W. A. CRAIG, INC.

STID 812

Industrial and Environmental Contractor
P.O. Box 448
Napa, California 94559-0448
Contractor License # 455752

Phone: (707) 252-3353 **Fax: (707) 252-3385**

W. A. Craig, Inc., Project No. 3365
January 9, 1995

Mr. and Mrs. Casimiro Damele
3750 Victor Avenue
Oakland, California 94619

SUBJECT: **Transmittal of Report for Soil and Ground Water Investigation Damele Property, 4401 Market Street, Oakland, California**

Dear Mr. and Mrs. Damele:

W. A. Craig, Inc. is pleased to present the attached report for the preliminary soil and ground water investigation at the above-referenced site. You have authorized W. A. Craig, Inc. to prepare this report for submittal to the Alameda County Health Services Agency - Local Oversight Program (ACHCSA). W. A. Craig, Inc. understands that you will forward copies of this report to the ACHCSA and San Francisco Bay Regional Water Quality Control Board (RWQCB) for review. W. A. Craig, Inc. will be pleased to prepare the Work Plan for the recommended additional soil and ground water assessment for submittal to the regulatory agencies, following your authorization. Please call W. A. Craig, Inc. at your convenience if you have any questions.

Sincerely,
W. A. CRAIG, INC.

William A. Craig, II
Owner, R.E.A. 01414

WAC/JHD/jhd
Attachment

W. A. CRAIG, INC.

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REPORT
SOIL AND GROUND WATER INVESTIGATION
DAMELE PROPERTY
4401 MARKET STREET
OAKLAND, CALIFORNIA
FOR
MR. AND MRS. CASIMIRO DAMELE

W. A. Craig, II, R.E.A. 0414

John H. Dailey, GE 256

REGISTERED PROFESSIONAL ENGINEER
JOHN H. DAILEY
No. 256
Exp. 3-31-96
GEOTECHNICAL
STATE OF CALIFORNIA

W. A. Craig, Inc., Project No. 3365
January 9, 1995

W. A. CRAIG, INC.

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REPORT
SOIL AND GROUND WATER INVESTIGATION
DAMELE PROPERTY
4401 MARKET STREET
OAKLAND, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of the preliminary soil and ground water investigation performed by W. A. Craig, Inc. at the subject site located at 4401 Market Street in Oakland, California. The general location of the site is shown on the Site Location Map, Plate 1. W. A. Craig, Inc. conducted the investigation at your request and following the requirements of the Alameda County Health Care Services Agency (ACHCSA) and the Regional Water Quality Control Board (RWQCB) - San Francisco Bay Region. The purpose of the investigation was to initially evaluate the lateral extent of soil and ground water contamination, if any, at the former underground storage tank (UST) excavations, and to develop recommendations for further investigation, if necessary.

2.0 BACKGROUND

The subject site is a former gasoline dispensing station located on the northwest corner of 44th Street and Market Street. Four underground storage tanks, which previously contained gasoline, were removed from the site on June 22, 1990. These tanks include one 1,000 gallon UST and three 500 gallon USTs, all constructed of single-wall steel. When the tanks were removed, they were rusted, pitted, and contained one or more holes, and the seam near the fill end of Tank D (1,000 gallon UST) was split. Slight to strong petroleum odors and staining of the surrounding soils were associated with all of the USTs. The gasoline USTs were all located in the southeastern corner of the site, but they may have been installed at different times. The ages of the USTs are not known; however, they apparently predated the construction of the sidewalks along both Market and 44th Streets because the tanks extended partially below the sidewalks. A dispenser island located west and northwest of the USTs, and associated piping were removed with the tanks. The existing building

along with the locations of the removed dispenser island and USTs, are shown on the Site Plan, Plate 2.

Soils from the excavation that appeared to be contaminated with petroleum hydrocarbons were excavated from the pit at the time of the UST removals. The depth of the excavations ranged from 7½ feet to 15 feet below grade, or approximately 2 feet (or more) below the bottoms of the USTs, as specified by Mr. Dennis Bryne of the ACHCSA. Soil samples were collected from beneath the removed USTs and from the stockpiled soils from the pit. All soil samples were analyzed by Anametrix, Inc. of San Jose, California. Laboratory test reports were previously submitted as part of Environmental Bio-Systems report dated July 26, 1990.

Up to 870 parts per million (ppm) Total Petroleum Hydrocarbons (TPH) as gasoline, 5 ppm benzene, 24 ppm toluene, 20 ppm ethylbenzene, and 110 ppm total xylenes were detected in the six soil samples collected from bottom of the gasoline UST excavation. The results of analytical testing of the composited soil samples from the stockpile, indicated a maximum of 130 TPH as gasoline. Based on the laboratory test results and the extension of the excavation under the sidewalks, the ACHCSA agreed that the stockpiled soil could be placed back in the excavation pit; the pit was backfilled in 1990.

Cross-trenching performed across the site identified in preparation for OE activities) presence of PH contamination at all locations along trench. — Depth?

3.0 REGIONAL GEOLOGY AND HYDROGEOLOGY

Based on our review of published geologic literature, the subject site and vicinity are underlain by undivided Pleistocene Age alluvium and colluvium deposited on the gentle slopes located between the Oakland Hills and the San Francisco Bay. These heterogeneous deposits predominately consist of irregularly bedded and poorly consolidated clays, silts, sands, and gravels of the Tamescal Formation, and include organic material and Claremont Chert inclusions. These deposits may also include San Antonio Formation materials and artificial fill.

Ground water is typically encountered at about 23 to 25 feet below grade, in an apparent confined water bearing zone. The ground water gradient is generally to the southeast; San Francisco Bay is approximately 1¼ miles to the west and northwest of the property.

4.0 SITE SAFETY PLAN

Field work performed at the site by W. A. Craig, Inc. was conducted in accordance with the Site Safety Plan submitted with our Work Plan on February 10, 1994. The safety plan described the basic safety requirements for a subsurface environmental investigation and drilling of soil borings at the site. The Site Safety Plan was applicable to personnel and

subcontractors performing work at the site. Personnel and subcontractors scheduled to perform work at the site were briefed on the contents of the Site Safety Plan and provided a copy before work began.

5.0 BOREHOLE DRILLING

We submitted our Work Plan on February 10, 1994; however, the Work Plan was revised in our addendum letter dated September 29, 1994. After approval of our addended Work Plan, we acquired a Monitoring Well Permit from the Zone 7 Water Agency prior to drilling. We were also required to obtain encroachment permits from the City of Oakland for drilling of borings in Market and 44th Streets.

Our geotechnical engineer and/or field geologist were onsite October 27 and 28, 1994 to observe the [redacted] (borings MW-1, MW-2, and MW-3), to log the materials encountered, and assist in collecting soil samples from the borings. The locations of the borings and monitoring wells are shown on the Site Plan with Soil Boring and Monitoring Well Locations, Plate 3. The locations of the seven borings were chosen to assess the lateral and vertical extent of petroleum hydrocarbon contamination in the soils beneath the site. The location of the borings for monitoring wells MW-1 and MW-2 were chosen to provide information on possible petroleum hydrocarbon contamination in the assumed down-gradient ground water flow direction (to the southwest) of the removed USTs. And the boring for monitoring well MW-3 was installed in the assumed up-gradient direction of the removed UST excavations. The locations of the three wells were also chosen to establish the direction of the ground water gradient.

The borings were drilled using a truck-mounted drill rig operated by Clear Heart Construction & Drilling of Guerneville, California. Four-inch-diameter continuous-flight solid augers were used to drill the soil borings, and eight-inch-diameter continuous-flight hollow-stem augers were used to drill the boreholes converted to monitoring wells. The augers were steam-cleaned prior to each use to reduce the possibility of downhole or crosshole contamination. Logs of the borings are illustrated on Plates 4A through 4G. An apparent confined ground water bearing zone was encountered at approximately 23 to 25 feet below grade in the seven borings.

The drill cuttings from the borings were placed on and covered with a plastic sheeting east of and adjacent to the existing building, and remain the responsibility of the owner. The auger decontaminate rinsate was placed in 55-gallon drums and is stored adjacent to the drill cuttings. The borings not converted to monitoring wells (SB-1, SB-2, SB-3, and SB-4) were backfilled with a cement-bentonite grout.

6.0 SOIL SAMPLING

Soil samples were collected at 5-foot intervals from the ground surface to the total depth in each boring. The soil samples were collected by driving a California type drive sampler, fitted with clean 6-inch brass liner tubes. The samples were collected by advancing the boring to a point immediately above the sampling depth and then driving the sampler 18 inches into the soil with a standard 140-pound hammer falling 30 inches. The number of blows necessary to drive the sampler each 6-inch increment was counted and recorded to evaluate the relative consistency of the soil materials.

The sampler was recovered and the samples removed and subjectively assessed for the presence of hydrocarbons; any free product, discoloration or odor was noted on the boring log by the field geologist. After subjective assessment, the soil samples were described and the brass sample tube was quickly capped on both ends with Teflon to cover the ends of the sampling tube, sealed with an air-tight polyethylene cap on each end, and taped to seal the caps. The samples were labeled and placed in zip-lock bags, then immediately placed in a refrigerated ice chest for subsequent transport to the laboratory. Formal chain-of-custody records were maintained for all samples. A copy of the Chain-of Custody Record is included with the results of the laboratory analyses which are attached as Appendix A.

Descriptions of the soils encountered in the borings are presented on the Boring Logs, Plates 4A through 4G. The Unified Soil Classification System was used to identify soil encountered in the borings. A copy of this classification system is shown on Plate 5, Unified Soil Classification Chart.

7.0 MONITORING WELL CONSTRUCTION

Well Installation

Three monitoring wells (MW-1, MW-2, and MW-3) were installed at the site using hollow-stem flight auger techniques. All monitoring wells were completed with 2-inch-inside-diameter, PVC casing set to approximately 25 feet below grade. The screened casing in the wells consists of factory-milled PVC with 0.020-inch-wide slots that were set from the total depth of the boring to approximately 20 feet below grade. Unslotted PVC casing was set from the top of the screened casing to the ground surface. The casing joints in the wells were flush-threaded; no glues, chemical cements, or solvents were used to construct the wells. The top of each well casing is covered with a locking compression cap, and the bottom has a threaded end-plug.

The annular space of each well was backfilled with a sand pack of clean, water-washed Monterey #3 sand from the total depth to approximately one foot above the top of the screened casing. The sand pack was placed by carefully pouring sand down the annulus

between the hollow-stem auger and the well casing. The auger was raised periodically and an auger flight removed to allow the sand to fill the annulus between the casing and the borehole wall. A bentonite plug, approximately one foot thick, was placed above the sand as a seal against cement entering the sand pack. The remaining annulus was backfilled to within a few inches of the ground surface with a neat cement grout containing about 5 percent bentonite. Well completions consisted of watertight "Christy" boxes with tamper deterrent bolts placed over each wellhead and set at grade in concrete. The "Christy" boxes have a watertight seal to protect the monitoring well against surface water intrusion. Well completion details are shown on the logs of borings converted to monitoring wells, Plates 4E through 4G.

