PHASE I SOIL AND GROUND WATER ASSESSMENT,
WONG'S TAXI TAXI,
2345 EAST 14TH STREET
OAKLAND, CALIFORNIA

~ 8/23/91
first new samples

Prepared by
Earth Systems Environmental, Inc.
6701 McDivitt Drive, Suite B
Bakersfield, CA 93313

December 23, 1991
Project No. EB-8014-1

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WONG'S TAXI TAXI,
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OAKLAND, CALIFORNIA

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December 23, 1991 Project No.: EB-8014-1

Mr. Jeffrey S. Johnson
Mobile Labs, Inc.
5327 Wingfoot Drive
Bakersfield, California 93309

SUBJECT:

REPORT OF PHASE I SOIL AND GROUND WATER ASSESSMENT,
WONG'S TAXI TAXI, 2345 EAST 14TH STREET,
OAKLAND, CALIFORNIA

1.0 INTRODUCTION

This report presents results of an environmental assessment performed by Earth Systems Environmental, Inc. (ESE) of the soil and ground water at the above referenced site. This assessment was required by the County of Alameda, Department of Environmental Health (ACDEH), in order to comply with the California Health and Safety Code (CHSC), Division 20, the California Code of Regulations (CCR), Title 22, and the Code of Federal Regulations (CFR), Title 40. Figure 1 is a vicinity map showing the location of the site and Figure 2 is a site map showing the location of the former underground fuel and waste oil storage tanks, soil boring locations, and ground water monitoring well locations. The purpose of this assessment was to determine the vertical and lateral limits of gasoline and the waste oil impacted soil discovered during the removal of all of the underground tanks at the site, and whether the operation of the gasoline and waste oil tanks had impacted the ground water beneath the site. Tasks completed to date include the drilling and sampling of eight soil borings, completion of three of these borings as ground water monitoring wells, chemical analysis of soil and ground water samples, and data analysis. All site assessment methods employed are in accordance with regulations and guidelines set forth in CCR Title 23, Chapter 3, CCR Title 22, Chapter 30, Article 11, LUFT Field Manual (SWRCB, 1989), California Site Mitigation Decision Tree Manual, the CFR Title 29, Part 1910, Section 120, CFR Title 40, Parts 190-299, as well as accepted professional environmental/geotechnical engineering procedures and applicable County of Alameda regulations.

initially well had FP

2.0 SITE DESCRIPTION

2.1 Site

The site is located on the west southwest side of East 14th Street at the intersection with Miller Avenue in the city of Oakland, California (see Figure 1). A rectangular shaped, single-story building is located in the center of the property and formerly served as the service station and maintenance bay. The property currently houses a used car dealership, and light maintenance continues to be performed in the service bay. Formerly located at the site were three underground gasoline storage tanks, one underground waste oil tank, two dispenser islands, and associated product lines (see Figure 2).

2.2 Background

On or about August 5, 1988, one 8,000 gallon underground gasoline storage tank, two 6,000 gallon underground gasoline storage tanks, one 1,000 gallon underground waste oil storage tank, two dispenser islands, and associated product lines were removed by SCS Engineers of Dublin, California from the above referenced property which had previous operated as a taxi cab service center following 40 years of operation as a gasoline service center (Figure 2). Soil samples were collected from beneath each of the removed tanks. The samples were analyzed for the presence of total petroleum hydrocarbons (TPH) as gasoline, the gasoline constituent volatile aromatics (BTEX), and total lead from beneath the former gasoline tanks along with oil & grease from beneath the former waste oil tank. Gasoline was detected reaching a maximum concentration of 1,500 mg/kg beneath the west end of the northern gasoline tank, and the volatile aromatic benzene at a concentration of 61 mg/kg beneath the east end of the southern gasoline tank.. Oil & grease was detected at a concentration of 783 mg/kg beneath the former 1,000 gallon waste oil storage tank. A Notice of Unauthorized Release from the Alameda County Health Care Services was issued. Subsequently, California Environmental Consultants was contracted to conduct a site characterization in the vicinity of the tank excavations. Three soil borings were advanced on October 3, 1988. Borings B1, and B2 were advanced immediately adjacent to the northern and western sidewall of the gasoline tank excavation pit, and Boring B3 was advanced immediately adjacent to the western sidewall of the waste oil tank excavation pit. Soil samples were collected at a depth of

15 feet below surface grade in each of the borings. Gasoline was detected at 3.4 mg/kg, and 83 mg/kg, and benzene at 0.31 mg/kg and 1.6 mg/kg in borings B1, and B2, respectively. Oil and grease was detected at 88 mg/kg, and benzene at 0.36 mg/kg in boring B3. Ground water was observed at approximately 19 feet below surface grade in each of the borings, and a grab sample of ground water was collected. Gasoline was detected at 67 mg/l and 110 mg/l, and benzene at 14 mg/l and 17 mg/l in borings B1 and B2 respectively. Oil and grease was detected at 290 mg/l and benzene 0.49 mg/l in boring B3. Two soil sample were collected from the spoils pile of soil excavated from the gasoline tank pit. Gasoline was detected in these samples at 1.3 mg/kg, and 13 mg/kg, respectively. No volatile aromatics were detected in either of these samples. A sample was collected from the waste oil tank pit spoils pile. Oil and grease was detected 1,300 mg/kg, and no volatile aromatics were detected. At that time the pits were unfenced open excavation pits and uncovered spoils piles. Subsequently, the pits were backfilled with the stockpiled spoils and imported fill, compacted, graded to surface contours, and capped with concrete.

again, where are the analytical results?

This previous investigation did not determine the lateral or vertical extent of either gasoline or waste oil in the subsurface. Additionally, grab samples of ground water from borings advanced through impacted soil may be cross contaminated with hydrocarbons from the overlying soil, and may not be indicative of concentrations present in the ground water.

Subsequently, Alameda County Health Care Services requested that a complete Phase I Soil Characterization which defined the vertical and lateral limits of gasoline and waste oil impacted soil be performed along with a Phase I Ground water Characterization consisting of a minimum of three ground water monitoring wells be conducted to assess whether ground water resources have been impacted. Mobile Labs, Inc. has been contracted by the current owner, Mr. Stanley Wong of Oakland, to conduct an investigation of the impacted soil and potentially impacted ground water at the site. Mobile Labs subcontracted with ESE to provide geologic services associated with conducting the Phase I soil and ground water characterizations including preparing a work plan and site health and safety plan for the field investigation, supervising the drilling of the eight soil borings, installation of the three ground water monitoring wells, obtaining fifteen soil, and three ground water samples which were analyzed by Mobile Labs, constructing cross sections showing

the estimated limits of impacted soil, surveying the location and relative elevation of the wells, constructing a ground water surface map showing flow direction and gradient, and providing this report of findings documenting the field activities, analytical results, data analysis, conclusions and recommendations resulting from the soil and ground water investigation. In May, 1991 ESE submitted a workplan for Phase I Characterization including a site health and safety plan to the County. In July,1991 the workplan was approved by the county, and ESE mobilized to the site on August 21, 1991 upon recieving monitoring well permits from the Alameda County Flood Control and Water Conservation District.

