HARTCROWSER

Earth and Environmental Technologies

Hart Crowser, Inc.
353 Sacramento Street Suite 1140
San Francisco, California 94111
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April 23, 1990

Mr. Gil Wistar
Alameda County Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

RE: Shell Service Station
4226 First Street
Pleasanton, California J-6006

Dear Mr. Wistar:

Enclosed is a copy of a Hart Crowser Supplemental Site Assessment Report for the above-referenced site. The purpose of this investigation was to further assess the presence of petroleum hydrocarbons in the soil and abandon an existing dry monitoring well. We drilled three shallow soil borings onsite. The report includes a summary of our procedures and findings for this investigation.

If you should have any questions or comments regarding this report, please do not hesitate to contact me.

Respectfully submitted,

HART CROWSER, INC.

Eric Schniewind
Senior Staff Hydrogeologist

Enc.

cc: Tom Callaghan, Regional Water Quality Control Board

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Earth and Environmental Technologies

REPORT OF

SUPPLEMENTAL SITE ASSESSMENT

SHELL SERVICE STATION

4226 FIRST STREET

PLEASANTON, CALIFORNIA

J-6006

HART CROWSER, INC.
APRIL 23, 1990

353 Sacramento Street Suite 1140 San Francisco, California 94111 415.391.2216 FAX 415.391.1885

REPORT OF
SUPPLEMENTAL SITE ASSESSMENT

SHELL SERVICE STATION
4226 First Street
Pleasanton, California

J-6006

Prepared for:

Shell Oil Company
511 N. Brookhurst Street
P.O. Box 4848
Anaheim, California 92803

Submitted by:

Hart Crowser, Inc.
353 Sacramento Street, Suite 1140
San Francisco, CA 94111

Ken Pill
Staff Hydrogeologist

P. Kent Aue, C.E.G.
Senior Project Hydrogeologist

TABLE OF CONTENTS

1.0 EXCUTIVE SUMMARY

A supplemental site assessment was performed by Hart Crowser, Inc., at the Shell service station located at 4226 First Street in Pleasanton, California during March, 1990. Previous work by other consultants at the site included five soil borings, replacement of five tanks and the installation of one shallow groundwater monitoring well. Previous assessments at this site reported a total petroleum hydrocarbon (TPH) concentration of 1,300 parts per million (ppm) at a depth of approximately 15 feet below ground surface (BGS) in the area of the former tank pit.

Hart Crowser, Inc., drilled three soil borings and abandoned the existing dry groundwater monitoring well. Selected soil samples were analyzed for TPH with benzene, toluene, ethylbenzene and xylene (BTEX) distinction. TPH concentrations ranged from nondetected to 18 parts per million (ppm) in samples collected from the three soil borings. Soil samples collected below the abandoned monitoring well contained TPH concentrations ranging from nondetectable to 380 ppm in the samples analyzed. The highest concentrations of TPH were detected in soil samples collected beneath the existing well at depths of 30 and 35 feet BGS. Detectable BTEX concentrations were associated with these two samples.

Based on our findings, we recommend two additional shallow soil borings to define the lateral extent of petroleum hydrocarbons in the subsurface soil.

S-1

2.0 INTRODUCTION

This report presents the results of a supplemental site assessment completed by Hart Crowser, Inc., at the Shell service station located at 4226 First Street in Pleasanton, California during March, 1990. A site location map is provided in Figure 1. The purpose of this assessment was to further delineate the potential extent of petroleum hydrocarbons in soil at the site and to abandon an existing dry groundwater monitoring well.

3.0 SITE HISTORY

Five underground storage tanks were originally installed at this site (one 1,550 gallon waste oil tank, two 8,000 gallon gasoline tanks and two 5,000 gallon gasoline tanks). In September, 1985, EMCON Associates drilled five borings in the proximity of these tanks prior to their removal as part of an initial soil and groundwater assessment (Figure 2). The total depth of these borings ranged from 20 to 28 feet below ground surface (BGS). Seven of the collected soil samples were analyzed for total petroleum hydrocarbons (TPH) with benzene, toluene, ethylbenzene and xylene (BTEX) distinction by EPA Methods 8015 and 5030.

Samples analyzed from boring S-B contained TPH concentrations which ranged from 2 to 1,300 parts per million (ppm) at depths from 4 to 15 feet BGS. Detectable levels of toluene, ethyl benzene and xylene were associated with these samples. Borings S-A, S-C and S-D did not contain detectable TPH concentrations. Benzene was not reported in any of the samples collected from these borings.

A fifth boring, S-1, drilled by EMCON to a total depth of 28 feet BGS in the assumed downgradient direction from the tanks, was converted to a groundwater monitoring well. There is no information available to indicate that groundwater has ever been present in this well.

In March, 1986, EMCON drilled one additional boring (S-E). This boring was intended to evaluate soil conditions adjacent to the underground product lines on site. No TPH or BTXE compounds were detected in the three soil samples (collected at depths of 5.5, 10.5, and 15.5 feet BGS) from this boring.

The five existing tanks were removed in May, 1986. During removal, Blaine Technologies collected nine soil samples from the excavation pits (one from beneath both ends of each tank, as well as one from beneath the waste oil tank) . Eight of the samples were analyzed for TPH in the gasoline range (EPA Method

8015). A waste oil analysis (EPA Method 3510) was completed on the remaining sample.

Reported concentrations of TPH ranged from non-detected to 240 ppm for the samples collected from the fuel tank excavation. No waste oil was detected in the sample from the waste oil pit. The fuel tank excavation was backfilled once the tanks were removed.

In 1986, three ten thousand gallon double-walled fiberglass tanks were installed at a different location onsite, directly in front of the station building. A new waste oil tank was installed in the same location as the original waste oil tank.

which pump islands?

Approximately 40 gallons of gasoline were spilled onsite on August 12, 1988. This surface spill occurred in the area of the pump islands. The station manager promptly contacted Central Petroleum to clean up the spill. Soil was removed from the spill area to a depth of one to two feet BGS. No samples were collected for laboratory analysis from this area.

4.0 OBJECTIVE AND SCOPE OF WORK

The objective of this supplemental assessment was to further evaluate the nature and extent of petroleum hydrocarbons in the subsurface soil. Prior investigations at this site did not fully characterize or delineate the extent of petroleum hydrocarbons in the soil.

The scope of work completed for this assessment includes the following:

- Drilling three borings with a hollow stem auger rig;
- Collecting soil samples at five foot intervals from these borings;
- Abandoning the existing groundwater monitoring well;
- Laboratory analysis of the soil samples; and
- Preparation of a report of the assessment.

5.0 SITE DESCRIPTION

This station is located at the southwest corner of First Street and Vineyard Avenue in Pleasanton, California. The site is at an approximate elevation of 370 feet above mean sea level (National Geodetic Vertical Datum of 1929). There is a gentle northeasterly slope onsite. The surface is covered with asphalt except in the vicinity of the underground tanks and pumping islands, which is covered with concrete. There is one building (approximately 1800 square feet) used for automobile repairs. A towing company is also based at this facility, with a large number of cars parked around the site. A site plan is provided in Figure 2.

The closest surface water body is the Arroyo Valle River, located approximately one-quarter of a mile north of the site. This stream is considered an area of recharge for the Pleasanton Valley.

6.0 METHODS AND PROCEDURES

6.1 SOIL BORINGS

Hart Crowser drilled three soil borings with a truck-mounted drilling rig using eight-inch outside diameter hollow stem augers during March, 1990. The locations of these borings are shown in Figure 2. Boring SB-1 was drilled in the area where the original tanks were located, in order to evaluate present concentrations of hydrocarbons in this vicinity. The total depth of this boring was 50 feet. The other two borings, SB-2 and SB-3, were drilled at opposite ends of the pump islands, to a total depth of approximately 30 feet BGS.

Soil samples were collected at five-foot intervals using a California sampler with stainless steel liners. All downhole equipment was steam-

cleaned before beginning operations and between borings in order to reduce the potential for cross-contamination.

Each borehole was lithologically logged by the Hart Crowser geologist onsite using the Unified Soil Classification System. These logs provide a record of the subsurface materials encountered, hydrogeologic information and results of field screening of soil samples for volatile organic compounds. Logs of these borings are included in Appendix A of this report.

Soil collected in the bottom tube of the sampler was sealed with teflon tape, covered with tight fitting plastic caps and placed in refrigerated storage for possible lab analysis. Material from the middle tube was screened for volatile hydrocarbons using a HNu photoionization detector (PID). A description of standard field screening procedures is included in Appendix B of this report. Between sampling events, the sampler was thoroughly cleaned using an Alconox detergent, rinsed in distilled water, and equipped with three clean sampling tubes. Strict chain-of-custody procedures were followed throughout sample acquisition, storage and transport. Copies of chain-of-custody records are included in Appendix C of this report.

All borings were backfilled with crushed bentonite up to one foot BGS and completed to surface with cold-patch asphalt.

