

**Harding Lawson Associates**

Engineering and Environmental Services



93104

**PRELIMINARY SOIL CHARACTERIZATION  
OAKLAND BROADWAY BLOCK  
CHINATOWN REDEVELOPMENT PROJECT AREA  
9TH STREET AND BROADWAY  
OAKLAND, CALIFORNIA**

11-11-93

**HLA Project No. 21078 02**


A Report Prepared for

City of Oakland  
Redevelopment Agency  
1333 Broadway, Ninth Floor  
Oakland, California 94612

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OAKLAND BROADWAY BLOCK  
CHINATOWN REDEVELOPMENT PROJECT AREA  
9TH STREET AND BROADWAY  
OAKLAND, CALIFORNIA**

HLA Project No. 21078 02

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November 11, 1993

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## 1.0 INTRODUCTION

This report presents the results of Harding Lawson Associates' (HLA) preliminary soil characterization investigation at the Oakland Broadway Block, Chinatown Redevelopment Project Area, 9th Street and Broadway, Oakland, California (site; Plate 1). The soil characterization was performed on behalf of and under contract to the Redevelopment Agency of the City of Oakland (Agency).

The site comprises the area bounded by Broadway, 9th Street, and Franklin Street, and the southern edge of the Transpacific Building. The site developer, Pacific Renaissance Associates (PRA II), plans to construct a high-rise building onsite. Before construction begins, the Agency wishes to assess whether soil contamination is present at the site, to minimize the potential for human exposure and construction delays during excavation and construction of the building's foundation and basement. Approximately 30,000 cubic yards of soil will be excavated from the site, assuming excavation to a depth of 15 feet.

### 1.1 Background

The site is currently an asphalt covered parking lot. The Agency has investigated previous uses of the site; these include but may not be limited to printing shops, paint supply dealers, a battery shop, a garage, a laundry, and a janitorial supply distributor. According to the Agency, most of these businesses operated for 5 years or less, except for the laundry and garage which operated for periods of 40 to 50 years. The former locations of known businesses and their years of operation are shown on Plate 1.



The Bay Area Rapid Transit District (BART) KAL and KAR lines traverse the site (Plate 1). The top of the shallower of the two tunnels is approximately 17 feet below ground surface (bgs).

A groundwater monitoring program is currently underway in the Chinatown Redevelopment Project Area. This area is bounded by Broadway, 9th, 11th, and Webster Streets. As part of groundwater monitoring in this area, two groundwater monitoring wells were installed at the site (Wells MW-20, MW-21) and a third near the site (Well MW-7). The wells are approximately 35 feet deep. Soil samples from the borings for MW-20 and MW-21 were screened for petroleum hydrocarbons using an organic vapor analyzer (OVA) and selected samples were submitted for laboratory analysis. Neither the OVA screening nor laboratory analysis indicated the presence of volatile organic compounds (VOCs) or petroleum hydrocarbons in unsaturated soil (HLA, 1990a, b).

During construction at the Pacific Renaissance Plaza (PRP) building east of the site, two underground storage tanks were discovered beneath the sidewalk on the east side of Franklin Street (Plate 1). Petroleum hydrocarbon contaminated soil was observed to extend beyond the PRP excavation toward the site. These observations were considered in selecting sample locations, depth, and analytes to assess subsurface conditions at the site and to assess whether petroleum hydrocarbons originating from the former tank location at the PRP site may have affected the subsurface at the site.

## 1.2 Purpose and Scope

The purpose of the soil characterization investigation was to:

- Characterize the nature and extent of contamination in site soil, from the near surface (fill and soil under the asphalt paving and baserock of the parking lot) to approximately 30 feet bgs. A depth of 30 feet was

selected as a practical limit of characterization because of the constraints imposed by the BART tunnels on the design of any future building.

- Estimate the volume of soil that would require special handling or disposal during excavation, and assess disposal options.

The soil characterization investigation comprised the following tasks:

- Preparing a work plan and job safety plan
- Obtaining permits from the Alameda County Flood Control and Water Conservation District (ACFCWCD) Zone 7, and BART
- Contracting a California-licensed surveyor to survey and mark the BART KAL line centerline, structural limits, and right-of-way
- Clearing boring locations using nonintrusive geophysical techniques and Underground Service Alert
- Assessing the possible presence of buried tanks using geophysical techniques. *Only in soil boring locations.*
- Drilling and collecting soil samples from 27 soil borings
- Selecting and analyzing soil samples based upon field observations and the historical uses of the site
- Arranging for the disposal of the soil cuttings from the borings
- Evaluating the field and analytical data and preparing this report.

### 1.3 Organization of This Report

The report is organized as follows. Section 2.0 describes the acquisition of required permits, field investigation techniques, sampling methods, and laboratory analyses. Section 3.0 describes the site geology, groundwater, and the nature and extent of the chemical compounds detected in the subsurface. Section 4.0 presents conclusions regarding the investigation and estimates of the volumes of soil affected by the chemical compounds which may be encountered during construction. Copies of permits, laboratory reports, sample custody documents, and a description of geophysical

procedures are included in the appendices. Limitations of the report and references used in preparing it are presented in Sections 5.0 and 6.0, respectively.

## **2.0 FIELD INVESTIGATION AND LABORATORY ANALYSIS**

### **2.1 Permitting and Preparing for Soil Boring Installation**

On October 14, 1992, HLA submitted a Request for Encroachment Permit to BART to drill soil borings within the BART subsurface easement; this easement is associated with tunnels and does not extend to ground surface. BART issued the Encroachment Permit to HLA on December 31, 1992. On December 30, 1992, the ACFCWCD issued Drilling Permit #92671 to HLA for the proposed borings. Copies of the permits are in Appendix A.

HLA contacted Underground Service Alert on January 11, 1993, to request that public and private agencies, utilities, and companies that have underground service and utility lines in or near the site mark their services and lines. On January 11 and 12, 1993, the BART KAL line centerline, limit of structure, and right-of-way were painted on the asphalt paving by Geotopo Inc. (surveyors), Oakland, California; these features are shown on Plate 1. On January 12, 1993, HLA used nonintrusive geophysical techniques at each boring location to identify buried utilities or obstacles prior to drilling.

### **2.2 Soil Boring and Sampling**

Between January 19 and 22, 1993, Borings 1 through 17 were drilled onsite. After completion of a geophysical survey on April 23 and 24, 1993, to locate any USTs onsite, 10 additional borings (Borings 18 through 27) were drilled on May 13, 1993. Boring locations are shown on Plate 1. Three borings were drilled within the BART subsurface easement; Borings 6, 12, and 13 were drilled to 15 feet bgs. Borings 19 through 22 were drilled to 3.5 feet bgs; these borings were within the footprint of the BART easement (projected to the surface) but did not encroach on the easement.

Borings 1 through 5, 7, 9 through 11, and 14 through 17 were located outside of the BART subsurface easement and were drilled to 26.5 or 30 feet bgs. Boring 8 was stopped at 7 feet bgs by an obstruction. Borings 18 and 27 were drilled near anomalies detected in the geophysical survey to depths of 16.5 and 25.5 feet, respectively. Borings 23 through 26 were shallow (5.5 feet) borings drilled in a cluster near Boring 17 on the southern boundary of the site to evaluate metals concentrations.

The borings were drilled by Gregg Drilling & Testing, Inc., Pacheco, California, using a truck mounted drill rig equipped with 6-inch-diameter, hollow-stem augers. Soil samples were collected at 5-foot intervals using a 2.0-inch-outside diameter, split-barrel sampler equipped with three clean, 1.5-inch-diameter, 6-inch-long, stainless steel sample tubes. The soil sample tubes were capped with Teflon-lined plastic caps, labeled, sealed in plastic bags, and refrigerated for transport to the analytical laboratory.

The borings were descriptively logged by an HLA field geologist. The soil was classified in accordance with ASTM Method D2488-90. The boring logs are presented on Plates 3 through 25; a summary of the soil classification system is presented on Plate 26. The soil samples were screened in the field using an organic vapor analyzer (OVA), and by visual inspection for soil staining. OVA readings, odor, and soil staining are noted on the boring logs.

Following completion, each boring was backfilled by pumping a lean cement/bentonite grout through a tremmie pipe from the bottom of the boring to the ground surface. Soil cuttings were temporarily stored onsite in a locked soil bin. Following receipt of the soil sample analytical results, the soil was disposed at McKittrick Waste Treatment Site, McKittrick, California.

### **2.3 Selection of Soil Samples for Analyses**

Soil samples were collected at approximately 5-foot intervals from each boring for lithologic description. Samples suspected of containing petroleum hydrocarbons were retained for organic compounds analyses. The samples analyzed for metals were selected on the basis of historical site uses and were concentrated in shallow soil (1.0 to 5.0 feet bgs) from areas where former businesses, such as the battery or print shops, may have released chemicals to the environment (Plate 1). To provide for areal distribution of soil samples and for confirmation purposes, additional samples were also selected and analyzed from areas and depths where soil contamination was not observed or suspected.

### **2.4 Soil Sample Analytical Program**

Soil samples were submitted under chain of custody to NET Pacific Laboratories, Inc. (NET), Santa Rosa, California, to be analyzed for total petroleum hydrocarbons as diesel (TPHd), TPH as gasoline (TPHg), benzene, toluene, ethylbenzene, and total xylenes (BTEX), VOCs, semivolatile organic compounds (SOCs), and priority pollutant metals. NET is a California-certified laboratory for the analyses requested. Copies of the laboratory reports and the chain of custody forms are presented in Appendix B.

### **2.5 Groundwater Sampling and Analysis**

Groundwater samples were collected from the three wells at and near the site to evaluate groundwater chemistry at the site and whether potential sources of petroleum hydrocarbons have affected groundwater. On June 24, 1993, groundwater samples were collected from Monitoring Wells MW-7, MW-20, and MW-21 (Plate 1); these wells were originally installed as part of a groundwater monitoring network for the adjacent PRP project site.

Depth to water was measured in each well prior to sampling. Three well volumes were purged from each well, collected in 55-gallon drums and retained onsite. Groundwater samples were collected using a stainless steel bailer and decanted into 40-milliliter sample containers which were labeled and stored on ice until delivery under chain of custody to the analytical laboratory. Samples were submitted to Pace Laboratories, Inc. (PACE), Novato, California, to be analyzed for TPHg using EPA Test Method 8015, and BTEX using EPA Test Method 8020. PACE is a state-certified laboratory for the analyses requested. Copies of laboratory reports, chain of custody documents and well sampling forms are included in Appendix B.

#### **2.6 Equipment Decontamination**

To minimize the possibility of cross contamination, all downhole drilling and sampling equipment was decontaminated before use. The augers and well development and sampling equipment were steam cleaned before drilling. The soil sampling equipment was washed in a low-phosphorus soap solution and rinsed with deionized water before sampling. Decontamination rinsate was temporarily stored onsite in sealed 55-gallon drums until receipt of laboratory analytical results, at which time it was appropriately disposed.

#### **2.7 Geophysical Survey**

To locate USTs at or near the site, HLA performed a geophysical survey April 22 and 23, 1993. Electromagnetic profiling (EM), ground penetrating radar (GPR), and two types of pipe and cable locators (RD400 and M-Scope) were used. The survey identified eight anomalies; two were associated with areas within the site boundary where historical uses and experience at other sites in the Chinatown Redevelopment

Project Area suggest that tanks, vaults, or similar objects might be present. These two areas were further investigated by drilling Borings 18 and 27. A description of the geophysical survey is presented in Appendix C.



### **3.0 RESULTS**

#### **3.1 Site Lithology**

Review of the soil boring logs indicate that the site is underlain by fill consisting of clayey gravel with sand to depths up to 4.5 feet, and dark yellowish brown and dark brown silty sands from below the fill to at least 30 feet bgs, the maximum depth explored. During drilling, water-saturated soil was encountered at depths ranging from 22.5 to 27.5 feet bgs.

#### **3.2 Analytical Results for Soil Samples**

Comparison of the analytical results with the location and depth of the soil samples does not indicate the presence of priority pollutant metals above estimated background concentrations or the presence of organic compounds in most site soil.

Three zones of soil having elevated concentrations of organic compounds or priority pollutant metals have been identified. Two of these areas are in shallow soil; one contains organic compounds and the other contains lead and zinc. The third is an area of soil at a depth of 25 feet bgs which is affected by petroleum hydrocarbons. Areas are shown on Plate 2.

##### **3.2.1 Organic Compounds in Shallow Soil**

Twenty-two soil samples from depths of 10 feet or less were analyzed for organic compounds. TPHd was detected in 13 of these shallow soil samples (Table 1, Plate 2). The sample from Boring 6 at 1.5 feet bgs contained 1,600 mg/kg TPHd. All other shallow samples contained less than 100 mg/kg TPHd. The analytical laboratory reported that the TPHd detected in the 1.5-foot samples from Borings 19 through 22 appeared to be due to the presence of hydrocarbons heavier than diesel. None of the shallow samples contained TPHg or BTEX compounds. Four of the samples also

contained low concentrations of tetrachloroethene (PCE). Samples from 1.5 to 5.0 feet bgs in Borings 6, 17, 19, and 20 contained PCE at concentrations between 0.0026 and 0.022 mg/kg.

### **3.2.2 Lead and Zinc in Shallow Soil**

Twenty-one shallow soil samples were analyzed for priority pollutant metals (Tables 2 and 3). One of the 21 soil samples contained zinc at an elevated concentration of 17,000 mg/kg (Boring 17 at 5.0 feet bgs). All other detected priority pollutant metals were at concentrations below the average metal concentrations in soil for the San Francisco Bay area (*Shacklette and Boerngen, 1984*). However, two of the samples contained lead at concentrations considerably higher than in other samples from the site. The sample from Boring 6 at 1.5 feet bgs contained 230 mg/kg lead and the sample from Boring 17 at 5.0 feet bgs contained 320 mg/kg lead. The zinc concentration from the sample in Boring 17 at 5.0 feet bgs exceeds the total threshold limit concentration (*TTLC, California Code of Regulations Title 22, Chapter 11, Article 3*) for zinc.

### **3.2.3 Petroleum Hydrocarbons in Deeper Soil**

Petroleum hydrocarbons, including TPHd, TPHg, and the BTEX components, were detected in soil samples collected from Borings 11, 15, 17, and 27 at 24.5 to 25 feet bgs. These borings were drilled along the southern edge of the site (Plate 2). Concentrations of TPHd ranged from 470 to 1,000 mg/kg, concentrations of TPHg ranged from 350 to 2,000 mg/kg, and concentrations of BTEX components ranged from nondetect to 15 mg/kg total xylenes. The sample from Boring 15 contained minor amounts of the SOCs 2-methylnaphthalene and naphthalene (Table 1).

Analysis of soil samples from Borings 17 and 27 reported TPHd to be present. However, review of the analytical chromatograms by chemists at NET and HLA

indicated that the chromatograms are not characteristic of diesel and may represent hydrocarbons lighter than diesel.

No petroleum hydrocarbons were detected in the 25-foot samples from Borings 3, 4, 10, or 16, or in the 20-foot samples from Borings 2, 11, 15, or 27. Similarly, no petroleum hydrocarbons were detected in unsaturated soil samples from borings for Wells MW-20 and MW-21 (HLA, 1990b).

### 3.3 Nature and Extent of Chemicals in Groundwater

No petroleum hydrocarbons or BTEX compounds were detected in groundwater samples from Wells MW-7, MW-20, and MW-21 collected on June 24, 1993.

### 3.4 Potential for Presence of Buried Objects

The geophysical survey results (Appendix C) indicate several anomalies within site boundaries or near the site. At two of these locations within the site, where historical uses and experience in the Chinatown Redevelopment Project Area indicate that tanks or vaults may be present, borings (18 and 27) were completed to investigate the presence of tanks and the potential for release. Results did not confirm the presence of tanks and did not identify the presence of chemicals indicative of release from the vicinity of the anomalies investigated.

### 3.5 Discussion

Occurrences of TPHd in shallow soil are primarily at depths of 2 feet and less, suggesting that diesel may have been discharged at the surface or may have been associated with fill used to bring the ground surface to grade after building demolition and prior to construction of the parking lot. If fill was used in this manner, there may be additional areas containing diesel. The volume of shallow soil containing TPHd at

concentrations less than 100 mg/kg is estimated to be approximately 1,500 cubic yards.

The volume of shallow soil containing TPH as diesel at concentrations greater than 100 mg/kg is estimated to be less than 20 cubic yards.

On the basis of data collected to date, the volume of shallow soil containing elevated concentrations of lead is estimated to be less than 30 cubic yards. Of this 30 cubic yards, it is estimated that less than 15 cubic yards also contain elevated concentrations of zinc.

The TPH pattern at the 25-foot depth near the southern boundary of the site suggests a source in this area. The petroleum hydrocarbons detected at 25 feet bgs appear to have originated from an unknown source along 9th Street and spread horizontally away from this source on the water table within the area bounded by Borings 10 and 16 and Monitoring Well MW-21. Geophysical survey results indicate the presence of an object that may be a tank within the release footprint and near the southern boundary of the site. No additional investigations have been undertaken to assess the nature of this object. Based on the data available, the volume of soil at this depth containing petroleum hydrocarbons is estimated to be 900 cubic yards.

Unknown source  
could be from  
the BART  
back fill.

#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

With the following exceptions, the analytical results for soil samples did not show the presence of organic chemicals, or of inorganic chemicals above normal background levels for soil from the San Francisco Bay Area:

- Shallow soil near Boring 6 shows elevated concentrations of lead and concentrations of TPHd greater than 100 mg/kg. About 20 cubic yards of soil at this location is expected to require disposal at a Class I or Class II landfill.
- Approximately 1,500 cubic yards of shallow soil showing concentrations of TPHd below 100 mg/kg should be acceptable for disposal at a Class III landfill.
- Shallow soil near Boring 17 shows elevated concentrations of lead and zinc. An estimated 15 cubic yards of soil at this location may require disposal at a Class I landfill.
- An estimated 900 cubic yards of soil within the site boundary at a depth of 25 feet bgs contains petroleum hydrocarbons. If excavated, these soils are expected to require disposal at a Class II landfill.

The distribution of petroleum hydrocarbons in soil at 25 feet bgs suggests that the petroleum hydrocarbons extend offsite beneath 9th Street (Plate 2).

During construction, the excavation subcontractor should be prepared to safely handle and dispose of soil containing petroleum hydrocarbons and metals. Soil containing elevated concentrations of analytes should be segregated for appropriate disposal. Excavation activities in the vicinity of the detected analytes should be observed by a geologist to evaluate the distribution of affected soil.

Because of the limited nature of the boring program implemented to explore the geophysical anomalies, it is possible that buried objects which could be tanks or vaults are present within site boundaries. Although there is no direct evidence of the presence of tanks or vaults, or of release from them, the presence of such objects and associated releases should be considered in planning for excavation. For the two anomalies

investigated with borings, it is recommended that the possible presence of buried objects be confirmed using direct exploration methods such as trenching prior to the start of excavation. Completing exploration for and removal of any tanks found prior to the start of excavation will minimize the potential for delays once construction commences.

## **5.0 LIMITATIONS**

The conclusions and recommendations presented in this report are professional opinions based on the indicated data described in this report. They are intended only for the purpose, site location, and project indicated. It should be recognized that this study was not intended to be a definitive study of all environmental conditions at the site and that other contaminants not analyzed during this study may be present, although HLA has no reason to believe that such may be the case. Interpretations presented on maps are only accurate at the specific points where samples were collected and/or chemically analyzed. The data presented between these points are interpretations and therefore subject to change as additional information becomes available.

Conclusions presented herein apply to site conditions existing at the time of our study. They cannot apply to site changes of which HLA is not aware and has not had the opportunity to evaluate. Changes in hazardous waste management standards can also occur as the result of legislation or from the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond our control.

HLA's services have been performed with the same degree of care, skill, and diligence normally provided by qualified and reputable professional persons performing services similar to those performed on this project.

## 6.0 REFERENCES

California Code of Regulations, Title 22, Article 3, Division of Environmental Health.

Harding Lawson Associates, 1990a. *Report of System Monitoring, December 1989, Soil Treatment System, Pacific Renaissance Plaza, Oakland, California.* February 1.

\_\_\_\_\_, 1990b. *Installation of Monitoring Wells MW-21, MW-22, and MW-23, Chinatown Redevelopment Project Area, Oakland, California.* October 4.

\_\_\_\_\_, 1992. *Request for Encroachment Permit, Chinatown Redevelopment Project Area, 9th and Franklin Streets, Oakland, California.* October 14.

Shacklette, Hansford T., and Josephine G. Boerngen, 1984. *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States.* U.S. Geological Survey Professional Paper 1270.



**Table 1. Soil Sample Analytical Results, Organic Compounds (mg/kg)<sup>1</sup>**  
**Preliminary Soil Characterization**  
**Oakland Broadway Block**  
**Chinatown Redevelopment Project Area**  
**Oakland, California**

Boring Number	Depth (feet)	Sample Number	Sample Date	TPH as Diesel <sup>2</sup>	TPH as Gasoline <sup>3</sup>	Benzene <sup>4</sup>	Toluene <sup>4</sup>	Ethylbenzene <sup>4</sup>	Total Xylenes <sup>4</sup>	Volatile Organic Compounds <sup>5</sup>	Semivolatile Organic Compounds <sup>6</sup>
1	1.5	93012201	1-19-93	23	ND<1 <sup>7</sup>	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND <sup>8</sup>	ND
2	2.0	93011901	1-19-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	ND
2	20	93011902	1-19-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0030	ND<0.0030	ND	NT
3	5	93011903	1-19-93	65	ND<1	ND<0.0025	ND<0.0025	ND<0.0030	ND<0.0030	ND	NT
3	25	93011904	1-19-93	NT	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
4	1.5	93011905	1-19-93	68	ND<1	ND<0.0025	ND<0.0025	ND<0.0030	ND<0.0030	ND	ND
4	10	93011906	1-19-93	21	ND<1	ND<0.0025	ND<0.0025	ND<0.0030	ND<0.0030	ND	NT
4	25	93011907	1-19-93	NT	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
5	15	93012202	1-20-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	NT
6	1.5	93012203	1-21-93	1,800	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	0.0054-PCE <sup>9</sup>	ND
7	2.0	93011908	1-19-93	83	ND<1	ND<0.0025	ND<0.0025	ND<0.0030	ND<0.0030	ND	ND
7	15	93011909	1-19-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0030	ND<0.0030	ND	ND
9	10	93012204	1-20-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	ND

**Table 1. Soil Sample Analytical Results, Organic Compounds (mg/kg)<sup>1</sup>**  
**Preliminary Soil Characterization**  
**Oakland Broadway Block**  
**Chinatown Redevelopment Project Area**  
**Oakland, California**

Boring Number	Depth (feet)	Sample Number	Sample Date	TPH as Diesel <sup>2</sup>	TPH as Gasoline <sup>3</sup>	Benzene <sup>4</sup>	Toluene <sup>4</sup>	Ethylbenzene <sup>4</sup>	Total Xylenes <sup>4</sup>	Volatile Organic Compounds <sup>5</sup>	Semivolatile Organic Compounds <sup>6</sup>
10	1.5	93012205	1-21-93	57	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	ND
10	25	93012206	1-21-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	NT
11	1.0	93012207	1-20-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	ND
11	20	93012208	1-20-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
11	25	93012209	1-20-93	1,000	1,500	5.1	4.2	ND<0.0025	15	ND	NT
12	10	93012210	1-21-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
13	5	93012211	1-21-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
14	1.5	93011910	1-19-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0030	ND<0.0030	ND	ND
15	1.5	93012212	1-20-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	ND
15	20	93012213	1-20-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	NT
15	25	93012214	1-20-93	750 <sup>10</sup>	2,000	8.2	2.7	4.0	12.0	ND	0.78 2-methyl naphthalene 2.2 naphthalene
16	1.5	93012215	1-21-93	11	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	ND

**Table 1. Soil Sample Analytical Results, Organic Compounds (mg/kg)<sup>1</sup>**  
**Preliminary Soil Characterization**  
**Oakland Broadway Block**  
**Chinatown Redevelopment Project Area**  
**Oakland, California**

Boring Number	Depth (feet)	Sample Number	Sample Date	TPH as Diesel <sup>2</sup>	TPH as Gasoline <sup>3</sup>	Benzene <sup>4</sup>	Toluene <sup>4</sup>	Ethylbenzene <sup>4</sup>	Total Xylenes <sup>4</sup>	Volatile Organic Compounds <sup>5</sup>	Semivolatile Organic Compounds <sup>6</sup>
16	25	93012216	1-21-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	ND	NT
17	5	93012217	1-22-93	1.6	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	0.022 <sup>9</sup>	ND
17	25	93012218	1-22-93	540 <sup>10</sup>	790	0.87	0.95	1.6	3.8	NT	NT
18	3.0	93051312	5-13-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
18	6.0	93051313	5-13-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
18	15.5	93051314	5-13-93	ND<1	ND<1	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
19	1.5	93051301	5-13-93	100 <sup>11</sup>	NT	NT	NT	NT	NT	0.0026 <sup>9</sup>	NT
20	1.5	93051302	5-13-93	24 <sup>11</sup>	NT	NT	NT	NT	NT	0.0075 <sup>9</sup>	NT
21	1.5	93051304	5-13-93	13 <sup>11</sup>	NT	NT	NT	NT	NT	ND	NT
22	1.5	93051303	5-13-93	26 <sup>11</sup>	NT	NT	NT	NT	NT	ND	NT
27	15.5	93051308	5-13-93	ND<1	ND<1.0	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT
27	20.5	93051310	5-13-93	ND<1	ND<1.0	ND<0.0025	ND<0.0025	ND<0.0025	ND<0.0025	NT	NT

**Table 1. Soil Sample Analytical Results, Organic Compounds (mg/kg)<sup>1</sup>**  
**Preliminary Soil Characterization**  
**Oakland Broadway Block**  
**Chinatown Redevelopment Project Area**  
**Oakland, California**

Boring Number	Depth (feet)	Sample Number	Sample Date	TPH as Diesel <sup>2</sup>	TPH as Gasoline <sup>3</sup>	Benzene <sup>4</sup>	Toluene <sup>4</sup>	Ethylbenzene <sup>4</sup>	Total Xylenes <sup>4</sup>	Volatile Organic Compounds <sup>5</sup>	Semivolatile Organic Compounds <sup>6</sup>
27	24.5	83051311	5-13-93	470 <sup>10</sup>	350	ND<0.5	1.4	1.8	3.9	NT	NT

1 mg/kg = milligrams per kilogram

2 EPA Test Method 3550

3 EPA Test Method 5030

4 EPA Test Method 8020

5 EPA Test Method 8010

6 EPA Test Method 8270

7 ND<1 = not detected at indicated reporting limit

8 ND = not detected; see laboratory analytical reports for reporting limits of individual analytes

9 Tetrachloroethene detected at this concentration. No other analytes were detected. See laboratory analytical reports for reporting limits of individual analytes.

10 The analytical laboratory report indicates that the result for TPH as diesel appears to be due to the presence of hydrocarbons lighter than diesel.

11 The analytical laboratory report indicates that the result for TPH as diesel appears to be due to the presence of hydrocarbons heavier than diesel.

**Table 2. Soil Sample Analytical Results, Priority Pollutant Metals (mg/kg)<sup>1</sup>**  
**Preliminary Soils Characterization**  
**Oakland Broadway Block**  
**Chinatown Redevelopment Project Area**  
**Oakland, California**

Boring Number	Depth (feet)	Sample Number	Sample Date	Antimony <sup>2</sup>	Arsenic <sup>3</sup>	Barium <sup>2</sup>	Beryllium <sup>2</sup>	Cadmium <sup>2</sup>	Chromium <sup>2</sup>	Chromium-6 <sup>4</sup>	Cobalt <sup>2</sup>	Copper <sup>2</sup>	Lead <sup>5</sup>	Mercury <sup>6</sup>	Molybdenum <sup>2</sup>	Nickel <sup>2</sup>	Selenium <sup>7</sup>	Silver <sup>2</sup>	Thallium <sup>2</sup>	Vanadium <sup>2</sup>	Zinc <sup>2</sup>
1	1.5	93012201	1-19-93	ND<10 <sup>8</sup>	3.0	170	ND<2.0 <sup>8</sup>	4.5	35	ND<10	14	27	50	ND<0.1	ND<5.0	55	ND<0.5	ND<2.0	ND<20	32	48
2	2.0	93011901	1-19-93	ND<10	1.3	46	ND<2.0	4.2	44	NT	7.3	18	11	ND<0.1	ND<5.0	40	ND<0.5	55	ND<20	26	28
2	20	93011902	1-19-93	ND<10	0.8	26	ND<2.0	3.4	37	NT	5.9	14	1.7	ND<0.1	ND<5.0	31	ND<0.5	ND<2.0	ND<20	24	21
3	5	93011903	1-19-93	ND<10	1.3	61	ND<2.0	4.1	42	NT	7.2	19	7.5	ND<0.1	ND<5.0	32	ND<0.5	ND<2.0	ND<20	30	33
4	1.5	93011905	1-19-93	ND<10	2.0	85	ND<2.0	4.1	37	NT	6.9	17	17	ND<0.1	ND<5.0	30	ND<0.5	ND<2.0	ND<20	26	33
4	10	93011906	1-19-93	ND<10	1.1	42	ND<2.0	4.3	44	NT	6.8	18	17	ND<0.1	ND<5.0	35	ND<0.5	ND<2.0	ND<20	28	23
4	25	93011907	1-19-93	ND<10	0.6	36	ND<2.0	3.3	36	NT	5.8	14	1.6	ND<0.1	ND<5.0	36	ND<0.5	ND<2.0	ND<20	26	22
5	15	93012202	1-20-93	ND<10	ND<0.5	34	ND<2.0	3.8	53	ND<10	9.2	16	2.3	ND<0.1	ND<5.0	39	ND<0.5	ND<2.0	ND<20	32	21
6	1.5	93012203	1-21-93	ND<10	2.4	82	ND<2.0	4.6	26	ND<10	8.1	26	230	0.23	ND<5.0	25	ND<0.5	ND<2.0	ND<20	26	69
7	2.0	93011908	1-19-93	ND<10	1.7	59	ND<2.0	3.9	34	NT	6.3	17	29	ND<0.1	ND<5.0	32	ND<0.5	ND<2.0	ND<20	26	49
7	15	93011909	1-19-93	ND<10	1.8	46	ND<2.0	4.3	46	NT	6.8	18	2.9	ND<0.1	ND<5.0	32	ND<0.5	ND<2.0	ND<20	33	19
8	10	93012204	1-20-93	ND<10	0.6	41	ND<2.0	2.8	33	ND<10	5.3	19	2.2	ND<0.1	ND<5.0	26	ND<0.5	ND<2.0	ND<20	23	20
10	1.5	93012205	1-21-93	ND<10	3.6	81	ND<2.0	5.8	18	ND<10	9.4	31	29	ND<0.1	ND<5.0	16	ND<0.5	ND<2.0	ND<20	39	67

**Table 2. Priority Pollutant Metals Analytical Results (mg/kg)<sup>1</sup>**  
**Preliminary Soils Characterization**  
**Oakland Broadway Block**  
**Chinatown Redevelopment Project Area**  
**Oakland, California**

Boring Number	Depth (feet)	Sample Number	Sample Date	Antimony <sup>2</sup>	Arsenic <sup>3</sup>	Berium <sup>2</sup>	Beryllium <sup>2</sup>	Cadmium <sup>2</sup>	Chromium <sup>2</sup>	Chromium-6 <sup>4</sup>	Cobalt <sup>2</sup>	Copper <sup>2</sup>	Lead <sup>5</sup>	Mercury <sup>5</sup>	Molybdenum <sup>2</sup>	Nickel <sup>2</sup>	Selenium <sup>7</sup>	Silver <sup>2</sup>	Thallium <sup>2</sup>	Vanadium <sup>2</sup>	Zinc <sup>2</sup>
11	1.0	83012207	1-20-83	ND<10	1.1	43	ND<2.0	2.3	27	ND<10	ND<5.0	14	2.0	ND<0.1	ND<5.0	15	ND<0.5	ND<2.0	ND<20	21	14
12	10	83012210	1-21-83	ND<10	1.4	40	ND<2.0	3.8	44	ND<10	6.8	21	6.3	ND<0.1	ND<5.0	28	ND<0.5	ND<2.0	ND<20	34	24
13	5	83012211	1-21-83	ND<10	1.9	85	ND<2.0	3.8	48	ND<10	5.7	21	2.8	ND<0.1	ND<5.0	33	ND<0.5	ND<2.0	ND<20	32	22
14	1.5	83011810	1-19-83	ND<10	ND<0.5	48	ND<2.0	2.7	29	NT	ND<5.0	12	2.9	ND<0.1	ND<5.0	18	ND<0.5	ND<2.0	ND<20	18	34
15	1.5	83012212	1-20-83	ND<10	1.0	42	ND<2.0	2.0	30	ND<10	ND<5.0	12	5.1	ND<0.1	ND<5.0	12	ND<0.5	ND<2.0	ND<20	18	15
15	25	83012214	1-20-83	ND<10	1.0	39	ND<2.0	3.2	33	ND<10	5.5	15	2.1	ND<0.1	ND<5.0	33	ND<0.5	ND<2.0	ND<20	25	17
16	1.5	83012215	1-21-83	ND<10	1.1	28	ND<2.0	2.8	30	ND<10	ND<5.0	18	3.7	ND<0.1	ND<5.0	14	ND<0.5	ND<2.0	ND<20	20	33
17	5	83012217	1-22-83	ND<10	ND<5.0	48	ND<2.0	7.6	3.2	ND<10	ND<5.0	18	320	ND<0.1	ND<5.0	6.7	ND<0.5	ND<2.0	ND<20	8.0	17,000
18	8.0	83051313	5-13-83	ND<10	1.7	NT	ND<2.0	ND<2.0	58	NT	NT	9.1	ND<20	ND<0.1	NT	39	ND<0.5	ND<2.0	ND<20	NT	26
19	1.5	83051301	5-13-83	NT	NT	NT	NT	NT	NT	NT	NT	NT	99	NT	NT	NT	NT	NT	NT	NT	NT
20	1.5	83051302	5-13-83	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.7	NT	NT	NT	NT	NT	NT	NT	NT
21	1.5	83051304	5-13-83	NT	NT	NT	NT	NT	NT	NT	NT	NT	3.2	NT	NT	NT	NT	NT	NT	NT	NT
22	1.5	83051303	5-13-83	NT	NT	NT	NT	NT	NT	NT	NT	NT	22	NT	NT	NT	NT	NT	NT	NT	NT

**Table 2. Priority Pollutant Metals Analytical Results (mg/kg)<sup>1</sup>**  
**Preliminary Soils Characterization**  
**Oakland Broadway Block**  
**Chinatown Redevelopment Project Area**  
**Oakland, California**

Boring Number	Depth (feet)	Sample Number	Sample Date	Antimony <sup>2</sup>	Arsenic <sup>3</sup>	Barium <sup>2</sup>	Beryllium <sup>2</sup>	Cadmium <sup>2</sup>	Chromium <sup>2</sup>	Chromium+6 <sup>4</sup>	Cobalt <sup>2</sup>	Copper <sup>2</sup>	Lead <sup>5</sup>	Mercury <sup>6</sup>	Molybdenum <sup>2</sup>	Nickel <sup>2</sup>	Selenium <sup>7</sup>	Silver <sup>2</sup>	Thallium <sup>2</sup>	Vanadium <sup>2</sup>	Zinc <sup>2</sup>
23	5.0	83051308	5-13-93	NT	NT	NT	NT	NT	NT	NT	NT	NT	4.7	NT	NT	NT	NT	NT	NT	NT	27
24	5.0	83051306	5-13-93	NT	NT	NT	NT	NT	NT	NT	NT	NT	4.4	NT	NT	NT	NT	NT	NT	NT	55
25	5.0	83051307	5-13-93	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.2	NT	NT	NT	NT	NT	NT	NT	56
26	5.0	83051305	5-13-93	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.2	NT	NT	NT	NT	NT	NT	NT	18
27	24.5	83051311	5-13-93	ND<10	1.8	NT	ND<2.0	ND<2.0	32	NT	NT	4.8	ND<20	ND<0.1	NT	31	ND<0.5	ND<2.0	ND<20	NT	19

<sup>1</sup> mg/kg = milligrams per kilogram

<sup>2</sup> EPA Test Method 6010

<sup>3</sup> EPA Test Method 7080

<sup>4</sup> EPA Test Method 7197

<sup>5</sup> EPA Test Method 7421

<sup>6</sup> EPA Test Method 7471

<sup>7</sup> EPA Test Method 7740

<sup>8</sup> ND <2.0 = Not detected at indicated detection limit.