This investigation has included advancing five soil borings to a depth of 20 feet in and around the location of the former gasoline tanks, advancing three soil borings to a depth of 20 feet in and around the location of the former waste oil tank, and installing three of the soil borings as ground water monitoring wells at the site to assess potential ground water impaction, flow direction, and gradient. The location of the ground water monitoring wells were selected given the information that ground water flow was believed to be from the hills to the east down to the bay to the west. Monitoring well MW-1 which is down gradient from the former gasoline tanks had been previously drilled and installed by ESE with the approval of Alameda County Health Care Services representative Cynthia Chapman on May 22, 1991 when ESE was conducting similar operations at a nearby site.

2.3 Regional Geology and Hydrology

The subject site is located within the Coast Range geomorphic province of California between the Pacific Ocean and the San Joaquin Valley. The province is characterized by ridges and valleys that trend N30W to N40W and dominate the gross topography of the region.

In general, the Coast Range consist of Jurassic eugeosynclinal basement rocks to the west and Cretaceous plutonic basement rocks to the east. These are overlain by upper Cretaceous and Cenozoic sedimentary and volcanic rocks that have been faulted and folded with a northwest-southeast trend. Local geology relevant to the subject property lie within the Bay Plains Basin. Sediments beneath the site are coalescing alluvial deposits sourced by the Diablo Range to the east, known as the San Leandro Cone, these sediments interfinger to the west with fluvial overbank deposits

of silts and clays, and with marine clays commonly known as bay muds. The elevation of the subject property is approximately 20 feet above sea level. The depth to ground water beneath the site is approximately 19 feet below surface grade, and the ground water flow direction is to the west northwest.

3.0 ENVIRONMENTAL SITE ASSESSMENT

3.1 Drilling and Soil Sampling

Prior to drilling, Underground Service Alert (USA) was notified a minimum of 48 hours in advance drilling activities. A total of seven borings were drilled on August 21, and 22, 1991 within this phase of the soil and ground water characterization. A single soil boring which was completed as MW-1 had been previously drilled on May 21, 1991. Two soil borings, MW-1, and MW-3, were drilled down ground water gradient of the former underground storage tanks, both of which will be converted into ground water monitoring wells (Figure 2). One soil boring, MW-2, was drilled east northeast of the former tank locations in a presumed up ground water gradient position and was also completed as a ground water monitoring well. All eight of the soil borings were drilled around the periphery of the former gasoline tanks to assess the vertical lateral limits of gasoline impacted soil. Three of these borings were also positioned in such a way as to assess the vertical and lateral limits of waste oil impacted soil in the vicinity of the former waste oil tank. Drilling for all borings were accomplished using a truck mounted Mobile™ B-57 drill rig 8 3/4-inch outside diameter hollow-stem augers. The three borings which were converted into ground water monitoring wells were drilled to a depth of 35 feet below surface grade. The soil borings which were drilled around the perimeter of the former underground storage tanks were drilled to a depth of 20 feet. Ground water was encountered during drilling at a depth of 19 feet.

Soil sampling was performed while drilling the borings at a five foot interval beginning at 5 feet below grade to the designed termination depth. Soil sampling was accomplished using a split-spoon sampler (ASTM D 3550 with shoe similar to ASTM D 1586) equipped with three 6-inch by 2.5-inch diameter brass sleeves for soil retention. The soil samples were obtained by driving the sampler with a one hundred and forty pound hammer dropping thirty inches in accordance with ASTM D 1586.

The lowermost sleeve at each sample interval (corresponding to approximately 6 inches below the actual sample interval) was screened for total organic vapors with a portable photo-ionization meter (PID). Headspace vapor analysis was performed by first discarding a portion of the soil retained at one end of the sleeve to produce a headspace. The sleeve was then capped and the probe of the PID inserted through a hole in the cap and into the headspace for analysis. The PID readings were recorded on the boring logs. The uppermost sleeve was observed for lithology.

The middle sample sleeve of the sampler was immediately sealed with Teflon™ film, capped, labeled, and placed on ice at 4°C for transport to a California Department of Health Services (DHS) certified laboratory. Strict chain-of-custody procedures were utilized for all samples collected to ensure sample integrity and to document sample possession from the time of collection to the final destination. A single sample collected from each borings at approximately six inches above the groundwater table was retained for laboratory analysis.

All sampling equipment was washed with TSP (tri-sodium phosphate) cleanser, and rinsed with tap water and de-ionized water prior to sampling, between sample intervals, and between borings to reduce the possibility of cross-contamination. The drilling augers were steam cleaned between borings, also to reduce the possibility of cross-contamination.

A registered geologist was on-site to log the borings in accordance with the Unified Soil Classification System, monitor soils during drilling for contamination, collect soil samples, and construct, develop, and sample the ground water monitoring wells.

3.2 Ground Water Monitoring Well Completion

Three ground water monitoring wells were installed to determine the presence of ground water contamination resulting from a release from the former underground tanks. The wells were constructed in accordance with the State of California Department of Water Resources Water Well Standards, Bulletins 74-81 and 74-90, as well as County of Alameda regulations. The borings were drilled to a depth of 35 feet below surface grade. The wells were cased with 20 feet of 2-inch 0.01" slotted PVC casing and #2/12 filter pack sand, installed from the bottom of the boring to 12 feet below surface grade. Blank PVC casing packed in Volclay grout extended

from the surface downward to the three foot bentonite seal placed above the filter pack. Locking, water-tight well covers were set in concrete to protect and secure the well heads.

3.3 Well Development and Ground Water Sampling

Following completion of the ground water monitoring wells, the wells were developed by surging and bailing to remove drilling residues and produce low turbidity ground water. All development, purging, and sampling equipment was washed TSP (tri-sodium phosphate) detergent, rinsed with clean tap water and deionized water, then allowed to air dry before each well was purged and sampled, to reduce the possibility of cross-contamination. Prior to sampling, the ground water monitoring wells were purged with a pre-cleaned bailer to remove stagnant water in the wells. During purging, key parameters including temperature, conductivity, and pH were measured with a portable electronic meter and recorded. The meter had been calibrated prior to the sampling event. The purging continued until the monitored parameters stabilized after three casing volumes of ground water had been removed. The ground water monitoring wells were sampled after water in the wells had recharged to approximately 80% of the original ground water elevation. During the development and purging of monitoring well MW-1 free floating product was observed in the well. All liquids recovered during the development and purging of the monitoring wells has been stored in a 55 gallon drum at the site for future disposal or on-site treatment.