6.2 WELL ABANDONMENT

According to the Alameda County Flood Control District, groundwater in this area occurs 50 to 100 feet BGS. Consequently, the 30 foot deep monitoring well installed by EMCON in September, 1985, is at least 20 feet above the water table. There was no mention of the water level or

groundwater sampling associated with this well in any of the previous reports reviewed.

Well abandonment was completed using ten inch augers on a truck-mounted rig. The larger-sized auger allowed over-drilling the three-inch casing.

WA1 = 51 "well abandonment" 1

At a depth of approximately 15 feet BGS, soil cuttings from the well annulus were observed to have a strong hydrocarbon odor. Drilling continued down to a depth of 30 feet, at which point the intact casing was removed. Boring WA-1 was continued below the well to collect soil samples for laboratory analysis. Six undisturbed soil samples (WA-30 to WA-50) were collected at five-foot intervals in the interval from 30 to 51 feet BGS. Soils encountered between these depths were lithologically logged. A log of this boring is included in Appendix A. The boring was terminated at 51 feet because no petroleum hydrocarbons were detected in the two deepest samples (collected from 45 and 50 feet) during field screening.

Alameda County guidelines were followed during the well abandonment procedure. The boring was backfilled with neat cement from the bottom of the boring to the surface inside the original traffic box.

7.0 RESULTS OF ASSESSMENT

7.1 SOIL CHARACTERISTICS

Sandy gravel interpreted as fill extended from the surface to a depth of 15 feet BGS in the former tank area (SB-1). Elsewhere it averaged approximately one to two feet in thickness. Approximately nine to fifteen feet of interbedded silty sands, clayey silts and silty gravels were

encountered beneath the sandy gravel. Another sandy gravel unit was encountered in all borings between 15 and 25 feet BGS. This unit extended to a depth of approximately 45 feet in borings SB-1 and WA-1, where a consolidated sandy silt was encountered. No groundwater was encountered during this assessment (Appendix A).

7.2 LABORATORY ANALYSIS

A total of eleven soil samples (three from SB-1, two each from SB-2 and SB-3, and four from WA-1) were analyzed by Sequoia Analytical Laboratory. The samples were analyzed for TPH with BTEX distinction by EPA Methods 8015/8020. Laboratory results are listed in Table 1.

Soil samples from the three soil borings contained TPH concentrations ranging from nondetectable to 18 ppm. Soils collected from boring SB-1 had TPH concentrations of 4.2 and 18 ppm at depths of 15 and 35 feet, respectively. No detectable TPH was present at 50 feet. BTEX compounds were not detected in any samples from SB-1. The soil sample collected at 30 feet BGS from boring SB-2 contained 7.2 ppm TPH and 0.17 ppm toluene. No other analytes were present at detectable levels. No TPH or BTEX were reported in the remaining sample from SB-2 (from 15 feet BGS) or the samples analyzed from boring SB-3 (from depths of 10 and 30 feet).

Samples collected from boring WA-1 at depths of 30 and 35 feet were reported to contain TPH concentrations of 380 ppm and 290 ppm, respectively. These samples also contained elevated BTEX concentrations. No TPH or BTEX compounds were detected in samples collected from 40 and 50 feet BGS.

8.0 CONCLUSIONS

Based on the results of this assessment, it is concluded:

- The stratigraphy beneath the site is an irregularly layered sequence of sandy and clayey silt, silty sand and sandy gravel deposits. The former tank area and the pump islands contain some soil interpreted as fill;
- No groundwater was encountered during this assessment;
- No petroleum hydrocarbon odor was noted during the drilling of borings SB1, SB2 or SB3. **During the well abandonment (boring WA-1) a strong odor was detected from approximately 15 to 35 feet; and**
- No free phase hydrocarbon was present at any boring location. Some soil samples analyzed contain petroleum hydrocarbons at elevated levels. **The highest concentrations were detected in soils beneath the abandoned monitoring well.**

9.0 RECOMMENDATIONS

Based on the conclusions, the following recommendations are considered appropriate:

- Copies of this report should be forwarded to the Alameda County Health Department and the San Francisco Bay Regional Water Quality Control Board;
- Drill two additional shallow soil borings in the area of the abandoned well, to define the lateral extent of petroleum hydrocarbons in the subsurface soil.

10.0 LIMITATIONS

Work for this project was performed, and this technical report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It was prepared for Shell Oil Company for specific application to the Shell service station located at 4226 First Street in Pleasanton, California. It should be understood that the interpretations and recommendations contained in this report are based upon a limited evaluation of soils onsite, and that variations in onsite soil conditions may not be reflected in the results obtained from this limited assessment. This report is not intended to represent a legal opinion. No other warranty, express or implied, is made.

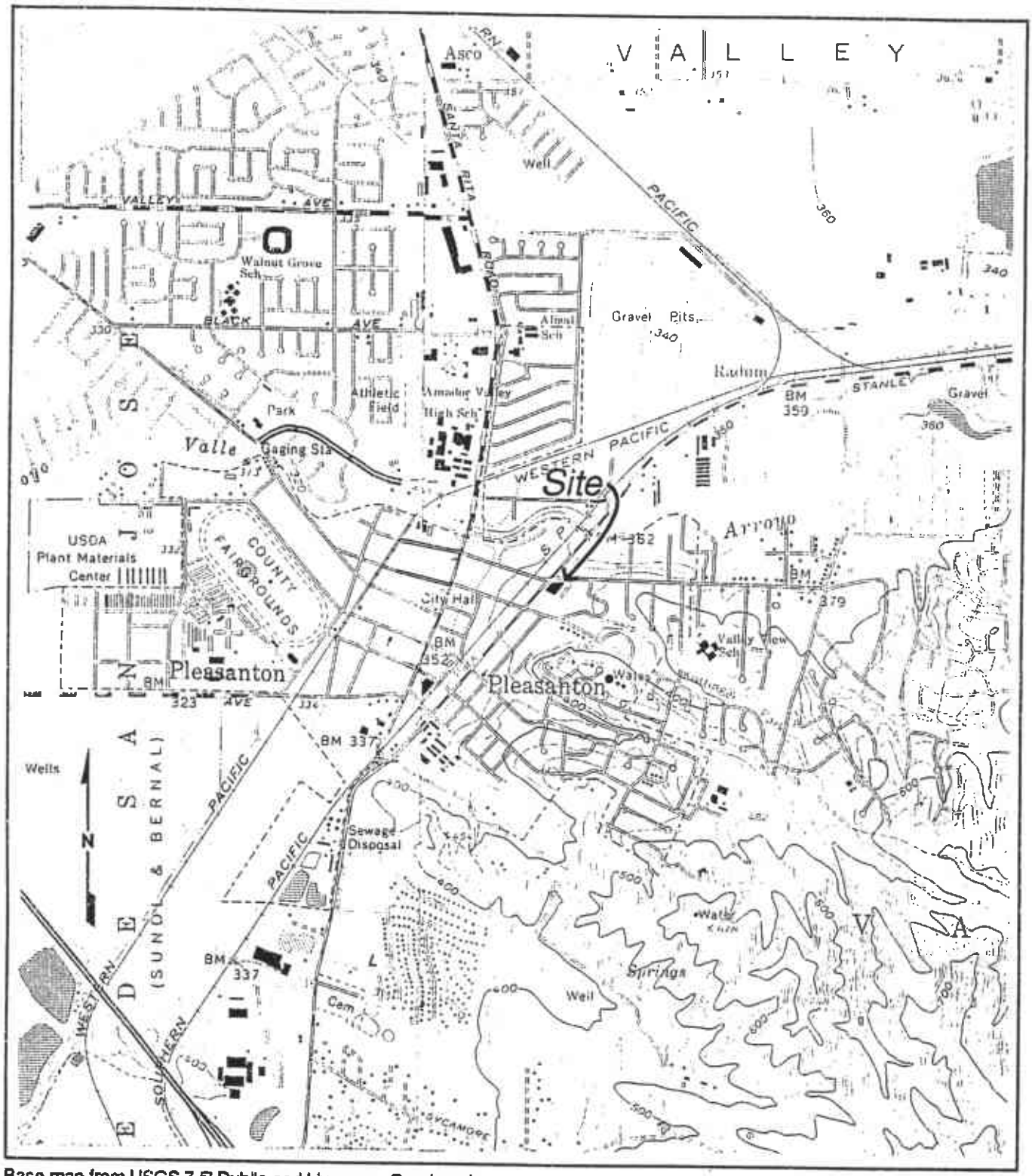
TABLE 1

CHEMICAL ANALYSIS OF SOIL SAMPLES
SHELL SERVICE STATION
4226 FIRST STREET
PLEASANTON, CALIFORNIA

Concentrations in mg/kg (parts per million)

Boring	Depth (ft)	TPH	Benzene	Toluene	Ethylbenzene	Xylene
SB-1	15	4.2	ND	ND	ND	ND
SB-1	35	18	ND	ND	ND	ND
SB-1	50	ND	ND	ND	ND	ND
SB-2	15	ND	ND	ND	ND	ND
SB-2	30	7.2	ND	0.17	ND	ND
SB-3	10	ND	ND	ND	ND	ND
SB-3	30	ND	ND	ND	ND	ND
WA-1	30	380	2.2	2.7	5.3	32
WA-1	35	290	1.8	0.35	0.24	1.5
WA-1	40	ND	ND	ND	ND	ND
WA-1	50	ND	ND	ND	ND	ND
Detection Limits:		1.0	0.050	0.10	0.10	0.10

Notes:
1) TPH - Total Petroleum Hydrocarbons (gasoline range) analyzed by EPA Methods 5030/8015
2) Benzene, Toluene, Ethylbenzene and Xylene analyzed by EPA Method 8020
3) ND- Not Detected at detection limit shown
4) SB-1, SB-2 and SB-3 samples collected March 5, 1990
   WA-1 samples collected March 6, 1990



Base map from USGS 7.5' Dublin and Livermore Quadrangles.

