



APR 29 1987

Applied GeoSystems

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REPORT
SUBSURFACE ENVIRONMENTAL INVESTIGATION
SOIL BORING AND
MONITORING WELL INSTALLATION

at the
Econo Gasoline Station
44 Lewelling Boulevard
San Lorenzo, California

AGS Job No. 87044-3

1987
June 1987

Report prepared for

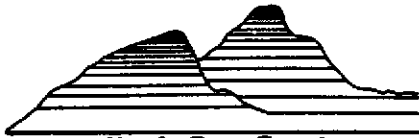
Kayo Oil Company
900 South Cherokee Lane
Lodi, California 95240

by

Glenn R. Dembroff
Project Geologist

Michael N. Clark
C.E.G. 1264

June 23, 1987



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June 23, 1987
87044-3

Mr. Paul Taylor
Kayo Oil Company
900 South Cherokee Lane
Lodi, California 95240

Subject: Transmittal of Report No. 87044-3, Subsurface
Environmental Investigation, Soil Boring and
Monitoring Well Installation at the Econo Gasoline
Station, 44 Lewelling Boulevard, San Lorenzo,
California

Mr. Taylor:

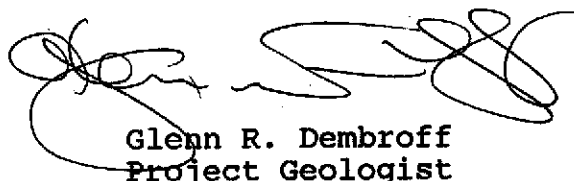
This report presents our findings from the environmental investigation conducted at the above-referenced site. The purpose of the investigation was to evaluate potential subsurface soil and ground water hydrocarbon contamination at the site. The investigation included the drilling of three soil borings, installation of three 2-inch diameter monitoring wells, well development and surveying, ground water sampling, and laboratory analyses.

This investigation indicates that ground water beneath the site has hydrocarbon contamination that is not within generally accepted drinking water standards set by the State Department of Health Services. We recommend that the water in the monitoring wells be sampled and analyzed quarterly for dissolved hydrocarbon contamination. This recommendation complies with guidelines of the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region.

In our opinion, the extent of ground water contamination should be further investigated by excavating selectively located boreholes and installing additional ground water monitoring wells. In order to more fully delineate the extent of ground water impact, it may be necessary to obtain authorization from adjacent landowners, or the City of San Lorenzo, to drill offsite in the downgradient direction from the underground tank cluster.

We recommend that a copy of this report be sent to Mr. Greg Zentner of the RWQCB, San Francisco Bay Region, 1111 Jackson Street, Room 6040, Oakland, CA 94607. After review and comments by the Board, we recommend that a ground water usage study be performed and a hydrocarbon contamination delineation program be initiated at this site. Based on the potability of the shallow non-contaminated ground water, the ground water usage in the vicinity of the site, and the extent of contamination, a dissolved hydrocarbon mitigation system may be required. If you have any questions regarding the content of this report, please do not hesitate to call.

Sincerely,
Applied GeoSystems

A handwritten signature in black ink, appearing to read 'Glenn R. Dembroff', is written over the typed name and title.

Glenn R. Dembroff
Project Geologist



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REPORT
SUBSURFACE ENVIRONMENTAL INVESTIGATION
SOIL BORING AND
MONITORING WELL INSTALLATION
Econo Gasoline Station
San Lorenzo, California
for: Kayo Oil Company

INTRODUCTION

The following report describes the work performed to drill three soil borings and install three ground water monitoring wells at the Econo gasoline station located at 44 Lewelling Boulevard, San Lorenzo, California. Kayo Oil Company contracted Applied GeoSystems to evaluate potential subsurface soil and ground water hydrocarbon contamination at the site. This investigation was requested by Kayo Oil Company to evaluate possible ground water impact of hydrocarbon contamination detected during tank replacement at the site. This report describes the work elements conducted during the investigation, presents the analytical results obtained, and presents our conclusions and recommendations for further work.

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BACKGROUND

A geologist from our office was present at the site to visually inspect the underground storage tanks upon their removal and to collect soil samples from beneath the tanks. The location of the site is shown on the Site Vicinity Map, Plate P-1. The site is located in a commercial- and residential-zoned area of San Lorenzo. Residential dwellings are located south of the site and commercial properties (restaurants and retail stores) are to the north, east, and west. It is our understanding, based on information provided by personnel of Kayo Oil Company, that three underground storage tanks present at the site were used to store gasoline product. Two tanks have 10,000-gallon capacities and the third tank a 7,500-gallon capacity. According to Kayo Oil Company personnel, a waste oil tank was not present at the site. Locations of the tanks and site structures are shown on the Generalized Site Plan, Plate P-2.

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Visual inspection of the three tanks was performed on April 28, 1987, after the tanks were placed on the ground surface near the tank pit. Mr. James Ferdinand of the Eden Consolidated Fire Protection District was present at the site during tank inspections and soil sampling. After removing the tanks from the tank cavity by hoptoe, the hoptoe operator, contracted by Kayo Oil Company, rolled the tanks on their sides for inspection. The outer surfaces of the tanks were inspected by an Applied GeoSystems' field geologist for signs of product leakage, holes, pitting, or areas of weakness. The sides and ends of the tank were scraped and particular attention was paid to seams and points directly below both the fill port and submersible pump port of each of the tanks. The tanks had no apparent through-going holes but had slight to moderate corrosion and pitting.