NT = Not Tested

**Table 3. Summary of Priority Pollutant Metals Analytical Results  
Preliminary Soils Characterization  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California**

Analyte	EPA Test Method	Number of Samples Analyzed	Number of Samples with Analyte Detected	Detection Limit (mg/kg) <sup>1</sup>	Detected Concentration		TTL <sup>2</sup> (mg/kg)	Number of Sample Results Exceeding TTL
					Minimum (mg/kg)	Maximum (mg/kg)		
Antimony	6010	23	0	10	NA	NA	500	0
Arsenic	7060	23	20	0.5	0.6	3.6	500	0
Barium	6010	21	21	2.0	28	170	10,000	0
Beryllium	6010	23	0	2.0	NA	NA	75	0
Cadmium	6010	23	21	2.0	2.0	7.6	100	0
Chromium	6010	23	23	2.0	3.2	58	2,500	0
Chromium <sup>+6</sup>	7197	12	0	10	NA	NA	500	0
Cobalt	6010	21	16	5.0	5.3	14	8,000	0
Copper	6010	23	23	2.0	4.6	31	2,500	0
Lead	7421	27	25	0.2	1.6	320	1,000	0
Mercury	7471	23	2	0.1	0.23	0.46	20	0
Molybdenum	6010	21	0	5.0	NA	NA	3,500	0
Nickel	6010	23	23	5.0	6.7	55	2,000	0
Selenium	7740	23	0	0.5	NA	NA	100	0
Silver	6010	23	1	2.0	55	55	500	0
Thallium	6010	23	0	20.0	NA	NA	700	0
Vanadium	6010	21	21	5.0	6.0	39	2,400	0
Zinc	6010	25	25	2.0/5.0	14	17,000	5,000	1

<sup>1</sup> mg/kg = milligrams per kilogram

<sup>2</sup> TTL = Total Threshold Limit Concentration Values, California Code of Regulations, Article 3, Title 22

NA = Not Applicable



**Table 4. Groundwater Sample Analytical Results  
Preliminary Soil Characterization  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California**

**Purgeable Aromatics (EPA Method 8020)  
Petroleum Hydrocarbons (EPA Method 8015)**

Well	Date	Benzene	Toluene	Ethyl- Benzene	Xylenes, Total	TPH as Gasoline
		LOD (mg/l) 0.0002	LOD (mg/l) 0.0002	LOD (mg/l) 0.0002	LOD (mg/l) 0.0002	LOD (mg/l) 0.05
MW-7	24-Jun-93	ND	ND	ND	ND	ND
MW-20	24-Jun-93	ND	ND	ND	ND	NT
MW-21	24-Jun-93	ND/ND	ND/ND	ND/ND	ND/ND	ND/NT

**Notes:**

Results reported in milligrams per liter (mg/l); equivalent to parts per million.

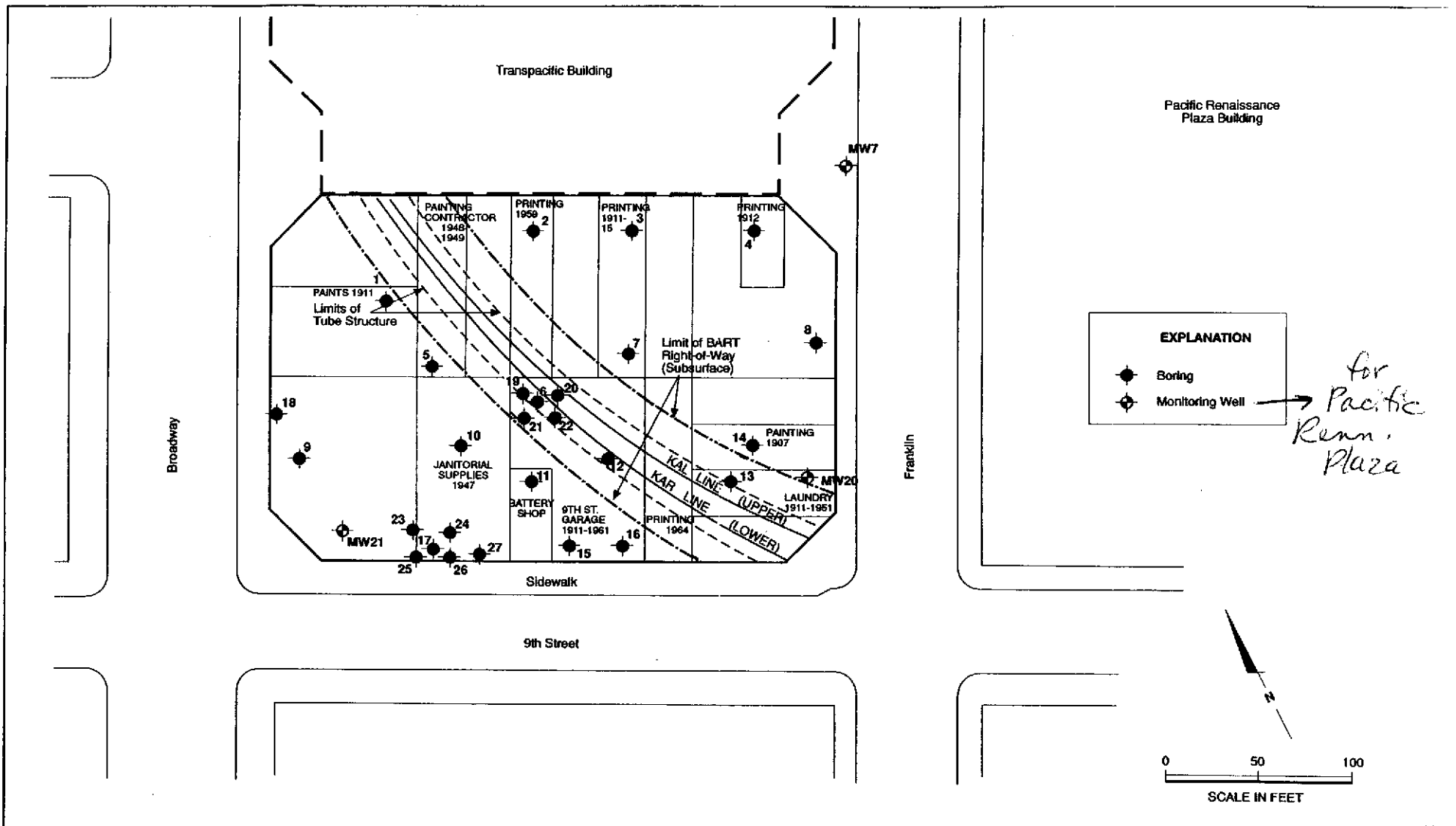
Analyses performed by PACE Laboratories, Inc., Novato, California.

Two values indicate results of duplicate analyses.

LOD: Limit of Detection.

ND: Not detected at or above LOD.

NT: Not tested.



Source for Base Map: Redevelopment Agency of City of Oakland



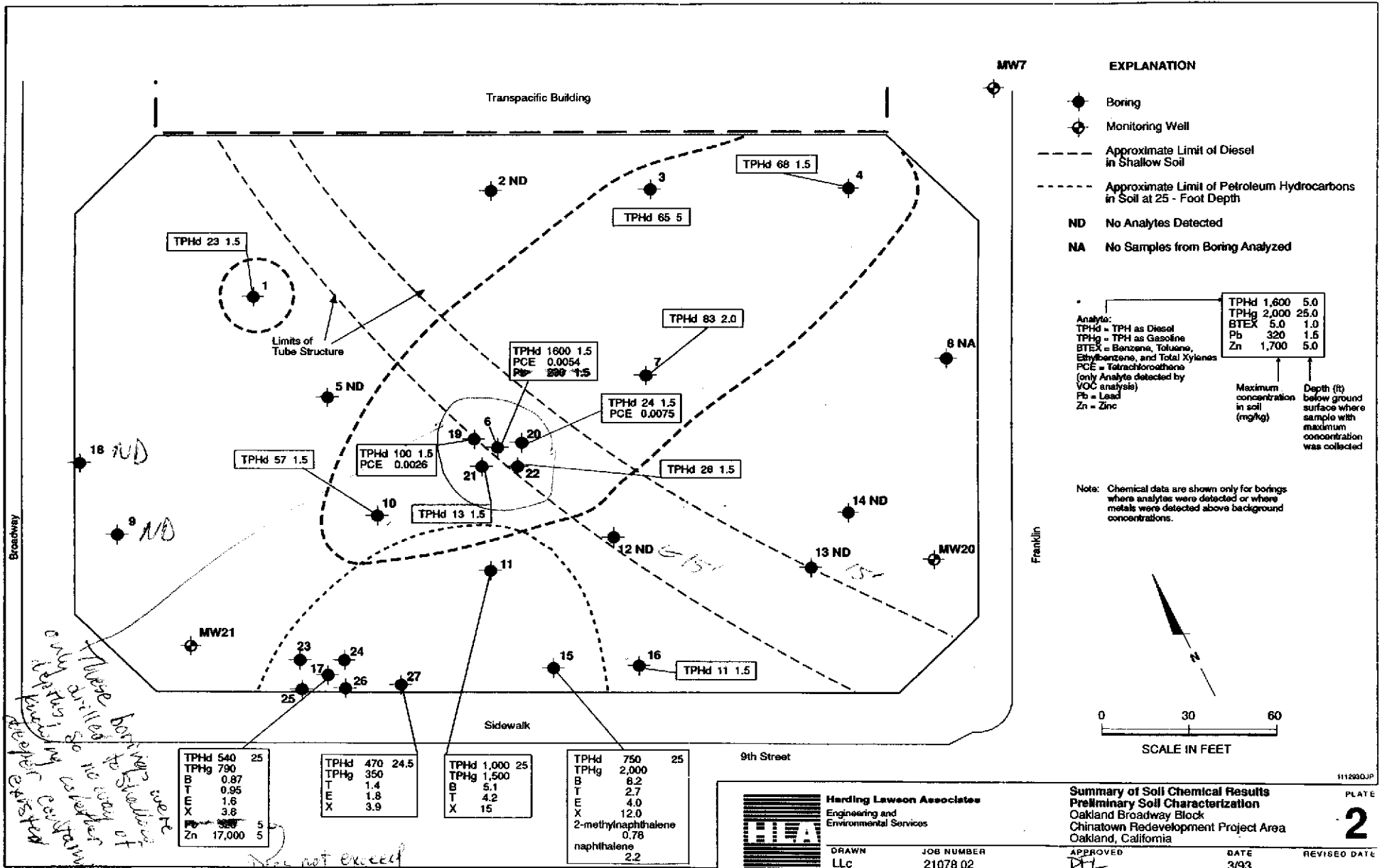
**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN: PMc  
JOB NUMBER: 21078 02

**Site Plan and Boring Locations**  
**Preliminary Soil Characterization**  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

APPROVED: DFL  
DATE: 3/93  
REVISED DATE:

PLANNING  
**1**



*Handwritten notes:*  
 only drilled to shallowest  
 These borings were  
 drilled by contractor  
 to confirm  
 presence of  
 contamination

TPHd 540	25	TPHd 470	24.5	TPHd 1,000	25	TPHd 750	25
TPHg 790		TPHg 350		TPHg 1,500		TPHg 2,000	
B 0.87		T 1.4		B 5.1		B 8.2	
T 0.95		E 1.8		T 4.2		T 2.7	
E 1.6		X 3.9		E 4.0		E 4.0	
X 3.8				X 12.0		X 12.0	
Pb 500	5			2-methylnaphthalene	0.78		
Zn 17,000	5			naphthalene	2.2		

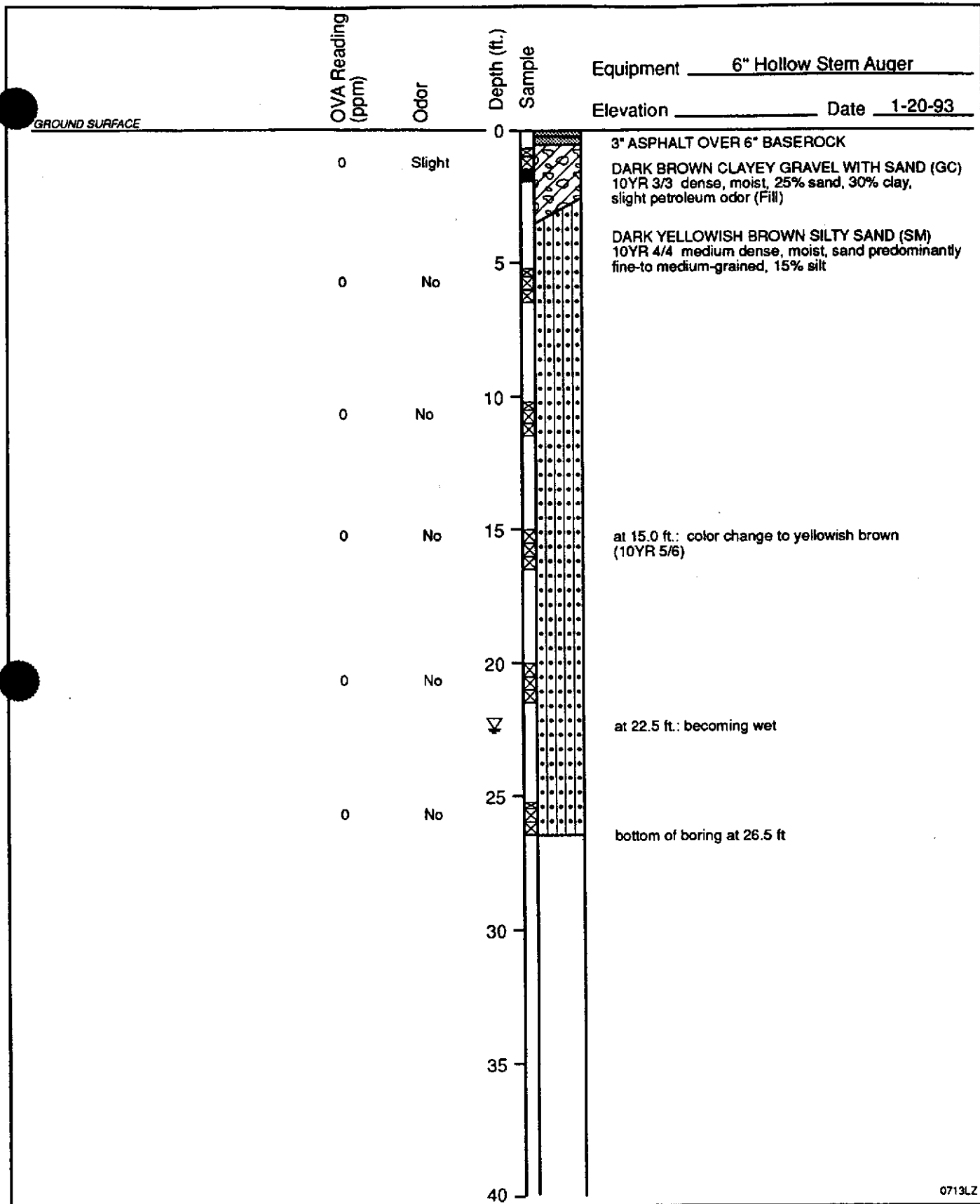
*Handwritten note:*  
 Does not exceed  
 institutional PCL  
 threshold.

**Harding Lawson Associates**  
 Engineering and Environmental Services

**Summary of Soil Chemical Results**  
 Preliminary Soil Characterization  
 Oakland Broadway Block  
 Chinatown Redevelopment Project Area  
 Oakland, California

DRAWN: LLC      JOB NUMBER: 21078 02      APPROVED: [Signature]      DATE: 3/93

PLATE **2**      REVISED DATE:



0713LZ



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Log of Boring 1**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**3**

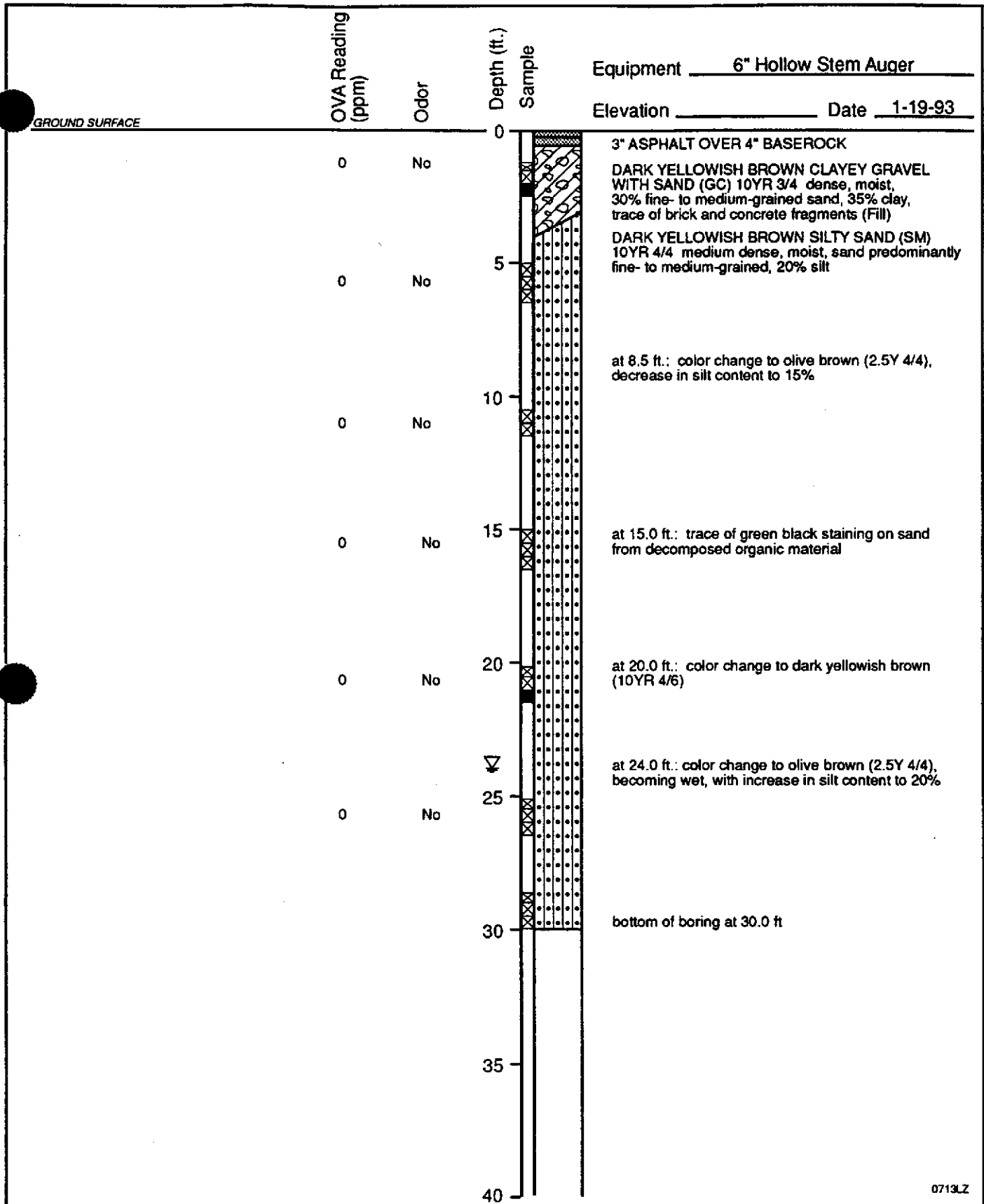
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CSNc

JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
2/93

REVISED DATE



0713LZ



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Engineering and Environmental Services

**Log of Boring 2**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**4**

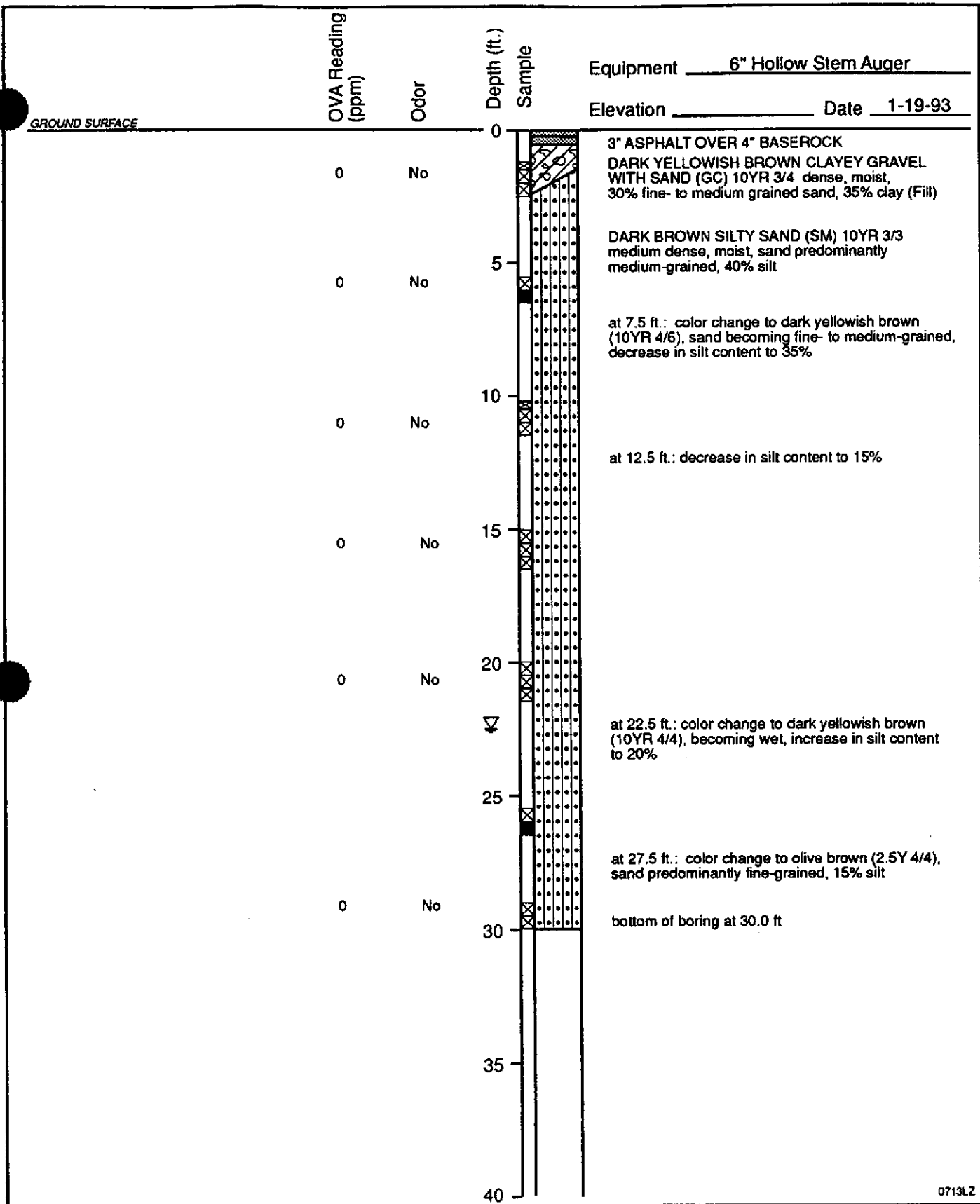
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JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
2/93

REVISED DATE



0713LZ



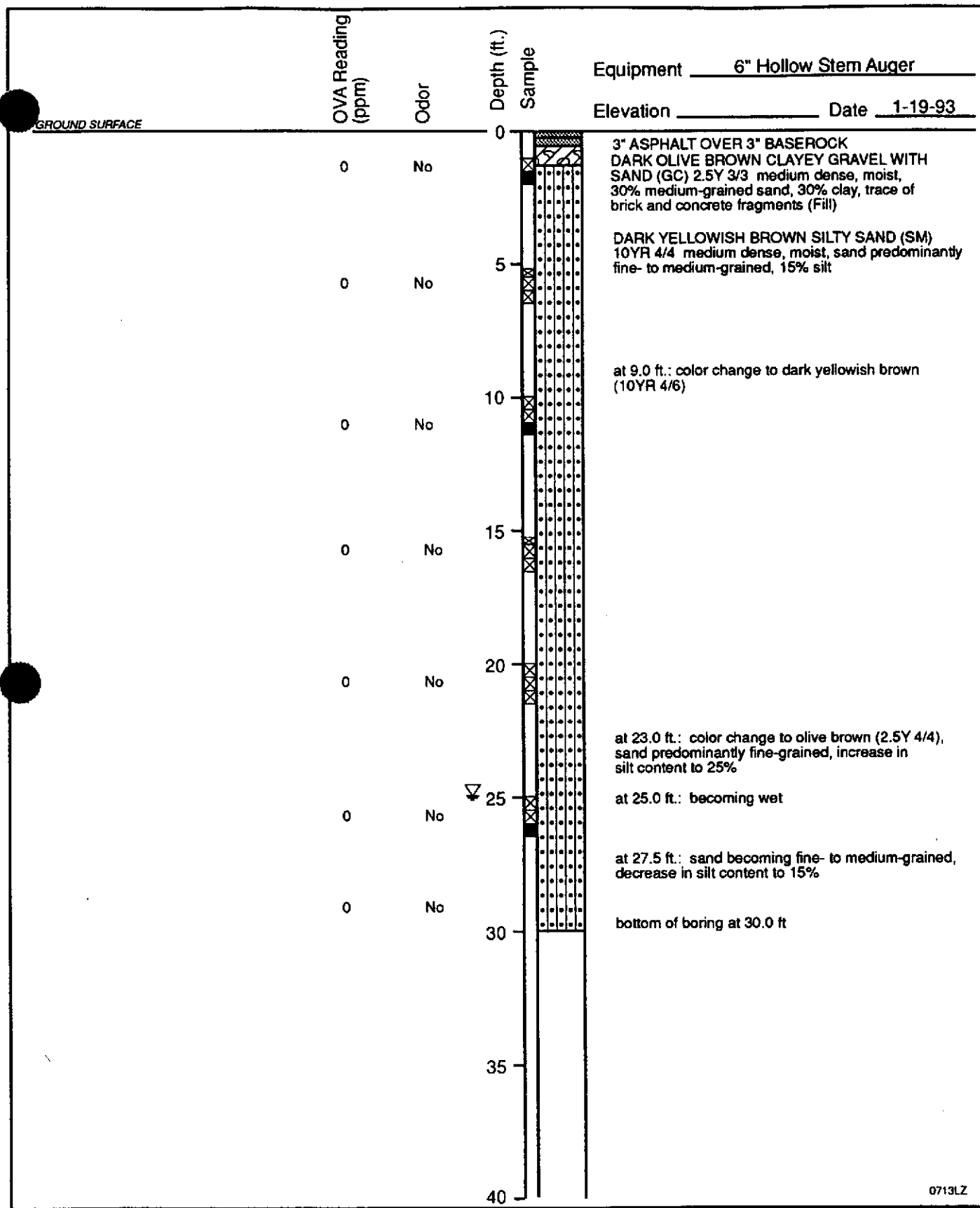
**Harding Lawson Associates**  
Engineering and Environmental Services

**Log of Boring 3**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**5**

DRAWN CSNc	JOB NUMBER 21078 02	APPROVED DFL	DATE 2/93	REVISED DATE
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0713LZ

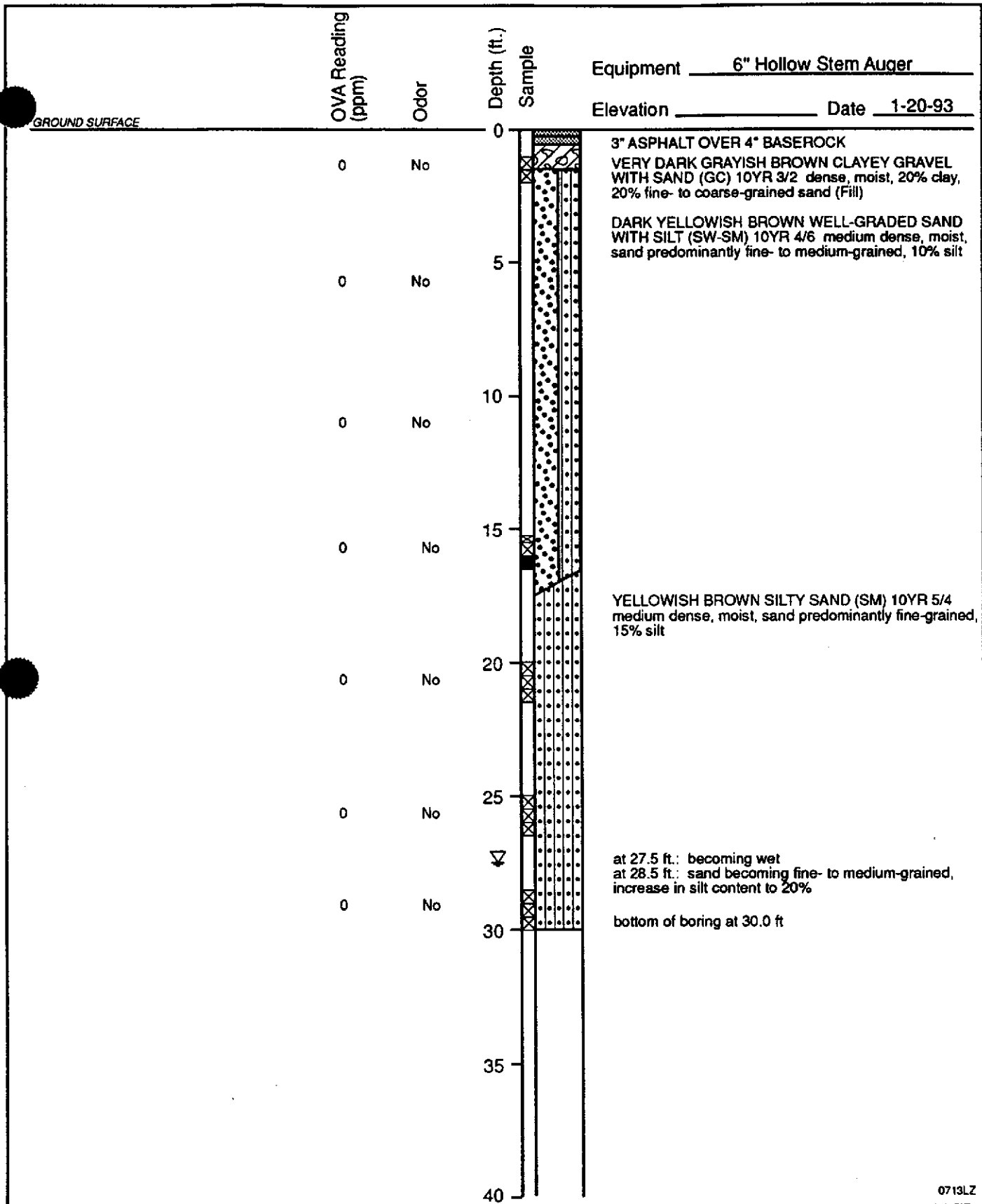


**Harding Lawson Associates**  
 Engineering and Environmental Services

**Log of Boring 4**  
**Preliminary Soil Characterization**  
 Broadway Block  
 Chinatown Redevelopment Project Area  
 Oakland, California