SCALE (In Feet)

0 1000 2000

SITE LOCATION

4226 First Street
Pleasanton, California

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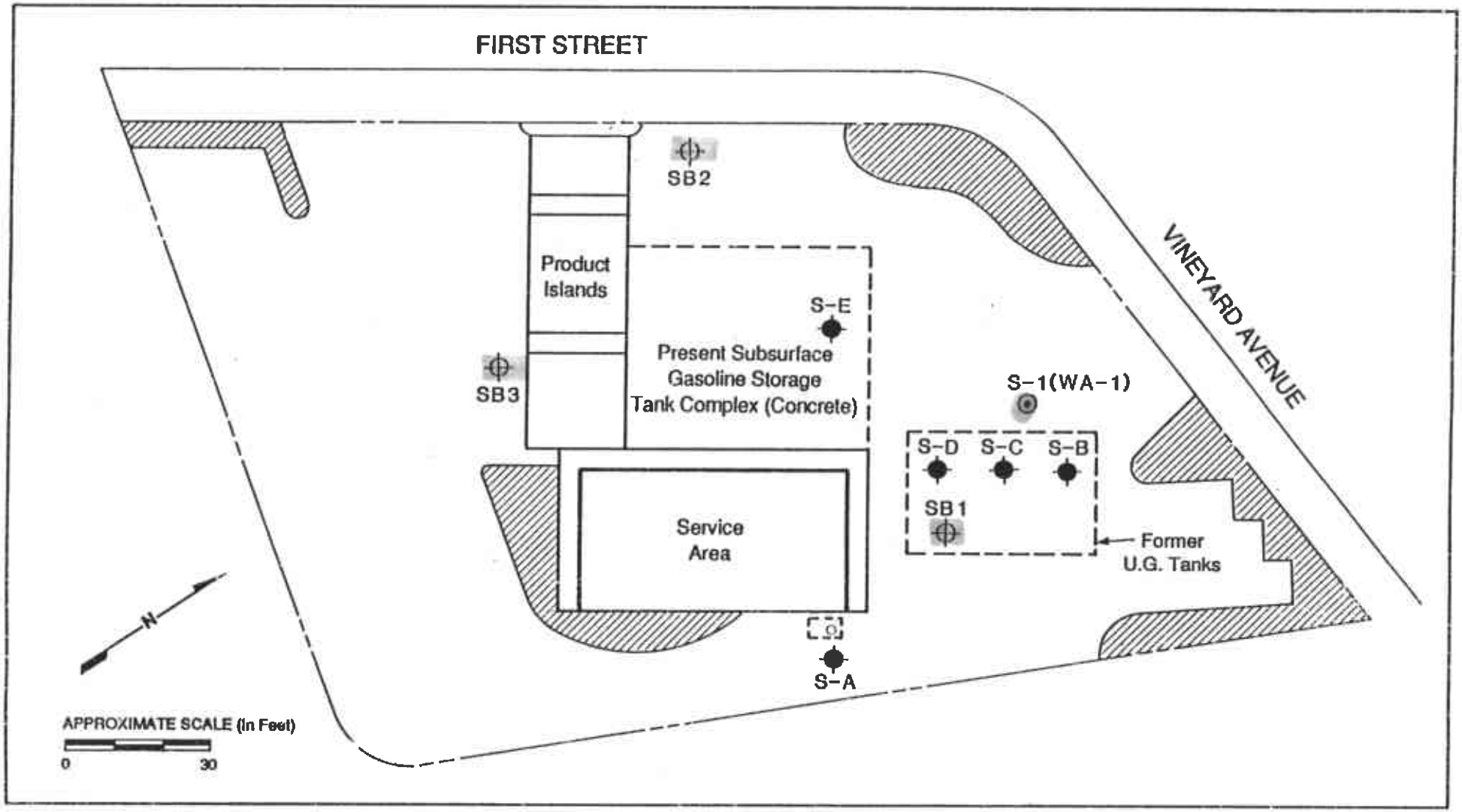
Figure 1



Legend

- Planter Area
- Subsurface Waste Oil Tank Location
- Abandoned Monitoring Well
- Location of Hart Crowser Borings
- Location of EMCON Borings

SITE PLAN

4226 First Street
Pleasanton, California

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Figure 2

APPENDIX A

BORING LOGS

Key to Exploration Logs

Sample Descriptions

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL Density	Standard Penetration Resistance in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 - 4	Very soft	0 - 2	<0.125
Loose	4 - 10	Soft	2 - 4	0.125 - 0.25
Medium dense	10 - 30	Medium stiff	4 - 8	0.25 - 0.5
Dense	30 - 50	Stiff	8 - 15	0.5 - 1.0
Very dense	>50	Very stiff	15 - 30	1.0 - 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

Minor Constituents

	Estimated Percentage
Not identified in description	0 - 5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

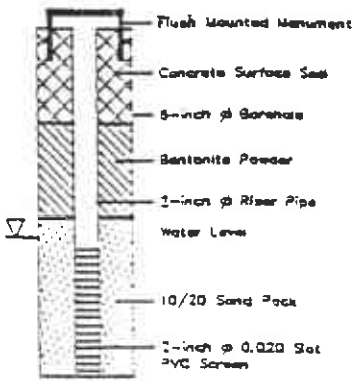
Legends

Sampling

BORING SAMPLES

- Split Spoon
- Shelby Tube
- Cuttings
- Core Run
- * No Sample Recovery
- P Tube Pushed, Not Driven

Ground Water Observations



Test Symbols

GS	Grain Size Classification
CN	Consolidation
TUU	Triaxial Unconsolidated Undrained
TCU	Triaxial Consolidated Undrained
TCD	Triaxial Consolidated Drained
QU	Unconfined Compression
DS	Direct Shear
K	Permeability
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits

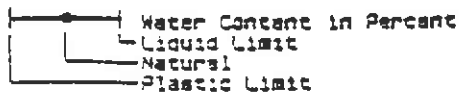


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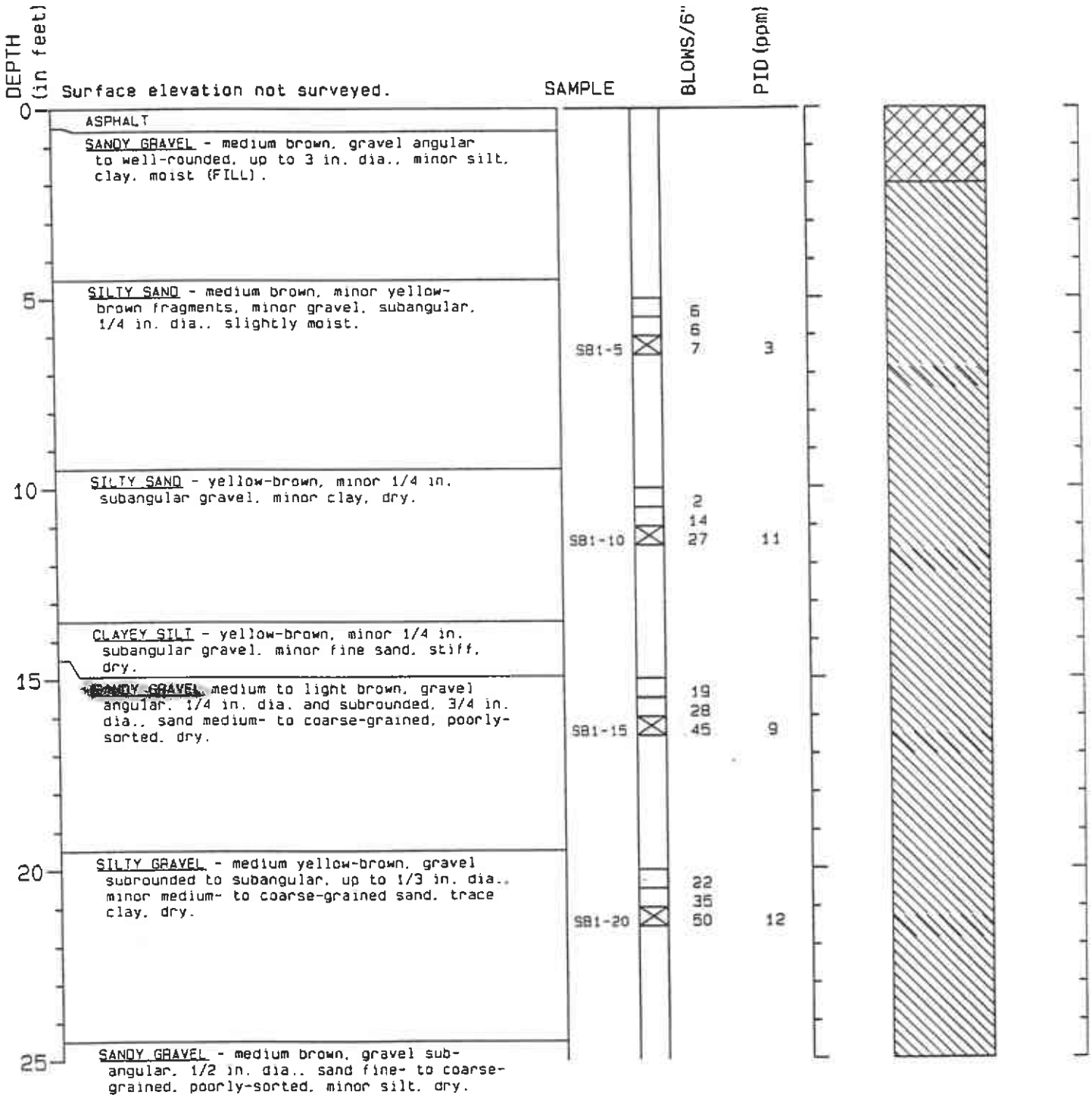
Figure A-1