Well Development

The three monitoring wells were developed on November 2, 1994. The wells were developed by a combined bailing, pumping and water-surging technique. The wells were subsequently pumped until each well was thoroughly developed and essentially free of sand, silt and turbidity. The well development water was stored in DOT Type 17E, lined 55-gallon drums that were labeled and are temporarily stored at the site.

8.0 GROUND WATER SAMPLING

On November 8, 1994, our field geologist visited the site to collect water samples from monitoring wells MW-1, MW-2, and MW-3; the collection of water samples was performed under the direction of our geotechnical engineer. Before collecting the water samples, the depth to water was measured to the nearest 0.01-foot with a Keck Oil Water Interface Meter. Ground water samples were collected from each well by gently lowering approximately half the length of a Teflon bailer past the air-water interface. Individual clean Teflon bailers were used in each well. The samples were retrieved and examined for any evidence of floating product, sheen, and emulsion. No subjective evidence of hydrocarbon contamination was observed in the water sample from the three monitoring wells.

Water samples for analytical testing were then collected by our field geologist for submittal to the analytical laboratory. The wells were purged of at least 5 well volumes to allow representative sampling of the formation water. The purge water was stored in DOT Type 17E, lined 55-gallon drums along with the previously collected development water. After purging, the water in the monitoring wells to be sampled were allowed to recharge to within 80 percent of their static water level before they were sampled for laboratory analysis. Water samples were collected with clean Teflon bailers. To establish that the water samples were representative of the aquifer, periodic measurements for pH, temperature and specific conductance were made. The sample was collected only when the pH, temperature and

specific conductance reached a more or less constant value; copies of the field log data sheets for each well are included in Appendix B to this report. Each well was sampled using a clean Teflon bailer to prevent cross contamination between wells. Approximately half the length of the bailer was lowered past the air-water interface to collect the water sample. The water was evaluated for floating product, sheen, or emulsion.

The water samples were slowly decanted into laboratory-cleaned, 40 milliliter glass vials for low boiling hydrocarbon water samples, as appropriate for the type of analysis. The samples were quickly sealed in the sample containers with Teflon-lined caps, labeled, and placed in iced storage for transport to McCampbell Analytical Inc., a certified analytical laboratory for testing. A Chain-of-Custody Record was initiated by our field geologist; a completed copy of this record is included in Appendix B to this report, with the results of the analytical laboratory testing.

9.0 SUBSURFACE CONDITIONS

[redacted] The materials encountered in the borings are described on Plates 4A through 4G. The Unified Soil Classification System was used to describe soils encountered in the borings. A copy of the classification system is shown on Plate 5, Unified Soil Classification Chart. Sieve analyses were performed in the laboratory on samples encountered in the water bearing zone in monitoring well MW-2 and soil boring SB-4. The resulting grain size distributions illustrated on Plate 6, can be used to determine the appropriate sand filter pack and screen slot size for future monitoring and extraction wells.

[redacted] Free product was not observed during drilling or measuring of water levels in the other borings. A slight to strong petroleum odor was noted in the soil during the drilling of soil borings SB-2 and SB-4 and the boring for monitoring well MW-2.

[redacted] Following drilling of the borings and installation of the monitoring wells, the ground water had risen to about 16½ feet below ground surface in the soil borings and the borings for the monitoring wells. [redacted]

10.0 ANALYTICAL RESULTS OF SOIL AND GROUND WATER SAMPLES

Twenty one soil samples, three samples from each the borings, were tested for petroleum hydrocarbon contamination. The samples collected from the borings were analyzed for TPH as gasoline and BTEX by EPA Methods 5030, 8015 (modified) and 8020. The results of the laboratory analyses of the soil samples indicated that the soil at the sample locations in the borings contained up to 220 ppm TPH as gasoline and up to 1.5 ppm benzene. The results of analytical laboratory analyses on soil samples from the borings are summarized on Table 1, at the end of this report. Copies of the Report of Laboratory Analysis are included in Appendix A to this report.

Ground water samples collected from wells at the site by our geologist were also tested for possible contaminants. Samples collected on November 8, 1994, from the monitoring wells were analyzed for TPH as gasoline and BTEX by EPA Methods 5030, 8015 (modified), and 602. The results of the laboratory analyses of the water samples indicated that 54 parts per billion (ppb) TPH as gasoline was detected in the water sample collected from monitoring well MW-1, and 20,000 ppb TPH as gasoline and 1,400 ppb benzene were detected in the water sample collected from monitoring well MW-2; the water sample from monitoring well MW-3 contained 0.71 ppb benzene. The results of the laboratory analyses of groundwater samples collected from the monitoring wells are summarized on Table 2, at the end of this report. Copies of the Report of Laboratory Analysis are included in Appendix B to this report.

11.0 EVALUATION OF GROUND WATER GRADIENT

The locations and elevations of the casings of wells were surveyed by David L. Contreras, Land Surveyor, on November 2, 1994. A copy of the Monitoring Well Survey is included as Appendix C of this report. Depth to ground water was measured in the monitoring wells to the nearest 0.01-foot using a Keck Oil Water Interface Meter. Depth-to-water measurements and the surveyed wellhead elevations were used to evaluate the ground water gradient on November 8, 1994. The ground water flow direction on November 8, 1994 was to the southeast (S40°E) at a gradient of 0.0179 (1.79 feet per 100 feet). The ground water elevation data are summarized in Table 3 at the end of the report.

12.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our preliminary soil and ground water investigation, soil and ground water beneath the site have been impacted by petroleum hydrocarbon contamination [redacted] The highest

↳ See meeting notes in memo dated 3/10/95. OE confirmed to be approp. in the vicinity of SB-2.

levels of contamination (220 ppm TPH as gasoline) were detected in soil boring SB-4, which was in the west traffic lane of Market Street. However, the final decision regarding overexcavation of petroleum hydrocarbon contaminated soil, will need to be negotiated with the regulatory agencies.

Laboratory analyses of groundwater beneath the site indicates that up to 20,000 ppb TPH as gasoline and 1,400 ppb benzene are present in the groundwater underlying the site. In addition, free product was observed in the water when measuring the water level in soil boring SB-2. Additional investigation should be performed to assess the lateral limits of the petroleum hydrocarbon contamination in the groundwater beneath the site. We recommend that two additional borings be drilled down-gradient of monitoring well MW-2 and converted to monitoring wells. The additional monitoring wells would assist in defining the lateral limits of the petroleum hydrocarbon contamination in the ground water.

A Work Plan for further assessment of the soil and ground water at the site will be prepared and submitted to the ACHCSA and RWQCB - San Francisco Bay Region for approval, following your authorization.

13.0 CLOSURE

This soil and ground water investigation has been performed by W. A. Craig, Inc. for the purposes of the preliminary assessment of contamination at the site of the subject, previously removed, underground tanks. The results and opinions of this work are based on data collected at the locations of soil and water samples obtained from borings performed, and monitoring wells that were installed, as part of the investigation. It should be recognized that occurrences of contamination can migrate with time and could exist, or occur in the future, at other locations, or in amounts greater than those detected during this investigation.

We trust this provides the information required at this time. If you have any questions, please call. The following plates and appendices are attached and complete this report. A copy of this report should be forwarded to the ACHCSA and RWQCB - San Francisco Bay Region.

Plate 1	Site Location Map
Plate 2	Site Plan
Plate 3	Site Plan with Soil Boring and Monitoring Well Locations

Plates 4A through 4G	Logs of Borings and Well Completion Details
Plate 5	Unified Soil Classification Chart
Plate 6	Gradation Test Data
Table 1	Analytical Laboratory Test Results of Soil Samples from Borings
Table 2	Analytical Laboratory Test Results of Groundwater Samples
Table 3	Ground Water Surface Elevation Data
Appendix A	McCampbell Analytical, Inc. Analytical Test Results (Soil Samples from Borings)
Appendix B	McCampbell Analytical, Inc. Analytical Test Results and Field Log Data Sheets (Ground Water Sampling)
Appendix C	Monitoring Well Survey

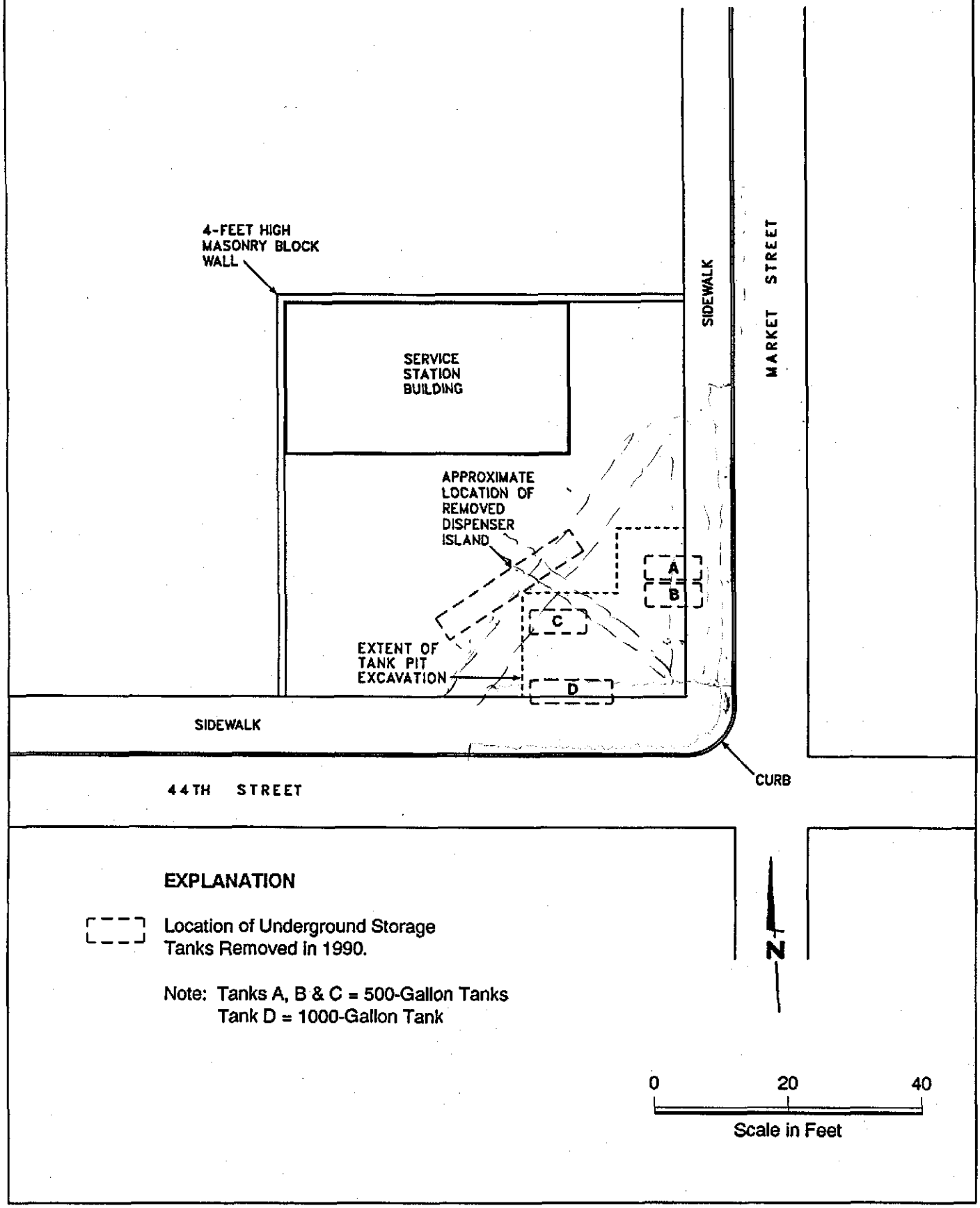
W. A. CRAIG, INC.

INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Site Location Map
4401 Market Street
Oakland, California

PLATE **1**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	



W. A. CRAIG, INC.

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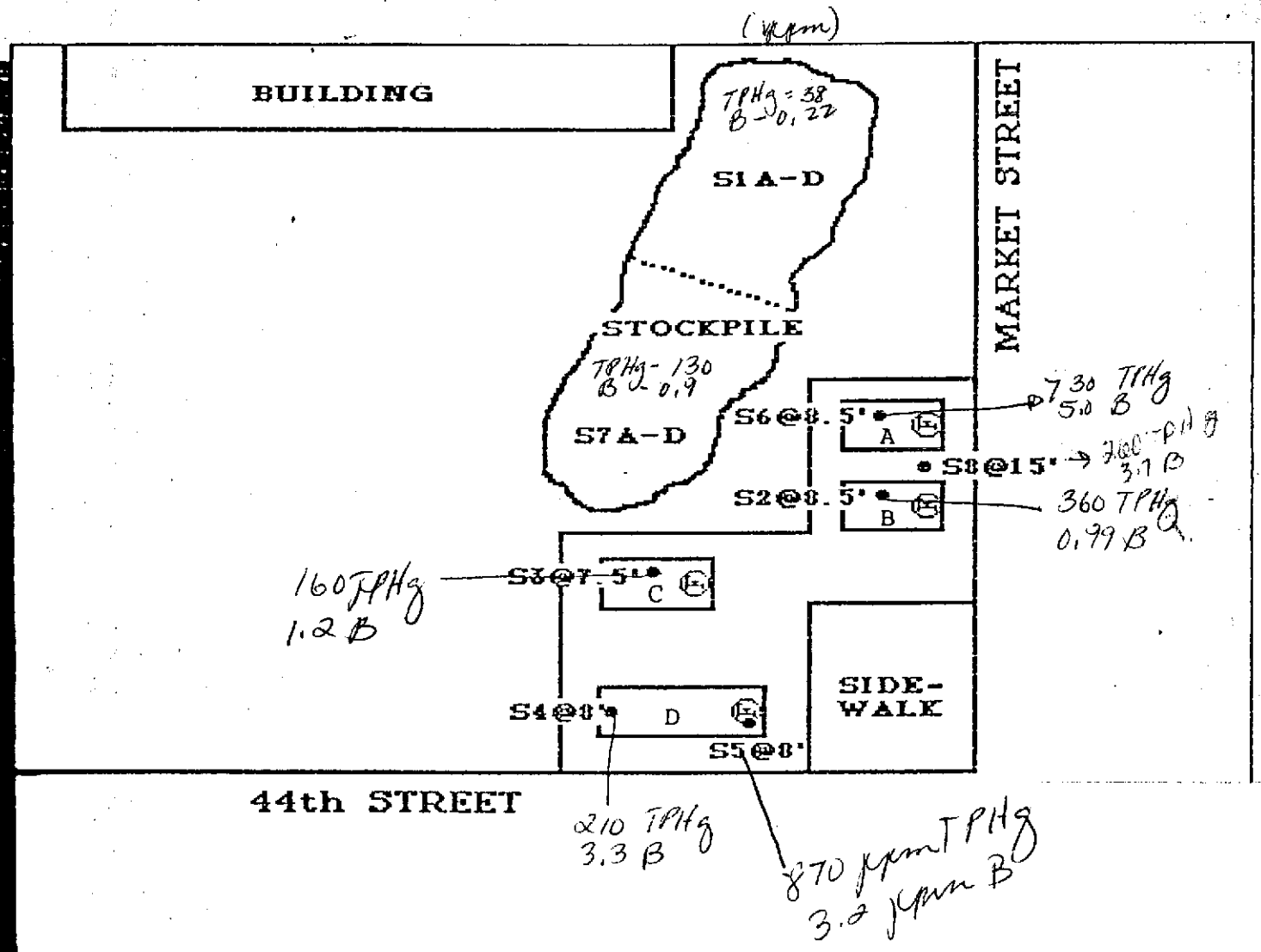
Site Plan
4401 Market Street
Oakland, California

PLATE **2**

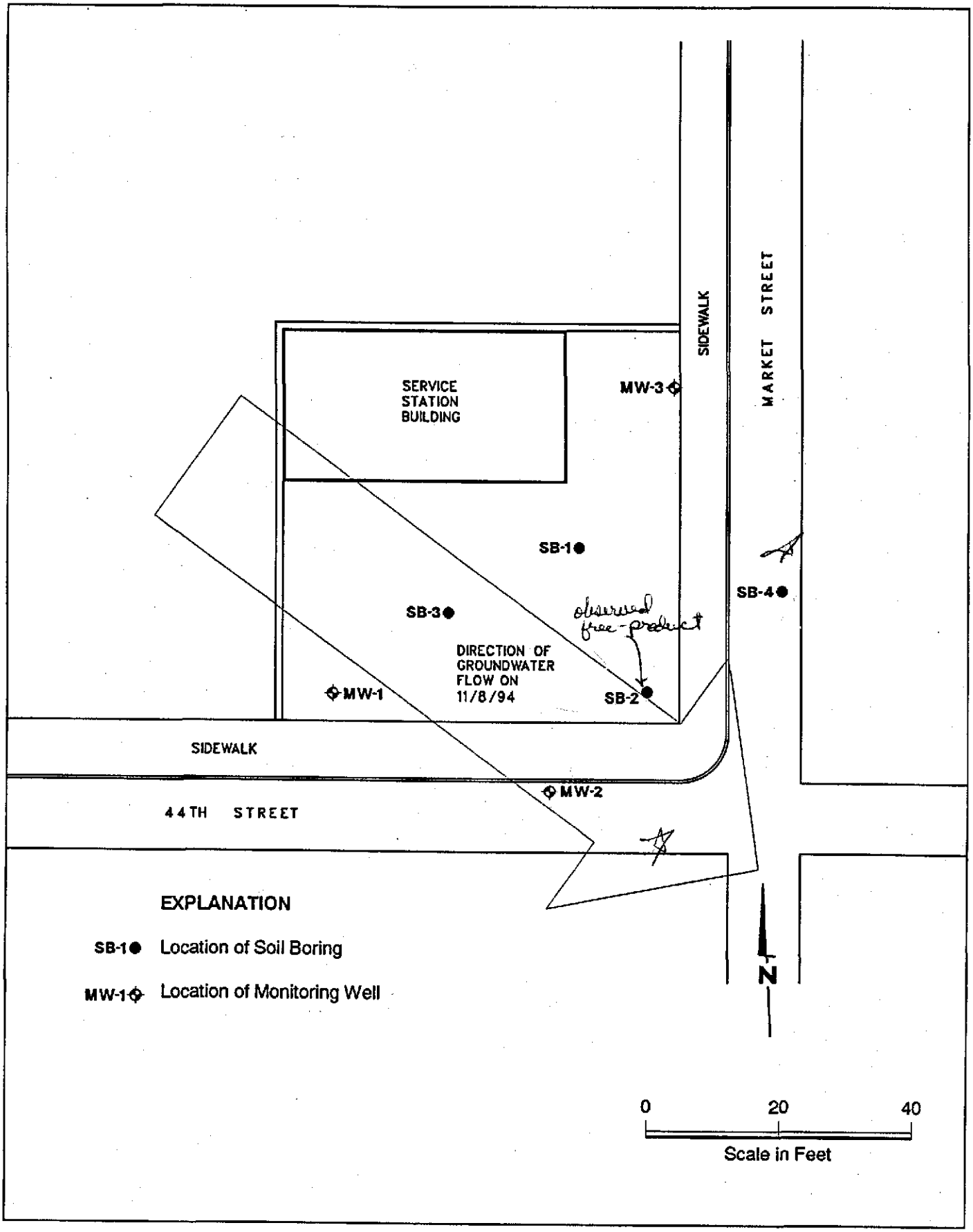
JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	



WA CRAIG, INC.
DAMELE PROPERTY
4401 MARKET ST.
OAKLAND, CA.
6/22/90 TANK PULL

N

0' 5' 10' 15' 20'



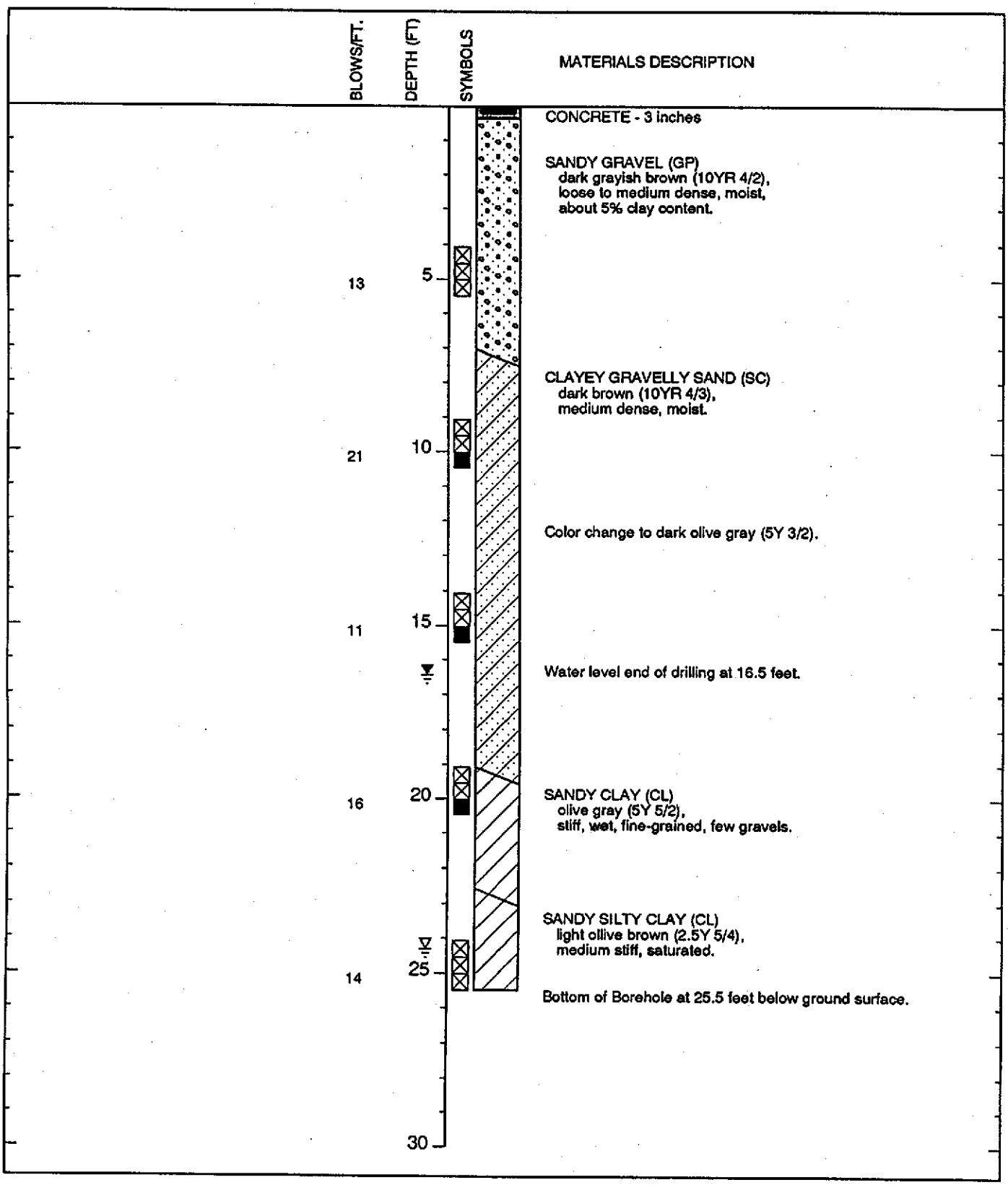
W. A. CRAIG, INC.

INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Site Plan with Soil Boring and Monitoring Well Locations
4401 Market Street
Oakland, California

PLATE **3**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	



DRILL RIG	4" Continuous Flight Auger	DIAMETER OF HOLE	4 inches
DATE STARTED	10/27/94	TOTAL DEPTH OF HOLE	25.5 feet
DATE COMPLETED	10/27/94	TOP OF CASING ELEVATION	72.5 feet MSL

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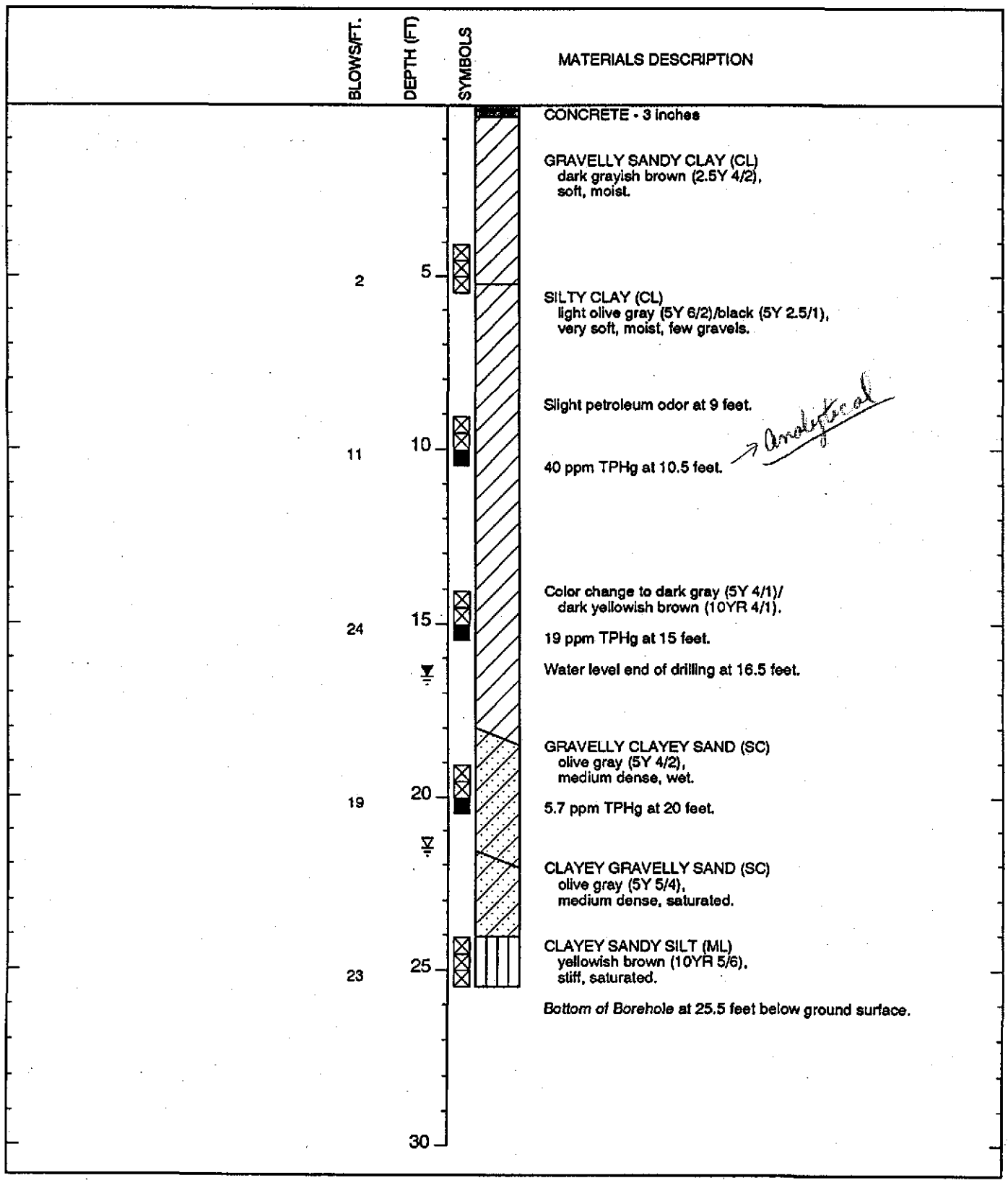
Log of Boring SB-1
4401 Market Street
Oakland, California

PLATE
4A

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	



DRILL RIG	4" Continuous Flight Auger	DIAMETER OF HOLE	4 inches
DATE STARTED	10/27/94	TOTAL DEPTH OF HOLE	25.5 feet
DATE COMPLETED	10/27/94	TOP OF CASING ELEVATION	72.0 feet MSL

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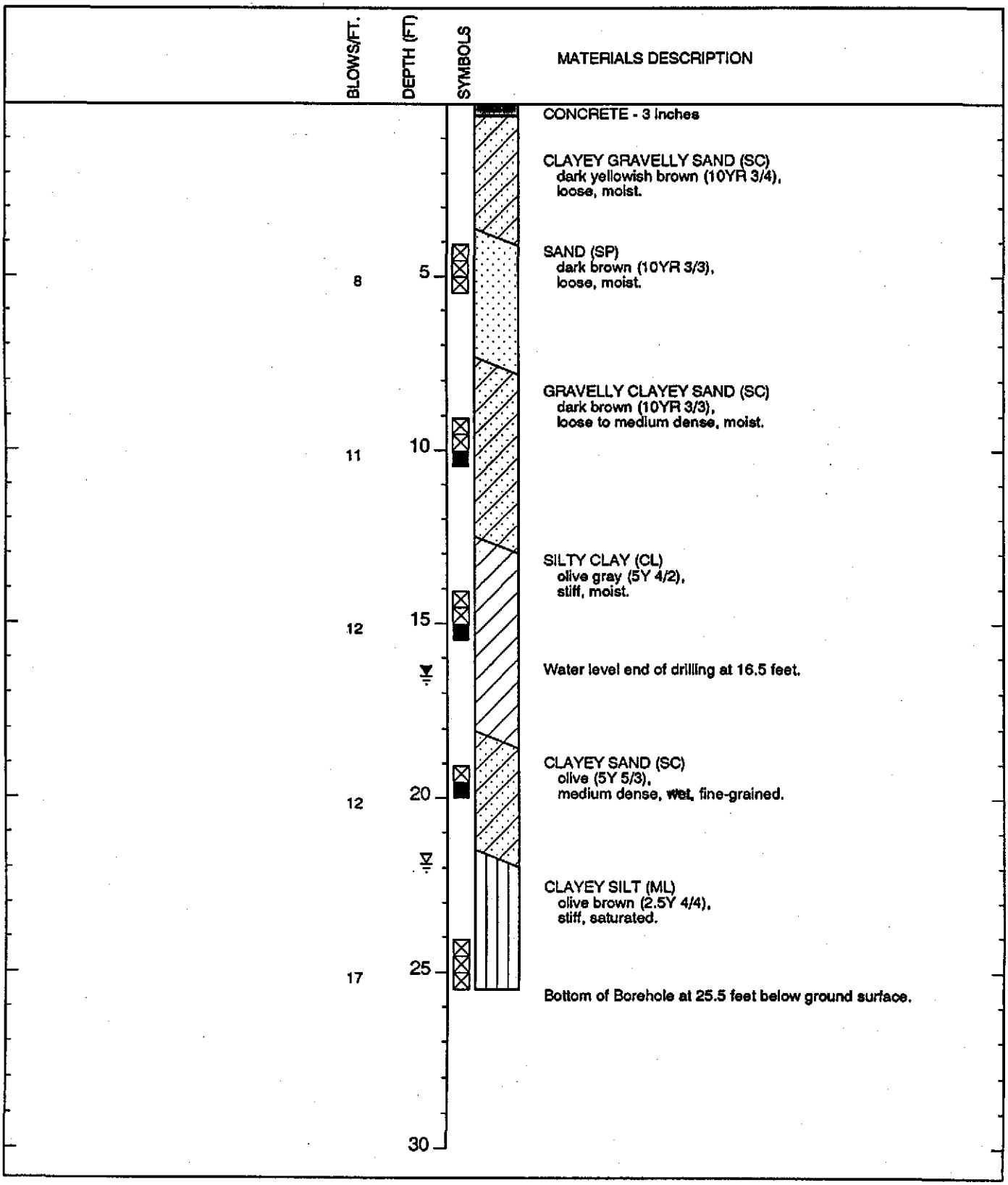
Log of Boring SB-2
4401 Market Street
Oakland, California

PLATE
4B

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	



DRILL RIG	4" Continuous Flight Auger	DIAMETER OF HOLE	4 inches
DATE STARTED	10/27/94	TOTAL DEPTH OF HOLE	25.5 feet
DATE COMPLETED	10/27/94	TOP OF CASING ELEVATION	72.3 feet MSL