Soil samples were collected from soil at a depth of approximately 14 feet (approximately 4 to 5 feet below the tank bottom). One sample was collected under each end of the three tanks. Field methodology for soil sample collection, and sample locations, are presented in Applied GeoSystems' report No. 87044-1, dated May 5, 1987. The results of the soils analyses are presented on the Table 1.

TABLE 1
LABORATORY ANALYSES ON SOIL SAMPLES
Collected at the Econo Gasoline Station
San Lorenzo, California

<u>Identifier</u>	<u>TVH</u>	<u>B</u>	<u>E</u>	<u>T</u>	<u>X</u>	<u>Detection Limit</u>
S-1	329	12	14	2	63	1.0
S-2	663	22	26	136	179	1.0
S-3	1136	52	43	158	288	1.0
S-4	510	16	19	8	116	1.0
S-5	1.64	ND	ND	ND	ND	0.05
S-6	4.22	0.41	0.21	0.08	0.31	0.05

Note: All results in parts per million (ppm)
TVH: Total Volatile Hydrocarbons
BETX: Benzene, Ethylbenzene, Toluene, and Xylenes
ND: Non-detectable

Laboratory analyses on the soil samples collected show the presence of hydrocarbon contamination. The level of contamination is moderately high in samples S-1, S-2, and S-3, relatively high in sample S-3 and relatively low in samples S-5 and S-6. Because sample S-3 showed a total volatile hydrocarbon concentration greater than 1000 parts per million, Applied GeoSystems recommended further excavation and sampling of the tank pit in the vicinity of sample S-3. This course of action complies with the California Regional Water Quality Control Board (CRWQCB), San Francisco Bay Region's Guidelines for Addressing Fuel Leaks (September, 1985).

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With the authorization of Kayo Oil Company, a field geologist from Applied GeoSystems returned to the site on April 30, 1987 to observe further excavation in the vicinity of sample S-3 (northwest corner of the tank pit). Soil in the vicinity of sample S-3 was excavated down to the saturated zone. Excavated soil was piled at the site and permitted for aeration through the San Francisco Bay Air Quality Management District. At the interface of the vadose and saturated zone (approximately 17 feet) a sample was collected. The result of the analysis of this sample, S-17-NW, shows total volatile hydrocarbon levels below the 1000 parts per million threshold. Results are presented in Table 2.

TABLE 2
ADDITIONAL LABORATORY ANALYSES
Econo Gasoline Station
San Lorenzo, California

<u>Identifier</u>	<u>TVH</u>	<u>B</u>	<u>E</u>	<u>T</u>	<u>X</u>	<u>Detection Limit</u>
S-17-NW	6.98	1.37	0.40	1.06	1.18	0.05

Note: All results in parts per million (ppm)
TVH: Total Volatile Hydrocarbons
BETX: Benzene, Ethylbenzene, Toluene, and Xylenes
ND: Non-detectable

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These data show that the greater than 1000 parts per million hydrocarbon contamination in the vicinity of sample S-3 has been mitigated. With the consent of the Eden Consolidated Fire Department, new tank placement was completed and the tank cavity was backfilled with imported pea gravel.

LOCAL GEOLOGIC AND HYDROLOGIC CONDITIONS

The site is underlain by Holocene to Pliocene river deposits of San Lorenzo Creek and neighboring streams. These unconsolidated sediments range in thickness from a few feet to approximately 600 feet and underlie, and are landward of, unconsolidated mud east and west of the San Francisco Bay (Generalized Geologic Map of the San Francisco Bay Region, California, J. Schlocker, 1970). The unconsolidated sediments generally consist of interfingering gravel, sand, silt, and clay. The inferred ground water flow direction is toward the west-southwest based on local topography and surface drainage patterns. Surface and subsurface waters in the vicinity of the site drain toward the San Lorenzo Creek (less than 1/4-mile to the south) and the San Francisco Bay (approximately 3 miles west of the site).

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FIELD WORK

A geologist from Applied GeoSystems observed soil borehole drilling and well construction on May 26 and 27, 1987. Three borings were drilled with a Mobile B-61 truck-mounted drill rig operated by Datum Exploration, Inc. of Pittsburg, California. Two borings were located in the inferred downgradient direction of the underground tank cluster and the third boring was located in the inferred upgradient direction of the underground tanks to access background soil and ground water quality data.

Steam-cleaned, 8-inch diameter, continuous flight hollow-stem augers were used to drill borings B-1 through B-3 to a depth of approximately 35 feet. Ground water was initially encountered at approximately 20 feet deep during drilling. Monitoring well MW-1 was installed in boring B-1, MW-2 in boring B-2, and MW-3 in boring B-3. Locations of monitoring wells at the site are shown on the Generalized Site Plan.