Boring Log SB-1

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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Figure A-2

Boring Log SB-1

Geologic Log

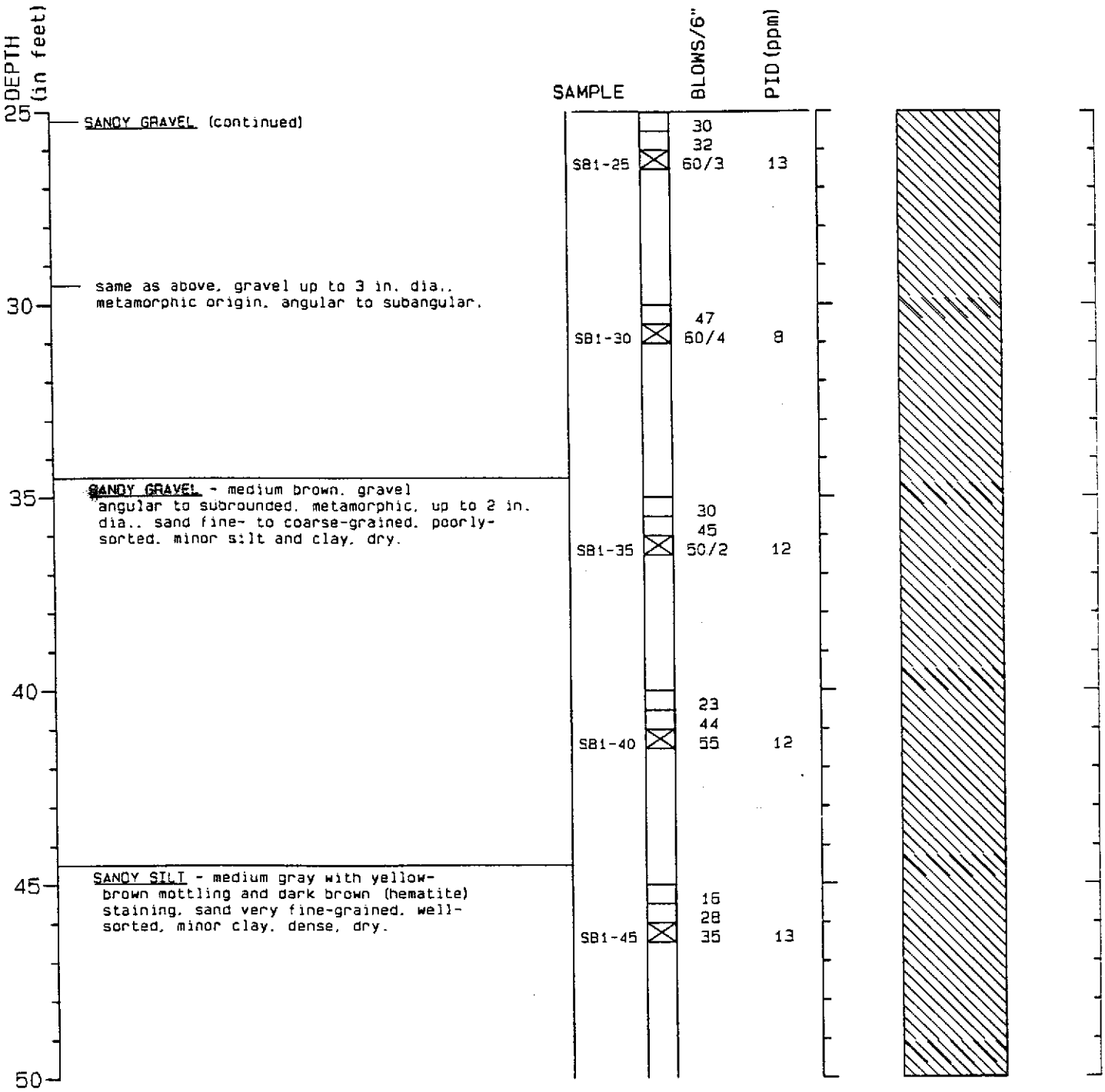

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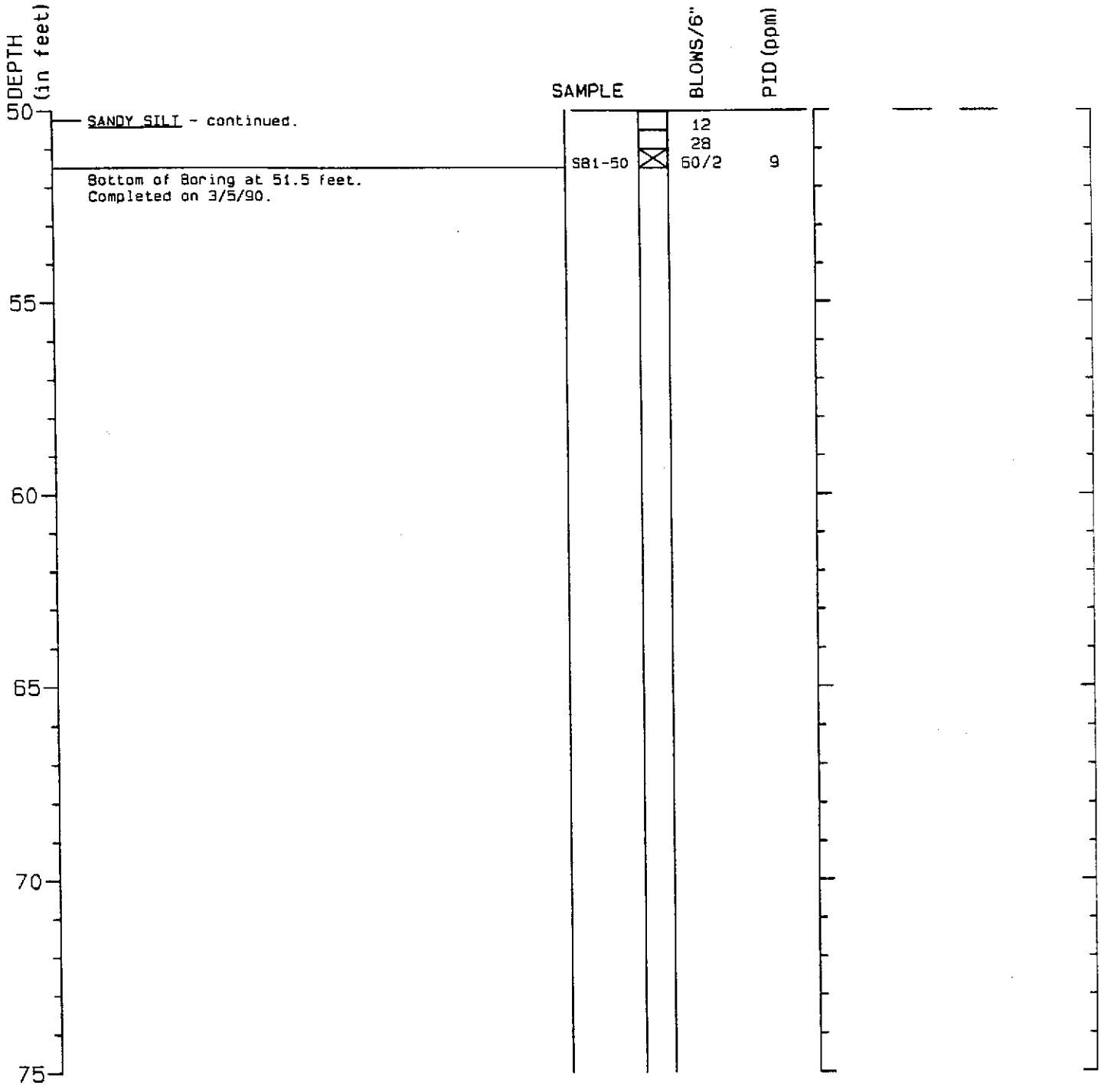
Figure A-2

