# DATA SUMMARY REPORT
# ELECTRO-COATINGS FACILITY
# 1401 PARK AVENUE
# EMERYVILLE, CALIFORNIA

**April 25, 1991**

A Report Prepared for:

Electro-Coatings, Inc.
1401 Park Avenue
Emeryville, California 94608

# DATA SUMMARY REPORT
# ELECTRO-COATINGS FACILITY
# 1401 PARK AVENUE
# EMERYVILLE, CALIFORNIA

Kleinfelder Job No. 10-2200-01/2

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# 1.0 INTRODUCTION

The purpose of this report is to summarize subsurface conditions (soil and ground water) beneath and in the vicinity of the Electro-Coatings facility, located at 1401 Park Avenue, Emeryville, California (Plate 1). With the exception of information recently obtained during a site well reconnaissance, all data and interpretations provided herein were obtained from reports and files related to work at the site prior to 1985 by Kleinfelder and Woodward-Clyde Consultants. The purpose of this report is to summarize existing knowledge of the site, and to provide information useful in assessing current data gaps and the most appropriate course of continued site investigations.

As was requested by the California Regional Water Quality Control Board (CRWQCB) in correspondence of April 8, 1986 (CRWQCB file 2199.9075[RWM]) and August 2, 1990 (file 2199.9075[TRG]), this document addresses the following topics:

(1) The locations, drilling methods, construction details, development methods, and lithologic logs for all existing wells.

(2) A tabular summary of historical water elevation data, identifying the methods of measurement, dates of measurement, survey reference datums, top of casing elevations, depth to water, and water surface elevations.

(3) A summary of all historical water quality data.

(4) Contour maps depicting water table and/or piezometric surface elevations.

(5) Updated geological cross sections, both parallel and perpendicular to ground water flow.

(6) Detailed base maps showing the locations of all monitoring wells, with adjacent facilities and structures.

(7) Updated iso-concentration maps depicting the variation in ground water contaminant concentrations.

(8) All pump test data, including methods of measurement and analysis, and assumptions related to aquifer analyses and their results.

(9) Available lithologic and construction data for nearby wells identified in the well canvass.

The information contained in this summary report was derived from several reports and from Kleinfelder files. These information sources include the following:

- Woodward-Clyde Consultants, Report of Findings, Monitoring Well Installations, Electro-Coatings, Inc., Emeryville, California, September 20, 1977.

- Woodward-Clyde Consultants, three boring logs dated February 21, 1978 (2), and March 13, 1978 (1).

- Woodward-Clyde Consultants, Report on Phase I Ground-Water Investigation, E-C Industries, Emeryville, California, 30 March, 1981.

- Ecology and Environment, Inc. *for* Field Inspections Section, Toxics and Waste Management Division, U.S. Environmental Protection Agency, Site Inspection, June, 1985.

- Kleinfelder, Preliminary Report for Investigation, Electro-Coatings Facility Emeryville, California, July, 1982,

- Kleinfelder, Progress Report, Electro-Coatings, Inc., Emeryville, California, November 1983,

- Kleinfelder, various project files under project number B-1132-x and 10-2200.

# 2.0 SITE DESCRIPTION

The 1.0 acre Electro-Coatings, Inc. (ECI) facility (Plate 2) consists of two parcels of property. Four buildings are located on the premises. The facility began operation in 1952 under the ownership of Industrial Hard Chrome Plating Corporation. In 1962 the business was purchased by ECI. One of the parcels is owned by ECI and one is leased.

From 1952 to August 1990 a hard chrome plating operation was conducted at the site. The operation included inside diameter honing, metal stripping and inside diameter chrome plating. Chromic acid waste was held in a storage tank located behind the building in a concrete lined pit. In 1974, the bottom seal of a sump in the pit was found to be leaking. The sump was subsequently reinforced with a double concrete liner, and a steel tank was placed into the pit to hold chromic acid wastes. The chromium waste storage area is identified on Plate 2.

Sometime in the late 1950s an electroless nickel plating operation was installed and currently operates in the building located at 1421 Park Avenue. The operation consists of two electroless nickel baths, one in a 1500 gallon tank and one in a 3000 gallon tank, a nitric strip bath and a hydrochloric acid pickling bath. A vapor degreasing tank has been used as part of the nickel plating operation. At first Trichloroethene (TCE) and later 1-1-1 Trichloroethane (TCA) were used to degrease metals prior to nickel plating. The use of the vapor degreaser has been discontinued. The current waste production of the nickel plating operation is nickel hydroxide which is hauled off site to a recycler.

## 2.1 Site Investigatory History

In 1977, the CRWQCB issued a Cleanup and Abatement Order (No. 77-011) which required ECI to cease on-site disposal of chromium-containing wastewater and to investigate ground water pollution at and emanating from the site. ECI conducted a well canvass and retained Woodward-Clyde Consultants (WCC) in 1977, initially to observe and report on the installation and sampling of the first seven monitoring wells (wells 1, 2, 3A, 3B, 3C, 4, and 5) and later to install additional wells (wells 6 through 13) and to perform ground water pump tests. In 1982, ECI retained Kleinfelder to continue the site investigation. Kleinfelder installed seven monitoring wells (wells 14 through 18) in

addition to soil boring B1 in 1982. In 1983, Kleinfelder installed four additional wells (wells 18A, 19, 20, and 21) and drilled ten soil borings (borings 22 through 31). Boring logs for all soil borings and monitoring well borings are provided in Appendix A. Monitoring well construction details are shown on Table 1.

### 2.1.1 1991 Monitoring Well Reconnaissance

In February, 1991 Kleinfelder conducted a site reconnaissance in an effort to confirm monitoring well locations, check current well depths and depths to water, and to assess the general condition of each well. The results of this activity was documented in correspondence from Kleinfelder to Electro-Coatings, dated March 26, 1991 and indicated that, of the 24 monitoring wells, three (2, 7, and 19) could not be located. In addition, well 1 could not be opened, the Christy box at well 14 contained soil up to surface grade, wells 8 and 10 were inaccessible (beneath parked vehicles), and well 21, located within the Southern Pacific Railroad right-of-way, was visible but not accessible. Of the 18 wells that were accessed, three (wells 9, 13, and 18) are in need of repairs at ground surface, and all wells need locking well caps. These activities are planned to take place in the next month. Table 2 presents a summary of observations resulting from this activity; a comparison of current well depth and original completion depth is shown in Table 1.

Differences between the reported completion depth and the depth measured in 1991 (Table 1) may indicate siltation of the wells. The depths of the shallow wells was generally between one and three feet less than the original construction depth. Monitoring well 3B has less than one foot of screen remaining. The deeper wells are between 3.5 and 11 feet shallower than constructed, suggesting considerable siltation.

## 3.0 SITE GEOLOGICAL CONDITIONS

Soil borings were drilled over a period of eight years, from 1977 through 1983, as a means of investigating subsurface conditions beneath the site. A total of 35 borings were drilled; fifteen by WCC in 1977, 1978, and 1980, and the remaining twenty by Kleinfelder in 1982 and 1983. Copies of the soil boring logs, illustrating the physical subsurface conditions encountered at each location, are located in Appendix A. Generalized geologic cross sections trending southeast to northwest and southwest to northeast are depicted in Plates 4 and 5 respectively. Cross section locations are depicted on Plate 2.

The project site lies in the San Francisco Bay area, approximately one-half mile east of the bay, and several miles west of the Berkeley Hills (a western extension of the Diablo Range). Shallow sediments in this area were laid down as alluvium and near-shore bay deposits, resulting in a series of interfingering and layered clays, silts, sands and gravels of Pleistocene to Recent age. Boring logs resulting from site investigations to date (Appendix A) and the geologic cross sections prepared from the boring logs (Plates 3 and 4) disclose the discontinuous nature of sediments beneath the site. Although silty clay is the most pervasive material beneath the site, it is often present with varying amounts of sand and gravel, apparently existing both within a silty clay matrix and as separate and distinct, though discontinuous lenses.

The first soil material encountered that appears generally consistent across the site is a dark grey to black stiff silty clay. The clay is usually encountered within the first four to eight feet of ground surface and is generally three to six feet thick. Beneath this clay is a thicker section of brown, gray and green silty clays with varying amounts of sand and gravel. At depths ranging from about 22 feet to about 35 feet below surface, a blue to blue-gray moderately stiff to stiff clay is present which appears to be relatively consistent across the site and which may be correlative with blue clays identified in borings 2000 feet north of the site. There exists some evidence that suggests this clay may act to retard chemical migration into soils and ground water below it. Boring logs prepared to date suggest that the clay is generally seven to ten feet thick. Beneath this clay interval, sediments again consist of silty clays with interfingering sands and gravels, although the sand and gravel content may be somewhat reduced over that of the interval above the blue clay.

# 4.0 SITE HYDROLOGICAL CONDITIONS

Of the 35 borings drilled on and near the site during investigation activities, 24 were completed as ground water monitoring wells. Fifteen of the wells were installed by WCC in 1977, 1978, and 1980. The remaining nine were installed by Kleinfelder in 1982 and 1983. Twenty-one of the wells intercept a shallow water bearing zone between 11 and approximately 30 feet below grade (i.e., above the apparently continuous blue clay). The remaining three wells (3A, 18A, and 20) intercept a deeper water bearing zone.

## 4.1 Water Level Measurements and Level Surveys

Measurements of depth to water are available from various wells for 1981, 1983, 1985 and from the February, 1991 site reconnaissance (Section 2.1.1). At least two reference datums have been used during the course of investigations at the ECI site. WCC established a mean sea level datum for measurements collected in 1981. This survey was completed to a precision of 0.01 foot.

Kleinfelder performed a second survey in August 1983 following installation of the most recent monitoring wells. This survey referenced an arbitrary datum of 100.00 feet at well 20 and was performed to an accuracy of 0.1 foot. For each survey, there exists no available data to indicate whether the reference points at each well were the top of the well casing or the rim of the well cover. Surveyed elevations, depth to water measurements, calculated ground water elevations and other relevant data are summarized on Table 3

## 4.2 Ground Water Gradients

### 4.2.1 Shallow Water Bearing Zone

Plates 6 through 9 depict inferred piezometric surface contours for the shallow water-bearing zone resulting from measurements of 1981, 1983, 1985, and 1991 respectively. Piezometric surface elevations for 1981 are based on the MSL datum, and subsequent (1983, 1985, and 1991) measurements are based on the arbitrary datum. Piezometric surface contours for January 1981 indicate a ground water flow direction to the west,

towards San Francisco Bay. A hydraulic gradient of approximately one percent was reported in Kleinfelder's 1983 report. Subsequent contour maps, however (based on August 1983 and June 1985 measurements) depict an apparent ridge, from which ground water flows in a west to south-southwest direction in the vicinity of the ECI facility. Contours resulting from measurements in February, 1991 again show a clear westerly flow direction. The apparent differences in ground water flow patterns may be due to seasonal influences (e.g., variable recharge).

Apparently anomalous piezometric elevations are present in the southwest corner of the site (in wells 3B, 3C, 11, 12, and 15), particularly in measurements for August 1983 and February, 1985. Such anomalies may be due to possible completion of wells in several perched ground water zones that are not interconnected, resulting in variation of recorded water level measurements. The anomalies may also be related to ground settlement and resultant survey error; until another accurate well datum survey is completed, the accuracy and meaning of piezometric contour maps for 1983 and 1985 in addition to future measurements and maps, must be questioned.

### 4.2.2 Second Water Bearing Zone

Kleinfelder also evaluated the ground water gradient for the second encountered water bearing zone in their 1983 report. At that time Kleinfelder reported that the piezometric surface elevation in deep wells 20 and 3A were three feet higher and six feet lower than the anticipated upper water bearing zone water level at each respective location, and that the piezometric level in deep well 18A was nearly equal to that of the upper water bearing zone at that location. It was concluded at that time that, based on these differences in elevations and the soil conditions encountered below the shallow water bearing zone, that the deeper wells had penetrated different water bearing zones which were not interconnected and consequently had differing piezometric surfaces.

## 4.3 Results of Pumping and Slug Tests

WCC conducted pumping and slug tests of the shallow water bearing zone on January, 1981. Relevant sections of the report describing this activity and the information derived, is presented in Appendix B. The activity included the performance of an eight hour constant rate pumping test in well 11, in addition to slug tests in wells 10 and 13, to provide

estimates of transmissivity, permeability, and storage coefficient of the water bearing zone. The pumping test yielded parameters considered to be characteristic of gravels that were penetrated by wells 11 and 12, while the slug tests yielded values considered to be more characteristic of the finer grained portion of alluvium. A summary of the findings of these tests is as follows (refer to Appendix B for details):

- All monitoring wells at the site (with the exception of distant wells 6 and 7) showed measurable drawdown during the pump test, indicating that the water bearing zone tapped by the wells is interconnected in the vicinity of the site. The relative symmetry of the resultant cone of depression is further evidence of this.

- Variations in storage coefficient values suggest that the ground water system is probably semi-confined near the pumping well, and confined away from the pumping well. The confinement is most likely caused by the silty and sandy clay layers in the top portion of the upper 30 feet of alluvium, which separates the sand and gravel layers from the ground surface.

- The general feasibility of pump withdrawal of contaminated ground water from the upper water bearing zone has been demonstrated by the results of the eight hour pump test.

A tabular summary of hydraulic parameters resulting from the aquifer tests performed in 1981 is presented in Table 4.

# 5.0 CHEMICAL CONSTITUENT DISTRIBUTION

## 5.1 Distribution of Constituents in Soil

A summary of results for soil total and hexavalent chromium analyses is given in Table 5. Up to 6700 mg/kg total chromium were reported in near-surface soils in the vicinity of the chromium waste storage area. Concentrations generally decrease with increased distance from the waste storage area (Plate 3). The greatest recorded concentrations from samples collected at the site are north of the chromium waste storage area (along buried railroad tracks [Plate 3]) and south to southeast of the area. Available information leads to the assessment that the source of soil contamination is the chromium waste storage area.

## 5.2 Distribution of Constituents in Ground Water

### 5.2.1 Metals

A summary of chemical results for ground water samples collect at the ECI site and analyzed for metals between 1977 and 1985 is given in Table 6. The total chromium concentration in ground water beneath the site has been recorded at levels as high as 892,000 $\mu$g/L (well 9). On review of files, however, it does not appear that water samples were filtered in the field. Comparison of total chromium concentrations with those of hexavalent chromium indicates that hexavalent chromium comprises most, if not all, of the total chromium found in ground water. Total chromium concentrations in the upper water bearing zone have been recorded at concentrations greater than California maximum contaminant levels (MCL [50 $\mu$g/L]) in all but four monitoring wells (wells 7, 15, 19, and 21). Plates 10 through 12 show isoconcentration contours of total chromium in the shallow water bearing zone in August, 1977, October, 1981, and February, 1985, respectively. These plates depict an apparent chromium plume which emanates from the site vicinity and is oriented in a downgradient direction. The source of the chromium plume, most evident in the contours for 1981 and 1985 (Plates 11 and 12), appears to be in the vicinity of the chromium waste storage area (discussed in Section 2).

In addition to chromium, sample analyses have indicated the presence of nickel in ground water beneath the site. Samples collected from monitoring wells 3B, 3C, 4, 5, and 11 have contained up to 30, 80, 20, 840, and 30 μg/L, respectively.

Other metals found in shallow ground water beneath the ECI site include arsenic (200 μg/L at well 11), iron (5400 μg/L at well 5), and zinc (40 μg/L at well 5, 19 μg/L at well 4, 10 μg/L at well 1).

Sample and analysis records indicate that total chromium may have impacted the second water bearing zone. Up to 1300 μg/L total chromium has been recorded in samples removed from well 20. In a progress report to ECI, dated November, 1983, Kleinfelder reported that such contamination may have been a temporary result of well installation. After re-developing wells 18A and 20, a decrease in concentration on the order of 10 to 15 times was recorded, indicating that cross contamination may have occurred during drilling of the two wells.

No additional metals have apparently been found impacting the lower water bearing zone.

### 5.2.2 Purgeable Halocarbons

Table 7 summarizes purgeable halocarbon analysis results for ground water samples collected at the ECI site in 1985. Trichloroethene (TCE) has been detected in the upper water bearing zone at concentrations as high as 12,000 μg/L at monitoring well 10 and is present in all wells for which sampling records exist. The distribution of TCE in the upper water bearing zone is depicted in Plate 13. Because TCE has been detected in all wells (i.e., no bounds can be placed on the plume) and because the distribution of TCE can be addressed by numerous possible interpretations, isoconcentration contours have not been prepared on Plate 13.

Tetrachloroethene (PCE) has also been found in samples from the upper water bearing zone at the ECI facility. Plate 14 depicts isoconcentration contours for PCE, and suggests a possible source at the ECI site, although, as far as can be determined, there is no record of PCE usage at the site. Concentrations at or near the site ranged from not-detected (up-gradient of the site, and at downgradient well 6) to 80 μg/L (in monitoring well 10).

Trans-1,2-dichloroethene (trans 1,2-DCE) has been reported in ground water samples from the shallow water bearing zone in 10 wells at or near the site (3C, 6, 8, 9, 10, 11, 15, 17, 18, and 21). The highest concentrations of trans 1,2-DCE are found in wells 21 (800 μg/L, up-gradient of site), 10 (600 μg/L), 15 (410 μg/L, up-gradient of site), and 18 (140 μg/L).

1,1,1- and 1,1,2-Trichloroethane (TCA) concentrations at the site have been reported in samples from wells 3C (2.4 μg/L), 6 (3.9 μg/L), 11 (1.3 μg/L), 17 (22 μg/L), 18 (52 to 66 μg/L), and 21 (110 μg/L).

Only TCE (10 μg/L) and methylene chloride (2.4 μg/L) have been detected in the lower water bearing zone (well 18A).

## 6.0 SUMMARY OF WELL CANVASS

Reference to one or more well canvases is made in reports by WCC and Kleinfelder. In a 1977 report, WCC referenced a well canvass that was conducted by ECI. The study indicated that the only well which exists between the ECI site and San Francisco Bay is a Judson Steel well. The abandoned well was reactivated for the collection of a water sample to assess possible chromium contamination. A sample collected from the well, located approximately 2000 feet west of the site, indicated that the water contained 0.07 mg/l hexavalent chromium. Quantities in excess of drinking water standards of both lead and cadmium, however, were also found -- these metals were apparently never used by ECI.

WCC also reported that two wells, identified as A and I, are located approximately 0.3 and 0.7 miles upgradient (east) of the site respectively. Although they were, at the time, considered to represent the best available source of "base line" water quality data, well construction details (i.e., depths of perforated zones) were not known. Tests of ground water from the two wells indicated that the water did not exceed regulatory levels at that time.

Kleinfelder reported, in a 1983 progress report, that well driller reports on file with the California Department of Water Resources indicated the presence of seven water wells within approximately one mile of the site. The wells varied in depth from 54 to 408 feet. None of the wells were believed to be extracting water from the upper water bearing zone.

## 7.0 SUMMARY DISCUSSION

A summary of key findings documented in project reports and files, and outlined in this document are as follows:

- Near-surface soils are impacted by chromium in the vicinity of a chromium waste storage area located near the southeast corner of the ECI property. The chromium waste storage area is the apparent source of soil contamination.

- Ground water quality beneath and in the vicinity of the site has been impacted by chromium and solvents (particularly TCE, 1,2-DCE, and PCE).

- The hydraulic gradient in the upper water bearing zone is generally to the west, towards San Francisco Bay. The chromium and solvent plume parallels this gradient and affects ground water up to at least 500 feet from the site.

- Soils beneath the site consist of silty clays with discontinuous lenses of sandy and gravelly material. A blue clay horizon is present at depths of approximately 22 to 35 feet. The clay is believed to be laterally consistent across the site and may act as a barrier to the movement of chemicals from the upper water bearing zone (above the clay) to lower water bearing zones. Although some chromium and TCE has been found in the second water bearing zone, it is believed that it may have been caused by cross-contamination during deep well installation -- well development has apparently greatly reduced contamination levels originally recorded in the second water bearing zone.

- Well pump and slug tests indicate that the shallow water bearing zone is interconnected across the site and that pump withdrawal of contaminated ground water from the upper water bearing zone may be feasible.

TABLE 2 (Continued)
CURRENT STATUS OF WELLS
FEBRUARY, 1991

| Well Number | Inside Diameter (Inches) | Original Depth (Feet) | Current Depth (Feet) | Depth to Water (Feet) | Observations (February, 1991 site visit) |
|---|---|---|---|---|---|
| 15 | 4 | 25 | 24.6 | 6.6 | No unusual conditions noted. |
| 16 | 4 | 22 | 21.6 | 5(b) | Bright yellow water noted. |
| 17 | 4 | 25 | 24.5 | 5(b) | Slightly yellow water. |
| 18 | 4 | 25 | 25 | 4.5 | Broken Christy lid. PVC casing exposed but does not appear to be cracked. |
| 18A | 4 | 51.5 | 40.5 | 4.9 | Hexagonal well cap. |
| 19 | NA | 25 | NA | NA | Could not locate. |
| 20 | 4 | 53 | 47.4 | 2.7 | Highly rusted stovepipe type cap. Slightly iridescent sheen on water. |
| 21 | NA | 25.5 | NA | NA | Located in SPRR Right-of-way. No access. |

Notes:

Information based on a site visit be Kleinfelder on February 21, 1991.

(a) NA - not accessible

(b) Water level indicator malfunction

TABLE 3

SUMMARY OF HISTORICAL WATER ELEVATION MEASUREMENTS

| Well Number | Date | Survey Elevation (feet) | Survey Datum | Depth to Water (feet) | Elevation (feet) | Measurement Device | Measurement Reference Point |
|---|---|---|---|---|---|---|---|
| 1 | 1/14/81 | 15.78 | MSL(a) | 7.02 | 8.76 | ukn | ukn |
| | 8/9/83 | 100.6 | (b) | 6.2 | 94.4 | ukn | ukn |
| | 9/2/83 | 100.6 | (b) | 6.8 | 93.8 | ukn | ukn |
| | 2/21/91 | | | Well Not Accessable | | | |
| 2 | 1/14/81 | 16.67 | MSL(a) | 6.13 | 10.54 | ukn | ukn |
| | 8/9/83 | | | Well Not Found | | | |
| | 9/2/83 | | | Well Not Found | | | |
| | 2/21/91 | | | Well Not Found | | | |
| 3A | 1/14/81 | 16.10 | MSL(a) | 9.80 | 6.30 | ukn | ukn |
| | 8/9/83 | 100.3 | (b) | 12.0 | 88.3 | ukn | ukn |
| | 9/2/83 | 100.3 | (b) | 11.3 | 89.0 | ukn | ukn |
| | 6/6/85 | 100.3 | (b) | 10.6 | 89.7 | ukn | TOC |
| | 6/11/85 | 100.3 | (b) | 10.6 | 89.7 | ukn | TOC |
| | 2/21/91 | 100.3 | (b) | 7.05 | 93.3 | CBWLI | TOC |
| 3B | 1/14/81 | 15.63 | MSL(a) | 6.04 | 9.59 | ukn | ukn |
| | 8/9/83 | 100.3 | (b) | 6.3 | 94.0 | ukn | ukn |
| | 9/2/83 | 100.3 | (b) | Not Measured | | | |
| | 2/21/91 | 100.3 | (b) | 6.42 | 93.9 | CBWLI | TOC |
| 3C | 1/14/81 | 16.31 | MSL(a) | 6.63 | 9.68 | ukn | ukn |
| | 8/9/83 | 100.3 | (b) | 6.9 | 93.4 | ukn | ukn |
| | 9/2/83 | 100.3 | (b) | Not Measured | | | |
| | 6/6/85 | 100.3 | (b) | 6.69 | 93.6 | ukn | TOC |
| | 6/11/85 | 100.3 | (b) | 6.69 | 93.6 | ukn | TOC |
| | 2/21/91 | 100.3 | (b) | 6.20 | 94.1 | CBWLI | TOC |

See Notes on last page

TABLE 3 (continued)
SUMMARY OF HISTORICAL WATER ELEVATION MEASUREMENTS

| Well Number | Date | Survey Elevation (feet) | Survey Datum | Depth to Water (feet) | Elevation (feet) | Measurement Device | Measurement Reference Point |
|---|---|---|---|---|---|---|---|
| 4 | 1/14/81 | 14.29 | MSL(a) | 6.37 | 7.92 | ukn | ukn |
| | 8/9/83 | 99.3 | (b) | 6.6 | 92.7 | ukn | ukn |
| | 9/2/83 | 99.3 | (b) | 6.6 | 92.7 | ukn | ukn |
| | 2/21/91 | 99.3 | (b) | 6.45 | 93.9 | CBWLI | TOC |
| 5 | 1/14/81 | 15.87 | MSL(a) | 7.08 | 8.79 | ukn | ukn |
| | 8/9/83 | 100.8 | (b) | 7.1 | 93.7 | ukn | ukn |
| | 9/2/83 | 100.8 | (b) | 7.1 | 93.7 | ukn | ukn |
| | 2/21/91 | 99.3 | (b) | 6.78 | 94.0 | CBWLI | TOC |
| 6 | 1/14/81 | 9.25 | MSL(a) | 3.56 | 5.69 | ukn | ukn |
| | 8/9/83 | 94.3 | (b) | 4.0 | 90.3 | ukn | ukn |
| | 9/2/83 | 94.3 | (b) | 4.0 | 90.3 | ukn | ukn |
| | 6/6/85 | 94.3 | (b) | 3.68 | 90.6 | ukn | TOC |
| | 6/10/85 | 94.3 | (b) | 3.68 | 90.6 | ukn | TOC |
| | 2/21/91 | 94.3 | (b) | 3.55 | 90.8 | CBWLI | TOC |
| 7 | 1/14/81 | 9.71 | MSL(a) | 3.73 | 5.98 | ukn | ukn |
| | 8/9/83 | | (b) | Well Not Found | | | |
| | 9/2/83 | | (b) | Well Not Found | | | |
| | 2/21/91 | | (b) | Well Not Found | | | |
| 8 | 1/14/81 | 15.63 | MSL(a) | 5.09 | 10.54 | ukn | ukn |
| | 8/9/83 | 100.5 | (b) | 6.1 | 94.4 | ukn | ukn |
| | 9/2/83 | 100.5 | (b) | 6.0 | 94.5 | ukn | ukn |
| | 6/6/85 | 100.5 | (b) | 5.19 | 95.3 | ukn | ukn |
| | 6/10/85 | 100.5 | (b) | 5.19 | 95.3 | ukn | ukn |
| | 2/21/91 | 100.5 | (b) | Well Not Accessable | | | |

See Notes on last page

TABLE 3 (continued)
SUMMARY OF HISTORICAL WATER ELEVATION MEASUREMENTS

| Well Number | Date | Survey Elevation (feet) | Survey Datum | Depth to Water (feet) | Elevation (feet) | Measurement Device | Measurement Reference Point |
|---|---|---|---|---|---|---|---|
| 9 | 1/14/81 | 16.08 | MSL(a) | 6.70 | 9.38 | ukn | ukn |
| | 8/9/83 | 100.1 | (b) | 6.9 | 93.2 | ukn | ukn |
| | 9/2/83 | 100.1 | (b) | Not Measured | | ukn | ukn |
| | 6/6/85 | 100.1 | (b) | 6.89 | 93.2 | ukn | TOC |
| | 6/10/85 | 100.1 | (b) | 6.89 | 93.2 | ukn | TOC |
| | 6/13/85 | 100.1 | (b) | 6.89 | 93.2 | ukn | TOC |
| | 2/21/91 | 100.1 | (b) | 6.42 | 93.7 | CBWLI | TOC |
| 10 | 1/14/81 | 15.10 | MSL(a) | 6.86 | 8.24 | ukn | ukn |
| | 8/9/83 | 100.2 | (b) | 7.1 | 93.1 | ukn | ukn |
| | 9/2/83 | 100.2 | (b) | 7.1 | 93.1 | ukn | ukn |
| | 6/6/85 | 100.2 | (b) | 6.95 | 93.3 | ukn | TOC |
| | 6/12/85 | 100.2 | (b) | 6.95 | 93.3 | ukn | TOC |
| | 2/21/91 | | (b) | Well Not Accessable | | | |
| 11 | 1/14/81 | 16.04 | MSL(a) | 6.32 | 9.72 | ukn | ukn |
| | 8/9/83 | 100.2 | (b) | 6.7 | 93.5 | ukn | ukn |
| | 9/2/83 | 100.2 | (b) | 6.7 | 93.5 | ukn | ukn |
| | 6/6/85 | 100.2 | (b) | 6.36 | 93.8 | ukn | TOC |
| | 6/11/85 | 100.2 | (b) | 6.36 | 93.8 | ukn | TOC |
| | 6/12/85 | 100.2 | (b) | 6.36 | 93.8 | ukn | TOC |
| | 2/21/91 | 100.2 | (b) | 6.40 | 93.8 | CBWLI | TOC |
| 12 | 1/14/81 | 16.05 | MSL(a) | 6.39 | 9.66 | ukn | ukn |
| | 8/9/83 | 100.3 | (b) | 6.8 | 93.5 | ukn | ukn |
| | 9/2/83 | 100.3 | (b) | 6.9 | 93.4 | ukn | ukn |
| | 2/21/91 | 100.3 | (b) | 6.20 | 94.1 | CBWLI | TOC |

See Notes on last page

TABLE 3 (continued)

SUMMARY OF HISTORICAL WATER ELEVATION MEASUREMENTS

| Well Number | Date | Survey Elevation (feet) | Survey Datum | Depth to Water (feet) | Elevation (feet) | Measurement Device | Measurement Reference Point |
|---|---|---|---|---|---|---|---|
| 13 | 1/14/81 | 15.36 | MSL(a) | 6.64 | 8.7 | ukn | ukn |
| | 8/9/83 | | | Well Not Found | | | |
| | 9/2/83 | | | Well Not Found | | | |
| | 6/6/85 | ukn | (b) | 6.82 | ukn | ukn | TOC |
| | 6/13/85 | ukn | (b) | 6.82 | ukn | ukn | TOC |
| | 2/21/91 | ukn | (b) | 6.20 | ukn | CBWLI | TOC |
| 14 | 8/9/83 | 100.6 | (b) | 7.0 | 93.6 | ukn | |
| | 9/2/83 | 100.6 | (b) | 7.0 | 93.6 | ukn | |
| | 2/21/91 | | (b) | Well Not Accessable | | | |
| 15 | 8/9/83 | 101.6 | (b) | 8.3 | 93.3 | ukn | ukn |
| | 9/2/83 | 101.6 | (b) | 8.3 | 93.3 | ukn | ukn |
| | 6/6/85 | 101.6 | (b) | 7.85 | 93.8 | ukn | TOC |
| | 6/13/85 | 101.6 | (b) | 7.85 | 93.8 | ukn | TOC |
| | 2/21/91 | 101.6 | (b) | 6.60 | 95.0 | CBWLI | TOC |
| 16 | 8/9/83 | 97.1 | (b) | 4.8 | 92.3 | ukn | ukn |
| | 9/2/83 | 97.1 | (b) | 4.8 | 92.3 | ukn | ukn |
| | 2/21/91 | 97.1 | (b) | 5 | 92 | CBWLI | TOC |
| 17 | 8/9/83 | 97.8 | (b) | 4.8 | 93.0 | ukn | ukn |
| | 9/2/83 | 97.8 | (b) | 4.8 | 93.0 | ukn | ukn |
| | 6/6/85 | 97.8 | (b) | 4.68 | 93.1 | ukn | TOC |
| | 6/13/85 | 97.8 | (b) | 4.68 | 93.1 | ukn | TOC |
| | 2/21/91 | 97.8 | (b) | 5 | 93 | CBWLI | TOC |

See Notes on last page

TABLE 3 (continued)
SUMMARY OF HISTORICAL WATER ELEVATION MEASUREMENTS

| Well Number | Date | Survey Elevation (feet) | Survey Datum | Depth to Water (feet) | Elevation (feet) | Measurement Device | Measurement Reference Point |
|---|---|---|---|---|---|---|---|
| 18 | 8/9/83 | 97.9 | (b) | 5.1 | 92.8 | ukn | ukn |
| | 9/2/83 | 97.9 | (b) | 5.1 | 92.8 | ukn | ukn |
| | 6/6/85 | 97.9 | (b) | 4.9 | 92.97 | ukn | TOC |
| | 6/12/85 | 97.9 | (b) | 4.9 | 92.97 | ukn | TOC |
| | 2/21/91 | 97.9 | (b) | 4.5 | 93.40 | CBWLI | TOC |
| 18A | 8/9/83 | 97.7 | (b) | 6.5 | 91.2 | ukn | ukn |
| | 9/2/83 | 97.7 | (b) | 6.4 | 91.3 | ukn | ukn |
| | 6/6/85 | 97.7 | (b) | 5.87 | 91.8 | ukn | TOC |
| | 6/13/85 | 97.7 | (b) | 5.87 | 91.8 | ukn | TOC |
| | 2/21/91 | 97.7 | (b) | 4.50 | 93.2 | CBWLI | TOC |
| 19 | 8/9/83 | 97.1 | (b) | 5.1 | 92.0 | ukn | ukn |
| | 9/2/83 | 97.1 | (b) | 5.1 | 92.0 | ukn | ukn |
| | 2/21/91 | 97.1 | (b) | Well Not Found | | | |
| 20 | 8/9/83 | 100.0 | (b) | 3.9 | 96.1 | ukn | ukn |
| | 9/2/83 | 100.0 | (b) | 3.9 | 96.1 | ukn | ukn |
| | 2/21/91 | 100.0 | (b) | 2.70 | 97.3 | CBWLI | TOC |
| 21 | 8/9/83 | 95.8 | (b) | 3.9 | 91.9 | ukn | ukn |
| | 9/2/83 | 95.8 | (b) | 4.1 | 91.7 | ukn | ukn |
| | 6/6/85 | 95.8 | (b) | 3.52 | 92.3 | ukn | TOC |
| | 6/13/85 | 95.8 | (b) | 3.52 | 92.3 | ukn | TOC |
| | 2/21/91 | | (b) | Well Not Accessable | | | |

See Notes on last page

TABLE 3 (continued)
SUMMARY OF HISTORICAL WATER ELEVATION MEASUREMENTS

Notes

a Survey by T.V. Tronoff, Civil Engineer and Surveyor, Inc.; USC&GS datum. Reported in Woodward Cl Consultants report of 30 March 1981.

b Survey by Kleinfelder staff, August 1983. Arbitrary datum: elevation well 20 = 100.0 feet. Specific datu listed.

MSL Mean Sea Level

ukn Unknown

TOC Measurement made from Top of Casing.

CBWLI Conductivity Based Water Level Indicator.

TABLE 4

SUMMARY OF HYDRAULIC PARAMETERS
RESULTING FROM PUMPING AND SLUG TESTS OF FEBRUARY, 1981[a]

| Subsurface Material | Storage Coefficient | Permeability (ft/day) | Hydraulic Gradient | Assumed Effective Porosity | Effective Velocity (ft/Year) |
|---|---|---|---|---|---|
| Sand and Gravel | 6 x 10-4 to 8 x 10-5 | 28 | 0.003 | 0.25 | 123.0 |
| Silty Clay and Gravelly Clay | NE | 1.1 | 0.006 | 0.25 | 10.0 |
| Clayey Silt and sand and sandy clay | NE | 0.25 | 0.006 | 0.25 | 2.0 |

NE: Not Evaluated

(a) Pumping and slug tests performed by Woodward-Clyde Consultants, January, 1981

TABLE 5

SUMMARY OF ANALYTICAL RESULTS -- CHROMIUM IN SOILS

| Boring No. | Approximate Sample Date | Sample Depth (feet) | Total Chromium (mg/Kg) | Hexavalent Chromium (mg/Kg) |
|---|---|---|---|---|
| 9[a] | 12/12/80 | 6-7 | 31 | -- |
| 10[a] | 12/16/80 | 3.5-4.5 | 29 | -- |
| | | 5-7.5 | 52 | -- |
| 11[a] | 12/18/80 | 3 | 39 | -- |
| | | 5.5 | 35 | -- |
| 13[a] | 12/22/80 | 3 | 48 | -- |
| | | 8 | 305 | -- |
| 14 | 4/13/82 | 5 | 33.0 | -- |
| | | 10 | 48.8 | -- |
| | | 15 | 40.2 | -- |
| | | 20 | 46.0 | -- |
| 22 | 6/08/83 | 4-4.5 | 5,200 | -- |
| | | 8-8.5 | 482 | -- |
| 23 | 6/83 | 2-2.5 | 38.4 | -- |
| | | 7.5-8 | 980 | -- |
| 24 | 1/05/85 | 2.0-2.5 | 6,700 | <0.2 |
| | | 4.0-4.5 | 727 | -- |
| | | 6.0-6.5 | 432 | 91 |
| | | 9.0-9.5 | 41.5 | -- |
| | | 11.0-11.5 | 41.5 | -- |
| 25 | 1/09/85 | 2.0-2.5 | 2,030 | <0.2 |
| | | 4.0-4.5 | 503 | <0.2 |
| | | 6.0-6.5 | 40.9 | -- |
| | | 9.0-9.5 | 44.9 | -- |
| | | 11.0-11.5 | 42.9 | -- |
| 26 | 1/09/85 | 4.0-4.5 | 48.2 | <0.2 |
| | | 6.0-6.5 | 39.9 | -- |
| | | 9.0-9.5 | 45.1 | -- |
| | | 11.0-11.5 | 66.1 | -- |
| 27 | 1/09/85 | 2.0-2.5 | 95.3 | -- |
| | | 4.0-4.5 | 78.2 | -- |
| | | 6.0-6.5 | 102 | -- |
| | | 9.0-9.5 | 250 | 1.6 |
| | | 11.0-11.5 | 51.7 | -- |

See Notes next page

TABLE 5 (continued)

SUMMARY OF ANALYTICAL RESULTS -- CHROMIUM IN SOILS

| Boring No. | Approximate Sample Date | Sample Depth (feet) | Total Chromium (mg/Kg) | Hexavalent Chromium (mg/Kg) |
|---|---|---|---|---|
| 28 | 1/09/85 | 2.0-2.5 | 52.2 | -- |
| | | 4.0-4.5 | 434 | <0.2 |
| | | 6.0-6.5 | 49.4 | -- |
| | | 9.0-9.5 | 49.5 | -- |
| | | 11.0-11.5 | 24.1 | -- |
| 29 | 1/09/85 | 2.0-2.4 | 55.6 | 0.4 |
| | | 4.0-4.5 | 46.0 | -- |
| | | 6.0-6.5 | 36.9 | -- |
| | | 9.0-9.5 | 47.6 | -- |
| 30 | 1/09/85 | 2.0-2.5 | 45.0 | -- |
| | | 4.0-4.5 | 48.5 | -- |
| | | 6.0-6.5 | 36.1 | -- |
| | | 9.0-9.5 | 57.9 | -- |
| | | 11.0-11.5 | 110 | 44 |
| 31 | 1/09/85 | 2.0-2.5 | 60.8 | -- |
| | | 4.0-4.5 | 45.2 | -- |
| | | 6.0-6.5 | 37.0 | <0.2 |
| | | 9.0-9.5 | 130 | -- |
| | | 11.0-11.5 | 73.7 | -- |

mg/Kg miligrams per kilogram (equal to parts per million)

-- Not Analyzed

• Sample collected by Woodward Clyde Consultants analyzed in January 1982.

