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REMEDIATION WORK PLAN

SNK Andante Project

3992 San Pablo Avenue
Emeryville, California

Prepared for:

SNK DEVELOPMENT INC.

March 2003

Project No. 9401.20

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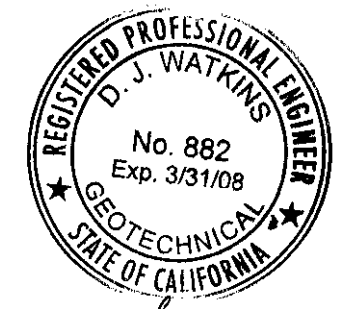
PROFESSIONAL CERTIFICATION AND LIMITATIONS

The professional engineering work reported herein was performed under the direction of the engineers whose seals and signatures appear below. The work was performed in accordance with generally accepted standards of engineering practice, based on information available to us at the time of its preparation and within the limits of the scope of work directed by the client. No other representation, expressed or implied, and no warranty or guarantee is included or intended as to professional opinions, recommendations, or field or laboratory data provided.



03/15/07

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1.0 INTRODUCTION

This Remediation Work Plan describes a program of environmental remediation to be performed at 3992 San Pablo Avenue, Emeryville, California, 94608 for SNK Development Inc. **(SNK**) of San Francisco, California. The remediation program will be conducted with the approval of and under the oversight of Alameda County Environmental Health Care Services (**ACEHCS).** This Work Plan has been prepared by The San Joaquin Company Inc. (**SJC**) of Oakland, California, which will serve as the project engineers. The remediation contractor will be Dietz Irrigation of Tracy California.

The location of the property is shown on Figure 1. Figure 2 is a site plan and Figure 3 is an architect's drawing showing a plan view of the development SNK plans to build on the property.

This Work Plan presents a description of the procedures to be used to remediate soil and to evaluate the quality of groundwater that has been affected by a release of fuel hydrocarbons from underground storage tanks at Celi's Alliance Service (**Celi's),** an automobile service station previously located at 4000 San Pablo Avenue, adjacent and to the north of SNK's 3992 San Pablo Avenue property. The Celi's site is now owned by the City of Emeryville and is in use as an extension of 40th Street in that city.

This document includes descriptions of procedures that will be employed for securing the SNK Andante site, excavation and management of unaffected and affected soil, confirmatory sampling, testing of soil remaining in situ following completion of the remediation program, and testing of soil to be shipped off-site for disposal at a Class II landfill or treated on the site and recycled in beneficial use as engineered fill. It also describes the procedure that will be used to make an initial evaluation of groundwater quality beneath the site and the preliminary selection of the locations for, and the construction details of, groundwater-quality monitoring wells that, if necessary, will be installed to improve current estimates of the lateral and vertical extent of the plume of affected ground that emanated from the automobile fueling station formerly located at 4000 San Pablo Avenue.

1.1 Site Codes

1.1.1 4000 San Pablo Avenue

The site at 4000 San Pablo Avenue, at which the discharge of petroleum hydrocarbons to the subsurface occurred, is recorded in California databases with the identifications shown below.

[**Note**: The automobile service station that was previously located on that site was known as Celi's Alliance Service Station, but in many reports prepared by others it is variously named the "Celis Alliance Service Station" or the "Celis Service Station." To maintain historical accuracy, in this report that facility will be referred to as Celi's Alliance Service Station (**Celi's**).]

1) The California State Water Resources Control Board (**SWRCB**) has established the following Global ID for the Celi's site

   Global ID: T0600101794

2) The California Regional Water Quality Control Board - San Francisco Bay Region (**RWQCB**) has been assigned the following Case Number to the Celi's site.

   Case Number: 01-1938

3) The ACEHCS Local Oversight Program (**LOP**), which is the lead agency for the site, has assigned the following Case Number to the Celi's site.

   Case Number: 567

1.1.2 3992 San Pablo Avenue

For the purposes of administrative review of work plans and engineering reports and the regulatory oversight of the planned remediation program, ACEHCS has assigned the following Site Name and Case Number to the 3992 San Pablo Avenue site:

Site Name: SNK Andante Project
Case No .: RO-0002529

The assignment of a case number to the site by ACEHCS does not indicate that the property has been identified by that agency as the site of an unauthorized release of regulated petroleum hydrocarbons to the subsurface. ACEHCS recognizes that the hydrocarbons that affected the subsurface beneath the SNK Andante Project site were discharged on property to the north and that, in so far as is known, no discharge occurred on the 3992 San Pablo Avenue property.

2.0 BACKGROUND

Summaries of the history of the site, the general environmental condition of the adjacent property and the current ownership of the 3992 San Pablo Avenue site are presented below.

2.1 Site History

Although major industries located in Emeryville in the early 20th Century and expanded rapidly during World War II, none were on, or in the neighborhood of, the subject property at 3992 San Pablo Avenue. Conventional and light rail systems were built to transport materials and workers to the City's industrial areas. At that time, several Atchison, Topeka and Santa Fe railroad tracks passed through the 3992 San Pablo Avenue property along its northern boundary, but these were main line tracks headed west toward the industrial areas. During that historical period, the balance of the SNK Andante property was occupied by residences, restaurants and commercial property. There were no rail yards or locomotive maintenance shops on the site. Thus, none of the environmental problems associated with such facilities have been discovered on the site or adjacent properties. By the late 20th Century, the rail lines passing through the site became disused, the right-of-way was sold and the tracks were removed *circa* 1970.

In the period following the removal of the railroad tracks, the majority of the small businesses located on what is today the 3992 San Pablo Avenue property closed and their buildings were demolished, leaving only the King Midas Club, at 3992 San Pablo Avenue, the Key Club at the same 3992 San Pablo Avenue address, and the Key Hotel at 3900½ San Pablo Avenue clustered in the southwestern corner of the property. The remainder of the site was, during that time, used as a parking area for the King Midas Club. The King Midas and Key Clubs were gaming establishments operating under the State of California's gaming laws and City of Emeryville ordinances.

By the early 1990s, the Key Club and Key Hotel had closed and their buildings languished empty and run-down. By 1997, the King Midas Club had also closed and the whole of the 3992 San Pablo Avenue property was acquired by the City of Emeryville Redevelopment Agency. In 2002, all of the remaining structures on the site were demolished so that, today, it is a paved empty lot.

2.2 Current Ownership of the 3992 San Pablo Avenue Property

As noted above, the 3992 San Pablo Avenue site is owned by the City of Emeryville Redevelopment Agency (**ERDA**). SNK currently holds an option to purchase the property under the terms of a Disposition and Development Agreement with the ERDA.

Subject to satisfactory negotiation of a contract of sale for the property, SNK plans to build a four-story, residential development on the site, which will include some restaurant and commercial retail space on the ground floor. The completed project will be known as SNK

"Andante."

An issue that SNK must evaluate prior to exercising its option to purchase the subject property is the likely final scope and cost of the remediation work described in this Remediation Work Plan. To improve the accuracy of the current estimates for the work, SNK has authorized SJC and Dietz Irrigation to open exploratory trenches and pits in the affected area of the site. These exploratory excavations are included as part of the scope of work encompassed by this Work Plan. They will permit the lateral and vertical extent of affected soil to be more precisely delineated compared to current estimates that are based on information from small-diameter borings, some of which did not penetrate deep into the subsurface because the drilling tools encountered bodies of hard material (*e.g.*, masses of buried concrete). This extended exploration will also provide a better estimate of the highest concentrations of analytes of concern affecting the soil than is currently available. Implementation of the extended exploratory work is discussed in more detail in Section 7.5.

Although the extended exploration of the site by opening pits and trenches is an essential element of this Remediation Work Plan, based on data presently available, it is not anticipated that the findings will cause SNK to relinquish its option to buy the 3992 San Pablo Avenue property. However, the possibility of such an outcome cannot be entirely discounted. If SNK is unable to move forward with the purchase and redevelopment of the site, all materials excavated from the exploratory pits and trenches will be managed and disposed as specified in the relevant sections of this document and the excavations will be restored by backfilling with clean material.

If, as is expected, the anticipated real estate transaction between SNK and the ERDA closes, SNK will promptly issue further instructions to SJC and Dietz Irrigation to implement the full scope remediation program described in this Work Plan.

3.0 SITE CHARACTERISTICS

The location of the SNK Andante Project site at 3922 San Pablo Avenue is shown on Figure 1. Figure 2 is a site plan.