Boring Log SB-1

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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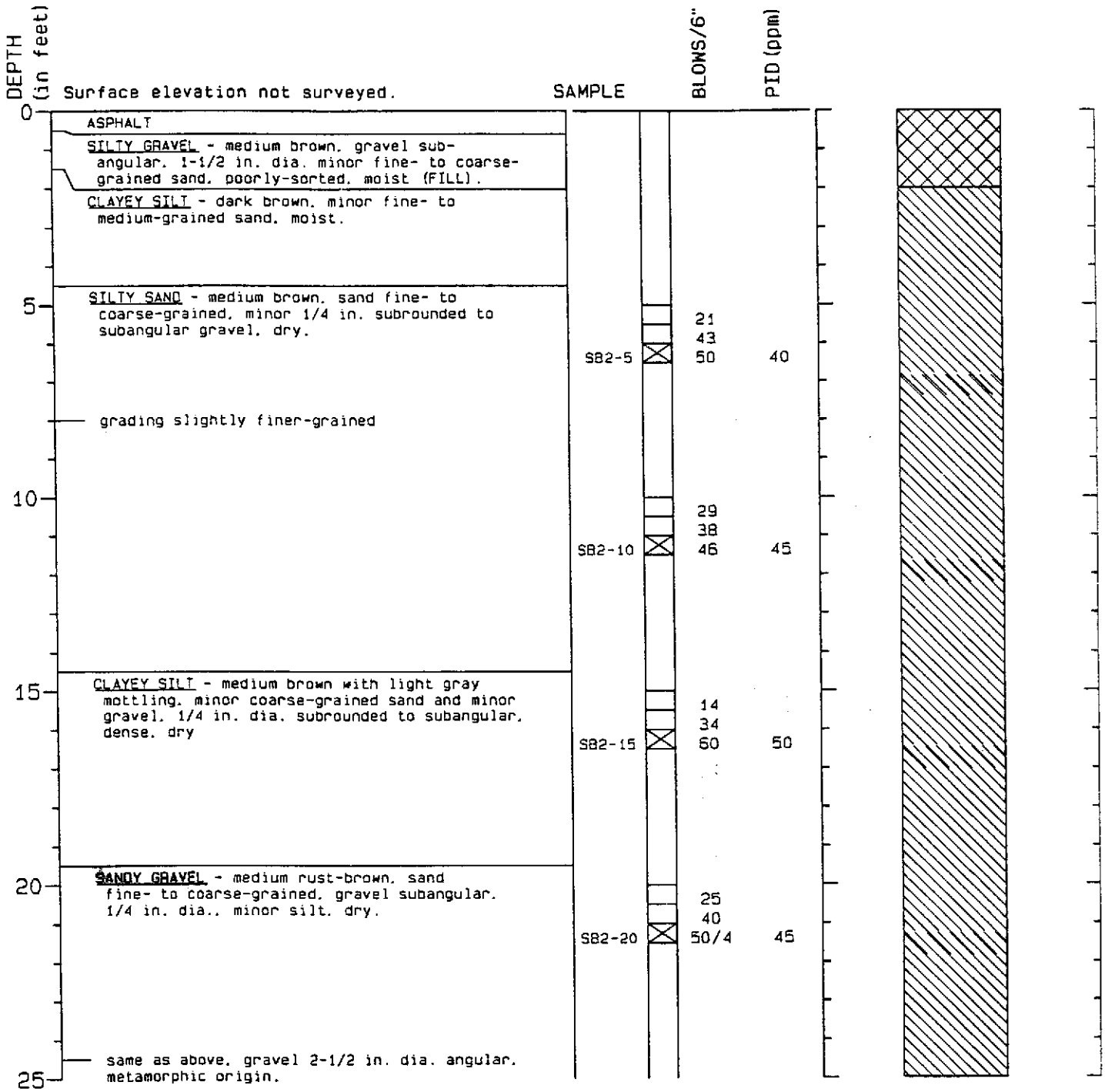
Figure A-2

Boring Log SB-2

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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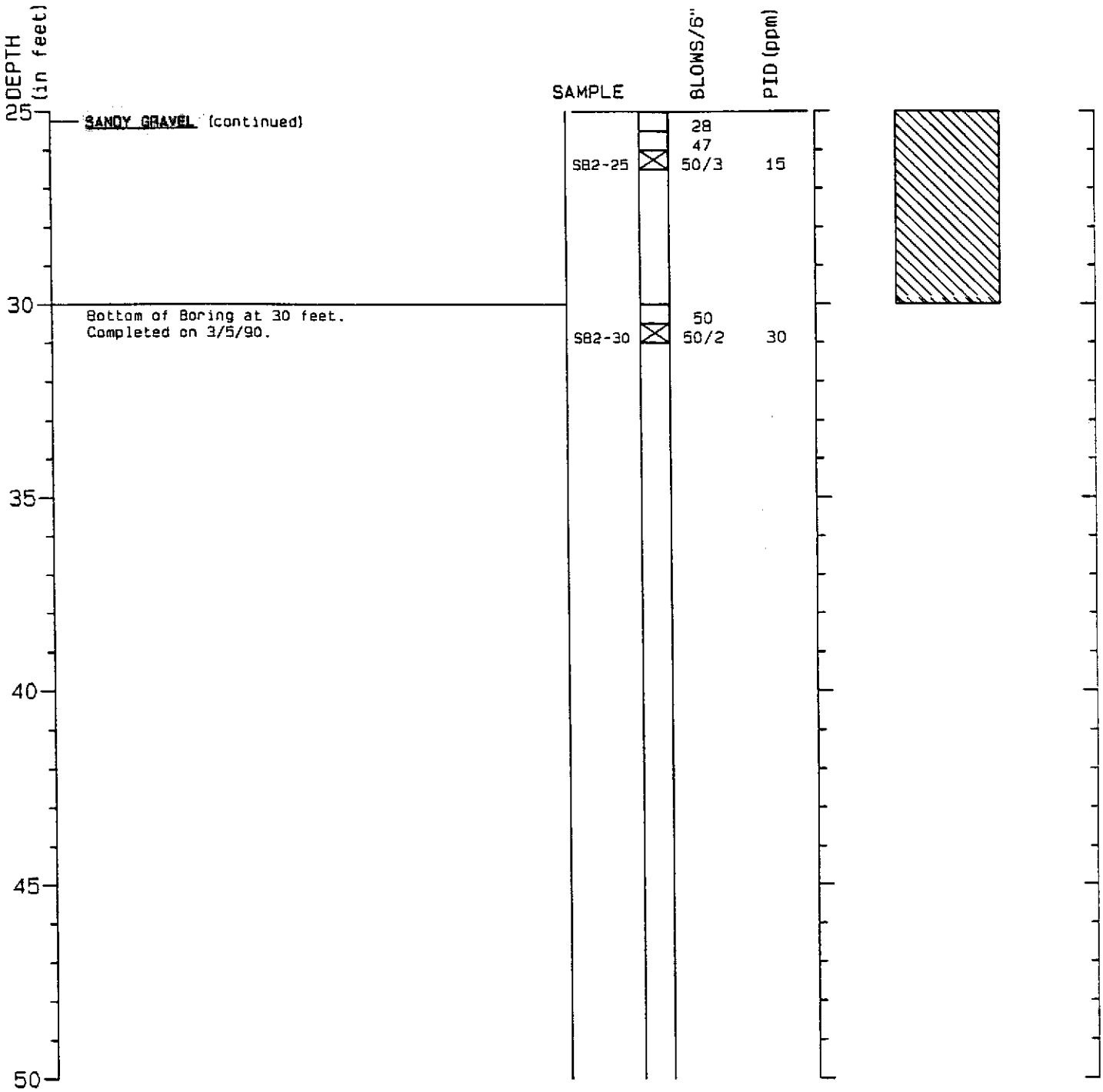
Figure A-3