Soil samples were collected from the boreholes with a California modified split spoon sampler. Descriptions of earth materials encountered in borings B-1 through B-3 are presented on the Boring Logs, Plates P-4 through P-9. Plate P-3 gives a summary

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of the Unified Soil Classification System used to identify the soils. The earth materials encountered at this site consist primarily of silt and sandy and silty clay. A geologic cross section (located on the Generalized Site Plan) is presented on Plate P-10. Total depth of the borings was approximately 37 feet. This depth was sufficient for well emplacement.

Cuttings excavated from the borings were subjectively analyzed as having hydrocarbon contamination. Cuttings from the boreholes were piled at the site and remain the responsibility of Kayo Oil Company. Applied GeoSystems can arrange to have this material hauled to an appropriate landfill facility upon completion of aeration operations.

SOIL SAMPLING PROCEDURE

Twenty-one soil samples were collected and described from borings B-1 through B-3 during drilling. These samples, labeled as indicated on the Boring Logs, were collected at 5-foot intervals from the ground surface to total depth. Soil samples were collected by advancing the boring to a point immediately above the sampling depth and then driving a California modified split spoon sampler (2 1/2-inch inside diameter) into the soil through the hollow center of the auger. The sampler was driven

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with a standard 140 pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each 6 inches was counted and recorded to evaluate the relative consistency of soil materials.

The samples were removed from the sampler, immediately sealed in their brass sleeves with aluminum foil, plastic caps, and air-tight tape, and were labeled and placed in iced storage. Selected samples were delivered to Applied GeoSystems' laboratory for analytical testing. The completed Chain-of-Custody form and laboratory report for the soil samples tested are included in the Appendix of this report.

MONITORING WELL CONSTRUCTION

Three ground water monitoring wells were constructed at the site in soil borings B-1 through B-3. The wells, MW-1 through MW-3, were completed with 2-inch inside diameter (I.D.) polyvinyl chloride (PVC) casing. The casing consists of 0.020-inch machine-slotted PVC set from the total depth of the boring to approximately 2 feet above the water table. Blank PVC casing was set from the top of the screened casing to the surface. All casing joints are threaded and no glues, chemical cements, or

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solvents were used in well construction. The top of the casing is covered with a slip cap and the bottom has a threaded end plug.

The annular space of each well was backfilled with #3 Monterey sand from total depth to approximately 2 feet above the screened casing. A bentonite plug, approximately 2 feet thick, was placed above the sand as a seal against cement entering the sand pack, and the remaining annulus was backfilled with neat cement to grade. Graphic representations of well constructions are shown on the right margin of the Boring Logs.

A cast-iron CNI utility box, with steel apron, was placed over each well head and concreted into place flush with the surrounding surface grade. The utility box has a water-tight threaded seal to protect against surface water infiltration and requires a specially-designed spanner wrench to open that reduces the possibility of well vandalism or accidental disturbance.

WATER SAMPLING PROCEDURE

Subjective water samples were collected from the three monitoring wells by gently lowering a teflon bailer approximately halfway through the air/water interface. The samples were retrieved and

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inspected for floating product, sheen, emulsion, and product odor. No subjective evidence of floating product, sheen, or emulsion was detected in the samples from wells MW-1 through MW-3. Slight to moderate product odor was detected in the three monitoring wells.

The wells were developed by air- and water-jetting and purged by pumping approximately five well volumes of liquid. Following the purge period, and after well recovery to static water level, water samples were collected using a laboratory-cleaned teflon bailer. The bailer was lowered through the air/water interface in order to retrieve a sample representative of the formation water.

The samples were transferred to laboratory-clean 40 ml glass Volatile Organic Analysis (VOA) vials, made acidic by adding hydrochloric acid, immediately sealed with a teflon-lined cap, labeled, and placed in iced storage for transport to the analytical laboratory for testing. The Chain-of-Custody and Record of Analysis forms for the water samples are included in the Appendix of this report.

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ANALYTICAL RESULTS

Four soil samples retrieved from the unsaturated zone (S-20-B1, S-20-B2, S-15-B3, and S-20-B3) were analyzed for total volatile hydrocarbons using gas chromatography with flame ionization detection (Environmental Protection Agency (EPA) Method 8020). Three water samples were analyzed for total volatile hydrocarbons and hydrocarbon constituents (benzene, ethylbenzene, toluene, and xylenes - BETX) using gas chromatography with photo- and flame ionization detection (EPA Method 602). The results of the chemical analyses are presented in Table 3 and in the Appendix of this report.

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TABLE 3
RESULTS OF CHEMICAL ANALYSES
OF SOIL AND WATER SAMPLES
Econo Gasoline Station
San Lorenzo, California

Soil:						
Identifier	Total Volatile Hydrocarbons					Detection limit
S-20-B1	904.0					0.5
S-20-B2	0.62					0.05
S-15-B3	101.39					0.05
S-20-B3	9.40					0.05
Water:						
Identifier	TVH	B	E	T	X	Detection limit
W-25-MW1	18.05	0.49	0.93	0.15	3.79	0.01
W-25-MW2	4.870	0.113	0.046	0.014	0.058	0.002
W-25-MW3	40.3	5.4	1.7	3.9	5.2	0.1
Results in parts per million (ppm)						
TVH: Total volatile hydrocarbons						
BETX: Benzene, Ethylbenzene, Toluene, and Xylenes						

EVALUATION OF GROUND WATER GRADIENT

A Wild NA-24 automatic levelling instrument was used to measure the differences in elevation between the instrument and the top of the casing for each of the monitoring wells. Measurements were recorded to the nearest 0.001 foot. The elevation differences were combined with measurements of the static water

levels made with a Solinst electric water level indicator to calculate the water level elevation differences between the wells (Table 4).