3.1 Site North

As is shown on Figures 1 and 2, true north at the 3922 San Pablo Avenue site is slightly to the west of the center line of Adeline Street, which runs along the eastern side of the property. However, to simplify discussion, in this Remediation Work Plan we have established a "Site North" that parallels the alignment of San Pablo Avenue, which runs along the western side of the property. Thus, for the purposes of planning and implementation of the remediation program, the boundary of the SNK Andante Project site where it adjoins 40th Street will be assumed to run from east to west and will be designated the "northern" boundary; other references to boundaries and features of the site and adjacent property will be consistently based on that assigned "Site North." Unless otherwise stated, or in cases where true north is shown on drawings, all compass directions referenced in this Remediation Work Plan and subsequent reports should be interpreted in the context of that directional construction.

3.2 Topography

SNK's Emeryville site has a total area of some 79,360 sq. ft. (1.2 acres) and occupies a major part of a triangular city block that is bounded by 40th Street, Adeline Street, and San Pablo Avenue.

The site is at a mean elevation close to 43 ft. above mean sea level (**MSL**). It is, for all practical purposes, flat, except for minor changes of elevation (typically less than one foot) that occur where one paved area joins another. At the scale of the property as a whole, it has a slight downward slope from east to west (*i.e.*, from Adeline Street to San Pablo Avenue).

The whole of the 3992 San Pablo Avenue site is surrounded by public streets except along its southern boundary, beyond which are a parking lot on adjacent property and the Bank Club building at 3900 San Pablo Avenue. The Bank Club houses a restaurant and is situated on the other side of the property line at the southwestern corner of the 3992 San Pablo Avenue property (see Figure 2).

3.3 Geology

The subject property is situated on the eastern side of San Francisco Bay in the California Coast Ranges section of the Pacific Border physiographic province.

The soils beneath the fill that covers the site are strata of the alluvial fan deposits of the Quaternary age, Temescal Formation that is comprised of inter-fingering lenses of clayey gravel, sandy silty clay and sand-clay-silt mixtures (Radbruch 1957). At the site, this

formation is some 20 ft. to 30 ft. thick and lies unconformably over earlier Quaternary continental and marine sands, clays and gravels of the Alameda Formation, the maximum thickness of which has not been fully explored in the region around the subject property, but is known to exceed 1,050 feet.

The entire area of the property is paved, either with concrete or with bituminous macadam. In the first several feet, varying in depth between some two and seven feet below the ground surface (**BGS)**, is road-base material, imported fill, reworked and re-graded local soils, and the concrete that formed building foundations. Except for the road base and other engineering materials, the fill material generally consists of firm to very stiff silty clay, sandy and clayey silts, and, in isolated areas, loose to medium-density sands and gravels. Geotechnical drilling on the site has revealed, from drill bit refusal and other indicators, that locally there may be additional large masses of concrete or other hard materials incorporated within the shallow soil and fill.

Below the surficial fill are inter-bedded layers of firm to hard silty clays, sandy silts, clayey silts and medium-dense, clayey sands to the maximum depth of geotechnical engineering borings that have been drilled on the site (approximately 81 ft. BGS). Those materials are typical of the Temescal Formation.

In July, August and September 2000, Harza Engineering Company, Inc. (**Harza**) of Oakland, California conducted a geotechnical engineering site investigation at the 3992 San Pablo Avenue property (Harza Engineering Company, Inc. 2000). A copy of Harza's report that describes the scope of work and the findings and recommendations from that site characterization is on file at ACEHCS.

Harza drilled a total of twelve exploratory borings at the locations shown on Figure 2. The maximum depth of exploration was reached in Boring H-ED-11, which reached a total depth of approximately 81 ft. In addition, Harza conducted three cone penetration tests that reached a maximum depth of 50 ft. For convenience of reference, copies of Harza's boring logs are reproduced in Appendix A.

3.4 Hydrology

Temescal Creek flows in underground culverts along a generally east to west course approximately 0.5 miles to the north of the subject property and discharges into San Francisco Bay, the shore of which is today some 0.8 miles to the west of the site. Prior to circa 1880, after which it was filled to become the site of a housing tract, there was a 30-acre tidal flat that formed an embayment in the shoreline of the Bay at a distance of some 0.5 miles southwest of the 3992 San Pablo Avenue property.

Temescal Creek and the tidal flats of San Francisco Bay dominated the regional hydrology of the area prior to its urbanization in the late 19th Century. Today, substantially all precipitation running from roofs and paved areas on the site flow to storm water drains that are part of the City of Emeryville's storm water management system. That system drains to San Francisco Bay.

3.5 Hydrogeology

The depth to the groundwater table in the area of the subject property reflects long term weather cycles as well as seasonal variations in local precipitation in the San Francisco Bay Area. Depending upon those factors, groundwater may be encountered at depths that vary between approximately 6 and 10 feet BGS. Regionally, the general direction of groundwater flow is west toward San Francisco Bay. The groundwater gradient is approximately 0.03 ft/ft (Woodward Clyde 1998).

4.0 ENVIRONMENTAL CONDITION OF ADJACENT PROPERTIES

Following is information on the environmental condition of property adjacent to and close by the 3992 San Pablo Avenue property.

4.1 Celi's Alliance Service Station at 4000 San Pablo Avenue

A gas station known as the Celi's Alliance Service Station (**Celi's**), owned by an independent distributor, operated from approximately 1936 until 1993 on the land that had the address 4000 San Pablo Avenue, which was adjacent to, and north of, SNK's project site at 3992 San Pablo Avenue. Tanks at that station leaked fuel hydrocarbons into the subsurface.

The size and use of the underground storage tanks that were present on the Celi's site in June 1993 (Woodward-Clyde International Americas 1998) are tabulated below and their former locations are shown on Figure 4.

- One 7,000 gallon tank containing diesel
- One 6,000 gallon tank containing regular gasoline
- One 4,000 gallon tank containing unleaded gasoline
- One 2,000 gallon tank containing unleaded gasoline
- One 3,500 gallon tank containing high-octane unleaded gasoline
- One 550 gallon tank containing waste oil

When the service station closed, the tanks were removed and the City of Emeryville Redevelopment Agency (**ERDA**) took title to the land by condemnation. By that action, the City of Emeryville became a "responsible party" for the 4000 San Pablo Avenue site.

At the direction of ERDA, Woodward-Clyde prepared a Remediation Work Plan for the 4000 San Pablo Avenue site that was approved by ACEHCS (Woodward-Clyde International Americas 1994). That engineering company then directed the initial phases of the remediation program. In 1994, affected soil within the property boundaries of the 4000 San Pablo Avenue was removed by excavation. Some 3,200 cu. yds. (loose measure) of affected soil were shipped from the Celi's site and disposed at Allied Waste Industries Inc.'s Class II Forward Landfill in Manteca, California. The remedial excavation extended down to 9 ft. BGS, which depth was just above the groundwater table at the elevation it was at that time, and laterally to the site boundaries. The southern limit of that excavation was located an average distance of approximately 12.5 feet north of the northern boundary of the 3992 San Pablo Avenue property.

After the affected soil had been excavated from the 4000 San Pablo Avenue site, the remedial excavation on that property was backfilled with clean, engineered fill and the City of Emeryville constructed an extension to 40th Street over the land. That street now runs along the northern boundary of the SNK Andante Project site at 3992 San Pablo Avenue.

To remove floating product that had been observed on the water table beneath the Celi's site, a recovery well was installed in the northwestern corner of that property. An ejector pump was installed in that well and it was pumped from September of 1996 through July of 1998; a total of 2,035 gallons of free product and water were removed from the subsurface.

The results of analyses of the confirmation samples recovered by Woodward-Clyde from the floor and walls of the remedial excavation opened on the Celi's site are reproduced in Table 1. The sampling locations are shown on Figure 4.

Concentrations of gasoline (TPHg) in the soil in the floor of the remedial excavation on the 4000 San Pablo Avenue property ranged from 540 mg/kg to 1,000 mg/Kg at sampling locations WC B-G-1 and WC BC-2, respectively. Those locations were near the southern boundary of the site, which was in close proximity to the 3992 San Pablo Avenue property with which this Work Plan is concerned. The concentrations of diesel in the samples recovered from those locations ranged from Not Detectable to 75 mg/Kg. As can be seen in Table 1, at both locations, low concentrations of benzene, toluene, ethyl benzene and xylene isomers (the **BTEX** compounds) were detected in the soil in the floor of the remedial excavation. Analysis of the sample from location WC B-G-1 detected the presence of 120 mg/Kg of Total Recoverable Petroleum Hydrocarbons (TRPH), but none were detectable in the sample from location WC B-C-2 at a concentration above 50 mg/Kg.