PLATE  
**6**

DRAWN CSNc	JOB NUMBER 21078 02	APPROVED DFL	DATE 2/93	REVISED DATE
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0713LZ



**Harding Lawson Associates**  
Engineering and Environmental Services

**Log of Boring 5**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**7**

DRAWN  
CSNc

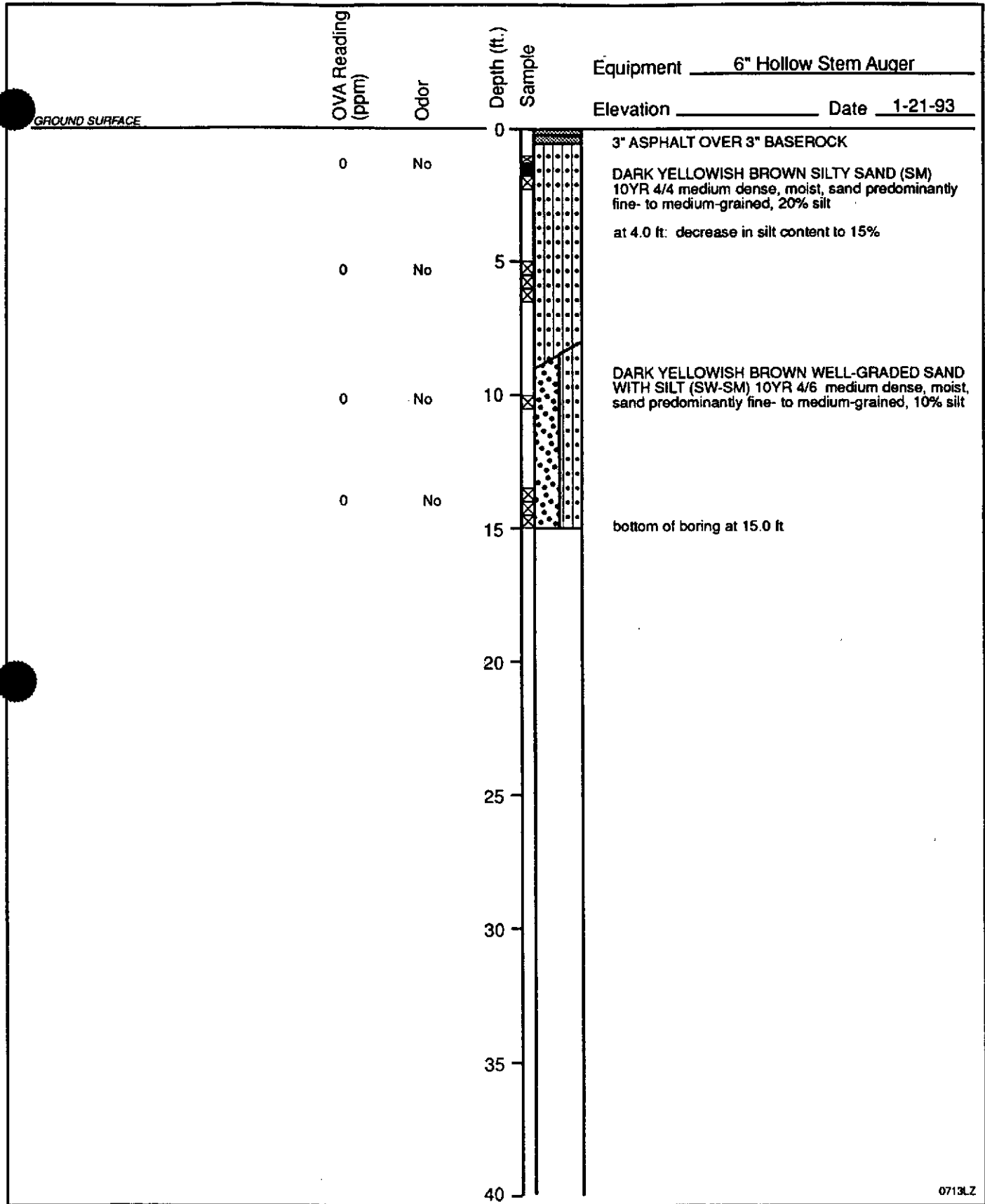
JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
2/93

REVISED DATE





0713LZ



**Harding Lawson Associates**  
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Environmental Services

Log of Boring 6  
Preliminary Soil Characterization  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**8**

DRAWN  
CSNc

JOB NUMBER  
21078 02

APPROVED  
DPL

DATE  
2/93

REVISED DATE

GROUND SURFACE

OVA Reading (ppm)

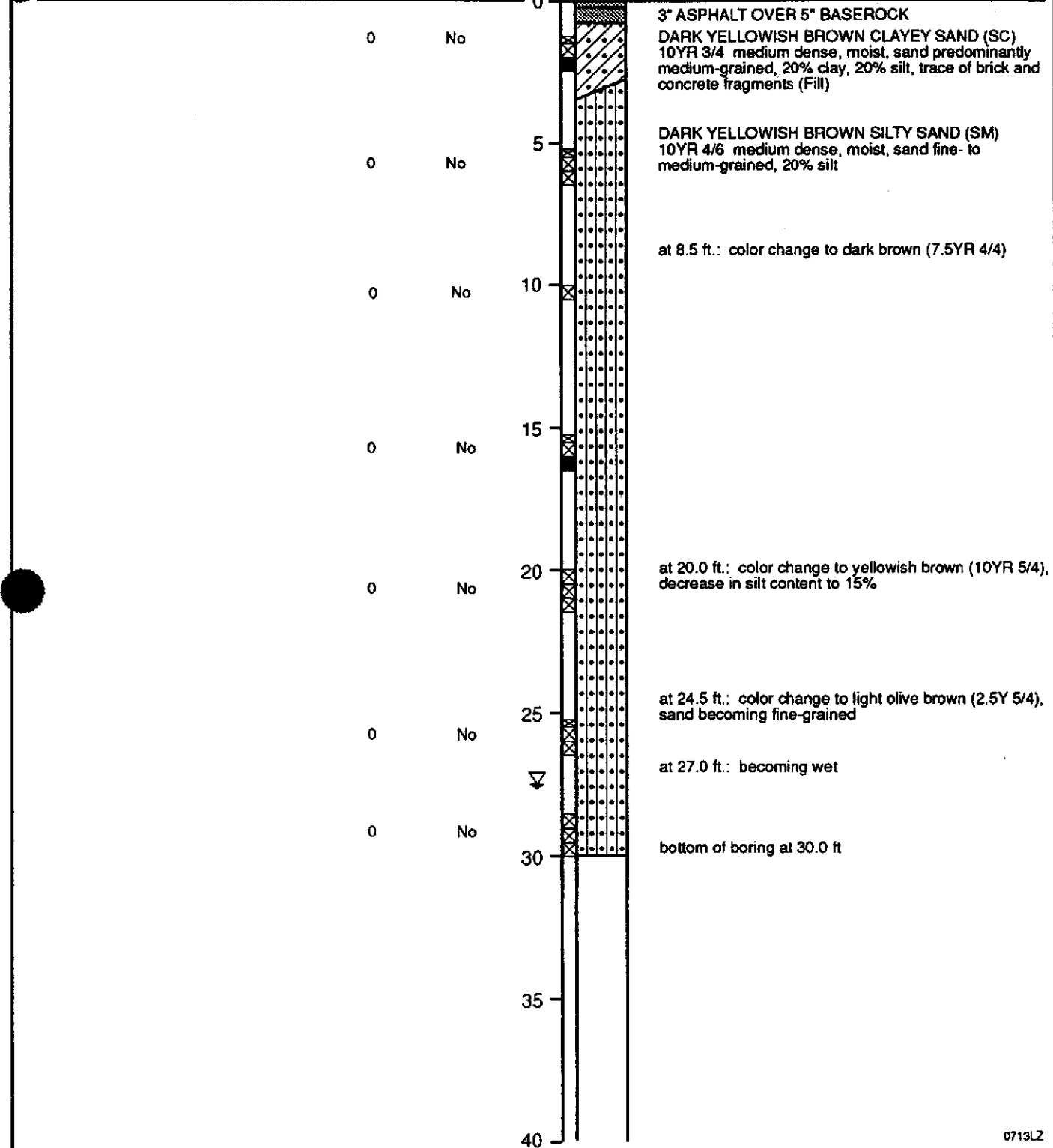
Odor

Depth (ft.)

Sample

Equipment 6" Hollow Stem Auger

Elevation \_\_\_\_\_ Date 1-19-93



0713LZ



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Engineering and  
Environmental Services

**Log of Boring 7**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**9**

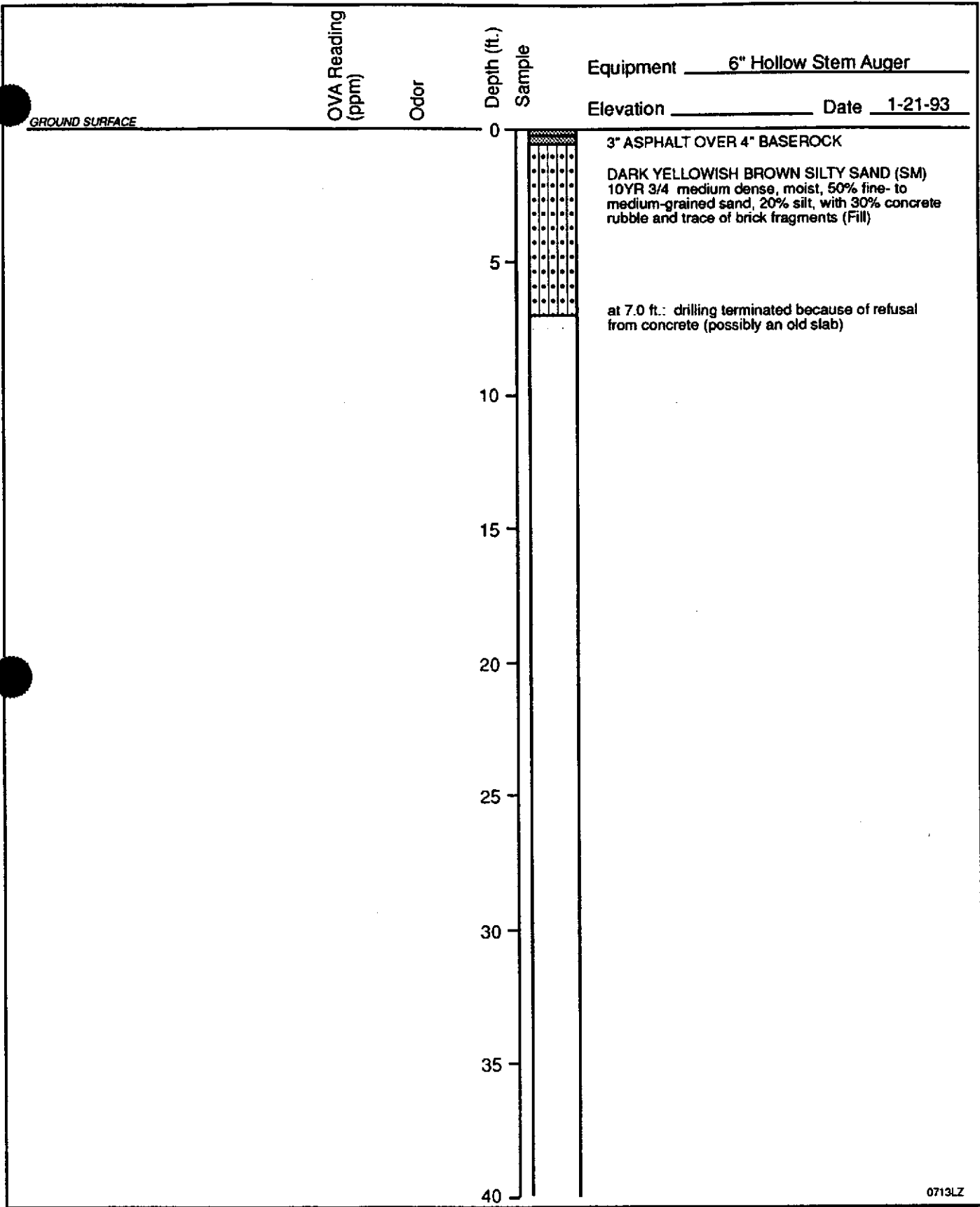
DRAWN  
CSNc

JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
2/93

REVISED DATE



Equipment 6" Hollow Stem Auger

Elevation \_\_\_\_\_ Date 1-21-93

GROUND SURFACE

OVA Reading (ppm)

Odor

Depth (ft.)  
Sample

3" ASPHALT OVER 4" BASEROCK  
  
DARK YELLOWISH BROWN SILTY SAND (SM)  
10YR 3/4 medium dense, moist, 50% fine- to medium-grained sand, 20% silt, with 30% concrete rubble and trace of brick fragments (Fill)

at 7.0 ft.: drilling terminated because of refusal from concrete (possibly an old slab)

0713LZ



**Harding Lawson Associates**  
Engineering and Environmental Services

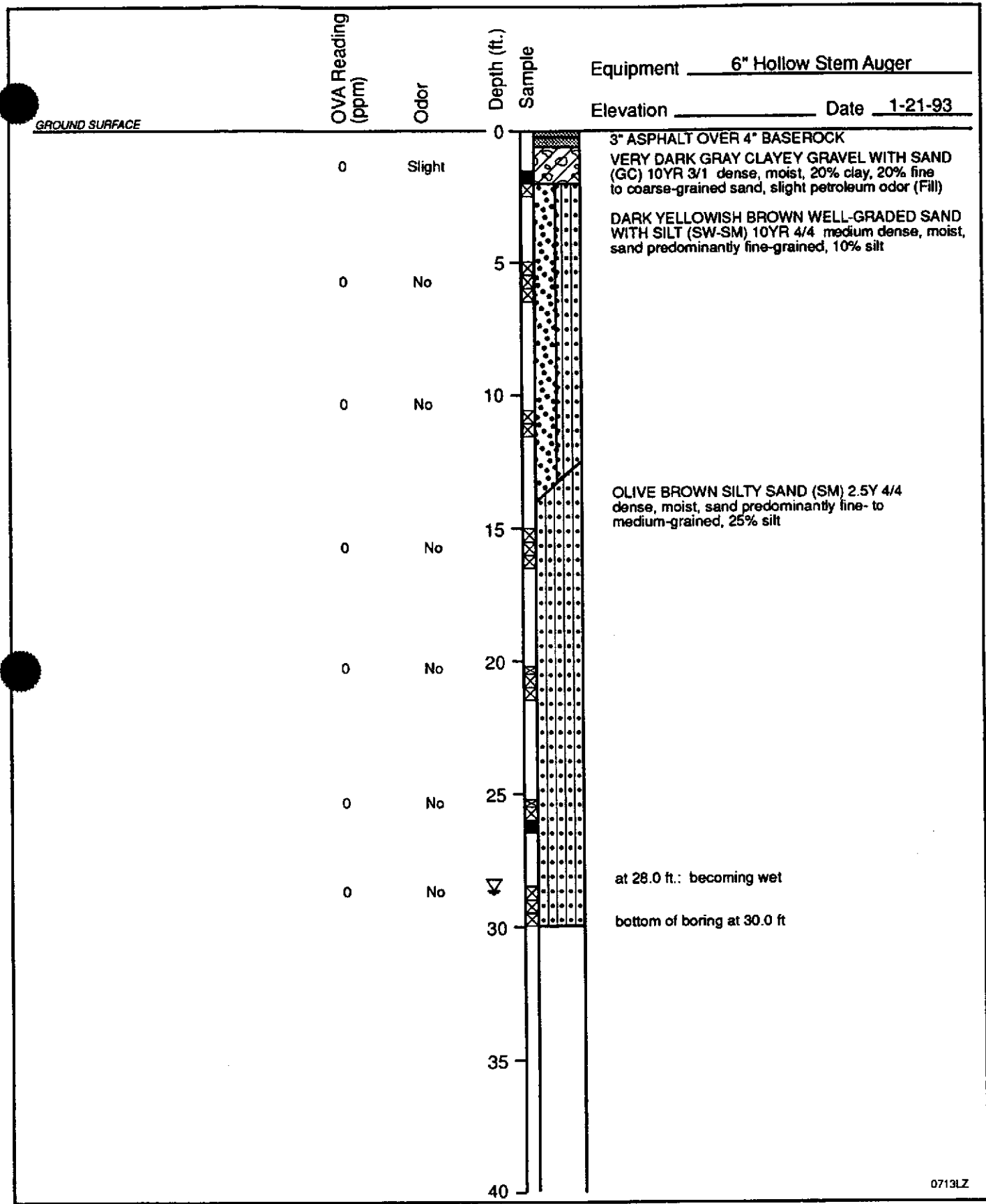
**Log of Boring 8**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**10**

DRAWN CSNc	JOB NUMBER 21078 02	APPROVED DFL	DATE 2/93	REVISED DATE
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0713LZ

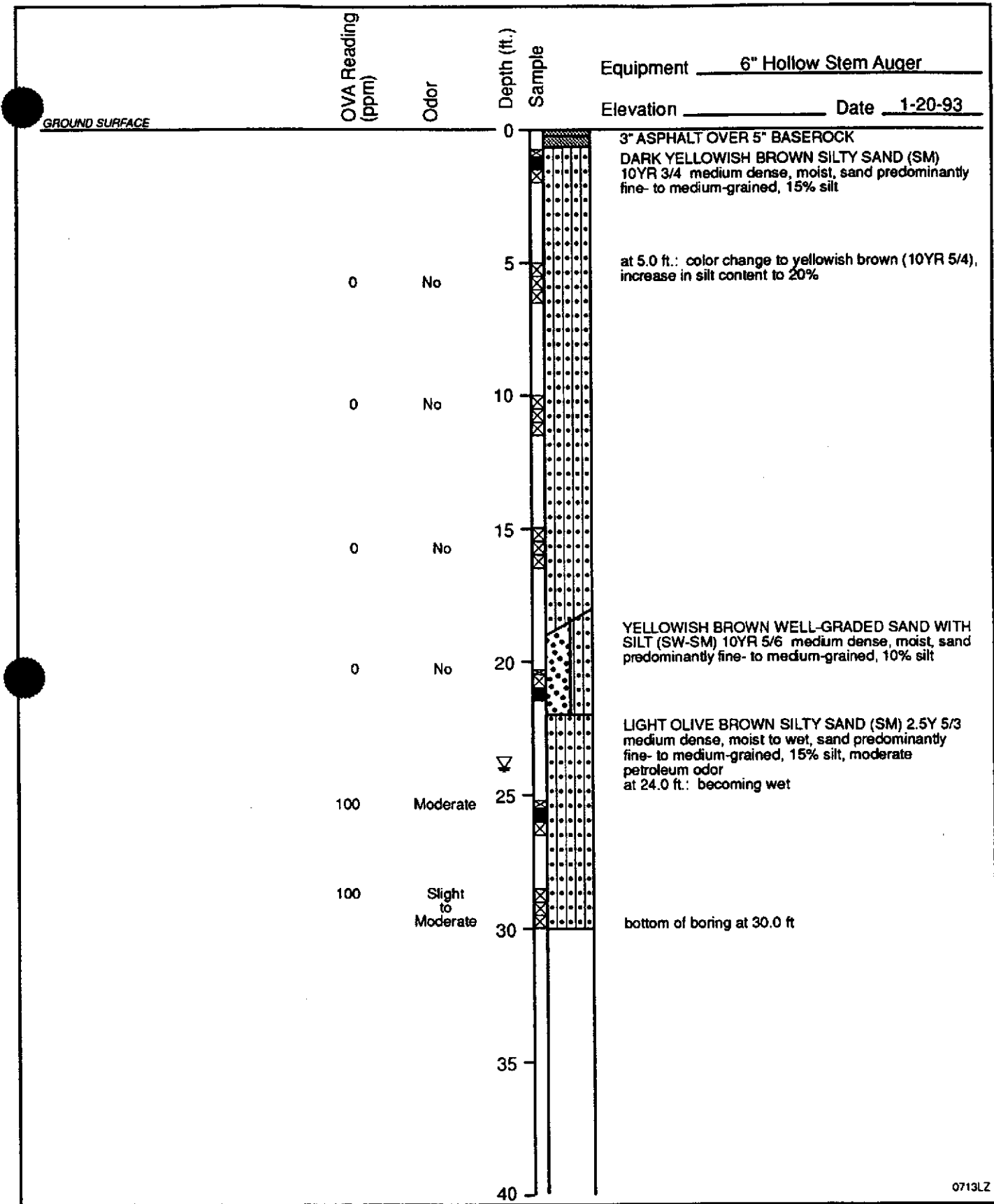


**Harding Lawson Associates**  
Engineering and Environmental Services


**Log of Boring 10**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE  
**12**

DRAWN CSNc	JOB NUMBER 21078 02	APPROVED DFL	DATE 2/93	REVISED DATE
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0713LZ



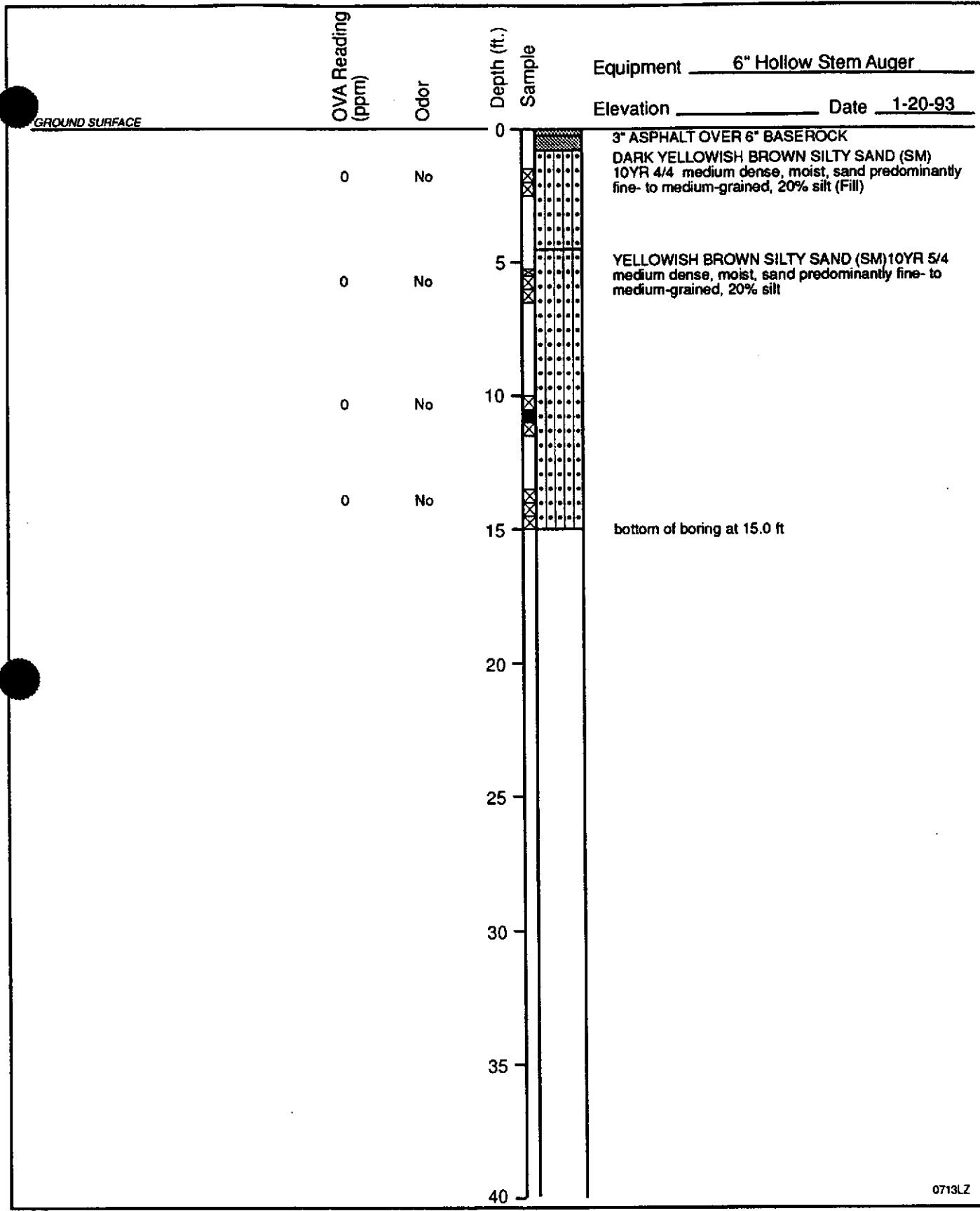
**Harding Lawson Associates**  
 Engineering and Environmental Services

**Log of Boring 11**  
**Preliminary Soil Characterization**  
 Broadway Block  
 Chinatown Redevelopment Project Area  
 Oakland, California

PLATE

**13**

DRAWN CSNc	JOB NUMBER 21078 02	APPROVED <i>DL</i>	DATE 2/93	REVISED DATE
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0713LZ



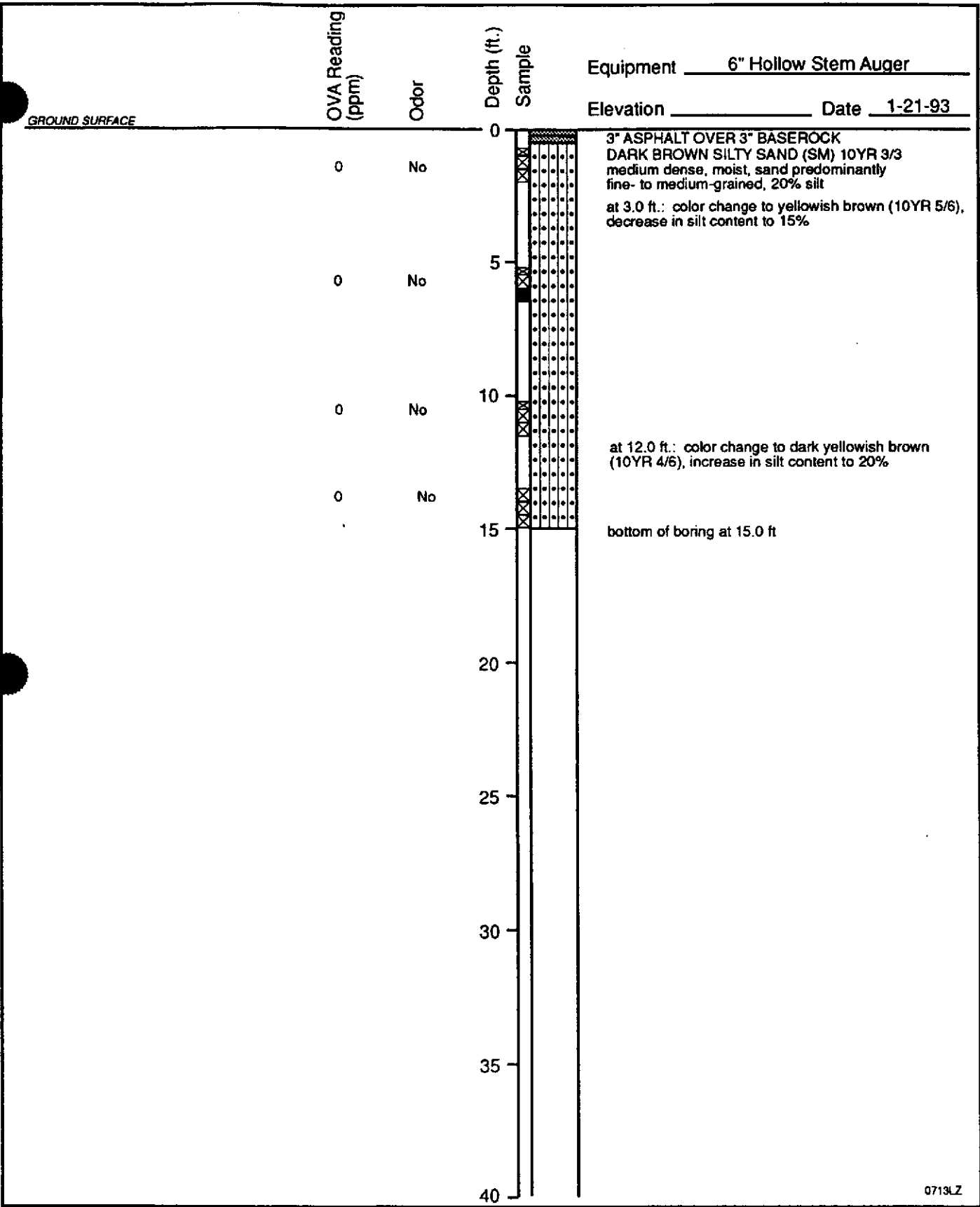
**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Log of Boring 12**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**14**

DRAWN CSNc	JOB NUMBER 21078 02	APPROVED DFL	DATE 2/93	REVISED DATE
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0713LZ



**Harding Lawson Associates**  
Engineering and  
Environmental Services

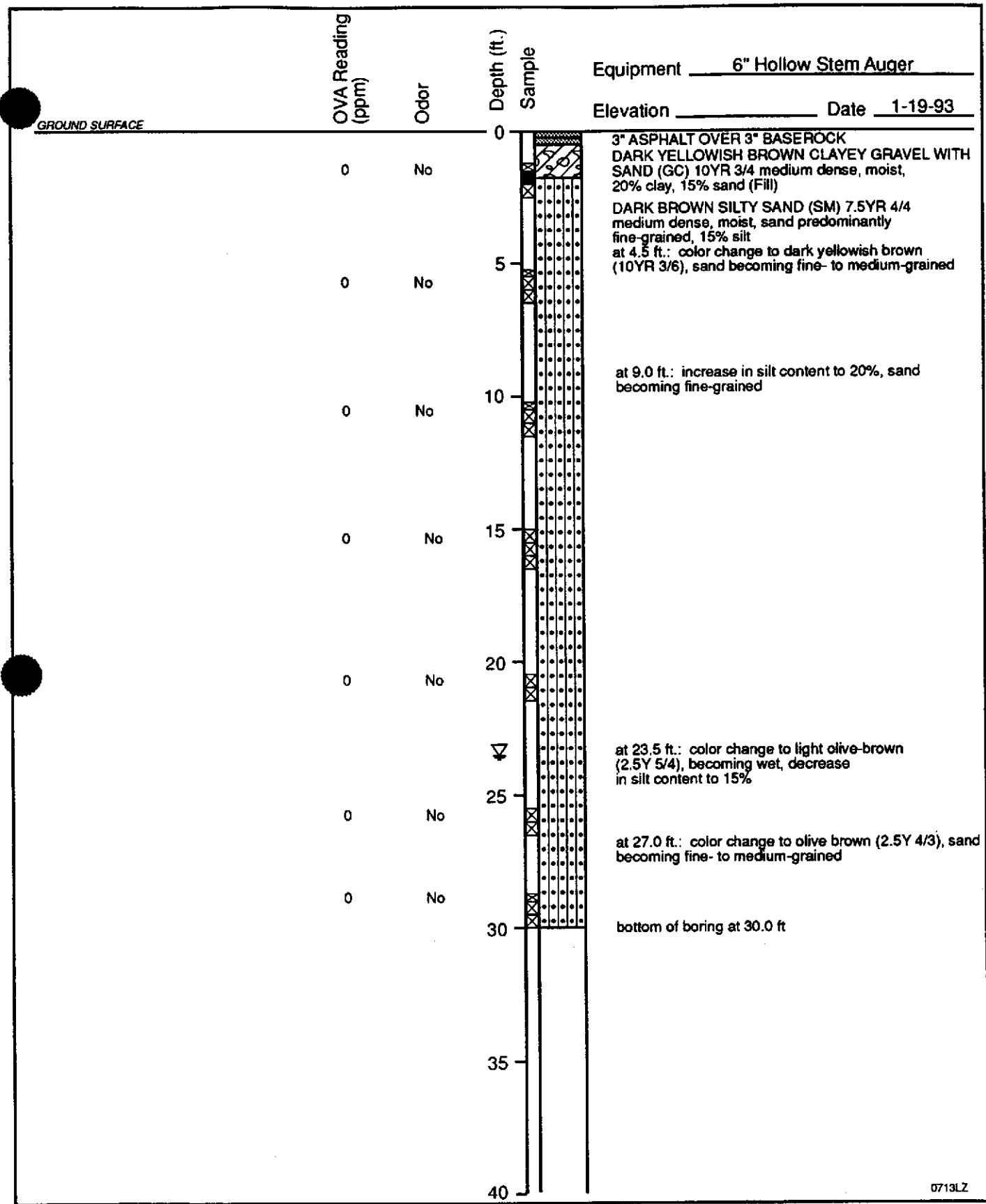
**Log of Boring 13**  
**Preliminary Soil Characterization**  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**15**

DRAWN CSNc	JOB NUMBER 21078 02	APPROVED DFL	DATE 2/93	REVISED DATE
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0713LZ