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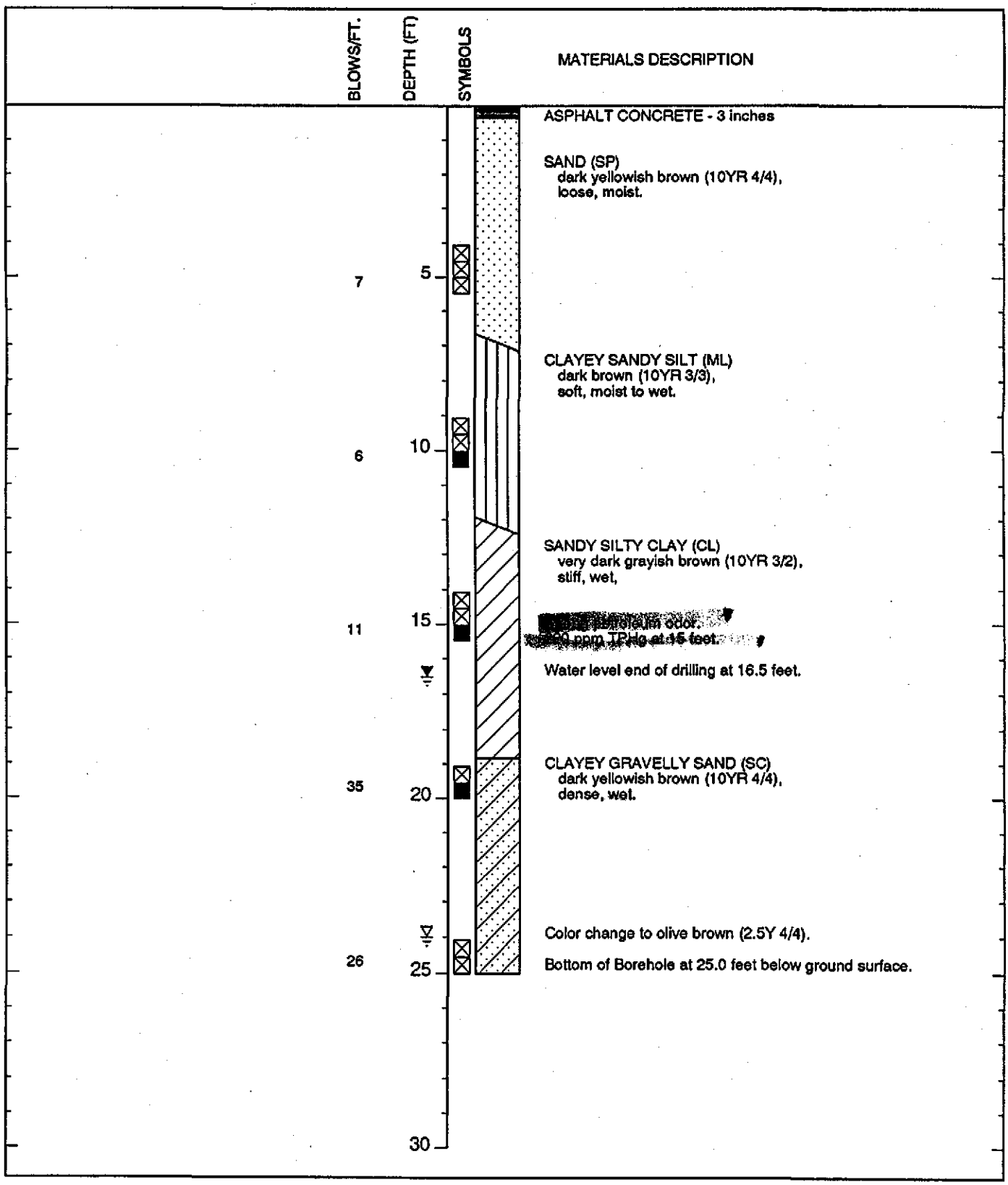
Log of Boring SB-3
4401 Market Street
Oakland, California

PLATE
4C

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	



DRILL RIG	4" Continuous Flight Auger	DIAMETER OF HOLE	4 inches
DATE STARTED	10/28/94	TOTAL DEPTH OF HOLE	25.0 feet
DATE COMPLETED	10/28/94	TOP OF CASING ELEVATION	71.9 feet MSL

W. A. CRAIG, INC.

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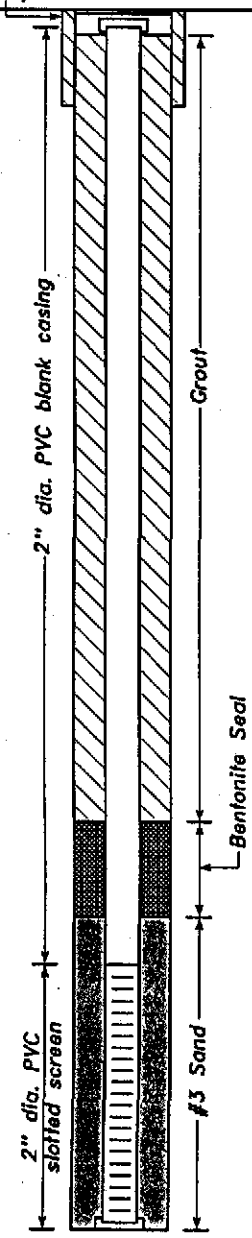
Log of Boring SB-4
4401 Market Street
Oakland, California

PLATE
4D

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	

WELL CONSTRUCTION DETAIL



BLOWS/FT.	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
			CONCRETE - 3 inches
			GRAVELLY SAND (SP) dark yellowish brown (10YR 4/4), loose, moist, minor clay.
5	5		SAND (SP) dark yellowish brown (10YR 4/4), loose, moist.
8	10		CLAYEY GRAVELLY SAND (SC) dark brown (10YR 3/3), loose, moist.
8	15		SILTY CLAY (CL) very dark gray (10YR 3/1), medium sstiff, ~~moist to~~ wet.
			Water level end of drilling at 16.5 feet.
18	20		CLAYEY SAND (SC) dark grayish brown (2.5Y 4/2)/olive brown (2.5Y 4/4), medium dense, wet.
			SILTY CLAY (CL) grayish brown (2.5Y 5/2)/light olive brown (2.5Y 5/6), medium stiff, saturated.
9	25		Bottom of Borehole at 25.5 feet below ground surface.
	30		

DRILL RIG	8" Hollow Stem Auger	DIAMETER OF HOLE	8 inches
DATE STARTED	10/27/94	TOTAL DEPTH OF HOLE	25.5 feet
DATE COMPLETED	10/27/94	TOP OF CASING ELEVATION	71.12 feet MSL

W. A. CRAIG, INC.

INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

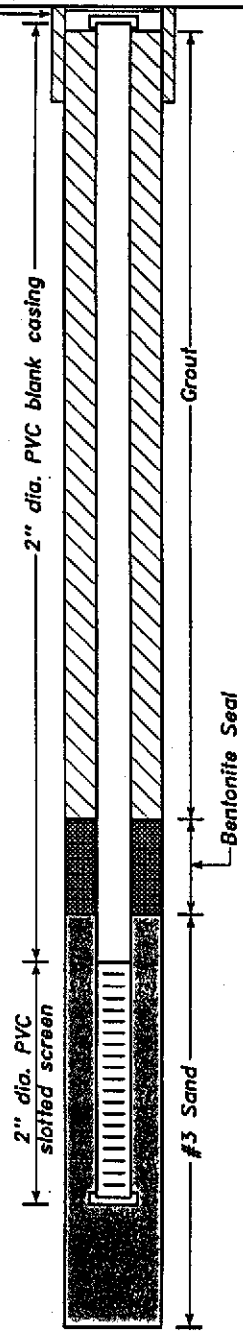
Log of Boring MW-1 and Well Completion Detail
4401 Market Street
Oakland, California

PLATE **4E**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	

WELL CONSTRUCTION DETAIL

Christy Box



BLOWS/FT.	DEPTH (FT)	MATERIALS DESCRIPTION
		ASPHALT CONCRETE - 3 inches
7	5	CLAYEY SAND (SC) dark brown (10YR 3/3), loose, moist, some gravels.
8	10	SILTY CLAY (CL) very dark grayish brown (2.5Y 3/3), meidum stiff, moist.
9	15	SANDY SILTY CLAY (CL) dark grayish brown (2.5Y 4/2), medium stiff, moist, Strong petroleum odor. 97 ppm TPHg at 15 feet. Water level end of drilling at 16.5 feet.
18	20	SANDY GRAVELLY CLAY (CL) olive gray (5Y 4/2)/dark yellowish brown (10YR 3/4), stiff, wet. 2.0 ppm TPHg at 20 feet.
11	25	SANDY SILT (ML) light olive brown (2.5Y 5/4), medium stiff, saturated.
	30	Bottom of Borehole at 27.5 feet below ground surface.

DRILL RIG	8" Hollow Stem Auger	DIAMETER OF HOLE	8 inches
DATE STARTED	10/28/94	TOTAL DEPTH OF HOLE	27.5 feet
DATE COMPLETED	10/28/94	TOP OF CASING ELEVATION	70.62 feet MSL

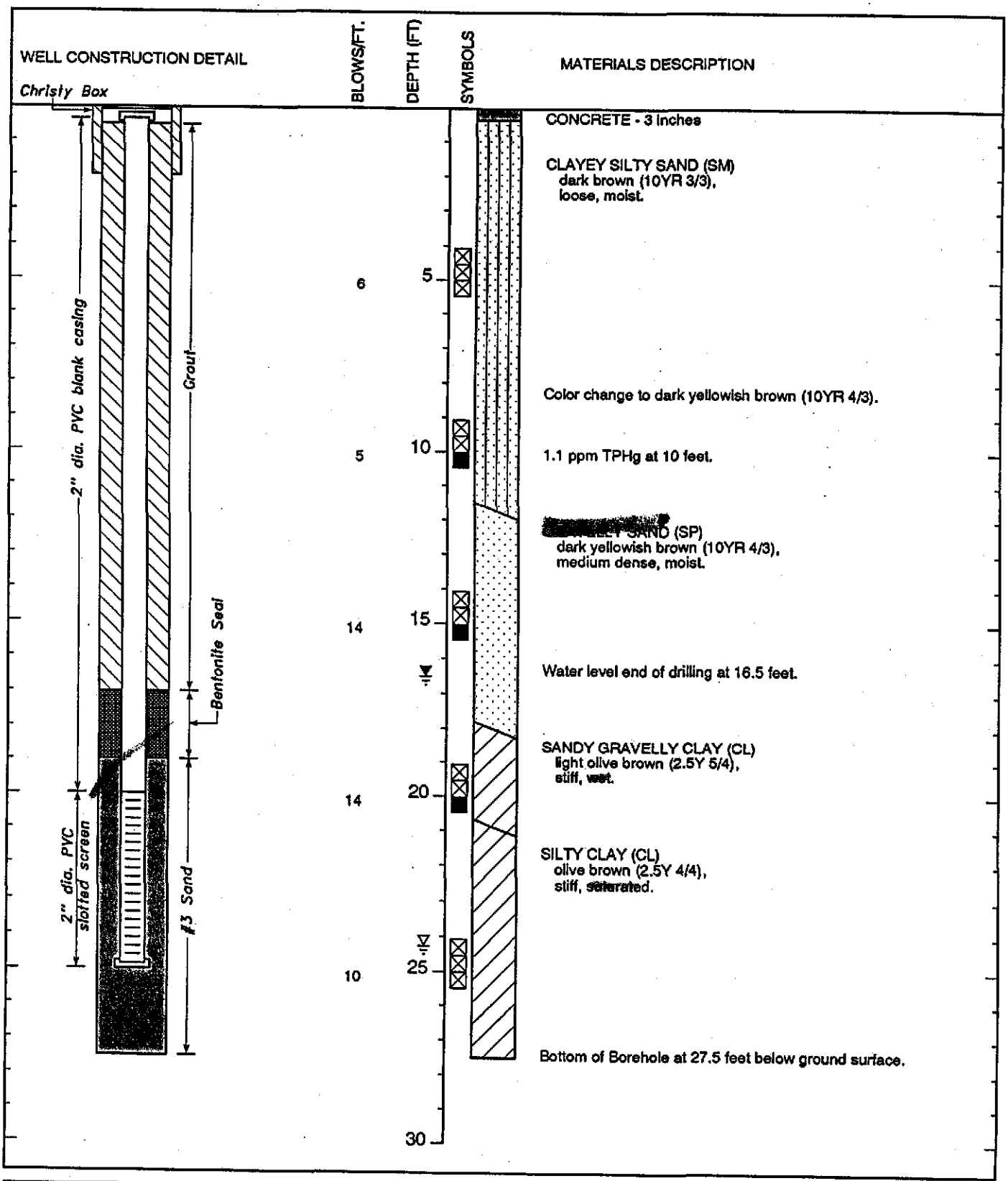
W. A. CRAIG, INC.

INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring MW-2 and Well Completion Detail
4401 Market Street
Oakland, California

PLATE **4F**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	



DRILL RIG	8" Hollow Stem Auger	DIAMETER OF HOLE	8 inches
DATE STARTED	10/28/94	TOTAL DEPTH OF HOLE	27.5 feet
DATE COMPLETED	10/28/94	TOP OF CASING ELEVATION	71.79 feet MSL

W. A. CRAIG, INC.

INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Log of Boring MW-3 and Well Completion Detail
4401 Market Street
Oakland, California

PLATE **4G**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

Perm	- Permeability
Consol	- Consolidation
LL	- Liquid Limit (%)
PI	- Plastic Index (%)
G_s	- Specific Gravity
MA	- Particle Size Analysis
2.5 YR 6/2	- Soil Color according to Munsell Soil Color Charts (1975 Edition)
5 GY 5/2	- GSA Rock Color Chart

☐	- No Soil Sample Recovered
⊘	- Disturbed Soil Sample Recovered
■	- Sample Submitted for Laboratory Analysis
⊠	- Undisturbed Soil Sample Recovered
▽	- First Encountered Ground Water Level
▼	- Piezometric Ground Water Level
Penetration	- Sample drive hammer weight - 140 pounds falling 30 inches. Blows required to drive sampler 1 foot are indicated on the logs

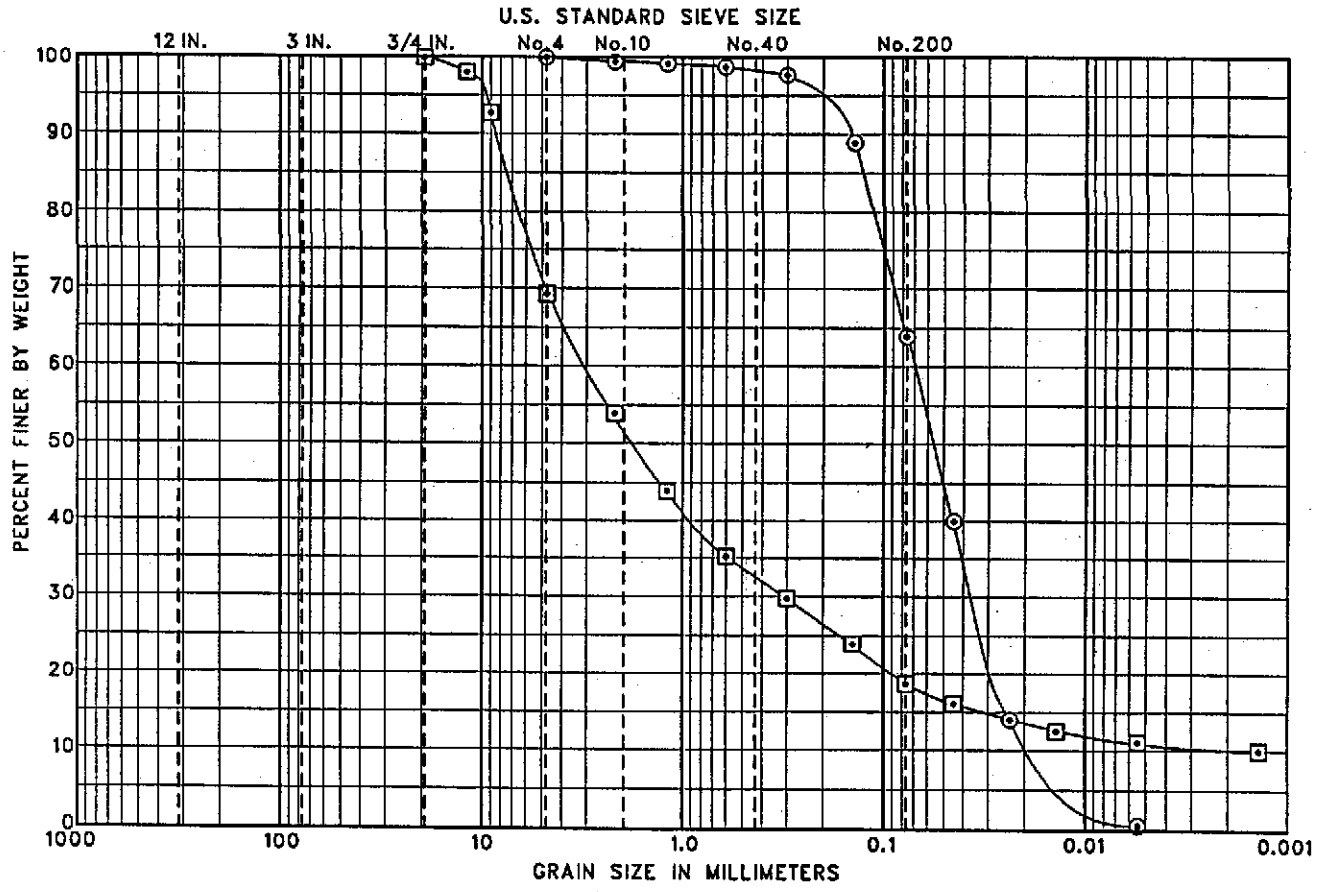
W. A. CRAIG, INC.

INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Unified Soil Classification Chart
4401 Market Street
Oakland, California

PLATE
5

JOB NUMBER 3365 | REVIEWED BY | DATE 1/95 | REVISED DATE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSICATON SYSTEM

LEGEND	⊙	⊡	⧋
BORING NUMBER	MW-2	SB-2	
DEPTH (FEET)	24.5	21.5	
SOIL DESCRIPTION	LIGHT OLIVE BROWN SANDY SILT (ML)	OLIVE GRAY CLAYEY GRAVELLY SAND (SC)	

GRADATION TEST DATA

W. A. CRAIG, INC.

INDUSTRIAL AND ENVIRONMENTAL CONTRACTOR

Gradation Test Data
4401 Market Street
Oakland, California

PLATE
6

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
3365		1/95	

TABLE 1
ANALYTICAL LABORATORY TEST RESULTS
OF SOIL SAMPLES FROM BORINGS
4401 Market Street
Oakland, California

Sample Location	TPH Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes
SB-1 @ 10'	ND	ND	ND	ND	ND
SB-1 @ 15'	[redacted]	ND<0.01	0.13	0.21	0.18
SB-1 @ 20'	ND	ND	ND	ND	ND
SB-2 @ 10.5'	[redacted]	0.079	0.034	0.43	4.7
SB-2 @ 15'	19	0.46	0.041	0.31	4.2
SB-2 @ 20.5'	5.7	0.006	ND	0.010	0.079
SB-3 @ 10'	ND	ND	ND	ND	ND
SB-3 @ 15'	ND	ND	ND	ND	ND
SB-3 @ 19.5'	ND	ND	ND	ND	ND
SB-4 @ 10'	ND	ND	0.005	0.006	0.016
SB-4 @ 15'	[redacted]	ND<0.01	0.60	0.46	0.93
SB-4 @ 20'	ND	ND	ND	ND	ND
MW-1 @ 10'	ND	ND	ND	ND	ND
MW-1 @ 15'	ND	ND	ND	0.005	ND
MW-1 @ 20'	ND	ND	ND	ND	ND
MW-2 @ 10'	ND	ND	ND	ND	ND
MW-2 @ 15'	[redacted]	1.5	1.4	2.3	12
MW-2 @ 20'	2.0	ND	0.009	0.016	0.062
MW-3 @ 10'	1.1	ND	0.006	ND	0.010
MW-3 @ 15'	ND	ND	ND	ND	ND
MW-3 @ 20'	ND	ND	ND	ND	ND

TPH = Total Petroleum Hydrocarbons
Results are in parts per million
ND = not detected at or above laboratory reporting limits

TABLE 2
ANALYTICAL LABORATORY TEST RESULTS
OF GROUNDWATER SAMPLES
4401 Market Street
Oakland, California

Sample Location	TPH Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-1	54	ND	ND	ND	1.2
MW-2	20,000	1,400	960	980	4,600
MW-3	ND	0.71	0.84	1.2	5.8

TPH = Total Petroleum Hydrocarbons
Results are in parts per billion (ppb)
ND = Not detected at or above laboratory reporting limits

TABLE 3
GROUND WATER SURFACE ELEVATION DATA
at
4401 Market Street
Oakland, California

Well No.	Casing Elevation	Depth to Groundwater	Groundwater Elevation
November 8, 1994			
MW-1	71.12	11.27	59.85
MW-2	70.62	11.41	59.21
MW-3	71.79	12.16	59.63

Elevation measurements are in feet and referenced to mean sea level

APPENDIX A

MCCAMPBELL ANALYTICAL, INC.
ANALYTICAL TEST RESULTS
(SOIL SAMPLES FROM BORINGS)

APPENDIX B

MCCAMPBELL ANALYTICAL, INC.
ANALYTICAL TEST RESULTS
(GROUND WATER SAMPLING)

McCAMPBELL ANALYTICAL INC. | 110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 510-798-1620 Fax: 510-798-1622

W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559	Client Project ID: # 3365	Date Sampled: 10/27/94
		Date Received: 10/28/94
	Client Contact: Bill Craig	Date Extracted: 10/31/94
	Client P.O:	Date Analyzed: 10/31-11/02/94

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	Benzene	Toluene	Ethylbenzene	Xylenes	% Rec. Surrogate
41941	3365 SB1-10	S	ND	ND	ND	ND	ND	109
41942	3365 SB1-15	S	72,g	ND< 0.01	0.13	0.21	0.18	105
41943	3365 SB1-20	S	ND	ND	ND	ND	ND	107
41944	3365 SB2-10.5	S	40,b	0.079	0.034	0.43	4.7	99
41945	3365 SB2-15	S	19,b,c	0.46	0.041	0.31	4.2	100
41946	3365 SB2-20.5	S	5.7,b,d	0.006	ND	0.010	0.079	109
41947	3365 SB3-10	S	ND	ND	ND	ND	ND	102
41948	3365 SB3-15	S	ND	ND	ND	ND	ND	104
41949	3365 SB3-19.5	S	ND	ND	ND	ND	ND	103
41950	3365 MW1-10	S	ND	ND	ND	ND	ND	105
41951	3365 MW1-15	S	ND,d	ND	ND	0.005	ND	107
41952	3365 MW1-20	S	ND	ND	ND	ND	ND	108
Detection Limit unless otherwise stated; ND means Not Detected		W	50 ug/L	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.005	0.005	0.005	0.005	