At the sampling locations numbered WC S-1 through WC S-4 which, as is shown in Figure 4, were distributed along the southern wall of the remedial excavation at 4000 San Pablo Avenue, concentrations of gasoline ranged from 20 mg/Kg to 730 mg/Kg, diesel concentrations ranged from undetectable to 69 mg/Kg, and the concentrations of the BTEX compounds were all very low.

Although all work required by the approved, but aerially limited, remediation plan for removal of contaminated soil and floating product from the Celi's site was completed, it did not address the soil affected by hydrocarbons that had migrated under a portion of the 3992 San Pablo Avenue property. However, concentrations of components of fuel hydrocarbons in affected soil and groundwater generally decline steadily due to the process of bio-remediation and other natural processes after the source of the discharge to the subsurface has been removed. These processes are further accelerated when the mass of soil containing the highest concentrations of the petroleum hydrocarbon is removed from the subsurface.

It is expected that, since a large volume of the affected soil beneath the Celi's site was removed in 1994 and floating product was subsequently pumped from the groundwater table through December 1997, the concentrations of fuel hydrocarbons remaining beneath that site and its surrounding area will have declined since that time. It is therefore likely that the environmental condition of the soil and groundwater beneath that property and adjacent areas will, by today, have improved compared to the conditions reflected in the data compiled in Table 1.

As a matter of record, it should be noted that the Celi's site has not yet been "closed" by

ACEHCS or the RWQCB. Although ACEHCS concurred with ERDA's consulting engineers that no additional remediation of soil on the Celi's property was required after the remediation program that was conducted on that site had removed a large mass of soil affected by fuel hydrocarbons from the subsurface, the Agency directed, *inter alia*, that a groundwater-quality monitoring program be implemented to demonstrate that that the plume of affected groundwater emanating from that site was stable (Alameda County Health Care Services Agency 1997). SJC understands that a groundwater-quality monitoring program that would define adequately the lateral extent of the groundwater plume has not been implemented at the Celi's site and it is for that reason that the site remains as an "open" case in ACEHCS records.

4.2 Other Sites

The only other property near the 3992 San Pablo Avenue site that is known to have had any form of environmental impairment is a site that, today, is also situated beneath the right-of-way of the extended 40th Street. This is the former location of the San Francisco French Bread Bakery, which, as is shown on Figure 3, was located some 65 ft. north of the subject property. When investigations were made prior to the construction of the 40th Street extension, two very old, unregistered, underground fuel storage tanks were discovered beneath the northern boundary of the San Francisco French Bread Bakery site. The footprint of the tanks extended beyond that site beneath property to its north. The tanks were located approximately 100 ft. beyond the northern boundary of the 3992 San Pablo Avenue site.

Based on currently available information, although the tanks on the San Francisco French Bread Bakery site had apparently leaked and some of the fuel hydrocarbons released from them may have migrated as far south as the northern property line of the SNK Andante Project site, it does not appear to have made a major contribution to the concentrations of fuel hydrocarbons in the area of the subsurface that is affected by those products on the 3992 San Pablo Avenue property. As has been noted previously, the dominant source of petroleum hydrocarbons affecting soil and groundwater beneath the SNK Andante Project originated at the Celi's site.

5.0 HYDROCARBONS BENEATH THE 3992 SAN PABLO AVENUE PROPERTY

The probability that the subsurface beneath a strip of land in the northwester corner of the 3992 San Pablo Avenue site is affected by petroleum hydrocarbons that were released from the Celi's site at 4000 San Pablo Avenue was identified in the Phase I Environmental Assessment prepared by SJC for SNK in September 2000 (The San Joaquin Company Inc. 2000).

In early February 2003, in preparation for the anticipated construction of the Andante project, SNK contracted with Apex Envirotech, Inc. (**Apex**) of Gold River, California to drill small-diameter, exploratory borings and recover soil samples from the subject property. The locations of the borings drilled by Apex and the results of the analyses performed on the samples it recovered (Apex Envirotech, Inc. 2003) are reproduced on Figure 2 and in Table 2, respectively. (Note: Due to drill bit refusal when hard objects were encountered at shallow depths, Apex did not recover samples from their borings at locations AE GP-14, AE GP-15, AE GP-19, and AE GP-20.)

A copy of Apex's report on its drilling program is on file at ACEHCS. For convenience of reference, Apex's boring logs are included in Appendix A.

Note: On several of the Apex's boring logs, where they encountered clayey soils in the subsurface, they are described as "OH-Bay Mud." We assume that the "OH" means that Apex classified the clay under the United Soil Classification System as OH, an organic clay of medium to high plasticity. However, there is, in fact, no Bay Mud in the subsurface directly beneath or in the area around the SNK Andante Project site. As is clearly shown on available geological maps such as that included in the United States Geological Survey publication *Areal and Engineering Geology of the Oakland West Quadrangle, California* (Radbruch, 1957), the closest formations of Bay Mud occur more than one-half mile to the west of the 3992 San Pablo Avenue site. As has been correctly reported by Harza (Harza Engineering Company, Inc. 2000) and SJC (The San Joaquin Company Inc. 2000), the clayey soils beneath the site are typical of those found in the Temescal Formation, which strata contain no Bay Mud.

When taken together with the information gathered by Woodward-Clyde as part of the remediation program implemented at the Celi's site to the north, the Apex data can be used as the basis for a conservative assessment of the lateral and vertical extent of the zone of the subsurface beneath the 3992 San Pablo Avenue site that has been significantly affected by petroleum hydrocarbons. SJC's assessments are presented in Sections 5.1 and 5.2 below.

Note: As is discussed in Section 7.5, the accuracy with which the lateral and vertical extent of the affected zone can be defined will be greatly improved when exploratory trenches have been excavated through and across its boundaries, which work is included as an element of the proposed remediation program.

5.1 Lateral Extent of Subsurface Affected by Fuel Hydrocarbons

The data from analyses of samples recovered from the small-diameter borings drilled by Apex in 2003 confirm that there are significant concentrations of fuel hydrocarbons in soil and groundwater beneath a limited area in the northwest corner of the 3992 San Pablo Avenue property. That area is some 20 ft. to the south of the former site of a cluster of underground gasoline storage tanks that were present on the former Celi's site (see Figure 4 for locations).

The subsurface data gathered by Apex from the 3992 San Pablo Avenue property and by Woodward-Clyde from the Celi's site and others were integrated by SJC to develop the graphical interpretation of the area of the affected subsurface that is labeled "Area to be Remediated" on Figure 2.

The results of Apex's laboratory analyses and the interpretation of the boundaries of the area of affected subsurface shown on Figure 2 as the "Area to be Remediated" are consistent with a major release of fuel hydrocarbons having occurred from the leaking underground storage tanks formerly located on the Celi's site to the north. Woodward-Clyde and others estimated that free product approximately 3 to 6 inches in thickness was floating on the water table beneath that site when the first subsurface investigation was conducted there. Given the westerly direction of groundwater flow beneath the Celi's site, the shape and dimensions of the highlighted area on Figure 2 have characteristics that are typical of the lateral and up-gradient dispersion of fuel hydrocarbons seen at such sites when the contents of leaking underground tanks migrate down to the groundwater table.

Note: The concentrations of lead in the samples recovered from Apex's borings were all low. They ranged from 2.17 mg/Kg to 10.3 mg/Kg and did nor correlate with concentrations of gasoline found in the same sample. These concentrations are all well within the range for lead that is present in soils in the East Bay Region that can be attributed to natural (Bradford *et al* 1996, Lawrence Berkeley National Laboratory 1995).

Although there was a significant loss of fuels from the underground storage tanks on the site at 4000 San Pablo Avenue and a plume of affected groundwater formed beneath that site and adjacent areas, the area within the boundaries of the 3992 San Pablo Avenue property where soil and groundwater has been affected is relatively limited. As shown on Figure 2, it extends only some 220 ft. eastward from the northwestern corner of the site at the intersection of 40th Street with San Pablo Avenue and does not appear to extend more than some 80 ft. south from 40th Street.

5.2 Vertical Extent of Subsurface Affected by Fuel Hydrocarbons

The borings drilled by Apex on the 3992 San Pablo Avenue site for SNK did not penetrate below a maximum of 11 ft. BGS and many had a total depth of 5 ft. or less. These limitations were imposed by Apex's scope of work and the fact that, at several locations, the drill bit could not be advanced below a shallow depth due to the presence of masses of hard materials, such a concrete, being encountered in the subsurface. However, a good

preliminary estimate of the depth to which soil on the subject property is affected can be made from the known characteristics of fuel hydrocarbon plumes that result from leakage from underground fuel storage tanks that are situated above or close to the water table.