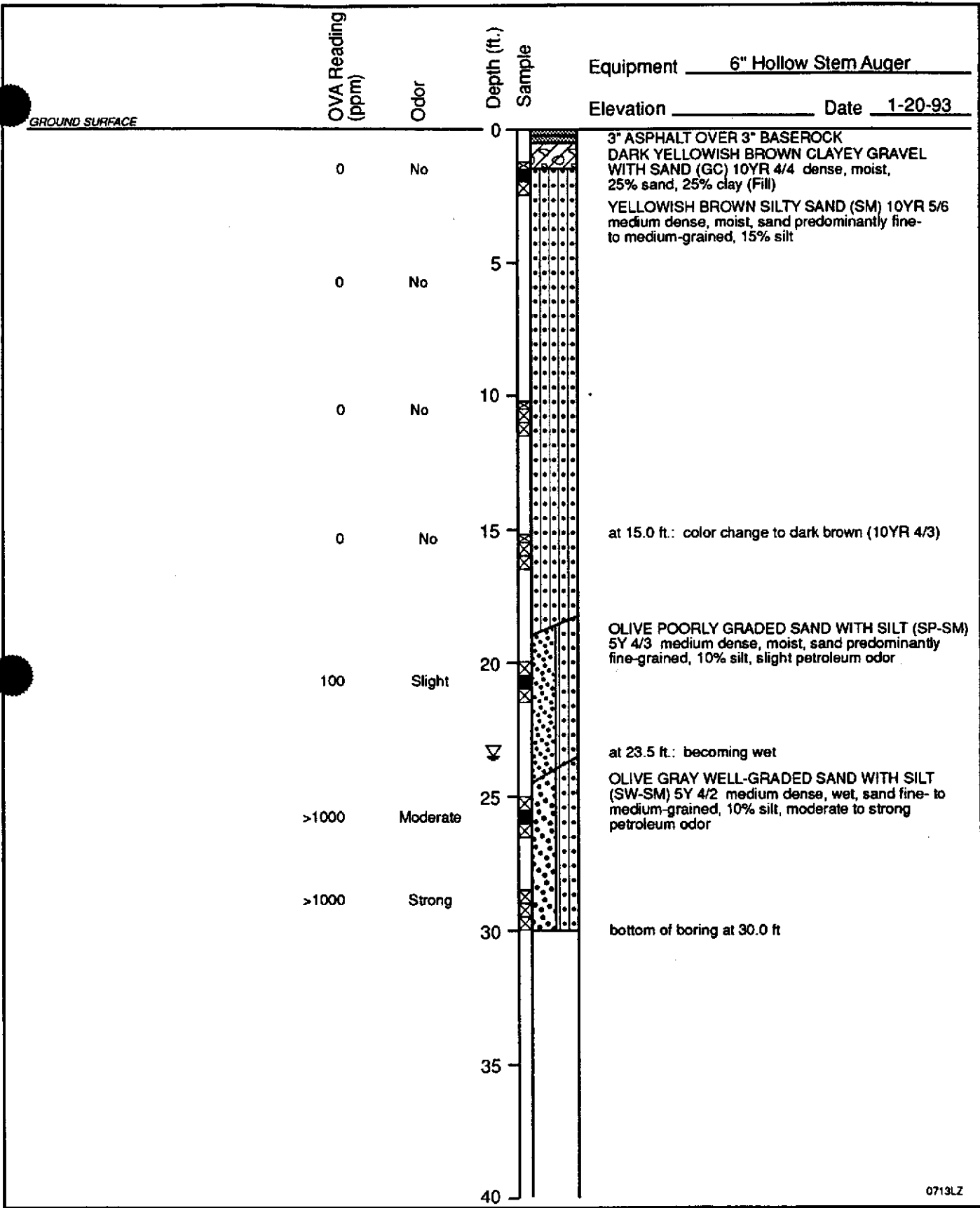


**Harding Lawson Associates**  
 Engineering and Environmental Services

**Log of Boring 14**  
 Preliminary Soil Characterization  
 Broadway Block  
 Chinatown Redevelopment Project Area  
 Oakland, California

PLATE  
**16**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CSNc	21078 02	DFL	2/93	



0713LZ



**Herding Lawson Associates**  
Engineering and Environmental Services

**Log of Boring 15**  
Preliminary Soil Characterization  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**17**

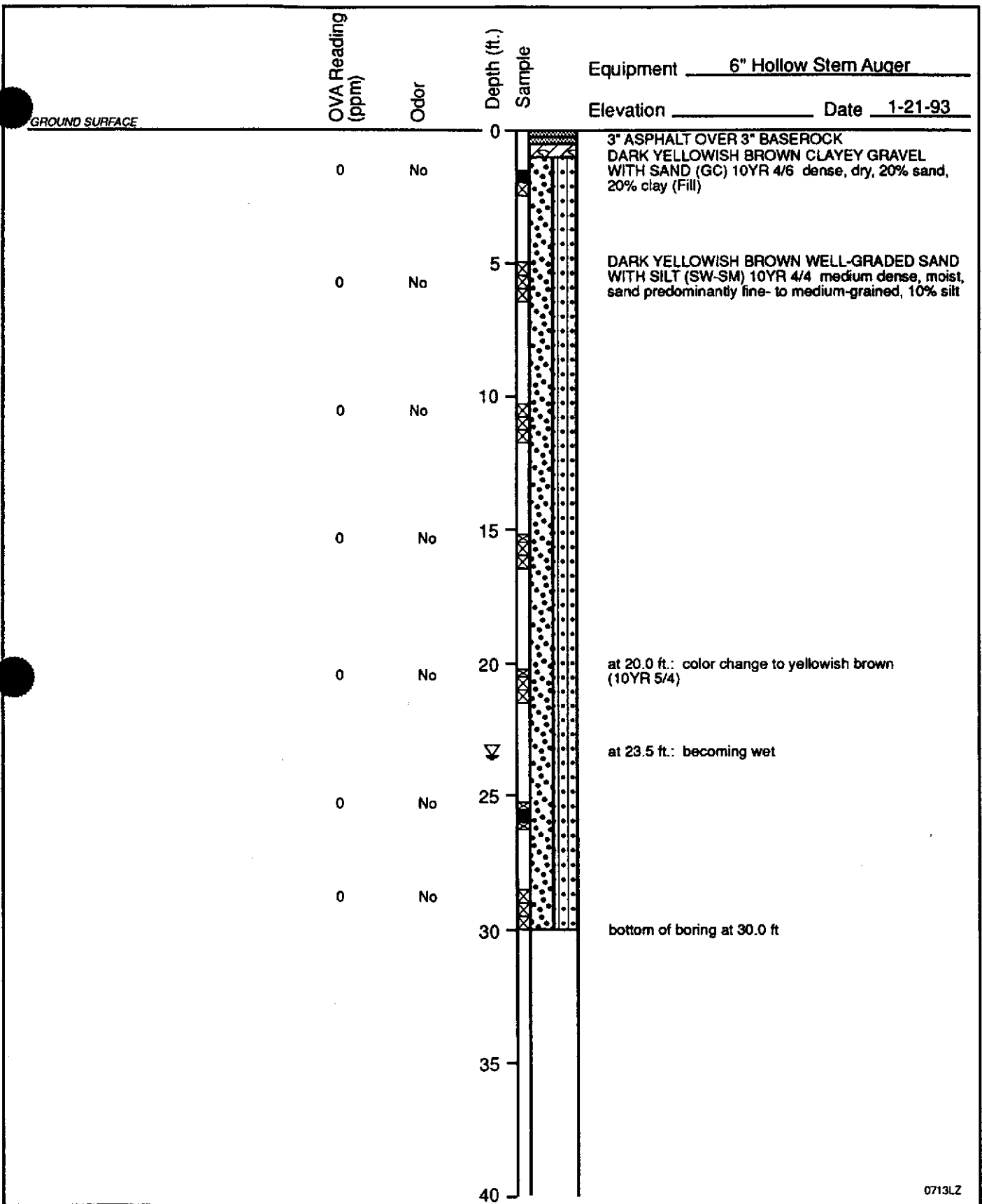
DRAWN  
CSNc

JOB NUMBER  
21078 02

APPROVED  
DL

DATE  
2/93

REVISED DATE



0713LZ



**Harding Lawson Associates**  
Engineering and Environmental Services

**Log of Boring 16**  
Preliminary Soil Characterization  
Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE  
**18**

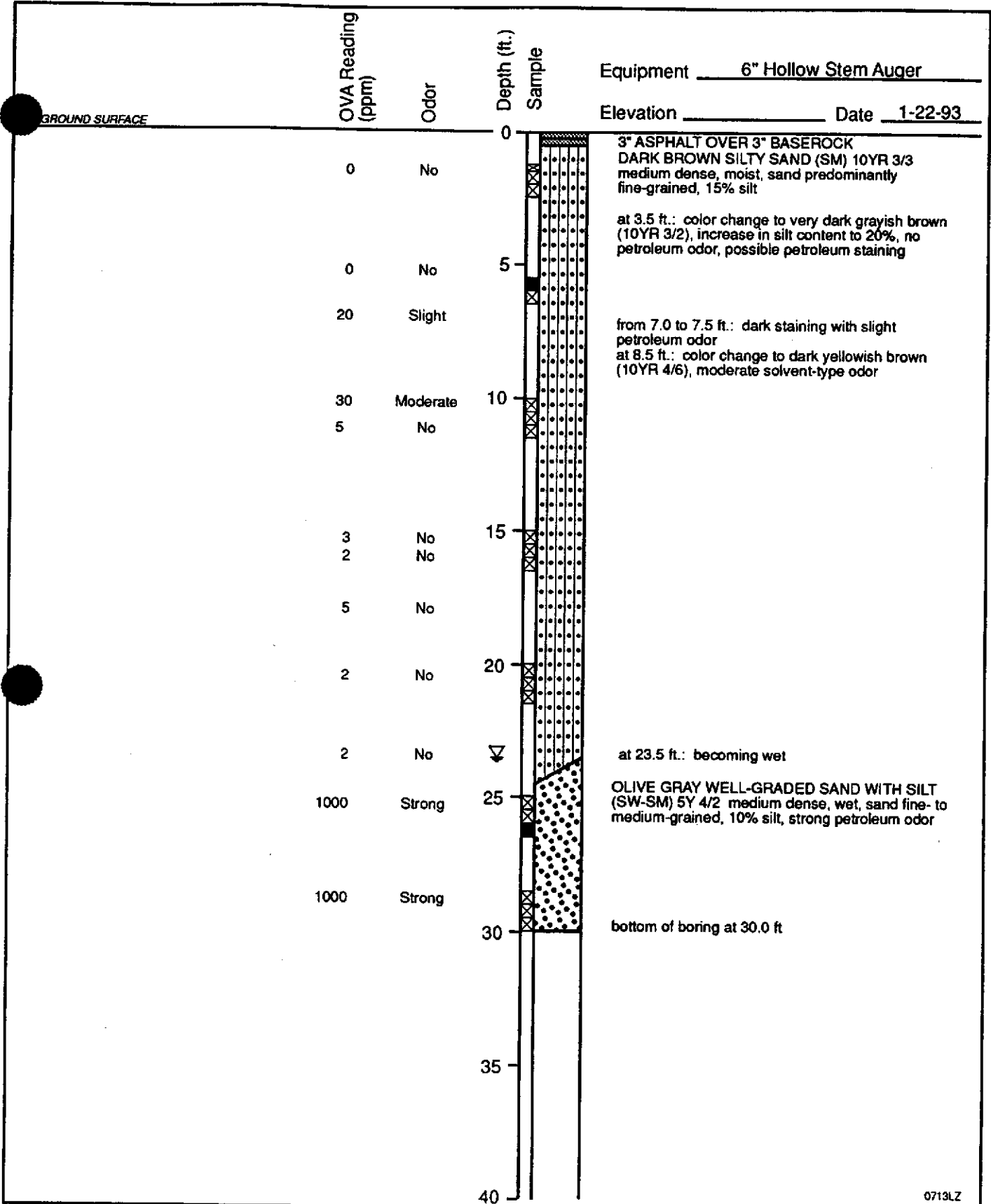
DRAWN  
CSNc

JOB NUMBER  
21078 02

APPROVED  
DL

DATE  
2/93

REVISED DATE



0713LZ



**Harding Lawson Associates**  
 Engineering and Environmental Services

**Log of Boring 17**  
**Preliminary Soil Characterization**  
 Broadway Block  
 Chinatown Redevelopment Project Area  
 Oakland, California

PLATE

**19**

DRAWN  
CSNC

JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
2/93

REVISED DATE

Laboratory Tests

OVA Reading (ppm)

Sample Number

Depth (ft.)  
Sample

Log of Boring 18

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

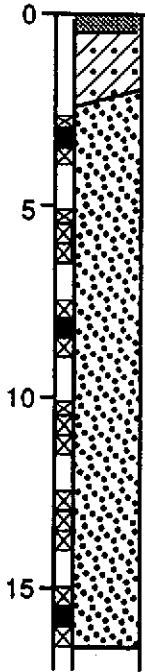
2 93051312

5 93051313

7 93051313

7 93051313

4 93051314



ASPHALT  
 DARK BROWN CLAYEY SAND WITH GRAVEL (SC)  
 10YR 3/3 medium dense, moist, fine- to medium-grained sand, 15% clay, 15% subangular gravel (Fill)  
 DARK YELLOWISH BROWN SAND (SP) 10YR 4/4  
 medium dense, moist, fine-grained sand

color change to 10YR 3/6 at 5.5 ft

bottom of boring at 16.5 ft

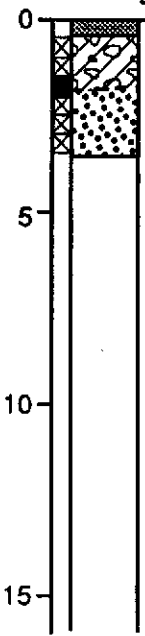
Log of Boring 19

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

0 93051301

0 93051301



5" ASPHALT  
 VERY DARK GRAYISH BROWN CLAYEY GRAVEL  
 WITH SAND (GC) 10YR 3/2 medium dense, moist,  
 subangular gravel, 20% clay, 30% fine- to coarse-  
 grained sand, trace of red brick fragments (Fill)  
 DARK BROWN SAND (SP) 10YR 3/3  
 medium dense, moist, fine-grained sand  
 bottom of boring at 3.5 ft

01111BAM



**Harding Lawson Associates**  
 Engineering and  
 Environmental Services

**Logs of Borings 18 and 19**  
**Preliminary Soil Characterization**  
 Oakland Broadway Block  
 Chinatown Redevelopment Project Area  
 Oakland, California

PLATE  
**20**

DRAWN LZc	JOB NUMBER 21078 02	APPROVED DFL	DATE 6/93	REVISED DATE
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Laboratory Tests

OVA Reading  
(ppm)

Sample  
Number

0

93051302

0

Depth (ft.)  
Sample



Log of Boring 20

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

5" ASPHALT  
DARK BROWN CLAYEY GRAVEL WITH SAND (GC)  
10YR 3/3 medium dense, moist, subangular gravel,  
20% clay, 30% fine- to coarse-grained sand  
DARK BROWN SAND (SP) 10YR 3/3  
medium dense, moist, fine-grained sand  
bottom of boring at 3.5 ft

Log of Boring 21

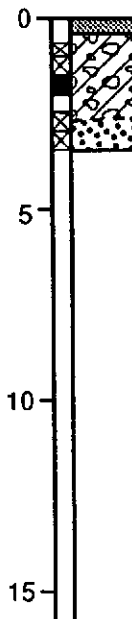
Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

0

93051304

0



ASPHALT  
DARK BROWN CLAYEY GRAVEL WITH SAND (GC)  
medium dense, moist, subangular gravel, 20% clay,  
30% fine- to coarse-grained sand, fill  
DARK YELLOWISH BROWN SAND (SP) 10YR 4/4  
medium dense, moist, fine-grained sand  
bottom of boring at 3.5 ft

11118AM



**Harding Lawson Associates**  
Engineering and  
Environmental Services

Logs of Borings 20 and 21  
Preliminary Soil Characterization  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**21**

DRAWN  
LZc

JOB NUMBER  
21078 02

APPROVED  
DEL

DATE  
6/93

REVISED DATE

Laboratory Tests

OVA Reading  
(ppm)

Sample  
Number

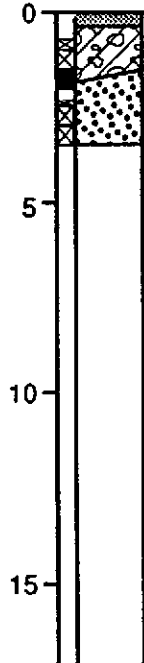
Depth (ft.)  
Sample

Log of Boring 22

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

0 93051303  
0



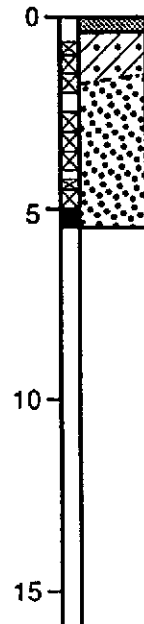
ASPHALT  
DARK BROWN CLAYEY GRAVEL WITH SAND (GC)  
10YR 3/3 medium dense, moist, subangular gravel,  
15% clay, 35% fine- to coarse-grained sand (Fill)  
DARK BROWN CLAYEY SAND WITH GRAVEL (SC)  
fine- to coarse-grained sand, 20% clay,  
20% subangular gravel, trace of red brick fragments  
(Fill)  
bottom of boring at 3.5 ft

Log of Boring 23

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

0  
0  
0 93051304



ASPHALT  
DARK BROWN CLAYEY SAND WITH GRAVEL (SC)  
10YR 3/3 medium dense, moist, fine- to medium-  
grained sand, 15% clay, 15% subangular gravel,  
some red brick and concrete fragments (Fill)  
DARK BROWN SAND (SP) 10YR 3/3  
medium dense, moist, fine-grained sand (10% fines),  
abundant red brick fragments between 3.0 and 5.0 ft  
(Fill)  
bottom of boring at 5.5 ft

1111BAM



**Harding Lawson Associates**  
Engineering and  
Environmental Services

Logs of Borings 22 and 23  
Preliminary Soil Characterization  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**22**

DRAWN  
LZc

JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
6/93

REVISED DATE

Laboratory Tests

OVA Reading  
(ppm)

Sample  
Number

Depth (ft.)  
Sample

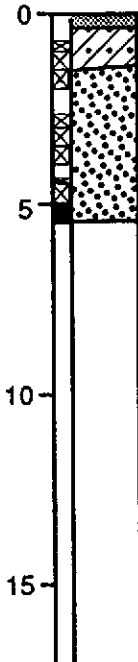
Log of Boring 24

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

0  
0  
0

93051306



ASPHALT  
DARK BROWN CLAYEY SAND WITH GRAVEL (SC)  
10YR 3/3 medium dense, moist, fine- to coarse-  
grained sand, 20% clay, 20% subangular gravel,  
trace of red brick fragments (Fill)  
DARK BROWN SAND (SP) 10YR 3/3  
medium dense, moist, fine-grained sand

bottom of boring at 5.5 ft

Log of Boring 25

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

0  
0  
0

93051307



ASPHALT  
DARK BROWN CLAYEY SAND WITH GRAVEL (SC)  
10YR 3/3 medium dense, moist, fine- to medium-  
grained sand, 15% clay, 15% subangular gravel,  
abundant red brick fragments from 1.0 to 4.0 ft (Fill)

DARK BROWN SAND (SP) 10YR 3/3  
medium dense, moist, fine-grained sand (10% fines)

bottom of boring at 5.5 ft

1111BAM

Logs of Borings 24 and 25  
Preliminary Soil Characterization  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**23**



**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN  
LZc

JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
6/93

REVISED DATE



Laboratory Tests

OVA Reading  
(ppm)

Sample  
Number

Depth (ft.)  
Sample

Log of Boring 26

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93

0

0

0

93051305

5

10

15



ASPHALT

DARK BROWN CLAYEY SAND WITH GRAVEL (SC)  
10YR 3/3 medium dense, moist, fine- to coarse-  
grained sand, 20% clay, 20% subangular gravel,  
some red brick fragments (Fill)

DARK BROWN SAND (SP) 10YR 3/3  
medium dense, moist, fine-grained sand

bottom of boring at 5.5 ft

1111BAM



**Harding Lawson Associates**

Engineering and  
Environmental Services

Log of Boring 26  
Preliminary Soil Characterization  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**24**

DRAWN  
LZc

JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
6/93

REVISED DATE

Laboratory Tests

OVA Reading (ppm)

Sample Number

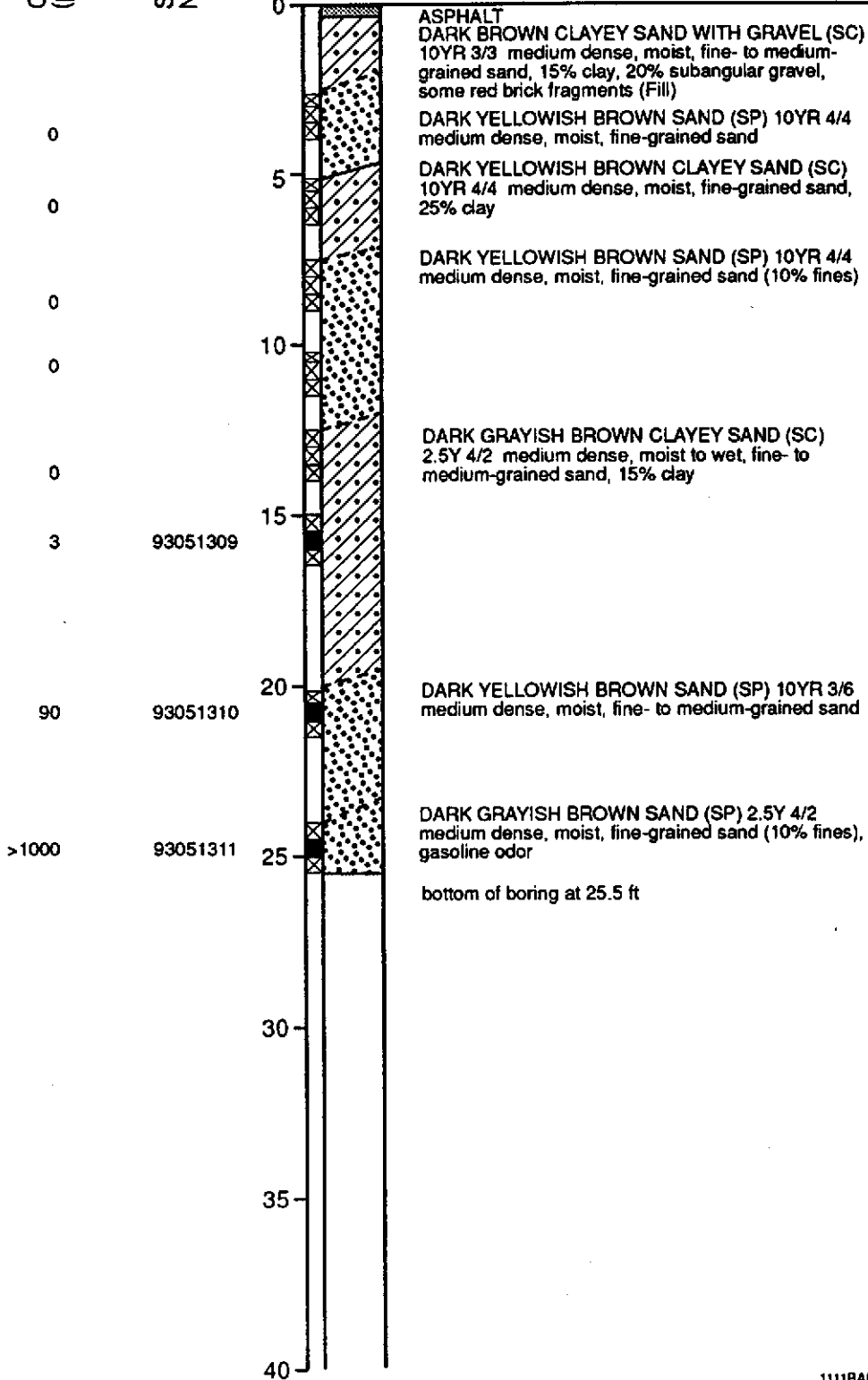
Depth (ft.)

Sample

Log of Boring 27

Equipment Hollow Stem Auger

Elevation \_\_\_\_\_ Date 5-13-93



1111BAM



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Log of Boring 27**  
**Preliminary Soil Characterization**  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**25**

DRAWN  
LZc

JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
6/93

REVISED DATE

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
		GRAVELS WITH OVER 15% FINES	GP	POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
	SANDS  MORE THAN HALF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	GM	SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC	CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
		SANDS WITH OVER 15% 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
			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		

### SYMBOLS KEY

	- Bulk or Classification Sample
	- Sample preserved for possible laboratory analysis
	- Hydropunch sample
	- First-encountered groundwater level
	- Static groundwater level
(10YR 4/4)	- Munsell soil color - 1990 edition
NA	- Not available
ND	- Not detected

### GRAIN SIZE CHART

Classification	Range of Grain Sizes	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	ABOVE 12"	ABOVE 305
COBBLES	12" To 3"	305 to 76.2
GRAVEL coarse fine	3" To No. 4	76.2 to 4.75
	3" to 3/4"	76.2 to 19.1
SAND coarse medium fine	3/4" to No. 4	19.1 to 4.75
	No. 4 to No. 200	4.75 to 0.075
	No. 4 to No. 10	4.75 to 2.00
	No. 10 to No. 40	2.00 to 0.425
	No. 40 to No. 200	0.425 to 0.075
SILT & CLAY	Below No. 200	Below 0.075

Source: ASTM D 2488-90, based on Unified Soil Classification System.



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Soil Classification Chart**  
**Preliminary Soil Characterization**  
Oakland Broadway Block  
Chinatown Redevelopment Project Area  
Oakland, California

PLATE

**26**

DRAWN

JOB NUMBER  
21078 02

APPROVED  
DFL

DATE  
3/93

REVISED DATE



BAY AREA RAPID TRANSIT DISTRICT  
800 Madison Street - Lake Merritt Station  
P.O. Box 12688  
Oakland, CA 94604-2688  
Telephone (510) 464-6000

December 31, 1992

JAN 5 '93 AM 9:21

Mr. David Leland  
Harding Lawson Assoc.  
7655 Redwood Boulevard  
P.O. Box 578  
Novato, CA 94948

WILFRED T. USSERY  
PRESIDENT

NELLO BIANCO  
VICE-PRESIDENT

FRANK J. WILSON  
GENERAL MANAGER

**Subject: Chinatown Redevelopment/9th & Franklin, Oakland, CA**

Dear Mr. Leland:

DIRECTORS

JOE FITZPATRICK  
1ST DISTRICT

NELLO BIANCO  
2ND DISTRICT

SUE HONE  
3RD DISTRICT

MARGARET K. PRYOR  
4TH DISTRICT

ED DeMARCUS  
5TH DISTRICT

JOHN GLENN  
6TH DISTRICT

WILFRED T. USSERY  
7TH DISTRICT

JAMES FANG  
8TH DISTRICT

MICHAEL BERNICK  
9TH DISTRICT

The San Francisco Bay Area Rapid Transit District (BART) has reviewed your October 14, 1992 request for an encroachment permit to drill three soil borings within the BART subsurface easement at the above project location.

Permission to drill, as set forth in your letter, is approved subject to the following conditions:

- (1) BART shall be indemnified from all liabilities associated with the drilling activity or resulting from any hazardous waste or toxic substances discovered during the boring operations.
- (2) BART shall be named as an additional insured on the insurance policies of the Redevelopment Agency and the contractor. The current amount of insurance is \$1,000,000 for each entity and shall be maintained during the performance of the work.
- (3) At least 14 calendar days prior to the beginning of any boring or construction activities, please contact Chris Koukis, Maintenance Coordinating Engineer, at (510) 464-6445, who will coordinate your plans with the District.
- (4) Prior to any boring or construction activity, the limits of BART subsurface easement and tunnel shall be surveyed and marked on the ground.

I have enclosed a copy of BART's "General Guidelines for Design and Construction Over or Adjacent to BART Subway Structures" for your use and guidance.

Mr. David Leland, Harding Lawson Assoc.  
December 21, 1992

Page 2

Please have an authorized person sign the acceptance block below and return to my attention together with certificates of insurance.

Incidentally, the ownership shown on plate 1 is incorrect in that the Redevelopment Agency is the fee owner of Parcels A, B, and C with BART holding only a subsurface easement interest in B.

If you have any questions, please feel free to call me at (510) 464-6161.

Sincerely,



Robert W. Zickwolf  
Real Estate Engineer

RWZ:cm

Enclosure

ACCEPTED

Name \_\_\_\_\_

Title \_\_\_\_\_

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

GENERAL GUIDELINES  
FOR  
DESIGN AND CONSTRUCTION OVER OR ADJACENT  
TO BART SUBWAY STRUCTURES

1. Zone of influence is defined as the area above a line from subway invert at a slope of 1-1/2 horizontal to 1 vertical.
2. Soil redistributions caused by temporary shoring or permanent foundation system shall be analyzed.
3. Shoring shall be required to maintain soil's at-rest condition. Shoring structure shall be monitored for movement.
4. Minimum predrilled depth for piles shall be approximately 10 feet below the line of influence.
5. Vibration monitoring of piling operations closest to subway will be required. Piles to be driven in a sequence away from the subway structure.
6. Tunnels, where affected, shall be monitored for movement and deformation due to adjacent construction activities as to ensure structural and operational safety.
7. Dewatering shall be monitored for changes in groundwater level. Recharge program will be required if existing groundwater level is expected to drop more than 2 feet.
8. Minimum clearance between any part of adjacent structure to existing exterior face of subway structure shall be 7'-6". No pile will be allowed between tunnels.
9. Minimum cover of 8 feet shall be maintained over existing subway structures wherever possible.
10. Structural and crack surveys shall be accomplished in a timely manner before, during and after construction.
11. Design loads above cut and cover subways are as follows:
  - a) Where the depth of cover (the vertical distance from the top of the subway roof to the ground surface) exceeds 20 feet, the subway structure is generally designed to support only the weight of the earth cover, and no additional surface load can be permitted without consideration of the specific design proposed.

- b) Where the depth of cover is from 5 feet to 20 feet, the structure is designed to support the weight of earth cover plus a vertical surcharge load computed from the following formula:  $L = 800 - 40d$ ; where L is the surcharge load in pounds per square foot and d is the depth of cover in feet.
- c) Where the depth of cover is less than 5 feet, the design load is computed from the depth of earth cover plus a vertical surcharge of 600 pounds per square foot.

12. Design loads over shallow tunneled subways are as follows:

The circular tunneled subways are designed to support the weight of 35 feet of earth above the roof of the tunnel. Wherever the actual depth of cover is less than this amount, construction may be added imposing an additional average vertical loading of 120 pounds per square foot for each foot of depth of reduced cover.

13. Loads in excess of the above shall not be imposed on the existing subway structure under any circumstances. Where basements are excavated, the amount of loading can be increased to the extent that it is balanced by the weight of the removed material (120 pounds per square foot for dry soil, and 70 pounds per square foot for submerged soil). However, the effects of soil rebound in such cases shall be fully analyzed.

14. All structures shall be so designed as not to impose any temporary or permanent adverse effects, including unbalanced loading and seismic loading, on the adjacent BART subways.

15. Design of underground storage tanks for flammable and combustible liquids shall conform to the requirements of Article 3-2.7 of NFPA 130 of the National Fire Codes.

16. The above should be considered as general information only and is not intended to cover all situations. Individual conditions may vary widely, and it is not possible to apply simple criteria that will adequately cover all possible loading conditions which might be imposed on the subway structures. For this reason, the District needs to review and approve design plans for each construction proposal.



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE    ♣    PLEASANTON, CALIFORNIA 94588    ♣    (510) 484-2600

JAN 4 '93 AM 10:08

31 December 1992

Harding Lawson Associates  
P.O. Box 578  
Novato, CA 94948

Gentlemen:

Enclosed is drilling permit 92671 for a contamination investigation at Broadway and 9th Street in and for the City of Oakland.

If you have any questions, please contact Craig Mayfield or me at 484-2600.

Very truly yours,

Wyman Hong  
Water Resources Technician

WH:mm  
Enc.





# ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588

RECEIVED

DEC 30 1992

ZONE 7, ACFC&WCD  
VOICE (510) 484-2600  
FAX (510) 462-3914

## DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT City block bounded by Broadway, 9th, & Franklin Streets and the location of the former 10th Street, Oakland

PERMIT NUMBER 92671

LOCATION NUMBER \_\_\_\_\_

APPLICANT Redevelopment Agency of the City of Oakland

PERMIT CONDITIONS

Address 1333 Broadway Phone 238-3692  
Oakland, California Zip 94612

Circled Permit Requirements Apply

APPLICANT Harding Lawson Associates

### A. GENERAL

Address 200 Rush Landing Phone (415) 892-0821, X7352  
Novato, California Zip 94945 or X6769

1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

### TYPE OF PROJECT

Construction	_____	Geotechnical Investigation	_____
Cathodic Protection	_____	General	_____
Water Supply	_____	Contamination	<u>X</u>
Monitoring	_____	Well Destruction	_____

### B. WATER WELLS, INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

### PROPOSED WATER SUPPLY WELL USE

Domestic	_____	Industrial	_____	Other	_____
Municipal	_____	Irrigation	_____		

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

### DRILLING METHOD:

Rotary	_____	Air Rotary	_____	Auger	<u>X</u>
Other	_____				

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

DRILLER'S LICENSE NO. C57 485 165

E. WELL DESTRUCTION. See attached.

### WELL PROJECTS

Drill Hole Diameter	_____ in.	Maximum	
Casing Diameter	_____ in.	Depth	_____ ft.
Surface Seal Depth	_____ ft.	Number	_____

### GEOTECHNICAL PROJECTS

Number of Borings	<u>16</u>	Maximum	
Hole Diameter	<u>6</u> in.	Depth	<u>30</u> ft.