All samples analyzed by Anlab

TABLE 6

SUMMARY OF ANALYTICAL RESULTS -- METALS AND SELECTED WATER QUALITY PARAMETERS

| Well No. | Date | Total Chromium (ug/l) | Hexavalent Chromium (ug/l) | Specific Conductance (umhos/cm) | pH | Arsenic (ug/l) | Iron (ug/l) | Nickel (ug/l) | Zinc (ug/l) | Analytical Lab (a) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8/24/77 | 200 | -- | 390 | -- | -- | -- | <20 | 10 | unk |
| | 9/15/81 | <1 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | 1 | -- | 753 | 7.2 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 2.5 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 32 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 2/26/85 | <20 | <20 | -- | -- | -- | -- | -- | -- | Anlab |
| 2 | 8/24/77 | 60 | -- | 360 | -- | -- | -- | <20 | <10 | unk |
| | 9/15/81 | <1 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | 4 | -- | 1,375 | 7.2 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 1.1 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 2 | -- | -- | -- | -- | -- | -- | -- | B&C |
| 3A | 8/18/77 | 50 | -- | 735 | -- | -- | -- | <20 | <5 | unk |
| | 9/15/81 | <1 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | <1 | -- | 465 | 7.8 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 230 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 14 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 2/14/85 | 770 | 80 | -- | -- | -- | -- | -- | -- | Anlab |
| 3B | 8/24/77 | 60 | -- | 1,840 | -- | -- | -- | 30 | <13 | unk |
| | 9/15/81 | <1 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | 480 | -- | 1,620 | 7.6 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 2,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 190 | -- | -- | -- | -- | -- | -- | -- | B&C |

See notes on last page

TABLE 6 (continued)

SUMMARY OF ANALYTICAL RESULTS -- METALS AND SELECTED WATER QUALITY PARAMETERS

| Well No. | Date | Total Chromium (ug/l) | Hexavalent Chromium (ug/l) | Specific Conductance (umhos/cm) | pH | Arsenic (ug/l) | Iron (ug/l) | Nickel (ug/l) | Zinc (ug/l) | Analytical Lab (a) |
|---|---|---|---|---|---|---|---|---|---|---|
| 3C | 8/18/77 | 18,000 | 12,000 | 1,600 | -- | -- | -- | 30 | <5 | unk |
| | 8/24/77 | 7,100 | 6,700 | 720 | | | | 80 | <10 | unk |
| | 9/15/81 | 30,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | 28,000 | -- | 1,360 | 7.2 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 22,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 17,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 2/26/85 | 7,250 | 6,300 | -- | -- | -- | -- | -- | -- | Anlab |
| 4 | 8/18/77 | 90,000 | 67,000 | 1,510 | -- | -- | -- | 20 | 19 | unk |
| | 9/15/81 | 57,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | 61,000 | -- | 957 | 6.5 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 56,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 55,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 2/26/85 | 59,000 | 59,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 5 | 8/24/77 | 360,000 | 295,000 | 720 | -- | -- | -- | 60 | <30 | unk |
| | 7/21/81 | -- | -- | -- | -- | -- | 5,400 | 840 | 40 | B&C |
| | 10/11/81 | 880,000 | 2,240 | 2,440 | 6.0 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 610,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 280,000 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 2/26/85 | 480,000 | 480,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 6 | 9/15/81 | 630 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | 80 | -- | 2,210 | 7.6 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 790 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 630 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 2/19/85 | 3,330 | 3,300 | -- | -- | -- | -- | -- | -- | Anlab |

See notes on last page

TABLE 6 (continued)

SUMMARY OF ANALYTICAL RESULTS -- METALS AND SELECTED WATER QUALITY PARAMETERS

| Well No. | Date | Total Chromium (ug/l) | Hexavalent Chromium (ug/l) | Specific Conductance (umhos/cm) | pH | Arsenic (ug/l) | Iron (ug/l) | Nickel (ug/l) | Zinc (ug/l) | Analytical Lab (a) |
|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 9/15/81 | <1 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | <1 | -- | 2,630 | 7.0 | -- | -- | -- | -- | B&C |
| | 12/21/81 | 3 | -- | -- | -- | -- | -- | -- | -- | B&C |
| 8 | 9/15/81 | <1 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 10/11/81 | 2 | -- | 966 | 7.3 | -- | -- | -- | -- | B&C |
| | 11/24/81 | 2.5 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 12/21/81 | 70 | -- | -- | -- | -- | -- | -- | -- | B&C |
| | 2/19/85 | <20 | <20 | -- | -- | -- | -- | -- | -- | Anlab |
| 9 | 1/15/81 | 258,000 | 185,000 | 1,330 | 9.8 | -- | -- | -- | -- | Ultrachem |
| | 2/26/85 | 892,000 | 877,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 10 | 1/15/81 | 17,000 | 14,000 | 590 | 10.2 | -- | -- | -- | -- | Ultrachem |
| | 2/14/85 | 746,000 | 740,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 11 (b) | 1/14/81 | 98,000 | 90,000 | 1,620 | 4.3 | -- | -- | -- | -- | Ultrachem |
| (b) | 1/14/81 | 127,000 | 98,000 | 1,320 | 4.4 | -- | -- | -- | -- | Ultrachem |
| (b) | 1/14/81 | 137,000 | 120,000 | 1,600 | 4.5 | -- | -- | -- | -- | Ultrachem |
| (b) | 1/14/81 | 145,000 | 124,000 | 1,590 | 4.5 | -- | -- | -- | -- | Ultrachem |
| (b) | 1/14/81 | 116,000 | 101,000 | 1,570 | 4.6 | -- | -- | -- | -- | Ultrachem |
| (b) | 1/14/81 | 122,000 | 122,000 | 1,570 | 4.6 | -- | -- | -- | -- | Ultrachem |
| (b) | 1/14/81 | 154,000 | 135,000 | 1,610 | 4.6 | -- | -- | -- | -- | Ultrachem |
| (b) | 1/14/81 | 134,000 | 134,000 | 1,590 | 4.7 | -- | -- | -- | -- | Ultrachem |
| | 7/21/81 | 340 | 34 | 804 | .5 | 200 | <10 | 30 | -- | B&C |
| | 2/26/85 | 2,440 | 2,410 | -- | -- | -- | -- | -- | -- | Anlab |

See notes on last page

TABLE 6 (continued)

SUMMARY OF ANALYTICAL RESULTS -- METALS AND SELECTED WATER QUALITY PARAMETERS

| Well No. | Date | Total Chromium (ug/l) | Hexavalent Chromium (ug/l) | Specific Conductance (umhos/cm) | pH | Arsenic (ug/l) | Iron (ug/l) | Nickel (ug/l) | Zinc (ug/l) | Analytical Lab (a) |
|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 1/15/81 | 32,000 | 12,000 | 880 | 9.2 | -- | -- | -- | -- | Ultrachem |
| | 2/26/85 | 240,000 | 240,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 13 | 1/15/81 | 381,000 | 325,000 | 1,880 | 6.5 | -- | -- | -- | -- | Ultrachem |
| | 2/14/85 | 676,000 | 676,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 14 | 2/26/85 | 654,000 | 632,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 15 | 2/19/85 | <20 | <20 | -- | -- | -- | -- | -- | -- | Anlab |
| 16 | 2/14/85 | 460,000 | 460,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 17 | 2/14/85 | 90,000 | 38,200 | -- | -- | -- | -- | -- | -- | Anlab |
| 18 | 2/19/85 | 60,500 | 55,000 | -- | -- | -- | -- | -- | -- | Anlab |
| 18A | 6/22/83 | 20 | <20 | 2,400 | 12.1 | -- | -- | -- | -- | Anlab |
| | 2/26/85 | <20 | <20 | -- | -- | -- | -- | -- | -- | Anlab |
| 19 | 6/22/83 | <20 | <20 | 840 | 7.9 | -- | -- | -- | -- | Anlab |
| | 2/19/85 | 20 | 20 | -- | -- | -- | -- | -- | -- | Anlab |
| 20 | 6/21/83 | 1,300 | 1,200 | 489 | 8.2 | -- | -- | -- | -- | B&C |
| | 6/22/83 | 1,300 | 530 | 520 | 7.9 | -- | -- | -- | -- | Anlab |
| | 8/11/83 | 90 | 40 | -- | -- | -- | -- | -- | -- | Anlab |
| | 2/26/85 | <20 | <20 | -- | -- | -- | -- | -- | -- | Anlab |

TABLE 6 (continued)

SUMMARY OF ANALYTICAL RESULTS -- METALS AND SELECTED WATER QUALITY PARAMETERS

| Well No. | Date | Total Chromium (ug/l) | Hexavalent Chromium (ug/l) | Specific Conductance (umhos/cm) | pH | Arsenic (ug/l) | Iron (ug/l) | Nickel (ug/l) | Zinc (ug/l) | Analytical Lab (a) |
|---|---|---|---|---|---|---|---|---|---|---|
| 21 | 6/22/83 | 20 | <20 | 3,200 | 2.7 | -- | -- | -- | -- | Anlab |
| | 2/19/85 | 40 | <20 | -- | -- | -- | -- | -- | -- | Anlab |

Notes:

-- No data, not analyzed

<10 Not detected above reported detection limit

ug/l micrograms per liter (equal to parts per billion)

umhos/cm micromhos per centimeter

(a) Analytical Laboratories:

- unk unknown, work reported by Woodward Clyde Consultants. Reported in their Report of Findings, Monitoring Well Installations, Electro-Coatings, Inc., Emeryville, California, September 20, 1977.
- Ultrachem Ultracham Laboratories; Data reported by Woodward Clyde Consultants. Reported in their Report on Phase 1 Ground-Water Investigation, E-C Industries, Emeryville, California 30 March 1981.
- B&C Brown and Caldwell; Data from Kleinfelder files B-1132-3, B-1132-4, and B-1132-5.
- Analab Anlab; Data from Kleinfelder files B-1132-3, B-1132-4, and B-1132-5.

(b) Data from sequential samples collected during a pumping test conducted by Woodward Clyde Consultants. Samples collected hourly from 10:30 am to 4:30 pm and at 5:00 pm. Reported in Woodward Clyde Consultants, Report of Findings, Monitoring Well Installations, Electro-Coatings, Inc., Emeryville, California, September 20, 1977.

TABLE 7

SUMMARY OF HISTORICAL ANALYTICAL RESULTS -- PURGABLE HALOCARBONS

| Well No. | Date | 1,1-DCE (ug/l) | trans 1,2-DCE (ug/l) | 1,1-DCA (ug/l) | TCE (ug/l) | TCA (ug/l) | PCE (ug/l) | Methylene Chloride (ug/l) | Vinyl Chloride (ug/l) | Lab (a) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3/21/85 | <0.5 | <0.5 | <0.5 | 33 | <0.5 | 21 | <0.5 | <0.5 | B&C |
| 3C | 6/11/85 | <0.5 | 23 | <0.5 | 150 | 2.4 | 1.7 | <0.5 | <0.5 | B&C |
| 6 | 6/11/85 | <5 | 54 | <5 | 220 | 3.9 | <5 | <5 | <5 | B&C |
| 8 | 6/10/85 | <1 | 19 | 1 | 46 | <1 | 18 | <1 | 3 | B&C |
| | 6/11/85 | 1 | 32 | 1 | 93 | <0.5 | 35 | <5 | -- | CT |
| 9 | 6/13/85 | <5 | 31 | <5 | 700 | <5 | 26 | 20 | <5 | B&C |
| 10 | 6/12/85 | <50 | <50 | <50 | 5,100 | <50 | 81 | <50 | <50 | B&C |
| (b) | 6/12/85 | <50 | 600 | <50 | 12,000 | <50 | <50 | <500 | -- | CT |
| 11 | 6/12/85 | <0.5 | 3.4 | <0.5 | 19 | 1.3 | 5.3 | 7.6 | <0.5 | B&C |
| 14 | 3/21/85 | <0.5 | <0.5 | <0.5 | 580 | <0.5 | 26 | <0.5 | <0.5 | B&C |
| 15 | 6/13/85 | <50 | 410 | <50 | 1,200 | <50 | <50 | <50 | <50 | B&C |
| 16 | 3/21/85 | <0.5 | <0.5 | <0.5 | 360 | <0.5 | 42 | <0.5 | <0.5 | B&C |
| 17 | 6/13/85 | 46 | 23 | <5 | 200 | 22 | 18 | <5 | <5 | B&C |
| 18 | 6/12/85 | <0.5 | 140 | <0.5 | 430 | 52 | 32 | <0.5 | <0.5 | B&C |
| (c) | 6/12/85 | <50 | <50 | <50 | 340 | 66 | <50 | <500 | -- | CT |
| 18A | 6/13/85 | <0.5 | <0.5 | <0.5 | 10 | <0.5 | <0.5 | 2.4 | <0.5 | B&C |
| 19 | 3/21/85 | <0.5 | <0.5 | <0.5 | 91 | <0.5 | 23 | <0.5 | <0.5 | B&C |
| 21 | 6/13/85 | <50 | 800 | <50 | 2,200 | 110 | <50 | 380 | <50 | B&C |

See notes next page

TABLE 7 (continued)

SUMMARY OF HISTORICAL ANALYTICAL RESULTS -- PURGABLE HALOCARBONS

NOTES

Chemical abreviations

| | |
|---|---|
| DCE | Dichloroethene |
| DCA | Dichloroethane |
| TCE | Trichloroethene |
| TCA | Trichloroethane (both 1,1,1 and 1,1,2 isomers) |
| PCE | Tetrachloroethene |

-- No data, Not analyzed

ug/l micrograms per liter (equal to parts per billion)

< 10 Not detected above reported detection limit

a Analytical Laboratories:
B&C - Brown and Caldwell. Data from Kleinfelder files B-1132-3, B-1132-4, and B-1132-5.
CT - Curtis and Tompkins. Data from Kleinfelder files B-1132-3, B-1132-4, and B-1132-5.

b Chloroform reported at a concentration of 88 ug/l

c Chloroform reported at a concentration of 84 ug/l

TABLE 1
Summary of Well Construction

| Well. No. | Date Completed | Drilling Method (a) | Total Depth of Boring (feet) | Total Depth of Well (feet) | Current Depth of Well (b) | Screen Interval (feet) | Well Diameter/ Slot Size (inches) | Casing/ Screen Material (c) | Type of Filterpack (d) | Depth of Well Seal (feet)(e) | Report (f) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8/18/77 | 6-A | 30 | 29 | N/A | 21-29 | 4/ukn | PVC/ukn | PG | 14 | 1 |
| 2 | 8/18/77 | 6-A | 23 | 21 | N/A | 14-21 | 1.5/ukn | PVC/ukn | #3 sd | 13 | 1 |
| 3A | 8/15/77 | 4.625-R | 65 | 65 | 60.5 | 57-61 | 1.5/ukn | PVC/ukn | #3 sd | 55 | 1 |
| 3B | 8/15/77 | 6-A | 20 | 18 | 17 | 16-18 | 1.5/ukn | PVC/ukn | #3 sd | 15 | 1 |
| 3C | 8/15/77 | 4.625-R | 15 | 15 | 13.5 | 11-14 | 1.5/ukn | PVC/ukn | #3 sd | 10 | 1 |
| 4 | 8/15/77 | 6-A | 20.5 | 20.5 | 19.6 | 16-20 | 1.5/ukn | PVC/ukn | #3 sd | 14.5 | 1 |
| 5 | 8/15/77 | 6-A | 15 | 15 | 14.5 | 11-15 | 1.5/ukn | PVC/ukn | #3 sd | 10 | 1 |
| 6 | 2/21/78 | 6-A | 18 | 17 | 16.1 | 13-17 | 1.5/ukn | PVC/ukn | PG | 11 | 2 |
| 7 | 2/21/78 | 6-A | 18 | 13 | N/A | 10-13 | 1.5/ukn | PVC/ukn | PG | 9 | 2 |
| 8 | 3/13/78 | 6-A | 22 | 22 | N/A | 16-22 | ukn/ukn | PVC/ukn | PG | 14 | 2 |
| 9[1] | 12/12/80 | 4.625-PCB | 33.5 | 24.5 | 23.9 | 17.5-24.5 | 4/ukn | PVC/ukn | PG | 15.5 | 3 |
| 10[2] | 12/16/80 | 4.625-PCB | 31.0 | 24.5 | N/A | 17.5-24.5 | 4/ukn | PVC/ukn | PG | 17 | 3 |
| 11[3] | 12/18/80 | 4.625-PCB | 34 | 29 | 27 | 16-29 | 6/ukn | PVC/ukn | PG | 14.5 | 3 |
| 12 | 12/19/80 | 8-R | 30 | 28.5 | 25.5 | 17.5-28.5 | 4/ukn | PVC/ukn | PG | 14.5 | 3 |
| 13[4] | 12/22/80 | 4.625-PCB | 15.5 | 15.5 | 14.8 | 10.5-15.5 | 6/ukn | PVC/ukn | PG | 9.5 | 3 |
| 14 | 4/13/82 | ukn-A | 26.5 | 25 | N/A | 15-25 | 4/0.01 | PVC/PVC | #20 sd | ukn | 4 |
| 15 | 4/13/82 | ukn-A | 26.5 | 25 | 24.6 | 15-25 | 4/0.01 | PVC/PVC | #20 sd | ukn | 4 |
| 16 | 4/13/82 | ukn-A | 26.5 | 22 | 21.6 | 12-22 | 4/0.01 | PVC/PVC | #20 sd | ukn | 4 |
| 17 | 4/13/82 | ukn-A | 26.5 | 25 | 24.5 | 10-20 | 4/0.01 | PVC/PVC | #20 sd | ukn | 4 |
| 18 | 4/13/82 | ukn-A | 31.5 | 25 | 25 | 15-25 | 4/0.01 | PVC/PVC | #20 sd | ukn | 4 |
| 18A[5] | 1983 | 8.25-A | 52.5 | 51.5 | 40.5 | 35-50 | 4/0.02 | PVC/PVC | sd | 35 | 4 |
| 19 | 6/10/83 | 8.25-A | 26.5 | 25 | N/A | 10-25 | 4/0.02 | PVC/PVC | sd | 6 | 4 |
| 20[6] | 1983 | 8.25-A | 56.5 | 51 | 47.4 | 31-51 | 4/0.02 | PVC/PVC | sd | 28 | 4 |
| 21 | 6/08/83 | 8.25-A | 26.5 | 25 | N/A | 10-25 | 4/0.02 | PVC/PVC | sd | 7 | 4 |

See notes next page

TABLE 1 (continued)
Summary of Well Construction

NOTES:

a Drilling Methods: diameter of boring in inches - method: A = Auger; R = Rotary; PCB = Pitcher Core Barrel; unk = unknown.

b Based on Kleinfelder reconnaissance of site February 21, 1991; N/A = not available

c Casing/Screen Material: PVC = polyvinyl chloride plastic; unk = unknown, not found on boring log;

d Type of Filterpack: PG = pea gravel; sd = sand; filterpack size given where known

e ukn = well seal data not found on boring log

f Reports

1 Woodward Clyde Consultants, Report of Findings, Monitoring Well Installations, Electro-Coatings, Inc., Emeryville, California, September 20, 1977.

2 Woodward Clyde Consultants, miscellaneous boring logs.

3 Woodward Clyde Consultants, Report on Phase I Ground Water Investigation, E-C Industries, Emeryville, California, 30 March, 1981.

4 Kleinfelder, Preliminary Report for Investigation, Electro-Coatings Facility, Emeryville, California. Kleinfelder file number B-1132-3.

Notes on Well Construction

1 Borehole filled with drill cuttings from 25 to 33.5 feet.

2 Borehole filled with drill cuttings from 24.5 to 31.0 feet.

3 Borehole filled with drill cuttings from 29 to 34 feet. 1-inch diameter stilling well installed alongside well in boring to 22 feet depth.

4 1-inch diameter stilling well installed alongside well in boring to 22 feet depth.

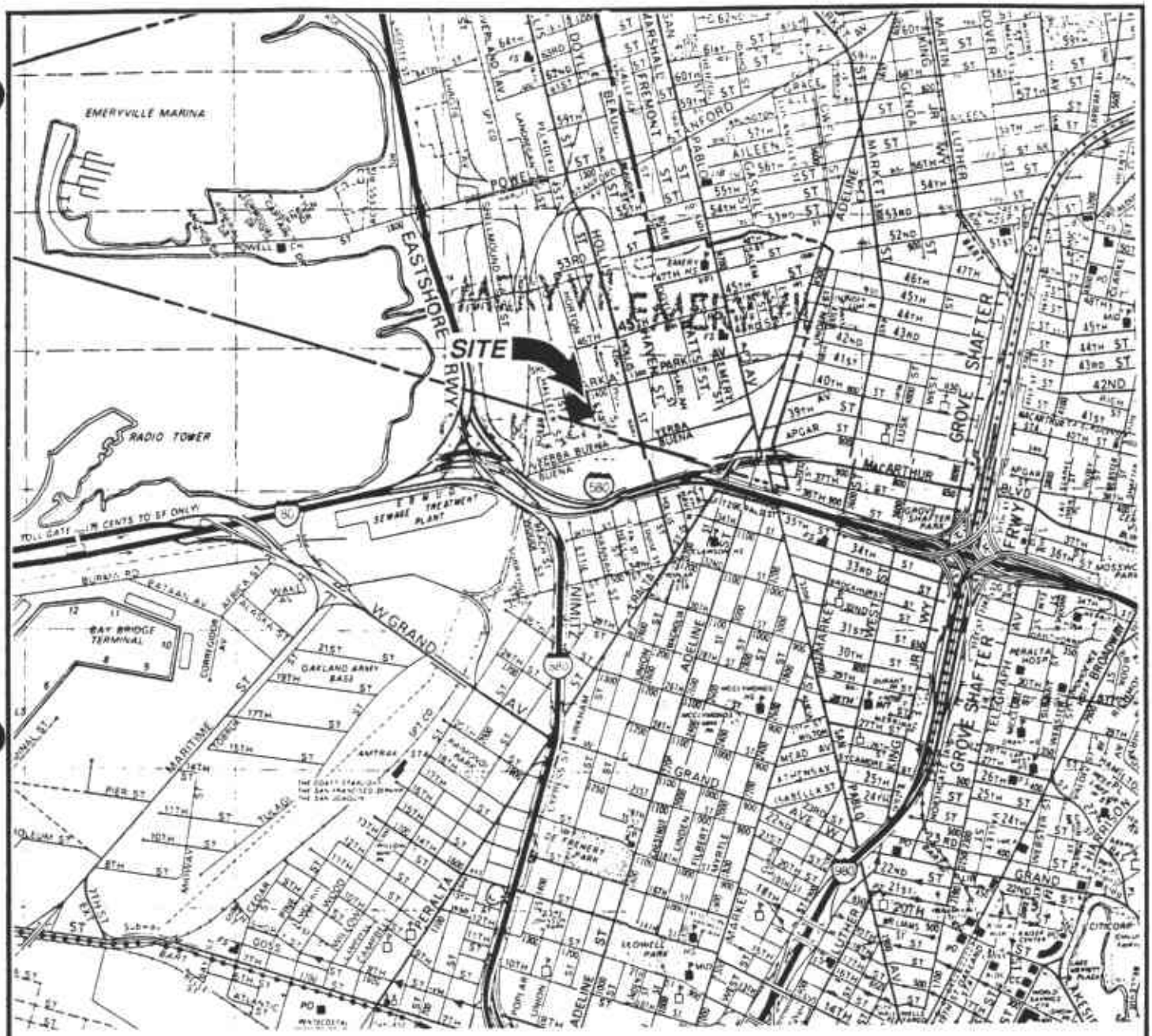
5 10-inch conductor casing set at 27 feet. Well seal may be interrupted between 27 and 28 feet, log unclear.

6 10-inch conductor casing set at 26.5 feet. 3.5 feet slough in bottom of boring.

TABLE 2
CURRENT STATUS OF WELLS
FEBRUARY, 1991

| Well Number | Inside Diameter (Inches) | Original Depth (Feet) | Current Depth (Feet) | Depth to Water (Feet) | Observations (February, 1991 site visit) |
|---|---|---|---|---|---|
| 1 | 4 | 29 | NA[a] | NA | Could not remove cap. |
| 2 | 1.5 | 21 | NA | NA | Could not locate. |
| 3A | 1.5 | 65 | 60.5 | 7.05 | Standing water in Christy box. |
| 3B | 1.5 | 18 | 17 | 6.42 | Standing water in Christy box. |
| 3C | 1.5 | 15 | 13.5 | 6.2 | Standing water in Christy box. |
| 4 | 1.5 | 20.5 | 19.65 | 6.45 | No unusual conditions noted. |
| 5 | 1.5 | 15 | 14.5 | 6.78 | No unusual conditions noted. |
| 6 | 1.5 | 18 | 16.1 | 3.55 | No well cap. |
| 7 | 1.5 | 18 | NA | NA | Could not locate. |
| 8 | NA | 22 | NA | NA | Vehicle was parked over this well. No access. Condition unknown. |
| 9 | 4 | 24.5 | 23.9 | 6.42 | Surface water draining from adjacent warehouse into Christy box. Needs repair. |
| 10 | 4 | 24.5 | NA | NA | Vehicle parked over this well. No access. Condition unknown. |
| 11 | 6 | 29 | 27 | 6.4 | Brownish tinge to water and strong iridescent sheen. |
| 12 | 4 | 28.5 | 25.5 | 6.2 | No unusual conditions noted. |
| 13 | 6&1 | 15.5 | 14.8 | 6.55 | Observed rust-colored water marks on inside of PVC casing. Appears that standing water in the Christy box has entered well. |
| 14 | 4 | 25 | NA | NA | Soil noted to grade surface around PVC casing. No access. Condition uncertain. |

See notes next page




N

0 1/2 1
mile

Map modified from Thomas Bros. Guide, 1988.

KLEINFELDER

PROJECT NO. 10-2200-01

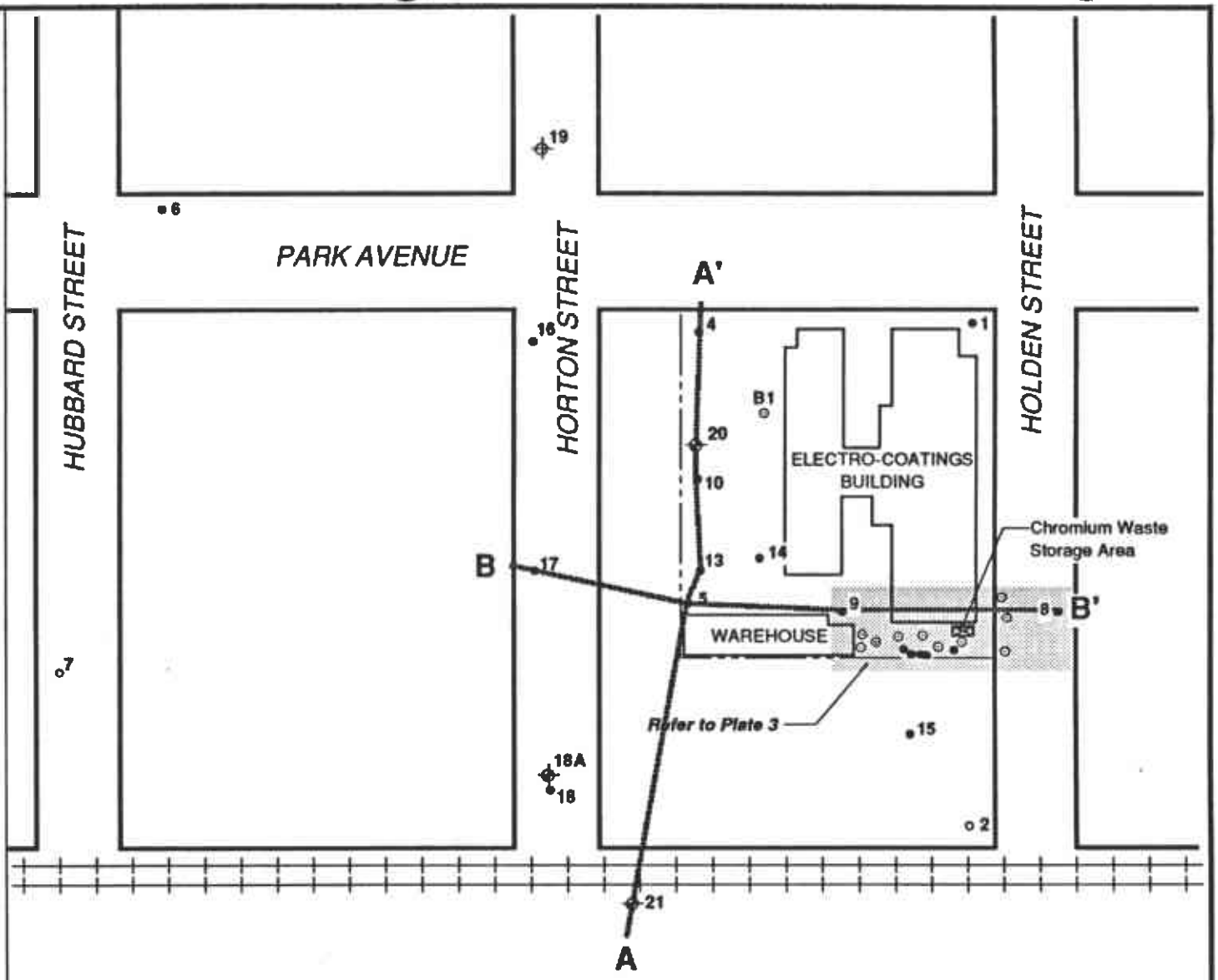
## SITE LOCATION MAP

ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

PLATE
1

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- •1 WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- ⌖20 WELLS INSTALLED BY KLEINFELDER AS OF 1985
- ○2 WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⌖19 WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- B1 ⊙ SOIL BORING
- A—A' CROSS-SECTION LOCATION




N

120 0 120

Approximate Scale (feet)

KLEINFELDER

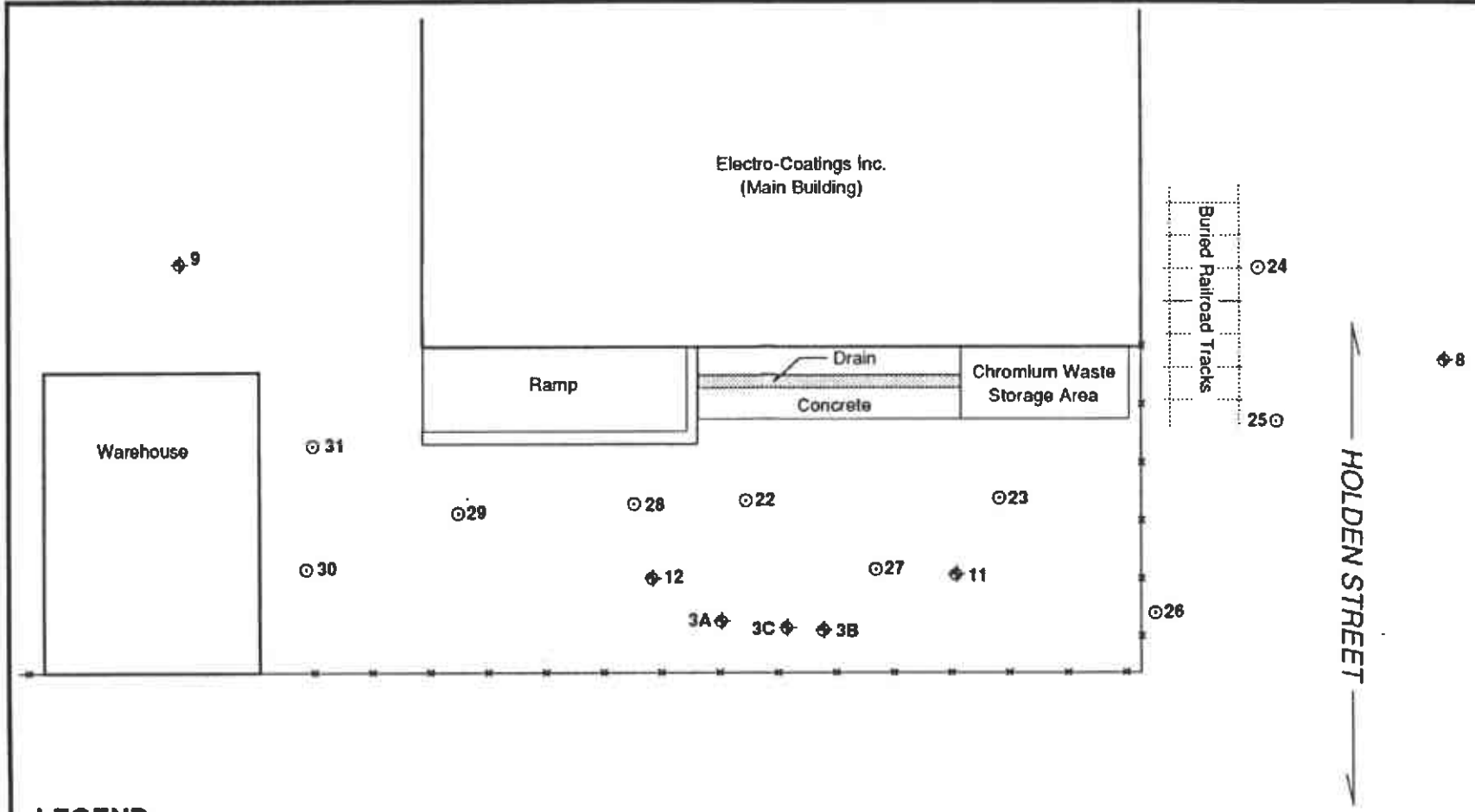
| | |
|---|---|
| DRAFTED BY: L. Sue | DATE: 4-16-91 |
| CHECKED BY: J. Romle | DATE: 4-23-91 |

**SITE PLAN**

ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-2200-01

PLATE 2




## LEGEND

9 MONITORING WELL

22 SOIL BORING

N

15 0 15

Approximate Scale (feet)

KLEINFELDER

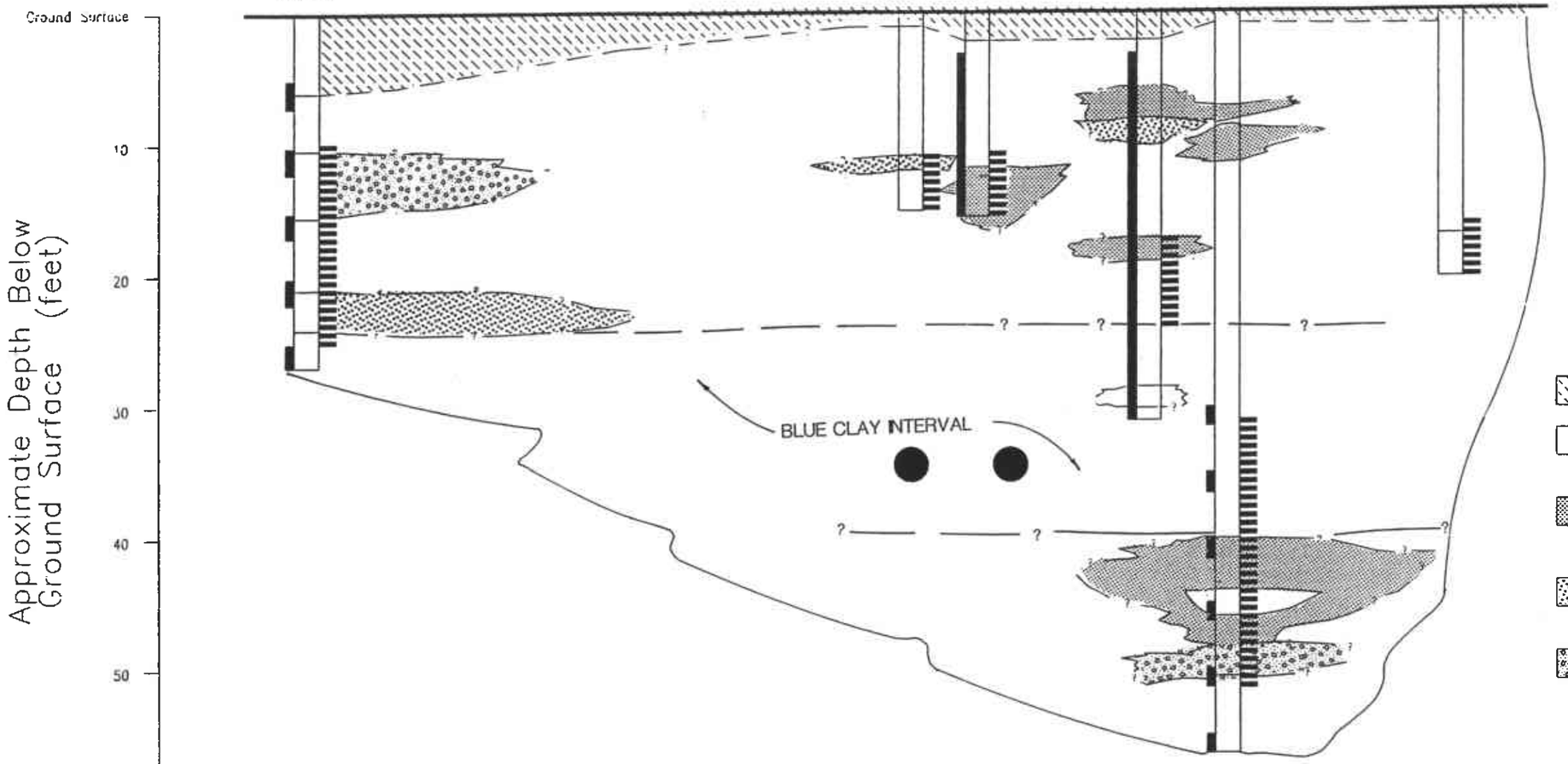
| | | | |
|---|---|---|---|
| DRAFTED BY: L. Sue | DATE: 4-16-91 | | |
| CHECKED BY: J. Romie | DATE: 4-23-91 | | |

**SITE PLAN DETAIL AT SOUTHEAST PROPERTY CORNER**

ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

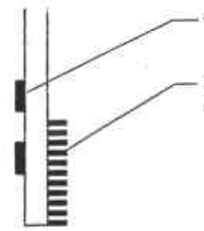
PROJECT NO. 10-2200-01

PLATE 3




## LEGEND

WELL 4 — Monitoring well number




A A' — Cross section designation

## DESCRIPTION OF UNITS

- Fill material
- Clay and Silty Clay – little or no coarse fraction
- Zones of increased coarse material (Sands, Gravels) within Clay or Silty Clay matrix
- Zones of increased fine material (Clays and Silts) within a Sand or Gravel matrix
- Clean Sands and Gravels – little or no fine fraction

## NOTE

Contacts between units are approximate only and are based on general soil descriptions provided in boring logs (Appendix A).

## SCALE

10 feet

50 feet

0

Vertical Exaggeration=5X

KLEINFELDER

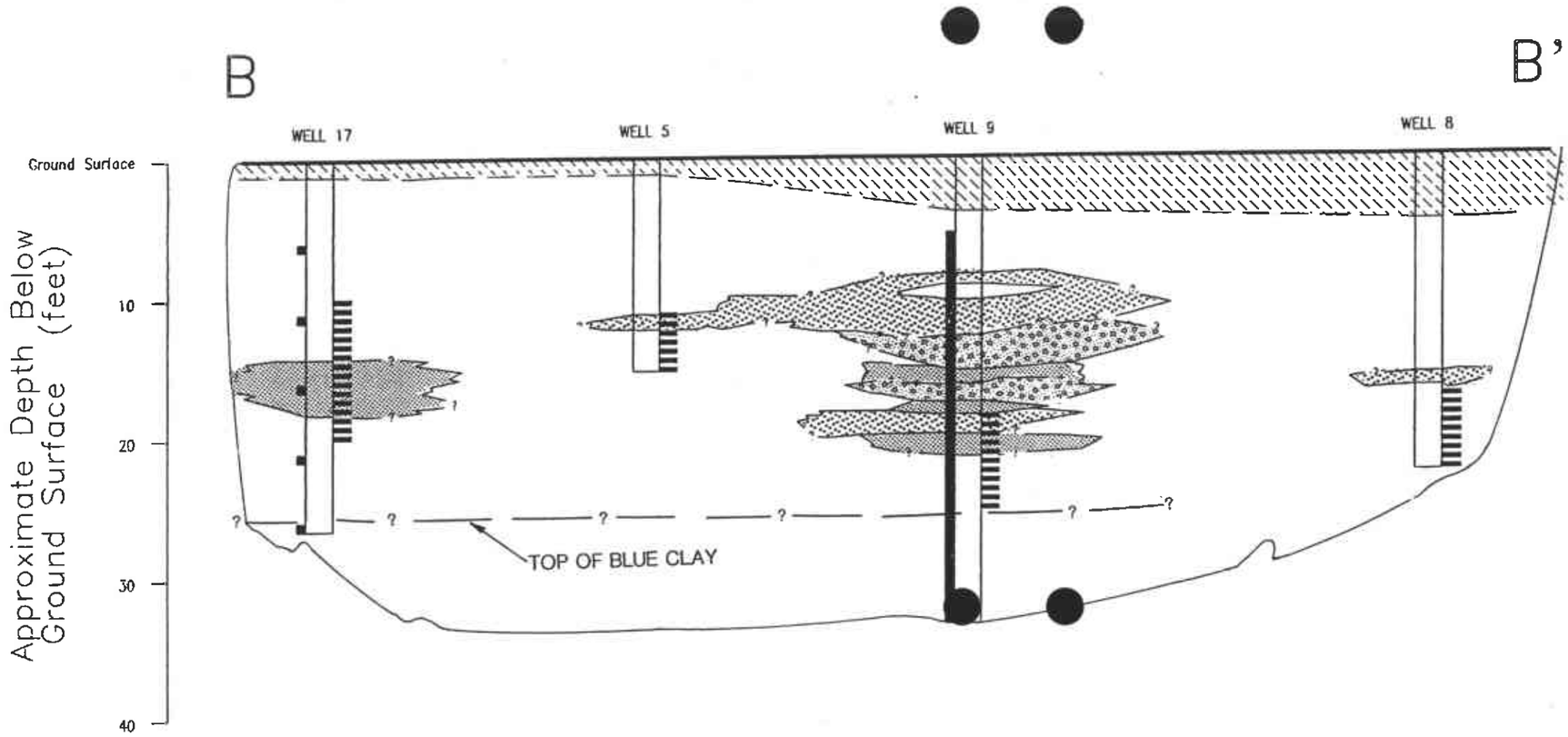
| | |
|---|---|
| DRAFTED BY: K. King | DATE: 04/18/91 |
| CHECKED BY: J. Romie | DATE: 04/18/91 |

CROSS-SECTION A-A'

Electro-Coatings, Inc.
1401 Park Avenue
Emeryville, California

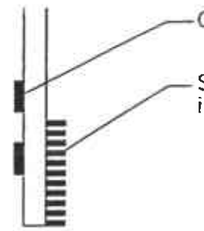
PROJECT NO. 10-2200-01

PLATE 4




## LEGEND

WELL 5 — Monitoring well number




A A' — Cross section designation

## DESCRIPTION OF UNITS

- Fill material
- Clay and Silty Clay – little or no coarse fraction
- Zones of increased coarse material (Sands, Gravels) within Clay or Silty Clay matrix
- Zones of increased fine material (Clays and Silts) within a Sand or Gravel matrix
- Clean Sands and Gravels – little or no fine fraction

## NOTE

Contacts between units are approximate only and are based on general soil descriptions provided in boring logs (Appendix A).