Following purging, ground water samples were collected on August 23, 1991 with pre-cleaned Teflon™ bailers, and discharged with a non-aerating bottom emptying device into sterilized glass containers, capped with Teflon™ septa, labeled, and chilled in an ice chest for transport. Water samples were handled and transported according to the United States Environmental Protection Agency (USEPA) protocol to the DHS certified laboratory requested. Sample identification and chain of custody procedures were utilized to ensure sample integrity and to document sample possession from the time of collection to its ultimate disposal. The sample labels identified the job number, sampler, date, time of collection, and sample number unique to the sample. The monitoring wells were surveyed relative to a permanent

must survey to a established benchmark

structure, and from a designated point on the north side of the top of the well casing and the groundwater levels were measured in each well to an accuracy of 0.01 feet.

3.4 Chemical Analysis of Soil and Ground Water Samples

Soil samples will be sent to Mobile Labs, Inc. a state certified laboratory for the request analysis. Two soil samples from each soil boring which field screened as having the greatest concentration of petroleum hydrocarbons and which would best define the vertical variations in petroleum hydrocarbon concentrations were selected for laboratory analysis. All fifteen selected soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline, and the gasoline constituent volatile aromatics benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 418.1, the California DHS LUFT Method, and USEPA Method 8020, respectively. Additionally, six selected soil samples from the three soil borings advanced in the former waste oil tank were analyzed for the presence of TPH as oil and grease using USEPA Method 418.1. The three ground water samples were also analyzed at Mobile Labs, Inc.. The ground water samples were analyzed for TPH as gasoline, and BTEX by the USEPA Method 502.1. former 602 for BTEX

4.0 RESULTS OF ENVIRONMENTAL SITE ASSESSMENT

4.1 Soil Conditions

As observed in the borings, soils beneath the site consist primarily of bay muds. These soils typically consist of dark bluish gray, highly plastic, organic clay (OL) to a depth of eleven feet, overlying brown, highly plastic, organic clay (OL) to a depth of fifiten feet. Underlying this was a zone of brown, loose silty sand (SM) with minor gravel. This zone varied in thickness over the site from twelve feet to one feet, and was underlain by an unknown thickness of greenish brown, highly plastic, organic clay (OL). Ground water was encountered in all of the borings at a depth of approximately 19 feet below ground surface (bgs). However, in the wells where the sand was less developed the augers did not immediately fill with ground water, but ground water was subsequently observed when the augers were allowed to stand open. In those wells where the sand zone was virtually absent, drilling continued to a depth of 30 feet below surface grade to further assess the lithology, since the wet clay provided good core samples. In the borings were the sand was well developed,

ground water immediately rose in the augers to a depth between of 13, and 16 feet below surface grade which gives evidence that the overlying clay serves as an aquitard, and that the sand layer is a locally confined aquifer.

4.2 Hydrology

On August 23, 1991 the elevations and locations of the north side of the top of casing of the three ground water monitoring wells were surveyed. The top of casings have been referenced to an arbitrary elevation of 100' and are 100.00' at MW-1, 98.585' at MW-2, and 99.25' at MW-3. The depth to water in each of the wells was then measured to an accuracy of 0.01'. The recorded depths were -15.42' in MW-1, -13.77' in MW-2, and -15.07' in MW-3. The relative ground water elevations are therefore, 84.58' at MW-1, 84.815' at MW-2, and 84.18' at MW-3. These ground water elevations are presented on Figure 2 along with the resultant ground water flow direction and gradient. The ground water flow direction is to the west with a gradient of .755' per 100'. Therefore, MW-1,and MW-2 are laterally down gradient of the former gasoline tanks, and MW-3 is laterally down gradient of both the former waste oil tank, and the former gasoline tanks. Both MW-1, and MW-2 are up gradient of the former waste oil tank. None of the monitoring wells are positioned up gradient of the former gasoline tanks due to the gradient being to the west. Therefore, ESE recommends a fourth groundwater monitoring well, MW-4, to be positioned up gradient of the former gasoline tanks to assess the potential for an up gradient source of gasoline hydrocarbons in the groundwater.

very steep

optional at this time

4.3 Analytical Results-Soil

Total Peroleum Hydrocarbons (TPH) as gasoline, the gasoline constituent volatile aromatics, and Total Recoverable Hydrocarbons (TRH) as oil and grease were detected in excess of Regional Water Quality Control Board (RWQCB) recommended guidelines in eleven of the fifteen soil samples analyzed. TPH as gasoline was detected at a concentration of 2,775 mg/kg at a depth of 15 feet in boring TH-1 advanced through the center of the former gasoline tanks excavation pit, 4,320 mg/kg at a depth of 10 feet in boring MW-2 advanced 50 feet north of the former gasoline tanks excavation pit, 450 mg/kg at a depth of 20 feet in boring TH-4 advanced 35 feet west northwest the former gasoline tanks excavation pit, 360 mg/kg

at a depth of 10 feet in boring TH-2 advanced 30 feet east of the former gasoline tanks excavation pit, and 255 mg/kg at a depth of 15 feet in boring MW-1 advanced 30 feet west southwest of the former gasoline tanks excavation pit. The volatile aromatic benzene was detected at a concentration of 1.235 mg/kg at a depth of 15 feet in boring TH-1 advanced through the center of the former gasoline tanks excavation pit, 7.275 mg/kg at a depth of 10 feet in boring MW-2 advanced 50 feet north of the former gasoline tanks excavation pit, and 1.505 mg/kg at a depth of 15 feet in boring MW-1 advanced 30 feet west southwest of the former gasoline tanks excavation pit. TRH as oil and grease was detected at a concentration of 1,600 mg/kg at a depth of 20 feet in boring TH-4 advanced 25 feet east of the former waste oil tank, 90 mg/kg at a depth of 10 feet in boring MW-3 advanced 15 feet south southwest of the former waste oil tank, and 60 mg/kg at a depth of 10 feet in boring TH-3 advanced 7.5 feet east northeast of the former waste oil tank. The analytical reports, and chain of custody documents are included as Appendix B.

Table 1 presents a summary of the analytical results for TRH as oil and grease, TPH as gasoline, and the gasoline constituent volatile aromatics (BTEX) in soil samples analyzed during the environmental site assessment:

TABLE 1. Analytical Results expressed in Parts per Million (ppm).