ESTIMATED STARTING DATE Jan. 20, 1993

ESTIMATED COMPLETION DATE Jan. 22, 1993

Applicant hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

Approved Wyman Hong Date 30 Dec 92  
Wyman Hong

APPLICANT'S SIGNATURE Robert L. Nelson Date 12-28-92

**APPENDIX B**

**LABORATORY REPORTS AND CHAIN OF CUSTODY DOCUMENTS**



**NET**

**NATIONAL  
ENVIRONMENTAL  
TESTING, INC.**

NET Pacific, Inc.  
435 Tesconi Circle  
Santa Rosa, CA 95401  
Tel: (707) 526-7200  
Fax: (707) 526-9623

David Leland  
Harding Lawson Associates  
200 Rush Landing  
Novato, CA 94947


Date: 02/04/1993  
NET Client Acct. No: 28100  
NET Pacific Job No: 93.00146  
Received: 01/20/1993

Client Reference Information

OBB, Job: 21078.01

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

  
Jules Skamarack  
Laboratory Manager

For:

Enclosure(s)



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

Date: 02/04/1993  
 Page: 2

Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011901  
 Date Taken: 01/19/1993  
 Time Taken: 10:10  
 LAB Job No: (-149325 )

Parameter	Method	Reporting Limit	Results	Units
CAM METALS (Solid, TLC)				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	1.3	mg/Kg
Barium (ICP)	EPA 6010	2.0	46	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	4.2	mg/Kg
Chromium (ICP)	EPA 6010	2.0	44	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	7.3	mg/Kg
Copper (ICP)	EPA 6010	2.0	18	mg/Kg
Lead (GFAA)	EPA 7421	0.2	11	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	40	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	55	mg/Kg
Thallium (ICP)	EPA 6010	20	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	28	mg/Kg
Zinc (ICP)	EPA 6010	2.0	26	mg/Kg

METHOD 5030 (GC, FID)

DILUTION FACTOR\* 1  
 DATE ANALYZED 01-22-93  
 as Gasoline 5030 1 ND mg/Kg  
 SURROGATE RESULTS --  
 Bromofluorobenzene 5030 88 % Rec.

METHOD 3550 (GC, FID)

DILUTION FACTOR\* 1  
 DATE EXTRACTED 01-22-93  
 DATE ANALYZED 01-25-93  
 as Diesel 3550 1 ND mg/Kg



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

Date: 02/04/1993  
 Page: 3

Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011901  
 Date Taken: 01/19/1993  
 Time Taken: 10:10  
 LAB Job No: (-149325 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8010 & 8020 (GC,Solid)				
DATE ANALYZED			01-25-93	
DILUTION FACTOR*			1	
Bromodichloromethane	8010	2.0	ND	ug/Kg
Bromoform	8010	2.0	ND	ug/Kg
Bromomethane	8010	2.0	ND	ug/Kg
Carbon tetrachloride	8010	2.0	ND	ug/Kg
Chlorobenzene	8020	2.0	ND	ug/Kg
Chloroethane	8010	2.0	ND	ug/Kg
2-Chloroethylvinyl ether	8010	5.0	ND	ug/Kg
Chloroform	8010	2.0	ND	ug/Kg
Chloromethane	8010	2.0	ND	ug/Kg
Dibromochloromethane	8010	2.0	ND	ug/Kg
1,2-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,3-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,4-Dichlorobenzene	8020	2.0	ND	ug/Kg
Dichlorodifluoromethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethane	8010	2.0	ND	ug/Kg
1,2-Dichloroethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethene	8010	2.0	ND	ug/Kg
trans-1,2-Dichloroethene	8010	2.0	ND	ug/Kg
1,2-Dichloropropane	8010	2.0	ND	ug/Kg
cis-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
trans-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
Methylene chloride	8010	50	ND	ug/Kg
1,1,2,2-Tetrachloroethane	8010	2.0	ND	ug/Kg
Tetrachloroethene	8010	2.0	ND	ug/Kg
1,1,1-Trichloroethane	8010	2.0	ND	ug/Kg
1,1,2-Trichloroethane	8010	2.0	ND	ug/Kg
Trichloroethene	8010	2.0	ND	ug/Kg
Trichlorofluoromethane	8010	2.0	ND	ug/Kg
Vinyl chloride	8010	2.0	ND	ug/Kg
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	3.0	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (total)	8020	3.0	ND	ug/Kg
SURROGATE RESULTS				
1,4-Difluorobenzene			72	% Rec.
1,4-Dichlorobutane			91	% Rec.



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Job No: 93.00146

Date: 02/04/1993  
Page: 4

Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011901  
Date Taken: 01/19/1993  
Time Taken: 10:10  
LAB Job No: (-149325 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED			01/22/93	
DATE ANALYZED			01/26/93	
DILUTION FACTOR*			1	
Acenaphthene	8270	330	ND	ug/Kg
Acenaphthylene	8270	330	ND	ug/Kg
Aldrin	8270	1600	ND	ug/Kg
Anthracene	8270	330	ND	ug/Kg
Benzidine	8270	1600	ND	ug/Kg
Benzo(a)anthracene	8270	330	ND	ug/Kg
Benzo(b)fluoranthene	8270	330	ND	ug/Kg
Benzo(k)fluoranthene	8270	330	ND	ug/Kg
Benzo(a)pyrene	8270	330	ND	ug/Kg
Benzo(g,h,i)perylene	8270	330	ND	ug/Kg
Benzoic acid	8270	1600	ND	ug/Kg
Benzyl alcohol	8270	330	ND	ug/Kg
Butyl benzyl phthalate	8270	330	ND	ug/Kg
delta-BHC	8270	1600	ND	ug/Kg
gamma-BHC	8270	1600	ND	ug/Kg
bis(2-Chloroethyl)ether	8270	330	ND	ug/Kg
bis(2-Chloroethoxy)methane	8270	330	ND	ug/Kg
bis(2-Chloroisopropyl)ether	8270	330	ND	ug/Kg
bis(2-Ethylhexyl)phthalate	8270	330	ND	ug/Kg
4-Bromophenyl phenyl ether	8270	330	ND	ug/Kg
4-Chloroaniline	8270	330	ND	ug/Kg
2-Chloronaphthalene	8270	330	ND	ug/Kg
4-Chlorophenyl phenyl ether	8270	330	ND	ug/Kg
Chrysene	8270	330	ND	ug/Kg
4,4'-DDD	8270	1600	ND	ug/Kg
4,4'-DDE	8270	1600	ND	ug/Kg
4,4'-DDT	8270	1600	ND	ug/Kg
Dibenzo(a,h)anthracene	8270	330	ND	ug/Kg
Dibenzofuran	8270	330	ND	ug/Kg
Di-n-butylphthalate	8270	330	ND	ug/Kg
1,2-Dichlorobenzene	8270	330	ND	ug/Kg
1,3-Dichlorobenzene	8270	330	ND	ug/Kg
1,4-Dichlorobenzene	8270	330	ND	ug/Kg
3,3'-Dichlorobenzidine	8270	660	ND	ug/Kg
Dieldrin	8270	1600	ND	ug/Kg
Diethylphthalate	8270	330	ND	ug/Kg
Dimethyl phthalate	8270	330	ND	ug/Kg
2,4-Dinitrotoluene	8270	330	ND	ug/Kg
2,6-Dinitrotoluene	8270	330	ND	ug/Kg
Di-n-octyl phthalate	8270	330	ND	ug/Kg
Endrin aldehyde	8270	1600	ND	ug/Kg
Fluoranthene	8270	330	ND	ug/Kg
Fluorene	8270	330	ND	ug/Kg



Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011901  
 Date Taken: 01/19/1993  
 Time Taken: 10:10  
 LAB Job No: (-149325 )

Parameter	Method	Reporting Limit	Results	Units
Heptachlor	8270	1600	ND	ug/Kg
Heptachlor epoxide	8270	1600	ND	ug/Kg
Hexachlorobenzene	8270	330	ND	ug/Kg
Hexachlorobutadiene	8270	330	ND	ug/Kg
Hexachlorocyclopentadiene	8270	330	ND	ug/Kg
Hexachloroethane	8270	330	ND	ug/Kg
Indeno(1,2,3-cd)pyrene	8270	330	ND	ug/Kg
Isophorone	8270	330	ND	ug/Kg
2-Methylnaphthalene	8270	330	ND	ug/Kg
Naphthalene	8270	330	ND	ug/Kg
2-Nitroaniline	8270	1600	ND	ug/Kg
3-Nitroaniline	8270	1600	ND	ug/Kg
4-Nitroaniline	8270	1600	ND	ug/Kg
Nitrobenzene	8270	330	ND	ug/Kg
N-Nitroso-Di-N-propylamine	8270	330	ND	ug/Kg
N-Nitrosodiphenylamine	8270	330	ND	ug/Kg
Phenanthrene	8270	330	ND	ug/Kg
Pyrene	8270	330	ND	ug/Kg
1,2,4-Trichlorobenzene	8270	330	ND	ug/Kg
ACID EXTRACTABLES			--	
4-Chloro-3-methylphenol	8270	330	ND	ug/Kg
2-Chlorophenol	8270	330	ND	ug/Kg
2,4-Dichlorophenol	8270	330	ND	ug/Kg
2,4-Dimethylphenol	8270	330	ND	ug/Kg
2,4-Dinitrophenol	8270	1600	ND	ug/Kg
4,6-Dinitro-2-methylphenol	8270	1600	ND	ug/Kg
2-Nitrophenol	8270	330	ND	ug/Kg
4-Nitrophenol	8270	1600	ND	ug/Kg
Pentachlorophenol	8270	1600	ND	ug/Kg
Phenol	8270	330	ND	ug/Kg
2,4,6-Trichlorophenol	8270	330	ND	ug/Kg
2-Methylphenol	8270	330	ND	ug/Kg
4-Methylphenol	8270	330	ND	ug/Kg
2,4,5-Trichlorophenol	8270	1600	ND	ug/Kg
SURROGATE RESULTS			--	
Nitrobenzene-d5	8270		70	% Rec.
2-Fluorobiphenyl	8270		58	% Rec.
p-Terphenyl-d14	8270		41	% Rec.
Phenol-d5	8270		60	% Rec.
2-Fluorophenol	8270		55	% Rec.
2,4,6-Tribromophenol	8270		51	% Rec.

Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011905  
 Date Taken: 01/19/1993  
 Time Taken: 14:30  
 LAB Job No: (-149326 )

Parameter	Method	Reporting Limit	Results	Units
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	2.0	mg/Kg
Barium (ICP)	EPA 6010	2.0	85	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	4.1	mg/Kg
Chromium (ICP)	EPA 6010	2.0	37	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	6.9	mg/Kg
Copper (ICP)	EPA 6010	2.0	17	mg/Kg
Lead (GFAA)	EPA 7421	0.2	17	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	30	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	ND	mg/Kg
Thallium (ICP)	EPA 6010	20	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	28	mg/Kg
Zinc (ICP)	EPA 6010	2.0	33	mg/Kg

**METHOD 5030 (GC, FID)**

DILUTION FACTOR*			1	
DATE ANALYZED			01-22-93	
as Gasoline	5030	1	ND	mg/Kg
SURROGATE RESULTS			--	
Bromofluorobenzene	5030		95	% Rec.

**METHOD 3550 (GC, FID)**

DILUTION FACTOR*			5	
DATE EXTRACTED			01-22-93	
DATE ANALYZED			01-25-93	
as Diesel	3550	1	68**	mg/Kg

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbon rather than Diesel.





Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

Date: 02/04/1993  
 Page: 7

Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011905  
 Date Taken: 01/19/1993  
 Time Taken: 14:30  
 LAB Job No: (-149326 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8010 & 8020 (GC,Solid)				
DATE ANALYZED			01-25-93	
DILUTION FACTOR*			1	
Bromodichloromethane	8010	2.0	ND	ug/Kg
Bromoform	8010	2.0	ND	ug/Kg
Bromomethane	8010	2.0	ND	ug/Kg
Carbon tetrachloride	8010	2.0	ND	ug/Kg
Chlorobenzene	8020	2.0	ND	ug/Kg
Chloroethane	8010	2.0	ND	ug/Kg
2-Chloroethylvinyl ether	8010	5.0	ND	ug/Kg
Chloroform	8010	2.0	ND	ug/Kg
Chloromethane	8010	2.0	ND	ug/Kg
Dibromochloromethane	8010	2.0	ND	ug/Kg
1,2-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,3-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,4-Dichlorobenzene	8020	2.0	ND	ug/Kg
Dichlorodifluoromethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethane	8010	2.0	ND	ug/Kg
1,2-Dichloroethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethene	8010	2.0	ND	ug/Kg
trans-1,2-Dichloroethene	8010	2.0	ND	ug/Kg
1,2-Dichloropropane	8010	2.0	ND	ug/Kg
cis-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
trans-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
Methylene chloride	8010	50	ND	ug/Kg
1,1,2,2-Tetrachloroethane	8010	2.0	ND	ug/Kg
Tetrachloroethene	8010	2.0	ND	ug/Kg
1,1,1-Trichloroethane	8010	2.0	ND	ug/Kg
1,1,2-Trichloroethane	8010	2.0	ND	ug/Kg
Trichloroethene	8010	2.0	ND	ug/Kg
Trichlorofluoromethane	8010	2.0	ND	ug/Kg
Vinyl chloride	8010	2.0	ND	ug/Kg
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	3.0	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (total)	8020	3.0	ND	ug/Kg
SURROGATE RESULTS				
1,4-Difluorobenzene			76	% Rec.
1,4-Dichlorobutane			90	% Rec.



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

Date: 02/04/1993  
 Page: 8

Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011905  
 Date Taken: 01/19/1993  
 Time Taken: 14:30  
 LAB Job No: (-149326 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED			01/22/93	
DATE ANALYZED			01/26/93	
DILUTION FACTOR*			1	
Acenaphthene	8270	330	ND	ug/Kg
Acenaphthylene	8270	330	ND	ug/Kg
Aldrin	8270	1600	ND	ug/Kg
Anthracene	8270	330	ND	ug/Kg
Benzidine	8270	1600	ND	ug/Kg
Benzo(a)anthracene	8270	330	ND	ug/Kg
Benzo(b)fluoranthene	8270	330	ND	ug/Kg
Benzo(k)fluoranthene	8270	330	ND	ug/Kg
Benzo(a)pyrene	8270	330	ND	ug/Kg
Benzo(g,h,i)perylene	8270	330	ND	ug/Kg
Benzoic acid	8270	1600	ND	ug/Kg
Benzyl alcohol	8270	330	ND	ug/Kg
Butyl benzyl phthalate	8270	330	ND	ug/Kg
delta-BHC	8270	1600	ND	ug/Kg
gamma-BHC	8270	1600	ND	ug/Kg
bis(2-Chloroethyl)ether	8270	330	ND	ug/Kg
bis(2-Chloroethoxy)methane	8270	330	ND	ug/Kg
bis(2-Chloroisopropyl)ether	8270	330	ND	ug/Kg
bis(2-Ethylhexyl)phthalate	8270	330	ND	ug/Kg
4-Bromophenyl phenyl ether	8270	330	ND	ug/Kg
4-Chloroaniline	8270	330	ND	ug/Kg
2-Chloronaphthalene	8270	330	ND	ug/Kg
4-Chlorophenyl phenyl ether	8270	330	ND	ug/Kg
Chrysene	8270	330	ND	ug/Kg
4,4'-DDD	8270	1600	ND	ug/Kg
4,4'-DDE	8270	1600	ND	ug/Kg
4,4'-DDT	8270	1600	ND	ug/Kg
Dibenzo(a,h)anthracene	8270	330	ND	ug/Kg
Dibenzofuran	8270	330	ND	ug/Kg
Di-n-butylphthalate	8270	330	ND	ug/Kg
1,2-Dichlorobenzene	8270	330	ND	ug/Kg
1,3-Dichlorobenzene	8270	330	ND	ug/Kg
1,4-Dichlorobenzene	8270	330	ND	ug/Kg
3,3'-Dichlorobenzidine	8270	660	ND	ug/Kg
Dieldrin	8270	1600	ND	ug/Kg
Diethylphthalate	8270	330	ND	ug/Kg
Dimethyl phthalate	8270	330	ND	ug/Kg
2,4-Dinitrotoluene	8270	330	ND	ug/Kg
2,6-Dinitrotoluene	8270	330	ND	ug/Kg
Di-n-octyl phthalate	8270	330	ND	ug/Kg
Endrin aldehyde	8270	1600	ND	ug/Kg
Fluoranthene	8270	330	ND	ug/Kg
Fluorene	8270	330	ND	ug/Kg



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

Date: 02/04/1993  
 Page: 9

Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011905  
 Date Taken: 01/19/1993  
 Time Taken: 14:30  
 LAB Job No: (-149326 )

Parameter	Method	Reporting Limit	Results	Units
Heptachlor	8270	1600	ND	ug/Kg
Heptachlor epoxide	8270	1600	ND	ug/Kg
Hexachlorobenzene	8270	330	ND	ug/Kg
Hexachlorobutadiene	8270	330	ND	ug/Kg
Hexachlorocyclopentadiene	8270	330	ND	ug/Kg
Hexachloroethane	8270	330	ND	ug/Kg
Indeno(1,2,3-cd)pyrene	8270	330	ND	ug/Kg
Isophorone	8270	330	ND	ug/Kg
2-Methylnaphthalene	8270	330	ND	ug/Kg
Naphthalene	8270	330	ND	ug/Kg
2-Nitroaniline	8270	1600	ND	ug/Kg
3-Nitroaniline	8270	1600	ND	ug/Kg
4-Nitroaniline	8270	1600	ND	ug/Kg
Nitrobenzene	8270	330	ND	ug/Kg
N-Nitroso-Di-N-propylamine	8270	330	ND	ug/Kg
N-Nitrosodiphenylamine	8270	330	ND	ug/Kg
Phenanthrene	8270	330	ND	ug/Kg
Pyrene	8270	330	ND	ug/Kg
1,2,4-Trichlorobenzene	8270	330	ND	ug/Kg
ACID EXTRACTABLES			--	
4-Chloro-3-methylphenol	8270	330	ND	ug/Kg
2-Chlorophenol	8270	330	ND	ug/Kg
2,4-Dichlorophenol	8270	330	ND	ug/Kg
2,4-Dimethylphenol	8270	330	ND	ug/Kg
2,4-Dinitrophenol	8270	1600	ND	ug/Kg
4,6-Dinitro-2-methylphenol	8270	1600	ND	ug/Kg
2-Nitrophenol	8270	330	ND	ug/Kg
4-Nitrophenol	8270	1600	ND	ug/Kg
Pentachlorophenol	8270	1600	ND	ug/Kg
Phenol	8270	330	ND	ug/Kg
2,4,6-Trichlorophenol	8270	330	ND	ug/Kg
2-Methylphenol	8270	330	ND	ug/Kg
4-Methylphenol	8270	330	ND	ug/Kg
2,4,5-Trichlorophenol	8270	1600	ND	ug/Kg
SURROGATE RESULTS			--	
Nitrobenzene-d5	8270		64	% Rec.
2-Fluorobiphenyl	8270		61	% Rec.
p-Terphenyl-d14	8270		43	% Rec.
Phenol-d5	8270		61	% Rec.
2-Fluorophenol	8270		54	% Rec.
2,4,6-Tribromophenol	8270		49	% Rec.



Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011908  
 Date Taken: 01/19/1993  
 Time Taken: 11:50  
 LAB Job No: (-149327 )

Parameter	Method	Reporting Limit	Results	Units
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	1.7	mg/Kg
Barium (ICP)	EPA 6010	2.0	59	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	3.9	mg/Kg
Chromium (ICP)	EPA 6010	2.0	34	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	6.3	mg/Kg
Copper (ICP)	EPA 6010	2.0	17	mg/Kg
Lead (GFAA)	EPA 7421	0.2	29	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	32	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	ND	mg/Kg
Thallium (ICP)	EPA 6010	2.0	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	26	mg/Kg
Zinc (ICP)	EPA 6010	2.0	49	mg/Kg

**METHOD 5030 (GC, FID)**

DILUTION FACTOR*			1	
DATE ANALYZED			01-22-93	
as Gasoline	5030	1	ND	mg/Kg
SURROGATE RESULTS			--	
Bromofluorobenzene	5030		87	% Rec.

**METHOD 3550 (GC, FID)**

DILUTION FACTOR*			5	
DATE EXTRACTED			01-22-93	
DATE ANALYZED			01-25-93	
as Diesel	3550	1	83**	mg/Kg

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbon rather than Diesel.



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 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011908  
 Date Taken: 01/19/1993  
 Time Taken: 11:50  
 LAB Job No: (-149327 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8010 & 8020 (GC,Solid)				
DATE ANALYZED			01-25-93	
DILUTION FACTOR*			1	
Bromodichloromethane	8010	2.0	ND	ug/Kg
Bromoform	8010	2.0	ND	ug/Kg
Bromomethane	8010	2.0	ND	ug/Kg
Carbon tetrachloride	8010	2.0	ND	ug/Kg
Chlorobenzene	8020	2.0	ND	ug/Kg
Chloroethane	8010	2.0	ND	ug/Kg
2-Chloroethylvinyl ether	8010	5.0	ND	ug/Kg
Chloroform	8010	2.0	ND	ug/Kg
Chloromethane	8010	2.0	ND	ug/Kg
Dibromochloromethane	8010	2.0	ND	ug/Kg
1,2-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,3-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,4-Dichlorobenzene	8020	2.0	ND	ug/Kg
Dichlorodifluoromethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethane	8010	2.0	ND	ug/Kg
1,2-Dichloroethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethene	8010	2.0	ND	ug/Kg
trans-1,2-Dichloroethene	8010	2.0	ND	ug/Kg
1,2-Dichloropropane	8010	2.0	ND	ug/Kg
cis-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
trans-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
Methylene chloride	8010	50	ND	ug/Kg
1,1,2,2-Tetrachloroethane	8010	2.0	ND	ug/Kg
Tetrachloroethene	8010	2.0	ND	ug/Kg
1,1,1-Trichloroethane	8010	2.0	ND	ug/Kg
1,1,2-Trichloroethane	8010	2.0	ND	ug/Kg
Trichloroethene	8010	2.0	ND	ug/Kg
Trichlorofluoromethane	8010	2.0	ND	ug/Kg
Vinyl chloride	8010	2.0	ND	ug/Kg
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	3.0	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (total)	8020	3.0	ND	ug/Kg
SURROGATE RESULTS				
1,4-Difluorobenzene			71	% Rec.
1,4-Dichlorobutane			87	% Rec.



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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011908  
Date Taken: 01/19/1993  
Time Taken: 11:50  
LAB Job No: (-149327 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED			01/22/93	
DATE ANALYZED			01/26/93	
DILUTION FACTOR*			1	
Acenaphthene	8270	330	ND	ug/Kg
Acenaphthylene	8270	330	ND	ug/Kg
Aldrin	8270	1600	ND	ug/Kg
Anthracene	8270	330	ND	ug/Kg
Benzidine	8270	1600	ND	ug/Kg
Benzo(a)anthracene	8270	330	ND	ug/Kg
Benzo(b)fluoranthene	8270	330	ND	ug/Kg
Benzo(k)fluoranthene	8270	330	ND	ug/Kg
Benzo(a)pyrene	8270	330	ND	ug/Kg
Benzo(g,h,i)perylene	8270	330	ND	ug/Kg
Benzoic acid	8270	1600	ND	ug/Kg
Benzyl alcohol	8270	330	ND	ug/Kg
Butyl benzyl phthalate	8270	330	ND	ug/Kg
delta-BHC	8270	1600	ND	ug/Kg
gamma-BHC	8270	1600	ND	ug/Kg
bis(2-Chloroethyl)ether	8270	330	ND	ug/Kg
bis(2-Chloroethoxy)methane	8270	330	ND	ug/Kg
bis(2-Chloroisopropyl)ether	8270	330	ND	ug/Kg
bis(2-Ethylhexyl)phthalate	8270	330	ND	ug/Kg
4-Bromophenyl phenyl ether	8270	330	ND	ug/Kg
4-Chloroaniline	8270	330	ND	ug/Kg
2-Chloronaphthalene	8270	330	ND	ug/Kg
4-Chlorophenyl phenyl ether	8270	330	ND	ug/Kg
Chrysene	8270	330	ND	ug/Kg
4,4'-DDD	8270	1600	ND	ug/Kg
4,4'-DDE	8270	1600	ND	ug/Kg
4,4'-DDT	8270	1600	ND	ug/Kg
Dibenzo(a,h)anthracene	8270	330	ND	ug/Kg
Dibenzofuran	8270	330	ND	ug/Kg
Di-n-butylphthalate	8270	330	ND	ug/Kg
1,2-Dichlorobenzene	8270	330	ND	ug/Kg
1,3-Dichlorobenzene	8270	330	ND	ug/Kg
1,4-Dichlorobenzene	8270	330	ND	ug/Kg
3,3'-Dichlorobenzidine	8270	660	ND	ug/Kg
Dieldrin	8270	1600	ND	ug/Kg
Diethylphthalate	8270	330	ND	ug/Kg
Dimethyl phthalate	8270	330	ND	ug/Kg
2,4-Dinitrotoluene	8270	330	ND	ug/Kg
2,6-Dinitrotoluene	8270	330	ND	ug/Kg
Di-n-octyl phthalate	8270	330	ND	ug/Kg
Endrin aldehyde	8270	1600	ND	ug/Kg
Fluoranthene	8270	330	ND	ug/Kg
Fluorene	8270	330	ND	ug/Kg



Client Acct: 28100  
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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011908  
Date Taken: 01/19/1993  
Time Taken: 11:50  
LAB Job No: (-149327 )

Parameter	Method	Reporting Limit	Results	Units
Heptachlor	8270	1600	ND	ug/Kg
Heptachlor epoxide	8270	1600	ND	ug/Kg
Hexachlorobenzene	8270	330	ND	ug/Kg
Hexachlorobutadiene	8270	330	ND	ug/Kg
Hexachlorocyclopentadiene	8270	330	ND	ug/Kg
Hexachloroethane	8270	330	ND	ug/Kg
Indeno(1,2,3-cd)pyrene	8270	330	ND	ug/Kg
Isophorone	8270	330	ND	ug/Kg
2-Methylnaphthalene	8270	330	ND	ug/Kg
Naphthalene	8270	330	ND	ug/Kg
2-Nitroaniline	8270	1600	ND	ug/Kg
3-Nitroaniline	8270	1600	ND	ug/Kg
4-Nitroaniline	8270	1600	ND	ug/Kg
Nitrobenzene	8270	330	ND	ug/Kg
N-Nitroso-Di-N-propylamine	8270	330	ND	ug/Kg
N-Nitrosodiphenylamine	8270	330	ND	ug/Kg
Phenanthrene	8270	330	ND	ug/Kg
Pyrene	8270	330	ND	ug/Kg
1,2,4-Trichlorobenzene	8270	330	ND	ug/Kg
ACID EXTRACTABLES			--	
4-Chloro-3-methylphenol	8270	330	ND	ug/Kg
2-Chlorophenol	8270	330	ND	ug/Kg
2,4-Dichlorophenol	8270	330	ND	ug/Kg
2,4-Dimethylphenol	8270	330	ND	ug/Kg
2,4-Dinitrophenol	8270	1600	ND	ug/Kg
4,6-Dinitro-2-methylphenol	8270	1600	ND	ug/Kg
2-Nitrophenol	8270	330	ND	ug/Kg
4-Nitrophenol	8270	1600	ND	ug/Kg
Pentachlorophenol	8270	1600	ND	ug/Kg
Phenol	8270	330	ND	ug/Kg
2,4,6-Trichlorophenol	8270	330	ND	ug/Kg
2-Methylphenol	8270	330	ND	ug/Kg
4-Methylphenol	8270	330	ND	ug/Kg
2,4,5-Trichlorophenol	8270	1600	ND	ug/Kg
SURROGATE RESULTS			--	
Nitrobenzene-d5	8270		67	% Rec.
2-Fluorobiphenyl	8270		60	% Rec.
p-Terphenyl-d14	8270		62	% Rec.
Phenol-d5	8270		59	% Rec.
2-Fluorophenol	8270		53	% Rec.
2,4,6-Tribromophenol	8270		54	% Rec.



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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011909  
 Date Taken: 01/19/1993  
 Time Taken: 12:20  
 LAB Job No: (-149328 )

Parameter	Method	Reporting Limit	Results	Units
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	1.6	mg/Kg
Barium (ICP)	EPA 6010	2.0	46	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	4.3	mg/Kg
Chromium (ICP)	EPA 6010	2.0	48	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	8.9	mg/Kg
Copper (ICP)	EPA 6010	2.0	18	mg/Kg
Lead (GFAA)	EPA 7421	0.2	2.9	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	32	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	ND	mg/Kg
Thallium (ICP)	EPA 6010	20	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	33	mg/Kg
Zinc (ICP)	EPA 6010	2.0	19	mg/Kg
<b>METHOD 5030 (GC, FID)</b>				
DILUTION FACTOR*			1	
DATE ANALYZED			01-22-93	
as Gasoline	5030	1	ND	mg/Kg
SURROGATE RESULTS			--	
Bromofluorobenzene	5030		101	% Rec.
<b>METHOD 3550 (GC, FID)</b>				
DILUTION FACTOR*			1	
DATE EXTRACTED			01-22-93	
DATE ANALYZED			01-25-93	
as Diesel	3550	1	ND	mg/Kg





Client Acct: 28100  
 Client Name: Harding Lawson Associates  
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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011909  
 Date Taken: 01/19/1993  
 Time Taken: 12:20  
 LAB Job No: (-149328 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8010 & 8020 (GC,Solid)				
DATE ANALYZED			01-25-93	
DILUTION FACTOR*			1	
Bromodichloromethane	8010	2.0	ND	ug/Kg
Bromoform	8010	2.0	ND	ug/Kg
Bromomethane	8010	2.0	ND	ug/Kg
Carbon tetrachloride	8010	2.0	ND	ug/Kg
Chlorobenzene	8020	2.0	ND	ug/Kg
Chloroethane	8010	2.0	ND	ug/Kg
2-Chloroethylvinyl ether	8010	5.0	ND	ug/Kg
Chloroform	8010	2.0	ND	ug/Kg
Chloromethane	8010	2.0	ND	ug/Kg
Dibromochloromethane	8010	2.0	ND	ug/Kg
1,2-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,3-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,4-Dichlorobenzene	8020	2.0	ND	ug/Kg
Dichlorodifluoromethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethane	8010	2.0	ND	ug/Kg
1,2-Dichloroethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethene	8010	2.0	ND	ug/Kg
trans-1,2-Dichloroethene	8010	2.0	ND	ug/Kg
1,2-Dichloropropane	8010	2.0	ND	ug/Kg
cis-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
trans-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
Methylene chloride	8010	50	ND	ug/Kg
1,1,2,2-Tetrachloroethane	8010	2.0	ND	ug/Kg
Tetrachloroethene	8010	2.0	ND	ug/Kg
1,1,1-Trichloroethane	8010	2.0	ND	ug/Kg
1,1,2-Trichloroethane	8010	2.0	ND	ug/Kg
Trichloroethene	8010	2.0	ND	ug/Kg
Trichlorofluoromethane	8010	2.0	ND	ug/Kg
Vinyl chloride	8010	2.0	ND	ug/Kg
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	3.0	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (total)	8020	3.0	ND	ug/Kg
SURROGATE RESULTS				
1,4-Difluorobenzene			78	% Rec.
1,4-Dichlorobutane			112	% Rec.