Boring Log SB-2

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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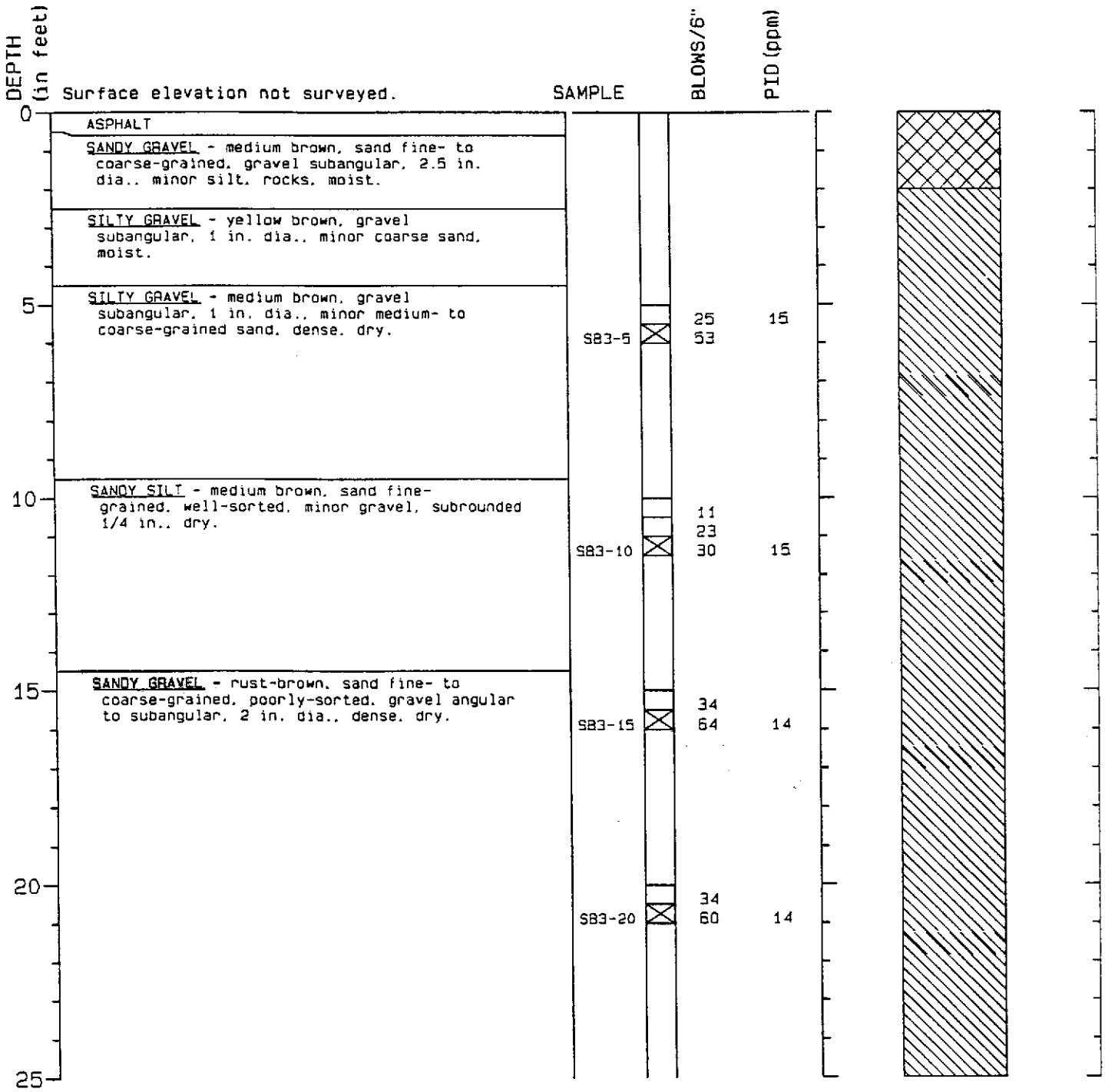
Figure A-3

Boring Log SB-3

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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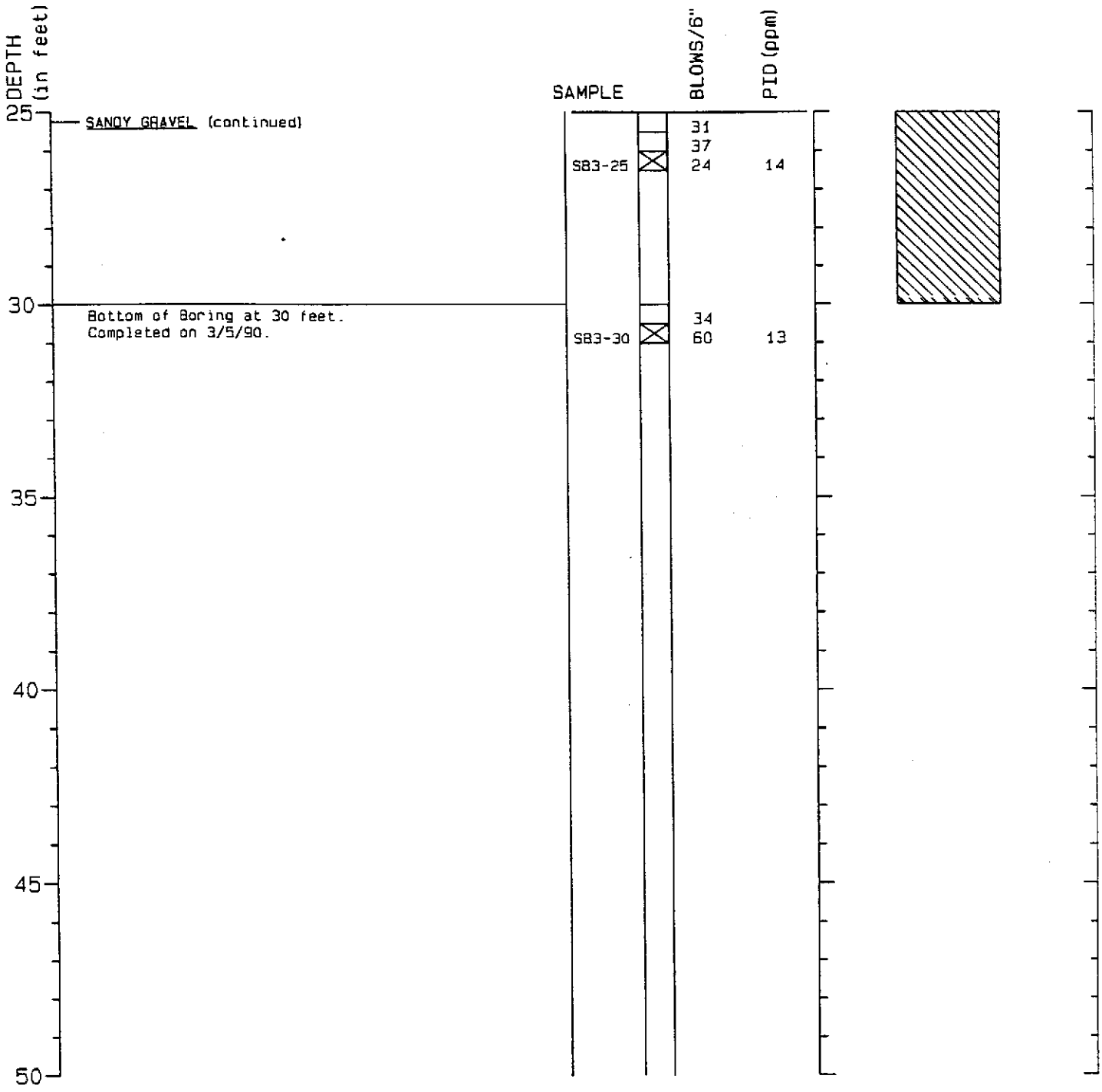
Figure A-4