MONITORING WELL NUMBER	TOP OF CASING BELOW DATUM (FEET)	STATIC WATER LEVEL*	WATER LEVEL BELOW DATUM
MW-1	0.000	16.42	16.42
MW-2	0.597	15.65	16.25
MW-3	0.569	15.93	16.50

Measurements in feet
* Static water level measured in feet below top of casing
Datum is an arbitrary elevation corresponding to top of MW1 casing

The calculations presented in Table 4 were used to estimate the ground water potentiometric surface across the site. The contours of this surface are shown on the Generalized Site Plan. The contours indicate a gradient of approximately 0.045 feet per 100 feet (24.0 feet per mile) and implies ground water flow predominantly toward the west (S81W). No data regarding flow rates are available at this time.

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CONCLUSIONS AND RECOMMENDATIONS

This investigation indicates that ground water beneath the site has hydrocarbon contamination that is not within generally accepted drinking water standards recommended by the State Department of Health Services. We recommend that the water in the monitoring wells be sampled and analyzed quarterly for dissolved hydrocarbon contamination. This recommendation complies with guidelines of the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region.

In our opinion, an evaluation of the ground water usage, and background quality, in the vicinity of the site should be performed. Additionally, the extent of ground water contamination should be further investigated by excavating selectively located boreholes and installing additional ground water monitoring wells. In order to more fully delineate the extent of ground water impact, it will probably be necessary to obtain authorization from adjacent landowners, or the City of San Lorenzo, to drill offsite to the west (downgradient).

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We recommend that a copy of this report be sent to Mr. Greg Zentner of the California Regional Water Quality Control Board, San Francisco Bay Region, 1111 Jackson Street, Room 6040, Oakland, CA 94607. After review and comments by the Board, we recommend that a hydrocarbon contamination delineation program be initiated at this site. With Kayo Oil Company's authorization, Applied GeoSystems will prepare a work plan addressing further delineation of the dissolved hydrocarbon plume and evaluation of background ground water quality and usage in the vicinity of the site. Based on the potability of the shallow non-contaminated ground water, the ground water usage in the vicinity of the site, and the extent of contamination, a dissolved hydrocarbon mitigation system may be required.