## SCALE

10 feet

50 feet

0

Vertical Exaggeration=5X

KLEINFELDER

| | |
|---|---|
| DRAFTED BY: K. King | DATE: 04/18/91 |
| CHECKED BY: J. Romie | DATE: 04/18/91 |

CROSS-SECTION B-B'

Electro-Coatings, Inc.
1401 Park Avenue
Emeryville, California

PROJECT NO. 10-2200-01

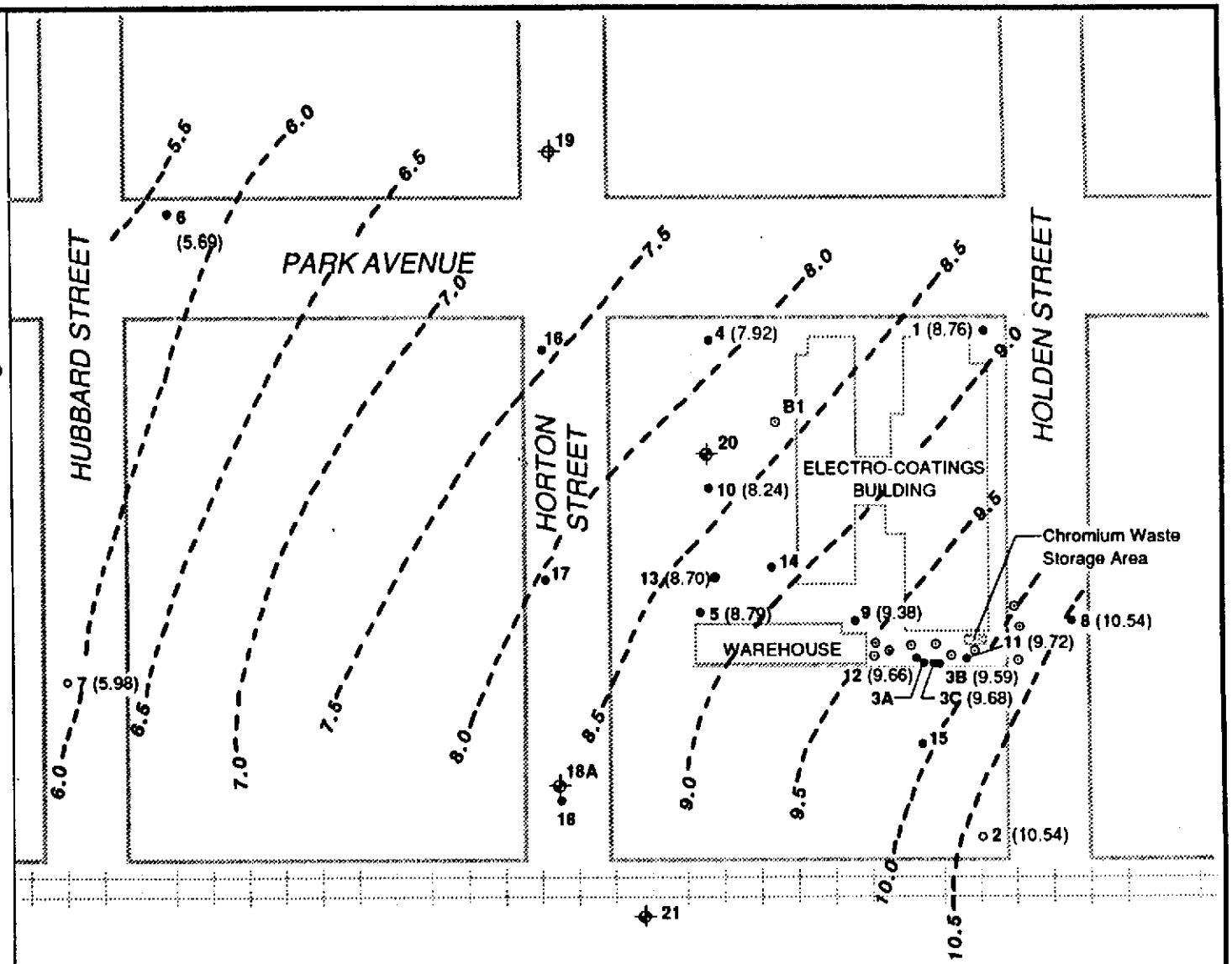
PLATE 5

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- •1 WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- ⊕ 20 WELLS INSTALLED BY KLEINFELDER AS OF 1985
- ○ 2 WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⊕ 19 WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- B1 ⊙ SOIL BORING
- (5.90) GROUND WATER SURFACE ELEVATION (feet)
- 5.5 GROUND WATER SURFACE ELEVATION CONTOUR (feet)

**NOTE:** Ground water elevations are based on an arbitrary survey datum.

120 0 120
Approximate Scale (feet)




KLEINFELDER

| | | |
|---|---|---|
| DRAFTED BY: L. Sue/L. Latman | DATE: 4-17-91 | |
| CHECKED BY: J. Romle | DATE: 4-23-91 | |

**INFERRED PIEZOMETRIC SURFACE CONTOUR MAP FOR SHALLOW WATER BEARING ZONE, JANUARY 1981**

ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

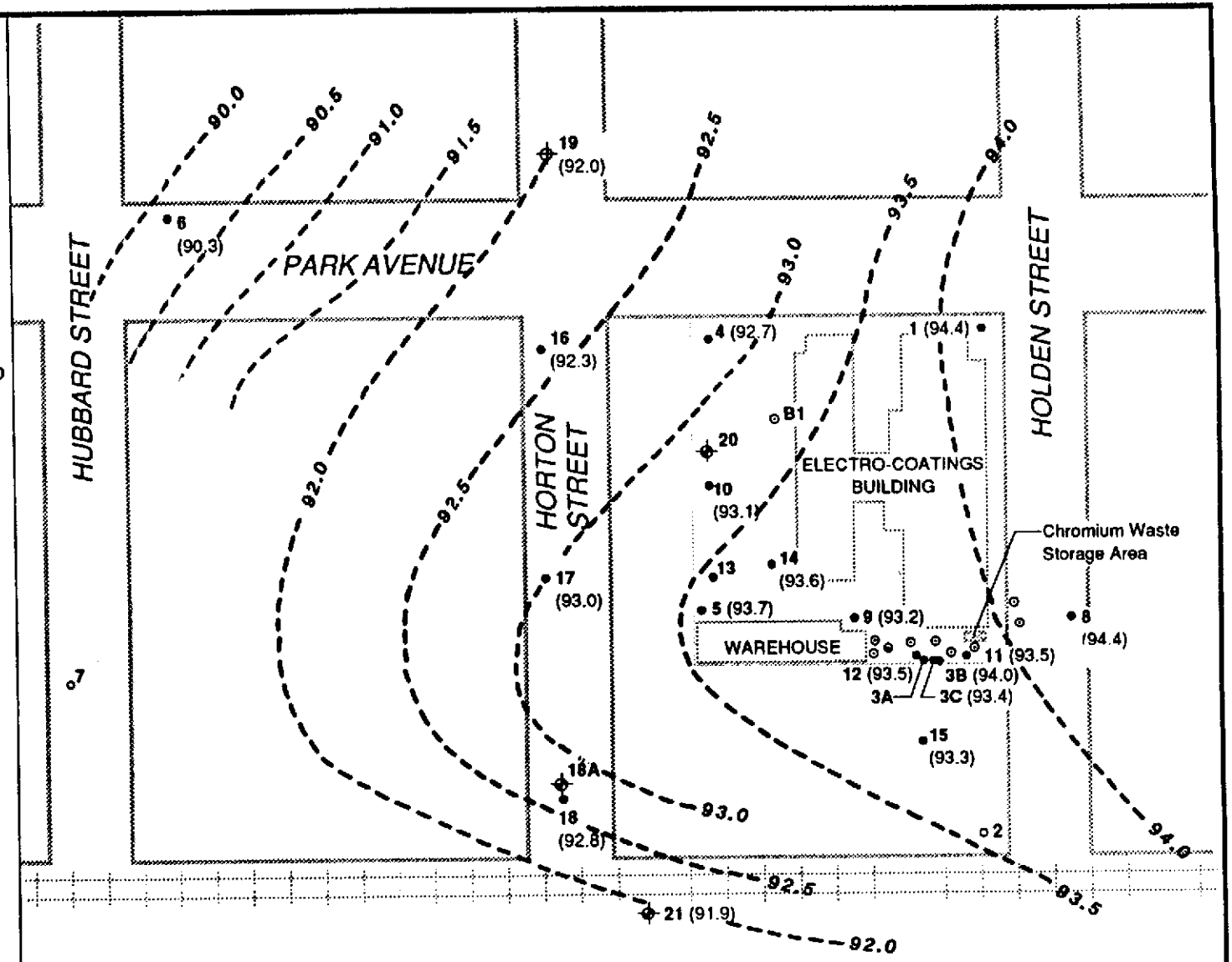
PROJECT NO. 10-2200-01

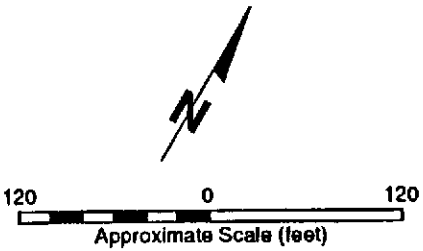
PLATE 6

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- •1 — WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- ⌖20 — WELLS INSTALLED BY KLEINFELDER AS OF 1985
- ○2 — WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⌖19 — WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- B1 ⊙ — SOIL BORING
- (90.3) — GROUND WATER SURFACE ELEVATION (feet)
- 91.0 — GROUND WATER SURFACE ELEVATION CONTOUR (feet)

**NOTE:** Ground water elevations are based on an arbitrary survey datum.




KLEINFELDER

DRAFTED BY: L. Sue/L. Latman DATE: 4-17-91

CHECKED BY: J. Romie DATE: 4-23-91

**INFERRED PIEZOMETRIC SURFACE CONTOUR MAP FOR SHALLOW WATER BEARING ZONE, AUGUST 9, 1983**

ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

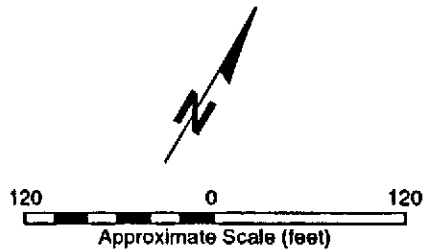
PROJECT NO. 10-2200-01

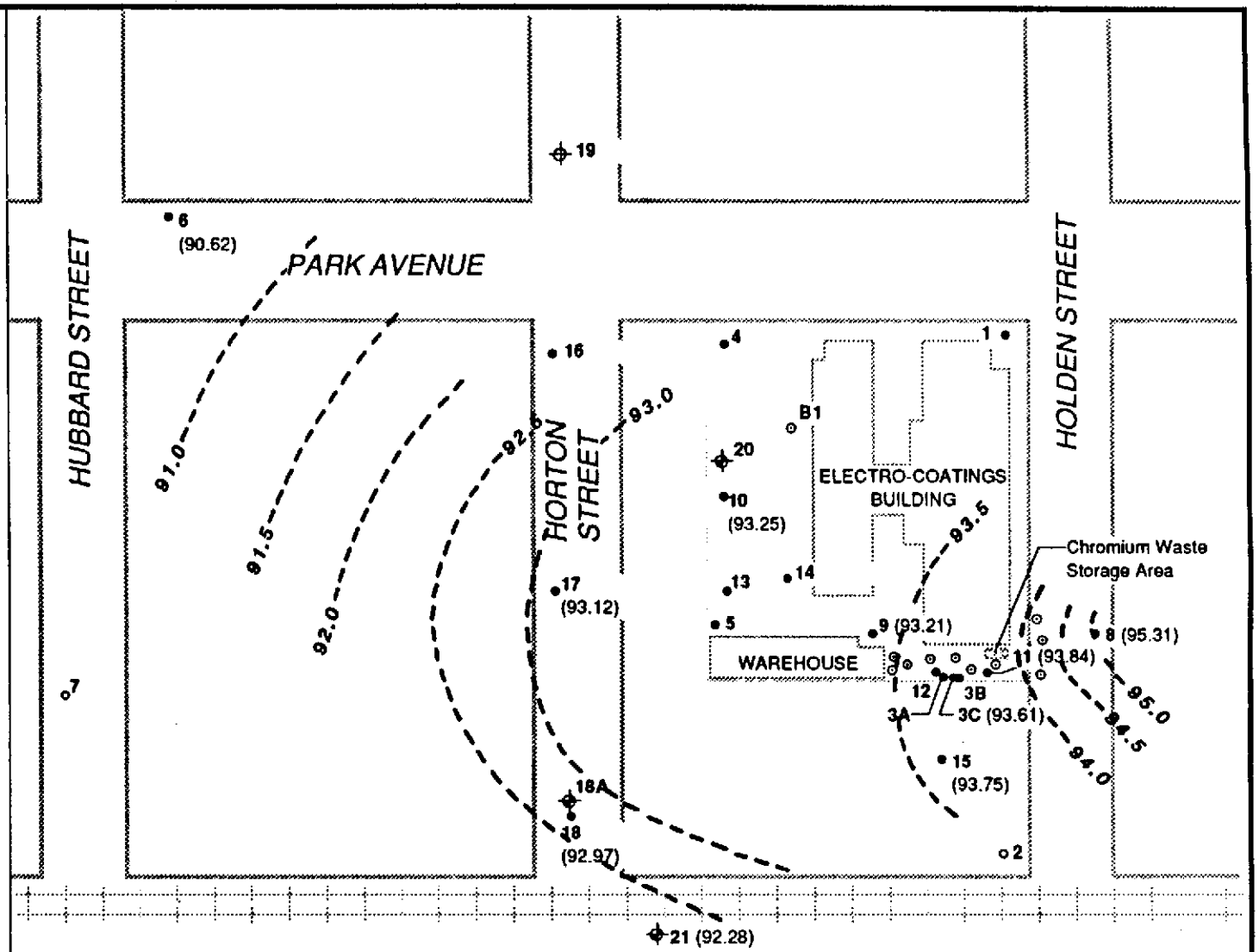
PLATE 7

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- •1 WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- ⊕ 20 WELLS INSTALLED BY KLEINFELDER AS OF 1985
- ○ 2 WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⊕ 19 WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- B1 ⊙ SOIL BORING
- (90.62) GROUND WATER SURFACE ELEVATION (feet)
- 92.0 GROUND WATER SURFACE ELEVATION CONTOUR (feet)

**NOTE:** Ground water elevations are based on an arbitrary survey datum.




KLEINFELDER

| | |
|---|---|
| DRAFTED BY: L. Sue/L. Latman | DATE: 4-17-91 |
| CHECKED BY: J. Romle | DATE: 4-23-91 |

**INFERRED PIEZOMETRIC SURFACE CONTOUR MAP FOR SHALLOW WATER BEARING ZONE, JUNE 6, 1985**

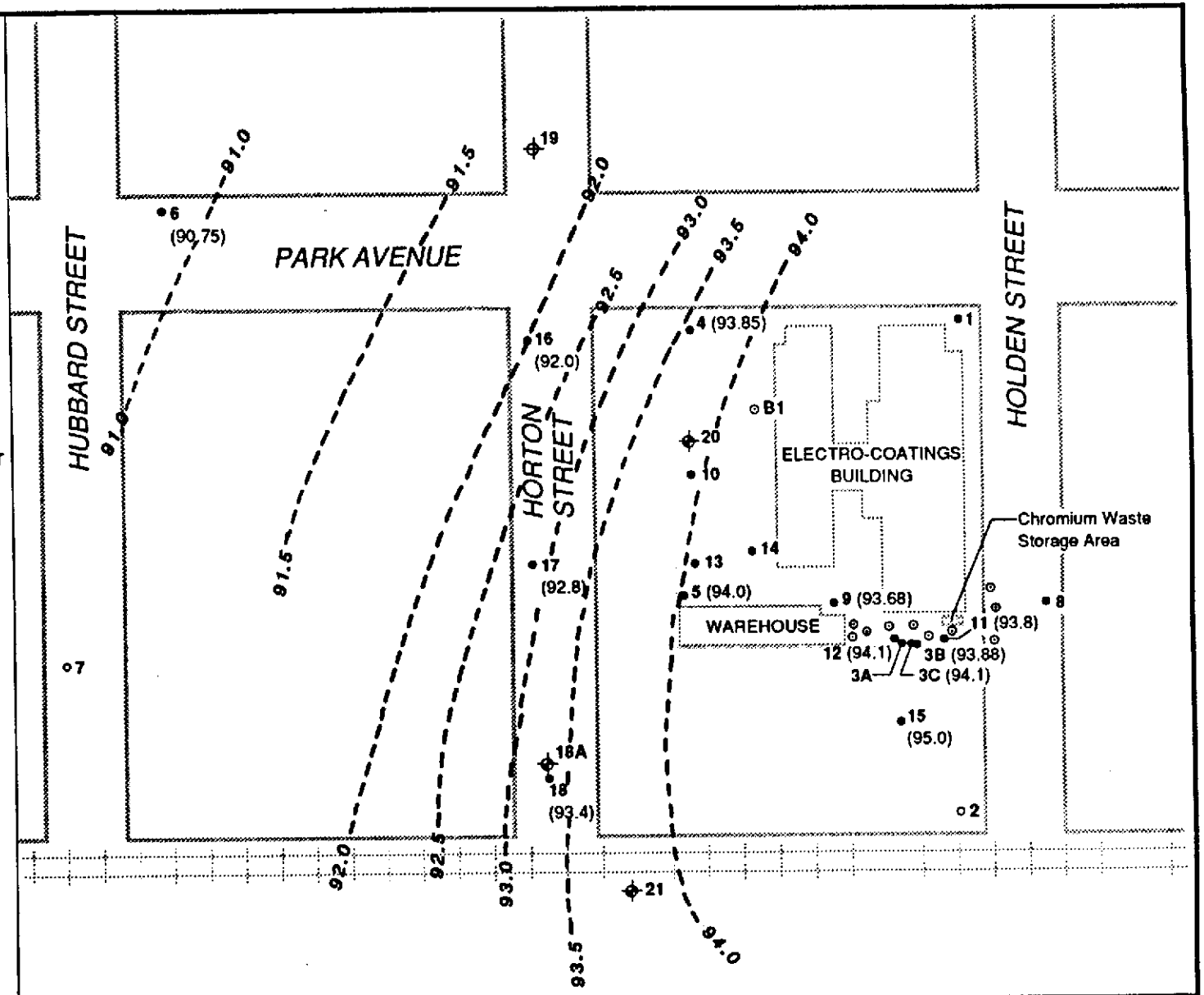
ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-2200-01

PLATE 8

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- •1 WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- ⊕20 WELLS INSTALLED BY KLEINFELDER AS OF 1985
- ○2 WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⊕19 WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- B1 ⊙ SOIL BORING
- (93.4) GROUND WATER SURFACE ELEVATION (feet)
- 93.5 GROUND WATER SURFACE ELEVATION CONTOUR (feet)




NOTE: Ground water elevations are based on an arbitrary survey datum.

N

120 0 120
Approximate Scale (feet)

KLEINFELDER

DRAFTED BY: L. Sue/L. Latman DATE: 4-17-91

CHECKED BY: J. Romie DATE: 4-23-91

**INFERRED PIEZOMETRIC SURFACE CONTOUR MAP FOR SHALLOW WATER BEARING ZONE, FEBRUARY 21, 1991**

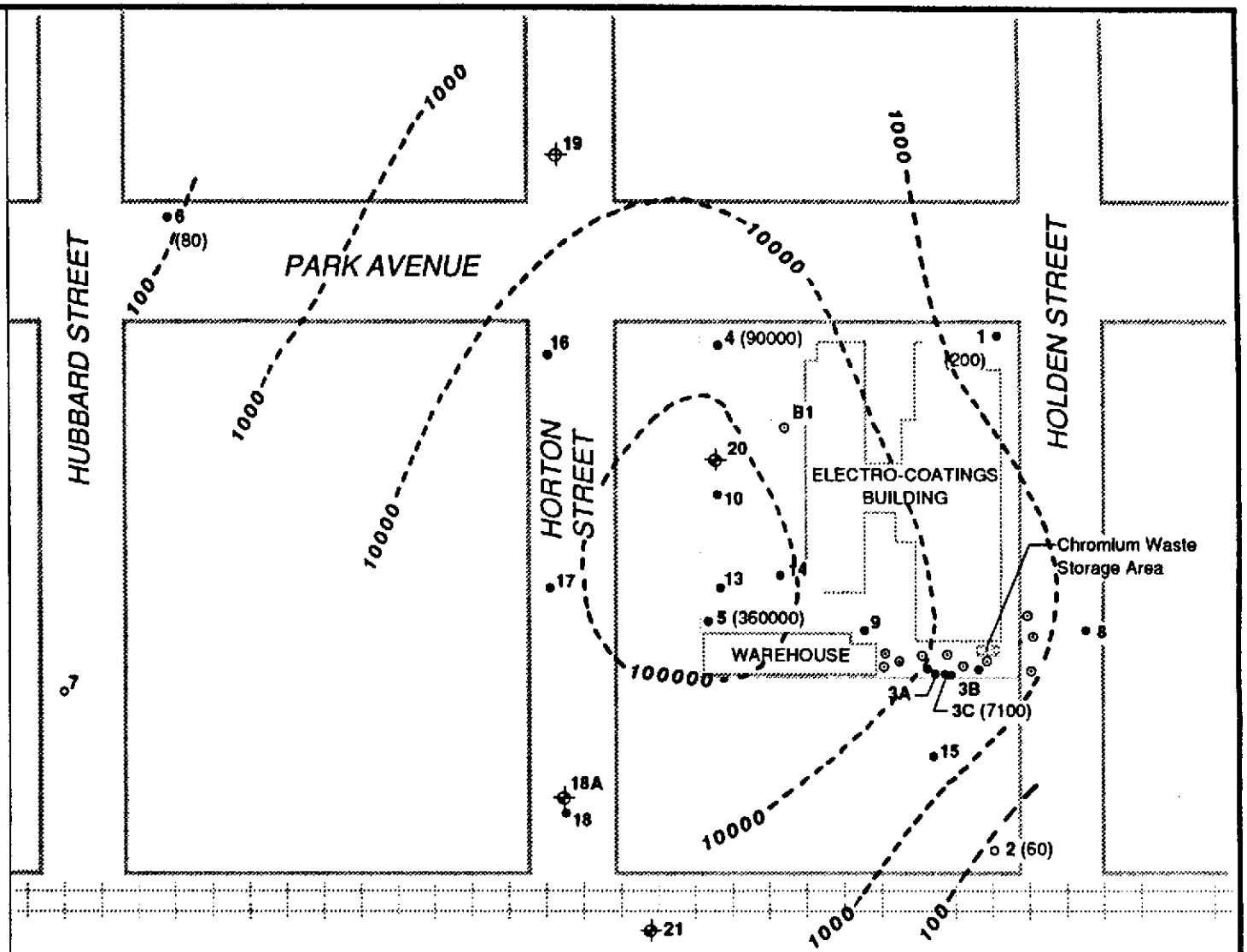
ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-2200-01

PLATE 9

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- •1 WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- ⌖20 WELLS INSTALLED BY KLEINFELDER AS OF 1985
- ○2 WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⌖19 WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⊙ B1 SOIL BORING
- (80) CHROMIUM CONCENTRATION (µg/l)
- 100 CHROMIUM ISOCONCENTRATION (µg/l)
- (ND) NOT DETECTED at or above laboratory detection limit




120 0 120
Approximate Scale (feet)

KLEINFELDER

DRAFTED BY: L. Sue/L. Latman DATE: 4-17-91

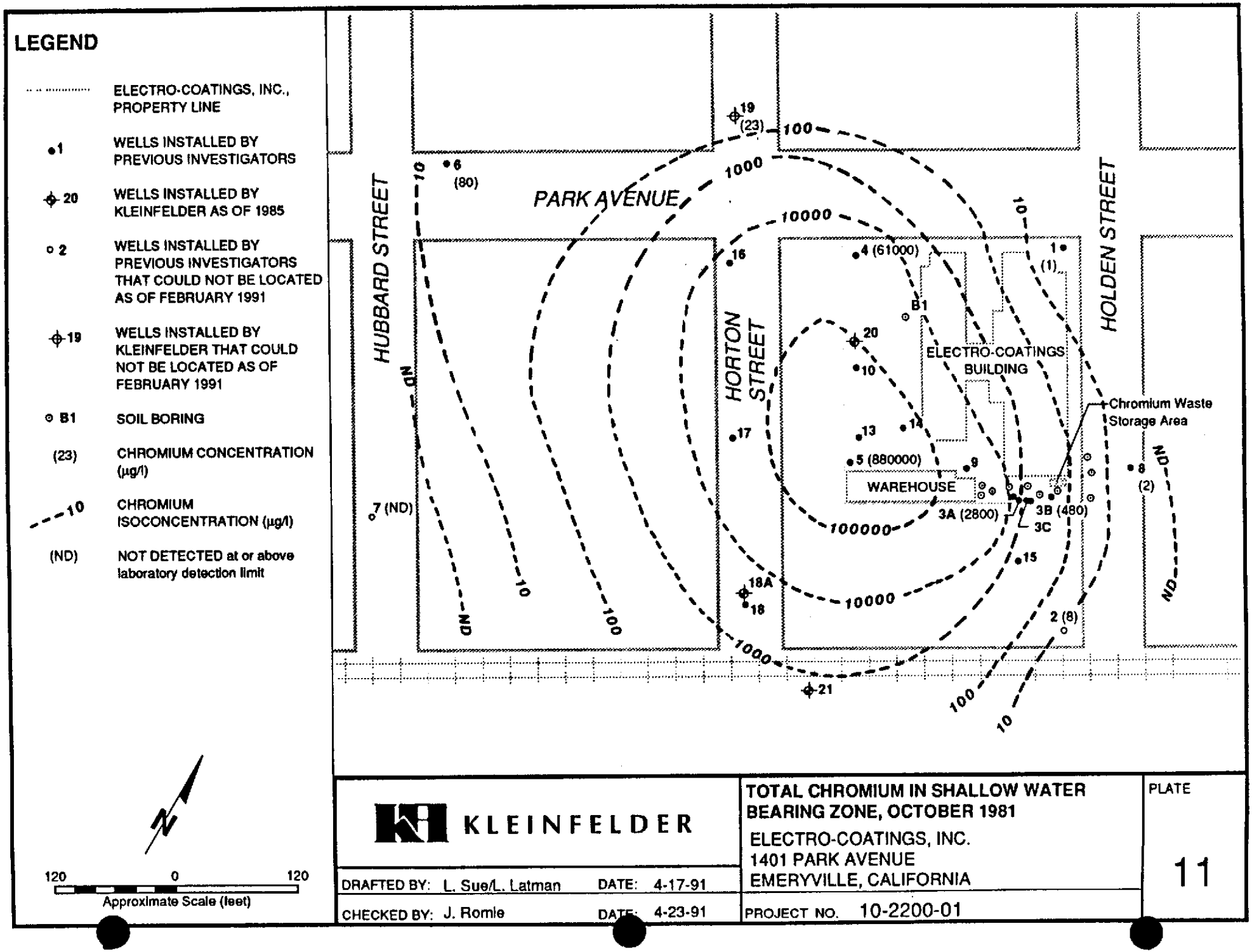
CHECKED BY: J. Romie DATE: 4-23-91

**TOTAL CHROMIUM IN SHALLOW WATER BEARING ZONE, AUGUST 1977**

ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-2200-01

PLATE 10




KLEINFELDER

DRAFTED BY: L. Sue/L. Latman DATE: 4-17-91

CHECKED BY: J. Romie DATE: 4-23-91

**TOTAL CHROMIUM IN SHALLOW WATER BEARING ZONE, OCTOBER 1981**

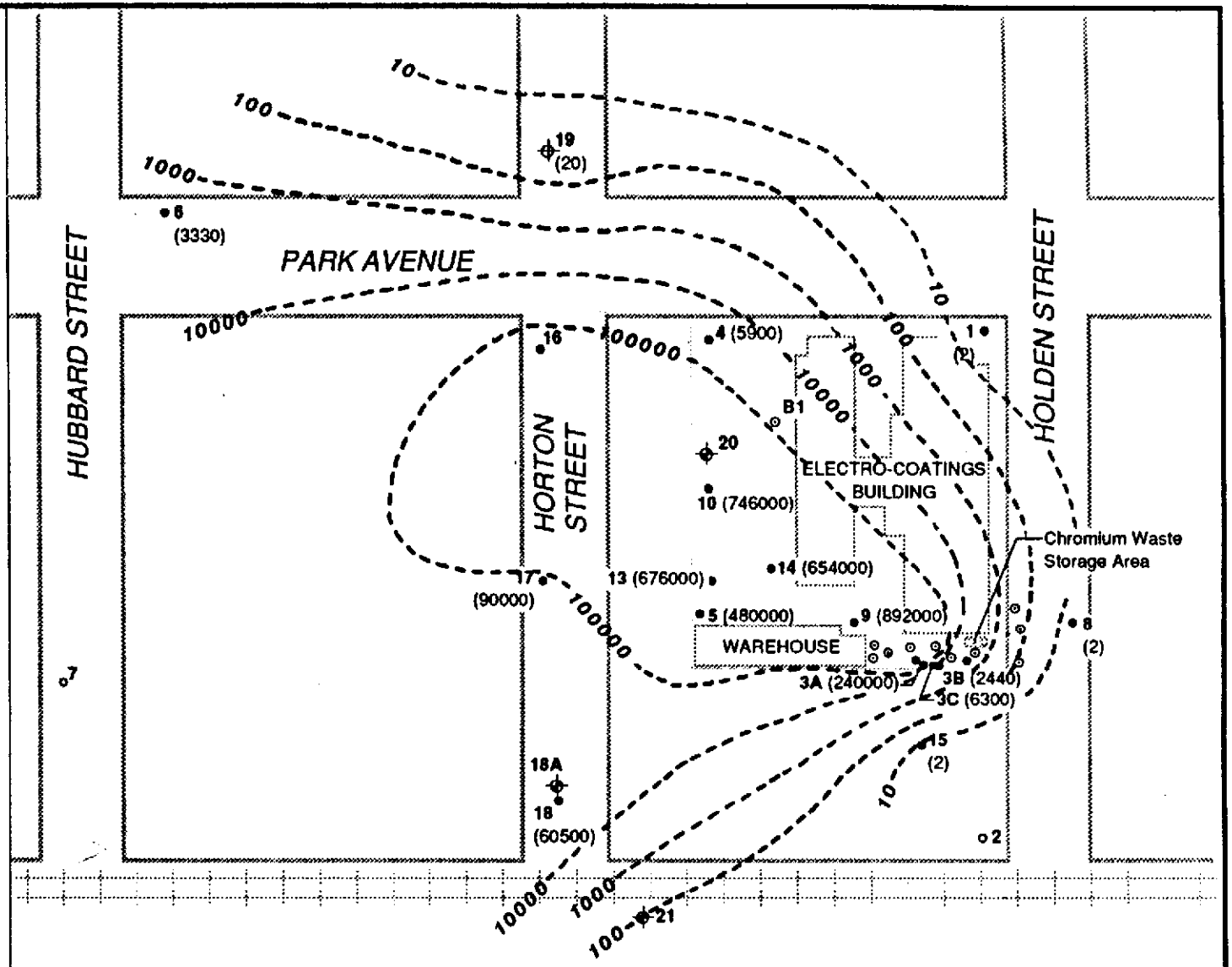
ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-2200-01

PLATE 11

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- •1 — WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- ⌖ 20 — WELLS INSTALLED BY KLEINFELDER AS OF 1985
- ○ 2 — WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⌖ 19 — WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- ⊙ B1 — SOIL BORING
- (1.7) — CHROMIUM CONCENTRATION (µg/l)
- 10 — CHROMIUM ISOCONCENTRATION (µg/l)
- (ND) — NOT DETECTED at or above laboratory detection limit




120 0 120
Approximate Scale (feet)

KLEINFELDER

| | |
|---|---|
| DRAFTED BY: L. Sue/L. Latman | DATE: 4-17-91 |
| CHECKED BY: J. Romie | DATE: 4-23-91 |

**TOTAL CHROMIUM IN SHALLOW WATER BEARING ZONE, FEBRUARY1985**

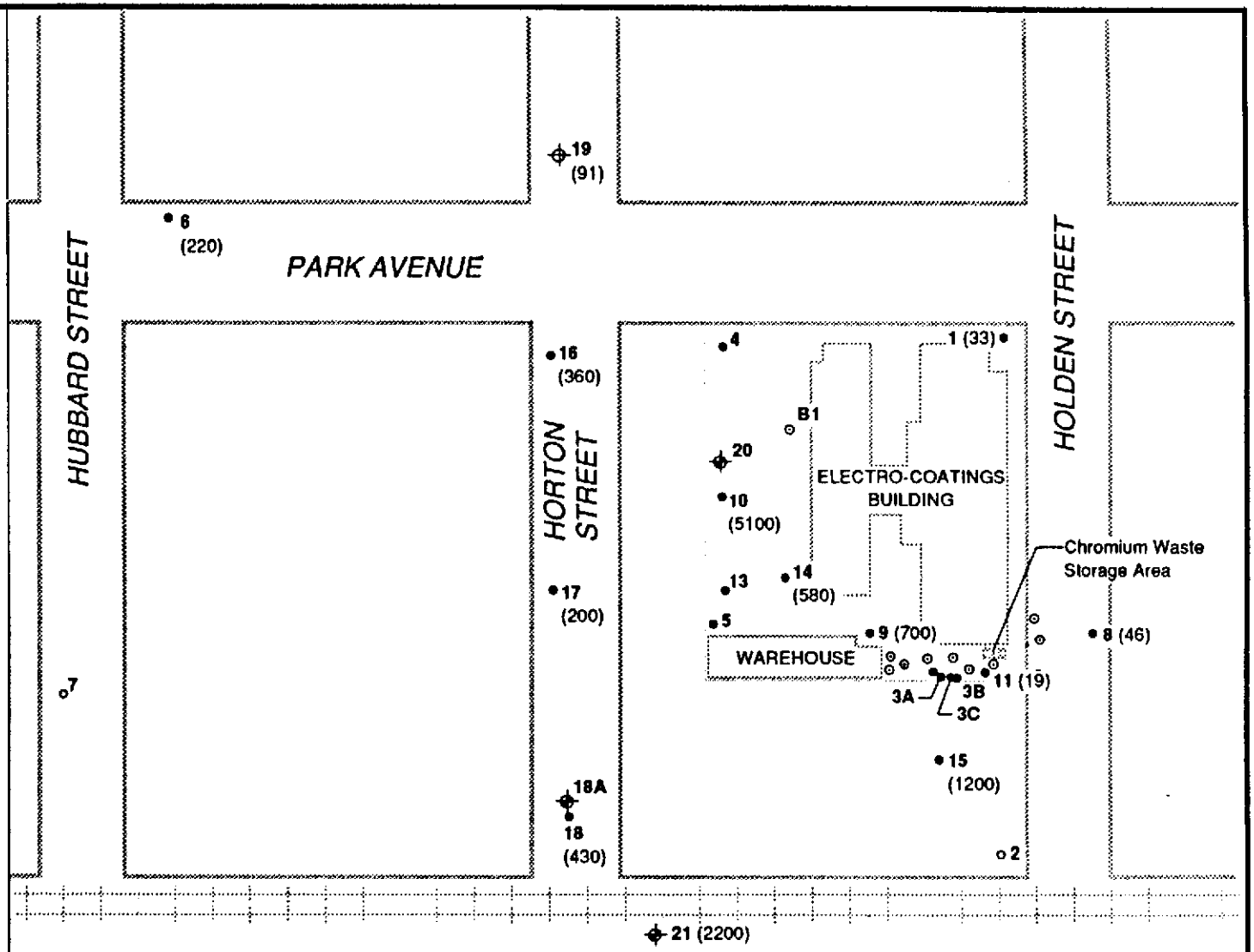
ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

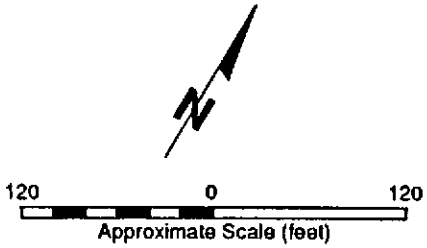
PROJECT NO. 10-2200-01

PLATE 12

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- 1 — WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- 20 — WELLS INSTALLED BY KLEINFELDER AS OF 1985
- 2 — WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- 19 — WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- B1 — SOIL BORING
- (91) — TRICHLOROETHENE CONCENTRATION (ppb)




KLEINFELDER

DRAFTED BY: L. Sue/L. Latman DATE: 4-17-91

CHECKED BY: J. Romie DATE: 4-23-91

**TRICHLOROETHENE IN SHALLOW WATER BEARING ZONE, 1985**

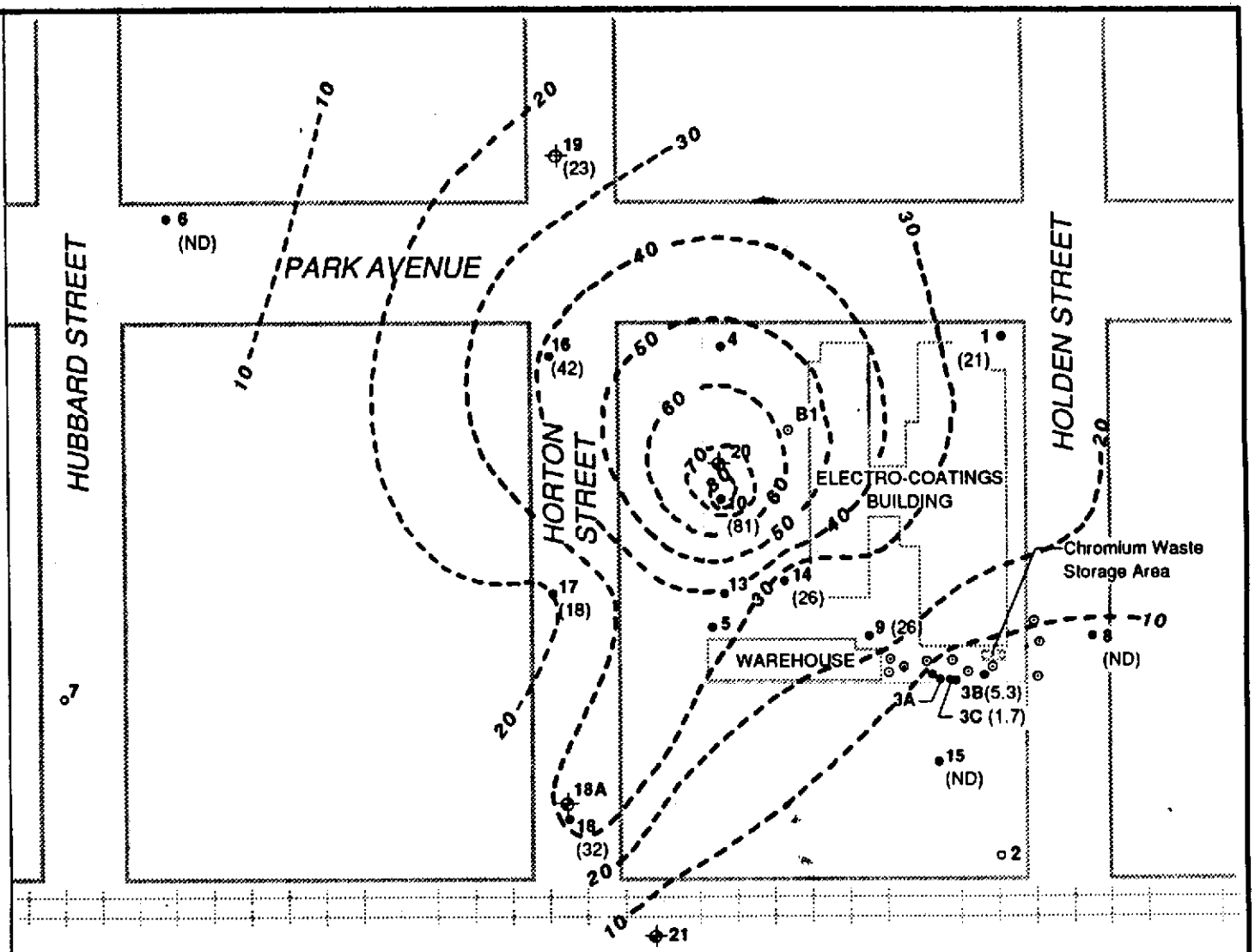
ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-2200-01