Petroleum hydrocarbons are lighter than water and float on the water table so that significant concentrations of the BTEX compounds and other fuel components in soil are usually restricted in depth to the first few feet beneath the lowest elevation of the groundwater table that occurs in the period following their discharge into the subsurface. Except in a zone immediately beneath, or close to the pits where the leaking tanks were located, at most sites the shallowest depth at which soil is affected by significant concentrations of petroleum hydrocarbons is found at an elevation some one foot above the highest elevation reached by the groundwater during the time that the leaked product was present in the subsurface.

Over the five years that site characterization, remediation and groundwater monitoring was in progress at the Celi's site, the depth of groundwater beneath that property varied between approximately 6 ft. and 9 ft. BGS. That data indicates that the top of the zone of affected soil in the area to be remediated on the 3992 San Pablo Avenue property would be found at approximately 5 ft. BGS. This can be confirmed by examining the boring locations shown on Figure 2 and the results of the analyses of soil samples that are shown in Table 2. In the affected area of the 3922 San Pablo Avenue site, it is generally the case that soil affected by relatively low concentrations of gasoline was detected in some borings at a depth of 5 ft. BGS while, in others, no gasoline was detected at that depth. However, at lower elevations in the same borings, if they penetrated beneath 5 ft. BGS (down to depths up to 11 ft. BGS, the maximum explored by Apex), the concentrations of gasoline in the soil were higher. A typical example is the case of Boring AE GP-2 in which there was no detectable concentration of gasoline at a depth of 5 ft., but at 8 ft. BGS, gasoline was present at 1,600 mg/Kg.

Given the lowest elevation of the groundwater table recorded beneath the Celi's site at approximately 9 ft. BGS, and from the classic characteristics of petroleum hydrocarbon plumes, it would be expected that the greatest depth to which the soil beneath the 3992 San Pablo Avenue site has been affected would be in the approximate range of 12 ft. to 14 ft. BGS. That estimate is confirmed by the results of analyses of samples recovered from beneath the right of way of the 40th Street extension by Levine-Fricke, who conducted a subsurface investigation of that street alignment over its entire length (including the portion that crosses the Celi's site) prior to its acquisition by the City of Emeryville.

In samples recovered from a depth of 14.5 ft. BGS in six borings drilled by Levine-Fricke on the southern half of the Celi's site (*i.e.,* the portion closest to the 3992 San Pablo Avenue property), many contained no detectable concentrations of analytes of concern or, if any were present, they were at very low concentrations that are less than those usually of regulatory concern at sites where petroleum hydrocarbons have leaked to the subsurface. [**Note**: Levine-Fricke's data is included in a report related to the Celi's site issued by Woodward-Clyde (Woodward-Clyde International-Americas 1998) and which is on file at ACEHCS.]

As noted above, the depth to which soil has been affected by petroleum hydrocarbons in the area to be remediated on the 3922 San Pablo Avenue site will be more fully delineated when the exploratory trenches, an element of the planned remediation program, are excavated (see Section 7.5 below).

6.0 REMEDIATION STRATEGY

The strategy developed for remediation of the area of the 3992 San Pablo Avenue property that has been affected by migration of petroleum hydrocarbons beneath the surface of the site is based on the following considerations and principal elements.

- The bulk of the petroleum hydrocarbons found beneath the 3992 San Pablo Avenue property originated on the Celi's site immediately to the north. However, the possibility that some of the contaminants may have migrated from the former site of the San Francisco French Bread Bakery, which was also located to the north of the SNK Andante Project, has not been discounted.

- The remediation must be completed rapidly and at the least practical cost. Extended delays or high cost will prevent SNK from proceeding with the Andante Project that is planned for the 3992 San Pablo Avenue property.

- The first excavations on the site will be exploratory trenches designed to define more precicely the lateral extent and depth of the affected zone of the subsurface. If findings made in the exploratory trenches differ greatly from present estimates of the scope or cost of the work required to remediate the site, it may be necessary for SNK to abandon its option to buy the property. This outcome is not expected, but if such occurs, the property will remain under the ownership of the City of Emeryville Redevelopment Agency. As owners, the responsibility for remediation of the site to comply with California laws and regulations would remain with that Agency as the responsible party for both the subject property and the Celi's property where the unauthorized discharge of petroleum hydrocarbons to the subsurface occurred.

- In parallel with the opening of exploratory trenches, small-diameter, temporary groundwater-quality monitoring wells will be installed within and around the area of the site that is to be remediated so that an improved understanding of the quality of the groundwater in the affected area can obtained.

- The *in situ* affected soil beneath the 3992 San Pablo Avenue site will be removed from the subsurface by excavation after concrete and bituminous macadam have been stripped from the surface and stockpiled on site.

- Following its excavation, affected soil will be staged on site in covered stockpiles. Clean, near-surface soil removed to expose the affected soil at depth will be separately stockpiled on site for reuse either on or off the site.

- Revisions to the San Francisco Bay Area Air Quality Management District's (**SFBAAQMD**) Regulation 8 - Organic Compounds, Rule 40 - Aeration of Contaminated Soil and Removal of Underground Storage Tanks (**Rule 40**) that became effective on June 1, 2000 have, unfortunately, greatly restricted on-site treatment of soil affected by gasoline by spreading and aerating the material. Since that highly effective and economic method is no longer available except for soils containing less than 50 mg/Kg of volatile organic compounds, it is expected that the bulk of the affected soil excavated from beneath the site will be shipped to Allied Waste Industries Inc.'s Class II landfill at Manteca, California for disposal. However, this Work Plan also provides for on-site treatment of soil containing less than 50 mg/Kg of volatile organic compounds, either by aeration of spread soil or by bioremediation using land-farming techniques. The selection of the technology for managing the affected soil will be made after it has been characterized and will be determined on a batch by batch basis. The selection will be predicated upon the concentrations and types of analytes of concern that the material contains the relative cost of off-site disposal versus on-site treatment, and the scheduling limitations of the remediation program.

- The limits of the remedial excavation, as it actually will be opened, will be set by the clean-up goals that are presented in Section 6.1, below, as are the standards that will be used to determine whether treated or untreated soil may be used to backfill the remedial excavation.

- All soil sampling for confirmation that clean-up goals have been met in the floor and walls of the remedial excavation, and in treated soil that may be re-used as backfill in the remedial excavation, will be performed by a California Registered Geotechnical Engineer.

- The project engineer and remediation contractor will maintain close coordination with the ACEHCS Case Officer throughout the progress of the work. The results of soil analyses and other findings developed during the remediation program will be promptly transmitted to the Case Officer.

- The remedial excavation will be backfilled with engineered fill composed either of clean soil from the site, treated soil or imported material. As necessary, the imported material will include large 4-in. to 6-in. rock, which will be used to backfill any part of the excavation that is below the water table. This material will permit the backfilled ground to support heavy foundations; moreover, it will not be susceptible to liquefaction during a seismic event.

- When the remedial excavation has been backfilled and all affected soil stockpiles removed from the site, SNK will request the ACEHCS Case Officer to issue a letter that will permit construction of the SNK Andante

development to proceed immediately. This request will be supported by the remediation contractor's report on the remediation work that has been performed, which will include a record of all laboratory data generated.

[**Note:** To comply with the geotechnical engineering requirements for the buildings that will be included in the SNK Andante project (see Figure 4) following release of the site to SNK's general construction contractor, the existing soil on the site will be re-worked and re-compacted as engineered fill and brought to the required grade. That site preparation work will include removal of concrete and other debris contained in the existing fill and temporary excavation of soils to a depth of approximately 5 ft. beneath the elevation of the bottom of the building foundations over the entire area of the site.]

- If, after the remediation of soil in the affected area of the site has been completed, the ACEHCS Case Officer determines that additional monitoring of groundwater-quality is required, and the ERDA does not meet its obligations in that respect in a timely manner, as it should as the owner of the property on which the discharge of petroleum hydrocarbons occurred, an array of groundwater-quality wells will be installed under the scope of this Work Plan. The wells will be located in the streets adjacent to the 3992 San Pablo Avenue property and, if appropriate and practicable, in open areas within the constructed development.

- All work performed as part of the remediation program will be controlled by the Project-Specific Health and Safety Plan, which is included as Appendix B.

6.1 Clean-up Goals

As part of an aggressive remediation strategy, the preferred goal of the remediation program will be to remove any soil containing analytes of concern at any detectable level from the subsurface beneath the site. However, if such cannot be practicably achieved by the technologies proposed for the work, or if the cost would impair the economic viability of the planned Andante residential development project, the conservatively-derived cleanup goals shown in the table below will apply to the floor and walls of the remedial excavation and to any treated soil that might be re-used as backfill for the remedial excavation.