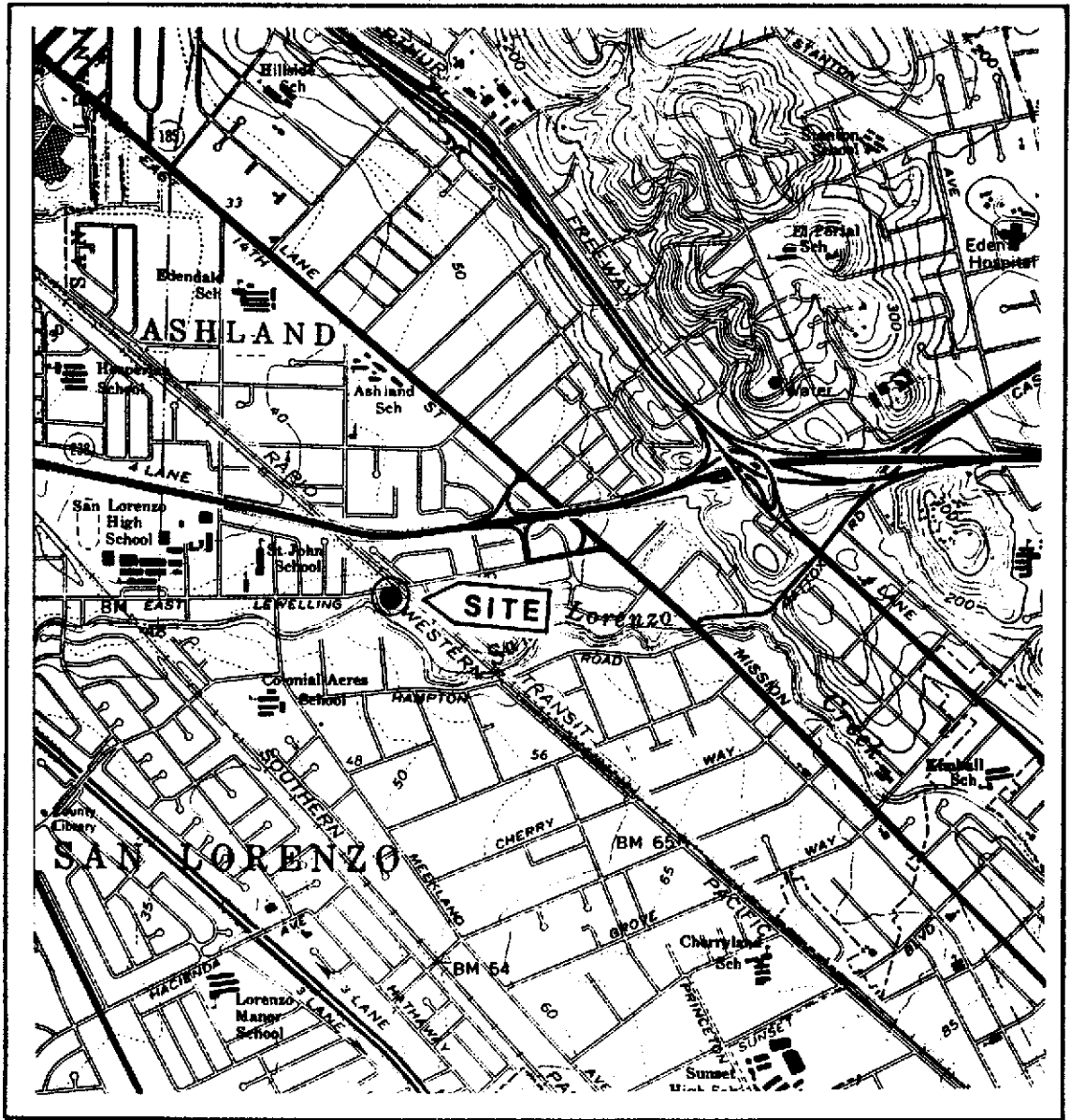
LIMITATIONS

This study has been conducted in accordance with generally accepted standards of environmental geological practice in California at the time this report was prepared. This investigation was conducted solely for the purpose of evaluating environmental conditions of the soil and ground water with respect to hydrocarbon product contamination in the vicinity of the subject property. No soil engineering or geotechnical recommendations are implied or inferred. Evaluation of geologic conditions at the site for the purpose of this investigation is

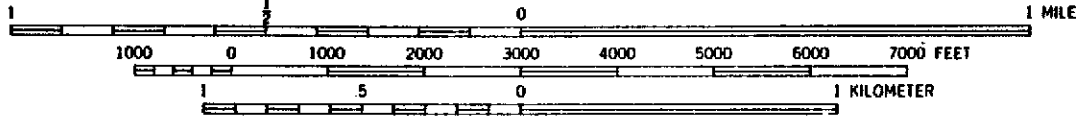
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made from a limited number of observation points. Subsurface conditions may vary away from the data points available. Additional work, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of investigation.



SCALE 1:24000



CONTOUR INTERVAL 20 FEET

Source: U.S.G.S. 7.5' quad.,
Hayward, California



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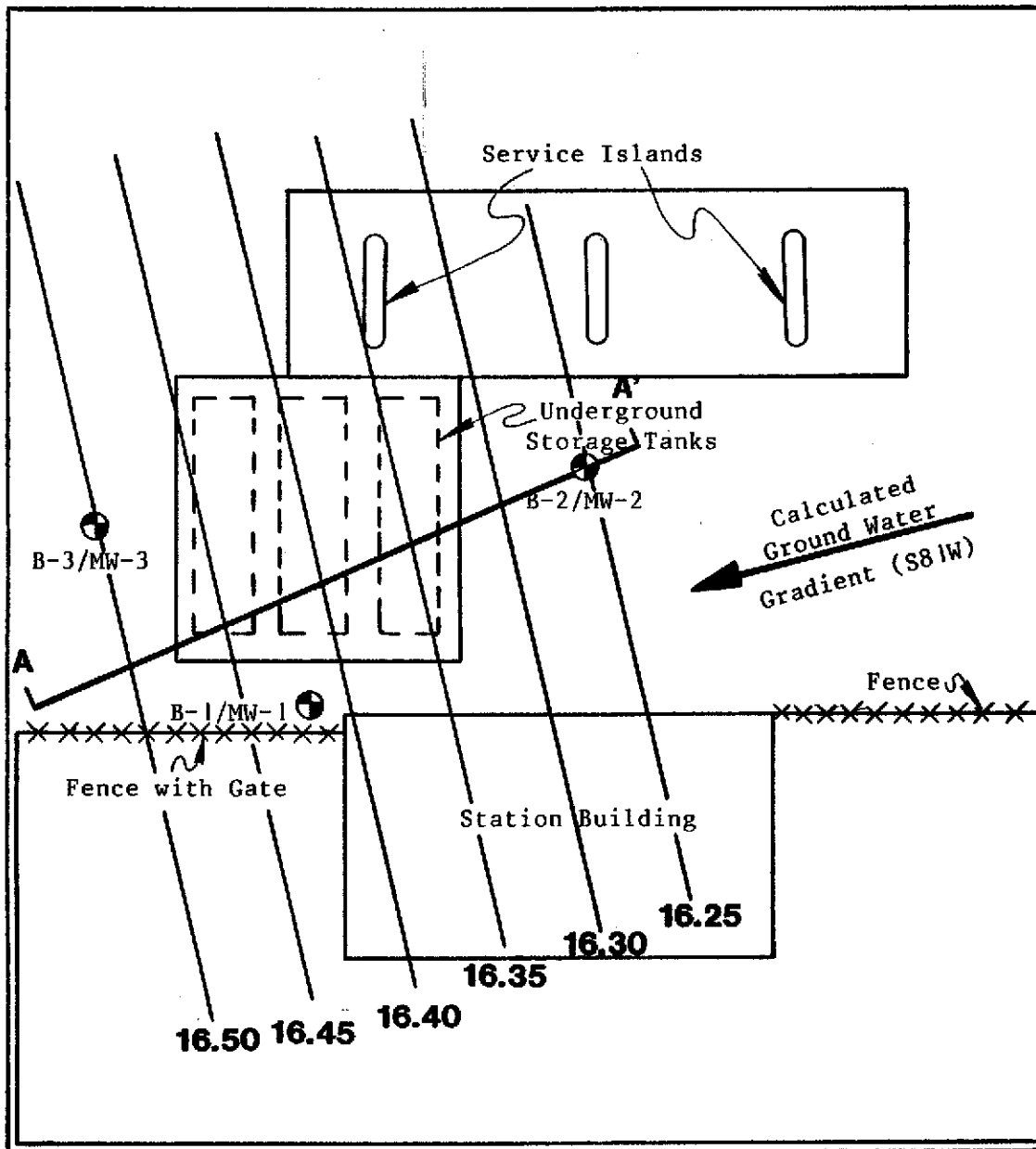
SITE VICINITY MAP
Econo Gasoline Station
San Lorenzo, California