PLATE 13

## LEGEND

- ELECTRO-COATINGS, INC., PROPERTY LINE
- 1 — WELLS INSTALLED BY PREVIOUS INVESTIGATORS
- 20 — WELLS INSTALLED BY KLEINFELDER AS OF 1985
- 2 — WELLS INSTALLED BY PREVIOUS INVESTIGATORS THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- 19 — WELLS INSTALLED BY KLEINFELDER THAT COULD NOT BE LOCATED AS OF FEBRUARY 1991
- B1 — SOIL BORING
- (1.7) — TETRACHLOROETHENE CONCENTRATION (ppm)
- 10 — TETRACHLOROETHENE ISOCONCENTRATION (ppm)
- (ND) — NOT DETECTED at or above laboratory detection limit




120 0 120
Approximate Scale (feet)

KLEINFELDER

| | |
|---|---|
| DRAFTED BY: L. Sue | DATE: 4-17-91 |
| CHECKED BY: J. Romie | DATE: 4-23-91 |

**TETRACHLOROETHENE IN SHALLOW WATER BEARING ZONE, 1985**

ELECTRO-COATINGS, INC.
1401 PARK AVENUE
EMERYVILLE, CALIFORNIA

PROJECT NO. 10-2200-01

PLATE 14

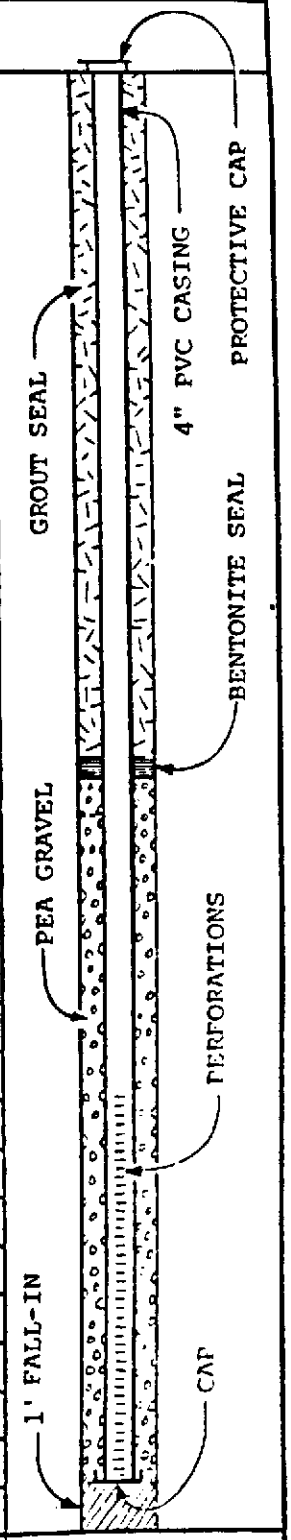
Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 1

Date Drilled: August 18, 1977
Type of Boring: 6" Auger
Hammer Weight: ---
Remarks:
(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| | | | S I L T Y  C L A Y  (CL-CH)<br>Stiff, dry, dark gray |
| | | | Becomes moist |
| | | | (FILL) |
| 5 | | | S I L T Y  C L A Y  (CL-CH)<br>Stiff, moist, dark gray |
| | | | ▽ 9-8-77<br>S I L T Y  C L A Y  (CL)<br>Medium stiff to stiff, moist, tan, very calcareous, with nodules |
| 10 | | | S I L T Y  C L A Y  (CL)<br>Stiff, moist to wet, greenish tan, trace of sand and subrounded gravel |
| | | | Gravelly layer |
| | | | Becomes medium stiff to stiff, dark brown and gray mottled |
| 15 | | | S I L T Y  C L A Y  (CL)<br>Stiff, wet, green and brown |
| | | | ▽ Upon completion of drilling |
| | | | Some sand |
| | | | Becomes brown |
| 20 | | | S I L T Y  C L A Y  (CL)<br>Stiff, moist to wet, blue |
| | | | Stiff to very stiff |
| | | | Becomes very silty, blue and brown |
| | | | Thin gravelly layer |
| 25 | | | Grades to sandy clay |
| | | | Clayey sand and gravel layer |
| 30 | | | BOTTOM OF HOLE @ 30' |

WELL INSTALLATION DETAILS




Proj. No. 13895B | WOODWARD-CLYDE CONSULTANTS | Figure 2

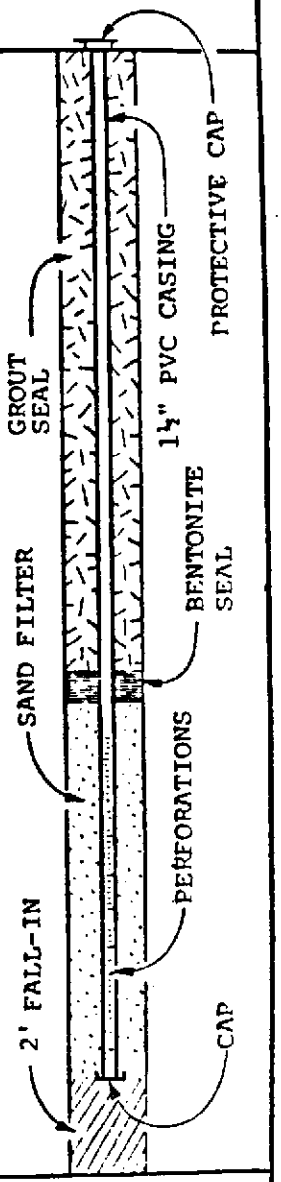
Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 2

Date Drilled: August 18, 1977
Type of Boring: 6" Auger
Hammer Weight: ---
Remarks:
(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| | | | S I L T Y C L A Y (CL) (FILL)<br>Dense, dry, light gray-brown, with trash |
| | | | S I L T Y C L A Y (CL): Stiff, moist, mottled dark brown & black & green (FILL) |
| | | | S I L T Y C L A Y (CL)<br>Stiff, moist, black |
| 5 | | | Becomes grayish brown |
| | | | 9-8-77 S I L T Y C L A Y (CL)<br>Stiff, moist, mottled green and gray, with trace of fine sand and gravel |
| | | | SILTY GRAVEL (GM): Dense, damp, brown |
| 10 | | | C L A Y E Y S I L T: Dense, damp, mottled gray and brown, with clay lenses |
| | | | S I L T Y C L A Y (CL): Stiff, moist, grayish brown, trace of fine sand and small gravel |
| | | | Trace of water |
| | | | Trace to some gravel |
| 15 | | | C L A Y E Y G R A V E L (GC)<br>Dense, moist, brown |
| | | | V E R Y S I L T Y C L A Y (CL)<br>Stiff, moist, gray-brown, with sand pockets |
| | | | CLAYEY GRAVEL: Dense, wet, brown |
| 20 | | | V E R Y S I L T Y C L A Y (CL)<br>Very stiff, moist, brown |
| | | | BOTTOM OF HOLE @ 23' |
| 25 | | | |
| 30 | | | |

WELL INSTALLATION DETAILS




Proj. No. 13895B | WOODWARD-CLYDE CONSULTANTS | Figure 3

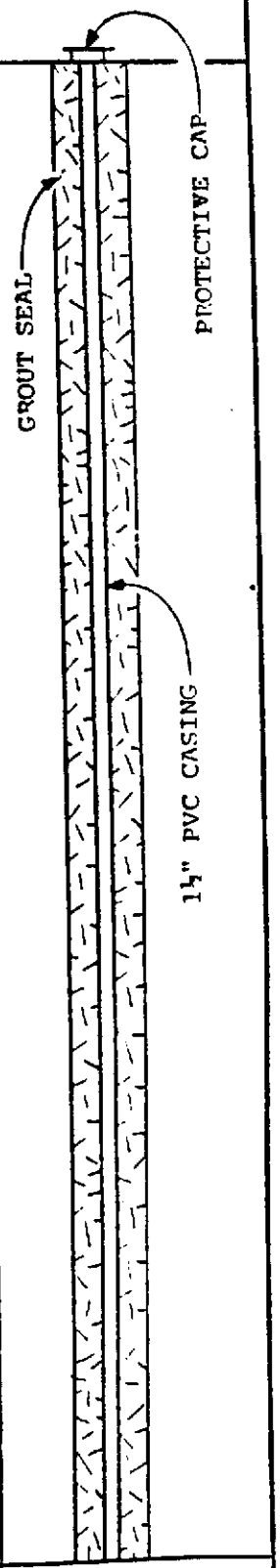
Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 3A

Date Drilled: August 15, 1977
Type of Boring: 4 7/8" ϕ Rotary
Hammer Weight: ---
Remarks:
(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| | | | 6" ASPHALT CONCRETE |
| | | | S A N D Y  C L A Y  F I L L<br>Stiff, moist, brown, with bricks & blue clay |
| | | | C L A Y E Y  S A N D  F I L L  (SC-SP)<br>Dense, moist, bluish green to brown |
| | | | GRAVEL LAYER: Dense, gray, with clay binder (FILL) |
| 5 | | | S I L T Y  C L A Y  (CL-CH)<br>Very stiff, moist, black<br>Becomes gray, with trace of gravel<br>9-8-77<br>Becomes bluish gray |
| 10 | | | S I L T Y  C L A Y  (CL)<br>Stiff, moist, blue-gray |
| 15 | | | S I L T Y  C L A Y  (CL)<br>Very stiff, moist, mottled gray and brown, with rust streaks |
| 20 | | | S A N D  A N D  G R A V E L  (GW-SW)<br>Dense, wet, brown, with trace of clay |
| 25 | | | |
| 30 | | | VERY SILTY CLAY (CL-ML): Medium stiff, very moist, blue, with trace of fine gravel<br>No gravel |

WELL INSTALLATION DETAILS



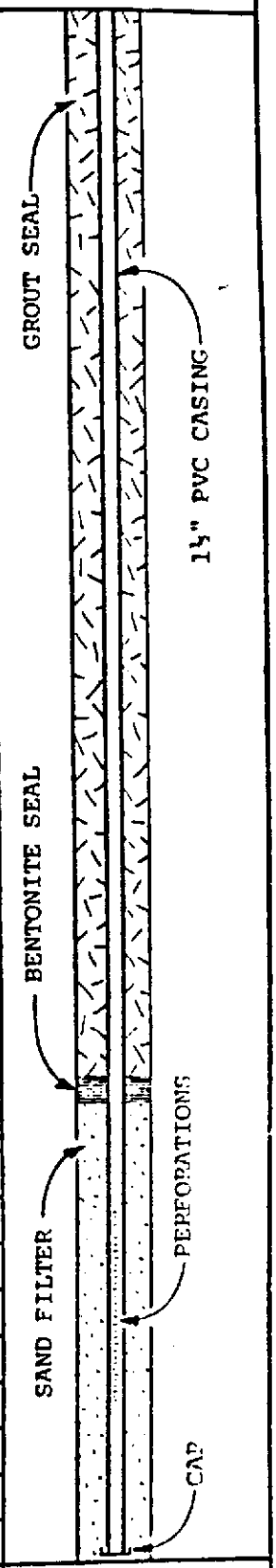

Proj. No. 13895B | WOODWARD-CLYDE CONSULTANTS | Figure 4

Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 3A (Continued)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION |
|---|---|---|---|
| 35 | | | } Sand lense: black and blue |
| 40 | | | |
| 45 | | | V E R Y  S I L T Y  C L A Y  (CL-ML)<br>Stiff, moist, gray, possibly with thin sand lenses |
| 50 | | | |
| 55 | | | S I L T Y  C L A Y  (CL)<br>Stiff, moist, brown |
| 60 | | | S I L T Y  S A N D  &  G R A V E L  (GM-SM)<br>Dense, wet, reddish brown, gravel to ± 1" diameter |
| 65 | | | S I L T Y  C L A Y  (CL)<br>Stiff, moist, reddish brown<br>BOTTOM OF HOLE @ 65' |

WELL INSTALLATION DETAILS




Proj. No. 13895B | WOODWARD-CLYDE CONSULTANTS | Figure 5

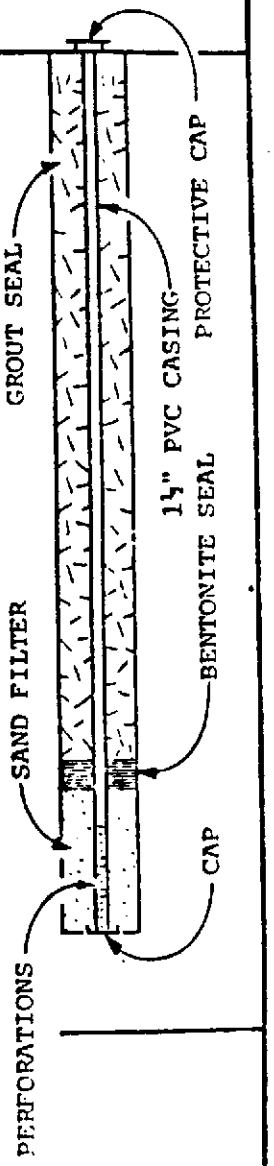
Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 3B

Date Drilled: August 15, 1977
Type of Boring: 6" Auger
Hammer Weight: ---
Remarks:
(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| | | | 6" ASPHALT CONCRETE |
| | | | SANDY CLAY FILL: Stiff, moist, brown, with bricks |
| | | | CLAYEY SAND (SC-SP): Medium dense, very moist, blue-green to brown |
| | | | ▽ 3'-0" after drilling — Gravel lense, (FILL) |
| 5 | | | SILTY CLAY (CL): Very stiff, moist, black |
| | | | ▽ 9-8-77 — Becomes gray, with organic material |
| | | | Becomes mottled blue-gray, with trace of fine gravel |
| 10 | | | SILTY CLAY (CL) |
| | | | Medium stiff, moist, gray-brown, trace of fine gravel and sand |
| | | | VERY SILTY CLAY (CL) |
| 15 | | | Very stiff, moist, mottled gray and brown |
| | | | Trace of water at time of drilling |
| | | | SAND AND GRAVEL (SW-GW) |
| | | | Dense, wet, dark brown, with trace of clay |
| 20 | | | Sand and gravel |
| | | | BOTTOM OF HOLE @ 20' |
| 25 | | | |
| 30 | | | |

WELL INSTALLATION DETAILS




Proj. No. 13895B | WOODWARD-CLYDE CONSULTANTS | Figure 6

Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 3C

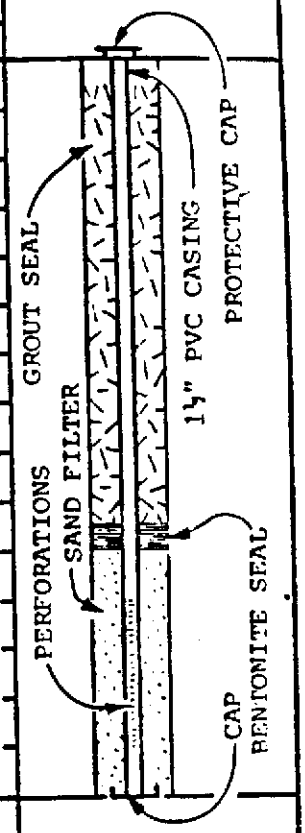
Date Drilled: August 15, 1977
Type of Boring: 4 7/8" ϕ Rotary
Hammer Weight: ---

Remarks:

(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| | | | 6" ASPHALT CONCRETE |
| | | | SANDY CLAY FILL: Stiff, moist, brown, with bricks |
| | | | C L A Y E Y  S A N D  F I L L  (SC-SP)<br>Dense, moist, blue green to brown |
| | | | CLAYEY GRAVEL: Dense, damp, brown, angular to 1½" in diameter (FILL) |
| 5 | | | after drilling<br>S I L T Y  C L A Y  (CL-CH)<br>Very stiff, moist, black |
| | | | 9-8-77<br>Becomes grayish blue, with organics, trace of fine gravel and hard nodules |
| | | | SILTY CLAY (CL): Stiff, moist, mottled brown and blue-gray, with trace of organic materials |
| 10 | | | SILTY CLAY (CL): Very stiff, moist, gray and brown and black mottled, with trace of fine gravel & sand |
| | | | SILTY CLAY (CL): Very stiff, moist, mottled gray and brown<br>Trace of water |
| 15 | | | BOTTOM OF HOLE @ 15' |
| 20 | | | |
| 25 | | | |
| 30 | | | |

WELL INSTALLATION DETAILS




Proj. No. 13895B | WOODWARD-CLYDE CONSULTANTS | Figure 7

Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 4

Date Drilled: August 15, 1977
Type of Boring: 6" Auger
Hammer Weight: ---
Remarks:
(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION | WELL INSTALLATION DETAILS |
|---|---|---|---|---|

Surface Elevation:

3" ASPHALT CONCRETE

S I L T Y  C L A Y  (CL)

Very stiff, moist, black

after drilling 16'-17'
9-8-77

Becomes gray

Trace of gravel

S I L T Y  C L A Y  (CL)

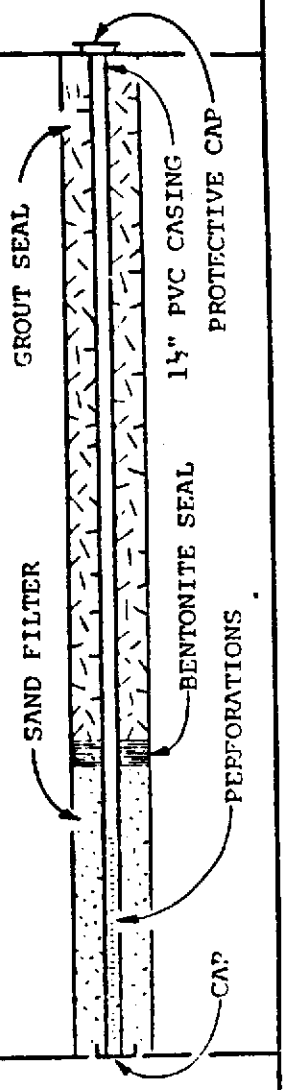
Very stiff, moist, gray-brown, with trace of gravel and sand

Water inflow, possibly gravelly layer

V E R Y  C L A Y E Y  S I L T  (ML-CL)

Medium dense, moist, brown

BOTTOM OF HOLE @ 20.5'




Proj. No. 13895B | WOODWARD-CLYDE CONSULTANTS | Figure 8

Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 5

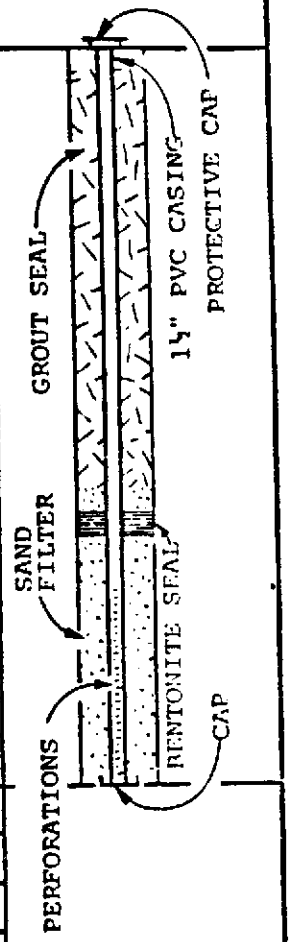
Date Drilled: August 15, 1977
Type of Boring: 6" Auger
Hammer Weight: ---

Remarks:

(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| | | | 3" ASPHALT CONCRETE |
| | | | CLAYEY GRAVEL (GC): Dense, moist, gray to reddish brown |
| | | | S I L T Y  C L A Y  (CL-CH) |
| | | | Very stiff, moist, black |
| 5 | | | ▽ 9-8-77 — Becomes bluish light gray, with trace of fine gravel |
| | | | SILTY CLAY (CL): Very stiff, moist, mottled gray & brown |
| 10 | | | SILTY CLAY (CL): Very stiff, moist, brown, trace of fine gravel and sand |
| | | | CLAYEY GRAVEL (GC): Dense, wet, brown |
| | | | S I L T Y  C L A Y: Very stiff, moist, gray-brown, with trace of fine gravel |
| 15 | | | BOTTOM OF HOLE @ 15' |
| 20 | | | |
| 25 | | | |
| 30 | | | |

WELL INSTALLATION DETAILS




Proj. No. 13895B | WOODWARD-CLYDE CONSULTANTS | Figure 9

Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 6

Date Drilled: February 21, 1978
Type of Boring: 6" Auger
Hammer Weight: ---
Remarks:
(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION | WELL INSTALLATION DETAILS |
|---|---|---|---|---|

Surface Elevation: 9.09

1" ASPHALT CONCRETE

5" C O N C R E T E

SILTY CLAY (CL-CH): Medium stiff, moist, dark gray to black

▽ 2/24/78

Becomes brown and dark gray mottled

Becomes stiff

Becomes stiff to very stiff, trace of calcareous fragments

Becomes brownish gray, trace of organics

▽ ATD

Trace of yellow and green with fine sand

SILTY CLAY (CL): Stiff to very stiff, wet yellowish green, some fine sand, trace of fine gravel

Becomes yellow with a trace of sand

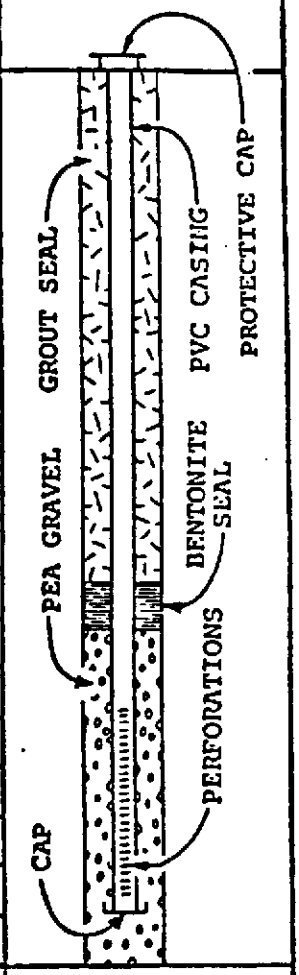
Very silty clay layer, yellowish brown

Becomes brown, no sand or gravel

Becomes medium stiff, brown and gray interbedded

Very silty sand to sandy silt layer

BOTTOM OF HOLE @ 18'




Proj. No. 13895C | WOODWARD-CLYDE CONSULTANTS | Figure

Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 7

Date Drilled: February 21, 1978
Type of Boring: 6" Auger
Hammer Weight: ---
Remarks:
(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION | WELL INSTALLATION DETAILS |
|---|---|---|---|---|

Surface Elevation: 9.58

**S I L T Y  C L A Y  (CL)**
Medium stiff to stiff, moist, dark gray to black

2/24/78

Trace of fine gravel

Becomes stiff, dark bluish gray, with trace of brown

Trace of lime nodules, bluish gray

**S I L T Y  C L A Y  (CL-CH)**: Stiff to very stiff, moist to wet, light green

**S I L T Y  C L A Y  (CL)**: Very stiff, moist, green and brown, some gravel and sand

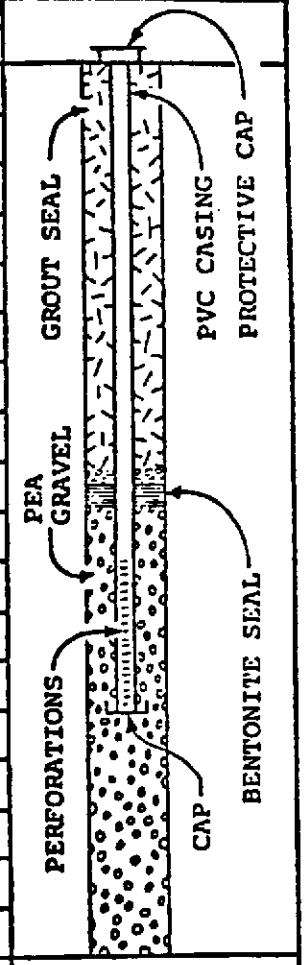
More sand and gravel (GC-CL)
seep in bottom of hole

**CLAYEY SAND AND GRAVEL (SC-GC)**
Medium dense, wet, brown, gravel to 1"

**S I L T Y  C L A Y  (CL)**
Stiff to very stiff, brown, trace of fine gravel

Becomes brown and gray mottled

BOTTOM OF HOLE @ 18'



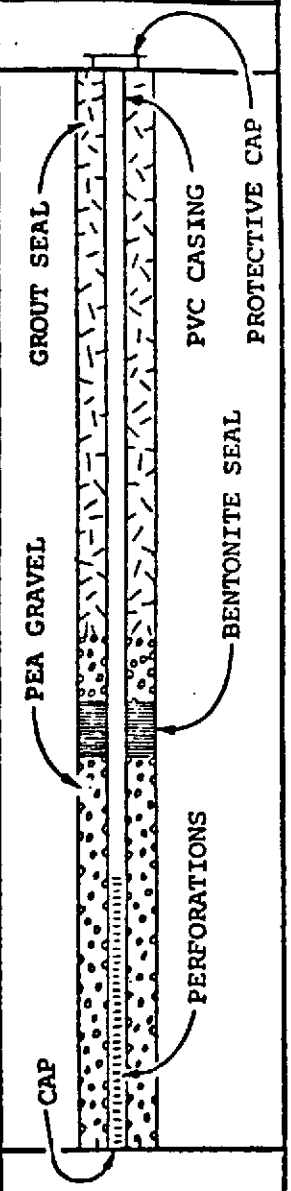
Project: ELECTRO COATINGS INC.
Emeryville, California

# LOG OF WELL NO. 8

Date Drilled: March 13, 1978
Type of Boring: 6" Auger
Hammer Weight: ---
Remarks:
(See Legend Sheet for sampler sizes and hammer weights)

| Depth, Ft. | Samples | Blows/Ft. | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| | | | 4" ASPHALT CONCRETE<br>5" AGGREGATE BASE |
| | | | CLAYEY SAND & GRAVEL FILL (SC-GC): Loose, moist, black |
| | | | SILTY CLAY (CL-CH) (FILL): Medium stiff, moist, black, trace of wood |
| | | | CLAYEY TO SANDY SILT (ML) (FILL)<br>Loose, wet, black, trace of wood |
| 5 | | | SILTY CLAY (CL-CH): Stiff, moist, dark gray<br>Grades to grayish blue, trace of lime nodules |
| | | | S I L T Y C L A Y (CL)<br>Stiff to very stiff, wet, bluish green, trace of lime nodules<br>Trace of fine gravel |
| | | ATD | |
| 10 | | | Becomes more silty, brown interbedded with dark gray |
| | | | S I L T Y C L A Y (CL): Stiff to very stiff, moist, reddish brown and gray marbled<br>Trace of fine sand, slightly greenish<br>With some sand |
| 15 | | | CLAYEY SAND & FINE GRAVEL (SC)<br>Medium dense, wet, reddish brown |
| | | | VERY SILTY CLAY (CL): Medium stiff, wet, brown, trace of sand and fine gravel<br>With thin clayey and silty fine and coarse sand layers |
| 20 | | | VERY SILTY CLAY (CL): Stiff to very stiff, brown marbled with gray |
| | | | BOTTOM OF HOLE @ 22' |
| 25 | | | |
| 30 | | | |

WELL INSTALLATION DETAILS




Proj. No. 13895C | WOODWARD-CLYDE CONSULTANTS | Figure 2

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No. 9

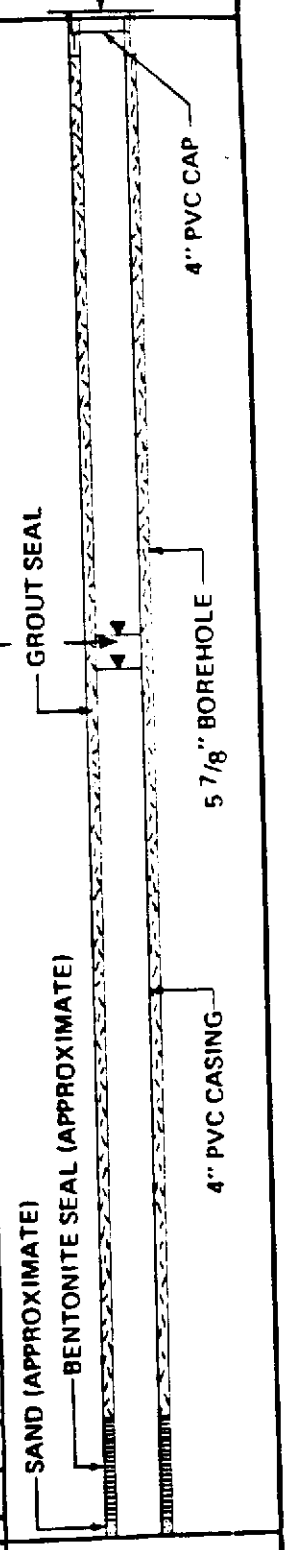
Date Drilled: 12/10/80 to 12/12/80
Type of Boring: 4 5/8" Pitcher Core Barrel
Hammer Weight:

Remarks:

(See Legend Sheet for sampler types and hammer weights)

| Depth, Ft. | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| 0 | CONTINUOUS CORING | | 8" ASPHALT |
| 1 | | | GRAVEL FILL<br>angular fragments (up to 1"), reddish-brown |
| 2 | | | |
| 3 | | | |
| 4 | | | CLAY<br>medium hard, very dark gray |
| 5 | | 0/1 | lost sample in hole |
| 6 | | | 12/29/80, 1/14/81 Water Levels<br>CLAY<br>firm to stiff, mottled, trace of coarse sand, fine gravel |
| 7 | | 2.15/2.5 | grading more sandy and softer |
| 8 | | | CLAYEY SAND<br>trace fine gravel, light green |
| 9 | | 1.5/1.5 | CLAYEY SILT–SILTY CLAY<br>soft, wet, gray<br>GRAVELLY SILTY SAND<br>green, orange mottling |
| 10 | | | SILTY SANDY GRAVEL<br>crumbly, moist, gravel is subangular-subrounded (maximum size of gravel is 1"), mottled, greenish-reddish brown |
| 11 | | 1.1/2.5 | |
| 12 | | | core loss |
| 13 | | 1.7/2.5 | SAND<br>fine-medium sand, trace gravel and clay, mottled, light brown to light green |
| 14 | | | transitional |
| 15 | | 1.0/1.0 | SANDY SILTY CLAY<br>soft, light brown to light green |
| | | | SANDY GRAVEL |

WELL INSTALLATION DETAILS




Proj. No. 14929A

Woodward-Clyde Consultants

Figure 2a

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No. 9 (Continued)

| Depth, Ft. | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION |
|---|---|---|---|
| 16 | CONTINUOUS CORING | | subrounded gravel, crumbly |
| | | | more clayey |
| 17 | | 2.1/2.5 | SANDY CLAY<br>firm, light brown to light green |
| 18 | | | CLAYEY SAND<br>trace of fine gravel, firm, slightly moist, in places sandy clay |
| 19 | | | core loss |
| 20 | | 1.3/2.5 | SANDY CLAY<br>fine sand, firm, slightly moist, light brown to light green, reddish-brown and brown mottling |
| 21 | | | SILTY CLAY<br>moderately stiff, light brown to light green |
| | | | core loss |
| 22 | | 1.5/2.5 | |
| 23 | | | |
| 24 | | 1.7/2.5 | core loss |
| | | | more sandy |
| 25 | | | trace gravel near base<br>orange mottling more common |
| 26 | | | SILTY CLAY<br>firm, common orange mottles, blue |
| | | | core loss |
| 27 | | 1.7/2.5 | angular fine gravel more predominant with minor sandy zones |
| 28 | | | |
| 29 | | 2.3/2.5 | SANDY CLAY<br>fine sand, trace gravel, orange mottling, bluish-gray |
| 30 | | | |
| 31 | | | extensive orange mottling |
| 32 | | 2.2/2.5 | grading more sandy |

WELL INSTALLATION DETAILS

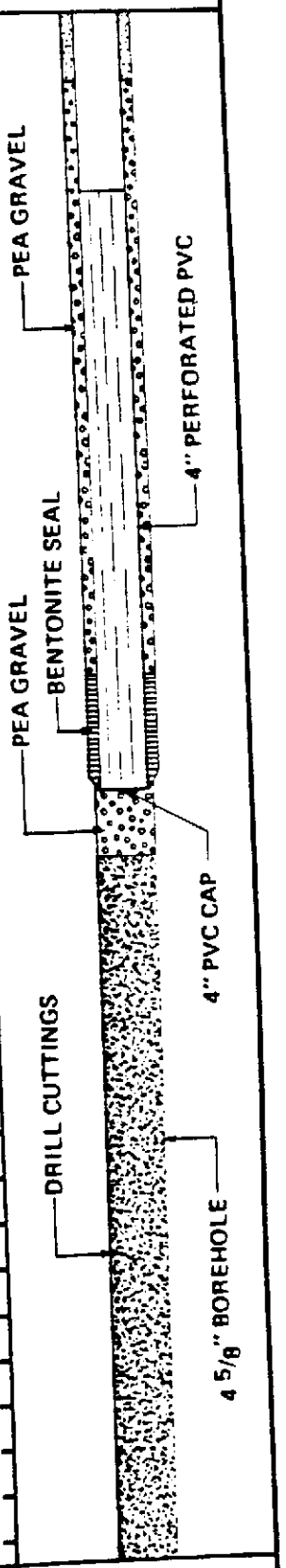



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Figure 2b

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No.9 (Continued)

| Depth, Ft. | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION | WELL INSTALLATION DETAILS |
|---|---|---|---|---|
| 33 | | | as above | DRILL CUTTINGS; 4 5/8" BOREHOLE |
| | | | Bottom of boring @ 33.5 feet | |

Proj. No. 14929A

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Figure 2c

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No. 10

Date Drilled: 12/12/80 to 12/16/80
Type of Boring: 4 5/8" Pitcher Core Barrel
Hammer Weight:

Remarks:

(See Legend Sheet for sampler types and hammer weights)

Surface Elevation:

| Depth, Ft | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION |
|---|---|---|---|
| 0 | | | 6" ASPHALT |
| | | | GRAVEL FILL (road ballast) |
| 1 | | | SILTY CLAY<br>slightly stiff, moist, black |
| 2 | | | more gravelly |
| 3 | | 1.5/1.5 | crumbly with less silt |
| 4 | | .5/.5 | |
| 5 | | 2.6/2.5 | SANDY CLAY<br>moist, trace orange mottling, dark gray<br>angular gravel (up to 3 cm) near top |
| 6 | | | 12/29/80, 1/14/81 Water Levels |
| 7 | | | core loss |
| 8 | | 1.8/2.5 | SILTY SAND<br>firm, yellowish-brown |
| 9 | | | SILTY CLAY<br>trace coarse sand, firm, olive brown |
| 10 | | | core loss |
| 11 | | 1.5/2.5 | some orange-brown color with coarse sand and fine gravel, orange mottling |
| 12 | | | core loss |
| 13 | | 2.0/2.5 | more sandy |
| 14 | | | brown mottling |
| 15 | | | |

CONTINUOUS CORING

WELL INSTALLATION DETAILS

PROTECTIVE CAP
4" PVC CAP
GROUT SEAL
8" BOREHOLE
4" PVC CASING

Proj. No. 14929A

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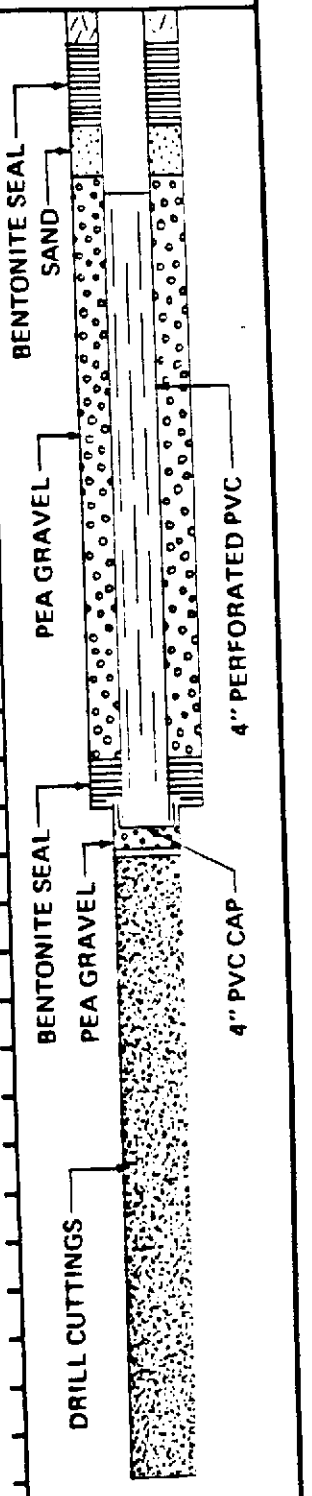
Figure 3a

Project: ELCTRO COATINGS INC.
Emeryville, California

# Log of Boring No. 10 (Continued)

| Depth, Ft. | Samples | Ft. recovered / Ft. cored | MATERIAL DESCRIPTION |
|---|---|---|---|
| 16 | CONTINUOUS CORING | 1.8 / 2.0 | |
| 17 | | | CLAYEY SAND<br>gravelly, firm, wet, olive-brown |
| 18 | | 2.8 / 3.0 | |
| 19 | | | SANDY SILTY CLAY<br>firm, moist, orange mottling, greenish-brown |
| 20 | | | |
| 21 | | 2.4 / 3.0 | |
| 22 | | | core loss<br>grading more brown |
| 23 | | | |
| 24 | | 2.9 / 3.0 | SILTY CLAY<br>trace sand, firm, blue |
| 25 | | | grading more clayey |
| 26 | | | |
| 27 | | 2.3 / 2.5 | |
| 28 | | | orange mottling predominant at base of core |
| 29 | | 2.2 / 2.5 | SILTY SANDY CLAY<br>firm, orange mottling, blue |
| 30 | | | grading to clayey fine sand |
| 31 | | | SILTY CLAY firm, reddish-orange mottling, blue<br>Bottom of boring @ 31.0 feet |
| 32 | | | |

WELL INSTALLATION DETAILS




Proj. No. 14929A

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Figure 3b

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No.11

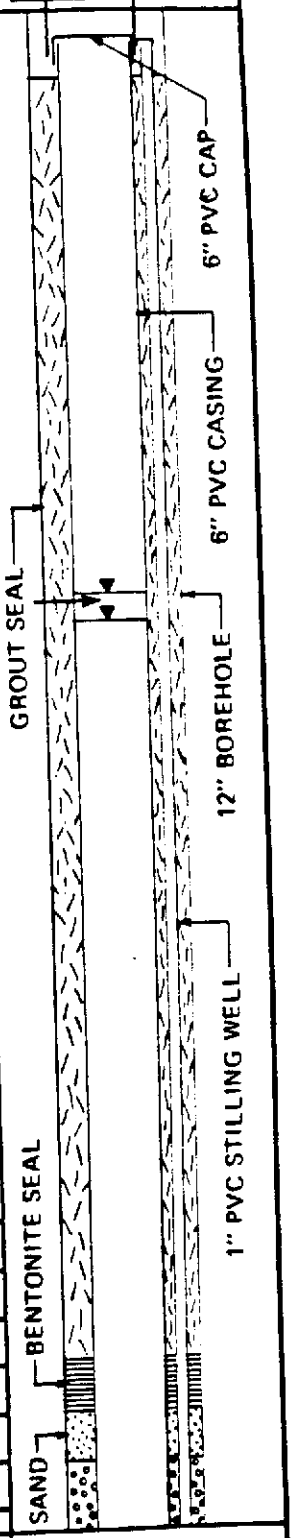
Date Drilled: 12/16/80 to 12/18/80
Type of Boring: 4 5/8" Pitcher Core Barrel
Hammer Weight: _____

Remarks: _____

(See Legend Sheet for sampler types and hammer weights)

| Depth, Ft | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| 0 | | | 8" ASPHALT |
| 1 | | | CLAY FILL<br>medium soft, moist, black |
| 2 | | | becoming firmer with depth |
| 3 | CONTINUOUS CORING | | |
| 4 | | 2.7/2.5 | SILTY CLAY<br>trace sand and fine angular gravels, brown-orange mottling, dark gray |
| 5 | | | core loss |
| 6 | | 1.3/2.5 | 12/29/80 } Water Levels<br>1/14/81<br>grading more dark green |
| 7 | | | core loss |
| 8 | | 2.8/3.0 | SANDY CLAY<br>fine sand, trace angular gravel, minor orange mottling, moist, dark green to green-blue |
| 9 | | | grading to more olive green |
| 10 | | | increased orange mottling |
| 11 | | | gravel more common |
| 12 | | 2.3/2.5 | SANDY SILTY CLAY<br>trace gravel, orange mottling, olive green |
| 13 | | | |
| 14 | | 2.0/2.0 | |
| 15 | | | increased fine gravel and orange mottling |