It is not expected that technical or economic issues will prevent remediation of soil in compliance with the clean-up goals stated below. However, if such is found to be the case, SJC will prepare a site-specific Tier 2 Risk-based Environmental Assessment based on the procedures specified by the American Society for Standards and Materials **(ASTM**) in its *Standard Guide for Risk-Based Corrective Action*, (ASTM Standard E2081-00) (American Society for Testing and Materials, 2001), which standard is consistent with United States Environmental Protection Agency (**USEPA**) guidelines (United States Environmental Protection Agency 1996 and 1998a). The risk computation will be made using the software

package RBCA Tool Kit - Chemical Releases, Version 1.3a (2000), or a later version if available, that is published by Groundwater Services Inc. of Houston, Texas.

Under the stated circumstances, but only after conferring with, and obtaining the approval of, ACEHCS's Case Officer, the results of the risk-based environmental assessment will be used as an alternate method to determine whether or not the site has been adequately remediated. If it is necessary to perform the risk-based assessment, that will be done before the remedial excavation is fully backfilled.

The proposed clean-up goals presented below are based on guidance provided to SJC by the ACEHCS Case Officer and the recommendation contained in the RWQCB's publication that cites (in Table D of the RWQCB document) that Agency's preferred clean-up standards for use in Tier 1, risk-based environmental assessments for subsurface soil at depths greater than 3 meters (approximately 9 ft.) at sites where groundwater is not a current or potential source of drinking water (California Regional Water Quality Control Board - San Francisco Bay Region 2001). Those clean-up standards are designed to be protective of groundwater and are thus more stringent than the standards that can be used at sites where no environmental risk other than those related to human health and safety must be considered.

Note: The groundwater in the shallow aquifers beneath the SNK Andante Project site is not a source of drinking water (California Regional Water Quality Control Board - San Francisco Bay Region 1999).

In the tables presented below, the proposed clean-up goals are, for those analytes for which such a standard has been established, compared to the USEPA Region IX Preliminary Remediation Goals (**PRG**) or, in those instances where that agency's goal is set at a lower concentration, to the similar goals published by the California Department of Toxic Substances Control **(DTSC**).

The US EPA's and the DTSC's PRGs are concerned with risks to human heath and safety but do not directly consider risks to groundwater quality. The USEPA and the DTSC use Residential PRGs to decide whether a site which a preliminary characterization has shown to be affected by regulated materials needs be investigated further or can be released for residential use without additional study or oversight by those agencies.

FOR SOIL REMAINING IN SITU FOLLOWING COMPLETION OF REMEDIAL EXCAVATION:

Analyte	**Proposed Clean-Up Goal**	**PRG Residential**
Total Petroleum hydrocarbons quantified as diesel (TPHd)	500 mg/Kg	Not Established
Total Petroleum hydrocarbons quantified as gasoline (TPHg)	400 mg/Kg	Not Established

Benzene:	0.18 mg/Kg	0.6 mg/Kg*
Toluene:	8.4 mg/Kg	520 mg/Kg*
Ethyl benzene:	24 mg/Kg	8.9 mg/Kg*
Total Xylene Isomers:	1.0 mg/Kg	270 mg/Kg*
Methyl tertiary butyl ether	1.0 mg/Kg	17 mg/Kg**

FOR TREATED SOIL RETURNED TO REMEDIAL EXCAVATION:

Analyte	**Proposed Clean-Up Goal**	**PRG Residential**
Total Petroleum hydrocarbons quantified as diesel (TPHd):	500 mg/Kg	Not Established
Total Petroleum hydrocarbons quantified as gasoline (TPHg):	100 mg/Kg	Not Established
Benzene:	ND	0.6 mg/Kg*
Toluene:	ND	520 mg/Kg*
Ethyl benzene:	ND	8.9 mg/Kg*
Total Xylene Isomers:	ND	270 mg/Kg*
Methyl tertiary butyl ether	1.0 mg/Kg	17 mg/Kg**

Notes:

ND = Not detectable at the method detection limit (MDL) of the analytical procedure used to measure the concentration of the applicable analyte.

* = US EPA Region IX PRG used when no more stringent goal has been set by the California Department of Toxic Substances Control DTSC.

** = California Department of Toxic Substances Control (**DTSC**) PRG.

7.0 PREPARATION FOR REMEDIATION

Following is a description of the security measures that will be taken and the work that will be performed to prepare for the phases of the program during which affected soil will be remediated.

7.1 Site Security

A chain link fence, 6 ft. in height, with lockable gates will secure the work site at all times until the project is completed.

No personnel, other than workers directly engaged in the remediation work or authorized representatives of the project engineers, SNK, the property owners or concerned regulatory agencies, shall be permitted to enter the property while the work is in progress. All visitors shall comply with the applicable requirements of SJC's *Master Health and Safety Plan.*

7.2 Detection of Underground Utilities

Prior to any excavation work being conducted on the site, the Underground Service Alert (**USA**) coordinator will be contacted so that the concerned public and private utility providers that serve the area will be notified and the locations of underground utilities present on, or in the area near, the site can be marked before any excavation is permitted on the property.

7.3 Notification to Alameda County Environmental Health Services

ACEHCS's Case Officer will be notified at least two days in advance of the date of initiation of the remediation work.

7.4 Notification to Air Quality Management District

At least five days before any excavations are opened on the site that might expose soil affected by volatile organic compounds, the remediation contractor will notify the SFBAAQMD in writing as required that agency's Rule 40 (8-4-402).

7.5 Excavation of Exploratory Trenches and Pits

To gain additional information about the characteristics and lateral and vertical extent of the affected soil in the area of the 3992 San Pablo Avenue property, three exploratory trenches will be excavated at the approximate locations shown on Figure 2. Those trenches will permit observation of the visual and olfactory condition of the soil in the subsurface so that the total depth to which it affected can be more precicely evaluated, to better delineate the lateral extent of the affected soil, and to assess, on a larger scale than has previously been

possible, the distribution and mean and maximum concentrations of analytes of concern in the subsurface.

If the findings from the three exploratory trenches currently planned indicate that additional trenches or exploratory pits are required to establish a good understanding of the lateral and vertical extent of the affected area of the subsurface, they will also be excavated during this first phase of the remediation program.

When exploratory trenches are opened in ground affected by fuel hydrocarbons, they permit the distribution of analytes of concern, including the demarcations between affected and clean soil to be easily seen; this allows an experienced engineer to more precisely target locations for soil sampling. Such detailed study, which is essential for the efficient and economical management of a remediation program, represents the correct standard of geotechnical practice for the planned work. These objectives cannot be achieved by subsurface investigations that rely on exploration by small-diameter borings alone.

Exploratory Trench No 1 (see Figure 2) is located so as to permit exploration of soil conditions in the area of the site that is furthest down the groundwater gradient and to identify the southern limit of the area of affected soil.

Trench No 2 is located so as to investigate the subsurface that, based on currently available information, appears to be the most severely affected by fuel hydrocarbons that migrated southward onto the SNK Andante Project site. It will also permit exploration of the maximum depth of affected soil at that location, as well as assist definition of the southern boundary of the area to be remediated.

Exploratory Trench No 3 is located so that it can be used to define more precisely the up-gradient (*i.e.*, eastern) limit of the area of the subsurface affected by the fuel hydrocarbons that migrated onto the subject property from the north.

When the exploratory trenches are being excavated, the project engineer or the remediation contractor will determine from which locations soil in the floors and walls of the trenches will be sampled to aid in refining understanding of the lateral and vertical extent and the characteristics of the affected area of the site. All samples will be recovered by a California Registered Geotechnical Engineer and they will be prepared and analyzed in compliance with the procedure specified in Section 9.0 of this Work Plan. The same engineer will also prepare geotechnical logs of the exploratory trenches or pits.

At least one of the exploratory trenches will be excavated to a depth that will expose the groundwater. This will permit the water table to be observed and any sheen of petroleum hydrocarbons or floating product that might be present to be identified. When the excavation has reached a depth a short distance beneath the groundwater table, a disposable plastic groundwater bailer will be submerged in the water and used to recover a sample that will be decanted so as to fill completely glassware supplied the laboratory that will perform soil and groundwater sample analyses for the remediation program. The methods of preparing the sample for shipping and analysis will be the same as those specified in Section 13.3 of this

Work Plan. When it reaches the laboratory the groundwater sample will be analyzed for TPH(d), TPH(g), the BTEX compounds and MTBE according to the analytical procedures that are also specified in Section 13.3.