Client Acct: 28100  
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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011909  
Date Taken: 01/19/1993  
Time Taken: 12:20  
LAB Job No: (-149328 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED			01/22/93	
DATE ANALYZED			01/26/93	
DILUTION FACTOR*			1	
Acenaphthene	8270	330	ND	ug/Kg
Acenaphthylene	8270	330	ND	ug/Kg
Aldrin	8270	1600	ND	ug/Kg
Anthracene	8270	330	ND	ug/Kg
Benzidine	8270	1600	ND	ug/Kg
Benzo(a)anthracene	8270	330	ND	ug/Kg
Benzo(b)fluoranthene	8270	330	ND	ug/Kg
Benzo(k)fluoranthene	8270	330	ND	ug/Kg
Benzo(a)pyrene	8270	330	ND	ug/Kg
Benzo(g,h,i)perylene	8270	330	ND	ug/Kg
Benzoic acid	8270	1600	ND	ug/Kg
Benzyl alcohol	8270	330	ND	ug/Kg
Butyl benzyl phthalate	8270	330	ND	ug/Kg
delta-BHC	8270	1600	ND	ug/Kg
gamma-BHC	8270	1600	ND	ug/Kg
bis(2-Chloroethyl)ether	8270	330	ND	ug/Kg
bis(2-Chloroethoxy)methane	8270	330	ND	ug/Kg
bis(2-Chloroisopropyl)ether	8270	330	ND	ug/Kg
bis(2-Ethylhexyl)phthalate	8270	330	ND	ug/Kg
4-Bromophenyl phenyl ether	8270	330	ND	ug/Kg
4-Chloroaniline	8270	330	ND	ug/Kg
2-Chloronaphthalene	8270	330	ND	ug/Kg
4-Chlorophenyl phenyl ether	8270	330	ND	ug/Kg
Chrysene	8270	330	ND	ug/Kg
4,4'-DDD	8270	1600	ND	ug/Kg
4,4'-DDE	8270	1600	ND	ug/Kg
4,4'-DDT	8270	1600	ND	ug/Kg
Dibenzo(a,h)anthracene	8270	330	ND	ug/Kg
Dibenzofuran	8270	330	ND	ug/Kg
Di-n-butylphthalate	8270	330	ND	ug/Kg
1,2-Dichlorobenzene	8270	330	ND	ug/Kg
1,3-Dichlorobenzene	8270	330	ND	ug/Kg
1,4-Dichlorobenzene	8270	330	ND	ug/Kg
3,3'-Dichlorobenzidine	8270	660	ND	ug/Kg
Dieldrin	8270	1600	ND	ug/Kg
Diethylphthalate	8270	330	ND	ug/Kg
Dimethyl phthalate	8270	330	ND	ug/Kg
2,4-Dinitrotoluene	8270	330	ND	ug/Kg
2,6-Dinitrotoluene	8270	330	ND	ug/Kg
Di-n-octyl phthalate	8270	330	ND	ug/Kg
Endrin aldehyde	8270	1600	ND	ug/Kg
Fluoranthene	8270	330	ND	ug/Kg
Fluorene	8270	330	ND	ug/Kg



Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011909  
 Date Taken: 01/19/1993  
 Time Taken: 12:20  
 LAB Job No: (-149328 )

Parameter	Method	Reporting Limit	Results	Units
Heptachlor	8270	1600	ND	ug/Kg
Heptachlor epoxide	8270	1600	ND	ug/Kg
Hexachlorobenzene	8270	330	ND	ug/Kg
Hexachlorobutadiene	8270	330	ND	ug/Kg
Hexachlorocyclopentadiene	8270	330	ND	ug/Kg
Hexachloroethane	8270	330	ND	ug/Kg
Indeno(1,2,3-cd)pyrene	8270	330	ND	ug/Kg
Isophorone	8270	330	ND	ug/Kg
2-Methylnaphthalene	8270	330	ND	ug/Kg
Naphthalene	8270	330	ND	ug/Kg
2-Nitroaniline	8270	1600	ND	ug/Kg
3-Nitroaniline	8270	1600	ND	ug/Kg
4-Nitroaniline	8270	1600	ND	ug/Kg
Nitrobenzene	8270	330	ND	ug/Kg
N-Nitroso-Di-N-propylamine	8270	330	ND	ug/Kg
N-Nitrosodiphenylamine	8270	330	ND	ug/Kg
Phenanthrene	8270	330	ND	ug/Kg
Pyrene	8270	330	ND	ug/Kg
1,2,4-Trichlorobenzene	8270	330	ND	ug/Kg
ACID EXTRACTABLES			--	
4-Chloro-3-methylphenol	8270	330	ND	ug/Kg
2-Chlorophenol	8270	330	ND	ug/Kg
2,4-Dichlorophenol	8270	330	ND	ug/Kg
2,4-Dimethylphenol	8270	330	ND	ug/Kg
2,4-Dinitrophenol	8270	1600	ND	ug/Kg
4,6-Dinitro-2-methylphenol	8270	1600	ND	ug/Kg
2-Nitrophenol	8270	330	ND	ug/Kg
4-Nitrophenol	8270	1600	ND	ug/Kg
Pentachlorophenol	8270	1600	ND	ug/Kg
Phenol	8270	330	ND	ug/Kg
2,4,6-Trichlorophenol	8270	330	ND	ug/Kg
2-Methylphenol	8270	330	ND	ug/Kg
4-Methylphenol	8270	330	ND	ug/Kg
2,4,5-Trichlorophenol	8270	1600	ND	ug/Kg
SURROGATE RESULTS				
Nitrobenzene-d5	8270		67	% Rec.
2-Fluorobiphenyl	8270		60	% Rec.
p-Terphenyl-d14	8270		51	% Rec.
Phenol-d5	8270		58	% Rec.
2-Fluorophenol	8270		53	% Rec.
2,4,6-Tribromophenol	8270		50	% Rec.



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

Date: 02/04/1993  
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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011910  
 Date Taken: 01/19/1993  
 Time Taken: 13:10  
 LAB Job No: (-149329 )

Parameter	Method	Reporting Limit	Results	Units
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	ND	mg/Kg
Barium (ICP)	EPA 6010	2.0	49	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	2.7	mg/Kg
Chromium (ICP)	EPA 6010	2.0	29	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	2.7	mg/Kg
Copper (ICP)	EPA 6010	2.0	12	mg/Kg
Lead (GFAA)	EPA 7421	0.2	2.9	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	16	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	ND	mg/Kg
Thallium (ICP)	EPA 6010	20	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	18	mg/Kg
Zinc (ICP)	EPA 6010	2.0	34	mg/Kg
<b>METHOD 5030 (GC, FID)</b>				
DILUTION FACTOR*			1	
DATE ANALYZED			01-22-93	
as Gasoline	5030	1	ND	mg/Kg
<b>SURROGATE RESULTS</b>				
Bromofluorobenzene	5030		100	% Rec.
<b>METHOD 3550 (GC, FID)</b>				
DILUTION FACTOR*			1	
DATE EXTRACTED			01-22-93	
DATE ANALYZED			01-25-93	
as Diesel	3550	1	ND	mg/Kg



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

Date: 02/04/1993  
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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011910  
 Date Taken: 01/19/1993  
 Time Taken: 13:10  
 LAB Job No: (-149329 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8010 & 8020 (GC,Solid)				
DATE ANALYZED			01-25-93	
DILUTION FACTOR*			1	
Bromodichloromethane	8010	2.0	ND	ug/Kg
Bromoform	8010	2.0	ND	ug/Kg
Bromomethane	8010	2.0	ND	ug/Kg
Carbon tetrachloride	8010	2.0	ND	ug/Kg
Chlorobenzene	8020	2.0	ND	ug/Kg
Chloroethane	8010	2.0	ND	ug/Kg
2-Chloroethylvinyl ether	8010	5.0	ND	ug/Kg
Chloroform	8010	2.0	ND	ug/Kg
Chloromethane	8010	2.0	ND	ug/Kg
Dibromochloromethane	8010	2.0	ND	ug/Kg
1,2-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,3-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,4-Dichlorobenzene	8020	2.0	ND	ug/Kg
Dichlorodifluoromethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethane	8010	2.0	ND	ug/Kg
1,2-Dichloroethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethene	8010	2.0	ND	ug/Kg
trans-1,2-Dichloroethene	8010	2.0	ND	ug/Kg
1,2-Dichloropropane	8010	2.0	ND	ug/Kg
cis-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
trans-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
Methylene chloride	8010	50	ND	ug/Kg
1,1,2,2-Tetrachloroethane	8010	2.0	ND	ug/Kg
Tetrachloroethene	8010	2.0	ND	ug/Kg
1,1,1-Trichloroethane	8010	2.0	ND	ug/Kg
1,1,2-Trichloroethane	8010	2.0	ND	ug/Kg
Trichloroethene	8010	2.0	ND	ug/Kg
Trichlorofluoromethane	8010	2.0	ND	ug/Kg
Vinyl chloride	8010	2.0	ND	ug/Kg
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	3.0	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (total)	8020	3.0	ND	ug/Kg
SURROGATE RESULTS				
1,4-Difluorobenzene			77	% Rec.
1,4-Dichlorobutane			106	% Rec.



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NET Job No: 93.00146

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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011910  
Date Taken: 01/19/1993  
Time Taken: 13:10  
LAB Job No: (-149329 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED			01/22/93	
DATE ANALYZED			01/26/93	
DILUTION FACTOR*			1	
Acenaphthene	8270	330	ND	ug/Kg
Acenaphthylene	8270	330	ND	ug/Kg
Aldrin	8270	1600	ND	ug/Kg
Anthracene	8270	330	ND	ug/Kg
Benzidine	8270	1600	ND	ug/Kg
Benzo(a)anthracene	8270	330	ND	ug/Kg
Benzo(b)fluoranthene	8270	330	ND	ug/Kg
Benzo(k)fluoranthene	8270	330	ND	ug/Kg
Benzo(a)pyrene	8270	330	ND	ug/Kg
Benzo(g,h,i)perylene	8270	330	ND	ug/Kg
Benzoic acid	8270	1600	ND	ug/Kg
Benzyl alcohol	8270	330	ND	ug/Kg
Butyl benzyl phthalate	8270	330	ND	ug/Kg
delta-BHC	8270	1600	ND	ug/Kg
gamma-BHC	8270	1600	ND	ug/Kg
bis(2-Chloroethyl)ether	8270	330	ND	ug/Kg
bis(2-Chloroethoxy)methane	8270	330	ND	ug/Kg
bis(2-Chloroisopropyl)ether	8270	330	ND	ug/Kg
bis(2-Ethylhexyl)phthalate	8270	330	ND	ug/Kg
4-Bromophenyl phenyl ether	8270	330	ND	ug/Kg
4-Chloroaniline	8270	330	ND	ug/Kg
2-Chloronaphthalene	8270	330	ND	ug/Kg
4-Chlorophenyl phenyl ether	8270	330	ND	ug/Kg
Chrysene	8270	330	ND	ug/Kg
4,4'-DDD	8270	1600	ND	ug/Kg
4,4'-DDE	8270	1600	ND	ug/Kg
4,4'-DDT	8270	1600	ND	ug/Kg
Dibenzo(a,h)anthracene	8270	330	ND	ug/Kg
Dibenzofuran	8270	330	ND	ug/Kg
Di-n-butylphthalate	8270	330	ND	ug/Kg
1,2-Dichlorobenzene	8270	330	ND	ug/Kg
1,3-Dichlorobenzene	8270	330	ND	ug/Kg
1,4-Dichlorobenzene	8270	330	ND	ug/Kg
3,3'-Dichlorobenzidine	8270	660	ND	ug/Kg
Dieldrin	8270	1600	ND	ug/Kg
Diethylphthalate	8270	330	ND	ug/Kg
Dimethyl phthalate	8270	330	ND	ug/Kg
2,4-Dinitrotoluene	8270	330	ND	ug/Kg
2,6-Dinitrotoluene	8270	330	ND	ug/Kg
Di-n-octyl phthalate	8270	330	ND	ug/Kg
Endrin aldehyde	8270	1600	ND	ug/Kg
Fluoranthene	8270	330	ND	ug/Kg
Fluorene	8270	330	ND	ug/Kg



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 Client Name: Harding Lawson Associates  
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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011910  
 Date Taken: 01/19/1993  
 Time Taken: 13:10  
 LAB Job No: (-149329 )

Parameter	Method	Reporting Limit	Results	Units
Heptachlor	8270	1600	ND	ug/Kg
Heptachlor epoxide	8270	1600	ND	ug/Kg
Hexachlorobenzene	8270	330	ND	ug/Kg
Hexachlorobutadiene	8270	330	ND	ug/Kg
Hexachlorocyclopentadiene	8270	330	ND	ug/Kg
Hexachloroethane	8270	330	ND	ug/Kg
Indeno(1,2,3-cd)pyrene	8270	330	ND	ug/Kg
Isophorone	8270	330	ND	ug/Kg
2-Methylnaphthalene	8270	330	ND	ug/Kg
Naphthalene	8270	330	ND	ug/Kg
2-Nitroaniline	8270	1600	ND	ug/Kg
3-Nitroaniline	8270	1600	ND	ug/Kg
4-Nitroaniline	8270	1600	ND	ug/Kg
Nitrobenzene	8270	330	ND	ug/Kg
N-Nitroso-Di-N-propylamine	8270	330	ND	ug/Kg
N-Nitrosodiphenylamine	8270	330	ND	ug/Kg
Phenanthrene	8270	330	ND	ug/Kg
Pyrene	8270	330	ND	ug/Kg
1,2,4-Trichlorobenzene	8270	330	ND	ug/Kg
ACID EXTRACTABLES			--	
4-Chloro-3-methylphenol	8270	330	ND	ug/Kg
2-Chlorophenol	8270	330	ND	ug/Kg
2,4-Dichlorophenol	8270	330	ND	ug/Kg
2,4-Dimethylphenol	8270	330	ND	ug/Kg
2,4-Dinitrophenol	8270	1600	ND	ug/Kg
4,6-Dinitro-2-methylphenol	8270	1600	ND	ug/Kg
2-Nitrophenol	8270	330	ND	ug/Kg
4-Nitrophenol	8270	1600	ND	ug/Kg
Pentachlorophenol	8270	1600	ND	ug/Kg
Phenol	8270	330	ND	ug/Kg
2,4,6-Trichlorophenol	8270	330	ND	ug/Kg
2-Methylphenol	8270	330	ND	ug/Kg
4-Methylphenol	8270	330	ND	ug/Kg
2,4,5-Trichlorophenol	8270	1600	ND	ug/Kg
SURROGATE RESULTS			--	
Nitrobenzene-d5	8270		64	% Rec.
2-Fluorobiphenyl	8270		55	% Rec.
p-Terphenyl-d14	8270		52	% Rec.
Phenol-d5	8270		56	% Rec.
2-Fluorophenol	8270		50	% Rec.
2,4,6-Tribromophenol	8270		46	% Rec.



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 NET Job No: 93.00146

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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011902  
 Date Taken: 01/19/1993  
 Time Taken: 10:45  
 LAB Job No: (-149330 )

Parameter	Method	Reporting Limit	Results	Units
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	0.8	mg/Kg
Barium (ICP)	EPA 6010	2.0	28	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	3.4	mg/Kg
Chromium (ICP)	EPA 6010	2.0	37	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	5.9	mg/Kg
Copper (ICP)	EPA 6010	2.0	14	mg/Kg
Lead (GFAA)	EPA 7421	0.2	1.7	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	31	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	ND	mg/Kg
Thallium (ICP)	EPA 6010	20	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	24	mg/Kg
Zinc (ICP)	EPA 6010	2.0	21	mg/Kg
<b>METHOD 5030 (GC, FID)</b>				
DILUTION FACTOR*			1	
DATE ANALYZED			01-22-93	
as Gasoline	5030	1	ND	mg/Kg
SURROGATE RESULTS			--	
Bromofluorobenzene	5030		97	% Rec.
<b>METHOD 3550 (GC, FID)</b>				
DILUTION FACTOR*			1	
DATE EXTRACTED			01-22-93	
DATE ANALYZED			01-25-93	
as Diesel	3550	1	ND	mg/Kg





Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

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Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011902  
 Date Taken: 01/19/1993  
 Time Taken: 10:45  
 LAB Job No: (-149330 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8010 & 8020 (GC,Solid)				
DATE ANALYZED			01-25-93	
DILUTION FACTOR*			1	
Bromodichloromethane	8010	2.0	ND	ug/Kg
Bromoform	8010	2.0	ND	ug/Kg
Bromomethane	8010	2.0	ND	ug/Kg
Carbon tetrachloride	8010	2.0	ND	ug/Kg
Chlorobenzene	8020	2.0	ND	ug/Kg
Chloroethane	8010	2.0	ND	ug/Kg
2-Chloroethylvinyl ether	8010	5.0	ND	ug/Kg
Chloroform	8010	2.0	ND	ug/Kg
Chloromethane	8010	2.0	ND	ug/Kg
Dibromochloromethane	8010	2.0	ND	ug/Kg
1,2-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,3-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,4-Dichlorobenzene	8020	2.0	ND	ug/Kg
Dichlorodifluoromethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethane	8010	2.0	ND	ug/Kg
1,2-Dichloroethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethene	8010	2.0	ND	ug/Kg
trans-1,2-Dichloroethene	8010	2.0	ND	ug/Kg
1,2-Dichloropropane	8010	2.0	ND	ug/Kg
cis-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
trans-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
Methylene chloride	8010	50	ND	ug/Kg
1,1,2,2-Tetrachloroethane	8010	2.0	ND	ug/Kg
Tetrachloroethene	8010	2.0	ND	ug/Kg
1,1,1-Trichloroethane	8010	2.0	ND	ug/Kg
1,1,2-Trichloroethane	8010	2.0	ND	ug/Kg
Trichloroethene	8010	2.0	ND	ug/Kg
Trichlorofluoromethane	8010	2.0	ND	ug/Kg
Vinyl chloride	8010	2.0	ND	ug/Kg
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	3.0	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (total)	8020	3.0	ND	ug/Kg
SURROGATE RESULTS				
1,4-Difluorobenzene			79	% Rec.
1,4-Dichlorobutane			110	% Rec.



Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011903  
 Date Taken: 01/19/1993  
 Time Taken: 09:00  
 LAB Job No: (-149331 )

Parameter	Method	Reporting Limit	Results	Units
<b>CAM METALS (Solid,TTLC)</b>				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	1.3	mg/Kg
Barium (ICP)	EPA 6010	2.0	61	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	4.1	mg/Kg
Chromium (ICP)	EPA 6010	2.0	42	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	7.2	mg/Kg
Copper (ICP)	EPA 6010	2.0	19	mg/Kg
Lead (GFAA)	EPA 7421	0.2	7.5	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	32	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	ND	mg/Kg
Thallium (ICP)	EPA 6010	20	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	30	mg/Kg
Zinc (ICP)	EPA 6010	2.0	33	mg/Kg
<b>METHOD 5030 (GC,FID)</b>				
DILUTION FACTOR*			1	
DATE ANALYZED			01-22-93	
as Gasoline	5030	1	ND	mg/Kg
<b>SURROGATE RESULTS</b>				
Bromofluorobenzene	5030		97	% Rec.
<b>METHOD 3550 (GC,FID)</b>				
DILUTION FACTOR*			5	
DATE EXTRACTED			01-22-93	
DATE ANALYZED			01-25-93	
as Diesel	3550	1	65**	mg/Kg

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbon rather than Diesel.



Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011903  
 Date Taken: 01/19/1993  
 Time Taken: 09:00  
 LAB Job No: (-149331 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8010 & 8020 (GC,Solid)				
DATE ANALYZED			01-25-93	
DILUTION FACTOR*			1	
Bromodichloromethane	8010	2.0	ND	ug/Kg
Bromoform	8010	2.0	ND	ug/Kg
Bromomethane	8010	2.0	ND	ug/Kg
Carbon tetrachloride	8010	2.0	ND	ug/Kg
Chlorobenzene	8020	2.0	ND	ug/Kg
Chloroethane	8010	2.0	ND	ug/Kg
2-Chloroethylvinyl ether	8010	5.0	ND	ug/Kg
Chloroform	8010	2.0	ND	ug/Kg
Chloromethane	8010	2.0	ND	ug/Kg
Dibromochloromethane	8010	2.0	ND	ug/Kg
1,2-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,3-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,4-Dichlorobenzene	8020	2.0	ND	ug/Kg
Dichlorodifluoromethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethane	8010	2.0	ND	ug/Kg
1,2-Dichloroethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethene	8010	2.0	ND	ug/Kg
trans-1,2-Dichloroethene	8010	2.0	ND	ug/Kg
1,2-Dichloropropane	8010	2.0	ND	ug/Kg
cis-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
trans-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
Methylene chloride	8010	50	ND	ug/Kg
1,1,2,2-Tetrachloroethane	8010	2.0	ND	ug/Kg
Tetrachloroethene	8010	2.0	ND	ug/Kg
1,1,1-Trichloroethane	8010	2.0	ND	ug/Kg
1,1,2-Trichloroethane	8010	2.0	ND	ug/Kg
Trichloroethene	8010	2.0	ND	ug/Kg
Trichlorofluoromethane	8010	2.0	ND	ug/Kg
Vinyl chloride	8010	2.0	ND	ug/Kg
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	3.0	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (total)	8020	3.0	ND	ug/Kg
SURROGATE RESULTS				
1,4-Difluorobenzene			73	% Rec.
1,4-Dichlorobutane			91	% Rec.



Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011906  
 Date Taken: 01/19/1993  
 Time Taken: 14:50  
 LAB Job No: (-149332 )

Parameter	Method	Reporting Limit	Results	Units
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	1.1	mg/Kg
Barium (ICP)	EPA 6010	2.0	42	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	4.3	mg/Kg
Chromium (ICP)	EPA 6010	2.0	44	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	6.8	mg/Kg
Copper (ICP)	EPA 6010	2.0	18	mg/Kg
Lead (GFAA)	EPA 7421	0.2	17	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	35	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	ND	mg/Kg
Thallium (ICP)	EPA 6010	20	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	28	mg/Kg
Zinc (ICP)	EPA 6010	2.0	23	mg/Kg
<b>METHOD 5030 (GC, FID)</b>				
DILUTION FACTOR*			1	
DATE ANALYZED			01-22-93	
as Gasoline	5030	1	ND	mg/Kg
<b>SURROGATE RESULTS</b>				
Bromofluorobenzene	5030		94	% Rec.
<b>METHOD 3550 (GC, FID)</b>				
DILUTION FACTOR*			1	
DATE EXTRACTED			01-22-93	
DATE ANALYZED			01-25-93	
as Diesel	3550	1	21**	mg/Kg

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbon rather than Diesel.



Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011906  
 Date Taken: 01/19/1993  
 Time Taken: 14:50  
 LAB Job No: (-149332 )

Parameter	Method	Reporting Limit	Results	Units
METHOD 8010 & 8020 (GC,Solid)				
DATE ANALYZED			01-25-93	
DILUTION FACTOR*			1	
Bromodichloromethane	8010	2.0	ND	ug/Kg
Bromoform	8010	2.0	ND	ug/Kg
Bromomethane	8010	2.0	ND	ug/Kg
Carbon tetrachloride	8010	2.0	ND	ug/Kg
Chlorobenzene	8020	2.0	ND	ug/Kg
Chloroethane	8010	2.0	ND	ug/Kg
2-Chloroethylvinyl ether	8010	5.0	ND	ug/Kg
Chloroform	8010	2.0	ND	ug/Kg
Chloromethane	8010	2.0	ND	ug/Kg
Dibromochloromethane	8010	2.0	ND	ug/Kg
1,2-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,3-Dichlorobenzene	8020	2.0	ND	ug/Kg
1,4-Dichlorobenzene	8020	2.0	ND	ug/Kg
Dichlorodifluoromethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethane	8010	2.0	ND	ug/Kg
1,2-Dichloroethane	8010	2.0	ND	ug/Kg
1,1-Dichloroethene	8010	2.0	ND	ug/Kg
trans-1,2-Dichloroethene	8010	2.0	ND	ug/Kg
1,2-Dichloropropane	8010	2.0	ND	ug/Kg
cis-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
trans-1,3-Dichloropropene	8010	2.0	ND	ug/Kg
Methylene chloride	8010	50	ND	ug/Kg
1,1,2,2-Tetrachloroethane	8010	2.0	ND	ug/Kg
Tetrachloroethene	8010	2.0	ND	ug/Kg
1,1,1-Trichloroethane	8010	2.0	ND	ug/Kg
1,1,2-Trichloroethane	8010	2.0	ND	ug/Kg
Trichloroethene	8010	2.0	ND	ug/Kg
Trichlorofluoromethane	8010	2.0	ND	ug/Kg
Vinyl chloride	8010	2.0	ND	ug/Kg
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	3.0	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (total)	8020	3.0	ND	ug/Kg
SURROGATE RESULTS				
1,4-Difluorobenzene			79	% Rec.
1,4-Dichlorobutane			92	% Rec.



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Job No: 93.00146

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SAMPLE DESCRIPTION: 93011904  
Date Taken: 01/19/1993  
Time Taken: 09:04  
LAB Job No: (-149333 )

<u>Parameter</u>	<u>Method</u>	<u>Reporting Limit</u>	<u>Results</u>	<u>Units</u>
TPH (Gas/BTXE,Solid)				
METHOD 5030 (GC,FID)			--	
DATE ANALYZED			01-22-93	
DILUTION FACTOR*			1	
as Gasoline	5030	1	ND	mg/Kg
METHOD 8020 (GC,Solid)			--	
DATE ANALYZED			01-22-93	
DILUTION FACTOR*			1	
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	2.5	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (Total)	8020	2.5	ND	ug/Kg
SURROGATE RESULTS			--	
Bromofluorobenzene	5030		97	% Rec.



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Job No: 93.00146

Date: 02/04/1993  
 Page: 29

Ref: OBB, Job: 21078.01

SAMPLE DESCRIPTION: 93011907  
 Date Taken: 01/19/1993  
 Time Taken: 15:15  
 LAB Job No: (-149334 )

Parameter	Method	Reporting Limit	Results	Units
<b>CAM METALS (Solid,TTLC)</b>				
Antimony (ICP)	EPA 6010	10	ND	mg/Kg
Arsenic (GFAA)	EPA 7060	0.5	0.6	mg/Kg
Barium (ICP)	EPA 6010	2.0	38	mg/Kg
Beryllium (ICP)	EPA 6010	2.0	ND	mg/Kg
Cadmium (ICP)	EPA 6010	2.0	3.3	mg/Kg
Chromium (ICP)	EPA 6010	2.0	36	mg/Kg
Chromium+6 (FLAA)	EPA 7197	2.0	NA	mg/Kg
Cobalt (ICP)	EPA 6010	5.0	5.8	mg/Kg
Copper (ICP)	EPA 6010	2.0	14	mg/Kg
Lead (GFAA)	EPA 7421	0.2	1.6	mg/Kg
Mercury (CVAA)	EPA 7471	0.1	ND	mg/Kg
Molybdenum (ICP)	EPA 6010	5.0	ND	mg/Kg
Nickel (ICP)	EPA 6010	5.0	38	mg/Kg
Selenium (GFAA)	EPA 7740	0.5	ND	mg/Kg
Silver (ICP)	EPA 6010	2.0	ND	mg/Kg
Thallium (ICP)	EPA 6010	20	ND	mg/Kg
Vanadium (ICP)	EPA 6010	5.0	26	mg/Kg
Zinc (ICP)	EPA 6010	2.0	22	mg/Kg
<b>TPH (Gas/BTXE,Solid)</b>				
METHOD 5030 (GC,FID)				
DATE ANALYZED			--	
DILUTION FACTOR*			01-22-93	
as Gasoline			1	
5030	1	ND		mg/Kg
METHOD 8020 (GC,Solid)				
DATE ANALYZED			--	
DILUTION FACTOR*			01-22-93	
1				
Benzene	8020	2.5	ND	ug/Kg
Ethylbenzene	8020	2.5	ND	ug/Kg
Toluene	8020	2.5	ND	ug/Kg
Xylenes (Total)	8020	2.5	ND	ug/Kg
SURROGATE RESULTS				
Bromofluorobenzene			--	
5030		90		% Rec.



Ref: OBB, Job: 21078.01

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	1	mg/Kg	105	ND	75	89	17
Motor Oil	10	mg/Kg	96	ND	N/A	N/A	N/A
Gasoline	1	mg/Kg	107	ND	81	86	6.2
Benzene	2.5	ug/Kg	114	ND	92	89	4.2
Toluene	2.5	ug/Kg	114	ND	96	95	1.9
Antimony	10	mg/Kg	100	ND	92	84	9.7
Arsenic	0.5	mg/Kg	103	ND	87	80	6.4
Barium	2	mg/Kg	99	ND	87	97	7.1
Beryllium	2	mg/Kg	91	ND	87	87	<1
Cadmium	2	mg/Kg	107	ND	91	91	<1
Chromium	2	mg/Kg	99	ND	91	104	9.3
Cobalt	5	mg/Kg	106	ND	92	91	<1
Copper	2	mg/Kg	107	ND	89	90	<1
Lead	20	mg/Kg	97	ND	104	100	3.9
Mercury	0.1	mg/Kg	105	ND	100	101	<1
Molybdenum	5	mg/Kg	106	ND	84	83	1.5
Nickel	5	mg/Kg	104	ND	91	98	5.0
Selenium	0.5	mg/Kg	101	ND	82	87	5.4
Silver	2	mg/Kg	98	ND	86	87	<1
Thallium	20	mg/Kg	94	ND	82	81	1.5
Vanadium	5	mg/Kg	103	ND	94	97	2.2
Zinc	2	mg/Kg	103	ND	90	87	2.5

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Benzene	2.5	ug/Kg	106	ND	112	109	2.7
Toluene	2.5	ug/Kg	101	ND	105	102	2.9
1,1-Dichloroethene	2.0	ug/Kg	96	ND	106	102	3.8
Trichloroethene	2.0	ug/Kg	122	ND	137	127	7.6
Chlorobenzene	2.0	ug/Kg	109	ND	116	105	10
Phenol	330	ug/Kg	98	ND	63	72	14
2-Chlorophenol	330	ug/Kg	97	ND	71	84	16
1,4-Dichlorobenzene	330	ug/Kg	109	ND	70	80	13
1,2,4-Trichlorobenzene	330	ug/Kg	113	ND	67	75	10
4-Nitrophenol	1600	ug/Kg	88	ND	72	82	13
Pyrene	330	ug/Kg	82	ND	69	75	8.0

COMMENT: Blank Results were ND on other analytes tested.



## KEY TO ABBREVIATIONS and METHOD REFERENCES

- < : Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
- \* : Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values).
- ICVS : Initial Calibration Verification Standard (External Standard).
- mean : Average; sum of measurements divided by number of measurements.
- mg/Kg (ppm) : Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
- mg/L : Concentration in units of milligrams of analyte per liter of sample.
- mL/L/hr : Milliliters per liter per hour.
- MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.
- N/A : Not applicable.
- NA : Not analyzed.
- ND : Not detected; the analyte concentration is less than applicable listed reporting limit.
- NTU : Nephelometric turbidity units.
- RPD : Relative percent difference,  $100 \text{ (Value 1 - Value 2) / mean value}$ .
- SNA : Standard not available.
- ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
- ug/L : Concentration in units of micrograms of analyte per liter of sample.
- umhos/cm : Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 17th Edition, APHA, 1989.

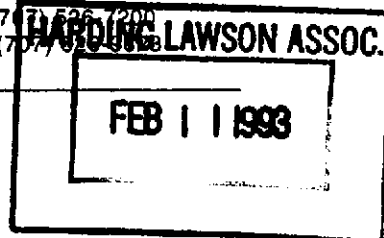




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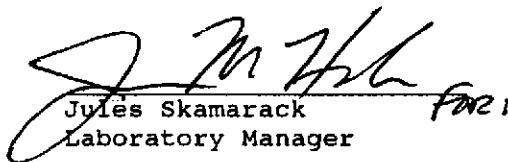
Date: 02/06/1993  
NET Client Acct. No: 28100  
NET Pacific Job No: 93.00189  
Received: 01/22/1993

Client Reference Information

OBB, Job No. 21078 02

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

  
Jules Skamarack  
Laboratory Manager

Enclosure(s)



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012201  
 Date Taken: 01/19/1993  
 Time Taken: 08:35  
 LAB Job No: (-149525 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	3.0	0.5	mg/Kg	EPA 7060
Barium (ICP)	170	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	4.5	2.0	mg/Kg	EPA 6010
Chromium (ICP)	35	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	14	5.0	mg/Kg	EPA 6010
Copper (ICP)	27	2.0	mg/Kg	EPA 6010
Lead (GFAA)	50	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	ND	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	55	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	32	5.0	mg/Kg	EPA 6010
Zinc (ICP)	48	2.0	mg/Kg	EPA 6010
<b>TPH (Gas/BTXE, Solid)</b>				
METHOD 5030 (GC, FID)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC, Solid)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	114		% Rec.	5030
<b>METHOD 3550 (GC, FID)</b>				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	23**	1	mg/Kg	3550

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbons rather than Diesel.



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.00189

Date: 02/06/1993  
 Page: 3

Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012201  
 Date Taken: 01/19/1993  
 Time Taken: 08:35  
 LAB Job No: (-149525 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	ND	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	70		% Rec.	
Bromochloromethane	70		% Rec.	