WELL INSTALLATION DETAILS




Proj. No. 14929A

Woodward-Clyde Consultants

Figure 4a

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No. 11 (Continued)

| Depth, Ft. | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION | WELL INSTALLATION DETAILS |
|---|---|---|---|---|
| 33 | | | SILTY CLAY<br>trace sand, orange mottling, some fat clay, bluish-gray | DRILL CUTTINGS |
| 34 | | | Bottom of boring @ 34 feet | |

Proj. No. 14929A

Woodward-Clyde Consultants

Figure 4c

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No. 11 (Continued)

| Depth, Ft. | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION |
|---|---|---|---|
| 16 | CONTINUOUS CORING | | GRAVELLY CLAYEY SAND<br>fine sand, poor to moderate sorting, moist to wet |
| 17 | | 2.2/2.5 | GRAVELLY SANDY CLAY<br>firm, wet, bright orange mottling, light brown |
| 18 | | | GRAVELLY SAND<br>gravel up to 25mm across, predominantly medium to coarse sand, poor sorting, minor clay, wet, loose, permeable, dark brown |
| 19 | | 1.3/2.5 | |
| 20 | | | |
| 21 | | 0/1 | core loss |
| 22 | | 2.2/2.5 | CLAYEY GRAVELLY SAND<br>pebble to cobble sizes, fine to coarse sand, poorly sorted, wet, orange mottling throughout, tan brown to light brown |
| 23 | | | less clay, loose |
| 24 | | | as above, with less cobble-sized gravel, better sorting |
| 25 | | 2.0/2.5 | gravel constituents: sandstone, chert, milky quartz, basalt |
| 26 | | | gravel is angular |
| 27 | | | core loss |
| 28 | | 1.3/2.5 | as above, less clay, moderately sorted, saturated appearance |
| 29 | | | clayey gravelly sand near top and bottom of interval<br>core loss |
| 30 | | 1.8/2.5 | SILTY SANDY CLAY<br>trace fine angular gravel, moist, orange-dark brown mottling, green to light brown |
| 31 | | | minor gravel lense |
| 32 | | 2.5/2.5 | SANDY CLAY–CLAYEY SAND<br>firm, slightly moist, gray to olive-brown |

WELL INSTALLATION DETAILS

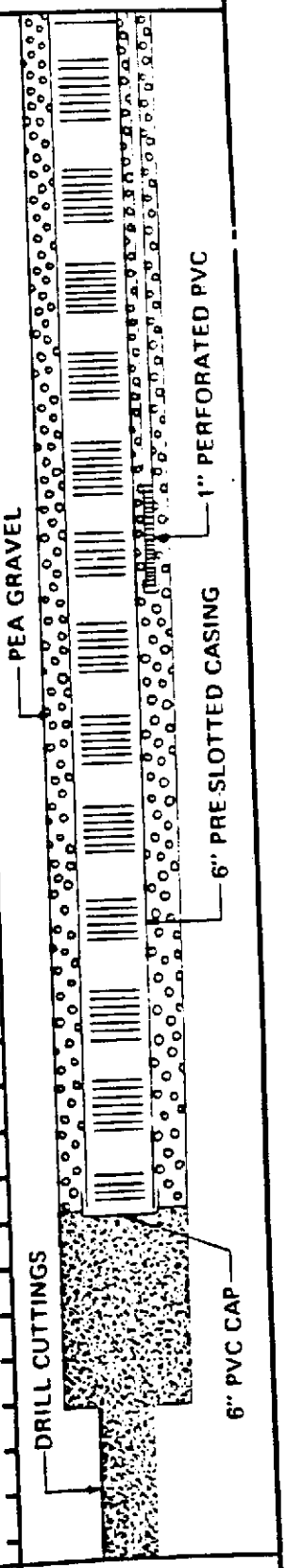



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Figure 4b

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No.12

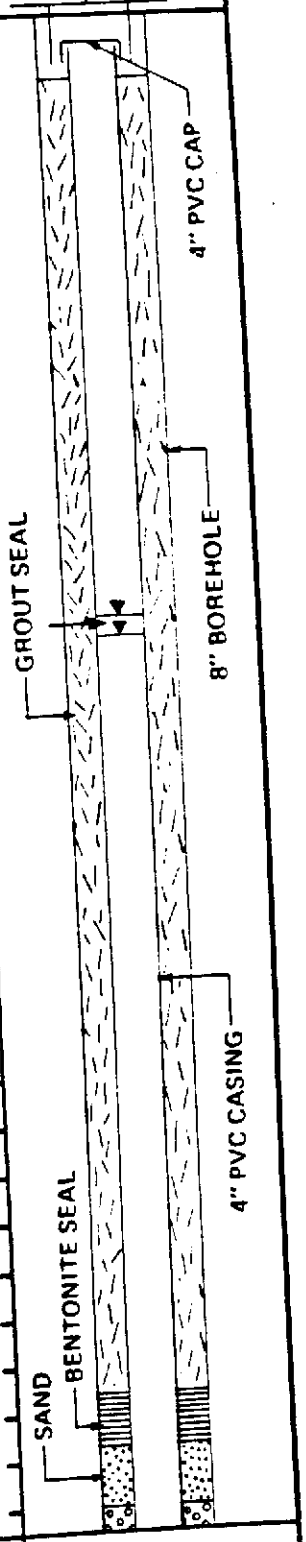
Date Drilled: 12/18/80 to 12/19/80
Type of Boring: 8" Rotary
Hammer Weight:

Remarks:

(See Legend Sheet for sampler types and hammer weights)

| Depth, Ft | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| | | | 6" ASPHALT |
| 1 | | | FINE SAND<br>brown to gray with angular chips of gray gravel |
| 2 | | | |
| 3 | | | fragments of granite (?) (very rough drilling) |
| 4 | | | SAND<br>brown |
| 5 | | | grading to |
| 6 | | | SILTY CLAY<br>black<br>12/29/81<br>1/14/81 } Water Levels |
| 7 | | | SILTY CLAY<br>gray |
| 8 | | | |
| 9 | | | SILTY CLAY<br>buff brown to blue-gray |
| 10 | | | grading more brown |
| 11 | | | SANDY SILTY CLAY<br>trace coarse sand and angular gravel, tan brown |
| 12 | | | grading less gravel |
| 13 | | | |
| 14 | | | |
| 15 | | | |

WELL INSTALLATION DETAILS




Proj. No. 14929A

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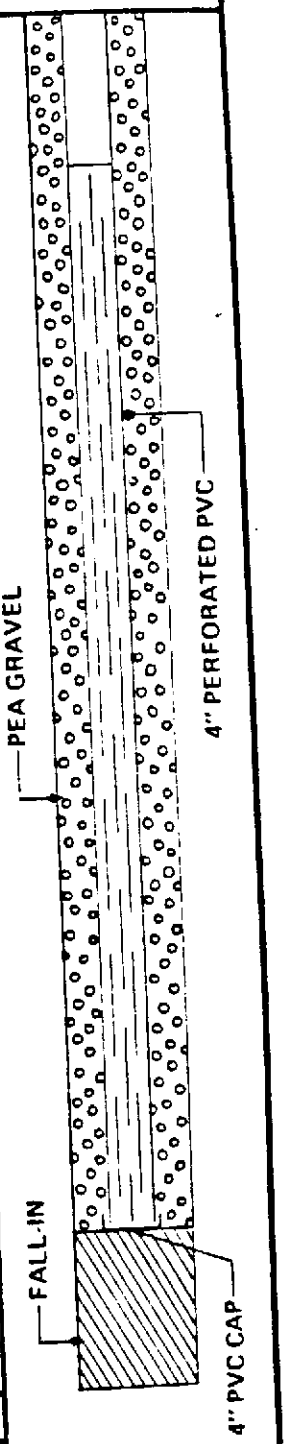
Figure 5a

Project: ELECTRO COATINGS INC.
Emeryville, California

# Log of Boring No. 12 (Continued)

| Depth, Ft. | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION | WELL INSTALLATION DETAILS |
|---|---|---|---|---|
| 16 | | | | |
| 17 | | | SAND AND GRAVEL<br>coarse sand, fine gravel, brown to gray | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | grading coarser | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | | | SILTY CLAY<br>trace of fine sand, tan-brown | |
| 29 | | | | |
| 30 | | | Bottom of boring @ 30 feet | |
| 31 | | | | |
| 32 | | | | |




Proj. No. 14929A

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Figure 5b

**Project:** ELECTRO COATING INC.
Emeryville, California

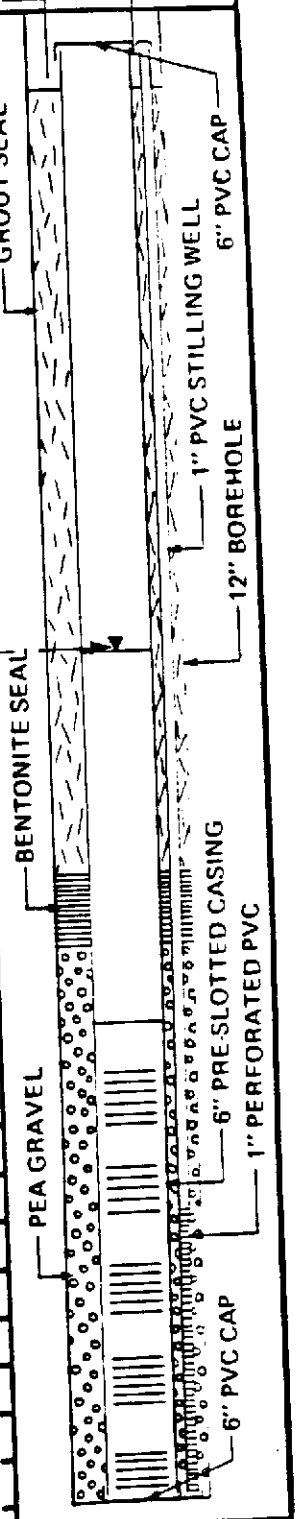
# Log of Boring No. 13

**Date Drilled:** 12/22/80
**Type of Boring:** 4 5/8" Pitcher Core Barrel
**Hammer Weight:**
**Remarks:**
(See Legend Sheet for sampler types and hammer weights)

| Depth, Ft. | Samples | Ft. recovered/ Ft. cored | MATERIAL DESCRIPTION |
|---|---|---|---|
| | | | Surface Elevation: |
| 0 | | | 4" ASPHALT |
| | | | SILTY CLAY FILL |
| 1 | | | SILTY CLAY<br>soft, moist |
| 2 | | | |
| 3 | | | core loss |
| 4 | | 2.0/2.5 | grading more firm |
| 5 | | | |
| 6 | | | transitional — 1/14/81 Water Level |
| | | 2.5/2.5 | trace fine gravels |
| 7 | | | SILTY CLAY<br>trace coarse sub rounded gravel (≈20 mm)<br>stiff, slight moist, light olive brown |
| 8 | | | becoming more tan brown, increasing gravel and sand |
| 9 | | 2.4/2.5 | |
| 10 | | | increased mottling |
| | | | core loss |
| 11 | | 1.6/2.5 | |
| 12 | | | SANDY SILTY CLAY<br>trace gravel, orange mottling around sand grains, tan-brown |
| 13 | | | fine gravels common near base<br>core loss<br>SANDY GRAVELLY CLAY heavy orange mottling |
| | | 2.3/2.5 | |
| 14 | | | SANDY SILTY CLAY<br>trace gravel, dark brown mottling common throughout,<br>light olive green to brown, locally black-orange sand<br>(weathered?) common |
| 15 | | | Bottom of boring @ 15.5 feet |

CONTINUOUS CORING

**WELL INSTALLATION DETAILS**




Proj. No. 14929A

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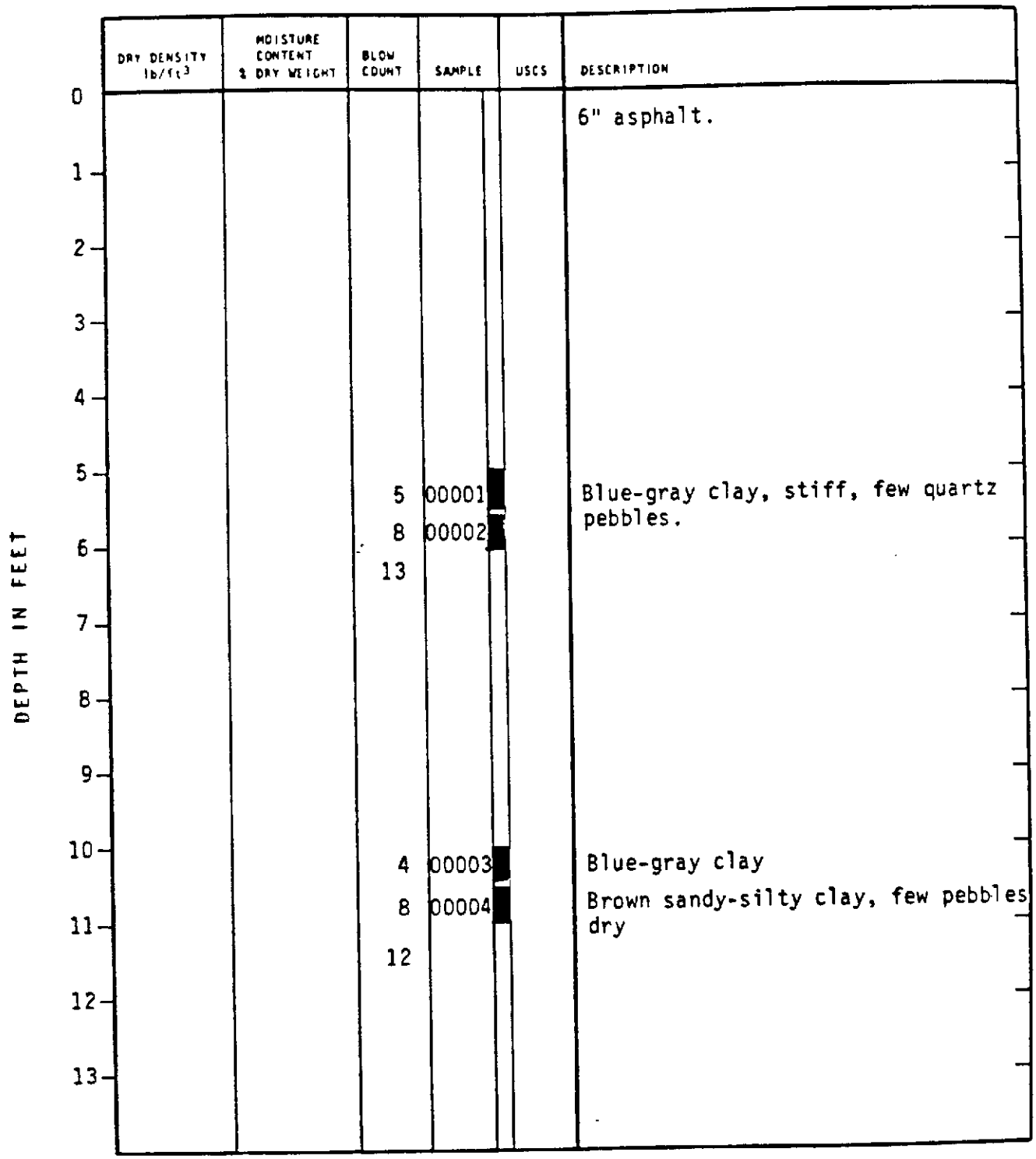
Figure 6




J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

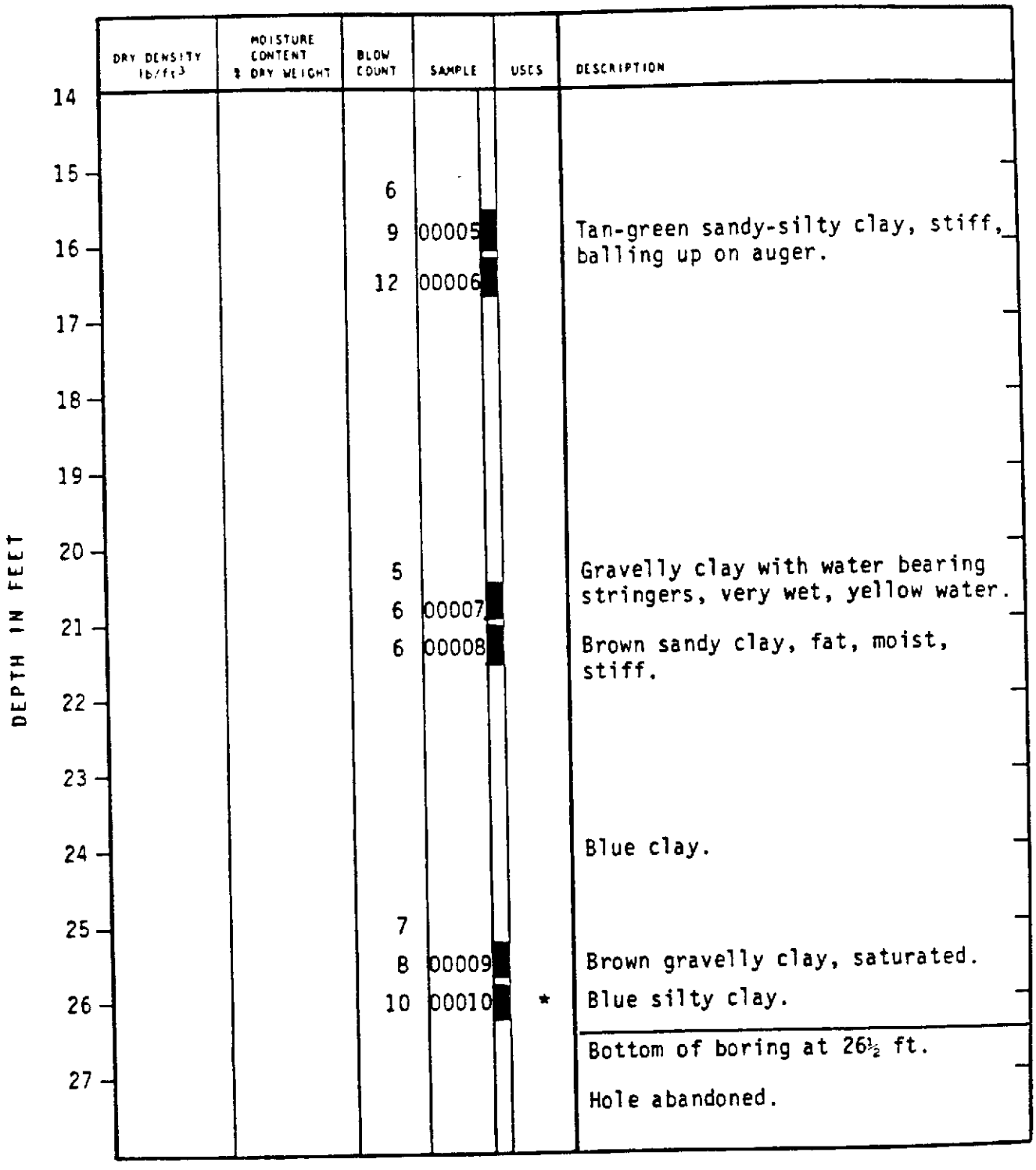
PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA
LOG OF BORING NO. B-1

PROJECT NO. B-1132-3

PLATE
A-2




* Assumed base of shallow groundwater.

J H KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

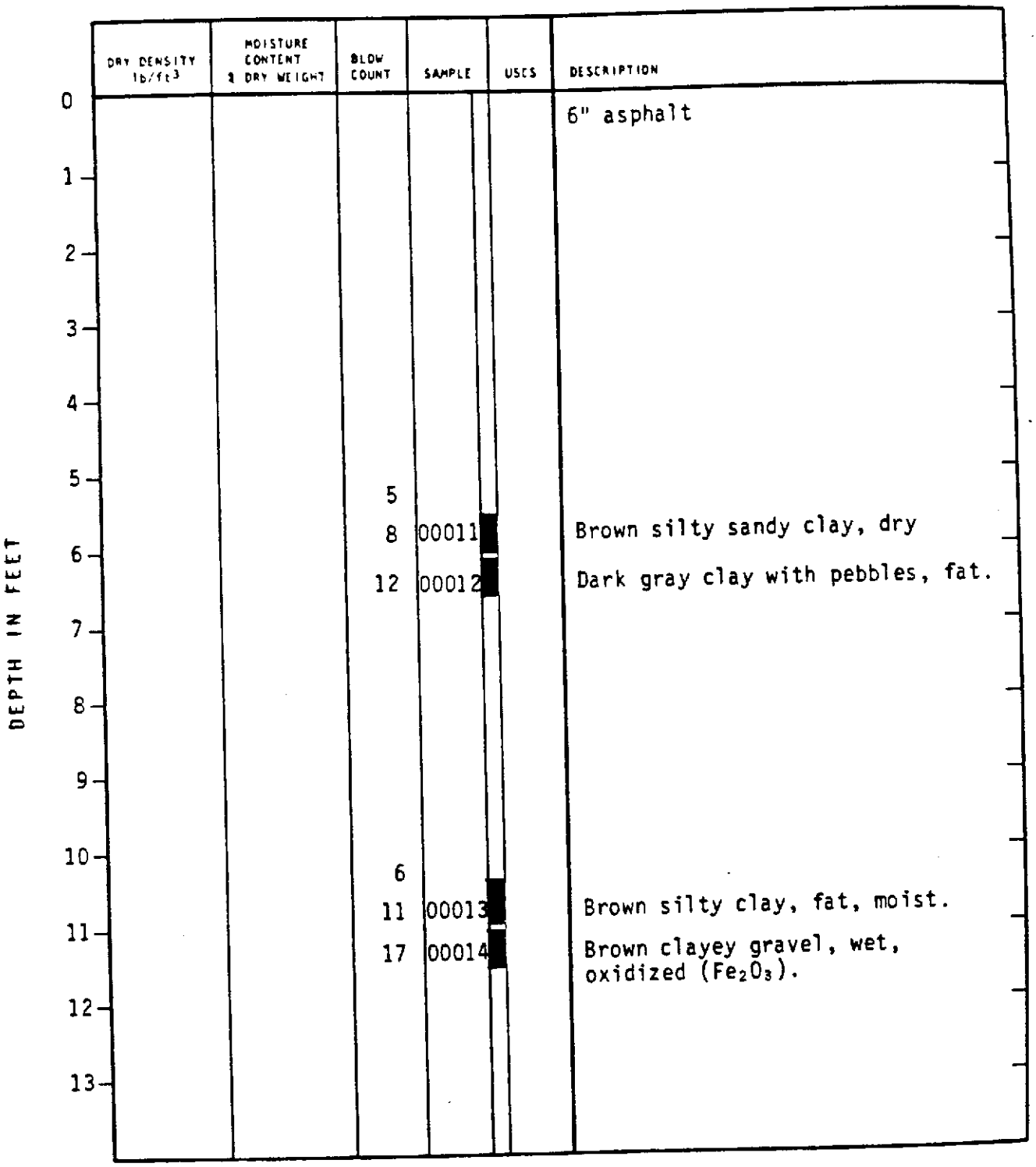
ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. B-1 (CONT)

PROJECT NO. B-1132-3

PLATE

A-2.1




J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

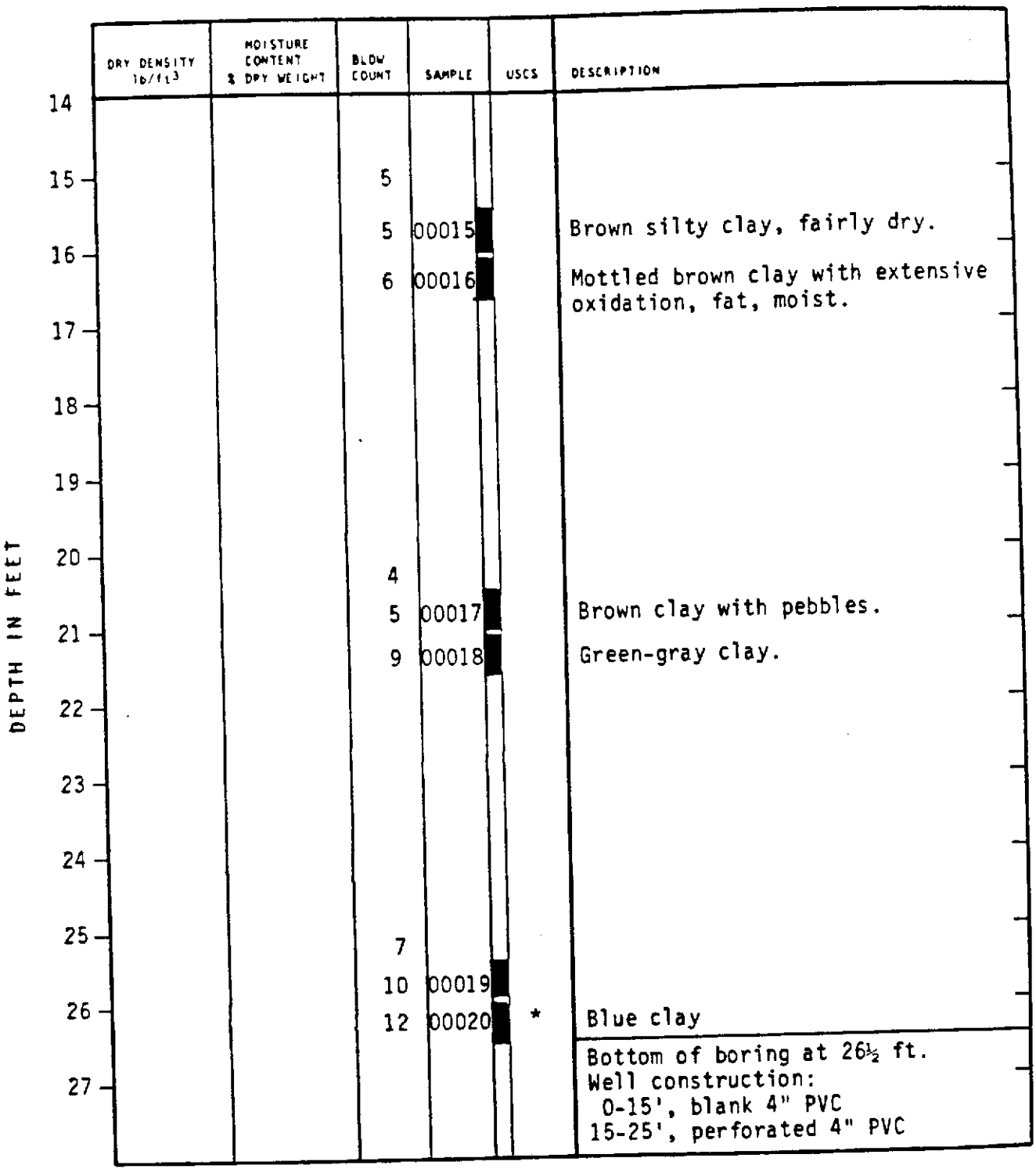
PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA
LOG OF BORING NO. 14

PROJECT NO. B-1132-3

PLATE
A-3




* Assumed base of shallow groundwater.

J H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

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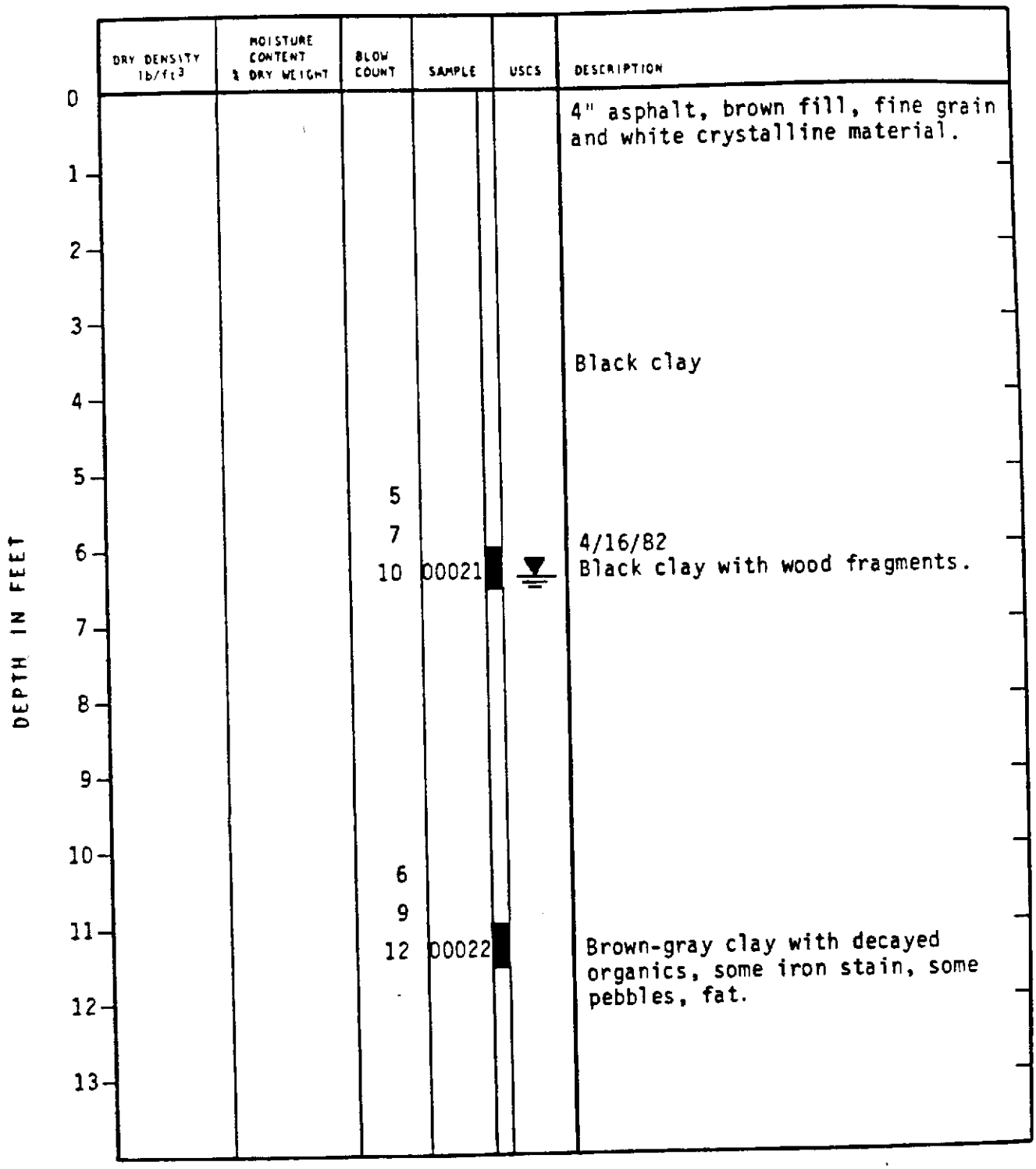
ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA
LOG OF BORING NO. 14 (CONT)

PROJECT NO. B-1132-3

PLATE
A-3.1

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GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

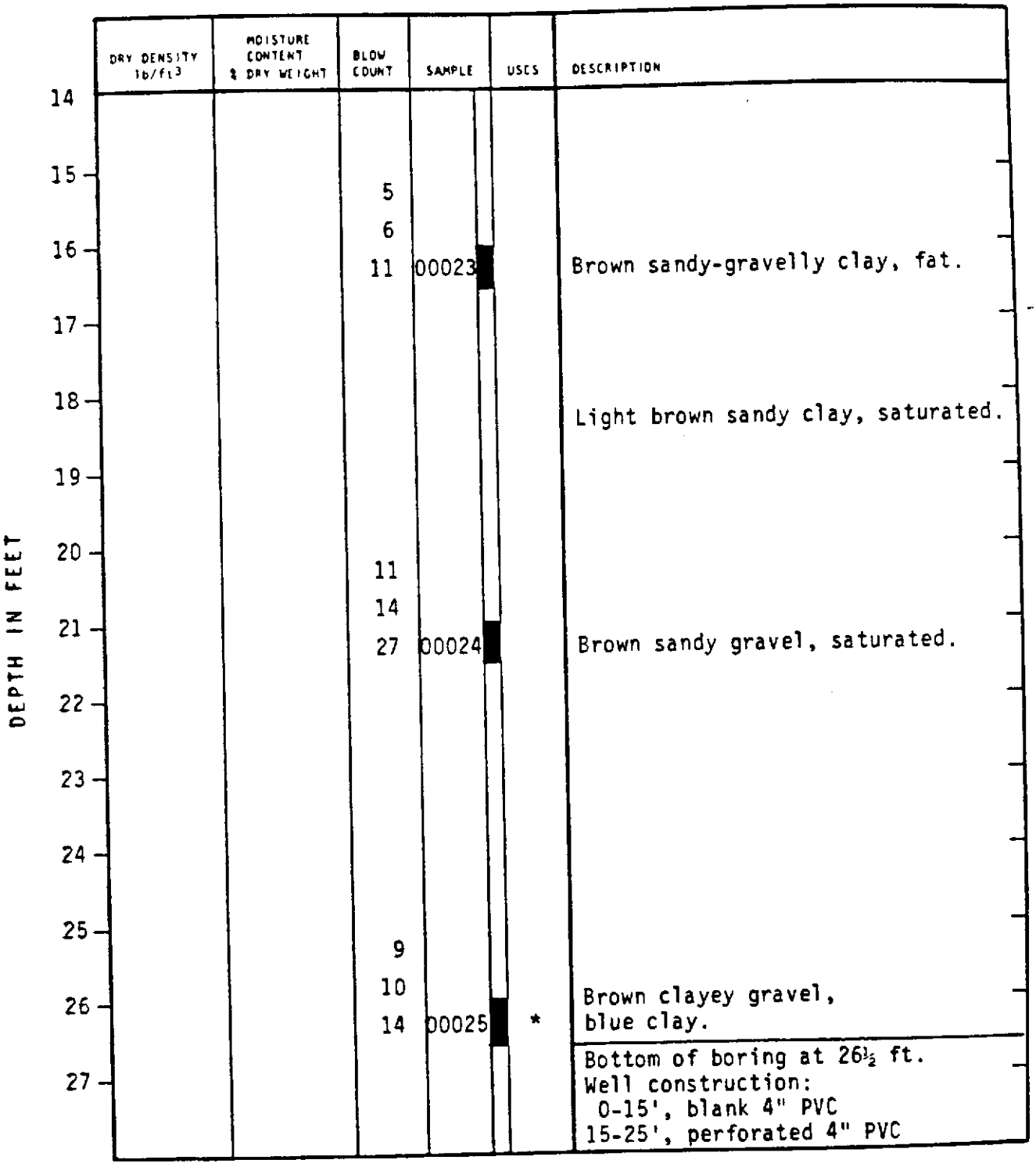
PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA
LOG OF BORING NO. 15

PROJECT NO. B-1132-3

PLATE
A-4




* Assumed base of shallow groundwater.

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

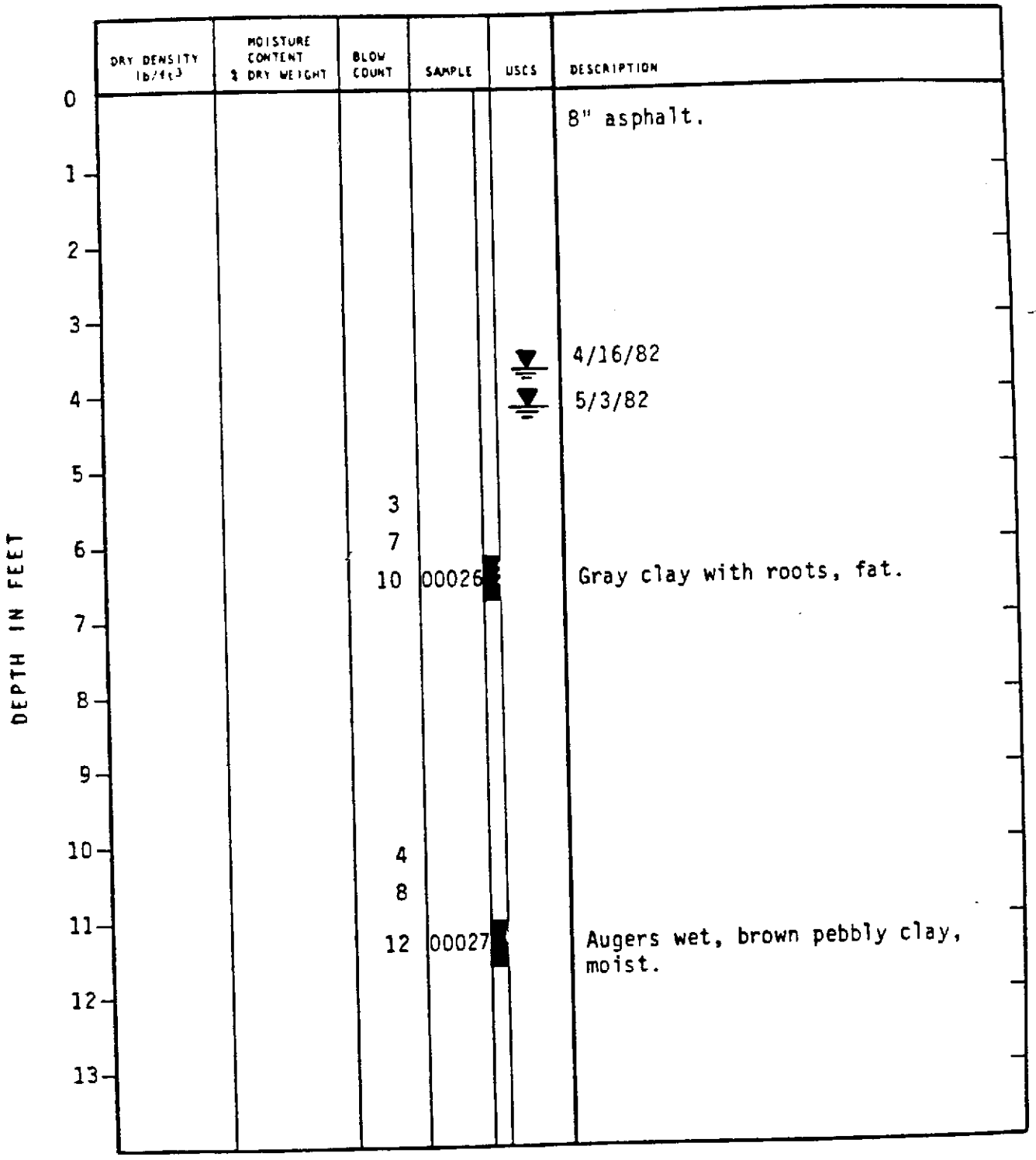
ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 15 (CONT)

PROJECT NO. B-1132-3

PLATE

A-4.1



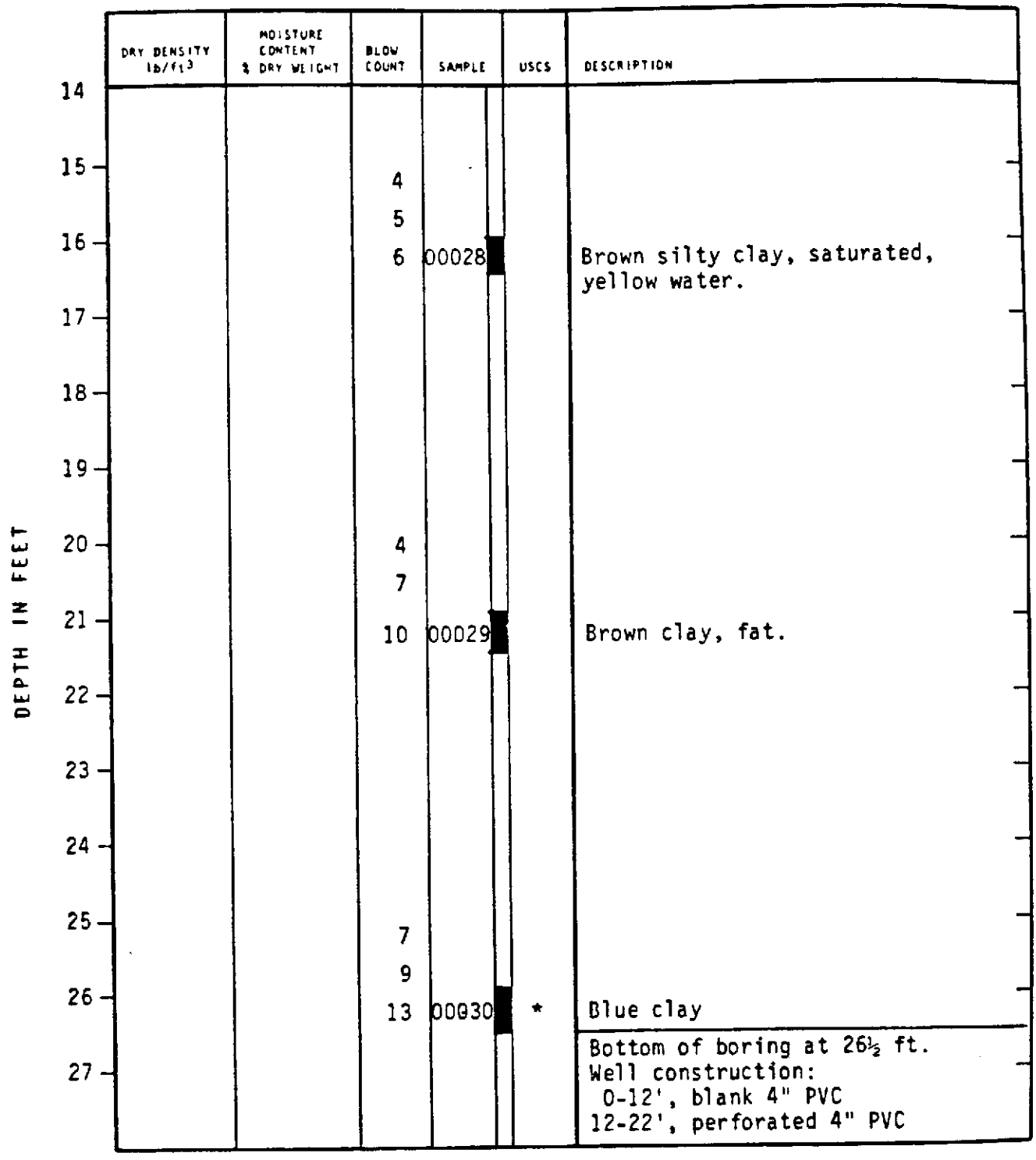

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: RJZ DATE: 5/10/82
CHECKED BY: DCM DATE: 5/10/82

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA
LOG OF BORING NO. 16

PROJECT NO. B-1132-3

PLATE
A-5




* Assumed base of shallow groundwater.