The results from the analyses of the sample of groundwater that has been described above will provide an initial check on the concentrations of analytes of concern in the groundwater beneath the affected area on the 3992 San Pablo Avenue site and will be of considerable assistance in detailed planning for the following phases of the remediation program.

The remediation contractor, or the project engineer, will promptly report the observations made in the exploratory trenches and the results of analyses of soil samples and groundwater recovered from them will also be provided to the ACEHCS Case Officer.

While such a conclusion is not expected, if the results of conditions observed in the exploratory trenches are such that the cost of the remediation program will imperil the economic viability of the planned Andante Project, SNK will promptly notify ACEHCS and release the site back to the control of the City of Emeryville Redevelopment Agency.

7.6 Small-diameter Temporary Groundwater-quality Monitoring Wells

At the same time that exploratory trenches are being excavated, five small-diameter, temporary, groundwater-quality monitoring wells will be installed within and around the area of the 3992 San Pablo Avenue site where the subsurface is affected by fuel hydrocarbons. These will be used to improve present understanding of the distribution of analytes of concern in groundwater beneath that area.

7.6.1 Placement and Installation

The locations of the five small-diameter wells that are currently planned are shown on Figure 2.

Permits to install the temporary groundwater-quality monitoring wells will be obtained from the Alameda County Public Works Agency (**ACPWA**) before the borings are drilled.

Depending upon the groundwater-quality information obtained from visual or olfactory indicators and analyses of samples of groundwater recovered during the installation of the small-diameter wells, the project engineer may direct that additional temporary wells be installed or that the locations of the wells should be different from those that have been preliminarily planned.

The construction details of the temporary groundwater-quality monitoring wells are shown on Figure 5. They will be installed by “push” drilling techniques and will have casings 0.75-in. in diameter that will be installed directly into the boring without an annular space between the wall of the boring and the wall of the casing. The casings will be have machine slotted screens that will extend from a depth approximately 1 ft. above the water table to the full depth of the boring, which will be approximately 15 ft. BGS.

The geotechnical engineer responsible for the field work will log the borings drilled for the temporary wells and note any visual and olfactory indicators of the presence of hydrocarbons in the soil cores, which will be removed from the boring in 4-ft. long, transparent, plastic core liners.

When a well boring has been drilled to its total depth (15 ft), the temporary well casing will be installed and the well developed by bailing and false bailing using the drilling rig's drill stem and a 0.5-in. diameter bailer. Groundwater will then be left to reach equilibrium in each well before a groundwater sample is recovered from it.

When groundwater has reached equilibrium in the temporary wells, a conductivity probe will be used to measure the depth to the water table in each well.

The elevations of the top of the temporary well casings will be surveyed to an accuracy of plus or minus 0.01 ft. MSL by an elevational survey performed by the project engineer (who is also licensed to perform land surveying in the State of California). The engineer will use as an elevational reference Geodetic Survey Benchmark No. 7, which is a bronze disk that was established by the City of Oakland (but which is located within the City of Emeryville) on the west side of the concrete deck of the bridge that carries San Pablo Avenue over McArthur Street near the intersection of San Pablo Avenue, Adeline Street and 38th Street. That benchmark has an elevation of 34.78 ft. above the United States Geodetic Survey's Sea Level Datum of 1929.

The depths to groundwater measured in the temporary wells, together with the surveyed elevations of the tops of their casings will be used to construct groundwater contours and assesses the direction and gradient of groundwater flow.

7.6.2 Groundwater Sampling and Analysis Procedure (Temporary Wells)

1) Prior to recovery of a groundwater sample from a well, the well will be purged of a minimum of 5 casing volumes. The purge water will be temporarily held in 50-gallon steel drums until it can be economically disposed on to a stockpile of affected soil.

2) Samples will be recovered from each temporary well to be sampled using a stainless steel, 0.5-inch diameter bailer. Water brought to the surface in the bailer will be decanted so as to completely fill clean glassware supplied by the laboratory and which, in the case of sub-samples that will be analyzed for volatile organic compounds, will contain 1.0 ml of pre-dispensed hydrochloric acid as a preservative The sample vials will then be tightly closed, labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport, within 10 hours, to Severn Trent Laboratories (**STL**) laboratory in Pleasanton, California.

3) Each groundwater sample recovered from the temporary monitoring wells and submitted to the laboratory will be analyzed for the following suite of analytes.

Analyte	Method of Analysis
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Total Petroleum Hydrocarbons (quantified as Gasoline)	EPA Method 8260B
Benzene	EPA Method 8260B
Toluene	EPA Method 8260B
Ethyl benzene	EPA Method 8260B
Total Xylene Isomers	EPA Method 8260B
Methyl-tertiary butyl ether	EPA Method 8260B

STL is certified to perform the specified analyses by the California Department of Health Services (**DHS**).

7.6.3 Closure of Temporary Wells

When groundwater-quality monitoring using the temporary wells is complete, they will be closed by removing the casings and pressure grouting the boreholes with Type II Portland cement. The well closures will be performed under the permit and oversight of the ACPWA.

7.7 Removal of Pavement and Clean Shallow Soil

To permit excavation of the soil affected by fuel hydrocarbons, bituminous macadam (and as necessary concrete) paving over an area of approximately 240 feet by 100 feet in the northwest area of the subject property will be broken up and stockpiled on-site for later transport to an asphalt (or concrete) recycling facility.

Unless additional data gained from the exploratory trenches described in Section 7.5 indicate that it should be enlarged or reduced, the area of the remedial excavation will conform to the "Area to be Remediated" shown on Figure 2. It is presently expected that some 5,000 cubic yards of clean overburden soil, as measured in situ, will be removed and placed in a covered stockpile on-site for future use on the property or for application in beneficial use at an off-site location. The tentatively planned location of the clean-soil stockpile is shown on Figure 2.

The paving and soil removal will be performed using a Komatsu PC200-LC-5 heavy excavator equipped with a 1-1/2 cu. yd. bucket and a Case 821 front loader with a 4-cu. yd. bucket. This array of equipment is well suited to the work and will permit obstructions such as concrete slabs or other masses of hard material to be removed easily from the subsurface and managed in the appropriate manner.

8.0 EXCAVATION OF HYDROCARBON-AFFECTED SOIL

After the clean overburden is removed, excavation of the hydrocarbon-affected soil will be initiated. To provide for stability, the walls of the excavation will be sloped. The slope angle will be such as to ensure safety while the excavation is open and will be selected by the California-registered Geotechnical Engineer in Responsible Charge of the remediation program and that selection will be based on the soil characteristics, the depth to the water table, and the anticipated rate of excavation.

8.1 Excavation Below the Groundwater Table

Because soils at the depth of the groundwater table and down to the full depth of excavation that may be required to remove affected materials from the subsurface could flow into any excavation that penetrates below the water table, it may not be possible to use conventional excavation methods to remove soil from those depths.

To permit excavation below the water table, a technique developed by SJC for remediating sites under similar conditions to those present at the SNK Andante Project will be applied. This technique involves use of large sized crushed or river-run rock to stabilize the submerged walls and floor of small, cell excavations. These cells are left open for only the minimum time necessary for spoil to be removed from them and a sample to be recovered from the bottom of the cell. These excavation cells are overlapped to achieve complete excavation over the whole of the hydrocarbon-affected area.

A primary concern during the excavation of the contaminated soil will be for the safety of the excavation and the stability of the public streets, sidewalks and the underground utilities that run beneath them. These conditions require careful control of the size of the excavation cells and the time that they are permitted to be open before they are backfilled to prevent destabilization of adjacent ground.

However, if the sides of the excavation remain stable, the size of the individual submerged excavation cells can be increased and, under suitable conditions, can be on the order of one-eighth to one-half of the whole area of the final remedial excavation.

To ensure that unstable conditions do not develop, the Observational Method (Peck 1969) for management and control of geotechnical construction will be employed. To implement the method at the 3992 San Pablo Avenue property, the work will be performed under the direction of an experienced, California-licensed Geotechnical Engineer. To gain a direct understanding of how the walls and floor of the excavation will behave, at the initiation of the excavation work, a number of test cells will be opened in the northwestern part of the "Area to be Remediated" that is shown on Figure 2. Those test cells will be excavated to the depth required to remove hydrocarbon-affected soil. When soil excavated from the bottom floor of a cell is free of visual or olfactory indicators of contamination by gasoline or diesel and it is estimated that the concentrations of analytes of concern that it contains are at or below those specified as clean-up goals in Section 6.1, or the safe limits of excavation have

been reached, the floor of the cell in that area will be sampled and the samples preserved for laboratory analysis in the manner described in Section 9.0 of this Work Plan.