PLATE

P-1

PROJECT NO. 87044-3

Lewelling Blvd.



⊕ = Monitoring Well Location
16.50 — = Potentiometric Surface (feet)
Depth measured from arbitrary Datum
A — A' = Cross Section Location

Approximate Scale
20 0 20 40
feet

Source: Measured by Tape and Compass



PROJECT NO. 87044-3

GENERALIZED SITE PLAN
Econo Gasoline Station
San Lorenzo, 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.				
	SAND AND SANDY SOILS	SW	Well-graded sands or gravelly sands, little or no fines.		SILTS AND CLAYS LL<50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		SP	Poorly-graded sands or gravelly sands, little or no fines.			CH	Inorganic clays of high plasticity, fat clays.
		SM	Silty sands, sand-silt mixtures.			OH	Organic clays of medium to high plasticity.
		SC	Clayey sands, sand-clay mixtures.				
					HIGHLY ORGANIC SOILS	Pt	Peat and other highly organic soils.



Depth through which sampler is driven



Sand pack



Relatively undisturbed sample



Bentonite annular seal



Missed sample



Neat cement annular seal



Ground water level observed in boring



Blank PVC

S-10

Sample number



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.



**UNIFIED SOIL CLASSIFICATION SYSTEM
AND SYMBOL KEY**

Econo Gasoline Station
San Lorenzo, California

PLATE

P-3

PROJECT NO. 87044-3

Blows/ Ft.	Sample No.	USCS	DESCRIPTION	WELL CONST.
0			Asphalt (10") over roadfill (2")	
2		CL	Silty clay with lenses of silty sand, brown and black, damp, slight plasticity, very stiff, no product odor.	
4				
6	17	S-5		
8				
10	8	S-10	ML Clayey silt with lenses of sand, silt, and sandy clay, green, damp, slight plasticity, medium stiff, slight product odor, (in silt only)	
12				
14				
16	14	S-15	Clayey silt, moist, stiff, very slight product odor.	
18				
20		ML		
22	15	S-20	Sandy silt with lenses of silty clay and poorly sorted silty sand, brown, wet, moderate product odor.	
24		ML		
26	25	S-25	Silt with trace sand, black, very stiff.	
28				
30		CL	Sandy clay, brown and black, wet, slight plasticity, very stiff, strong product odor.	

(Section continues downward)



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LOG OF BORING B-1/MW-1 PLATE

Econo Gasoline Station
San Lorenzo, California

P-4

PROJECT NO. 87044-3

Blows/ Ft.	Sample No.	USCS	DESCRIPTION	WELL CONST.
30	18	S-30	CL	
32			Sandy clay, brown and black, wet, slight plasticity, very stiff, strong product odor.	
34			CL	
36	30	s-35	CL	Caved
			Clay with trace gravel, black, high plasticity, very slight product odor.	
38			Total Depth = 36.5 feet Boring terminated at sufficient depth for monitoring well.	
40				

DEPTH IN FEET



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LOG OF BORING B-1/MW-1 PLATE

Econo Gasoline Station
 San Lorenzo, California

P-5

PROJECT NO. 87044-3

Blows/ Ft.	Sample No.	USCS	DESCRIPTION	WELL CONST.
0			Asphalt (8") over roadfill (4")	
2		ML	Silt with lenses of clayey silt, brown, slightly damp, slight plasticity, stiff, no product odor.	
4				
6	15	S-5		
8		CL	Silty clay with lenses of silt, black and brown, slightly damp, slight plasticity, stiff, no product odor.	
10	15	S-10		
12		ML	Silt with some clay and lenses of sandy silt, green, very moist, very stiff, no product odor.	
14	23	S-15		
16				
18		ML		
20	9	S-20	Clayey silt, brown, slight plasticity, stiff.	
22				
24	34	S-25	Brown and black, hard.	
26				
28		ML		
30	44	S-30	Silt with some clay, brown, very moist, slight plasticity, hard, no product odor.	
			(Section continues downward)	