Sample	Boring	Depth	TRH Oil	TPH Gasoline	Benzene	Toluene	Ethyl Benzene	Total Xylenes
8014-1	MW-1	10-10.5'	NA	*150	*0.460	0.365	*0.305	*0.960
8014-2	MW-1	15-15.5'	NA	*255	*1.505	*4.255	*4.015	*4.270
8014-3	TH-1	15-15.5'	NA	*2775	*1.235	*1.060	*1.625	*5.280
8014-4	TH-2	10-10.5'	NA	*360	ND	ND	ND	*0.770
8014-5	TH-2	29.5-30'	NA	*50	ND	ND	ND	ND
8014-6	MW-2	10-10.5'	NA	*4320	*7.275	*6.620	*3.470	*13.815
8014-7	MW-2	15-15.5'	NA	*160	ND	ND	ND	ND
8014-8	TH-3	10-10.5'	60	10	ND	ND	ND	ND
8014-9	TH-3	18.5-19'	20	10	ND	ND	ND	ND
8014-10	TH-4	10-10.5'	40	*25	ND	ND	ND	0.175
8014-11	TH-4	19.5-20'	*1,600	*450	ND	ND	ND	ND
8014-12	MW-3	10-10.5'	90	*50	ND	ND	ND	ND
8014-13	MW-3	15-15.5'	40	*25	ND	ND	ND	ND
8014-14	TH-5	10-10.5'	NA	10	ND	ND	ND	ND
8014-15	TH-5	18-18.5'	NA	ND	ND	ND	ND	ND
A L	-	-	100.0	10.0	**0.01	***0.4	***0.3	***0.2

ND: None Detected above or above minimum reporting level.
NA: Not Analyzed
A L: Regional Water Quality Control Board Action Level for contaminants in soil. Action Levels were calculated using the LUFT methodology by multiplying the most stringent current federal or state water quality standards by a factor of 10 to account for attenuation due to soil composition and close proximity to ground water which results in a high potential of leaching to ground water.
*: exceeds current Action Level
**: California Department of Health Services, Code of Regulations, Title 22 Primary Maximum Contaminant Level.
***: California Department of Health Services, Code of Regulations, Title 22 Secondary Maximum Contaminant Level.

4.4 Analytical Results-Ground Water

Total Petroleum Hydrocarbons (TPH) as gasoline was detected at a concentration of 2,090,000 ug/L in monitoring well MW-1. TPH as gasoline was detected at a concentration of 10,000 ug/L in monitoring well MW-2. TPH as gasoline was not detected at or above the minimum reporting level in monitoring well MW-3. The volatile aromatics were detected in monitoring well MW-1 at concentrations of 2,150 ug/L of benzene, 9,345 ug/L of toluene, 2,145 ug/L of ethylbenzene, and 23,150 ug/L of total xylenes. Each of these concentrations exceeds the RWQCB Action Level

concentrations for ground water. No volatile aromatics were detected at or above the minimum reporting levels in monitoring wells MW-2, and MW-3.

Table 2 presents a summary of the analytical results for TPH as gasoline, and the gasoline constituent volatile aromatics (BTEX) in ground water samples analyzed during the environmental site assessment:

TABLE 2. Analytical Results expressed in Parts per Billion (ppb).

Sample No.	TPH Gasoline	Benzene	Toluene	Ethyl Benzene	Total Xylenes
MW-1	*2,090,000	*2,150.0	*9,345.0	*2,145.0	*23,150.0
MW-2	*10,000	ND	ND	ND	ND
MW-3	ND	ND	ND	ND	ND
A L		**1.0	***40.0	***30.0	***20.0

ND: None Detected above minimum reporting level.
A L: Regional Water Quality Control Board Action Level for contaminants in ground water.
*: exceeds current Action Level.
**: California Department of Health Services, Code of Regulations, Title 22 Primary Maximum Contaminant Level.
***: California Department of Health Services, Code of Regulations, Title 22 Secondary Maximum Contaminant Level.

5.0 SUMMARY AND CONCLUSI0NS

Based on the sampling and analysis, ground water down gradient from the former gasoline tanks is impacted with TPH as gasoline and the gasoline constituent volatile aromatics above RWQCB Action Levels. The release of gasoline has also resulted in soil being impacted with gasoline hydrocarbons in much of the vadose radially 50 feet from the tank and to a depth of 20 feet. Aditionally, soil immediately adjacent to the the former waste oil tank is impacted with TPH as oil and grease in excess of RWQCB Action Levels to a depth of 20 feet below surface grade, and radially 30 feet from the former tank.

Based upon the groundwater sampling and analysis, remedial measures are deeemed neccessary to reduce the concentrations of gasoline, gasoline constituent volatile aromatics, and oil and grease in both the soil at the subject property. A series of periodic monitorings of the ground water is initially required to establish the extent to which ground water is impacted and whether remedial measures will be

required. Additionally, no up gradient groundwater monitoring well is current at the subject property, therefore, there is a possibility that the gasoline impacting the groundwater has an up gradient source which has not been identified, and can only be assessed through the installation of a fourth and up gradient groundwater monitoring well.

6.0 RECOMMENDATIONS

ESE recommends that additional site characterization be conducted to assess the down gradient limits of ground water impacted with gasoline and gasoline constituent volatile aromatics with concentrations in excess of RWQCB Action Levels to the west of the former gasoline tanks. One additional ground water monitoring well should be installed at the location MW-4 shown on Figure 2. This location will assess ground water in an up gradient position from the former gasoline tanks. A second additional ground water monitoring well should be installed at the location MW-5 shown on Figure 2. This location will assess the down gradient edge of the plume. At this time all of the monitoring wells at the site should be resampled to see if any dynamic changes in the concentration of gasoline in the ground water is occurring. Periodic monitoring of the wells will determine if remediation of the ground water is required. Additionally a single soil boring should be advanced to the south of the former gasoline tanks in the direction of Miller Avenue to more completely define the edge of impacted soil in that direction, and provide data on lateral variations in the sandy zone so as to provide information in the design of a remedial system.

Remedial alternatives which should be considered if monitoring of the ground water does indicate that mitigation is required include the pumping of ground water from monitoring well MW-1 to remove the threat of impacted ground water migrating offsite. The extracted ground water can be stored in 55 gallon drums awaiting disposal or on-site treatment. If the volume of impacted water extracted becomes significant, then on-site treatment of the water using technologies such as carbon absorption, a stripper tower with thermal oxidation, ultra violet light, or a bioreactor may become cost effective. Mitigation of the impacted soil may involve in-situ vapor extraction of the gasoline hydrocarbons, and in-situ bioremediation of the waste oil impacted soil, or may require that the soil be excavated and either

treated on-site, or disposed of off-site at an appropriate solid waste disposal facility. Excavation of the impacted soil down to ground water and subsequent pumping of the water which accumulates in the pit may be a very effective method for remediating both the soil and ground water at the site.

7.0 CLOSURE

This report has been prepared for the exclusive use of Mobile Labs, Inc. as it pertains to the referenced property in Oakland, California. The findings and conclusions rendered in this report are opinions based on laboratory testing of soil, and ground water samples collected during this project. This report does not reflect subsurface variations which may exist between sampling points. These variations cannot be anticipated nor can they be entirely accounted for even with exhaustive additional testing. All work has been performed in accordance with generally accepted practices in geotechnical/environmental engineering, engineering geology, and hydrogeology. No other warranty, either express or implied, is made.