After samples are recovered from their bottoms, the cells below the water table will be immediately backfilled with 6-in. to 1-1/2-in., river-run surge rock containing no fines. The excavator will be used to distribute the rock over the area of the cell floor until the surface of the rock is a few inches above the water table. Each excavated and backfilled cell can then be used as dry, hard standing for the heavy equipment.

The test excavations will show whether the rock backfilling technique can be applied at the site and will provide useful information regarding the maximum size of a cell that can be safely excavated and the time available for sampling the soil at the bottom of the cell before the rock backfill has to be placed to prevent flowing soil from filling the excavation. If the maximum size of an excavation cell and the time over which it will remain temporarily stable is found to be small, it will be necessary to limit the plan dimensions of the cell to some 20 ft. by 20 ft., or smaller, and to recover a soil sample rapidly from the bottom so that the rock backfill can be placed with minimum delay.

Following its placement in the excavation, the clean, 6-in. to 1-1/2-in. rock will be thoroughly compacted using a heavy, vibratory compactor. Due to the large voids between the rocks, this material, when so compacted, can serve as support for heavy foundations and, because it has a very high permeability, it is not susceptible to liquefaction during a seismic event.

In addition to stabilizing wet or flowing soil in the excavation, the rock backfill also serves to provide a stable access to the areas of the excavation distant from the edges of the pit. By progressively overlapping excavation cells - from the northwest end of the excavation area towards the center - it will be possible to construct a submerged rock berm, the top of which is just above the water table. This permits the excavator to advance into the central area of the remedial excavation followed by the front-end loader, which will be used to transport the excavated soil to a temporary stockpile on the concrete-paved area of the property. Without this trafficable berm, the excavator and loader could sink into soft unstable soil.

8.2 Estimated Depth of Remedial Excavation

It is expected that the total depth of the remedial excavation will vary locally from 5 ft. to 15 ft., depending upon the concentration of analytes of concern that are found in the subsurface,' It is currently estimated that a total of some 5,000 cu. yd. of hydrocarbon-affected soil, as measured in situ, will be removed from the subsurface and placed in a temporary stockpile preparatory to its off-site disposal or on-site treatment.

8.3 Removal of Affected Soil to Stockpiles

The affected soil excavated from the subsurface will be placed in segregated stockpiles, which, except when they are being worked, sampled or loaded into trucks, will be covered by plastic sheeting that will have either no joints, or sealed joints, so as to comply with SFBAAQMD Rule 40 regulations. As is also required by Rule 40, the plastic sheeting will be weighted and anchored so that there will be the minimum headspace that can be practicably formed between the soil and the sheeting. The tentatively planned location for the stockpiles of affected soil is shown on Figure 2.

8.4 Management of Floating Product

If floating product is seen on the groundwater table after the first area of the remedial excavation has been opened down to the depth of the groundwater, it will be managed as follows.

An area of the largest practicable size that is expected by the project engineer to remain stable will be excavated into the bottom of the pit to a depth of one or two feet beneath the water table.

Before that pit is partially backfilled with rock, all of the floating product that flows into it, or migrates to it from surrounding areas of the subsurface will be extracted by skimming the product from the water table into a 4,000-gallon vacuum truck. When all floating product has been eliminated, or the truck is full, the load will be transported to a permitted facility for recycling in beneficial use.

As necessary, the water in the pit will be inspected daily over a period of days. If any floating product, or significant sheen, re-forms on its surface, the vacuum truck will again be used to remove it from the water table. If appropriate, a similar method of pumping and disposal can be used to extract and dispose off-site one or more volumes of groundwater affected by analytes of concern equal or greater in volume to that of the submerged portion of the remedial excavation.

9.0 SOIL SAMPLING IN REMEDIAL EXCAVATION

As noted above, when the remedial excavation reaches a depth at which the cleanup goals are expected to have been achieved, soil samples to quantify the success of the remediation will be recovered from the pit bottom. Samples will be recovered at the intersections of a 20 ft. by 20 ft. grid. Sidewall samples will be taken every 20 ft. around the perimeter of the excavation. If groundwater flows into the excavation, these samples will be recovered in the excavator bucket points around the perimeter of the excavation at which the submerged floor and the sidewalls meet around the perimeter of the pit. If the remedial excavation remains dry, the samples taken around the perimeter will be recovered at a height of 1 ft. above the floor of the pit.

To obtain samples for analysis, intact blocks of soil will be excavated from the target locations and raised to the surface in the excavator bucket. A face of the block of soil in the bucket will be cut with a shovel to expose an undisturbed surface and a clean, 2-in. diameter by 6-in. long, brass sampling tube will be driven into the cut soil face until the tube is completely filled with soil.

Following sample recovery, each sample tube will be cleaned externally, its ends covered with a Teflon sheet and closed with tightly-fitting plastic caps. The caps will be secured with adhesiveless tape. Each sample tube will be labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport to STL's laboratory in Pleasanton, California.

All confirmatory soil sampling and the sample preparation of conformation samples for analysis will be performed by a California Registered Geotechnical Engineer.

Each soil sample submitted to the laboratory will be analyzed for the following suite of analytes.

Analyte	**Method of Analysis**
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Total Petroleum Hydrocarbons (quantified as Gasoline)	EPA Method 8260B
Benzene	EPA Method 8260B
Toluene	EPA Method 8260B
Ethyl benzene	EPA Method 8260B

Total Xylene Isomers	EPA Method 8260B
Tertiary-Butyl alcohol	EPA Method 8260B
Methyl-tertiary butyl ether	EPA Method 8260B
Di-isopropyl ether	EPA Method 8260B
Ethyl tertiary-butyl ether	EPA Method 8260B
Tertiary-amyl methyl ether	EPA Method 8260B
Polynuclear Aromatic Compounds *	EPA Method 8270C

***Note:** In a first analysis of each sample, Polynuclear Aromatic Compounds (**PNA**) will be omitted from the analytical protocol, but if any detectable concentration of diesel is found in the sample, an analysis for PNA will be made. PNA analyses will be performed, as necessary, on confirmation samples intended to demonstrate that clean-up goals have been met. They will not be made on samples recovered solely to provide information to aid in assessing the extent or depth of soil remediation required.

Excluding samples analyzed to assist the remediation, and depending upon its final dimensions, some 60 soil samples will be recovered from the bottom of the remedial excavation.

Note: The laboratory certificates of analysis for all of the analyses reported herein will be provided to the ACEHCS Case Officer in submittals provided to that agency during the progress of the remediation work.

10.0 TESTING OF HYDROCARBONS IN STOCKPILES OF AFFECTED SOIL

As previously noted, hydrocarbon-affected soil removed from the subsurface in the affected area of the site will be stockpiled on the paved area of the property. The stockpile will be covered with plastic, which will either have no joints, or sealed joints, so as to comply with SFBAAQMD Rule 40 regulations, except when the stockpiles are being created, sampled or the soil is being loaded onto trucks.

When a stockpile area has been filled, or when site logistics demand, that stockpile of affected soil will be quartered and sampled to determine the range and mean concentration of components of fuel hydrocarbons it contains. A total of four samples will be taken - one from each quarter of the stockpile. The samples will be recovered by driving a clean, 2-in. diameter by 4-in. long, brass sampling tube into the bottom of a pit dug into the stockpile at each of the four designated sampling locations until the tube is completely filled with soil.

Following sample recovery, each sample tube will be cleaned externally, its ends covered with Teflon sheets and closed with tightly-fitting plastic caps. The caps will be secured with adhesiveless tape. Each sample tube will then be labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport to STL's laboratory within 24 hours.

At the laboratory, the samples will be composited and the composite sample will be analyzed for the following suite of analytes.

Analyte	**Method of Analysis**
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Total Petroleum Hydrocarbons (quantified as Gasoline)	EPA Method 8260B
Benzene	EPA Method 8260B
Toluene	EPA Method 8260B
Ethyl benzene	EPA Method 8260B
Total Xylene Isomers	EPA Method 8260B
Methyl-tertiary butyl ether	EPA Method 8260B
Polynuclear Aromatic Compounds	EPA Method 8270C

11.0 DISPOSAL OR TREATMENT OF HYDROCARBON-AFFECTED SOIL

The results from the analyses of the stockpiled soil will be used, together with other technical and economic data, to determine the most cost- and technically-effective method for management of the affected soil. Depending upon the findings from that evaluation, the affected soil will be either a) shipped to Allied Waste Industries Inc.'s Landfills or b) selected for on-site treatment.