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LOG OF BORING B-2/MW-2 PLATE

Econo Gasoline Station
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P-6

PROJECT NO. 87044-3

DEPTH IN FEET	Blows/ Ft.	Sample No.	USCS	DESCRIPTION	WELL CONST.
30			ML	Silt with some clay, brown, very moist, slight plasticity, hard, no product odor.	
32			CL	Clay with trace silt, brown, damp, medium plasticity, very stiff, no product odor.	
34					
36	17	S-35			Caved
38				Total Depth = 37 feet Boring terminated at sufficient depth for monitoring well.	
40					



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LOG OF BORING B-2/MW-2 PLATE

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P-7

PROJECT NO. 87044-3

DEPTH IN FEET	Blows/ Ft.	Sample No.	USCS	DESCRIPTION	WELL CONST.
0				Asphalt (6") over concrete (3")	
2			ML	Silt, brown, slightly damp, slight plasticity, stiff, very slight product odor.	
4					
6	15	S-5			
8					
10	12	S-10		Silt with trace clay and lenses of silt, green and brown, damp.	
12			ML		
14	9	S-15		Clayey silt, moist, medium plasticity, moderate product odor.	
16					
18					
20	14	S-20		With trace sand, green, very moist, strong product odor.	
22			ML		
24	34	S-25		Silt with some clay, slight plasticity, hard.	
26					
28			CL		
30	20	S-30		Clay with trace silt and gravel, green, moist, very stiff, slight product odor.	
(Section continues downward)					



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LOG OF BORING B-3/MW-3 PLATE

Econo Gasoline Station
San Lorenzo, California

P-8

PROJECT NO. 87044-3

DEPTH IN FEET

Blows/ Ft.	Sample No.	USCS	DESCRIPTION	WELL CONST.
30		CL	Clay with trace silt and gravel, green, moist, very stiff, slight product odor.	
32		CL		
34		CL		
36	13	S-35	Silty clay, brown, medium plasticity, stiff, very slight product odor.	Caved
38			Total Depth = 37 feet Boring terminated at sufficient depth for monitoring well.	
40				



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LOG OF BORING B-3/MW-3 PLATE

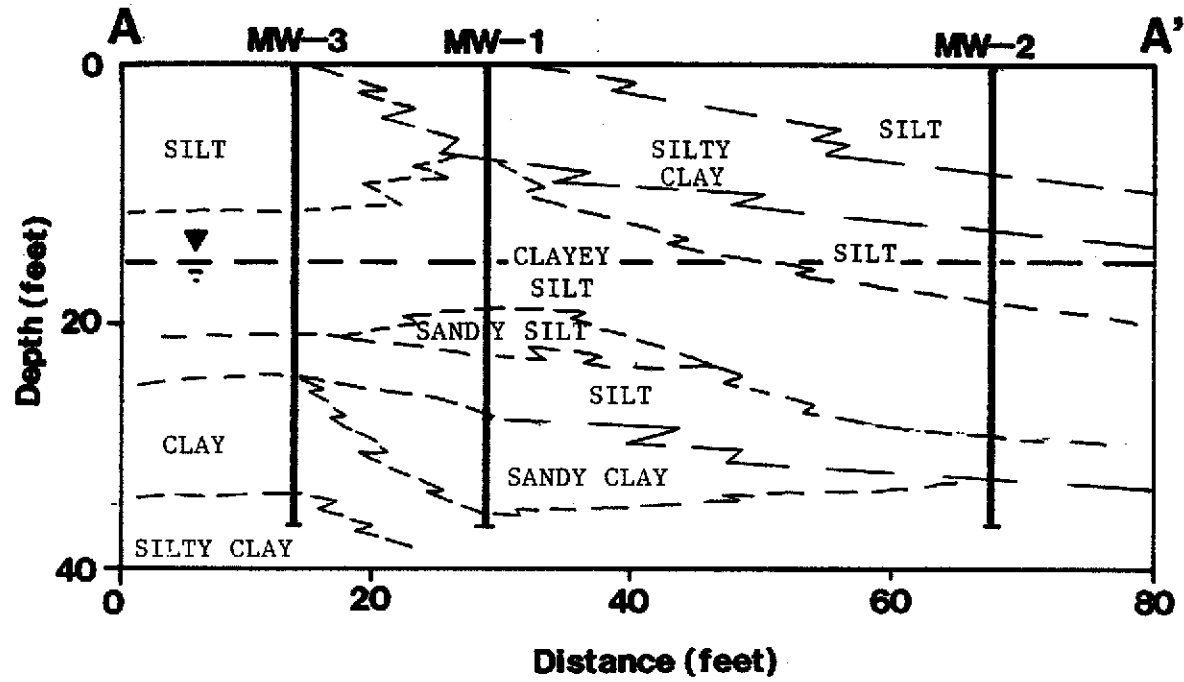
Econo Gasoline Station
San Lorenzo, California


P-9

PROJECT NO. 87044-3

PROJECT NO. 87044-3

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 - Potentiometric surface

Note: Borings B-1/MW-1 and B-3/MW-3 are projected into cross section.