Thank you for this opportunity to have been of service. If you have any questions regarding this report or the information contained herein, please contact this office at your convenience.

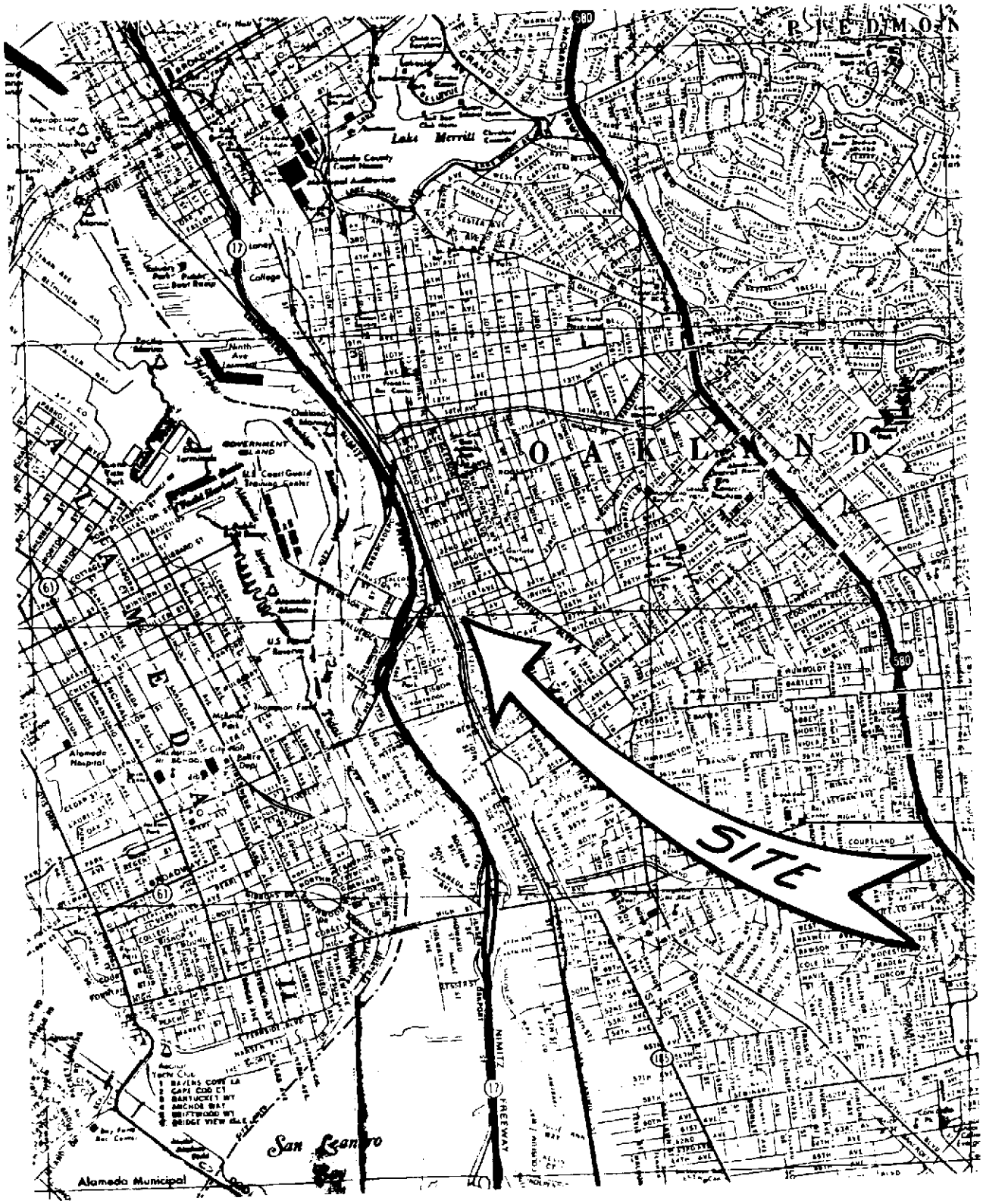
Sincerely,

EARTH SYSTEMS ENVIRONMENTAL, INC.

Mark R. Magargee, RG# 4892
Senior Geologist

cc: 2 - Addressee
1 - SLO
1 - BAK

FIGURES



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TITLE

WONG'S TAXI TAXI

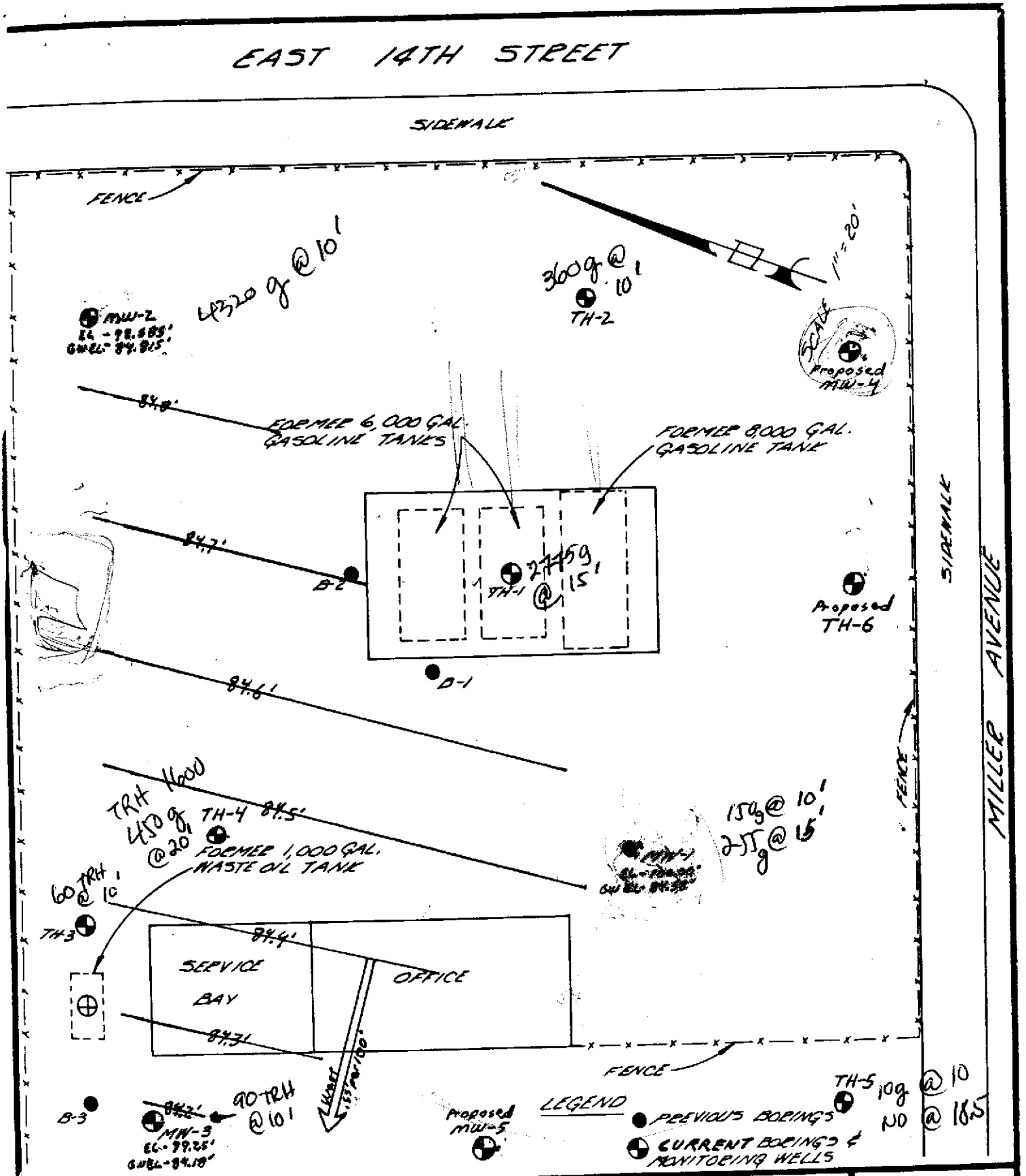
2314 EAST 14TH STREET
OAKLAND, CALIFORNIA