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.00189

Date: 02/06/1993  
Page: 4

Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012201  
Date Taken: 01/19/1993  
Time Taken: 08:35  
LAB Job No: (-149525 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED	01-27-93			
DATE ANALYZED	01-28-93			
DILUTION FACTOR*	1			
Acenaphthene	ND	330	ug/Kg	8270
Acenaphthylene	ND	330	ug/Kg	8270
Aldrin	ND	1600	ug/Kg	8270
Anthracene	ND	330	ug/Kg	8270
Benzidine	ND	1600	ug/Kg	8270
Benzo(a)anthracene	ND	330	ug/Kg	8270
Benzo(b)fluoranthene	ND	330	ug/Kg	8270
Benzo(k)fluoranthene	ND	330	ug/Kg	8270
Benzo(a)pyrene	ND	330	ug/Kg	8270
Benzo(g,h,i)perylene	ND	330	ug/Kg	8270
Benzoic acid	ND	1600	ug/Kg	8270
Benzyl alcohol	ND	330	ug/Kg	8270
Butyl benzyl phthalate	ND	330	ug/Kg	8270
delta-BHC	ND	1600	ug/Kg	8270
gamma-BHC	ND	1600	ug/Kg	8270
bis(2-Chloroethyl)ether	ND	330	ug/Kg	8270
bis(2-Chloroethoxy)methane	ND	330	ug/Kg	8270
bis(2-Chloroisopropyl)ether	ND	330	ug/Kg	8270
bis(2-Ethylhexyl)phthalate	ND	330	ug/Kg	8270
4-Bromophenyl phenyl ether	ND	330	ug/Kg	8270
4-Chloroaniline	ND	330	ug/Kg	8270
2-Chloronaphthalene	ND	330	ug/Kg	8270
4-Chlorophenyl phenyl ether	ND	330	ug/Kg	8270
Chrysene	ND	330	ug/Kg	8270
4,4'-DDD	ND	1600	ug/Kg	8270
4,4'-DDE	ND	1600	ug/Kg	8270
4,4'-DDT	ND	1600	ug/Kg	8270
Dibenzo(a,h)anthracene	ND	330	ug/Kg	8270
Dibenzofuran	ND	330	ug/Kg	8270
Di-n-butylphthalate	ND	330	ug/Kg	8270
1,2-Dichlorobenzene	ND	330	ug/Kg	8270
1,3-Dichlorobenzene	ND	330	ug/Kg	8270
1,4-Dichlorobenzene	ND	330	ug/Kg	8270
3,3'-Dichlorobenzidine	ND	660	ug/Kg	8270
Dieldrin	ND	1600	ug/Kg	8270
Diethylphthalate	ND	330	ug/Kg	8270
Dimethyl phthalate	ND	330	ug/Kg	8270
2,4-Dinitrotoluene	ND	330	ug/Kg	8270
2,6-Dinitrotoluene	ND	330	ug/Kg	8270
Di-n-octyl phthalate	ND	330	ug/Kg	8270
Endrin aldehyde	ND	1600	ug/Kg	8270
Fluoranthene	ND	330	ug/Kg	8270
Fluorene	ND	330	ug/Kg	8270



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.00189

Date: 02/06/1993  
Page: 5

Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012201  
Date Taken: 01/19/1993  
Time Taken: 08:35  
LAB Job No: (-149525 )

Parameter	Results	Reporting Limit	Units	Method
Heptachlor	ND	1600	ug/Kg	8270
Heptachlor epoxide	ND	1600	ug/Kg	8270
Hexachlorobenzene	ND	330	ug/Kg	8270
Hexachlorobutadiene	ND	330	ug/Kg	8270
Hexachlorocyclopentadiene	ND	330	ug/Kg	8270
Hexachloroethane	ND	330	ug/Kg	8270
Indeno(1,2,3-cd)pyrene	ND	330	ug/Kg	8270
Isophorone	ND	330	ug/Kg	8270
2-Methylnaphthalene	ND	330	ug/Kg	8270
Naphthalene	ND	330	ug/Kg	8270
2-Nitroaniline	ND	1600	ug/Kg	8270
3-Nitroaniline	ND	1600	ug/Kg	8270
4-Nitroaniline	ND	1600	ug/Kg	8270
Nitrobenzene	ND	330	ug/Kg	8270
N-Nitroso-Di-N-propylamine	ND	330	ug/Kg	8270
N-Nitrosodiphenylamine	ND	330	ug/Kg	8270
Phenanthrene	ND	330	ug/Kg	8270
Pyrene	ND	330	ug/Kg	8270
1,2,4-Trichlorobenzene	ND	330	ug/Kg	8270
ACID EXTRACTABLES	--			
4-Chloro-3-methylphenol	ND	330	ug/Kg	8270
2-Chlorophenol	ND	330	ug/Kg	8270
2,4-Dichlorophenol	ND	330	ug/Kg	8270
2,4-Dimethylphenol	ND	330	ug/Kg	8270
2,4-Dinitrophenol	ND	1600	ug/Kg	8270
4,6-Dinitro-2-methylphenol	ND	1600	ug/Kg	8270
2-Nitrophenol	ND	330	ug/Kg	8270
4-Nitrophenol	ND	1600	ug/Kg	8270
Pentachlorophenol	ND	1600	ug/Kg	8270
Phenol	ND	330	ug/Kg	8270
2,4,6-Trichlorophenol	ND	330	ug/Kg	8270
2-Methylphenol	ND	330	ug/Kg	8270
4-Methylphenol	ND	330	ug/Kg	8270
2,4,5-Trichlorophenol	ND	1600	ug/Kg	8270
SURROGATE RESULTS	--			
Nitrobenzene-d5	76		% Rec.	8270
2-Fluorobiphenyl	73		% Rec.	8270
p-Terphenyl-d14	73		% Rec.	8270
Phenol-d5	74		% Rec.	8270
2-Fluorophenol	67		% Rec.	8270
2,4,6-Tribromophenol	73		% Rec.	8270



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.00189

Date: 02/06/1993  
 Page: 6

Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012202  
 Date Taken: 01/20/1993  
 Time Taken: 07:30  
 LAB Job No: (-149526 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid,TTLC)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	ND	0.5	mg/Kg	EPA 7060
Barium (ICP)	34	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	3.8	2.0	mg/Kg	EPA 6010
Chromium (ICP)	53	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	9.2	5.0	mg/Kg	EPA 6010
Copper (ICP)	16	2.0	mg/Kg	EPA 6010
Lead (GFAA)	2.3	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	ND	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	39	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	32	5.0	mg/Kg	EPA 6010
Zinc (ICP)	21	2.0		EPA 6010
<b>TPH (Gas/BTXE,Solid)</b>				
METHOD 5030 (GC,FID)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC,Solid)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	102		% Rec.	5030
<b>METHOD 3550 (GC,FID)</b>				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	ND	1	mg/Kg	3550





Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.00189

Date: 02/06/1993  
 Page: 7

Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012202  
 Date Taken: 01/20/1993  
 Time Taken: 07:30  
 LAB Job No: (-149526 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	ND	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	94		% Rec.	
Bromochloromethane	102		% Rec.	



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012203  
 Date Taken: 01/21/1993  
 Time Taken: 14:00  
 LAB Job No: (-149527 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	2.4	0.5	mg/Kg	EPA 7060
Barium (ICP)	82	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	4.6	2.0	mg/Kg	EPA 6010
Chromium (ICP)	28	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	8.1	5.0	mg/Kg	EPA 6010
Copper (ICP)	26	2.0	mg/Kg	EPA 6010
Lead (GFAA)	230	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	0.23	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	25	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	28	5.0	mg/Kg	EPA 6010
Zinc (ICP)	69	2.0	mg/Kg	EPA 6010
<b>TPH (Gas/BTXE, Solid)</b>				
METHOD 5030 (GC, FID)				
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC, Solid)				
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS				
Bromofluorobenzene	107		% Rec.	5030
METHOD 3550 (GC, FID)				
DILUTION FACTOR*	100			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	1,600**	1	mg/Kg	3550

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbons rather than Diesel.



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.00189

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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012203  
 Date Taken: 01/21/1993  
 Time Taken: 14:00  
 LAB Job No: (-149527 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	5.4	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	92		% Rec.	
Bromochloromethane	109		% Rec.	



Client Acct: 28100  
Client Name: Harding Lawson Associates  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012203  
Date Taken: 01/21/1993  
Time Taken: 14:00  
LAB Job No: (-149527 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED	01-27-93			
DATE ANALYZED	01-28-93			
DILUTION FACTOR*	1			
Acenaphthene	ND	330	ug/Kg	8270
Acenaphthylene	ND	330	ug/Kg	8270
Aldrin	ND	1600	ug/Kg	8270
Anthracene	ND	330	ug/Kg	8270
Benzidine	ND	1600	ug/Kg	8270
Benzo(a)anthracene	ND	330	ug/Kg	8270
Benzo(b)fluoranthene	ND	330	ug/Kg	8270
Benzo(k)fluoranthene	ND	330	ug/Kg	8270
Benzo(a)pyrene	ND	330	ug/Kg	8270
Benzo(g,h,i)perylene	ND	330	ug/Kg	8270
Benzoic acid	ND	1600	ug/Kg	8270
Benzyl alcohol	ND	330	ug/Kg	8270
Butyl benzyl phthalate	ND	330	ug/Kg	8270
delta-BHC	ND	1600	ug/Kg	8270
gamma-BHC	ND	1600	ug/Kg	8270
bis(2-Chloroethyl)ether	ND	330	ug/Kg	8270
bis(2-Chloroethoxy)methane	ND	330	ug/Kg	8270
bis(2-Chloroisopropyl)ether	ND	330	ug/Kg	8270
bis(2-Ethylhexyl)phthalate	ND	330	ug/Kg	8270
4-Bromophenyl phenyl ether	ND	330	ug/Kg	8270
4-Chloroaniline	ND	330	ug/Kg	8270
2-Chloronaphthalene	ND	330	ug/Kg	8270
4-Chlorophenyl phenyl ether	ND	330	ug/Kg	8270
Chrysene	ND	330	ug/Kg	8270
4,4'-DDD	ND	1600	ug/Kg	8270
4,4'-DDE	ND	1600	ug/Kg	8270
4,4'-DDT	ND	1600	ug/Kg	8270
Dibenzo(a,h)anthracene	ND	330	ug/Kg	8270
Dibenzofuran	ND	330	ug/Kg	8270
Di-n-butylphthalate	ND	330	ug/Kg	8270
1,2-Dichlorobenzene	ND	330	ug/Kg	8270
1,3-Dichlorobenzene	ND	330	ug/Kg	8270
1,4-Dichlorobenzene	ND	330	ug/Kg	8270
3,3'-Dichlorobenzidine	ND	660	ug/Kg	8270
Dieldrin	ND	1600	ug/Kg	8270
Diethylphthalate	ND	330	ug/Kg	8270
Dimethyl phthalate	ND	330	ug/Kg	8270
2,4-Dinitrotoluene	ND	330	ug/Kg	8270
2,6-Dinitrotoluene	ND	330	ug/Kg	8270
Di-n-octyl phthalate	ND	330	ug/Kg	8270
Endrin aldehyde	ND	1600	ug/Kg	8270
Fluoranthene	ND	330	ug/Kg	8270
Fluorene	ND	330	ug/Kg	8270



Client Acct: 28100  
Client Name: Harding Lawson Associates  
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SAMPLE DESCRIPTION: 93012206  
Date Taken: 01/21/1993  
Time Taken: 08:20  
LAB Job No: (-149530 )

Parameter	Results	Reporting Limit	Units	Method
TPH (Gas/BTXE,Solid)				
METHOD 5030 (GC,FID)	--			
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC,Solid)	--			
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	102		% Rec.	5030
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	ND	1	mg/Kg	3550



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.00189

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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012209  
 Date Taken: 01/20/1993  
 Time Taken: 10:50  
 LAB Job No: (-149533 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-27-93			
DILUTION FACTOR*	10			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	ND	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	107		% Rec.	
1,4-Dichlorobutane	104		% Rec.	



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012210  
 Date Taken: 01/21/1993  
 Time Taken: 14:10  
 LAB Job No: (-149534 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid,TTL)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	1.4	0.5	mg/Kg	EPA 7060
Barium (ICP)	40	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	3.6	2.0	mg/Kg	EPA 6010
Chromium (ICP)	44	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	6.8	5.0	mg/Kg	EPA 6010
Copper (ICP)	21	2.0	mg/Kg	EPA 6010
Lead (GFAA)	6.3	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	ND	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	28	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	34	5.0	mg/Kg	EPA 6010
Zinc (ICP)	24	2.0	mg/Kg	EPA 6010
<b>TPH (Gas/BTXE,Solid)</b>				
METHOD 5030 (GC,FID)				
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC,Solid)				
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS				
Bromofluorobenzene	114		% Rec.	5030
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	ND	1	mg/Kg	3550



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012211  
 Date Taken: 01/21/1993  
 Time Taken: 12:35  
 LAB Job No: (-149535 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	1.9	0.5	mg/Kg	EPA 7060
Barium (ICP)	65	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	3.8	2.0	mg/Kg	EPA 6010
Chromium (ICP)	49	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	5.7	5.0	mg/Kg	EPA 6010
Copper (ICP)	21	2.0	mg/Kg	EPA 6010
Lead (GFAA)	2.8	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	ND	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	33	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	32	5.0	mg/Kg	EPA 6010
Zinc (ICP)	22	2.0	mg/Kg	EPA 6010
<b>TPH (Gas/BTXE, Solid)</b>				
METHOD 5030 (GC, FID)				
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC, Solid)				
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS				
Bromofluorobenzene	111		% Rec.	5030
METHOD 3550 (GC, FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	ND	1	mg/Kg	3550





Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012212  
 Date Taken: 01/20/1993  
 Time Taken: 12:18  
 LAB Job No: (-149536 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	1.0	0.5	mg/Kg	EPA 7060
Barium (ICP)	42	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	2.0	2.0	mg/Kg	EPA 6010
Chromium (ICP)	30	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	ND	5.0	mg/Kg	EPA 6010
Copper (ICP)	12	2.0	mg/Kg	EPA 6010
Lead (GFAA)	5.1	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	ND	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	12	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	18	5.0	mg/Kg	EPA 6010
Zinc (ICP)	15	2.0	mg/Kg	EPA 6010
<b>TPH (Gas/BTXE, Solid)</b>				
METHOD 5030 (GC, FID)				
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC, Solid)				
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS				
Bromofluorobenzene	105		% Rec.	5030
METHOD 3550 (GC, FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	ND	1	mg/Kg	3550



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.00189

Date: 02/06/1993  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012212  
 Date Taken: 01/20/1993  
 Time Taken: 12:18  
 LAB Job No: (-149536 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	ND	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	101		% Rec.	
Bromochloromethane	109		% Rec.	



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.00189

Date: 02/06/1993  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012212  
Date Taken: 01/20/1993  
Time Taken: 12:18  
LAB Job No: (-149536 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED	01-27-93			
DATE ANALYZED	01-28-93			
DILUTION FACTOR*	1			
Acenaphthene	ND	330	ug/Kg	8270
Acenaphthylene	ND	330	ug/Kg	8270
Aldrin	ND	1600	ug/Kg	8270
Anthracene	ND	330	ug/Kg	8270
Benzidine	ND	1600	ug/Kg	8270
Benzo(a)anthracene	ND	330	ug/Kg	8270
Benzo(b)fluoranthene	ND	330	ug/Kg	8270
Benzo(k)fluoranthene	ND	330	ug/Kg	8270
Benzo(a)pyrene	ND	330	ug/Kg	8270
Benzo(g,h,i)perylene	ND	330	ug/Kg	8270
Benzoic acid	ND	1600	ug/Kg	8270
Benzyl alcohol	ND	330	ug/Kg	8270
Butyl benzyl phthalate	ND	330	ug/Kg	8270
delta-BHC	ND	1600	ug/Kg	8270
gamma-BHC	ND	1600	ug/Kg	8270
bis(2-Chloroethyl)ether	ND	330	ug/Kg	8270
bis(2-Chloroethoxy)methane	ND	330	ug/Kg	8270
bis(2-Chloroisopropyl)ether	ND	330	ug/Kg	8270
bis(2-Ethylhexyl)phthalate	ND	330	ug/Kg	8270
4-Bromophenyl phenyl ether	ND	330	ug/Kg	8270
4-Chloroaniline	ND	330	ug/Kg	8270
2-Chloronaphthalene	ND	330	ug/Kg	8270
4-Chlorophenyl phenyl ether	ND	330	ug/Kg	8270
Chrysene	ND	330	ug/Kg	8270
4,4'-DDD	ND	1600	ug/Kg	8270
4,4'-DDE	ND	1600	ug/Kg	8270
4,4'-DDT	ND	1600	ug/Kg	8270
Dibenzo(a,h)anthracene	ND	330	ug/Kg	8270
Dibenzofuran	ND	330	ug/Kg	8270
Di-n-butylphthalate	ND	330	ug/Kg	8270
1,2-Dichlorobenzene	ND	330	ug/Kg	8270
1,3-Dichlorobenzene	ND	330	ug/Kg	8270
1,4-Dichlorobenzene	ND	330	ug/Kg	8270
3,3'-Dichlorobenzidine	ND	660	ug/Kg	8270
Dieldrin	ND	1600	ug/Kg	8270
Diethylphthalate	ND	330	ug/Kg	8270
Dimethyl phthalate	ND	330	ug/Kg	8270
2,4-Dinitrotoluene	ND	330	ug/Kg	8270
2,6-Dinitrotoluene	ND	330	ug/Kg	8270
Di-n-octyl phthalate	ND	330	ug/Kg	8270
Endrin aldehyde	ND	1600	ug/Kg	8270
Fluoranthene	ND	330	ug/Kg	8270
Fluorene	ND	330	ug/Kg	8270



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.00189

Date: 02/06/1993  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012212  
Date Taken: 01/20/1993  
Time Taken: 12:18  
LAB Job No: (-149536 )

Parameter	Results	Reporting Limit	Units	Method
Heptachlor	ND	1600	ug/Kg	8270
Heptachlor epoxide	ND	1600	ug/Kg	8270
Hexachlorobenzene	ND	330	ug/Kg	8270
Hexachlorobutadiene	ND	330	ug/Kg	8270
Hexachlorocyclopentadiene	ND	330	ug/Kg	8270
Hexachloroethane	ND	330	ug/Kg	8270
Indeno(1,2,3-cd)pyrene	ND	330	ug/Kg	8270
Isophorone	ND	330	ug/Kg	8270
2-Methylnaphthalene	ND	330	ug/Kg	8270
Naphthalene	ND	330	ug/Kg	8270
2-Nitroaniline	ND	1600	ug/Kg	8270
3-Nitroaniline	ND	1600	ug/Kg	8270
4-Nitroaniline	ND	1600	ug/Kg	8270
Nitrobenzene	ND	330	ug/Kg	8270
N-Nitroso-Di-N-propylamine	ND	330	ug/Kg	8270
N-Nitrosodiphenylamine	ND	330	ug/Kg	8270
Phenanthrene	ND	330	ug/Kg	8270
Pyrene	ND	330	ug/Kg	8270
1,2,4-Trichlorobenzene	ND	330	ug/Kg	8270
ACID EXTRACTABLES	--			
4-Chloro-3-methylphenol	ND	330	ug/Kg	8270
2-Chlorophenol	ND	330	ug/Kg	8270
2,4-Dichlorophenol	ND	330	ug/Kg	8270
2,4-Dimethylphenol	ND	330	ug/Kg	8270
2,4-Dinitrophenol	ND	1600	ug/Kg	8270
4,6-Dinitro-2-methylphenol	ND	1600	ug/Kg	8270
2-Nitrophenol	ND	330	ug/Kg	8270
4-Nitrophenol	ND	1600	ug/Kg	8270
Pentachlorophenol	ND	1600	ug/Kg	8270
Phenol	ND	330	ug/Kg	8270
2,4,6-Trichlorophenol	ND	330	ug/Kg	8270
2-Methylphenol	ND	330	ug/Kg	8270
4-Methylphenol	ND	330	ug/Kg	8270
2,4,5-Trichlorophenol	ND	1600	ug/Kg	8270
SURROGATE RESULTS	--			
Nitrobenzene-d5	74		% Rec.	8270
2-Fluorobiphenyl	70		% Rec.	8270
p-Terphenyl-d14	96		% Rec.	8270
Phenol-d5	79		% Rec.	8270
2-Fluorophenol	154		% Rec.	8270
2,4,6-Tribromophenol	59		% Rec.	8270



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.00189

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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012213  
 Date Taken: 01/20/1993  
 Time Taken: 12:35  
 LAB Job No: (-149537 )

Parameter	Results	Reporting Limit	Units	Method
TPH (Gas/BTXE,Solid)	--			
METHOD 5030 (GC,FID)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC,Solid)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	105		% Rec.	5030
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	ND	1	mg/Kg	3550



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.00189

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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012213  
Date Taken: 01/20/1993  
Time Taken: 12:35  
LAB Job No: (-149537 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	ND	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS	--			
1,4-Difluorobenzene	102		% Rec.	
Bromochloromethane	107		% Rec.	



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012214  
 Date Taken: 01/20/1993  
 Time Taken: 12:45  
 LAB Job No: (-149538 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	1.0	0.5	mg/Kg	EPA 7060
Barium (ICP)	39	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	3.2	2.0	mg/Kg	EPA 6010
Chromium (ICP)	33	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	5.5	5.0	mg/Kg	EPA 6010
Copper (ICP)	15	2.0	mg/Kg	EPA 6010
Lead (GFAA)	2.1	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	ND	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	33	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	25	5.0	mg/Kg	EPA 6010
Zinc (ICP)	17	2.0	mg/Kg	EPA 6010
<b>TPH (Gas/BTXE, Solid)</b>				
METHOD 5030 (GC, FID)				
DATE ANALYZED	01-27-93			
DILUTION FACTOR*	200			
as Gasoline	2,000	1	mg/Kg	5030
METHOD 8020 (GC, Solid)				
DATE ANALYZED	01-27-93			
DILUTION FACTOR*	200			
Benzene	8,200	2.5	ug/Kg	8020
Ethylbenzene	4,000	2.5	ug/Kg	8020
Toluene	2,700	2.5	ug/Kg	8020
Xylenes (Total)	12,000	2.5	ug/Kg	8020
SURROGATE RESULTS				
Bromofluorobenzene	142***		% Rec.	5030
METHOD 3550 (GC, FID)				
DILUTION FACTOR*	200			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	750**	1	mg/Kg	3550

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of lighter hydrocarbons rather than Diesel.

\*\*\* High surrogate recovery due to matrix interference.



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012214  
 Date Taken: 01/20/1993  
 Time Taken: 12:45  
 LAB Job No: (-149538 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-27-93			
DILUTION FACTOR*	10			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	ND	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	127		% Rec.	
1,4-Dichlorobutane	135		% Rec.	



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012214  
Date Taken: 01/20/1993  
Time Taken: 12:45  
LAB Job No: (-149538 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8270(GCMS,Solid)				
DATE EXTRACTED	01-27-93			
DATE ANALYZED	01-28-93			
DILUTION FACTOR*	1			
Acenaphthene	ND	330	ug/Kg	8270
Acenaphthylene	ND	330	ug/Kg	8270
Aldrin	ND	1600	ug/Kg	8270
Anthracene	ND	330	ug/Kg	8270
Benzidine	ND	1600	ug/Kg	8270
Benzo(a)anthracene	ND	330	ug/Kg	8270
Benzo(b)fluoranthene	ND	330	ug/Kg	8270
Benzo(k)fluoranthene	ND	330	ug/Kg	8270
Benzo(a)pyrene	ND	330	ug/Kg	8270
Benzo(g,h,i)perylene	ND	330	ug/Kg	8270
Benzoic acid	ND	1600	ug/Kg	8270
Benzyl alcohol	ND	330	ug/Kg	8270
Butyl benzyl phthalate	ND	330	ug/Kg	8270
delta-BHC	ND	1600	ug/Kg	8270
gamma-BHC	ND	1600	ug/Kg	8270
bis(2-Chloroethyl)ether	ND	330	ug/Kg	8270
bis(2-Chloroethoxy)methane	ND	330	ug/Kg	8270
bis(2-Chloroisopropyl)ether	ND	330	ug/Kg	8270
bis(2-Ethylhexyl)phthalate	ND	330	ug/Kg	8270
4-Bromophenyl phenyl ether	ND	330	ug/Kg	8270
4-Chloroaniline	ND	330	ug/Kg	8270
2-Chloronaphthalene	ND	330	ug/Kg	8270
4-Chlorophenyl phenyl ether	ND	330	ug/Kg	8270
Chrysene	ND	330	ug/Kg	8270
4,4'-DDD	ND	1600	ug/Kg	8270
4,4'-DDE	ND	1600	ug/Kg	8270
4,4'-DDT	ND	1600	ug/Kg	8270
Dibenzo(a,h)anthracene	ND	330	ug/Kg	8270
Dibenzofuran	ND	330	ug/Kg	8270
Di-n-butylphthalate	ND	330	ug/Kg	8270
1,2-Dichlorobenzene	ND	330	ug/Kg	8270
1,3-Dichlorobenzene	ND	330	ug/Kg	8270
1,4-Dichlorobenzene	ND	330	ug/Kg	8270
3,3'-Dichlorobenzidine	ND	660	ug/Kg	8270
Dieldrin	ND	1600	ug/Kg	8270
Diethylphthalate	ND	330	ug/Kg	8270
Dimethyl phthalate	ND	330	ug/Kg	8270
2,4-Dinitrotoluene	ND	330	ug/Kg	8270
2,6-Dinitrotoluene	ND	330	ug/Kg	8270
Di-n-octyl phthalate	ND	330	ug/Kg	8270
Endrin aldehyde	ND	1600	ug/Kg	8270
Fluoranthene	ND	330	ug/Kg	8270
Fluorene	ND	330	ug/Kg	8270



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012214  
 Date Taken: 01/20/1993  
 Time Taken: 12:45  
 LAB Job No: (-149538 )

Parameter	Results	Reporting Limit	Units	Method
Heptachlor	ND	1600	ug/Kg	8270
Heptachlor epoxide	ND	1600	ug/Kg	8270
Hexachlorobenzene	ND	330	ug/Kg	8270
Hexachlorobutadiene	ND	330	ug/Kg	8270
Hexachlorocyclopentadiene	ND	330	ug/Kg	8270
Hexachloroethane	ND	330	ug/Kg	8270
Indeno(1,2,3-cd)pyrene	ND	330	ug/Kg	8270
Isophorone	ND	330	ug/Kg	8270
2-Methylnaphthalene	780	330	ug/Kg	8270
Naphthalene	2,200	330	ug/Kg	8270
2-Nitroaniline	ND	1600	ug/Kg	8270
3-Nitroaniline	ND	1600	ug/Kg	8270
4-Nitroaniline	ND	1600	ug/Kg	8270
Nitrobenzene	ND	330	ug/Kg	8270
N-Nitroso-Di-N-propylamine	ND	330	ug/Kg	8270
N-Nitrosodiphenylamine	ND	330	ug/Kg	8270
Phenanthrene	ND	330	ug/Kg	8270
Pyrene	ND	330	ug/Kg	8270
1,2,4-Trichlorobenzene	ND	330	ug/Kg	8270
ACID EXTRACTABLES	--			
4-Chloro-3-methylphenol	ND	330	ug/Kg	8270
2-Chlorophenol	ND	330	ug/Kg	8270
2,4-Dichlorophenol	ND	330	ug/Kg	8270
2,4-Dimethylphenol	ND	330	ug/Kg	8270
2,4-Dinitrophenol	ND	1600	ug/Kg	8270
4,6-Dinitro-2-methylphenol	ND	1600	ug/Kg	8270
2-Nitrophenol	ND	330	ug/Kg	8270
4-Nitrophenol	ND	1600	ug/Kg	8270
Pentachlorophenol	ND	1600	ug/Kg	8270
Phenol	ND	330	ug/Kg	8270
2,4,6-Trichlorophenol	ND	330	ug/Kg	8270
2-Methylphenol	ND	330	ug/Kg	8270
4-Methylphenol	ND	330	ug/Kg	8270
2,4,5-Trichlorophenol	ND	1600	ug/Kg	8270
SURROGATE RESULTS	--			
Nitrobenzene-d5	79		% Rec.	8270
2-Fluorobiphenyl	69		% Rec.	8270
p-Terphenyl-d14	70		% Rec.	8270
Phenol-d5	72		% Rec.	8270
2-Fluorophenol	64		% Rec.	8270
2,4,6-Tribromophenol	74		% Rec.	8270



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012215  
 Date Taken: 01/21/1993  
 Time Taken: 09:00  
 LAB Job No: (-149539 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	1.1	0.5	mg/Kg	EPA 7060
Barium (ICP)	28	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	2.6	2.0	mg/Kg	EPA 6010
Chromium (ICP)	30	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	ND	5.0	mg/Kg	EPA 6010
Copper (ICP)	16	2.0	mg/Kg	EPA 6010
Lead (GFAA)	3.7	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	ND	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	14	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	20	5.0	mg/Kg	EPA 6010
Zinc (ICP)	33	2.0	mg/Kg	EPA 6010
<b>TPH (Gas/BTXE, Solid)</b>				
METHOD 5030 (GC, FID)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC, Solid)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	111		% Rec.	5030
<b>METHOD 3550 (GC, FID)</b>				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	11**	1	mg/Kg	3550

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbons rather than Diesel.



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.00189

Date: 02/06/1993  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012215  
 Date Taken: 01/21/1993  
 Time Taken: 09:00  
 LAB Job No: (-149539 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	ND	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	99		% Rec.	
Bromochloromethane	112		% Rec.	



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012215  
Date Taken: 01/21/1993  
Time Taken: 09:00  
LAB Job No: (-149539 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8270(GCMS, Solid)				
DATE EXTRACTED	01-27-93			
DATE ANALYZED	01-28-93			
DILUTION FACTOR*	1			
Acenaphthene	ND	330	ug/Kg	8270
Acenaphthylene	ND	330	ug/Kg	8270
Aldrin	ND	1600	ug/Kg	8270
Anthracene	ND	330	ug/Kg	8270
Benzidine	ND	1600	ug/Kg	8270
Benzo(a)anthracene	ND	330	ug/Kg	8270
Benzo(b)fluoranthene	ND	330	ug/Kg	8270
Benzo(k)fluoranthene	ND	330	ug/Kg	8270
Benzo(a)pyrene	ND	330	ug/Kg	8270
Benzo(g,h,i)perylene	ND	330	ug/Kg	8270
Benzoic acid	ND	1600	ug/Kg	8270
Benzyl alcohol	ND	330	ug/Kg	8270
Butyl benzyl phthalate	ND	330	ug/Kg	8270
delta-BHC	ND	1600	ug/Kg	8270
gamma-BHC	ND	1600	ug/Kg	8270
bis(2-Chloroethyl)ether	ND	330	ug/Kg	8270
bis(2-Chloroethoxy)methane	ND	330	ug/Kg	8270
bis(2-Chloroisopropyl)ether	ND	330	ug/Kg	8270
bis(2-Ethylhexyl)phthalate	ND	330	ug/Kg	8270
4-Bromophenyl phenyl ether	ND	330	ug/Kg	8270
4-Chloroaniline	ND	330	ug/Kg	8270
2-Chloronaphthalene	ND	330	ug/Kg	8270
4-Chlorophenyl phenyl ether	ND	330	ug/Kg	8270
Chrysene	ND	330	ug/Kg	8270
4,4'-DDD	ND	1600	ug/Kg	8270
4,4'-DDE	ND	1600	ug/Kg	8270
4,4'-DDT	ND	1600	ug/Kg	8270
Dibenzo(a,h)anthracene	ND	330	ug/Kg	8270
Dibenzofuran	ND	330	ug/Kg	8270
Di-n-butylphthalate	ND	330	ug/Kg	8270
1,2-Dichlorobenzene	ND	330	ug/Kg	8270
1,3-Dichlorobenzene	ND	330	ug/Kg	8270
1,4-Dichlorobenzene	ND	330	ug/Kg	8270
3,3'-Dichlorobenzidine	ND	660	ug/Kg	8270
Dieldrin	ND	1600	ug/Kg	8270
Diethylphthalate	ND	330	ug/Kg	8270
Dimethyl phthalate	ND	330	ug/Kg	8270
2,4-Dinitrotoluene	ND	330	ug/Kg	8270
2,6-Dinitrotoluene	ND	330	ug/Kg	8270
Di-n-octyl phthalate	ND	330	ug/Kg	8270
Endrin aldehyde	ND	1600	ug/Kg	8270
Fluoranthene	ND	330	ug/Kg	8270
Fluorene	ND	330	ug/Kg	8270



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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012215  
 Date Taken: 01/21/1993  
 Time Taken: 09:00  
 LAB Job No: (-149539 )

Parameter	Results	Reporting Limit	Units	Method
Heptachlor	ND	1600	ug/Kg	8270
Heptachlor epoxide	ND	1600	ug/Kg	8270
Hexachlorobenzene	ND	330	ug/Kg	8270
Hexachlorobutadiene	ND	330	ug/Kg	8270
Hexachlorocyclopentadiene	ND	330	ug/Kg	8270
Hexachloroethane	ND	330	ug/Kg	8270
Indeno(1,2,3-cd)pyrene	ND	330	ug/Kg	8270
Isophorone	ND	330	ug/Kg	8270
2-Methylnaphthalene	ND	330	ug/Kg	8270
Naphthalene	ND	330	ug/Kg	8270
2-Nitroaniline	ND	1600	ug/Kg	8270
3-Nitroaniline	ND	1600	ug/Kg	8270
4-Nitroaniline	ND	1600	ug/Kg	8270
Nitrobenzene	ND	330	ug/Kg	8270
N-Nitroso-Di-N-propylamine	ND	330	ug/Kg	8270
N-Nitrosodiphenylamine	ND	330	ug/Kg	8270
Phenanthrene	ND	330	ug/Kg	8270
Pyrene	ND	330	ug/Kg	8270
1,2,4-Trichlorobenzene	ND	330	ug/Kg	8270
ACID EXTRACTABLES	--			
4-Chloro-3-methylphenol	ND	330	ug/Kg	8270
2-Chlorophenol	ND	330	ug/Kg	8270
2,4-Dichlorophenol	ND	330	ug/Kg	8270
2,4-Dimethylphenol	ND	330	ug/Kg	8270
2,4-Dinitrophenol	ND	1600	ug/Kg	8270
4,6-Dinitro-2-methylphenol	ND	1600	ug/Kg	8270
2-Nitrophenol	ND	330	ug/Kg	8270
4-Nitrophenol	ND	1600	ug/Kg	8270
Pentachlorophenol	ND	1600	ug/Kg	8270
Phenol	ND	330	ug/Kg	8270
2,4,6-Trichlorophenol	ND	330	ug/Kg	8270
2-Methylphenol	ND	330	ug/Kg	8270
4-Methylphenol	ND	330	ug/Kg	8270
2,4,5-Trichlorophenol	ND	1600	ug/Kg	8270
SURROGATE RESULTS	--			
Nitrobenzene-d5	71		% Rec.	8270
2-Fluorobiphenyl	71		% Rec.	8270
p-Terphenyl-d14	73		% Rec.	8270
Phenol-d5	70		% Rec.	8270
2-Fluorophenol	63		% Rec.	8270
2,4,6-Tribromophenol	77		% Rec.	8270



Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012216  
 Date Taken: 01/21/1993  
 Time Taken: 09:33  
 LAB Job No: (-149540 )

Parameter	Results	Reporting Limit	Units	Method
TPH (Gas/BTXE,Solid)				
METHOD 5030 (GC,FID)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC,Solid)	--			
DATE ANALYZED	01-25-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	108		% Rec.	5030
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	ND	1	mg/Kg	3550



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 Client Name: Harding Lawson Associates  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012216  
 Date Taken: 01/21/1993  
 Time Taken: 09:33  
 LAB Job No: (-149540 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/Kg	8010
Bromoform	ND	2.0	ug/Kg	8010
Bromomethane	ND	2.0	ug/Kg	8010
Carbon tetrachloride	ND	2.0	ug/Kg	8010
Chlorobenzene	ND	2.0	ug/Kg	8010
Chloroethane	ND	2.0	ug/Kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/Kg	8010
Chloroform	ND	2.0	ug/Kg	8010
Chloromethane	ND	2.0	ug/Kg	8010
Dibromochloromethane	ND	2.0	ug/Kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/Kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/Kg	8010
Dichlorodifluoromethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethane	ND	2.0	ug/Kg	8010
1,2-Dichloroethane	ND	2.0	ug/Kg	8010
1,1-Dichloroethene	ND	2.0	ug/Kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/Kg	8010
1,2-Dichloropropane	ND	2.0	ug/Kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/Kg	8010
Methylene chloride	ND	50	ug/Kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/Kg	8010
Tetrachloroethene	ND	2.0	ug/Kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/Kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/Kg	8010
Trichloroethene	ND	2.0	ug/Kg	8010
Trichlorofluoromethane	ND	2.0	ug/Kg	8010
Vinyl chloride	ND	2.0	ug/Kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	97		% Rec.	
Bromochloromethane	98		% Rec.	