Boring Log SB-3

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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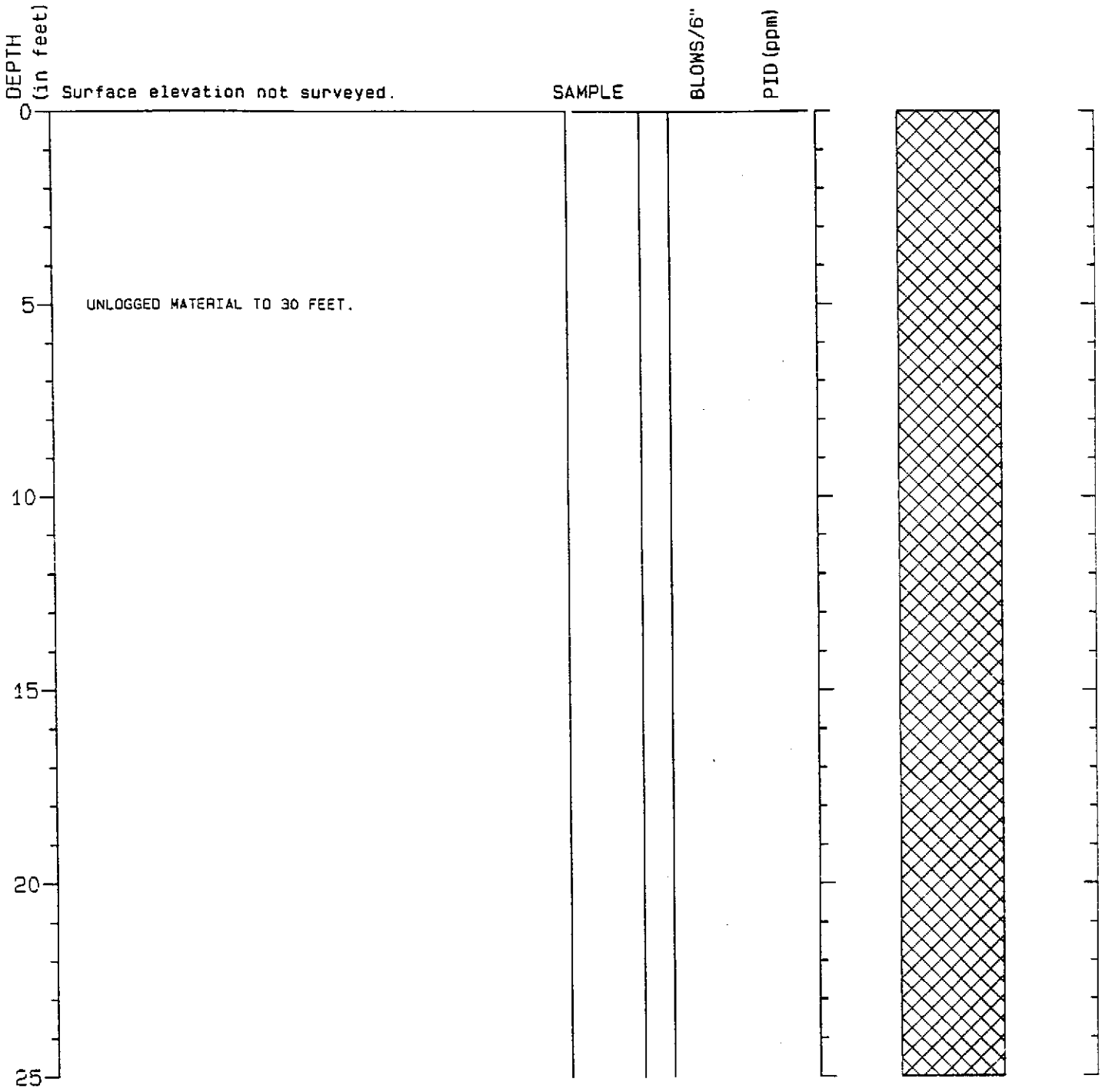
Figure A-4

Boring Log WA-1

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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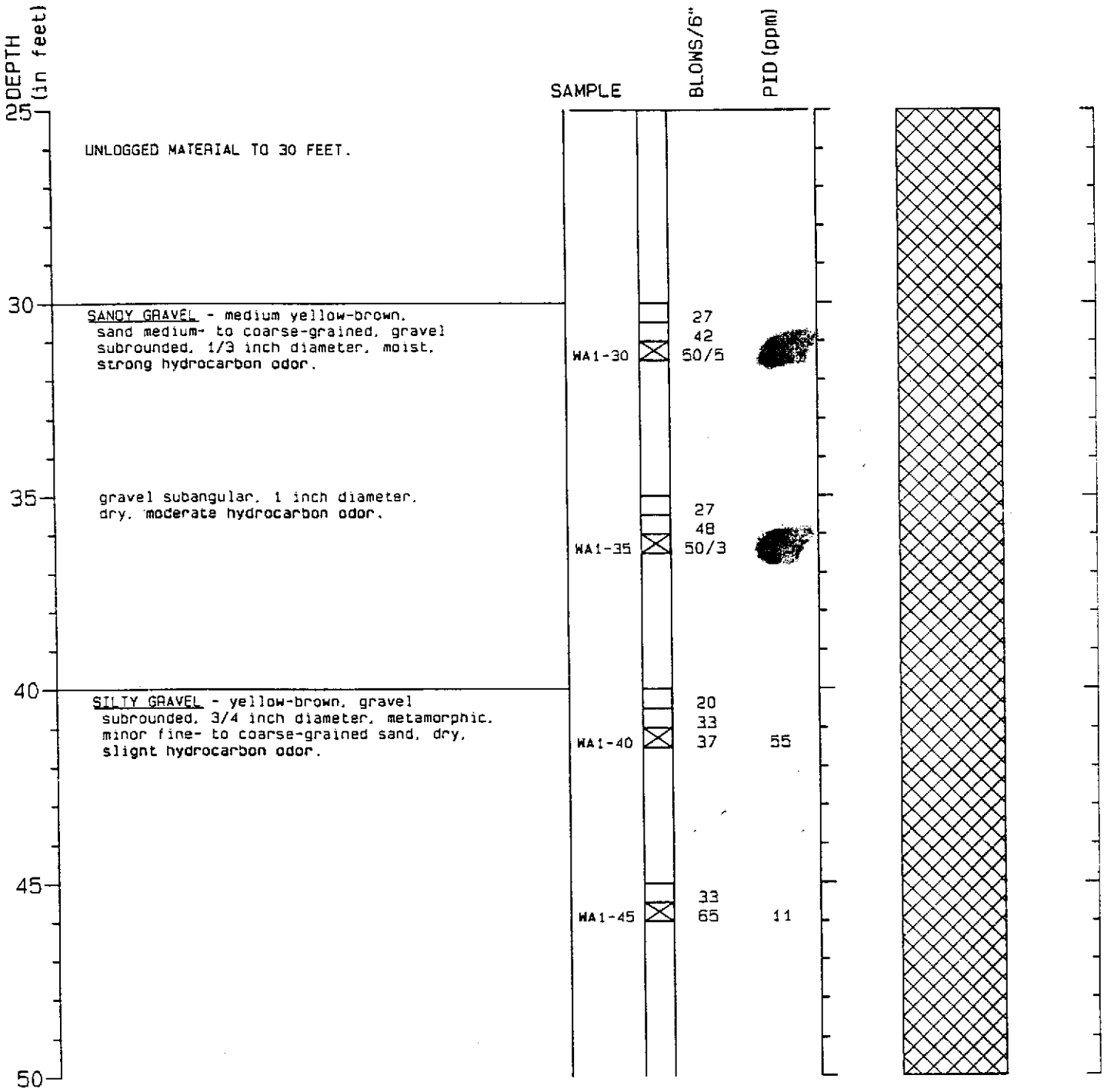
Figure A-5

Boring Log WA-1

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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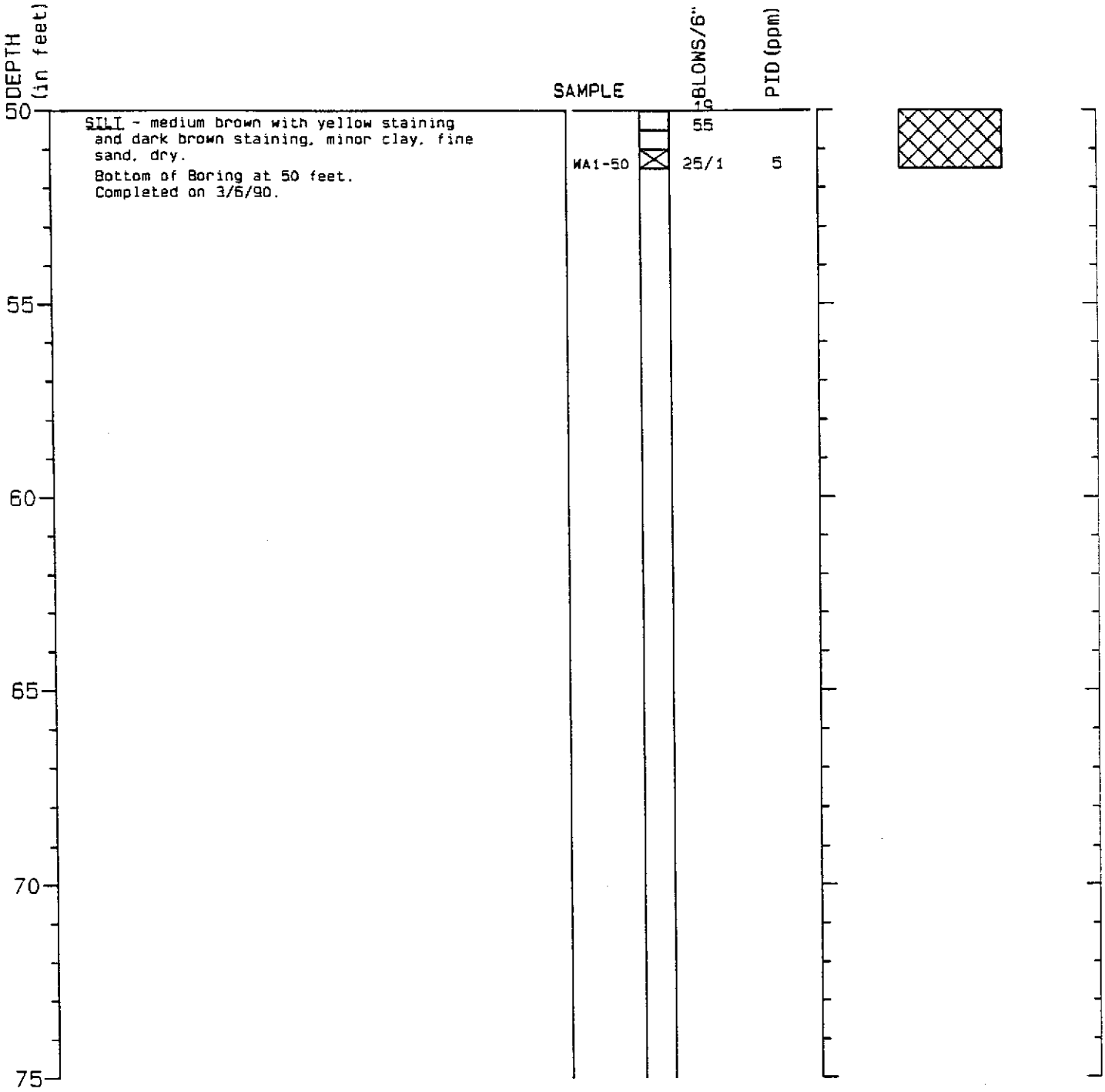
Figure A-5

Boring Log WA-1

Geologic Log



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil description and stratum lines are interpretive and actual changes may be gradual.
3. No free water encountered.