LOCATION MAP

Figure

1

JOB NO.
EB-8014-1



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TITLE

WONG'S TAXI TAXI

2314 EAST 14TH STREET
OAKLAND, CALIFORNIA

SITE MAP

Figure 2

JOB NO. EB-8016-1

APPENDIX A

BORING LOGS

WELL CONSTRUCTION	CHEMICAL ANALYSES Laboratory TPH (mg/kg)	CHEMICAL ANALYSES Field PID (ppm)	BLOW COUNT	DEPTH (feet)	INTERVAL	SAMPLE NUMBER	U.S.C.S. DESIGN.	SOIL DESCRIPTION
				0				
		20	4 6 7	5			ML/SM	Sand, silt to silty sand with minor clay, dark greenish gray, loose, dry, no stain, very slight odor
		ND		10			ML/CL	Ground water in backfilled pit @ 9' Clayey silt to silty clay, dark greenish gray, wet, loose, no stain, no odor
	2775	ND		15		80143	ML/CL	Same as above TD 16' 2775 @ 15' Only no odor

Geologist: ESE - Mark Magargee, R.G.

Wong's Taxi

Project Number: ES-8014-1

8/21/91

Driller: S & S

LOG of BORING

TH-1

PLATE

Page 1 of 1

WELL CONSTRUCTION	CHEMICAL ANALYSES Laboratory TPH (mg/kg)	CHEMICAL ANALYSES Field PID (ppm)	BLOW COUNT	DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	U.S.C.S. DESIGN.	SOIL DESCRIPTION
				0				
		30	4/9/17	5			CL/ML	Silty Clay with trace fine sand, dark greenish gray, slightly moist, medium dense, good plasticity, no staining, trace hydrocarbon like odor
	360	1050	6/11/16	10		8014-4	SM/ML	Silty Sand with minor clay, light grayish green, slightly moist, loose, no staining, st[illegible] odor
		200	7/9/12	15			CL	Fat Clay, minor silt, grayish brown, moist, good plasticity, no staining, moderate odor
							SM/CL	Gravelly Sand, significant clay and silt, yellowish brown, slightly moist, no staining, very slight odor
							▽?	
		100	14/20/24	20			CL	Fat Clay, minor silt, grayish brown, moist, good plasticity, no staining, mod. odor
		20	9/13/20	25			CL	Same as above, moist, no odor
	50	60	7/10/17	30		8014-5	CL	Same as above. TD 31'

Geologist: ESE - Mark Magargee, R.G.

Driller: S & S

Wong's Taxi

LOG of BORING

TH-2

PLATE

Page 1 of 1

Project Number: 93-8014-1

8/2/91

WELL CONSTRUCTION	CHEMICAL ANALYSES Laboratory TPH (mg/Kg)	CHEMICAL ANALYSES Field PID (ppm)	BLOW COUNT	DEPTH (Feet)	SAMPLE INTERVAL	SAMPLE NUMBER	U.S.C.S. DESIGN.	SOIL DESCRIPTION
				0				
		NO	4/8/11	5			CL/ML	Clay, trace sandy silt, yellowish brown to dark greenish gray,
	10	NO	6/9/14	10		8014-8	OL	Organic Clay, dark greenish gray, slightly moist, good plasticity, no stain, no odor
		70	13/18/35	15			CL	Fat clay, minor silt, light green, moist, medium dense, good plasticity, no stain, minor Avocado-like odor
	10	70	12/20/20	20		8014-9	CL ?	Same as above, light brownish yellow, slight odor
		NO	7/11/15	25			CL	Same as above, very moist, no odor
		NO	11/10/15	30			SM /CL	Silty Gravelly Sand; significant clay, light yellowish brown, very moist, medium dense, no stain, no odor TD 31'

Geologist: ESE - Mark Magargee, R.G.

Driller: 5 B J S

Wong's Taxi

LOG of BORING

TH-3

PLATE

Page 1 of 1

Project Number: ES-8014-1

8/2/91

WELL CONSTRUCTION	CHEMICAL ANALYSES: Laboratory TPH (mg/Kg)	CHEMICAL ANALYSES: Field PID (ppm)	BLOW COUNT	DEPTH (Feet)	SAMPLE: INTERVAL	SAMPLE: NUMBER	U.S.C.S. DESIGN.	SOIL DESCRIPTION
				0				
		80	4/6/10	5			CL	Clay, dark greenish gray, slightly moist, medium dense, good plasticity, no stain
	25	140	4/9/9	10		8014-10	SM/CL	Gravelly Clayey Sand, dark gray to black, slightly moist, slightly dense, dark stain, moderate hydrocarbon like odor
		20	4/7/7	15			CL	Fat Clay, minor silt, light green, moist, medium dense, good plasticity, no stain, slight odor
	450	20	6/6/12	20		8014-11	SM	Clayey Silty Sand, light green, saturated, medium dense, no stain, moderate odor TD 21'

Geologist: ESE - Mark Magargee, R.G.