*water samples are reported in ug/L, soil samples in mg/kg, and all TCLP extracts in mg/L

cluttered chromatogram; sample peak co-elutes with surrogate peak

+ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds are significant; no recognizable pattern; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible phase is present.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC. | 110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 510-798-1620 Fax: 510-798-1622

W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559	Client Project ID: # 3365	Date Sampled: 10/28/94
		Date Received: 10/28/94
	Client Contact: Bill Craig	Date Extracted: 10/31/94
	Client P.O:	Date Analyzed: 10/31-11/01/94

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	Benzene	Toluene	Ethylben-zene	Xylenes	% Rec. Surrogate
41932	3365 MW2-10	S	ND	ND	ND	ND	ND	107
41933	3365 MW2-15	S	97,a	1.5	1.4	2.3	12	102
41934	3365 MW2-20	S	2.0,b	ND	0.009	0.016	0.062	102
41935	3365 MW3-10	S	1.1,g	ND	0.006	ND	0.010	106
41936	3365 MW3-15	S	ND	ND	ND	ND	ND	107
41937	3365 MW3-20	S	ND	ND	ND	ND	ND	107
41938	3365 SB4-10	S	ND,b	ND	0.005	0.006	0.016	104
41939	3365 SB4-15	S	220,b,d	ND< 0.01	0.60	0.46	0.93	95
41940	3365 SB4-19.5	S	ND	ND	ND	ND	ND	106
Detection Limit unless other-wise stated; ND means Not Detected		W	50 ug/L	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.005	0.005	0.005	0.005	

*water samples are reported in ug/L, soil samples in mg/kg, and all TCLP extracts in mg/L

cluttered chromatogram; sample peak co-elutes with surrogate peak

+ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds are significant; no recognizable pattern; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible phase is present.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 510-798-1620 Fax: 510-798-1622

QC REPORT FOR HYDROCARBON ANALYSES

Date: 10/30-10/31/94 Matrix: Soil

Analyte	Concentration (mg/kg)			Amount Spiked	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
TPH (gas)	0.000	2.057	1.967	2.03	101	97	4.5
Benzene	0.000	0.162	0.170	0.2	81	85	4.8
Toluene	0.000	0.160	0.176	0.2	80	88	9.5
Ethylbenzene	0.000	0.158	0.168	0.2	79	84	6.1
Xylenes	0.000	0.512	0.538	0.6	85	90	5.0
TPH (diesel)	0	297	299	300	99	100	0.7
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 510-798-1620 Fax: 510-798-1622

QC REPORT FOR HYDROCARBON ANALYSES

Date: 11/01-11/02/94 Matrix: Soil

Analyte	Concentration (mg/kg)			Amount Spiked	% Recovery		RPD
	Sample	MS	MSD		MS	MSD	
TPH (gas)	0.000	1.640	1.738	2.03	81	86	5.8
Benzene	0.000	0.180	0.182	0.2	90	91	1.1
Toluene	0.000	0.182	0.182	0.2	91	91	0.0
Ethylbenzene	0.000	0.178	0.180	0.2	89	90	1.1
Xylenes	0.000	0.550	0.552	0.6	92	92	0.4
TPH (diesel)	0	293	298	300	98	99	1.8
TRPH (oil & grease)	0.0	17.4	16.7	20.8	84	80	4.1

% Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

11-11-1994 09:49AM FROM McCampbell Analytical Inc TO 17077798527 P.05

W. A. CRAIG, INC.

CHAIN-OF-CUSTODY RECORD

#3157 AWAC 256

PROJECT NO.: 3365

PROJECT NAME:

PURCHASE ORDER NO.:

SIGNATURE OF SAMPLER: Glenn T. Mattson

DATE	TIME	W. A. CRAIG, INC.'S SAMPLE IDENTIFICATION	MATRIX: Soil, Water, Air, Sludge, Other	TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	TPHg & BTEX					Preserved?	REMARKS	LABORATORY I. D. NUMBER
10/27	8:15	3365 SB1 -10	SOIL				X							41941
10/27	8:30	3365 SB1 -15	↓				X							41942
10/27	8:50	3365 SB1 -20	↓				X							41943
10/27	10:10	3365 SB2 -10.5	↓				X							41944
10/27	10:30	3365 SB2 -15	↓				X							41945
10/27	10:45	3365 SB2 -20.5	↓				X							41946
10/27	12:45	3365 SB3 -10	↓				X							41947
10/27	13:10	3365 SB3 -15	↓				X							41948
10/27	13:20	3365 SB3 -19.5	↓				X							41949
10/27	14:20	3365 MW1 -10	↓				X							41950
10/27	14:35	3365 MW-1 -15	↓				X							41951
10/27	14:45	3365 MW1 -20	↓				X							41952

VOAS | O&G | METALS | OTHER

ICE/T° ✓ PRESERVATIVE
GOOD CONDITION ✓ APPROPRIATE
HEAD SPACE ABSENT ✓ CONTAINERS ✓

RELINQUISHED BY (Signature):	DATE/TIME	RECEIVED BY (Signature):
Glenn T. Mattson	10/28 17:50	M. Casanova
M. Casanova	10/28/94 8:00 pm	[signature]

LABORATORY:

TURNAROUND TIME: Pre-Paid #5037

PLEASE SEND RESULTS TO:
W. A. CRAIG, INC.
P.O. BOX 448
NAPA, CA 94559-0448
(707) 252-3353

ATTN:

W. A. CRAIG, INC.

CHAIN-OF-CUSTODY RECORD

#3154 AWAC255

PROJECT NO.: 3365 | PROJECT NAME:

PURCHASE ORDER NO.: | SIGNATURE OF SAMPLER: Glenn I Matthews

DATE	TIME	W. A. CRAIG, INC.'S SAMPLE IDENTIFICATION	MATRIX: Soil, Water, Air, Sludge, Other	ANALYSIS: TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	TPHg & BTEX	Preserved?	REMARKS	LABORATORY I. D. NUMBER
10/28	7:50	3365 MW 2-10	Soil				X			41932
10/28	8:20	3365 MW 2-15					X			41933
10/28	8:45	3365 MW 2-20					X			41934
10/28	11:15	3365 MW 3-10					X			41935
10/28	11:30	3365 MW 3-15					X			41936
10/28	11:45	3365 MW 3-20					X			41937
10/28	14:50	3365 SB 4-10					X			41938
10/28	15:05	3365 SB 4-15					X			41939
10/28	15:15	3365 SB 4-19.5					X			41940

ICE/T° ___
GOOD CONDITION ___
HEAD SPACE ABSENT ___
PRESERVATIVE APPROPRIATE ___
CONTAINERS ___

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
Glenn I Matthews	10/28 17:50	M. Casanova
M. Casanova	10/28/94 8:00 pm	

LABORATORY:

TURNAROUND TIME: 10-Day # 5037

PLEASE SEND RESULTS TO:
W. A. CRAIG, INC.
P.O. BOX 448
NAPA, CA 94559-0448
(707) 252-3353

ATTN:

McCAMPBELL ANALYTICAL INC.	110 2nd Avenue South, #D7, Pacheco, CA 94553 Tele: 510-798-1620 Fax: 510-798-1622

W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559	Client Project ID: # 3365; 4401 Market St., Oakland	Date Sampled: 11/08/94
		Date Received: 11/09/94
	Client Contact: Bill Craig	Date Extracted: 11/09/94
	Client P.O:	Date Analyzed: 11/09/94

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	Benzene	Toluene	Ethylben-zene	Xylenes	% Rec. Surrogate
42212	3365 MW1	W	54,b	ND	ND	ND	1.2	100
42213	3365 MW2	W	20,000,a	1400	960	980	4600	105
42214	3365 MW3	W	ND,a	0.71	0.84	1.2	5.8	100
Detection Limit unless otherwise stated; ND means Not Detected		W	50 ug/L	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.005	0.005	0.005	0.005	

*water samples are reported in ug/L, soil samples in mg/kg, and all TCLP extracts in mg/L

cluttered chromatogram; sample peak co-elutes with surrogate peak

+ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds are significant; no recognizable pattern; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible phase is present.

DHS Certification No. 1644

Edward Hamilton, Lab Director

W. A. CRAIG, INC.

CHAIN-OF-CUSTODY RECORD

3217AWAC264

PROJECT NO. 3365

PROJECT NAME 4401 MARKET ST OAKLAND, CA

PURCHASE ORDER NO.

SIGNATURE OF SAMPLER Glenn L Matthews

DATE	TIME	W. A. CRAIG, INC.'S SAMPLE IDENTIFICATION	MATRIX: Soil, Water, Air, Sludge, Other	ANALYSIS: TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	TPHg & BTEX					Preserved?	REMARKS	LABORATORY I. D. NUMBER
11/8	12:50	3365 MW1 -3	VOAS		X									42212
11/8	13:07	3365 MW2 -3	VOAS										LID OF 1 SAMPLE DAMAGED - NO LEAKS	42213
11/8	13:30	3365 MW3 -3	VOAS											42214

ICE/T ✓ PRESERVATIVE ✓
GOOD CONDITION ✓ APPROPRIATE
HEAD SPACE ABSENT ✓ CONTAINERS ✓

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
Glenn L Matthews	11/9 8:50	Leland Pialebi
Leland Pialebi	11/9 10:53	Tom Worthey
Tom Worthey	11/9/94 11:30 AM	Nadia Rica

LABORATORY:

TURNAROUND TIME:

PLEASE SEND RESULTS TO:
W. A. CRAIG, INC.
P.O. BOX 448
NAPA, CA 94559-0448
(707) 252-3353

ATTN:

GROUNDWATER SAMPLING DATA

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	ELECTRICAL CONDUCTIVITY (µmhos/cm)	pH	TEMPERATURE (°C)	TURBIDITY (NTU)
10 37	0.5	690	6.36	19.0	CLEAR
10:39	1.5	500	6.44	21.0	
10:40	2.5	530	6.50	20.0	
10:41	3.5	490	6.50	19.8	
10:42	4.0	500	6.47	20.1	
10:43	4.5	490	6.48	20.0	
10:44	5.5	480	6.49	20.1	
10:45	7.0	530	6.46	19.9	
10:46	7.5	480	6.46	20.1	
10:48	8.5	630	6.49	20.0	
10:49	9.5	480	6.51	20.1	
10:52	10.5	580	6.46	20.5	
10:54	11.5	500	6.51	20.5	

DEPTH TO BOTTOM OR CASING LENGTH

TOTAL DEPTH TO BOTTOM 25.0 − DEPTH TO WATER = 11.27 = ΔH (FT) 13.73

ΔH (FT) 13.73 X (V.F.) = .163 = WELL CASING VOLUME (GAL) 2.24

WELL INSIDE DIAMETER

VOLUME FACTOR V. F. = GAL/FT	2" = 0.163	3" = 0.367	4" = 0.653	5" = 1.02	6" = 1.47	8" = 2.61	10" = 4.08	12" = 5.87

DATE (S) PURGED 11/8/94

PURGE METHOD SUBMER. PUMP

INITIAL DEPTH TO WATER 11.27

TOTAL VOLUME REMOVED (GAL) 11.5

CASING VOLUMES REMOVED 5.13

PURGE RATE (GPM)

WELL DEWATERED ☐ YES ☐ NO

DATE SAMPLED 11/8/94

TIME SAMPLED 12:50

SAMPLING METHOD BAILER

WEATHER CONDITIONS CLEAR

PURGED / SAMPLED BY GM

DEPTH TO WATER AFTER RECOVERY 11.32 (FT) = 99.5 % RECOVERED PRIOR TO SAMPLING

NOTES 3365

DATE

JOB NO.