J.H KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

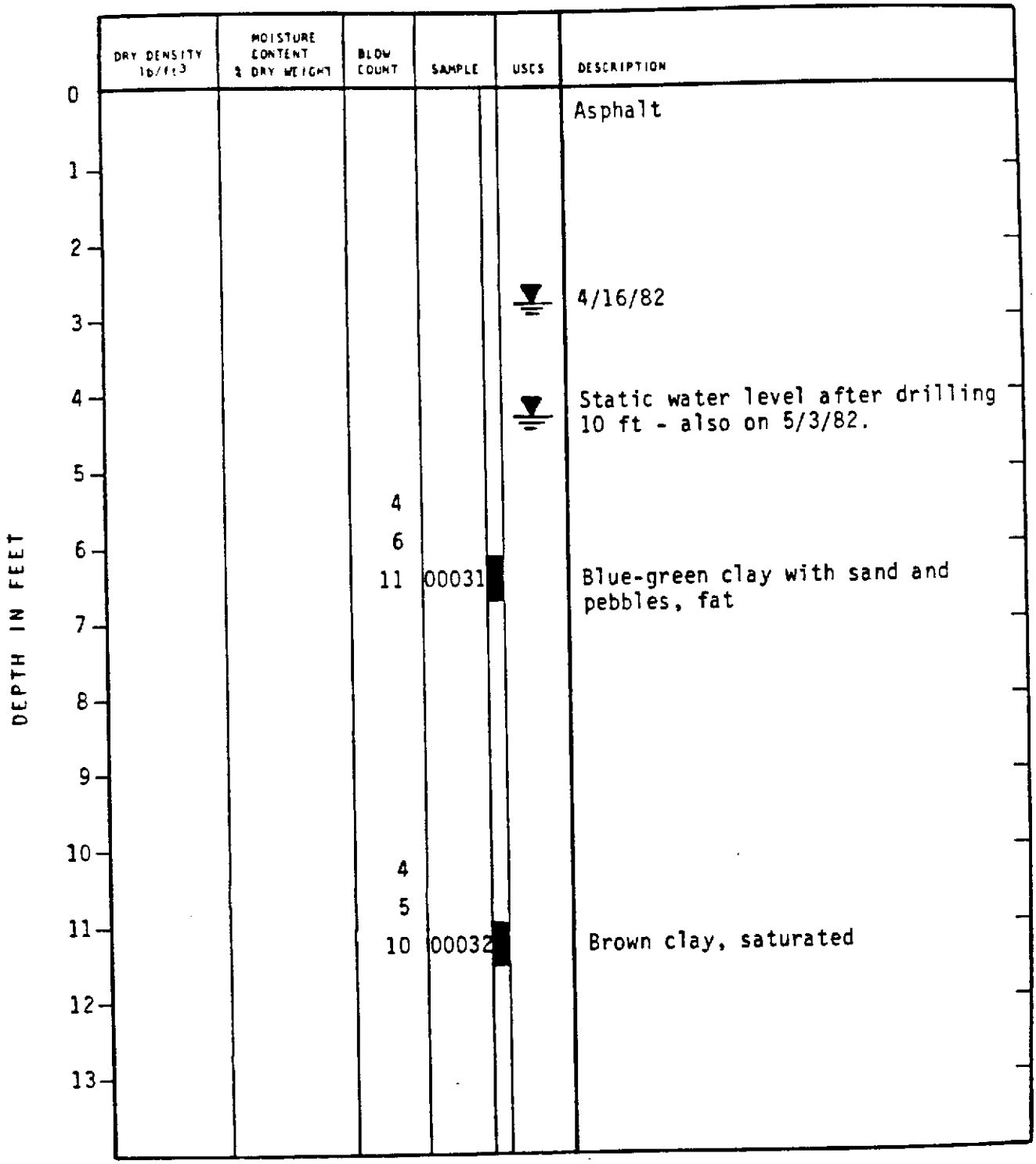
ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 16 (CONT)

PROJECT NO. B-1132-3

PLATE

A-5.1




J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

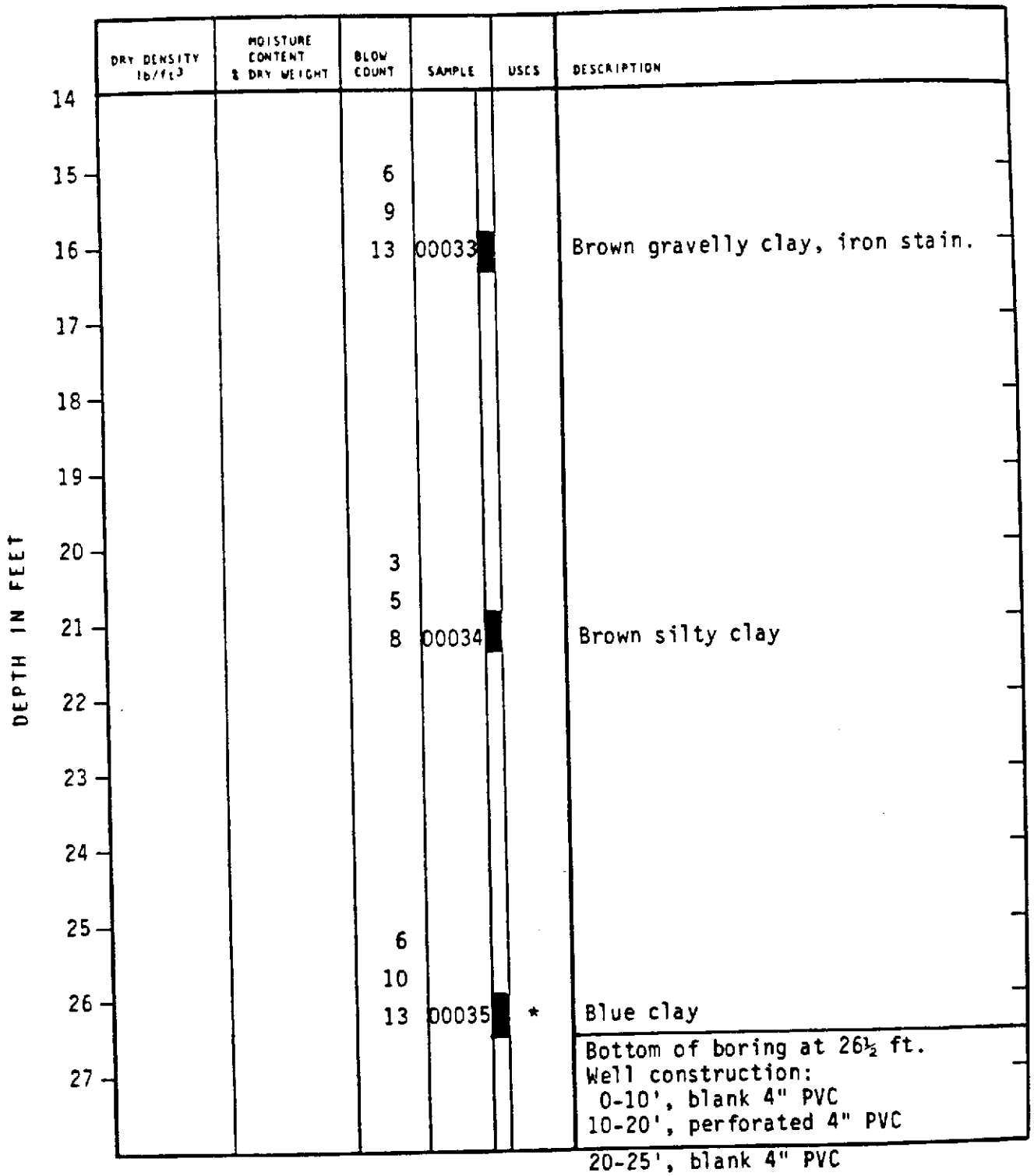
PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA
LOG OF BORING NO. 17

PROJECT NO. B-1132-3

PLATE
A-6




* Assumed base of shallow groundwater.

J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 17 (CONT)

PROJECT NO. B-1132-3

PLATE

A-6.1

| DEPTH IN FEET | DRY DENSITY lb/ft³ | MOISTURE CONTENT % DRY WEIGHT | BLOW COUNT | SAMPLE | USCS | DESCRIPTION |
|---|---|---|---|---|---|---|
| 0 | | | | | | Asphalt |
| 1 | | | | | | |
| 2 | | | | | | Gray silty clay. |
| 3 | | | | | ▼ | 4/16/82 |
| 4 | | | | | ▼ | 5/3/82 |
| 5 | | | 3 | | | |
| | | | 7 | | | |
| 6 | | | 10 | * | | Black clay. |
| 7 | | | | | | Brown clay. |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | 10 | | | Water on outside of Porter sampler. |
| | | | 14 | | | Brown sandy clay, some iron stain, |
| 11 | | | 19 | * | | saturated. |
| 12 | | | | | | |
| 13 | | | | | | |

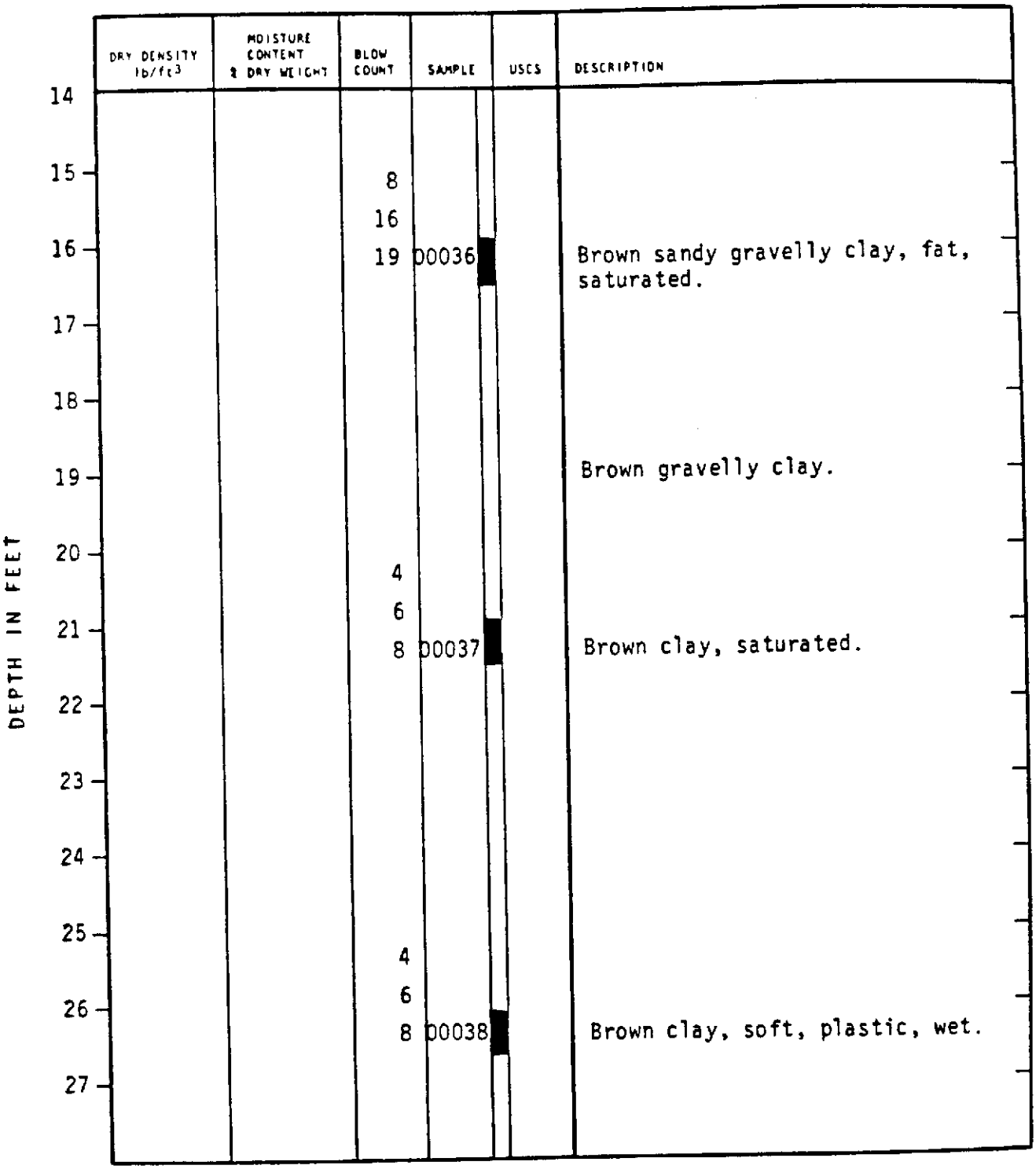
J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: RJZ DATE: 5/10/82
CHECKED BY: DCM DATE: 5/10/82

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA
LOG OF BORING NO. 18

PROJECT NO. B-1132-3

PLATE
A-7




J.H KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

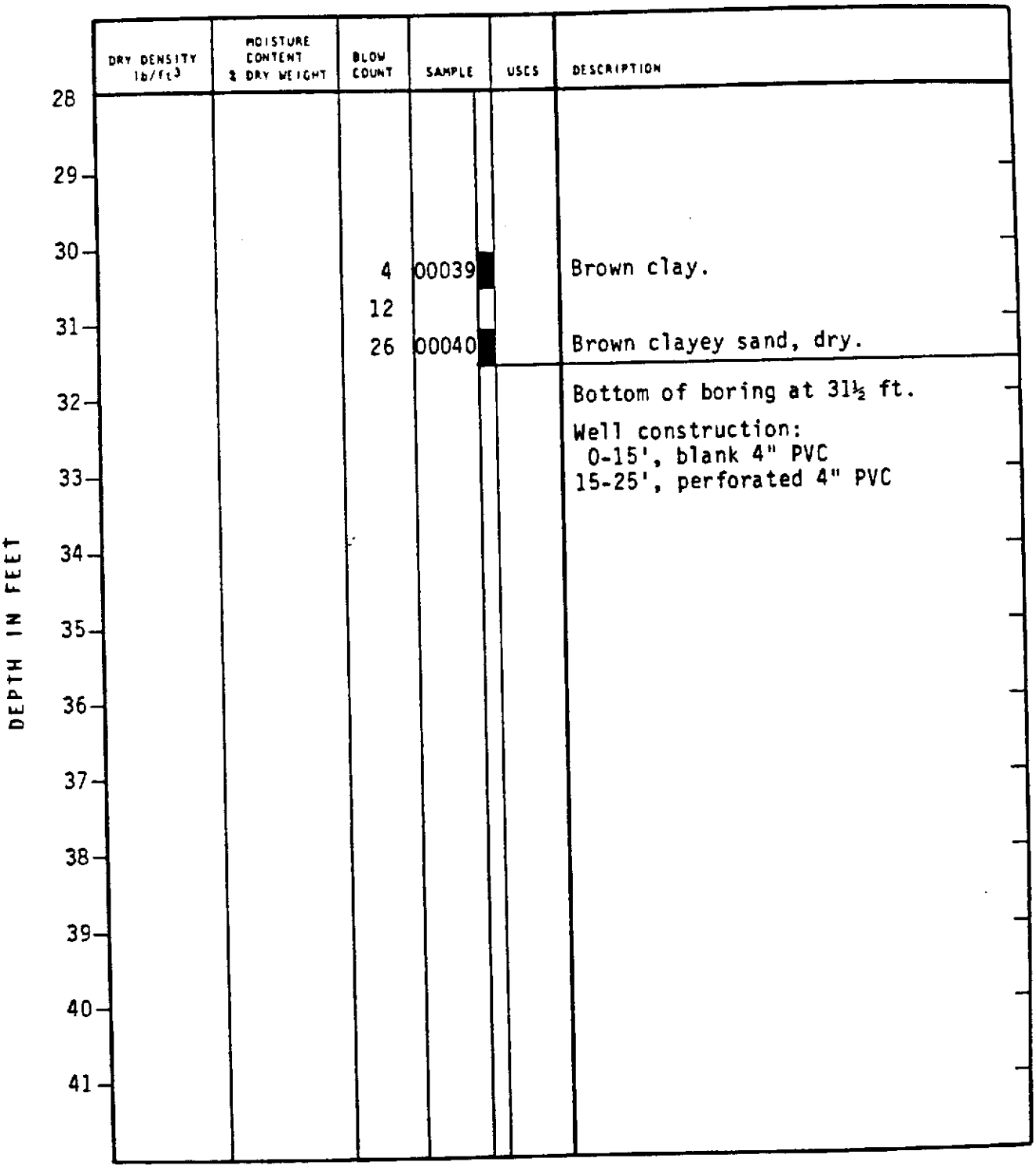
ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 18 (CONT)

PROJECT NO. B-1132-3

PLATE

A-7.1




J.H KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: RJZ DATE: 5/10/82

CHECKED BY: DCM DATE: 5/10/82

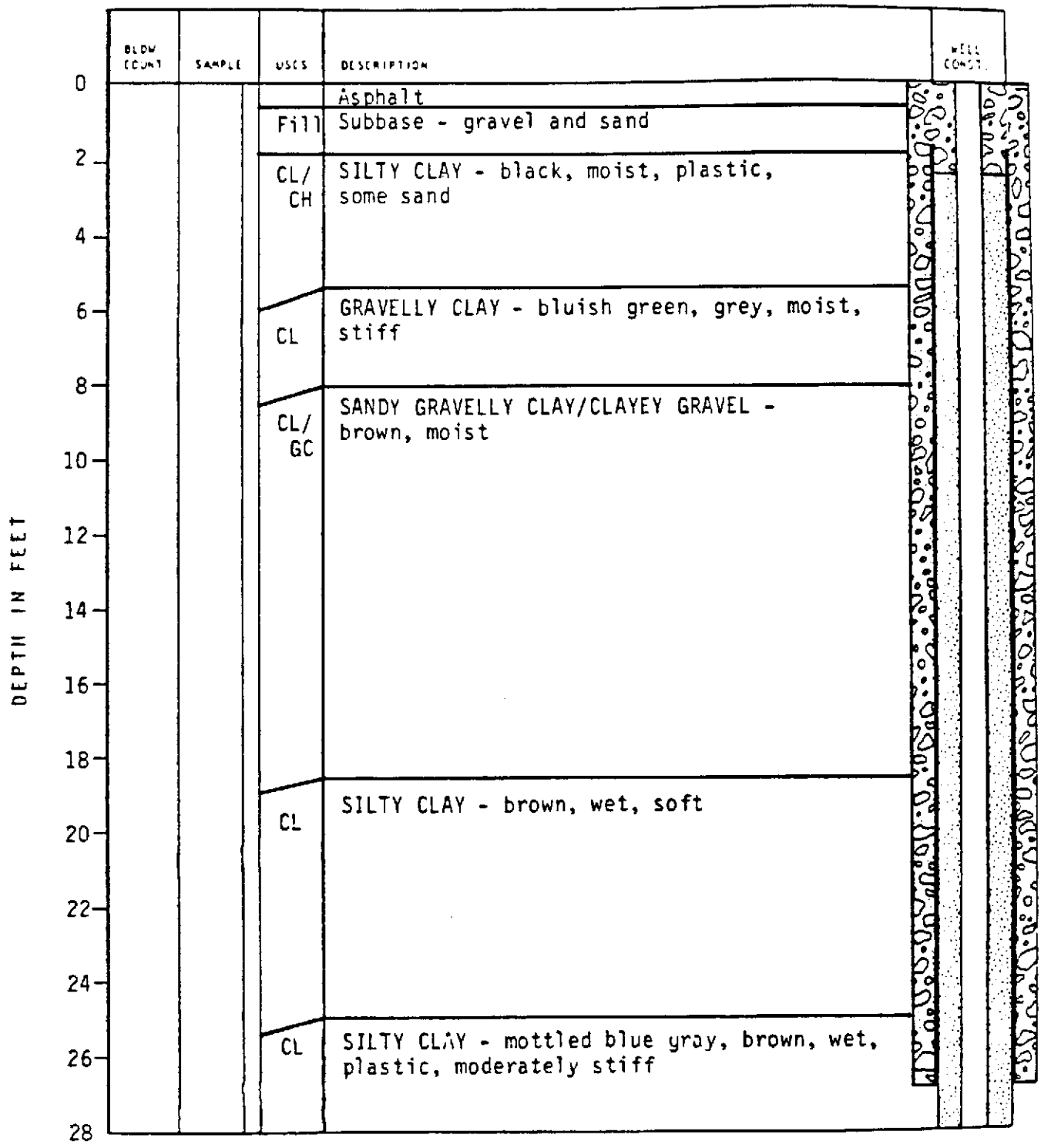
ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 18 (CONT)

PROJECT NO. B-1132-3

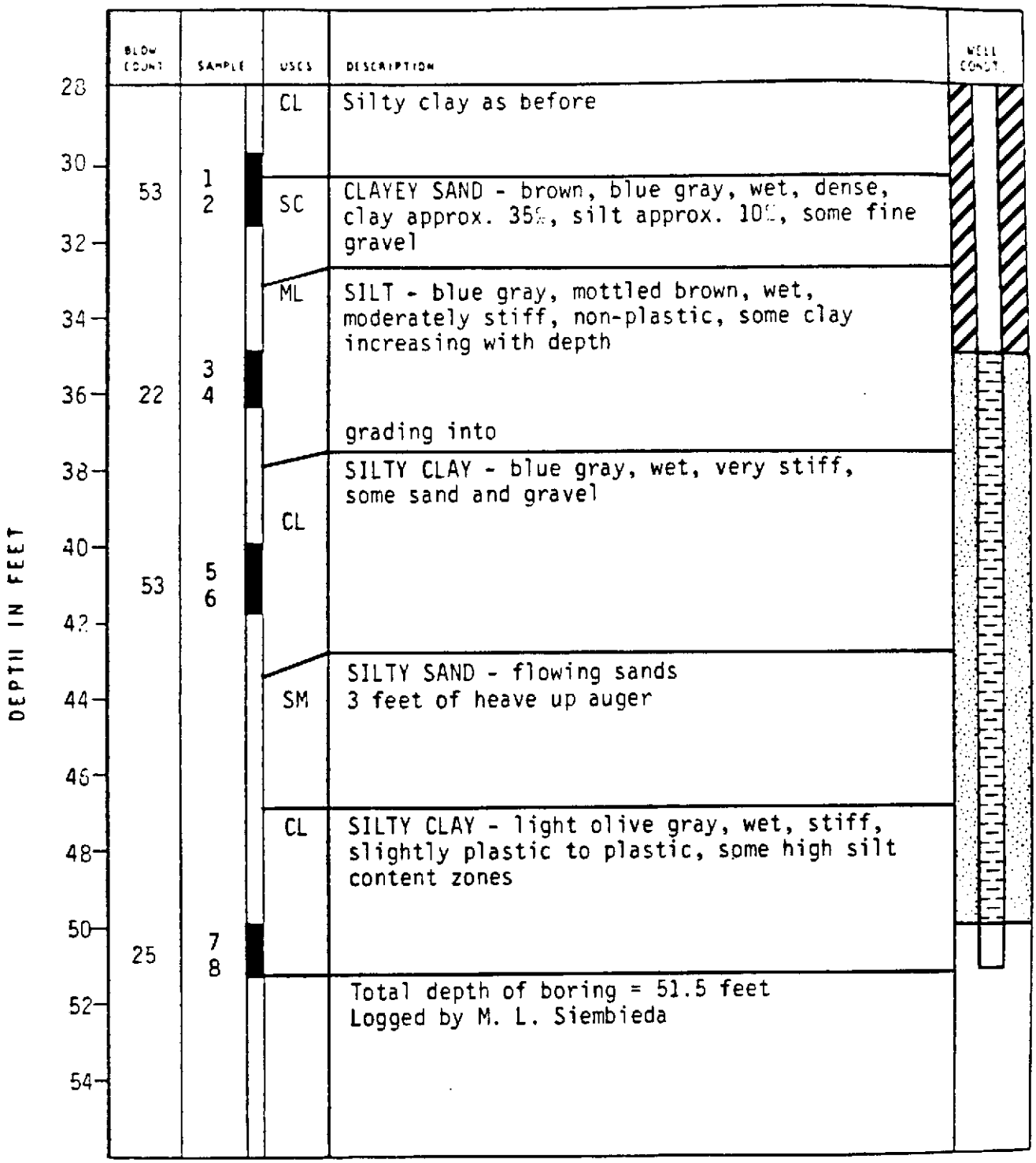
PLATE

A-7.2




(1) 16" diameter hole drilled to 27', 10" casing set and annulus backfilled with bentonite/cement grout that was tremied in place.

| | | |
|---|---|---|
| J H KLEINFELDER & ASSOCIATES<br>GEOTECHNICAL CONSULTANTS • MATERIALS TESTING | ELECTRO-COATINGS INC.<br>EMERYVILLE, CALIFORNIA<br>LOG OF BORING NO. 18A | PLATE<br>7 |
| PREPARED BY: AP DATE: 7/83 | | |
| CHECKED BY: MLS DATE: 7/83 | PROJECT NO. B-1132-4 | |

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PREPARED BY: AP DATE: 7/83

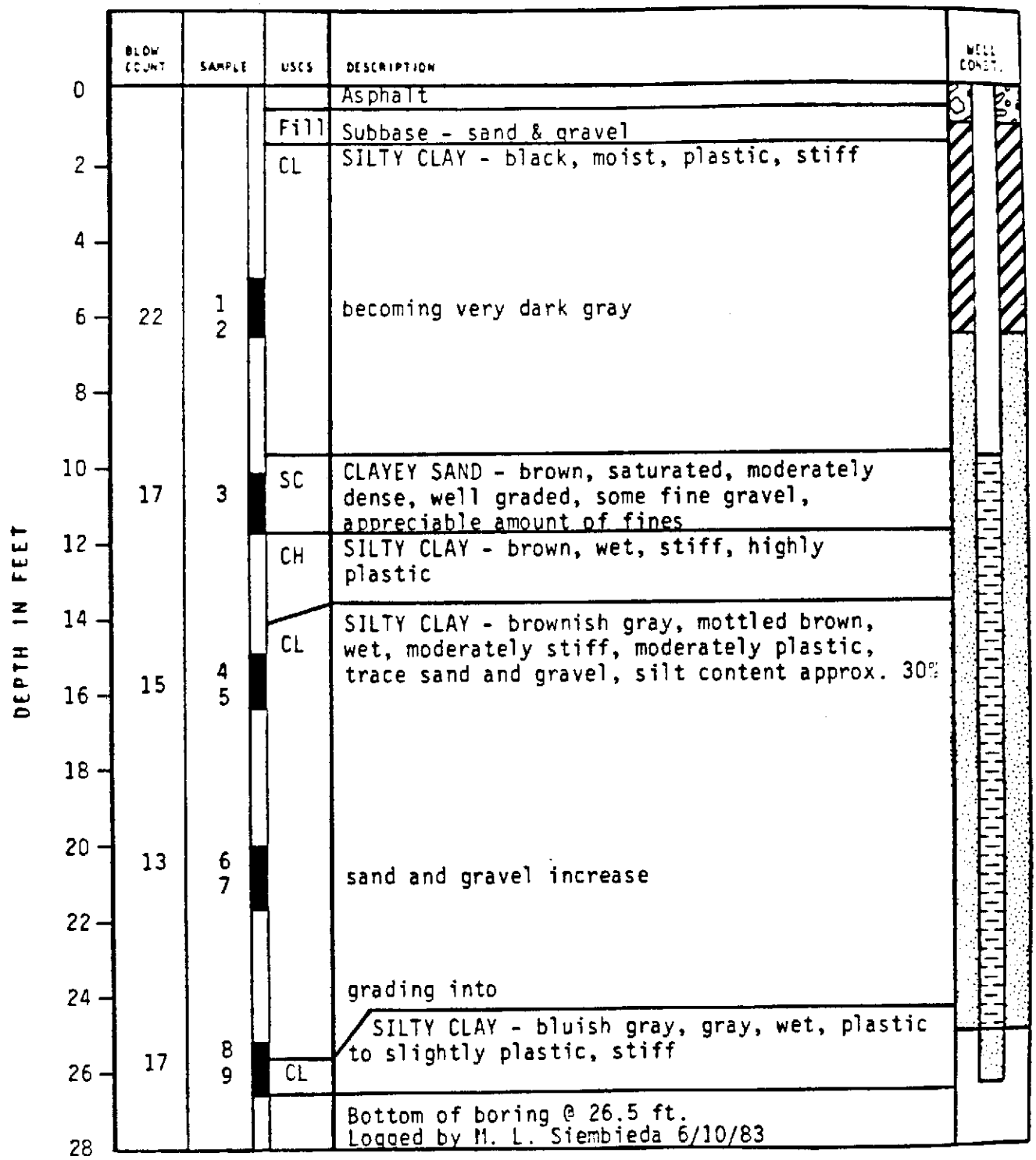
CHECKED BY: MLS DATE: 7/83

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 18A

PROJECT NO. B-1132-4

PLATE
7A

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PREPARED BY: AP DATE: 7/83

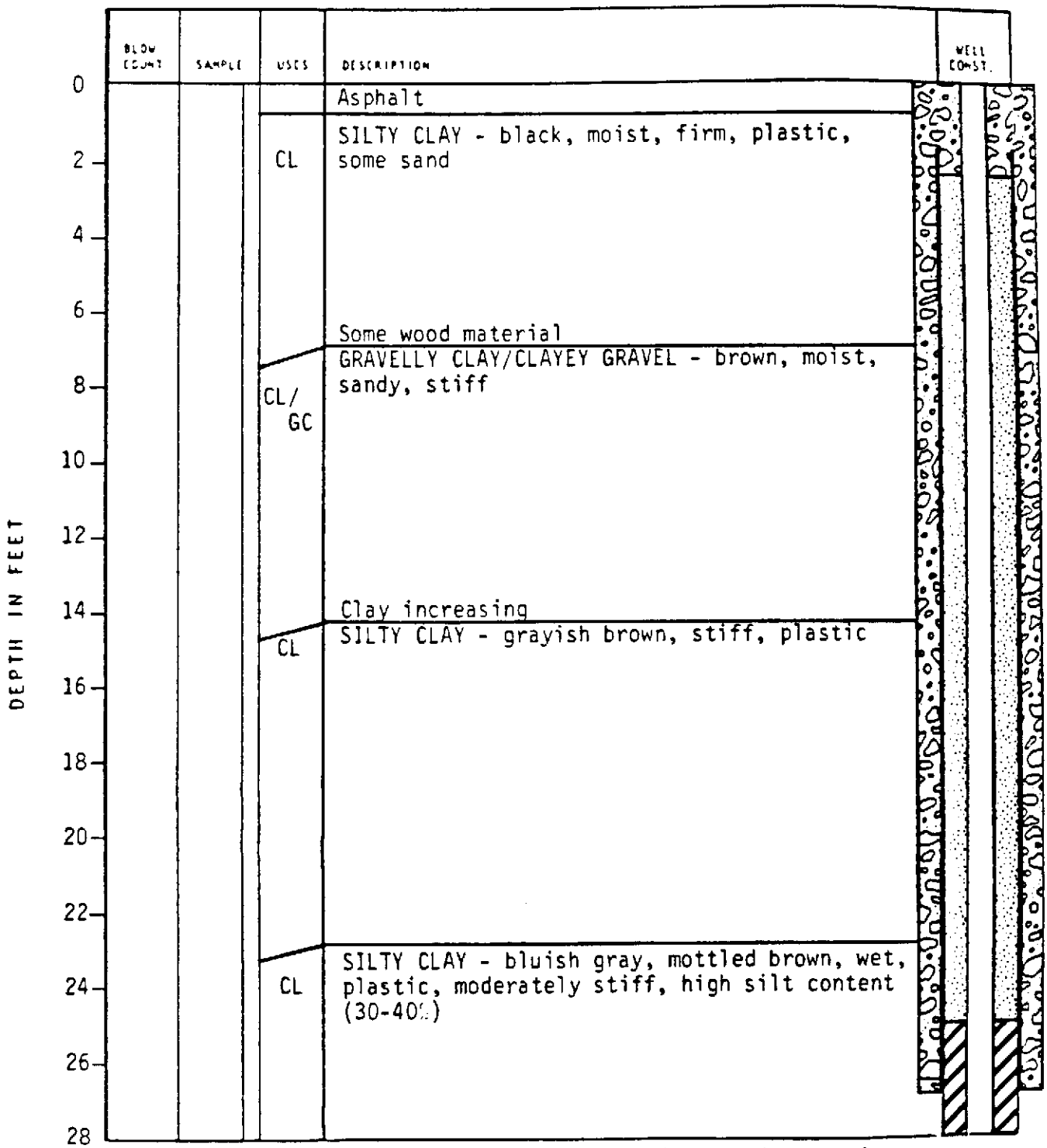
CHECKED BY: MLS DATE: 7/83

**ELECTRO-COATINGS INC.**
**EMERYVILLE, CALIFORNIA**

**LOG OF BORING NO. 19**

PROJECT NO. B-1132-4

PLATE
**8**




(1) 16" diameter hole drilled to 26.5 feet, 10 foot casing set & annulus backfilled with bentonite/cement grout that was tremied in place.

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PREPARED BY: AP DATE: 7/83

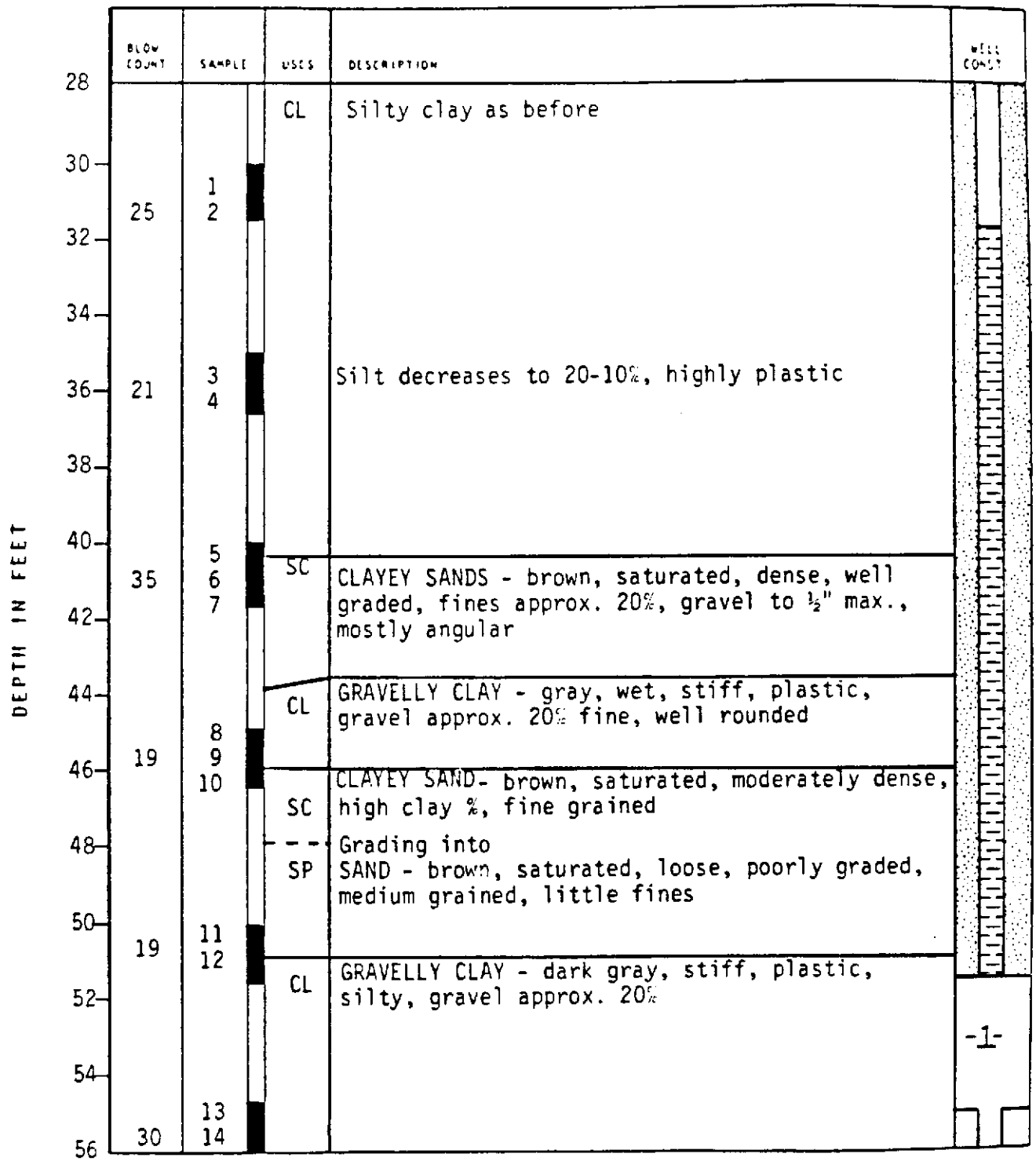
CHECKED BY: MLS DATE: 7/83

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 20

PROJECT NO. B-1132-4

PLATE 9




Bottom of boring @ 56.5 feet
Logged by M.L. Siembieda

(1) 3.5 feet of slough in hole.

