-88	0900

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W. Effluent	25-018034-2	7-25-88	TPH & BTEX	iced

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-26-88
Laboratory Number: 07054W01
Project: 018034-2
Sample: W-EFFLUENT 25
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	07-28-88	
TEH as Diesel						NR
Benzene		ND		0.0005	07-28-88	
Toluene		ND		0.0005	07-28-88	
Ethylbenzene		ND		0.0005	07-28-88	
Total Xylenes		ND		0.0005	07-28-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

8-03-88
Date Reported

CHAIN OF CUSTODY RECORD

Applied GeoSystems

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

SAMPLER (signature): Burton E. Gilpin

Phone: 415 651 1906

LABORATORY:
APPLIED GEOSYSTEMS
43255 MISSION BLVD
FREMONT, CA 94539

TURNAROUND TIME: 1 WEEK

Project Leader: RODGER WITHAM

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
Burton E. Gilpin	Rodger C. Witham	7/26/88	4:05 p.m.
Rodger C. Witham	Received for laboratory by: [signature]	72688	1610 pm.

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-EFFLUENT-26	018034-2	7-26-88	TPH, BTEX	ICED, HCl

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ANALYSIS REPORT

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Report Prepared for:
Applied GeoSystems
43255 Mission Blvd.
Fremont, CA 94539
Attention: Rodger C. Witham

Date Received: 7-26-88
Laboratory Number: 07056W01
Project: 018034-2
Sample: W-EFFLUENT 26
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	07-28-88	
TEH as Diesel						NR
Benzene		0.0005		0.0005	07-28-88	
Toluene		ND		0.0005	07-28-88	
Ethylbenzene		ND		0.0005	07-28-88	
Total Xylenes		ND		0.0005	07-28-88	

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

PROCEDURES

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

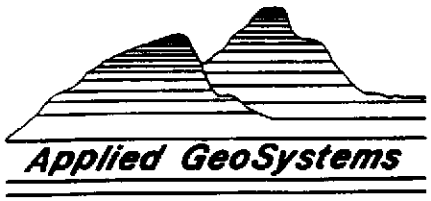
TPH--Total petroleum hydrocarbons (low-to-medium boiling points) are measured by extraction according to EPA Method 5030 followed by analysis by a modified EPA Method 8015 which uses a GC equipped with an FID. Soil extracts and water samples are subjected to purge-and-trap introduction into the GC.

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

Tia Tran, Laboratory Supervisor

8-03-88
Date Reported

CHAIN OF CUSTODY RECORD



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

SAMPLER (signature):

Phone: (415) 651-1906

LABORATORY: Applied GeoSystems

TURNAROUND TIME: 1 Week

Project Leader: Rodger Witham

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
	Rodger C. Witham	8/6/88	2:00 p.m.
Rodger C. Witham	Received for laboratory by:	8-8-88	0930

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

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-25-MW5s	18034-2	8/5/88	TPH (gasoline) + BTEX	Iced + HCl
W-42-MW6	18034-2	8/5/88	TPH (gasoline) + BTEX	Iced + HCl
W-45-MW7	18034-2	8/5/88	TPH (gasoline) + BTEX	Iced + HCl
W-Effluent 05	18034-2	8/5/88	TPH (gasoline) + BTEX	Iced + HCl

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

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ANALYSIS REPORT

0212lab.frm

Report Prepared for:
Applied GeoSystems
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Attention: Rodger C. Witham

Date Received: 8-08-88
Laboratory Number: 08015W01
Project: 018034-2
Sample: W-EFFLUENT05
Matrix: Water

Parameter	Result (mg/kg)	Result (mg/L)	Detection Limit (mg/kg)	Detection Limit (mg/L)	Date Analyzed	Notes
TVH as Gasoline						NR
TPH as Gasoline		ND		0.02	08-10-88	
TEH as Diesel						NR
Benzene		ND		0.0005	08-10-88	
Toluene		ND		0.0005	08-10-88	
Ethylbenzene		ND		0.0005	08-10-88	
Total Xylenes		ND		0.0005	08-10-88	

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

PROCEDURES

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

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

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

Tia Tran, Laboratory Supervisor

8-12-88
Date Reported