CROSS SECTION A - A'
Econo Gasoline Station
San Lorenzo, California

PLATE

P-10

APPENDIX



Applied GeoSystems

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RECORD OF ANALYSIS

Date 6-3-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 5-28-87
Date Analyzed: 5-28-87

Laboratory# 8705S167

Procedure:

The soil sample referenced on the attached Chain-of-Custody was analyzed for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The sample was concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for this sample is 0.5 milligrams/kilogram (parts per million = ppm).

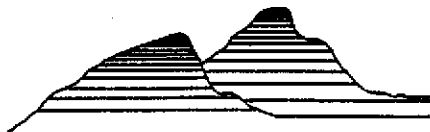
The results are presented in the table below:

<u>SAMPLE</u>	<u>SITE</u>	<u>TOTAL VOLATILE HYDROCARBONS</u>
S-20-B1	87044-3	904.0

Results in milligrams/kilogram (parts per million = ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).



Applied GeoSystems

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

RECORD OF ANALYSIS

Date 6-3-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 5-28-87
Date Analyzed: 5-28-87

Laboratory# 8705S168

Procedure:

The soil samples referenced on the attached Chain-of-Custody were analyzed for Total Volatile Hydrocarbons (TVH) by EPA method 8020. The samples were concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for these samples is 0.05 milligrams/kilogram (parts per million = ppm).

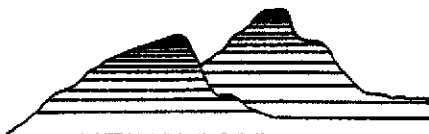
The results are presented in the table below:

<u>SAMPLE</u>	<u>SITE</u>	<u>TOTAL VOLATILE HYDROCARBONS</u>
S-20-B2	87044-3	0.62
S-15-B3	87044-3	101.39
S-20-B3	87044-3	9.40

Results in milligrams/kilogram (parts per million = ppm).

Tia Tran, Chemist

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Applied GeoSystems

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

RECORD OF ANALYSIS

Date 6-15-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 6-1-87
Date Analyzed: 6-5-87

Laboratory# 8706W022

Procedure:

The water sample referenced on the attached Chain-of-Custody was analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 602. The sample was concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for this sample is 0.01 milligrams/liter (parts per million = ppm).

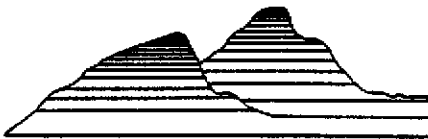
The results are presented in the table below:

<u>SAMPLE</u>	<u>SITE</u>	<u>BENZENE</u>	<u>ETHYL BENZENE</u>	<u>TOLUENE</u>	<u>TOTAL XYLENES</u>	<u>TVH</u>
W-25-MW1	87044-3	0.49	0.93	0.15	3.79	18.05

Results in milligrams/liter (parts per million = ppm).

Tia Tran, Chemist

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Applied GeoSystems

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

RECORD OF ANALYSIS

Date 6-15-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 6-1-87
Date Analyzed: 6-5-87

Laboratory# 8706W023

Procedure:

The water sample referenced on the attached Chain-of-Custody was analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 602. The sample was concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for this sample is 0.002 milligrams/liter (parts per million = ppm).

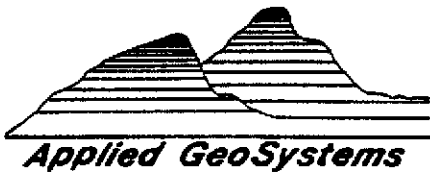
The results are presented in the table below:

<u>SAMPLE</u>	<u>SITE</u>	<u>BENZENE</u>	<u>ETHYL BENZENE</u>	<u>TOLUENE</u>	<u>TOTAL XYLENES</u>	<u>TVH</u>
W-25-MW2	87044-3	0.113	0.046	0.014	0.058	4.870

Results in milligrams/liter (parts per million = ppm).

Tia Tran, Chemist

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Applied GeoSystems

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

RECORD OF ANALYSIS

Date 6-15-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Glenn R. Dembroff

Date Received: 6-1-87
Date Analyzed: 6-5-87

Laboratory# 8706W024

Procedure:

The water sample referenced on the attached Chain-of-Custody was analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 602. The sample was concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for this sample is 0.1 milligrams/liter (parts per million = ppm).

The results are presented in the table below:

<u>SAMPLE</u>	<u>SITE</u>	<u>BENZENE</u>	<u>ETHYL BENZENE</u>	<u>TOLUENE</u>	<u>TOTAL XYLENES</u>	<u>TVH</u>
W-25-MW3	87044-3	5.4	1.7	3.9	5.2	40.3

Results in milligrams/liter (parts per million = ppm).

Tia Tran, Chemist

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