Driller: S&J S

Wong's Taxi

LOG of BORING

TH-4

PLATE

Page 1 of 1

Project Number: EB-8014-1

8/21/91

WELL CONSTRUCTION	CHEMICAL ANALYSES Laboratory TPH (mg/kg)	CHEMICAL ANALYSES Field PID (ppm)	BLOW COUNT	DEPTH (Feet)	SAMPLE INTERVAL	SAMPLE NUMBER	U.S.C.S. DESIGN.	SOIL DESCRIPTION
				0				
		20	3 5 7	5			CL	Fat Clay, minor fine sand, dark green/gray, slightly moist, medium dense, good plasticity, no stain, no odor
	10	20	7 10 20	10		8014-14	CL/ML	Clay with silty sand, dark green/gray, slightly moist, no stain, no odor
		20	15 17 32	15			CL/SM	Fine grained sandy Clay, light green, moist, medium dense, no stain, no odor
				▽				
	~0	10	7 9 14	20		8014-15	SM	Silty Clayey Sand, light yellow/green, saturated, medium dense, no stain, no odor
								TD 21'

Geologist: ESE - Mark Magargee, R.G.

Driller: SOS

Wong's Taxi

Project Number: EB-8014-1

8/2/91

LOG of BORING

TH-5

PLATE

Page 1 of 1

WELL CONSTRUCTION	CHEMICAL ANALYSES: Laboratory TPH (mg/kg)	CHEMICAL ANALYSES: Field PID (ppm)	BLOW COUNT	DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	U.S.C.S. DESIGN.	SOIL DESCRIPTION
Concrete cover				0				
Asphalt Cement								
N. Pac Plant								
		5	5 5 6	5			OL	Organic Clay, trace silt, sand & gravel, dark gray to black, very slightly moist, medium dense, good plasticity, no stain, no odor
	Bentonite	35	5 10 17	10		8014-1	OL	Same as above, minor silt, shell fragments, moderate hydrocarbon like odor
		45	9 13 17	15		8014-2	CL	Fat Clay, trace silt, gray to brown, moist, medium dense, good plasticity, gray staining, strong odor
								▽
		12	5 7 9	20			SM	Silty Gravelly Sand, gray, saturated, loose, gray staining, moderate odor
				25			SM	Same as above, brown, no staining, no odor
				30			CL	Fat clay, minor sand, brown, saturated, medium dense, good plasticity, no staining, no odor
							SW	well graded Sand
				35			GW	Well graded Gravel TD 35'
Cap								

Geologist: ESE - Mark Magargee, R. G.

Driller: Consolidated Testing

Wong's Taxi

LOG of BORING

MW-1

PLATE

Project Number: ES-8014-1

5/22/91

Page 1 of 1

WELL CONSTRUCTION	CHEMICAL ANALYSES Laboratory TPH (mg/Kg)	Field PID (ppm)	BLOW COUNT	DEPTH (Feet)	SAMPLE INTERVAL	SAMPLE NUMBER	U.S.C.S. DESIGN.	SOIL DESCRIPTION
Neat Cement (2" PVC Blank)				0				
		90	5, 13/16	5	■		CL/SM	Silty Clay with minor gravelly sand, dark greenish gray, slightly moist, medium dense, good plasticity, no staining, very slight hydrocarbon like odor
Bentonite	4320	360	7, 13/13	10	■	8014-6	SM	Silty Sand, slightly moist, dark gray, loose, gray staining, strong odor
#2/12 Lonestar Sand (2" .020" PVC Slot)	160	250	7, 13/20	15	■	8014-7	SM/CL	Silty Clayey Sand with minor gravel, light greenish gray, moist, medium dense, no stain, very slight odor
				20			SM/CL	Same as above, saturated, no odor
				25			CL	Fat Clay, greenish brown, saturated, medium dense, good plasticity, no staining, no odor
				30			CL	Same as above
Cap				35			CL	Same as above TD 35'

Geologist: ESE - Mark Magargee, R.G.

Driller: S B & S

Wong's Taxi

Project Number: ES-8014-1

8/2/91

LOG of BORING

MW-2

PLATE

Page 1 of 1

WELL CONSTRUCTION	CHEMICAL ANALYSES Laboratory TPH (mg/kg)	CHEMICAL ANALYSES Field PID (ppm)	BLOW COUNT	DEPTH (Feet)	SAMPLE INTERVAL	SAMPLE NUMBER	U.S.C.S. DESIGN.	SOIL DESCRIPTION
Well cover				0				
Concrete								
2" PVC Blank								
Bentonite		40	2/3/6	5			CL/SM	Fat Clay, trace gravel, silty Sand, dark greenish gray, slightly moist, medium dense, good plasticity, no staining, no odor
	50	nd	2/8/12	10		8014-12	OL	Organic clay, greenish brown, moist, medium dense, good plasticity, no staining, no odor
2" PVC 0.010" Machine Slot Screen	25	70	5/19/20	15		8014-13	SM	silty Sand, dark gray, moist, loose, no staining, no odor
				20			SM/CL	▽ Silty Clayey Sand, gray, saturated, medium dense, no staining, no odor
				25			CL	Fat Clay, greenish brown saturated, medium dense, good plasticity, no staining, no odor
				30			CL	Same as above
				35			SM	Silty Sand, light green, saturated, loose, no staining, no odor TD 35'
Sand								

Geologist: ESE - Mark Magargee, R.G.

Driller: SOS

Wong's Taxi

LOG of BORING

MW-3

PLATE

Project Number: ES-8014-1

8/21/91

Page 1 of 1

APPENDIX B

ANALYTICAL REPORTS AND CHAIN OF CUSTODY

Nevada

Mobile Labs Inc.

Arizona

5327 Wingfoot Drive
Bakersfield, CA 93306
(805) 872-4750

Laboratory Results For :
Wong's Taxi Taxi
2345 East 14th Street
Oakland, CA

Date Received : 5/24/91
Date Analyzed : 5/27/91
Analyst : J.S. Johnson
Lab No. 910069

Sample Matrix ; Soils

	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg	Tot Pet Hyds mg/kg
MW-1@10'	.460	.365	.305	.960	150
MW-1@15'	1.505	4.255	4.015	4.270	255
QA/QC Sample % Recovery	86	79	97	102	86 Gasoline

All Results Reported in Milligrams per Kilogram
ND = Non Detectable ; EPA 8020 (.005 mg/kg)
EPA 8015 Modified for Gasoline (5 mg/kg)
Analysis of Volatile Aromatics ; EPA 8020
*Analysis of Total Petroleum Hydrocarbons ; EPA 8015 MOdified for Gasoline
*The TPH Method for Gasoline is the Calif DOHS Recommended Procedure

Certificate Number : E739

Jeff Johnson, Chemist

Mobile Labs Inc.
5327 WINGFOOT DRIVE
BAKERSFIELD, CALIFORNIA 93306
(805) 872-4750

CALIFORNIA • NEVADA • ARIZONA

CERTIFIED FULL SERVICE ON SITE ANALYTICAL LABORATORIES

PROJECT NO.:	SITE NAME:
EB-8014-1	Wong's Taxi
SAMPLERS (SIGNATURE):	SITE ADDRESS
Mark R Maguire	2345 East 14th Street, Oakland

SAMPLE ID. NO.	DATE	TIME	COMP	GRAB	SAMPLE MATRIX	SAMPLE LOCATION DESIGNATION	NO. OF CONTAINERS	BTEX/MTBE (Gas)	EMBO20 (BTEX)	REMARKS
8014-1	5-22-91	11:45AM	N	N	Soil	mw-1@10'	1	✓	✓	
8014-2	5-22-91	12:00PM	N	N	Soil	mw-1@15'	1	✓	✓	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS:	
Mark R Maguire	5-24-91	5:30PM		5/24/91	1730		

Nevada

Mobile Labs Inc.