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Figure A-5

APPENDIX B

ANALYTICAL LABORATORY RESULTS

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hart Crowser, Inc.
353 Sacramento St., Suite 1140
San Francisco, CA 94111
Attention: Eric Schniewind

Project: J-6006, Shell, Pleasanton

Enclosed are the results from 11 soil samples received at Sequoia Analytical on March 7,1990. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
30742	Soil, SB1-15	3/7/90	EPA 5030/8015/8020
30743	Soil, SB1-35	3/7/90	EPA 5030/8015/8020
30744	Soil, SB1-50	3/7/90	EPA 5030/8015/8020
30745	Soil, SB2-15	3/7/90	EPA 5030/8015/8020
30746	Soil, SB2-30	3/7/90	EPA 5030/8015/8020
30747	Soil, SB3-10	3/7/90	EPA 5030/8015/8020
30748	Soil, SB3-30	3/7/90	EPA 5030/8015/8020
30749	Soil, WA-30	3/7/90	EPA 5030/8015/8020
30750	Soil, WA-35	3/7/90	EPA 5030/8015/8020
30751	Soil, WA-40	3/7/90	EPA 5030/8015/8020
30752	Soil, WA-50	3/7/90	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

MTague

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hart Crowser, Inc.	Client Project ID:	J-6006, Shell, Pleasanton	Sampled:	Mar 7, 1990
353 Sacramento St., Suite 1140	Matrix Descript:	Soil	Received:	Mar 7, 1990
San Francisco, CA 94111	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Mar 15, 1990
Attention: Eric Schniewind	First Sample #:	003-0742	Reported:	Mar 20, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
003-0742	SB1-15	4.2	N.D.	N.D.	N.D.	N.D.
003-0743	SB1-35	18	N.D.	N.D.	N.D.	N.D.
003-0744	SB1-50	N.D.	N.D.	N.D.	N.D.	N.D.
003-0745	SB2-15	N.D.	N.D.	N.D.	N.D.	N.D.
003-0746	SB2-30	7.2	N.D.	0.17	N.D.	N.D.
003-0747	SB3-10	N.D.	N.D.	N.D.	N.D.	N.D.
003-0748	SB3-30	N.D.	N.D.	N.D.	N.D.	N.D.
003-0749	WA-30	380	2.2	2.7	5.3	32
003-0750	WA-35	290	1.8	0.35	0.24	1.5
003-0751	WA-40	N.D.	N.D.	N.D.	N.D.	N.D.
003-0752	WA-50	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.050**	**0.10**	**0.10**	**0.10**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

30742.HHH <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Hart Crowser, Inc.
353 Sacramento St., Suite 1140
San Francisco, CA 94111
Attention: Eric Schniewind

Client Project ID: J-6006, Shell, Pleasanton

QC Sample Group: 0030742-752

Reported: Mar 20, 1990

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Lari	M. Lari	M. Lari	M. Lari
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Mar 15, 1990	Mar 15, 1990	Mar 15, 1990	Mar 15, 1990
QC Sample #:	003-0844	003-0844	003-0844	003-0844
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.18	0.17	0.19	0.60
Matrix Spike % Recovery:	90	85	95	100
Conc. Matrix Spike Dup.:	0.19	0.18	0.18	0.56
Matrix Spike Duplicate % Recovery:	95	90	90	93
Relative % Difference:	5.4	5.7	5.4	6.9

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

APPENDIX C

CHAIN-OF-CUSTODY RECORDS

Sample Custody Record

DATE 3/6/90 PAGE 1 OF 13

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699

JOB NUMBER J-6006 LAB NUMBER

PROJECT MANAGER E. SCHNIEWIND

PROJECT NAME SHELL / PLEASANTON 4226 1st St.

SAMPLED BY: K. PILL

LAB NO.	SAMPLE	TIME	STATION	MATRIX	TESTING: TPH-GAS + BTEX 8015/8020	TESTING: HOLD	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	SB1-5			SOIL		X	1	
	SB1-10			"		X	1	
	SB1-15			"	X		1	
	SB1-20			"		X	1	
	SB1-25			"		X	1	
	SB1-30			"		X	1	
	SB1-35			"	X		1	
	SB1-40			"		X	1	
	SB1-45			"		X	1	
	SB1-50			"	X		1	
	SB2-5			"		X	1	
	SB2-10			"		X	1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature: Eric Schniewind	3/7/90	Signature: Michelle Y. Harman	3/7
Printed Name: ERIC SCHNIEWIND	TIME	Printed Name: Michelle Y. Harman	TIME
Company: HC	12:26	Company: Sequoia Analytical	12:26
RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature		Signature	
Printed Name	TIME	Printed Name	TIME
Company		Company	

TOTAL NUMBER OF CONTAINERS 12 (THIS PG)

METHOD OF SHIPMENT

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS SHELL 5-DAY

DISTRIBUTION:

1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY
2. RETURN PINK COPY TO PROJECT MANAGER
3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT
4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER

Sample Custody Record

DATE 3/6/90 PAGE 2 OF 3

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699

JOB NUMBER 6006 LAB NUMBER

PROJECT MANAGER E. SCHWIEWIND

PROJECT NAME SHELL / PLEASANTON 4226 1ST ST.

SAMPLED BY: K. PILL

LAB NO.	SAMPLE	TIME	STATION	MATRIX	TESTING: TPH-GAS + BTEX 8015/8020	TESTING: HOLD	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	SB2-15			SOIL	X		1	
	SB2-20			"		X	1	
	SB2-25			"		X	1	
	SB2-30			"	X		1	
	SB3-5			"		X	1	
	SB3-10			"	X		1	
	SB3-15			"		X	1	
	SB3-20			"		X	1	
	SB3-25			"		X	1	
	SB3-30			"	X		1	
	WA-15		WELL S-1	"		X	1	
	WA-30		WELL S-1	"	X		1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature	3/7/90	Signature	3/7
Printed Name: ERIC SCHWIEWIND	TIME	Printed Name: Michelle Y. Jarman / Michelle K. Jarman	TIME
Company: HC	12:26	Company: Sequoia Analytical	12:26
RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature	TIME	Signature	TIME
Printed Name		Printed Name	
Company		Company	

TOTAL NUMBER OF CONTAINERS 12 (TH) PG)

METHOD OF SHIPMENT

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS SHELL 5-DAY

DISTRIBUTION:

1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY
2. RETURN PINK COPY TO PROJECT MANAGER
3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT
4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER

Sample Custody Record

DATE 3/6/90 PAGE 3 OF 3

HARTCROWSER
Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699

JOB NUMBER 6006 LAB NUMBER
PROJECT MANAGER E. SCHNIEWIND
PROJECT NAME SHELL / PLEASANTON 4226 1ST ST.
SAMPLED BY: K. FILL

LAB NO.	SAMPLE	TIME	STATION	MATRIX	TESTING: TPH-GAS + BTEX 8015/8020	TESTING: TPH-D	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	WA-35		WELL S-1	SOIL	X		1	
	WA-40			"	X	X	1	
	WA-45			"		X	1	
	WA-50			"	X		1	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature: [signature]	3/7/90	Signature: Michelle G. Jarman	3/7
Printed Name: ERIC SCHNIEWIND	TIME	Printed Name: Michelle G. Jarman	TIME
Company: HC	12:26	Company: Sequoia Analytical	12:26
RELINQUISHED BY	DATE	RECEIVED BY	DATE
Signature	TIME	Signature	TIME
Printed Name		Printed Name	
Company		Company	

TOTAL NUMBER OF CONTAINERS 4 (THIS PG) 28 TOTAL

METHOD OF SHIPMENT

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS SHELL - 5 DAY

DISTRIBUTION:
1. PROVIDE WHITE AND YELLOW COPIES TO LABORATORY
2. RETURN PINK COPY TO PROJECT MANAGER
3. LABORATORY TO FILL IN SAMPLE NUMBER AND SIGN FOR RECEIPT
4. LABORATORY TO RETURN WHITE COPY TO HART CROWSER