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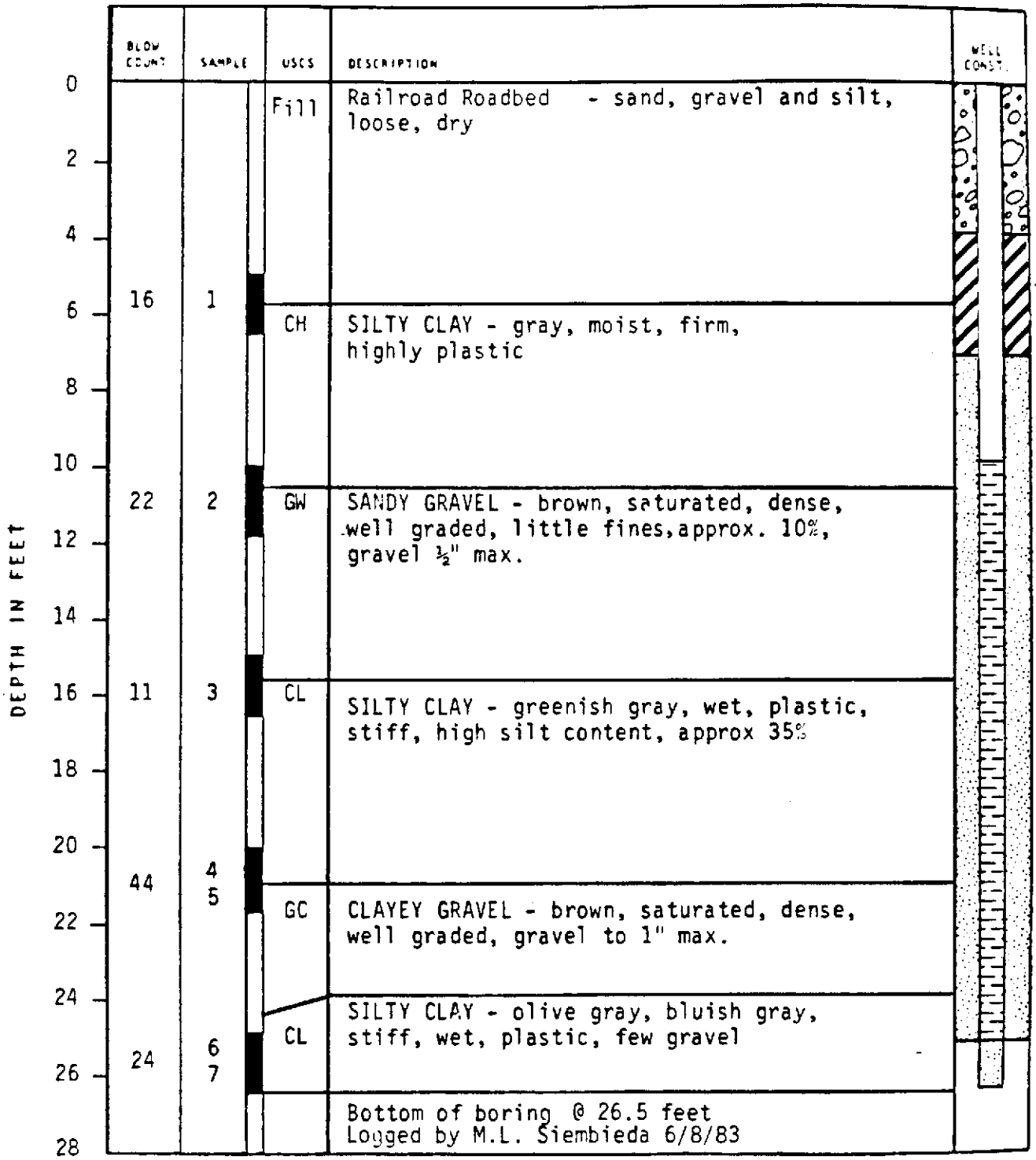
ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 20

PROJECT NO. B-1132-4

PLATE
9A




| | | |
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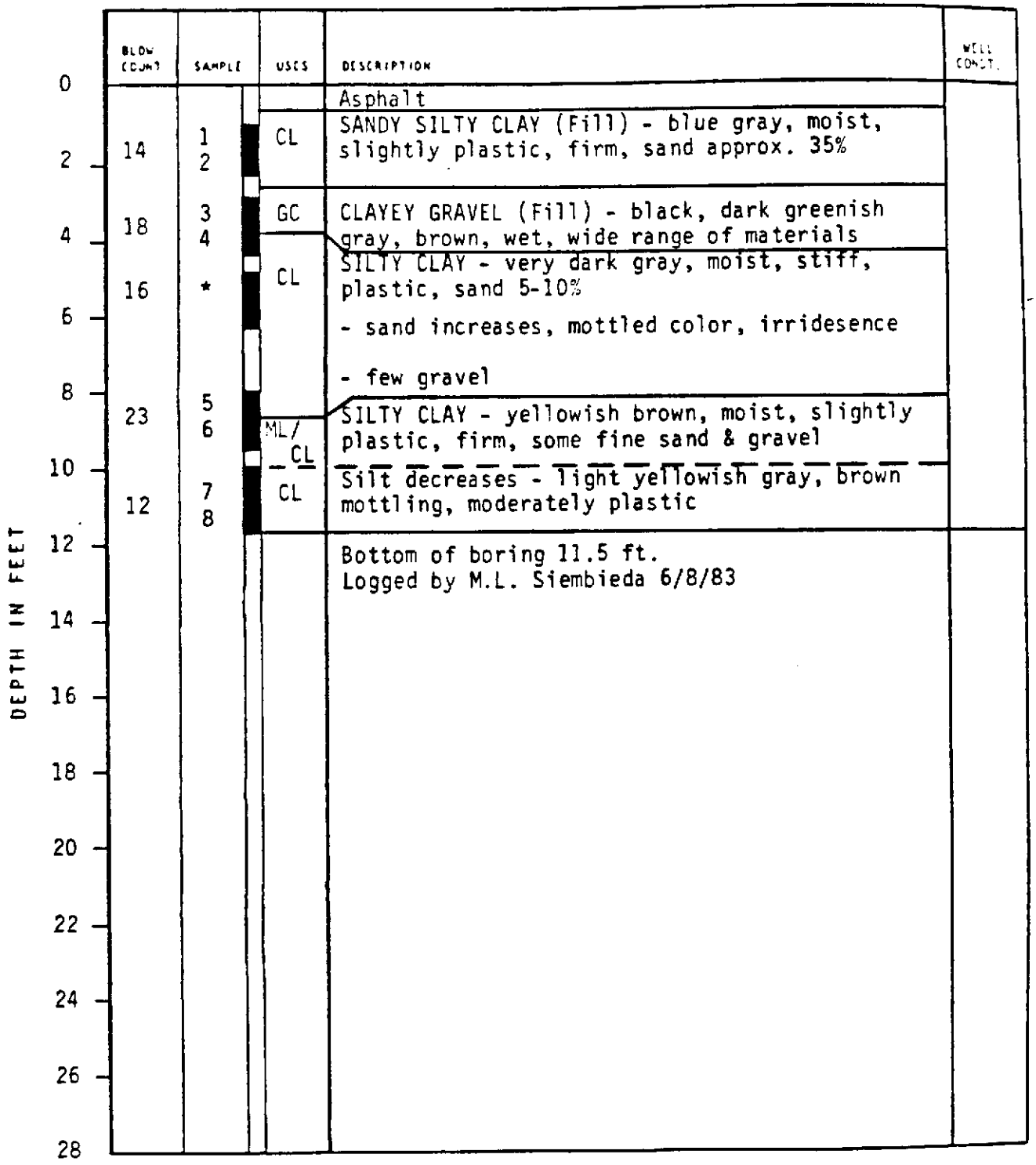
| J H KLEINFELDER & ASSOCIATES<br>GEOTECHNICAL CONSULTANTS • MATERIALS TESTING | ELECTRO-COATINGS INC.<br>EMERYVILLE, CALIFORNIA<br>LOG OF BORING NO. 21 | PLATE<br>10 |
| PREPARED BY: AP DATE: 7/83 | | |
| CHECKED BY: MLS DATE: 7/83 | PROJECT NO. B-1132-4 | |

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PREPARED BY: AP DATE: 7/83

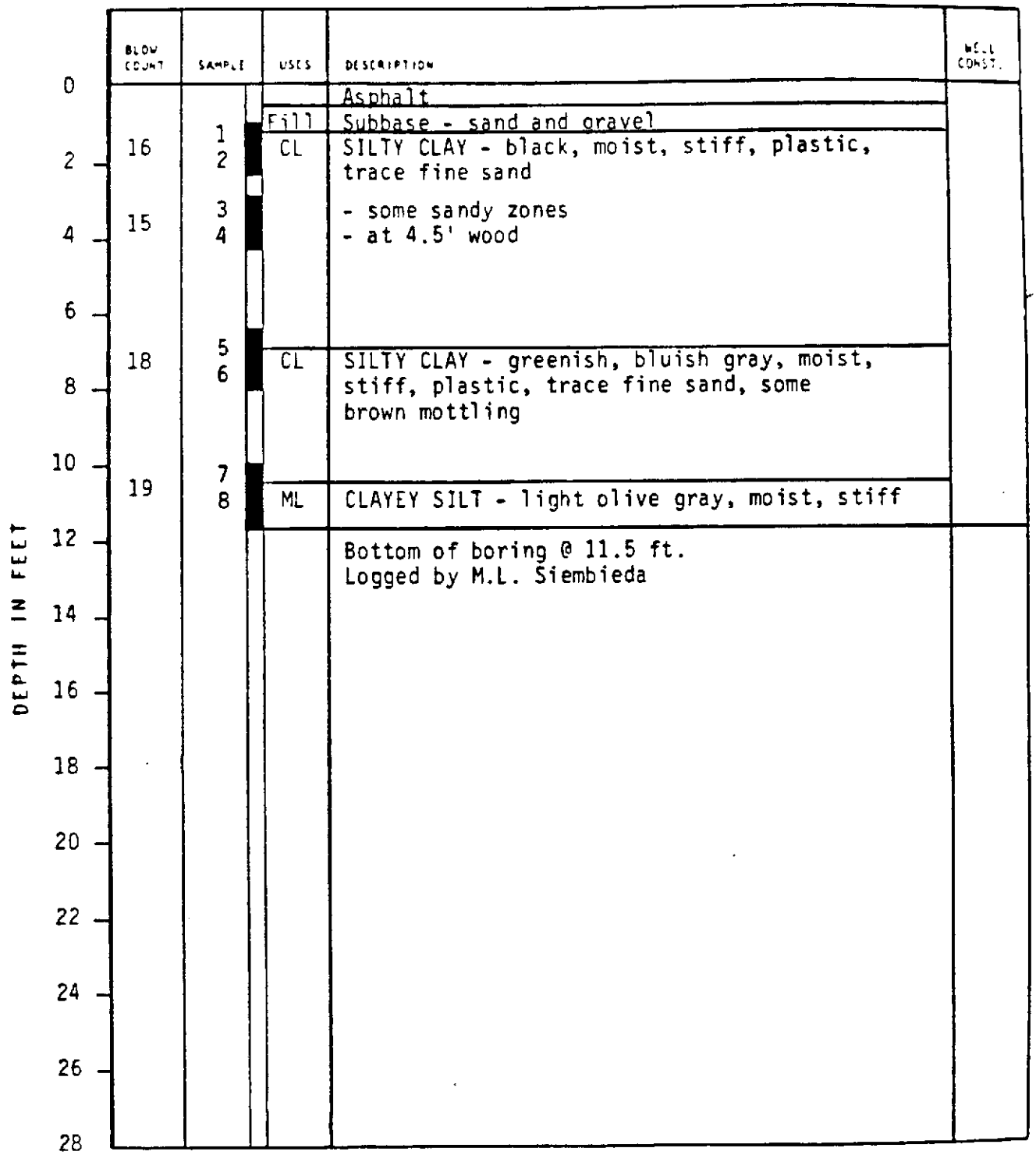
CHECKED BY: MLS DATE: 7/83

ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 22

PROJECT NO. B-1132-4

PLATE 11

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ELECTRO-COATINGS INC.
EMERYVILLE, CALIFORNIA

LOG OF BORING NO. 23

PLATE 12

| | | | |
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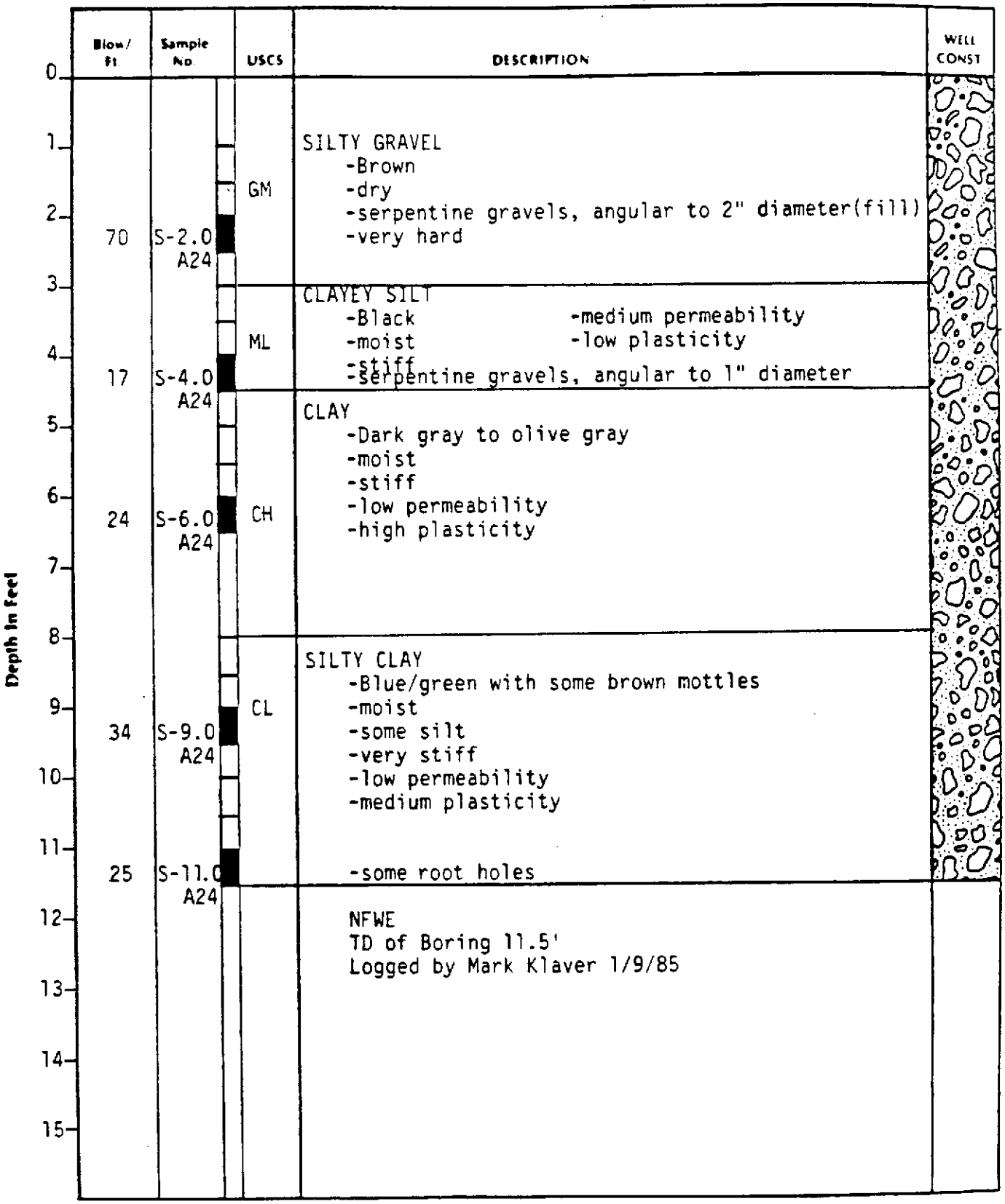
| PREPARED BY | AP | DATE: | 7/83 |
| CHECKED BY | MLS | DATE: | 7/83 |

PROJECT NO. B-1132-4

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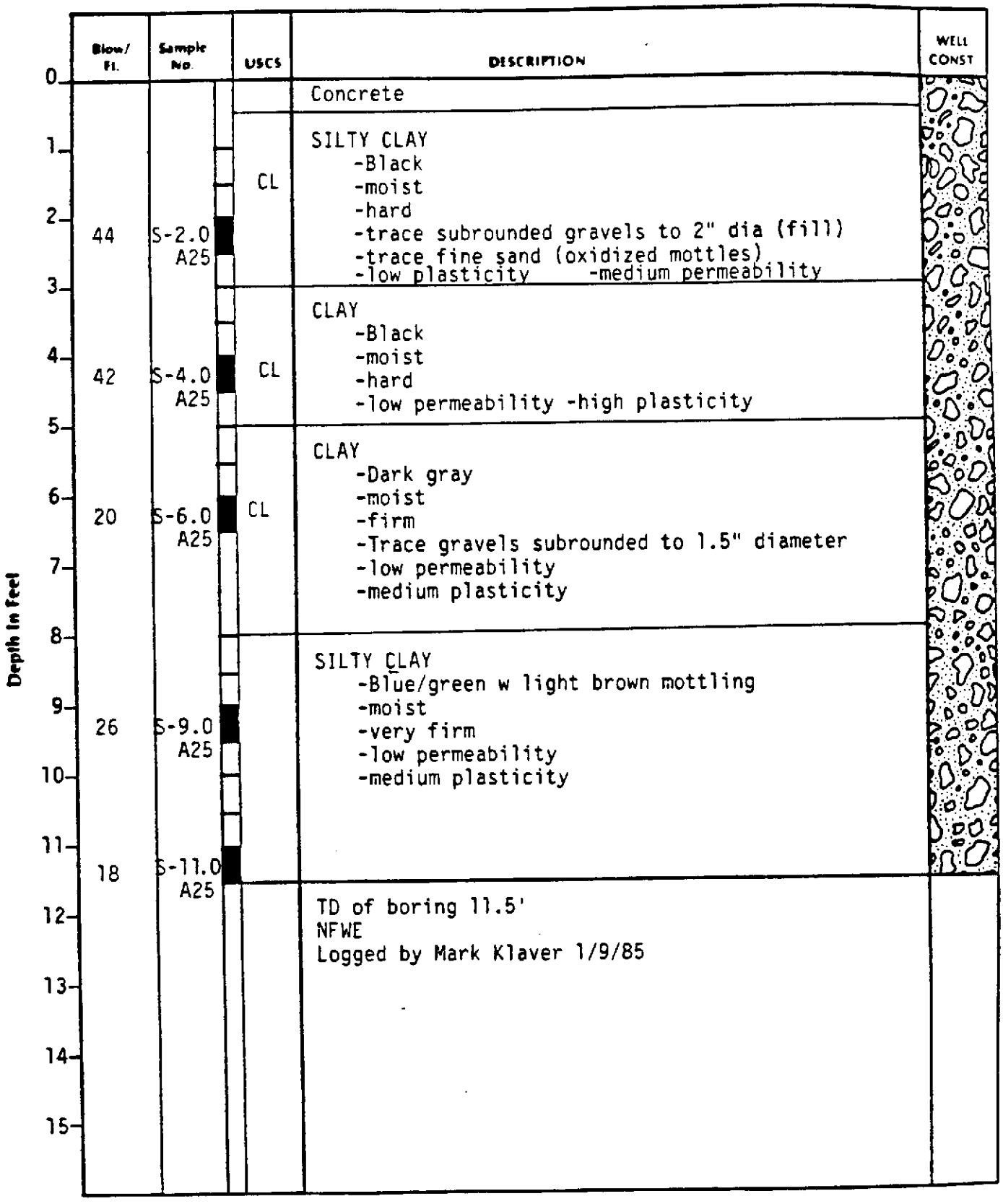
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. B-1132-5

ELECTRO - COATINGS
EMERYVILLE, CALIFORNIA

**LOG OF BORING NO. 24**

PLATE

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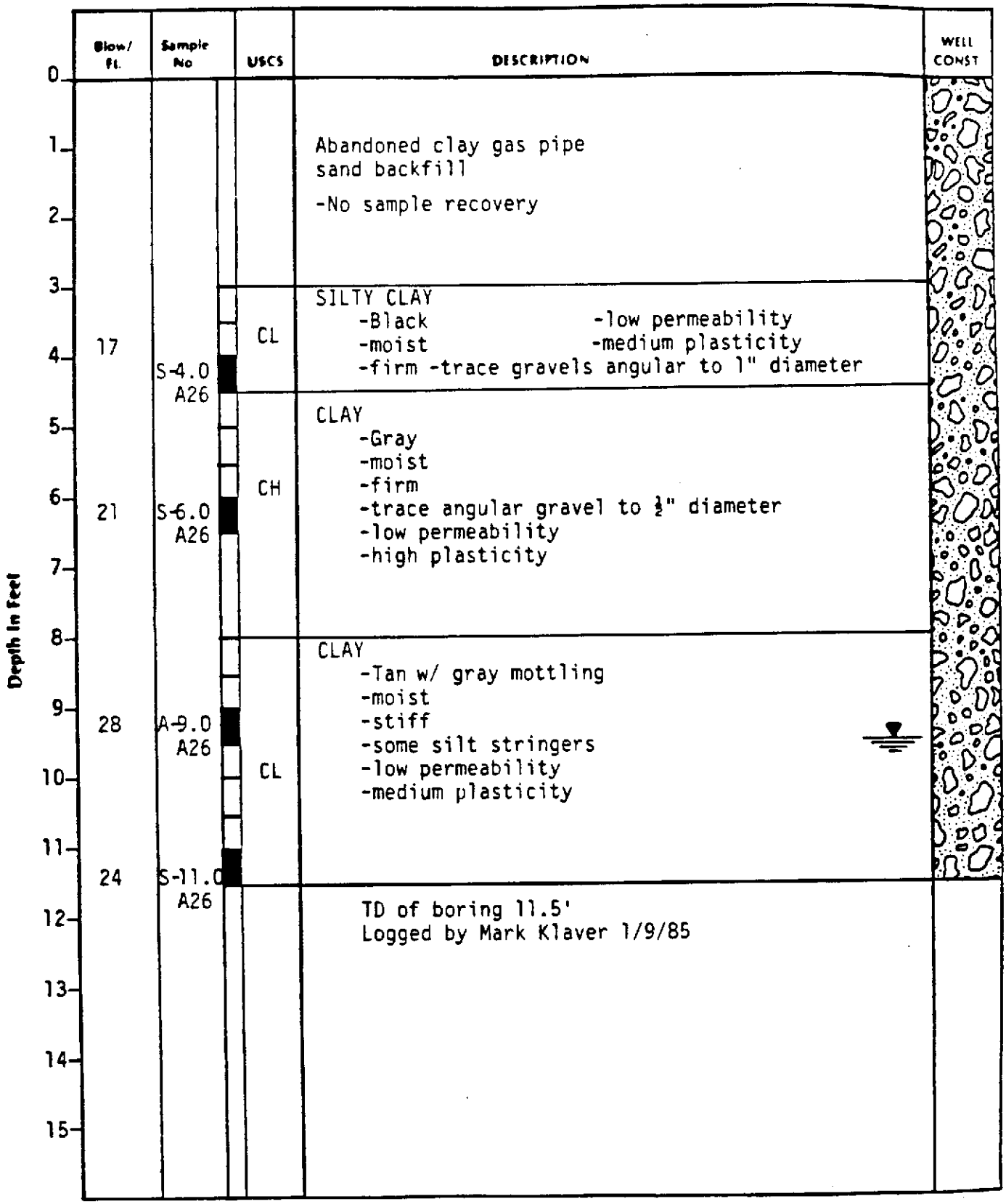
PROJECT NO. B-1132-5

ELECTRO - COATINGS
EMERYVILLE, CALIFORNIA

**LOG OF BORING NO. 25**

PLATE

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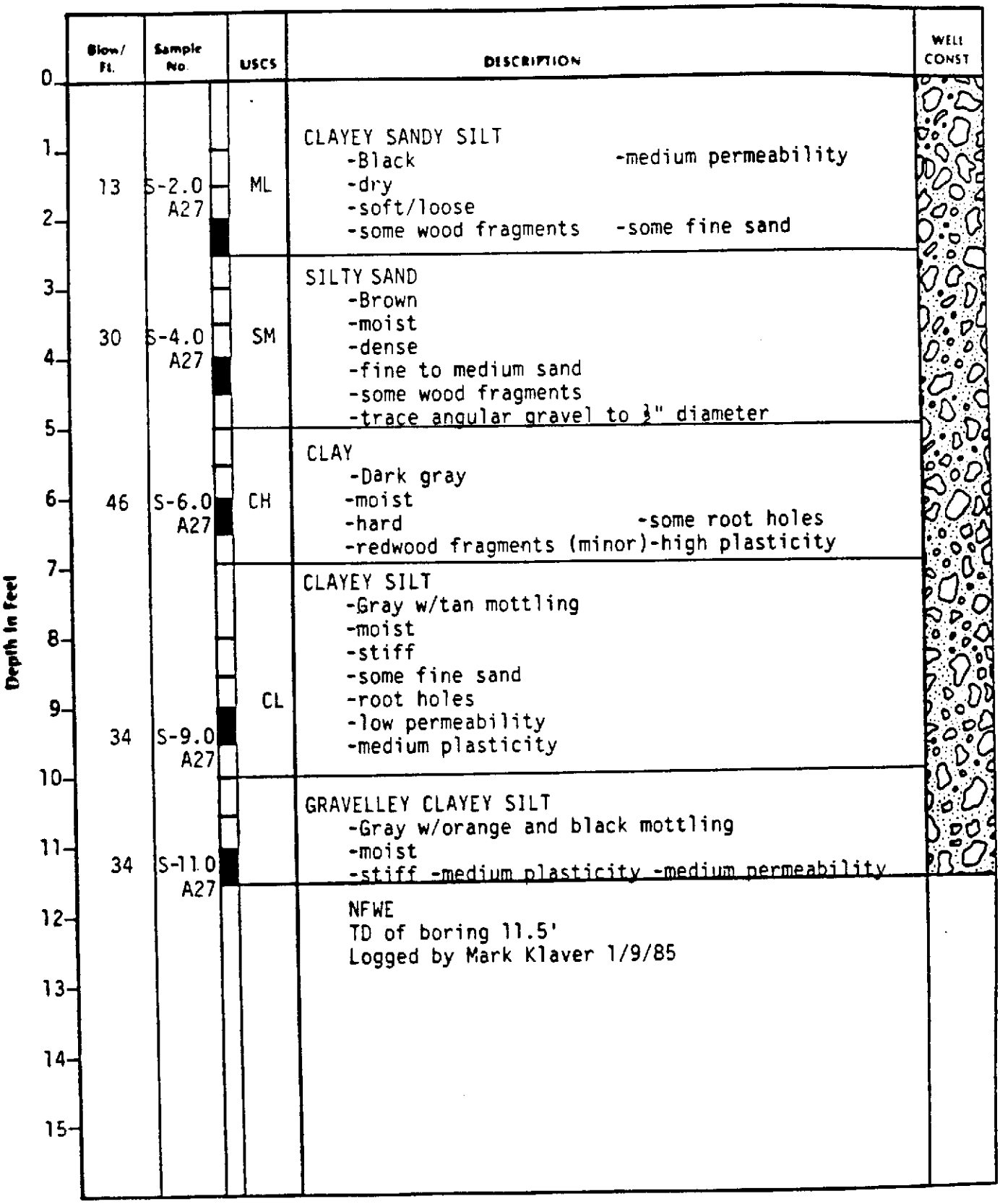
PROJECT NO. B-1132-5

ELECTRO - COATINGS
EMERYVILLE, CALIFORNIA

**LOG OF BORING NO. 26**

PLATE

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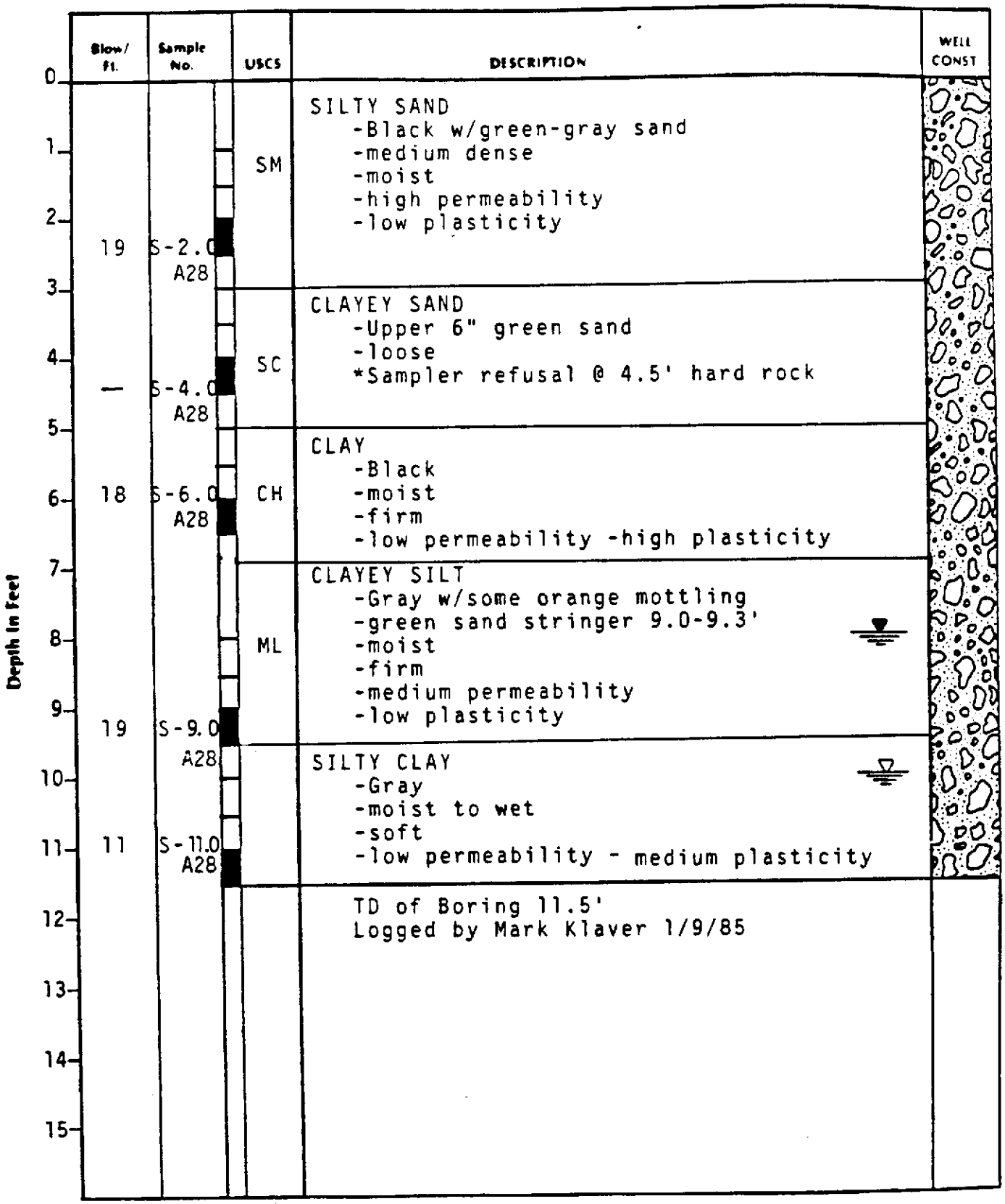
PROJECT NO. B-1132-5

ELECTRO - COATINGS
EMERYVILLE, CALIFORNIA

**LOG OF BORING NO. 27**

PLATE

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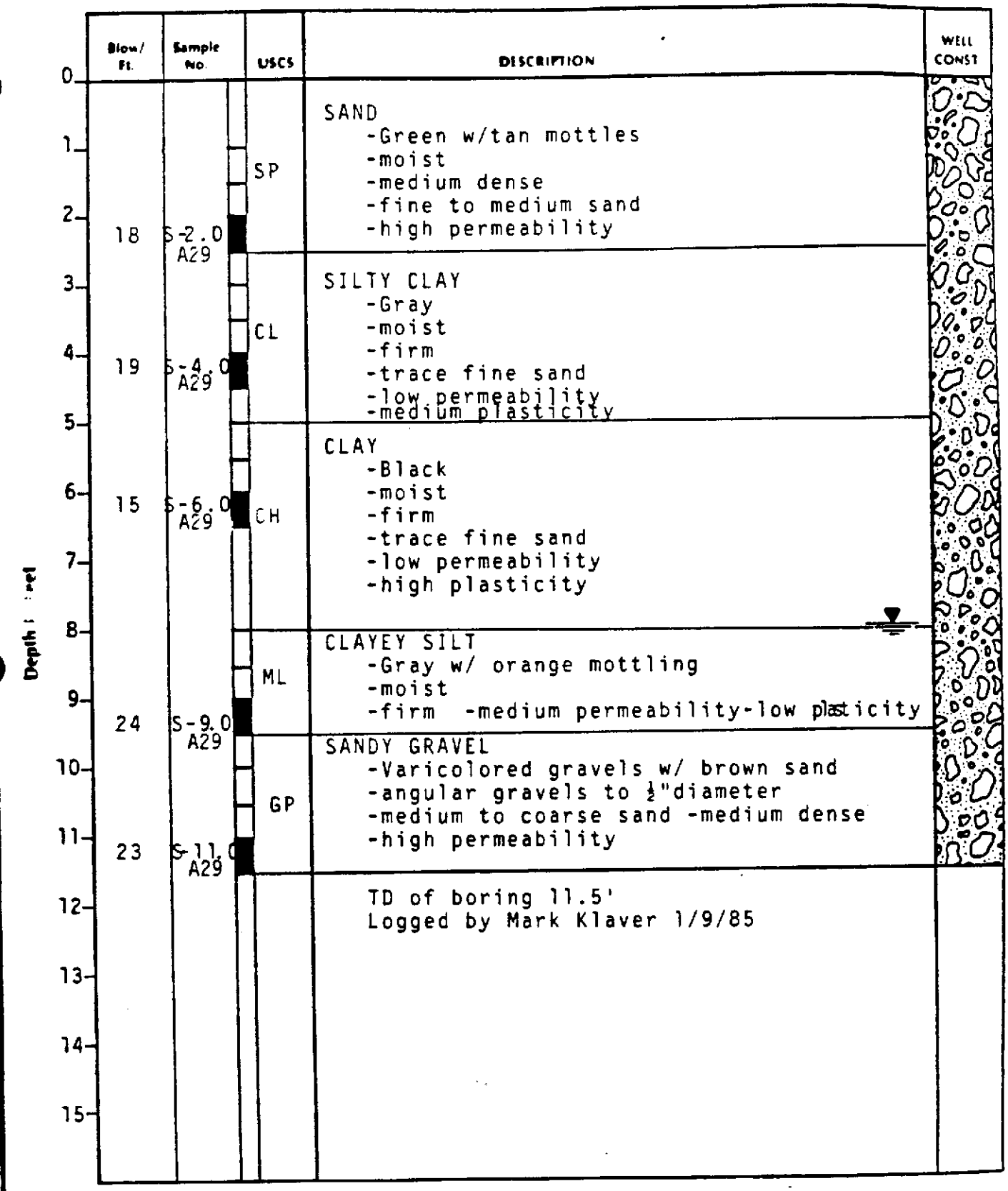
PROJECT NO. B-1132-5

ELECTRO - COATINGS
EMERYVILLE, CALIFORNIA

**LOG OF BORING NO. 28**

PLATE

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GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. B-1132-5

ELECTRO - COATINGS
EMERYVILLE, CALIFORNIA

**LOG OF BORING NO. 29**

PLATE

| Depth in feet | Blow/ Ft. | Sample No. | USCS | DESCRIPTION | WELL CONST |
|---|---|---|---|---|---|
| 0–2 | 17 | S-2.0 A30 | SP | SILTY SAND<br>-Brown w/ green sand lenses<br>-moist<br>-loose<br>-fine to medium sand<br>-trace fine gravel -medium permeability | |
| 3–4 | 19 | S-4.0 A30 | ML | SANDY SILT<br>-Greenish gray<br>-moist<br>-loose<br>-medium permeability | |
| 5–6 | 12 | S-6.0 A30 | CH | CLAY<br>-Black<br>-moist<br>-soft<br>-low permeability -high plasticity | |
| 7–9 | 21 | S-9.0 A30 | CL | SILTY CLAY<br>-Gray w/orange mottles<br>-moist<br>-slightly stiff<br>-trace fine sand<br>-low permeability<br>-medium plasticity | |
| 10–11 | 18 | S-11.0 A30 | ML | CLAYEY SILT<br>-Gray -low permeability<br>-moist -low plasticity<br>-firm -trace root holes | |
| 12–15 | | | | TD of Boring 11.5'<br>Logged by Mark Klaver 1/9/85 | |

J H KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. B-1132-5

ELECTRO - COATINGS
EMERYVILLE, CALIFORNIA

**LOG OF BORING NO. 30**

PLATE

| Depth In Feet | Blow/ Ft. | Sample No. | USCS | DESCRIPTION | WELL CONST |
|---|---|---|---|---|---|
| 0–2 | 31 | S-2.0 A31 | SW | Concrete 4"<br><br>GRAVELLEY CLAYEY SAND<br>-Black w/green sand stringers<br>-moist<br>-dense<br>-high permeability | |
| 3–5 | 18 | S-4.0 A31 | ML | SANDY SILT<br>-Black w/green sand stringers<br>-moist<br>-loose to medium dense<br>-medium - high permeability | |
| 6–7 | 18 | S-6.0 A31 | CL | CLAY<br>-Black -medium plasticity<br>-moist<br>-firm<br>-trace fine sand -low permeability | |
| 8–9 | 26 | S-9.0 A31 | ML | SANDY SILT<br>-Light gray<br>-slightly wet<br>-firm<br>-trace fine sand and fine gravels<br>-medium permeability | |
| 10–11 | 15 | S-11.0 A31 | CL | GRAVELLEY SILTY CLAY<br>-Gray w/orange and black mottles<br>-wet<br>-firm -medium to high permeability<br>-gravel lens at 10.5'-11.0' | |
| 12–15 | | | | TD of Boring 11.5'<br>Logged by Mark Klaver 1/9/85 | |

J H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. B-1132-5

ELECTRO - COATINGS
EMERYVILLE, CALIFORNIA

**LOG OF BORING NO. 31**

PLATE

Woodward-Clyde Consultants

# REPORT ON PHASE I
# GROUND-WATER INVESTIGATION
# EC INDUSTRIES
# Emeryville, California

Prepared for

EC Industries
Technical Center
1401 Park Avenue
Emeryville, California 94608

TABLE OF CONTENTS

LIST OF FIGURES

# REPORT ON PHASE I
# GROUND WATER INVESTIGATION
# EC INDUSTRIES
# Emeryville, California

## INTRODUCTION

This report presents the results of our Phase I ground-water investigation of the EC Industries property at the intersection of Park Avenue and Holden Streets in Emeryville. The purposes of the Phase I investigation were to: (1) install pumping and observation wells; (2) perform pump tests to determine aquifer coefficients; (3) estimate the probable extent of chromium contamination in the ground-water body; and (4) evaluate the time involved and feasibility of pump-withdrawal of the contaminated ground water.

## CONDUCT OF STUDY

To achieve the above objectives, the following program was conducted between December 9, 1980 and January 16, 1981.

1. Five test wells were drilled; wells 11 and 13 as production wells and wells 9, 10, and 12 as observation wells (Fig. 1).

2. Water levels were measured, by surveying the well casing elevations and measuring the depth to water at each well, to determine the water-level gradient.

3. A pump test was performed (8 hours) in well 11, utilizing wells 9 and 12 as observation wells.

4. Water quality samples were collected from wells 9 through 13 and analyzed for chromium content, pH, and specific conductance.

5. Pump test and slug test results were analyzed to determine the extent of the cone of depression in all monitoring wells after the 8-hour pump test, and to determine permeability values (slug tests were performed in wells 10 and 13 only).

6. The overall ground-water conditions were estimated by using the calculated aquifer parameters, the water table gradient, and the subsurface conditions as indicated from the boring logs.

ACKNOWLEDGEMENTS

The study was performed by the various Woodward-Clyde personnel. The pump test, water-level measurements and collection of water-quality samples were performed by Mark Howland, Senior Staff Hydrogeologist, and Richard Casias, Staff Hydrologist. The pump-test results were analyzed by David Dunbar, Senior Staff Hydrologist, and the report written by William Hansen, Senior Project Engineering Geologist. Peer review of the report was performed by Benjamin Lofgren, Senior Project Advisor. The wells were drilled by Pitcher Drilling Company, Palo Alto; the elevation survey was done by T.V. Tronoff Civil Engineer and Surveyor, Inc., Berkeley; and the chemical analyses were done by Ultrachem Corporation, Walnut Creek.

GEOLOGIC CONDITIONS

The drilling of five new monitoring wells, the interpretation of continuous core extracted from several of the wells, and

the evaluation of previous reports provided a generalized profile of the subsurface geologic conditions of the study area. The locations of the five new monitoring wells (numbers 9-13) are shown in Figure 1 and the logs and construction details of these wells are shown in Figures 2 through 7.

The lithologic conditions of the sediments penetrated by borings beneath the subject site are shown in Figure 7. The upper 25-30 feet of alluvium is composed of interfingering layers of gravel, sand, silt and clay while the underlying alluvium appears to be finer-grained and contain extensive silty-clay layers. A blue silty-clay layer was encountered in all borings below a depth of 30 feet. This layer appears to be areally extensive and may correlate with a similar unit identified in borings 2,000 feet north of the subject site (Woodward-Clyde Consultants, 1977).

## GROUND WATER CONDITIONS

Ground water exists in the vicinity of the site at a depth of approximately seven feet (Table 1). All of the monitoring wells encountered ground water in the coarse-grained sand and gravel and coarse silt layers penetrated. The static water levels in these monitoring wells define the configuration of the water table in the area; the water table slopes gently westward and has a gradient of about .006 or 32 feet per mile (Figure 8). The hydraulic gradient in the sand and gravel layer encountered in wells 3B, 11, and 12 is approximately .003.

### Effect of Pumping

Pumping of well 11 during an 8-hour pump test created a cone of depression around the pumping well (Figure 9). All monitoring wells showed measureable drawdown, except wells 6

and 7 which are located farthest from the pumping well (Table 2 and Figure 9). This indicates that the aquifer system tapped by these wells is interconnected in the vicinity of the site. This widespread distribution of drawdown may also indicate that ground water withdrawn during the pump test was derived from the 12-foot thick sand and gravel layer at the base of the upper unit that the pumping well was screened against, and from the overlying fine-grained silty and clayey layers. The relative symmetry of the cone of depression is further evidence of the interconnection of the ground-water system.

## Aquifer Coefficients

The 8-hour pump test and the two slug tests were performed to provide estimates of the aquifer parameters of transmissivity, permeability, and storage coefficient. The derived aquifer parameters are shown in Table 3.

During the 8-hour pump test, the drawdowns in wells 3C, 9, 12, and in pumping well 11, were measured on a continuous basis. This drawdown information was analyzed for each well using the Theis nonequilibrium type-curve method as described in Lohman (1972). This method involves the matching of the drawdown curve with a type curve, picking a match point, and calculating transmissivity and storage coefficient. The results of this method of analysis for observation well 12 are shown in Figure 10 to illustrate the method. Permeability was calculated by dividing the transmissivity by the thickness of the screened interval in the well (Table 3).

The logarithmic plots of time vs. drawdown for observation wells 9 and 12 and pumping well 11 exhibit slight irregularities between the early and late portions that may be due to geologic heterogenieties within the aquifer system.