Arizona

5327 Wingfoot Drive
Bakersfield, CA 93306
(805) 872-4750

Laboratory Results For :
Wong's Taxi Taxi
2345 East 14th Street
Oakland, CA

Date Received : 8/23/91
Date Analyzed : 8/24/91
Analyst : J.S. Johnson
Lab No. 910124

Sample Matrix ; Soils

	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg	Tot Pet Hyds mg/kg
TH-1@15'	1.235	1.060	1.625	5.280	2775
TH-2@10'	ND	ND	ND	.770	360
TH-2@30'	ND	ND	ND	ND	50
MW-2@10'	7.275	6.620	3.470	13.815	4320
MW-2@15'	ND	ND	ND	ND	160
TH-3@10'	ND	ND	ND	ND	10
TH-3@19'	ND	ND	ND	ND	10
TH-4@10'	ND	ND	ND	.175	25
TH-4@20'	ND	ND	ND	ND	450
MW-3@10'	ND	ND	ND	ND	50
MW-3@15'	ND	ND	ND	ND	25
TH-5@10'	ND	ND	ND	ND	10
TH-5@18'	ND	ND	ND	ND	ND

All Results Reported in Milligrams per Kilogram
ND = Non Detectable ; EPA 8020 (.005 mg/kg)
EPA 8015 Modified for Gasoline (5 mg/kg)
Analysis of Volatile Aromatics ; EPA 8020
*Analysis of Total Petroleum Hydrocarbons ; EPA 8015 Modified for Gasoline
*The TPH Method for Gasoline is the Calif DOHS Recommended Procedure

Certificate Number : E739

Jeff Johnson, Chemist

evada

Mobile Labs Inc.

Arizona

5327 Wingfoot Drive
Bakersfield, CA 93306
(805) 872-4750

Laboratory Results For :
Wong's Taxi Taxi
2345 East 14th Street
Oakland, CA

Date Received : 8/23/91
Date Analyzed : 8/24/91
Analyst : J.S. Johnson
Lab No. 910124

Sample Matrix Soil and Water

	Benzene ug/L	Toluene ug/L	Ethylbenzene ug/L	Xylenes ug/L	Tot Pet Hyds ug/L
MW-1 (Water)	2150	9345	2145	23,150	2,090,000
MW-2 (Water)	ND	ND	ND	ND	10,000
MW-3 (Water)	ND	ND	ND	ND	ND

Sample I.D.	Total Recoverable Hydrocarbons mg/kg
TH-3@10'	60
TH-3@19'	20
TH-4@10'	40
TH-4@20'	1600
MW-3@10'	90
MW-3@15'	40

All Results Reported in Milligrams per Kilogram or Micrograms per Liter
ND = Non Detectable ; EPA 602 (5 ug/L)
EPA 8015 Modified for Gasoline (5000 ug/L)
EPA 418.1 (10 mg/kg)
Analysis of Volatile Aromatics ; EPA 602
Analysis of Total Recoverable Hydrocarbons ; EPA 418.1
*Analysis of Total Petroleum Hydrocarbons ; EPA 8015 Modified for Gasoline
*The TPH Method for Gasoline is the Calif DOHS Recommended Procedure

Certificate Number : E739

Jeff Johnson, Chemist

5327 WINGFOOT DRIVE
BAKERSFIELD, CALIFORNIA 93306
(805) 872-4750

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CERTIFIED FULL SERVICE ON SITE ANALYTICAL LABORATORIES

PROJECT NO.: 68-8014-1
SITE NAME: Wong's Taxi
SAMPLERS (SIGNATURE): Mark Maguire
SITE ADDRESS: 2345 East 14th Street

SAMPLE ID. NO.	DATE	TIME	COMP	GRAB	SAMPLE MATRIX	SAMPLE LOCATION DESIGNATION	NO. OF CONTAINERS	8015 (Gas)	8020 (BTEX)	418.1	REMARKS
8014-3	8/22/91	10:40AM			Soil	TH-1 @ 15'	1	V	V		Gas Tank Only
8014-4		11:15AM				TH-2 @ 10'		V	V		Gas Tank Only
8014-5		12:30PM				TH-2 @ 30'		V	V		Gas Tank Only
8014-6		2:00PM				MW-2 @ 10'		V	V		Gas Tank Only
8014-7		2:10PM				MW-2 @ 15'		V	V		Gas and waste oil tanks
8014-8	8/23/91	7:30AM				TH-3 @ 10'		V	V	V	Gas and waste oil tanks
8014-9		8:10AM				TH-3 @ 19'		V	V	V	Gas and waste oil tanks
8014-10		9:55AM				TH-4 @ 10'		V	V	V	Gas and waste oil tanks
8014-11		10:15AM				TH-4 @ 20'		V	V	V	Gas and waste oil tanks
8014-12		11:15AM				MW-3 @ 10'		V	V	V	Gas and waste oil tanks
8014-13		11:50AM				MW-3 @ 15'		V	V	V	Gas and waste oil tanks
8014-14		2:00PM				TH-5 @ 10'		V	V		Gas Tank Only
8014-15		2:25PM				TH-5 @ 18'		V	V		Gas Tank Only

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS:	
Mark R Maguire	8/23/91	5:30PM		8/23/91	1735		

Moore Labs Inc.

5327 WINGFOOT DRIVE
BAKERSFIELD, CALIFORNIA 93306
(805) 872-4750

CALIFORNIA • NEVADA • ARIZONA

CERTIFIED FULL SERVICE ON SITE ANALYTICAL LABORATORIES

PROJECT NO.: EB-8014-1

SITE NAME: Wong's Taxi

SAMPLERS (SIGNATURE): Mark Magargee

SITE ADDRESS: 2345 East 14th Street

SAMPLE ID. NO.	DATE	TIME	COMP	GRAB	SAMPLE MATRIX	SAMPLE LOCATION DESIGNATION	NO. OF CONTAINERS	8015 (Gas)	8020 (BTEX)	418.1	REMARKS
MW-2	8/23/91	9:30AM			water	MW-2	4	✓	✓	✓	
MW-3	8/23/91	10:30AM				MW-3	1	✓	✓	✓	
MW-1	8/23/91	11:20AM				MW-1	1	✓	✓	✓	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED FOR LABORATORY BY (SIGNATURE)	DATE	TIME	REMARKS:	
Mark Magargee	8/23/91	5:35PM		8/23/91	1935		