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 Client Name: Harding Lawson Associates  
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Ref: OBB, Job No. 21078 02

SAMPLE DESCRIPTION: 93012217  
 Date Taken: 01/22/1993  
 Time Taken: 08:49  
 LAB Job No: (-149541 )

Parameter	Results	Reporting Limit	Units	Method
<b>CAM METALS (Solid, TTLC)</b>				
Antimony (ICP)	ND	10	mg/Kg	EPA 6010
Arsenic (GFAA)	<5.0	0.5	mg/Kg	EPA 7060
Barium (ICP)	48	2.0	mg/Kg	EPA 6010
Beryllium (ICP)	ND	2.0	mg/Kg	EPA 6010
Cadmium (ICP)	7.6	2.0	mg/Kg	EPA 6010
Chromium (ICP)	3.2	2.0	mg/Kg	EPA 6010
Chromium+6 (FLAA)	<10	2.0	mg/Kg	EPA 7197
Cobalt (ICP)	ND	5.0	mg/Kg	EPA 6010
Copper (ICP)	16	2.0	mg/Kg	EPA 6010
Lead (GFAA)	320	0.2	mg/Kg	EPA 7421
Mercury (CVAA)	ND	0.1	mg/Kg	EPA 7471
Molybdenum (ICP)	ND	5.0	mg/Kg	EPA 6010
Nickel (ICP)	6.7	5.0	mg/Kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/Kg	EPA 7740
Silver (ICP)	ND	1.0	mg/Kg	EPA 6010
Thallium (ICP)	ND	20	mg/Kg	EPA 6010
Vanadium (ICP)	6.0	5.0	mg/Kg	EPA 6010
Zinc (ICP)	17,000	2.0	mg/Kg	EPA 6010
<b>TPH (Gas/BTXE, Solid)</b>				
METHOD 5030 (GC, FID)	--			
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/Kg	5030
METHOD 8020 (GC, Solid)	--			
DATE ANALYZED	01-26-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/Kg	8020
Ethylbenzene	ND	2.5	ug/Kg	8020
Toluene	ND	2.5	ug/Kg	8020
Xylenes (Total)	ND	2.5	ug/Kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	20**		% Rec.	5030
<b>METHOD 3550 (GC, FID)</b>				
DILUTION FACTOR*	1			
DATE EXTRACTED	01-26-93			
DATE ANALYZED	01-27-93			
as Diesel	1.6	1	mg/Kg	3550

\*\* Low surrogate recovery, confirmed upon reanalysis.



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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051301  
 Date Taken: 05/13/1993  
 Time Taken: 06:30  
 LAB Job No: (-157227 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	05-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/kg	8010
Bromoform	ND	2.0	ug/kg	8010
Bromomethane	ND	2.0	ug/kg	8010
Carbon tetrachloride	ND	2.0	ug/kg	8010
Chlorobenzene	ND	2.0	ug/kg	8010
Chloroethane	ND	2.0	ug/kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/kg	8010
Chloroform	ND	2.0	ug/kg	8010
Chloromethane	ND	2.0	ug/kg	8010
Dibromochloromethane	ND	2.0	ug/kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/kg	8010
Dichlorodifluoromethane	ND	2.0	ug/kg	8010
1,1-Dichloroethane	ND	2.0	ug/kg	8010
1,2-Dichloroethane	ND	2.0	ug/kg	8010
1,1-Dichloroethene	ND	2.0	ug/kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/kg	8010
1,2-Dichloropropane	ND	2.0	ug/kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/kg	8010
Methylene chloride	ND	50	ug/kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/kg	8010
Tetrachloroethene	2.6	2.0	ug/kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/kg	8010
Trichloroethene	ND	2.0	ug/kg	8010
Trichlorofluoromethane	ND	2.0	ug/kg	8010
Vinyl chloride	ND	2.0	ug/kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	92		% Rec.	
1,4-Dichlorobutane	94		% Rec.	



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Client Name: Harding Lawson Associates  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051302  
Date Taken: 05/13/1993  
Time Taken: 07:00  
LAB Job No: (-157228 )

Parameter	Results	Reporting Limit	Units	Method
Lead (GFAA)	2.7	0.2	mg/kg	EPA 7421
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-19-93			
as Diesel	24**	1	mg/kg	3550

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to a combination of heavier hydrocarbons and Diesel.



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 Client Name: Harding Lawson Associates  
 NET Log No: 93.01963

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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051302  
 Date Taken: 05/13/1993  
 Time Taken: 07:00  
 LAB Job No: (-157228 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	05-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/kg	8010
Bromoform	ND	2.0	ug/kg	8010
Bromomethane	ND	2.0	ug/kg	8010
Carbon tetrachloride	ND	2.0	ug/kg	8010
Chlorobenzene	ND	2.0	ug/kg	8010
Chloroethane	ND	2.0	ug/kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/kg	8010
Chloroform	ND	2.0	ug/kg	8010
Chloromethane	ND	2.0	ug/kg	8010
Dibromochloromethane	ND	2.0	ug/kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/kg	8010
Dichlorodifluoromethane	ND	2.0	ug/kg	8010
1,1-Dichloroethane	ND	2.0	ug/kg	8010
1,2-Dichloroethane	ND	2.0	ug/kg	8010
1,1-Dichloroethene	ND	2.0	ug/kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/kg	8010
1,2-Dichloropropane	ND	2.0	ug/kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/kg	8010
Methylene chloride	ND	50	ug/kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/kg	8010
Tetrachloroethene	7.5	2.0	ug/kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/kg	8010
Trichloroethene	ND	2.0	ug/kg	8010
Trichlorofluoromethane	ND	2.0	ug/kg	8010
Vinyl chloride	ND	2.0	ug/kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	82		% Rec.	
1,4-Dichlorobutane	80		% Rec.	



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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051303  
Date Taken: 05/13/1993  
Time Taken: 07:20  
LAB Job No: (-157229 )

<u>Parameter</u>	<u>Results</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Lead (GFAA)	22	0.2	mg/kg	EPA 7421
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-24-93			
as Diesel	26**	1	mg/kg	3550

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbons rather than Diesel.



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 Client Name: Harding Lawson Associates  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051303  
 Date Taken: 05/13/1993  
 Time Taken: 07:20  
 LAB Job No: (-157229 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC, Solid)				
DATE ANALYZED	05-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/kg	8010
Bromoform	ND	2.0	ug/kg	8010
Bromomethane	ND	2.0	ug/kg	8010
Carbon tetrachloride	ND	2.0	ug/kg	8010
Chlorobenzene	ND	2.0	ug/kg	8010
Chloroethane	ND	2.0	ug/kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/kg	8010
Chloroform	ND	2.0	ug/kg	8010
Chloromethane	ND	2.0	ug/kg	8010
Dibromochloromethane	ND	2.0	ug/kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/kg	8010
Dichlorodifluoromethane	ND	2.0	ug/kg	8010
1,1-Dichloroethane	ND	2.0	ug/kg	8010
1,2-Dichloroethane	ND	2.0	ug/kg	8010
1,1-Dichloroethene	ND	2.0	ug/kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/kg	8010
1,2-Dichloropropane	ND	2.0	ug/kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/kg	8010
Methylene chloride	ND	50	ug/kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/kg	8010
Tetrachloroethene	ND	2.0	ug/kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/kg	8010
Trichloroethene	ND	2.0	ug/kg	8010
Trichlorofluoromethane	ND	2.0	ug/kg	8010
Vinyl chloride	ND	2.0	ug/kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	79		% Rec.	
1,4-Dichlorobutane	84		% Rec.	



Client Acct: 28100  
Client Name: Harding Lawson Associates  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051304  
Date Taken: 05/13/1993  
Time Taken: 07:45  
LAB Job No: (-157230 )

Parameter	Results	Reporting Limit	Units	Method
Lead (GFAA)	3.2	0.2	mg/kg	EPA 7421
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-24-93			
as Diesel	13**	1	mg/kg	3550

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of heavier hydrocarbons rather than Diesel.



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051304  
 Date Taken: 05/13/1993  
 Time Taken: 07:45  
 LAB Job No: (-157230 )

Parameter	Results	Reporting Limit	Units	Method
METHOD 8010 (GC,Solid)				
DATE ANALYZED	05-26-93			
DILUTION FACTOR*	1			
Bromodichloromethane	ND	2.0	ug/kg	8010
Bromoform	ND	2.0	ug/kg	8010
Bromomethane	ND	2.0	ug/kg	8010
Carbon tetrachloride	ND	2.0	ug/kg	8010
Chlorobenzene	ND	2.0	ug/kg	8010
Chloroethane	ND	2.0	ug/kg	8010
2-Chloroethylvinyl ether	ND	5.0	ug/kg	8010
Chloroform	ND	2.0	ug/kg	8010
Chloromethane	ND	2.0	ug/kg	8010
Dibromochloromethane	ND	2.0	ug/kg	8010
1,2-Dichlorobenzene	ND	2.0	ug/kg	8010
1,3-Dichlorobenzene	ND	2.0	ug/kg	8010
1,4-Dichlorobenzene	ND	2.0	ug/kg	8010
Dichlorodifluoromethane	ND	2.0	ug/kg	8010
1,1-Dichloroethane	ND	2.0	ug/kg	8010
1,2-Dichloroethane	ND	2.0	ug/kg	8010
1,1-Dichloroethene	ND	2.0	ug/kg	8010
trans-1,2-Dichloroethene	ND	2.0	ug/kg	8010
1,2-Dichloropropane	ND	2.0	ug/kg	8010
cis-1,3-Dichloropropene	ND	2.0	ug/kg	8010
trans-1,3-Dichloropropene	ND	2.0	ug/kg	8010
Methylene chloride	ND	50	ug/kg	8010
1,1,2,2-Tetrachloroethane	ND	2.0	ug/kg	8010
Tetrachloroethene	ND	2.0	ug/kg	8010
1,1,1-Trichloroethane	ND	2.0	ug/kg	8010
1,1,2-Trichloroethane	ND	2.0	ug/kg	8010
Trichloroethene	ND	2.0	ug/kg	8010
Trichlorofluoromethane	ND	2.0	ug/kg	8010
Vinyl chloride	ND	2.0	ug/kg	8010
SURROGATE RESULTS				
1,4-Difluorobenzene	59		% Rec.	
1,4-Dichlorobutane	60		% Rec.	





Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.01963

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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051305  
Date Taken: 05/13/1993  
Time Taken: 08:35  
LAB Job No: (-157231 )

<u>Parameter</u>		<u>Results</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Lead	(GFAA)	2.2	0.2	mg/kg	EPA 7421
Zinc	(ICP)	16	5.0	mg/kg	EPA 6010



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.01963

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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051306  
Date Taken: 05/13/1993  
Time Taken: 09:15  
LAB Job No: (-157232 )

<u>Parameter</u>		<u>Results</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Lead	(GFAA)	4.4	0.2	mg/kg	EPA 7421
Zinc	(ICP)	55	5.0	mg/kg	EPA 6010



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.01963

Date: 06/03/1993  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051307  
Date Taken: 05/13/1993  
Time Taken: 09:45  
LAB Job No: (-157233 )

<u>Parameter</u>		<u>Results</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Lead	(GFAA)	2.2	0.2	mg/kg	EPA 7421
Zinc	(ICP)	56	5.0	mg/kg	EPA 6010



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.01963

Date: 06/03/1993  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051308  
Date Taken: 05/13/1993  
Time Taken: 10:10  
LAB Job No: (-157234 )

Parameter		Results	Reporting Limit	Units	Method
Lead	(GFAA)	4.7	0.2	mg/kg	EPA 7421
Zinc	(ICP)	27	5.0	mg/kg	EPA 6010



Client Acct: 28100  
Client Name: Harding Lawson Associates  
NET Log No: 93.01963

Date: 06/03/1993  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051309  
Date Taken: 05/13/1993  
Time Taken: 11:00  
LAB Job No: (-157235 )

Parameter	Results	Reporting Limit	Units	Method
TPH (Gas/BTXE,Solid)				
METHOD 5030 (GC,FID)	--			
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/kg	5030
METHOD 8020 (GC,Solid)	--			
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/kg	8020
Ethylbenzene	ND	2.5	ug/kg	8020
Toluene	ND	2.5	ug/kg	8020
Xylenes (Total)	ND	2.5	ug/kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	80		% Rec.	5030
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-19-93			
as Diesel	ND	1	mg/kg	3550



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.01963

Date: 06/03/1993  
 Page: 15

Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051310  
 Date Taken: 05/13/1993  
 Time Taken: 11:05  
 LAB Job No: (-157236 )

Parameter	Results	Reporting Limit	Units	Method
TPH (Gas/BTXE,Solid)	--			
METHOD 5030 (GC,FID)	--			
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/kg	5030
METHOD 8020 (GC,Solid)	--			
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/kg	8020
Ethylbenzene	ND	2.5	ug/kg	8020
Toluene	ND	2.5	ug/kg	8020
Xylenes (Total)	ND	2.5	ug/kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	82		% Rec.	5030
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-19-93			
as Diesel	ND	1	mg/kg	3550



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.01963

Date: 06/03/1993  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051311  
 Date Taken: 05/13/1993  
 Time Taken: 11:15  
 LAB Job No: (-157237 )

Parameter	Results	Reporting Limit	Units	Method
<b>PRIORITY POLLUTANTS (Solid)</b>				
Antimony (ICP)	ND	10	mg/kg	EPA 6010
Arsenic (GFAA)	1.8	0.5	mg/kg	EPA 7060
Beryllium (ICP)	ND	2.0	mg/kg	EPA 6010
Cadmium (ICP)	ND	2.0	mg/kg	EPA 6010
Chromium (ICP)	32	2.0	mg/kg	EPA 6010
Copper (ICP)	4.6	2.0	mg/kg	EPA 6010
Lead (ICP)	ND	20	mg/kg	EPA 6010
Mercury (CVAA)	ND	0.1	mg/kg	EPA 7471
Nickel (ICP)	31	5.0	mg/kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/kg	EPA 7740
Silver (ICP)	ND	2.0	mg/kg	EPA 6010
Thallium (ICP)	ND	20	mg/kg	EPA 6010
Zinc (ICP)	19	5.0	mg/kg	EPA 6010
<b>TPH (Gas/BTXE,Solid)</b>				
METHOD 5030 (GC,FID)	--			
DATE ANALYZED	05-17-93			
DILUTION FACTOR*	200			
as Gasoline	350	1	mg/kg	5030
METHOD 8020 (GC,Solid)	--			
DATE ANALYZED	05-17-93			
DILUTION FACTOR*	200			
Benzene	ND	2.5	ug/kg	8020
Ethylbenzene	1,800	2.5	ug/kg	8020
Toluene	1,400	2.5	ug/kg	8020
Xylenes (Total)	3,900	2.5	ug/kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	124***		% Rec.	5030
<b>METHOD 3550 (GC,FID)</b>				
DILUTION FACTOR*	10			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-19-93			
as Diesel	470**	1	mg/kg	3550

\*\* The positive result for Petroleum Hydrocarbons as Diesel appears to be due to the presence of lighter hydrocarbons rather than Diesel.

\*\*\* High surrogate recovery due to matrix interference.



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.01963

Date: 06/03/1993  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051312  
 Date Taken: 05/13/1993  
 Time Taken: 12:15  
 LAB Job No: (-157238 )

Parameter	Results	Reporting Limit	Units	Method
TPH (Gas/BTXE,Solid)				
METHOD 5030 (GC,FID)	--			
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/kg	5030
METHOD 8020 (GC,Solid)	--			
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/kg	8020
Ethylbenzene	ND	2.5	ug/kg	8020
Toluene	ND	2.5	ug/kg	8020
Xylenes (Total)	ND	2.5	ug/kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	71		% Rec.	5030
METHOD 3550 (GC,FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-19-93			
as Diesel	ND	1	mg/kg	3550





Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.01963

Date: 06/03/1993  
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Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051313  
 Date Taken: 05/13/1993  
 Time Taken: 12:25  
 LAB Job No: (-157239 )

Parameter	Results	Reporting Limit	Units	Method
<b>PRIORITY POLLUTANTS (Solid)</b>				
Antimony (ICP)	ND	10	mg/kg	EPA 6010
Arsenic (GFAA)	1.7	0.5	mg/kg	EPA 7060
Beryllium (ICP)	ND	2.0	mg/kg	EPA 6010
Cadmium (ICP)	ND	2.0	mg/kg	EPA 6010
Chromium (ICP)	58	2.0	mg/kg	EPA 6010
Copper (ICP)	9.1	2.0	mg/kg	EPA 6010
Lead (ICP)	ND	20	mg/kg	EPA 6010
Mercury (CVAA)	ND	0.1	mg/kg	EPA 7471
Nickel (ICP)	39	5.0	mg/kg	EPA 6010
Selenium (GFAA)	ND	0.5	mg/kg	EPA 7740
Silver (ICP)	ND	2.0	mg/kg	EPA 6010
Thallium (ICP)	ND	20	mg/kg	EPA 6010
Zinc (ICP)	26	5.0	mg/kg	EPA 6010
<b>TPH (Gas/BTXE, Solid)</b>				
METHOD 5030 (GC, FID)				
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/kg	5030
METHOD 8020 (GC, Solid)				
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/kg	8020
Ethylbenzene	ND	2.5	ug/kg	8020
Toluene	ND	2.5	ug/kg	8020
Xylenes (Total)	ND	2.5	ug/kg	8020
SURROGATE RESULTS				
Bromofluorobenzene	75		% Rec.	5030
METHOD 3550 (GC, FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-19-93			
as Diesel	ND	1	mg/kg	3550



Client Acct: 28100  
 Client Name: Harding Lawson Associates  
 NET Log No: 93.01963

Date: 06/03/1993  
 Page: 19

Ref: Oakland/Broadway Block, Job No. 21078,04

SAMPLE DESCRIPTION: 93051314  
 Date Taken: 05/13/1993  
 Time Taken: 12:45  
 LAB Job No: (-157240 )

Parameter	Results	Reporting Limit	Units	Method
TPH (Gas/BTXE, Solid)				
METHOD 5030 (GC, FID)	--			
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
as Gasoline	ND	1	mg/kg	5030
METHOD 8020 (GC, Solid)	--			
DATE ANALYZED	05-14-93			
DILUTION FACTOR*	1			
Benzene	ND	2.5	ug/kg	8020
Ethylbenzene	ND	2.5	ug/kg	8020
Toluene	ND	2.5	ug/kg	8020
Xylenes (Total)	ND	2.5	ug/kg	8020
SURROGATE RESULTS	--			
Bromofluorobenzene	77		% Rec.	5030
METHOD 3550 (GC, FID)				
DILUTION FACTOR*	1			
DATE EXTRACTED	05-19-93			
DATE ANALYZED	05-19-93			
as Diesel	ND	1	mg/kg	3550



Ref: Oakland/Broadway Block, Job No. 21078,04

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	1	mg/kg	105	ND	76	84	11
Benzene	2.5	ug/kg	90	ND	74	83	11
Toluene	2.5	ug/kg	86	ND	80	84	4.5
Gasoline	1	mg/kg	101	ND	87	85	2.1
Benzene	2.5	ug/kg	89	ND	91	89	2.6
Toluene	2.5	ug/kg	94	ND	89	88	1.5
Diesel	1	mg/kg	98	ND	N/A	N/A	1.2

COMMENT: Blank Results were ND on other analytes tested.

Antimony	10	mg/kg	100	ND	97	97	<1
Arsenic	0.5	mg/kg	109	ND	81	80	1.2
Beryllium	2	mg/kg	98	ND	93	94	1.0
Cadmium	2	mg/kg	100	ND	92	93	1.1
Chromium	2	mg/kg	98	ND	94	95	1.1
Copper	2	mg/kg	98	ND	91	92	<1
Lead	20	mg/kg	105	ND	104	104	<1
Mercury	0.1	mg/kg	105	ND	80	82	2.5
Nickel	5	mg/kg	100	ND	92	92	<1
Selenium	0.5	mg/kg	99	ND	99	94	5.8
Silver	2	mg/kg	98	ND	87	87	<1
Thallium	20	mg/kg	98	ND	91	91	<1
Zinc	2	mg/kg	101	ND	88	89	<1

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
1,1-Dichloroethene	2.0	ug/kg	100	ND	71	66	6.8
Trichloroethene	2.0	ug/kg	100	ND	83	85	2.4
Chlorobenzene	2.0	ug/kg	100	ND	74	66	12

COMMENT: Blank Results were ND on other analytes tested.

## KEY TO ABBREVIATIONS and METHOD REFERENCES

- < : Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
- \* : Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values).
- ICVS : Initial Calibration Verification Standard (External Standard).
- mean : Average; sum of measurements divided by number of measurements.
- mg/Kg (ppm) : Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
- mg/L : Concentration in units of milligrams of analyte per liter of sample.
- mL/L/hr : Milliliters per liter per hour.
- MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.
- N/A : Not applicable.
- NA : Not analyzed.
- ND : Not detected; the analyte concentration is less than applicable listed reporting limit.
- NTU : Nephelometric turbidity units.
- RPD : Relative percent difference,  $100 \text{ [Value 1 - Value 2] / mean value}$ .
- SNA : Standard not available.
- ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
- ug/L : Concentration in units of micrograms of analyte per liter of sample.
- umhos/cm : Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 17th Edition, APHA, 1989.





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 P.O. Box 578  
 Novato, California 94948  
 415/892-0831  
 General: 415/892-0831  
 Accounting: 415/898-1052

# CHAIN OF CUSTODY FORM 3576

Lab: MEI

Samplers: Tom Drinkard

Job Number: 21078, 04

Name/Location: OAKLAND BROADWAY BLOCK

Project Manager: DANA LELAND

Recorder: Tom A. Leland  
 (Signature Required)

ANALYSIS REQUESTED										
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH Diesel	TPH GAS	DTEX	P.P. METALS	
						X	X	X		
						X	X	X		
						X	X	X		
						X	X	X		

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER			DATE				STATION DESCRIPTION/ NOTES
	Water	Sediment	Soil	Oil	Unpres.	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	Yr	Wk	Seq	Yr	Mo	Dy	Time	
SO			X		1			93	05	1311	93	05	1311	15	
SO			X		1			2		1312				1215	
SO			X		1					1313				1225	
SO			X		1					1314				1245	

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						2 WEEK TURNAROUND

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>Tom A. Leland</u>	RECEIVED BY: (Signature) <u>Andy McKay</u>	DATE/TIME <u>5/13/93 1425</u>
RELINQUISHED BY: (Signature) <u>Andy McKay</u>	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature) by Lab: <u>George</u>	DATE/TIME <u>5/14/93 0800</u>
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature) <u>1700</u>
METHOD OF SHIPMENT <u>LAB COURIER</u>		

Laboratory Copy White  
 Project Office Copy Yellow  
 Field or Office Copy Pink

**APPENDIX C**  
**GEOPHYSICAL SURVEY**

## GEOPHYSICAL SURVEY

### INTRODUCTION

The objective of the survey was to detect, to the extent possible, the location, size, and orientation of potential buried underground storage tanks (USTs). The area covered by our investigation was a strip approximately 30 feet wide that paralleled the curbs of Broadway, 9th, and Franklin Streets. The geophysical survey was performed on April 22 and 23, 1993, by HLA geophysicists Thomas A. Casebier and J. Scott Lewis.

### GEOPHYSICAL METHODS

A combination of methods was used for the UST search, including electromagnetic profiling (EM), ground penetrating radar (GPR), and two types of pipe and cable locators (RD-400 and M-Scope).

#### Electromagnetic Profiling

The EM technique entails transmitting a primary signal that is inductively coupled to the earth. Secondary signals are generated in the ground, and both the primary and secondary fields are detected by the EM receiver. The EM system is also susceptible to the presence of buried conductors, including both ferrous and non-ferrous metals. Metal objects such as steel USTs are electrically conductive compared to native soil and therefore produce anomalous readings in conductivity values. A Geonics Ltd. Model EM31-D electromagnetic terrain conductivity system was used in this investigation. The in-phase mode of the EM31-D is particularly sensitive to buried metal objects. The system is limited to a depth of approximately 20 feet and is not effective within approximately 20 feet of surface metal structures or vehicles.



### Ground Penetrating Radar

The GPR system uses radar technology to obtain a continuous high-resolution electromagnetic profile of the subsurface. The depth of penetration is a function of the electrical conductivity properties of the subsurface materials and the radar antenna frequency. GPR transmits a signal that is coupled to the ground by an antenna. When the subsurface signal encounters a boundary between media of different electrical properties, such as that between a buried tank and overlying soil, some of the energy is reflected back to the surface, received by the antenna, amplified, and displayed on a monitor. A traverse along a GPR scan line results in a continuous graphic profile record of the subsurface. A GSSI Model SIR-7 system and a 500-MHz antenna were used to acquire the GPR data. The depth of investigation for the GPR was approximately 6 feet at the site.

### Pipe and Cable Locators

The Fisher Model TW-6 M-Scope is an electromagnetic system similar in principle to the EM31-D but is susceptible only to buried metal objects and pipes. The M-Scope is comprised of separate modular transmitter and receiver connected by a carrying handle. It can resolve smaller metal objects than the EM31-D. The M-Scope is effective to depths of approximately 4 to 5 feet and within approximately 8 feet of surface metal.

The Radio Detection Corporation RD-400 consists of a separate transmitter and receiver. Two types of signals can be passively detected: those resulting from electrically powered lines and those associated with metal pipes that re-radiate ambient radio signals. In the active mode, the transmitter generates an 8- or 33-KHz signal that can either be inductively coupled to subsurface pipes or cables, or directly connected to

pipes or cables that extend to the surface. The resulting signals may then be traced on the surface by the receiver.

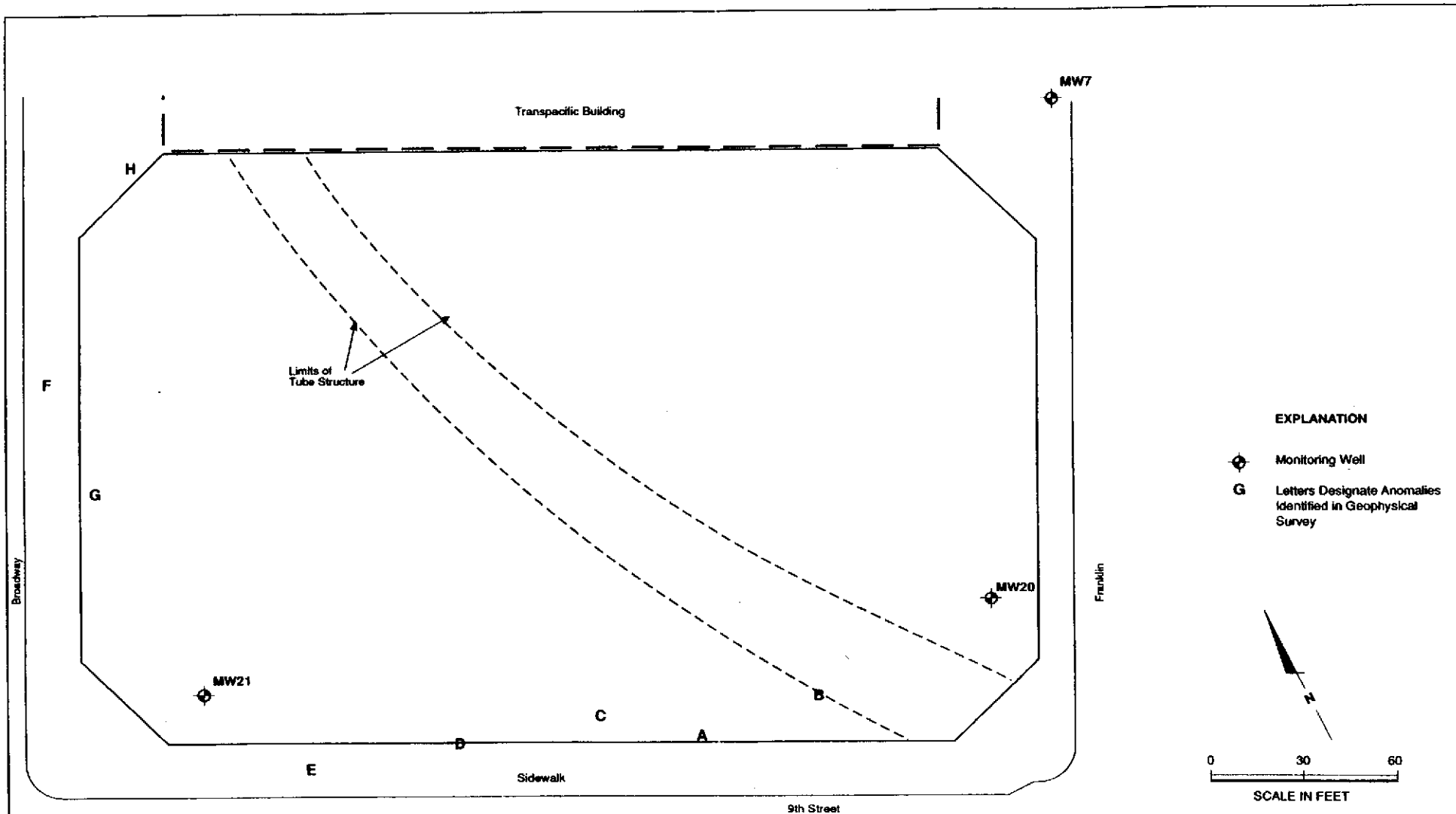
## **FIELD PROCEDURES**

Field work was coordinated with Mr. Robert Nelson, HLA geologist. After a review of site conditions and a discussion with Mr. Nelson, the following tasks were performed:

1. Barricades and caution tape were used to close off the parking spaces of the eastern half off the site and adjacent to the wall separating the sidewalk and the parking lot.
2. The EM31-D system was used to perform a reconnaissance of the site on lines spaced 5 feet apart. The instrument was operated to monitor both conductivity and in-phase (mode susceptible to metal) signals to search for anomalous signals indicative of large masses of buried metal. Anomalous areas were marked using spray paint on the ground surface.
3. The M-Scope was used to perform a reconnaissance of the site using procedures similar to the EM-31D.
4. GPR was used to generate continuous graphical profiles of the subsurface on lines spaced 5 feet apart and parallel to the curbs. Both 300- and 500-MHz antennas were pulled by hand along all profiles.
5. The RD-400 receiver was used to trace buried utilities. The locations of all detected utilities were marked on the surface with lumber crayon. These locations were then eliminated from consideration as possible UST locations.
6. A site field sketch was generated that included prominent surface features, detected EM and M-Scope anomalies, and detected buried utilities.
7. Tasks 1 through 5 were repeated for the western half of the site on day 2 of the field survey.
8. Boring locations were cleared to avoid buried utilities and other subsurface obstructions in the areas determined to be potential UST locations.

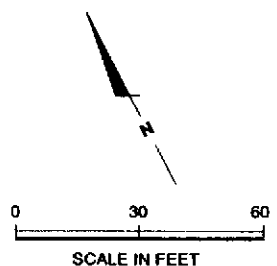
## FINDINGS



The EM and M-Scope reconnaissance detected eight localized anomalous areas, labeled A through H, indicative of possible buried metal. GPR profiles extending across the anomalous areas detected no discernable USTs within approximately 5 feet of the surface. An UST buried deeper than 5 feet may not have been detected by GPR. GPR data quality was good due to the moderate conductivity (less than 100 millimhos/meter for the upper 20 feet) of local soil and low conductivity of the upper 5 feet of clean fill. Five of the anomalous areas, A, C, D, E, and G, are recommended for further investigation by potholing, borings, or other direct methods. No other anomalous areas were detected that could not be attributed to buried utilities.



**EXPLANATION**

- ◆ Monitoring Well
- G Letters Designate Anomalies Identified in Geophysical Survey



	<b>Harding Lawson Associates</b> Engineering and Environmental Services		<b>Locations of Geophysical Anomalies</b> Preliminary Site Characterization Oakland Broadway Block Chinatown Redevelopment Project Area Oakland, California		11163.FD PLATE
	DRAWN LLC	JOB NUMBER 21078 02	APPROVED 	DATE 9/93	REVISD DATE

DISTRIBUTION

PRELIMINARY SOIL CHARACTERIZATION  
OAKLAND BROADWAY BLOCK  
CHINATOWN REDEVELOPMENT PROJECT AREA  
9TH STREET AND BROADWAY  
OAKLAND, CALIFORNIA

November 11, 1993

Copy No. 3

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5 copies:	City of Oakland Redevelopment Agency 1333 Broadway, Ninth Floor Oakland, California 94612  Attention: Mr. Peter Chen	1-5
3 copies:	Job File	6-8
1 copy:	QC/Bound File	9

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QUALITY CONTROL REVIEWER



R. Bruce Scheibach, R.G.  
Principal Hydrogeologist