DWG NO.

DRAWN

CHK'D

APP'D

MW 1

WELL PURGING AND SAMPLING FIELD DATA

PLATE NO.

GROUNDWATER SAMPLING DATA

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	ELECTRICAL CONDUCTIVITY (µmhos/cm)	pH	TEMPERATURE (°C)	TURBIDITY (NTU)
11:18	1.5	770	6.46	20.8	CLEAR
11:21	2.5	810	6.40	20.8	
11:23	3.5	890	6.42	20.5	
11:25	4.5	840	6.37	20.6	
11:28	5.5	820	6.38	20.6	
11:30	6.5	820	6.39	21.0	
11:32	7.5	810	6.39	21.0	
11:35	8.5	800	6.39	21.0	
11:36	9.5	800	6.40	20.9	

DEPTH TO BOTTOM OR CASING LENGTH

TOTAL DEPTH TO BOTTOM 25.00 − DEPTH TO WATER = 11.41 = ΔH (FT) 13.59

ΔH (FT) 13.59 x (V.F.) = .163 = WELL CASING VOLUME (GAL) 2.22

WELL INSIDE DIAMETER

VOLUME FACTOR V. F. = GAL/FT			
	2" = 0.163	5" = 1.02	10" = 4.08
	3" = 0.367	6" = 1.47	12" = 5.87
	4" = 0.653	8" = 2.61	

DATE (S) PURGED 11/8/94

WELL DEWATERED ☐ YES ☐ NO

PURGE METHOD Submerg. Pump

DATE SAMPLED 11/8/94

INITIAL DEPTH TO WATER 11.41

TIME SAMPLED 13:07

TOTAL VOLUME REMOVED (GAL) 11.5

SAMPLING METHOD Bail

CASING VOLUMES REMOVED 5.18

WEATHER CONDITIONS Clear

PURGE RATE (GPM)

PURGED / SAMPLED BY GM

DEPTH TO WATER AFTER RECOVERY 11.35 (FT) = 100.5 % RECOVERED PRIOR TO SAMPLING

NOTES 3365

DATE 11/8/94

JOB NO.

DWG NO.

DRAWN

CHK'D

APP'D

MW-2

WELL PURGING AND SAMPLING FIELD DATA

PLATE NO.

GROUNDWATER SAMPLING DATA

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	ELECTRICAL CONDUCTIVITY (µmhos/cm)	pH	TEMPERATURE (°C)	TURBIDITY (NTU)
11:55	1.0	500	6.67	19.5	TURBID
11:56	2.0	440	6.69	20.0	
11:57	3.0	450	6.68	20.0	
12:01	4.0	410	6.54	19.9	
12:04	5.0	400	6.47	19.9	
12:06	6.0	440	6.60	19.8	
12:08	7.0	480	6.66	19.5	
12:12	8.0	410	6.60	19.8	
12:15	9.0	400	6.52	19.8	CLEARING
12:18	11.0	390	6.52	20.0	
12:19	12.0	390	6.52	20.0	
12:20	13.0	410	6.47	20.0	
12:24	14.0	390	6.52	20.0	
12:27	15.0	400	6.56	20.0	

DEPTH TO BOTTOM OR CASING LENGTH

TOTAL DEPTH TO BOTTOM 25.0 − DEPTH TO WATER 12.16 = ΔH (FT) 12.84

ΔH (FT) 12.84 x (V.F.) .163 = WELL CASING VOLUME (GAL) 2.09

WELL INSIDE DIAMETER

VOLUME FACTOR V. F. = GAL/FT	2" = 0.163	3" = 0.367	4" = 0.653	5" = 1.02	6" = 1.47	8" = 2.61	10" = 4.08	12" = 5.87

DATE(S) PURGED 11/8/94

PURGE METHOD SUBMER PUMP

INITIAL DEPTH TO WATER 12.16

TOTAL VOLUME REMOVED (GAL) 15.0

CASING VOLUMES REMOVED 7.18

PURGE RATE (GPM)

WELL DEWATERED ☐ YES ☐ NO

DATE SAMPLED 11/8/94

TIME SAMPLED 13:30

SAMPLING METHOD BAIL

WEATHER CONDITIONS CLEAR

PURGED / SAMPLED BY GM

DEPTH TO WATER AFTER RECOVERY 12.19 (FT) = 99.8 % RECOVERED PRIOR TO SAMPLING

NOTES 3365

DATE

JOB NO.

DWG NO.

DRAWN

CHK'D

APP'D

MW3

WELL PURGING AND SAMPLING FIELD DATA

PLATE NO.

GROUNDWATER SAMPLING DATA

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	ELECTRICAL CONDUCTIVITY (µmhos/cm)	pH	TEMPERATURE (° C)	TURBIDITY (NTU)
10 37	0.5	690	6.36	19.0	CLEAR
10:39	1.5	500	6.44	21.0	
10:40	2.5	530	6.50	20.0	
10:41	3.5	490	6.56	19.8	
10:42	4.0	500	6.47	20.1	
10:43	4.5	490	6.48	20.0	
10:44	5.5	480	6.49	20.1	
10:45	7.0	530	6.46	19.9	
10:46	7.5	480	6.46	20.1	
10:48	8.5	630	6.49	20.0	
10:49	5.5	480	6.51	20.1	
10:52	10.5	580	6.46	20.5	
10:54	11.5	500	6.51	20.5	

DEPTH TO BOTTOM OR CASING LENGTH

TOTAL DEPTH TO BOTTOM 25.0 — DEPTH TO WATER = 11.27 = ΔH (FT) 13.73

ΔH (FT) 13.73 x (V.F.) = .163 = WELL CASING VOLUME (GAL) 2.24

WELL INSIDE DIAMETER

VOLUME FACTOR V. F. = GAL/FT	2" = 0.163	3" = 0.367	4" = 0.653	5" = 1.02	6" = 1.47	8" = 2.61	10" = 4.08	12" = 5.87

DATE (S) PURGED 11/8/94

WELL DEWATERED ☐ YES ☐ NO

PURGE METHOD SUBMER. PUMP

DATE SAMPLED 11/8/94

INITIAL DEPTH TO WATER 11.27

TIME SAMPLED 12:50

TOTAL VOLUME REMOVED (GAL) 11.5

SAMPLING METHOD BAILED

CASING VOLUMES REMOVED 5.13

WEATHER CONDITIONS CLEAR

PURGE RATE (GPM)

PURGED / SAMPLED BY GM

DEPTH TO WATER AFTER RECOVERY 11.32 (FT) = 99.5 % RECOVERED PRIOR TO SAMPLING

NOTES 3365

DATE

JOB NO.

DWG NO.

DRAWN

CHK'D

APP'D

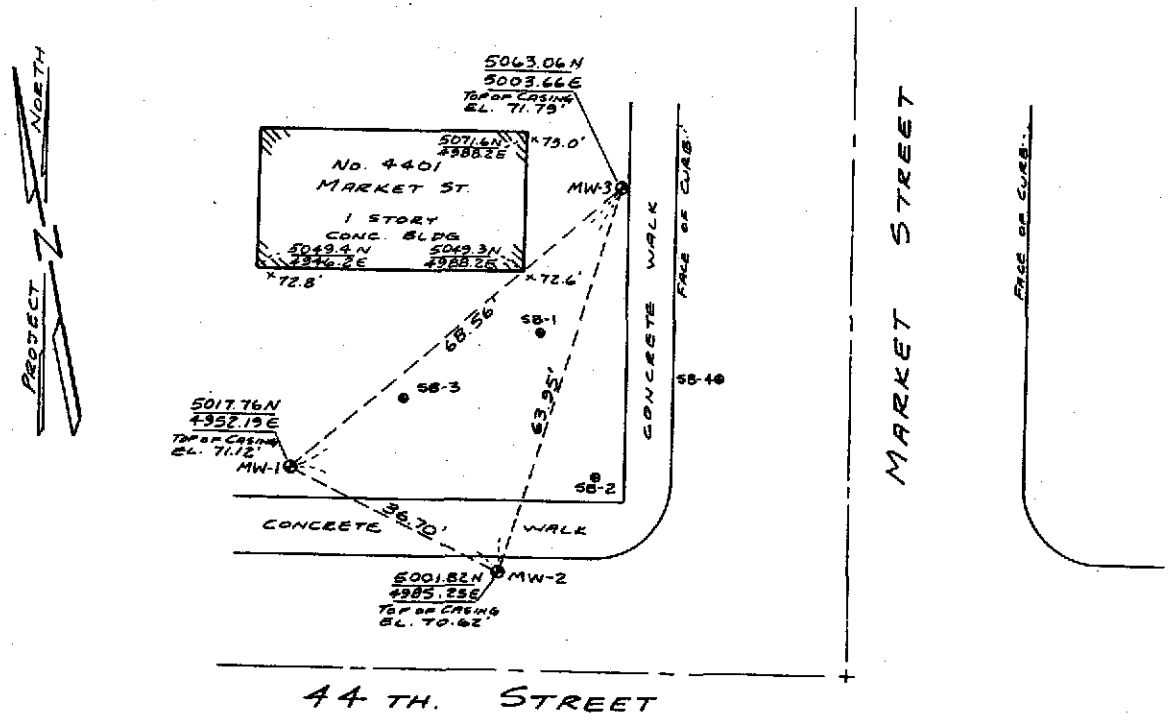
MW 1

WELL PURGING AND SAMPLING FIELD DATA

PLATE NO.

APPENDIX C

MONITORING WELL SURVEY



FACE OF CURB...

BENCH MARK:
CHISLED SQUARE
@ MID-RETURN, TOP
OF CURB. EL. 71.547
MEAN SEA LEVEL

BORING	NORTHING	EASTING	ELEV.
SB-1	5039.66	4890.79	72.5'
SB-2	5016.96	5000.28	72.0'
SB-3	5029.12	4969.48	72.3'
SB-4	5032.73	5019.75	71.9'

NOTES:

1) PUNCH MARK SET AT NORTH SIDE, TOP OF CASING AT MONITORING WELLS MW-1 THROUGH MW-3, IS BASIS OF MEASUREMENT OF DISTANCES, COORDINATES AND ELEVATIONS.
2) ELEVATION DATUM IS MEAN SEA LEVEL AS DEFINED BY CITY OF OAKLAND DEPARTMENT OF PUBLIC WORKS.

LICENSED LAND SURVEYOR
DAVID L. CONTRERAS
5065
EXPIRES 12-30-95
STATE OF CALIFORNIA

David L. Contreras

MONITORING WELL SURVEY
OF
No. 4401 MARKET ST.
CITY OF OAKLAND, CA
FOR
W.A. CRAIG, INC.

BY
DAVID L. CONTRERAS, LAND SURVEYOR
(415) 892-5905
20 VIVIAN CT. NOVATO, CA

SCALE: 1" = 20' NOVEMBER 2, 1994

SURVEY 0035