Consequently, transmissivity, storage coefficient, and permeability were calculated for both the early and late data (Table 3). The traditional interpretation is that the early data represent conditions close to the pumping well, and the late data represent conditions over a larger volume of aquifer.

The drawdown curves for observation wells 9 and 12 and pumping well 11 were also analyzed for transmissivity by the Jacob straight-line method, as described in Lohman (1972), as a check against the Theis nonequilibrium type-curve results. The results of the application of the Jacob method to the data from observation well 12 are shown in Figure 11.

The results of the two methods are in reasonable agreement for the analysis of the late data. The storage coefficient ranges from a high of $1.9 \times 10^{-3}$ for the early data in well 12, to $8 \times 10^{-5}$ for the late data in well 9. As mentioned previously, early data represent conditions near the pumping well and late data conditions far from the pumping well. Low storage coefficients such as $8 \times 10^{-5}$ normally indicate confined ground-water conditions and values in the range as high as $1.9 \times 10^{-3}$ approach unconfined or water-table conditions. Therefore, it is our conclusion that the ground-water system is probably semi-confined near the pumping well and confined away from the pumping well. Confinement is most likely caused by the silty and sandy clay layers in the top portion of the upper 30 feet of alluvium which separates the sand and gravel layers from the ground surface (Figure 3).

The permeability values range from 24 feet per day for the early data in well 12 to 78 feet per day for the late data in well 9. Because the early data are most representative of the geologic conditions near the wells, conditions which are known from the well logs, we believe the early results are more reliable. Therefore, the average of the three early

permeability values of 28 feet per day is chosen as most likely to represent the permeability of the gravel layer penetrated by wells 11 and 12. This is the most permeable unit encountered in the monitoring wells drilled on and near the property.

The slug tests were performed in wells 10 and 13 by introducing a five-gallon volume of water instantaneously into the well and measuring the water level in the well continually as the "slug" of water flows outward through the well screen. The slug test data was analyzed by the Hvorslev (1951) method.

The two slug tests were performed in the finer-grained portion of the alluvium encountered by the monitoring wells. The resulting permeability values of 1.1 feet per day in well 13 and 0.25 feet per day in well 10 are much lower than the values for the sand and gravel layer discussed above.

The aquifer coefficients can be summarized as follows:

| Subsurface Material | Storage Coefficient | Permeability (ft/day) |
|---|---|---|
| Sand and gravel | $6 \times 10^{-4}$ to $8 \times 10^{-5}$ | 28* |
| Silty clay and gravelly clay | cannot be calculated | 1.1 |
| Clayey silt and sand and sandy clay | cannot be calculated | .25 |

These values show that the sand and gravel layer is approximately 25 times more permeable than the next most permeable unit tested.

*average of the 3 early values in Table 3.

## Chemical Quality

The five monitoring wells drilled during this investigation were sampled for chromium, pH, and specific conductance. Well 11 was sampled periodically during the 8-hour pump test to identify changes in chromium content with time during the test. The results of these chemical analyses are shown in Table 4.

Over the 8-hour pumping period, the hexavalent chromium content increased from 90 to 134 milligrams per liter and the pH gradually increased from 4.3 to 4.7. These low pH values are perhaps the most unusual characteristic of the water pumped from well 11, because they are well within the acid range. In contrast, the pH in well 12, which is located only 8 feet from the pumping well and screened in the same gravel layer, had a pH of 9.2 well within the basic range. This suggests either that the ground water has unusual chemistry or that chemical reactions took place in sample bottle to change the pH between the times of sampling and analysis. The chemical changes could occur because the water came in contact with the atmosphere or because of a change in pressure at the time of sampling. A slight precipitate developed in the sample bottles just after sampling.

## Calculated Rate of Movement

The rate of movement of ground water beneath the subject site can be calculated by the following formula:

$$V_e = \frac{KI}{n_e}$$

where

$V_e$ = effective velocity
$K$ = permeability
$I$ = hydraulic gradient
$n_e$ = effective porosity

Three values for permeability of the alluvium have been determined from field tests and are listed in the previous section entitled Aquifer Coefficients. The regional hydraulic gradient established from the contours in Figure 9 is .006, and the assumed value for porosity of 25% for sand and gravel and the finer-grained layers are reasonable estimates. The hydraulic gradient in the sand and gravel layer appears to be approximately .003 based on water level elevations in wells 3B, 11 and 12 (Table 1). The calculation of velocity for the three permeability cases (designated as I through III) are given below.

| Case | Permeability (ft/day) | Hydraulic Gradient | Assumed Effective Porosity | Effective Velocity (ft/day) | Effective Velocity (ft/year) |
|---|---|---|---|---|---|
| I | 28.0 | .003 | .25 | .34 | 123.0 |
| II | 1.1 | .006 | .25 | .026 | 10.0 |
| III | .25 | .006 | .25 | .006 | 2.0 |

From the above simple calculations, it is clear that the rate of movement of chromium-contaminated ground water is dependent most directly on the permeability of the alluvial sediments and the hydraulic gradient. If the sand and gravel layer is continuous within the finer-grained sediments, then the rate of movement is dependent on the hydraulic gradient and permeability of the gravel. In contrast, if the gravel layer identified in wells 11 and 12 is a discontinuous lens within

the finer-grained sediments, then the rate of movement is largely dependent on the permeability and hydraulic gradient of these finer-grained sediments. The boring logs on site show the geologic conditions to be complicated; therefore, without additional borings it is not possible to identify which of these two conditions is present beyond the site. Further discussion of these two conditions is given below.

## DISCUSSION OF RESULTS

To a depth of approximately 30 feet beneath the site ground water is contaminated by chromium from a source or sources as yet unidentified. The high levels of chromium in the shallow wells 5 and 13 and the lower, though significant, levels of chromium in wells 11 and 12, which tap the gravel layer, suggest two separate sources of chromium contamination.

The direction of ground-water movement in the study area is westerly. Therefore, the chromium-contaminated ground water will tend to move in that direction. If the movement of ground water in the sand and gravel layer was as rapid as that calculated above (123 feet per year), the zone of contaminated ground water would have moved down gradient to the west past wells 11 and 12. The chromium content of well 3B (Figure 7) is approximately 0.17 milligrams per liter, which suggests that the near-surface alluvium at that point is not transmitting chromium downward to the sand and gravel layer beneath it. The source of this contamination would appear to be either the shallow disposal well, a highly contaminated area of soil beneath or near the chromium waste storage pit, or another unknown source entering the sand and gravel layer. Whether the sand and gravel layer is a lens within the finer-grained silty clay layers can be tested by accurately determining the hydraulic gradient in the layer. The actual rate of movement is most likely to be less than the Case I

condition and more likely to lie somewhere between the Case I and III conditions.

There are three major indications that the chromium contamination is isolated above a depth of 30 feet by the blue silty clay layer that underlies the sand and gravel layer. First, the chromium content and pH of well 3A, the deepest of the monitoring wells, suggest that contamination has not reached the level of the screened interval of this well (Figure 7). Second, the water level in well 3A is lower than that of any of the others monitoring wells (Table 1). Third, the water level in well 3A rose during the pumping test while the water levels in other wells declined (Table 2). This latter behavior is the characteristic response of a confined aquifer that is isolated from an overlying pumped aquifer.

The general feasibility of pump withdrawal of the chromium-contaminated ground water has been demonstrated by the results of the eight-hour pump test. Drawdown occurred throughout the upper 30 feet of alluvium - in both the coarser-grained sand and gravel layers and in the less permeable silty and clayey layers. Furthermore, the cone of depression due to pumping extended to all of the monitoring wells except for those (wells 6 and 7) farthest from the pumping well.

## SUMMARY AND CONCLUSIONS

1. The subject site is underlain by alluvium composed of an upper unit and a lower unit. The former consists of layers of gravel, sand, silt and clay with a prominent sand and gravel layer near the base. The lower unit contains a finer-grained silty clay with one prominent blue silty clay layer that appears to correlate with boring logs 2,000 feet further north.

2. Ground water beneath the site to a depth of approximately 30 feet is contaminated by chromium from a source or sources as yet unidentified.

3. On the basis of both the 8-hour pump test and the slug tests, the sand and gravel layer is approximately 25 times more permeable than the next most permeable unit tested.

4. During the pumping test, the hexavalent chromium content in well 11 increased from 90 to 134 milligrams per liter and the pH gradually increased from 4.3 to 4.7. However, these pH values were not consistent with those measured in other monitoring wells.

5. Chromium-contaminated ground water exists in significant volume within the sand and gravel layer. The true rate of movement of contaminated ground water in the vicinity of the subject site is most likely less than 123 feet per year (Case I conditions) and more likely to lie somewhere between 2 feet per year (Case III conditions) and 123 feet per year.

6. The rate and direction of movement of contaminated ground water beyond the vicinity of the subject site depend in part on whether the sand and gravel layer is continuous within the finer-grained sediments, or whether the sand and gravel layer is a lens within the finer-grained sediments. Without additional borings, it is impossible to identify which of these two conditions are present beyond the site.

7. Pumping of well 11, which taps the sand and gravel layers near the bottom of the upper 30 feet of alluvium, caused measurable drawdown in all the monitoring wells except wells 6 and 7 which are located farther from the pumping well.

8. The results of this study indicate the general feasibility of a pump withdrawal scheme for removal of chromium-contaminated ground water present in the coarser-grained units beneath the site.

RECOMMENDATIONS

1. Investigate the peculiar chemistry of ground water pumped from well 11 by conducting complete chemical analyses of ground water from the 5 monitoring wells completed in Phase I. These should include standard minerals, heavy metals, organics, field pH and specific conductance.

2. Precisely measure the elevation of the water levels in 3 wells which tap the sand and gravel layer to determine the actual hydraulic gradient.

3. Drill additional monitoring wells down gradient and west of the site to better define the extent of chromium contamination in the ground water.

4. Obtain complete chemical analyses (the suite recommended in 1 above) of ground water collected from the new monitoring wells recommended in 3 above.

5. Analyze chromium content of the soil above the ground-water level in areas suspected of having high concentrations.

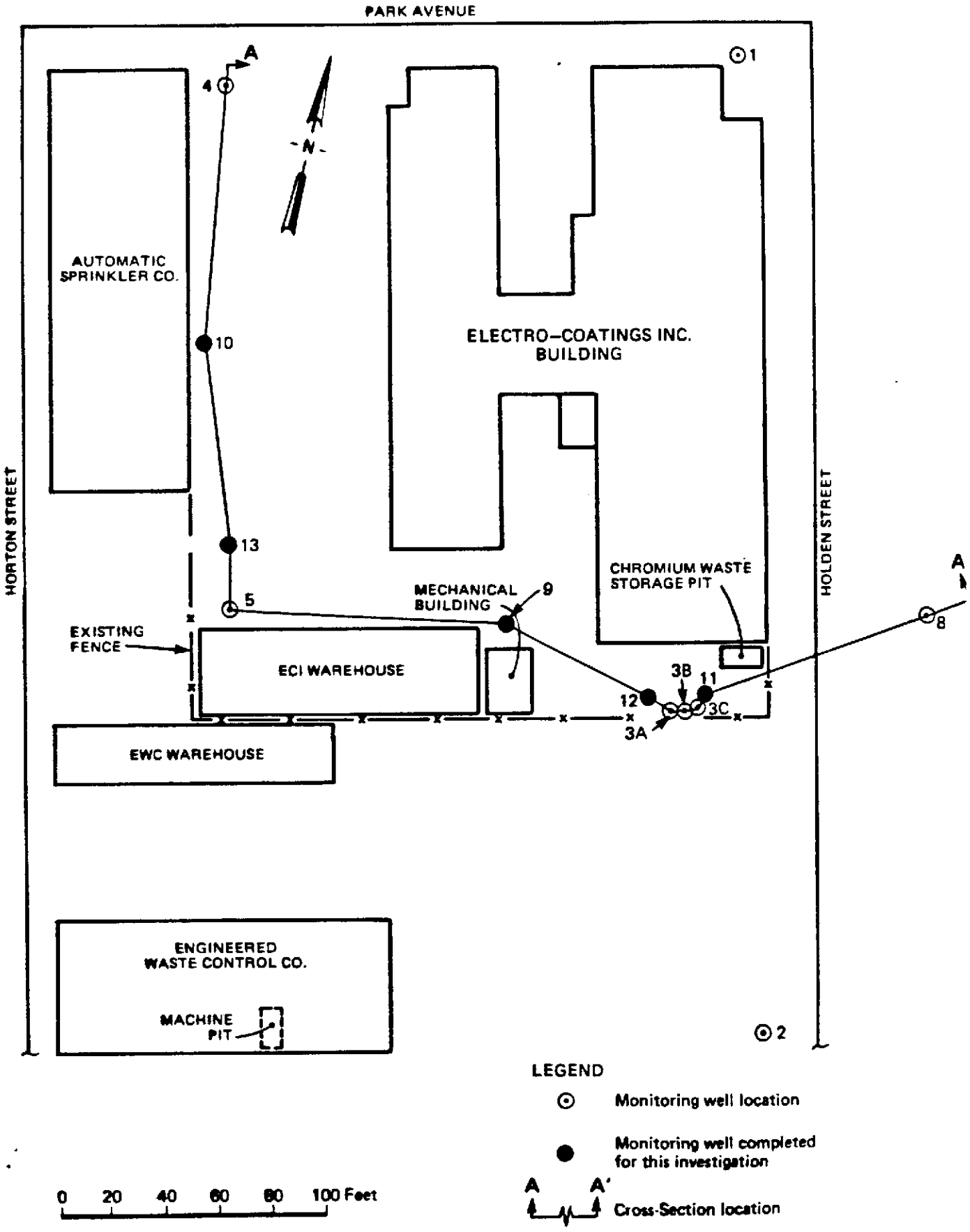
6. Estimate the volume of chromium contaminated ground water present at the site.

# REFERENCES

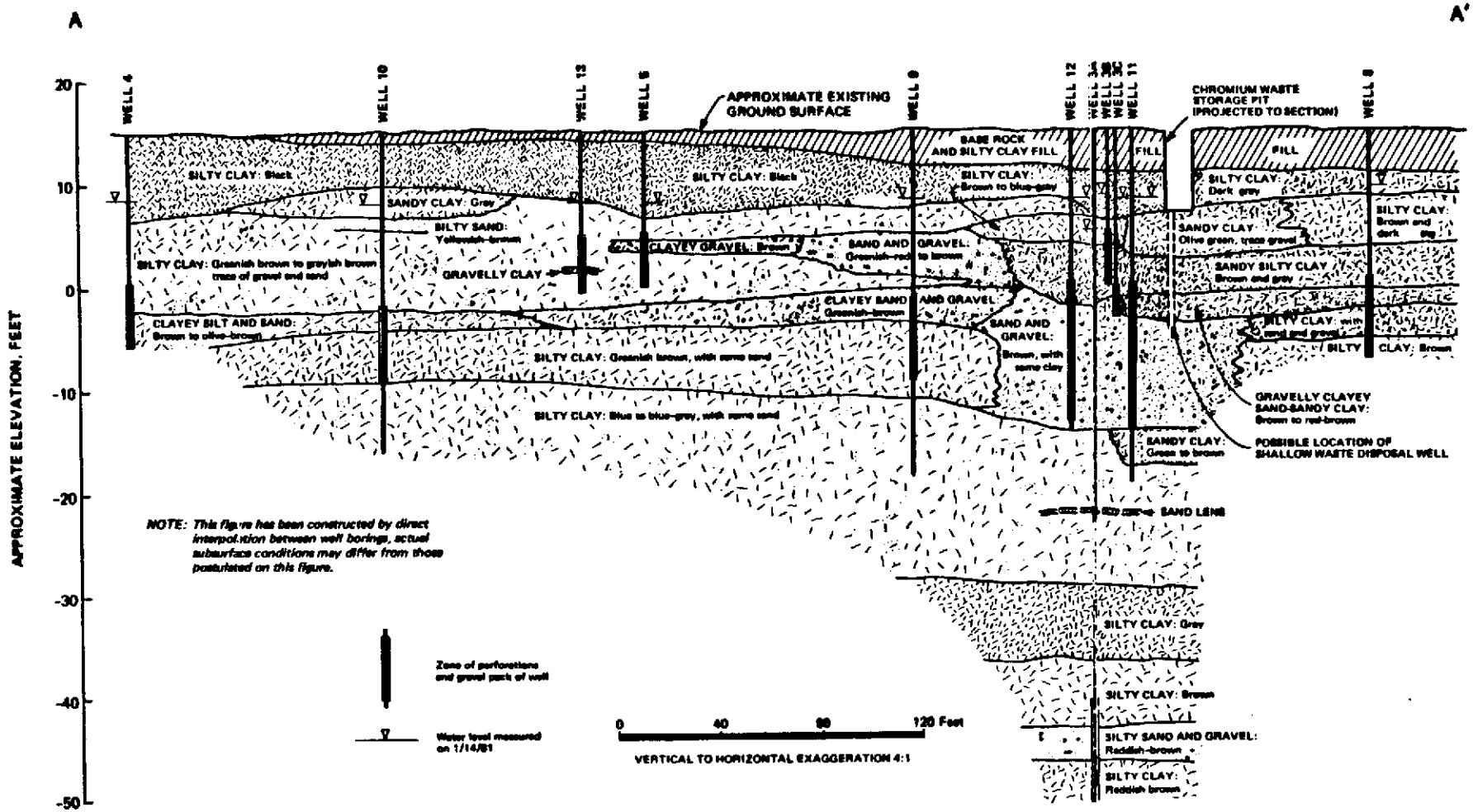
Hvorslev, M. J., 1951, "Time Lag and Soil Permeability Groundwater Observations," Waterways Experiment Station Bulletin No. 36, Vicksburg, Miss.

Lohman, S. W., 1972, "Ground-Water Hydraulics," U.S.G.S. Prof. Paper No. 708.

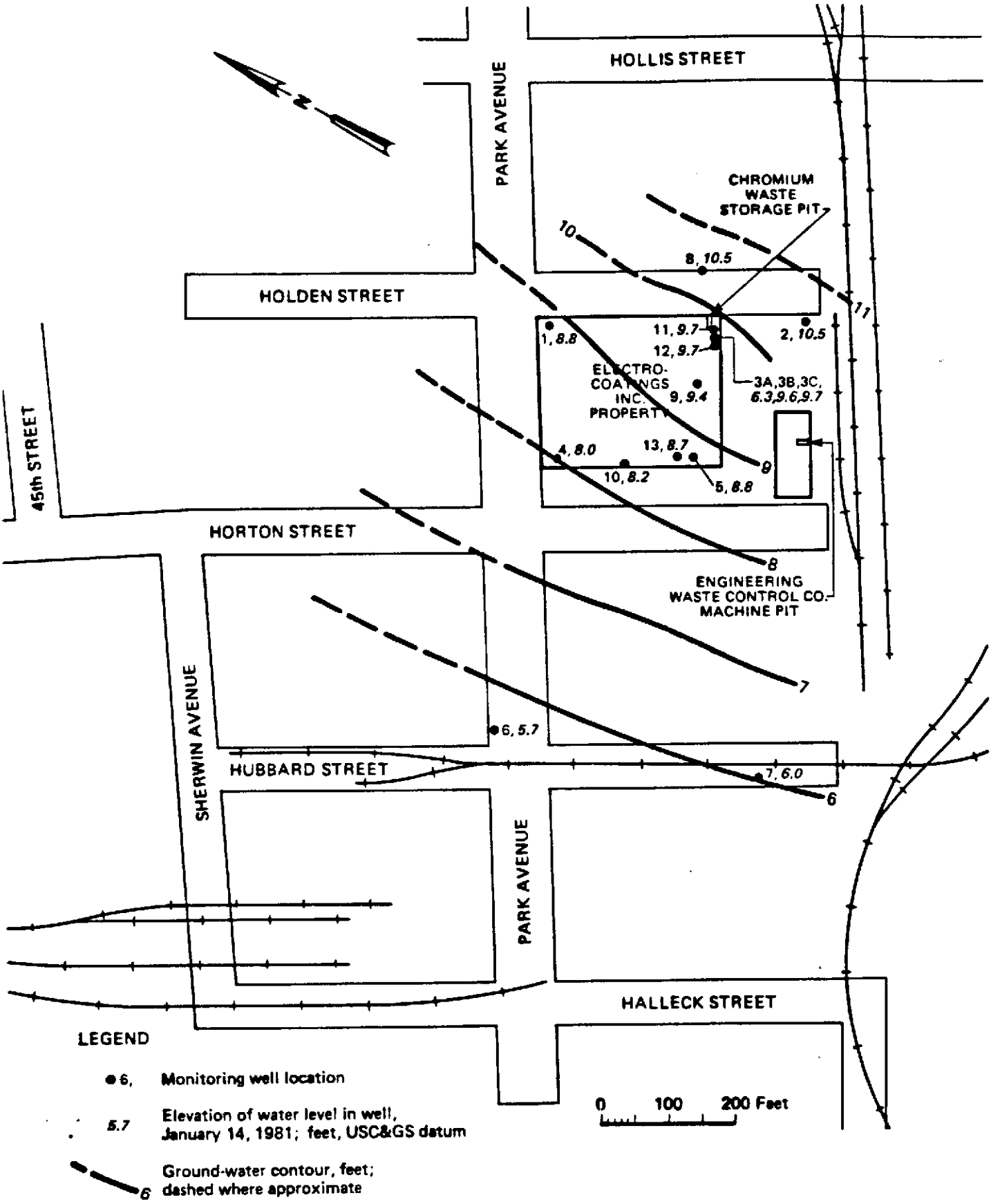
Woodward-Clyde Consultants, 1977, "Report of Findings Data Study Regarding Subsurface Soil and Ground Water Conditions, Electro Coatings, Inc.," unpublished report dated July 22.



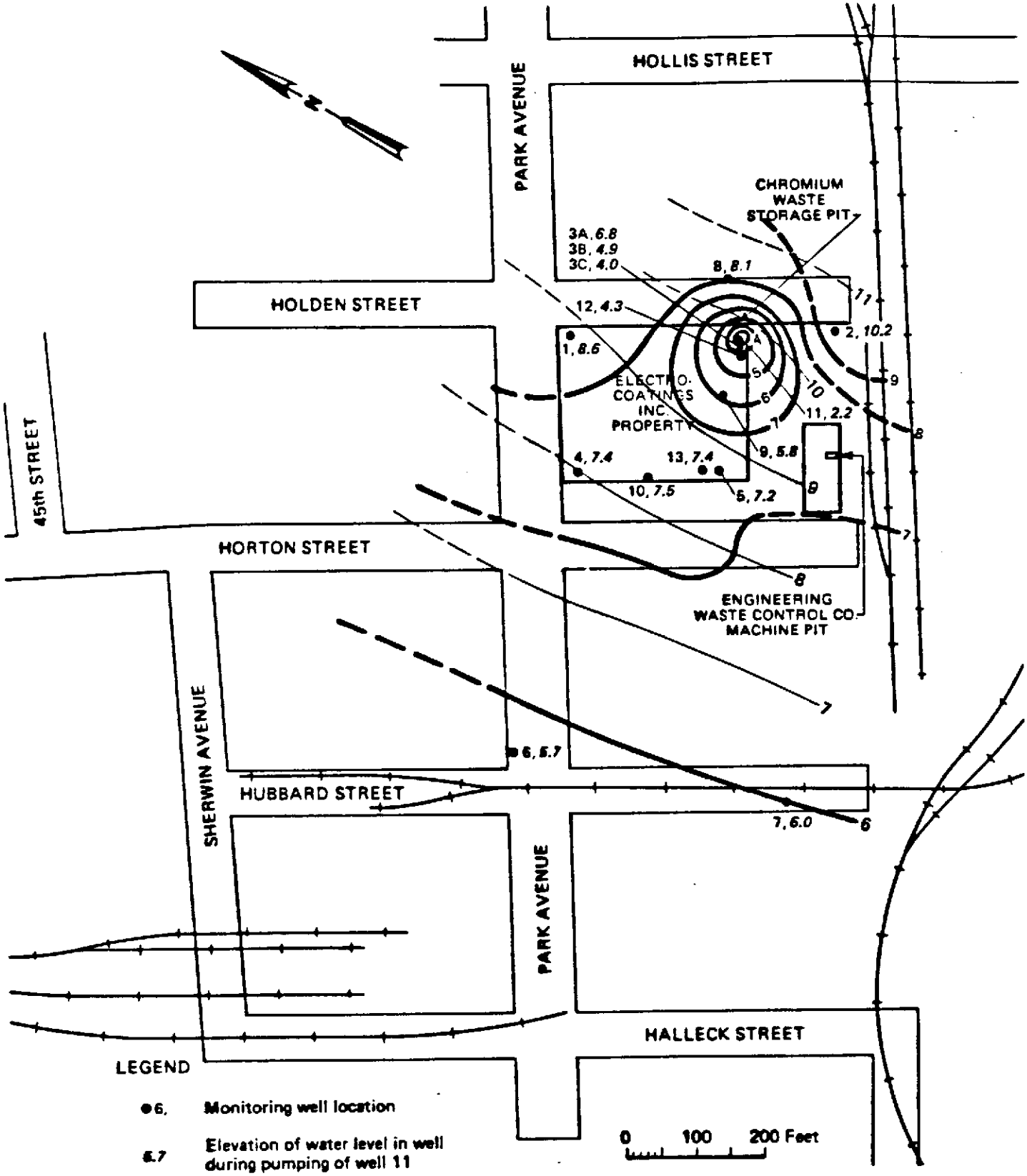

| Project No. 14929A | ELECTRO-COATINGS INC. Emeryville, California | SITE & MONITORING WELL LOCATIONS | Figure 1 |
|---|---|---|---|
| Woodward-Clyde Consultants | | | |



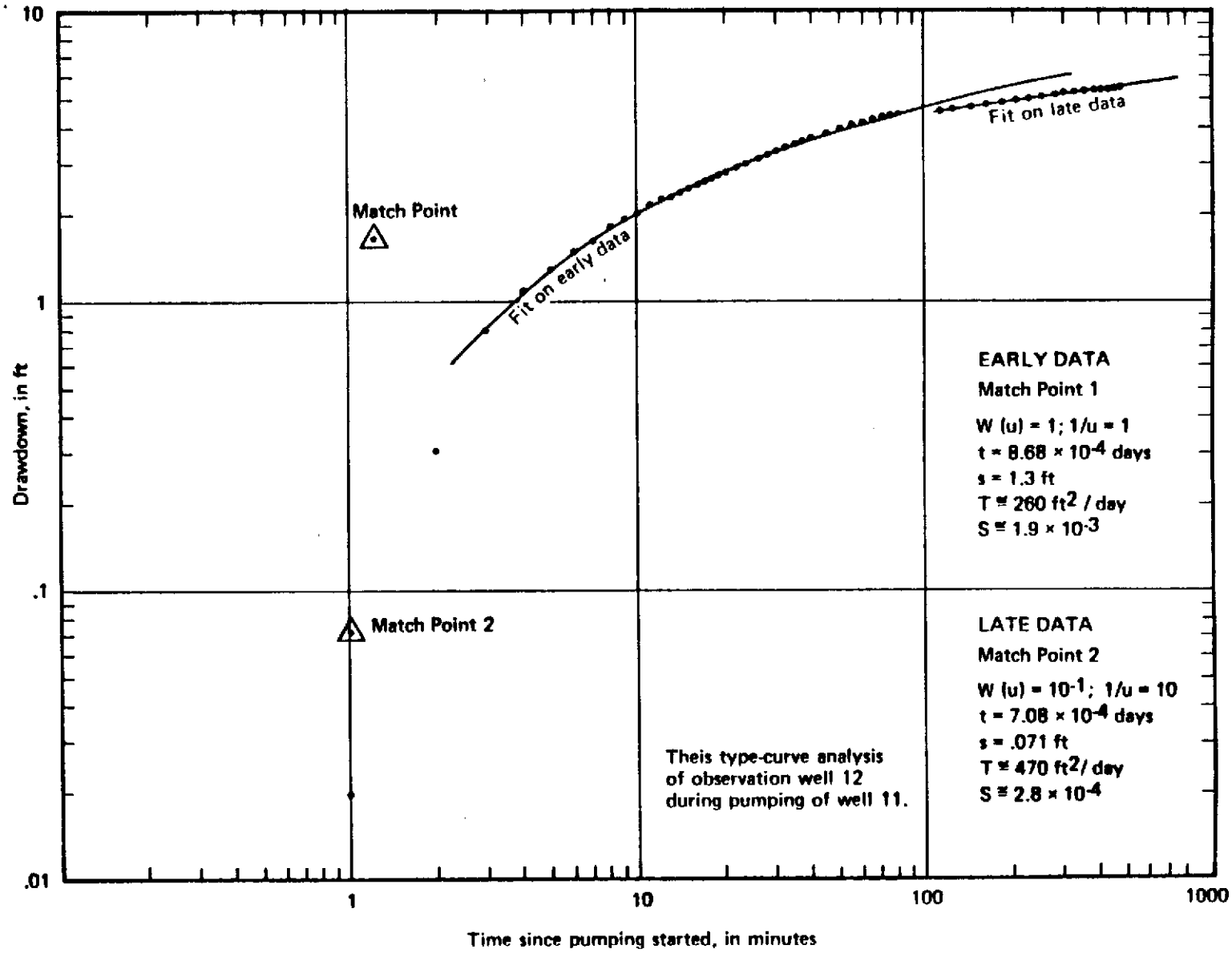

| Project No. 14928A | ELECTRO COATINGS INC. Emeryville, California | GENERALIZED SOIL PROFILE SECTION A - A' | Figure 7 |
|---|---|---|---|
| Woodward-Clyde Consultants | | | |




| Project No. 14929A | ELECTRO-COATING INC. Emeryville, California | GROUND-WATER LEVEL | Figure 8 |
|---|---|---|---|
| Woodward-Clyde Consultants | | | |




| Project No. 14929A | ELECTRO-COATINGS INC. Emeryville, California | GROUND-WATER LEVEL DURING PUMPING OF WELL 11 | Figure 9 |
|---|---|---|---|
| Woodward-Clyde Consultants | | | |

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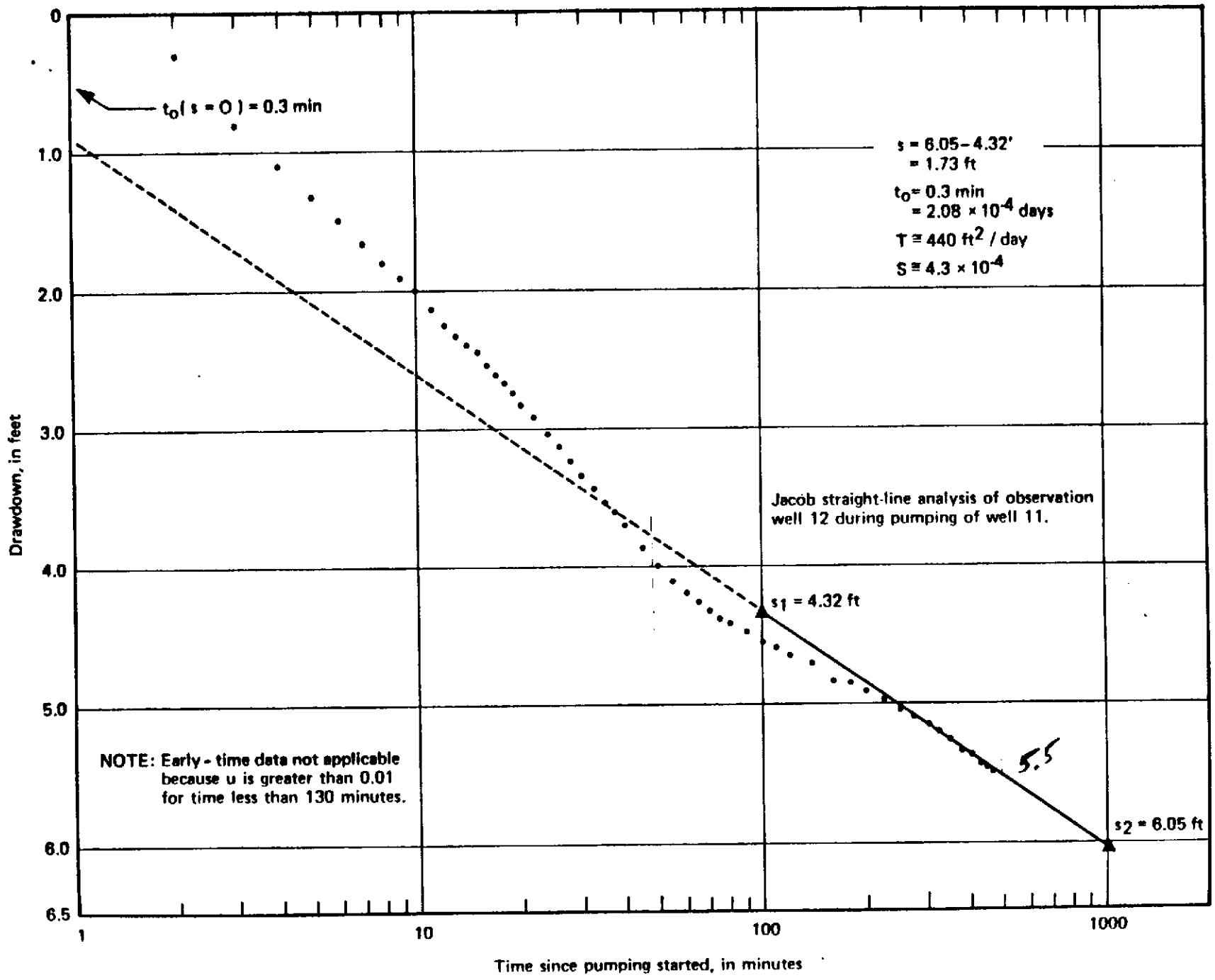
LOGARITHMITIC PLOT OF TIME VS. DRAWDOWN, OBSERVATION WELL 12

Figure 10

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SEMILOGARITHMITIC PLOT OF TIME VS. DRAWDOWN, OBSERVATION WELL 12

Figure 11

TABLE 1
GROUND-WATER LEVELS

| Well Number | Reference-Point Elevation[1] (feet) | Depth to Water[2] (feet) | Water-Level Elevation (feet) |
|---|---|---|---|
| 1 | 15.78 | 7.02 | 8.76 |
| 2 | 16.67 | 6.13 | 10.54 |
| 3A | 16.10 | 9.80 | 6.30 |
| 3B | 15.63 | 6.04 | 9.59 |
| 3C | 16.31 | 6.63 | 9.68 |
| 4 | 14.29 | 6.37 | 7.92 |
| 5 | 15.87 | 7.08 | 8.79 |
| 6 | 9,24 | 3.56 | 5.68 |
| 7 | 9.71 | 3.73 | 5.98 |
| 8 | 15.63 | 5.09 | 10.54 |
| 9 | 16.08 | 6.70 | 9.38 |
| 10 | 15.10 | 6.86 | 8.24 |
| 11 | 16.04 | 6.32 | 9.72 |
| 12 | 16.05 | 6.39 | 9.66 |
| 13 | 15.36 | 6.64 | 8.72 |

[1]Reference point is top of casing. Surveyed elevations by T.V. Tronoff Civil Engineer and Surveyor, Inc.; USC&GS datum

[2]Measured on January 14, 1981

TABLE 2
PUMP-TEST DRAWDOWN

| Well Number | Depth To Water Before Test (Feet) | Depth To Water Near End of Test[1] (Feet) | Water Level Elevation Near End of Test (Feet) | Drawdown (Feet) |
|---|---|---|---|---|
| 1 | 7.02 | 7.16 | 8.62 | 0.14 |
| 2 | 6.13 | 6.51 | 10.16 | 0.38 |
| 3A | 9.80 | 9.32 | 6.78 | +0.48[2] |
| 3B | 6.04 | 10.73 | 4.90 | 4.69 |
| 3C | 6.63 | 12.34 | 3.97 | 5.71 |
| 4 | 6.37 | 6.88 | 7.41 | 0.51 |
| 5 | 7.08 | 8.63 | 7.24 | 1.55 |
| 6 | 3.56 | 3.57 | 5.67 | none |
| 7 | 3.73 | 3.70 | 6.01 | none |
| 8 | 5.09 | 7.57 | 8.06 | 2.48 |
| 9 | 6.70 | 10.29 | 5.79 | 3.59 |
| 10 | 6.86 | 7.65 | 7.45 | 0.79 |
| 11[3] | 6.32 | 13.78 | 2.26 | 7.46[3] |
| 12 | 6.39 | 11.77 | 4.28 | 5.38 |
| 13 | 6.64 | 8.00 | 7.36 | 1.36 |

[1]Pumping ceased at 1716 hours on January 14, 1981

[2]Rise rather than drawdown

[3]Pumping well

TABLE 1 -- AQUIFER TEST RESULTS

| Well No. | Depth (ft.) | Screened Interval Thickness (ft.) | Lithology | Test Method | Aquifer Coefficients: Transmissivity ($ft^2$/day) | Storage Coeff. | Permeability (ft/day) | Analysis Method | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 3C | 20 | 3 | upper portion: silty clay<br>lower portion: sand and gravel | pump test of #11 (obs. well) | | | | none used | Not analyzed due to minimal penetration of aquifers; drawdown was observed. |
| 9 | 34 | 8 | upper portion: clayey sand and gravel<br>lower portion: silty clay | pump test of #11 (obs. well) | 260* | $6.3 \times 10^{-4}$* | 33* | Theis type-curve | Significant change in time-drawdown slope after 100 min. |
| | | | | | 620** | $8 \times 10^{-5}$** | 78** | Theis type-curve | |
| | | | | | 460** | $8.3 \times 10^{-5}$** | 58** | Jacob str.-line | |
| 10 | 31 | 7 | upper portion: clayey silt and sand<br>lower portion: silty clay | slug test | | | 0.25 | Hvorslev | Technique assumed unconfined conditions; confined curves did not fit. |
| 11 | 34 | 10 | extreme upper portion: silty clay, clayey sand-sandy clay<br>major portion: sand and gravel<br>extreme lower portion: sandy clay | pump test of #11 (pumping well) | 280* | | 28* | Theis type-curve | Discontinuity in time-drawdown data, with later return (100 min.) to original time-drawdown slope. |
| | | | | | 310** | | 31** | Theis type-curve | |
| | | | | | 400** | | 40** | Jacob str.-line | |
| 12 | 28 | 11 | major portion: sand and gravel<br>extreme upper portion: silty clay | pump test of #11 (obs. well) | 260* | $1.9 \times 10^{-3}$* | 24* | Theis type-curve | Discontinuity in time-drawdown data similar to that in well 9. |
| | | | | | 470** | $2.8 \times 10^{-4}$** | 43** | Theis type-curve | |
| | | | | | 440** | $4.3 \times 10^{-4}$** | 40** | Jacob str.-line | |
| 13 | 15 | 5.5 | upper portion: clayey silt and sand<br>major portion: silty clay; thin gravelly clay. | slug test | | | 1.1 | Hvorslev | |

* - These aquifer coefficients were calculated using time-drawdown data from approximately the first 100 minutes of the 8-hr pump test.

** - These aquifer coefficients were calculated using time-drawdown data from after approximately the first 100 minutes of the 8-hr pump test.

TABLE 4

GROUND-WATER ANALYSES[1]

| | Well Number | Date and Time Sampled | Temp °C | pH | Specific Conductance mhos/cm at 20°C | Hexavalent Chromium mg/l | Trivalent Chromium[3] mg/l | Total Chromium mg/l |
|---|---|---|---|---|---|---|---|---|
| WH8 | 11[2] | 1/14/81:1030 | 19 | 4.3 | 1620 | 90 | 8 | 98 |
| | 11[2] | 1/14/81:1130 | 20 | 4.4 | 1620 | 98 | 29 | 127 |
| | 11[2] | 1/14/81:1230 | 20 | 4.5 | 1600 | 120 | 17 | 137 |
| | 11[2] | 1/14/81:1330 | 20 | 4.5 | 1590 | 124 | 21 | 145 |
| | 11[2] | 1/14/81:1430 | 19.5 | 4.6 | 1570 | 101 | 15 | 116 |
| | 11[2] | 1/14/81:1530 | 19.5 | 4.6 | 1570 | 122 | 0 | 122 |
| | 11[2] | 1/14/81:1630 | -- | 4.6 | 1610 | 135 | 19 | 154 |
| | 11[2] | 1/14/81:1700 | -- | 4.7 | 1590 | 134 | 0 | 134 |
| WH6 | 9 | 1/15/81 | -- | 9.8 | 1330 | 185 | 73 | 258 |
| WH7 | 10 | 1/15/81 | -- | 10.2 | 590 | 14 | 3 | 17 |
| WH9 | 12 | 1/15/81 | -- | 9.2 | 880 | 12 | 20 | 32 |
| WH10 | 13 | 1/15/81 | -- | 6.5 | 1880 | 325 | 56 | 381 |

[1]Chemical analyses by Ultrachem Corporation

[2]Sample collected during period of continuous pumping of well 11 from 0930 to 1716 hours on 1/14/81.

[3]Calculated as the difference between total and hexavalent chromium.