11.1 Off-Site Disposal

If affected soil is disposed off-site, it will be removed from the covered stockpiles and loaded into end-dump trucks and covered by tarpaulin so that venting of volatile organic compounds will be minimized during transport as is required by SFBAAQMD Rule 40. The soil will be shipped under a Special Waste Manifest to Allied Waste Industries Inc.'s Landfill in Manteca, California for disposal.

11.2 On-site Treated of Soil by Aeration

If soil containing no more than 50 mg/Kg of volatile organic compounds (aeration of soil containing higher concentration of such compounds is prohibited by SABAAQND Rule 40) is to be treated on-site by aeration, the following procedures will be followed

1) The results of the analyses of the stockpiled soil obtained by the procedures described in Section 10.0 above will be used to estimate the number of samples from each spread of treated soil that will be needed to provide a statistically meaningful measure of components of hydrocarbon fuels remaining in the treated soil, according to the procedure presented in the US EPSA publication: *Methods of Evaluating the Attainment of Cleanup Standards.* Vol. 1. Soils and Solid Media. Report No. EPA 230/02-89-042 United States Environmental Protection Agency 1989).

2) The soil to be treated will then be excavated from the stockpiles in batches and laid down in the soil treatment area. A large front-end loader and agricultural tractor equipped with a rototiller will be used to thoroughly mix and spread the soil though its full thickness. Each spread of soil will be re-tilled, as necessary, until volatile analytes of concern contained in the soil in the spread have been reduced to less than the clean-up goals specified in this Work Plan.

3) Aeration of the spread soil will continue, as necessary, by daily rototilling and periodic re-stockpiling and spreading using the large front-end loader. Spread soil will be rototilled at least twice per day when the remediation site is otherwise active. When the site is not so active rototilling will be performed at least weekly.

4) As necessary, straw bails will be placed around the perimeter of the spread of soil to contain any precipitation that might fall and seep out from the soil spread.

5) When no olfactory indicators of components of gasoline or other short-chain hydrocarbons can be detected, treatment by aeration will be complete, at which time the spread soil will be sampled and the samples analyzed for TPH(g), TPH(d), the BTEX compounds, MTBE and PAH compounds, according to the protocol described in Section 11.4. If the measured concentrations of the analytes of concern meet the clean-up goals established for TPH(g), the BTEX compounds and MTBE in this Work Plan, aeration of the soil batch will complete. If not, aeration of the spread soil by roto-tilling and turning over with a front-end loader will continue until the clean-up criteria have been met.

6) The aerated soil will then be set aside for future use as backfill for the remedial excavation.

11.3 On-site Treatment of Soil by Bioremediation

If further treatment of the soil is required after treatment by aeration is complete, bioremediation of the aerated soil by land farming will be initiated. The activity of the native biota in the soil to be treated will be stimulated by providing access to oxygen (by tilling the spread soil) and nutrients in the form of common agricultural fertilizers (biostimulation).

If, although it is considered unlikely, the native biota are insufficient in number or activity to provide the desired conversion of hydrocarbons to carbon dioxide and water in a timely manner, the spread soil will be treated with an inoculum of imported biota if it is determined that such additional treatment would significantly reduce the time required to meet the clean-up goals defined in Section 6.1 of this Work Plan. The following procedures will be followed to effect the bioremediation.

1) A mixture of agricultural fertilizers containing nitrogen and phosphorus will be distributed over the entire spread of soil to be treated at a rate of one pound per square yard. This fertilizer mix will contain nutrients in the approximate ratios Phosphorus 2**:** Potassium 0**:** Nitrogen 10. Standard formulations of agricultural fertilizers are not usually available with these nutrient ratios but appropriate mixtures can be obtained by adding ammonium sulfate to commercially available mixes. The potassium content of the mixture applied to the spread soil will be held to the minimum practicable concentration.

2) The fertilizer will then be thoroughly roto-tilled into the spread soil.

3) An array of removable, minimal-discharge, irrigation spray nozzles will then be constructed over the soil spread to provide for complete coverage of the soil spread. The irrigation array will be supplied from a local fire hydrant.

4) The irrigation flow rate and timing will be adjusted to maintain soil moisture content to between 20% and 60% saturation.

5) The soil will be periodically analyzed for nitrogen, phosphorus content and pH.

   Note: The preferred pH of the soil is slightly alkaline at 7.0 to 7.5. If the pH varies significantly from this range, it will be cautiously adjusted by addition of judicious quantities of hydrated lime or an acid balance product. The nitrogen content of the soil should be maintained in excess of 5.0 ppm (parts per million) at all times; the concentration of phosphorus should be above 1.0 ppm.

6) As might be necessary from time to time, the prefabricated irrigation system will be removed from the soil spread and additional fertilizer broadcast at the rate of 1 lb. per square yard, or at such other rate as is indicated by the results of the soil tests noted in work element 5), above.

7) After the fertilizer has been spread, it will be roto-tilled and the soil and the irrigation system replaced and set it in operation.

8) When visual and olfactory indicators are such that all remnants of hydrocarbon fuels appear to have been removed from the bioremediated soil, or a maximum of fourteen days have elapsed since the irrigation system was reinstalled over the soil spread, samples will be recovered for analysis for TPH(d), TPH (g), the BTEX compounds. MTBE and PAH compounds according to the protocol described in Section 11.4.

The results from the analyses made on the samples recovered from the soil spread will then be examined to determine if traces of components of hydrocarbon fuels in the soil are less than the specified clean-up goals. If they are, bioremediation will be complete. If not, work elements 6) though 8) above will be repeated until the clean-up goals are met or an evaluation of the redevelopment schedule and budget indicates that off-site disposal of the soil at Allied Waste Industries' Class II Forward Landfill in Manteca, California as a special waste, or, if the treated soil is in a suitable condition, disposal at a local Class III landfill would be advantageous.

11.4 Sampling of Treated Soil

When treatment (either by aeration or bioremediation) of a spread of hydrocarbon-affected soil is judged to be complete, the following protocol will be used for sampling the spread soil to determine whether any remaining traces of fuel hydrocarbons are at concentrations above the applicable clean-up goals.

11.4.1 Selection of Sampling Locations

The soil spread in the treatment area will be subdivided into a numbered grid of approximately 20 equally-sized cells, each individual cell being identified by the row and column which contain it.

To select cells from within which samples of the treated soil are to be recovered, dice will be repeatedly tossed to yield randomly-paired sets of column letters and row numbers until an adequate number of cells are identified for sampling. The number of cells to be sampled will be determined by application of the USEPA procedure described in Section 11.5 of this Work Plan. Within each selected cell, a discrete sampling point will be arbitrarily selected by tossing a sampling tube into it without consideration for the appearance, olfactory properties or any other characteristic of the soil therein.

11.4.2 Sampling and Analysis Procedures

At each randomly selected sampling location, a shovel will be used to remove the top 3 inches of soil. A clean, 2-in. diameter by 4-in. long, brass sampling tube will then be driven into the wall of the small pit near its bottom until the tube is completely filled with treated soil.

Following sample recovery, each sample tube will be cleaned externally and its ends covered with Teflon tape and closed with tightly fitting plastic caps. The caps will be secured with adhesiveless tape. Each sample tube will be identified by the row and column number of the grid cell from which the sample that it contained has been recovered. The tubes will then be labeled accordingly for identification, entered into chain-of-custody control and packed on chemical ice for transport to STL's laboratory in Pleasanton, California within 10 hours.

Each sample of aerated soil submitted to the laboratory will be analyzed for the following suite of analytes.

Analyte	**Method of Analysis**
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Total Petroleum Hydrocarbons (quantified as Gasoline)	EPA Method 8260B
Benzene	EPA Method 8060B
Toluene	EPA Method 8060B
Ethyl Benzene	EPA Method 8060B
Total Xylene Isomers	EPA Method 8060B

Methyl-tertiary butyl ether	EPA Method 8260B
Polynuclear Aromatic Compounds *	EPA Method 8270C

*Note: Samples will be analyzed for PAH compounds only in cases where they contain detectable concentrations of diesel.

11.5 Statistical Evaluation of Results of Analyses of Treated Soil

The validity of any finding, with respect to the achievement of clean-up goals, made from the analyses of samples recovered from spreads of treated soil will be tested statistically in accordance with the procedures documented in *Methods of Evaluating the Attainment of Cleanup Standards. Vol.1. Soils and Solid Media* published by the USEPA (United States Environmental Protection Agency 1989).

The formula for an upper one-sided percent confidence limit around the mean of the result from the samples can be computed from:

$$\mu_{\upsilon\alpha} = \bar{x} + t_{1-\alpha,df} \cdot s/n^{½} \qquad \text{Equation (1)}$$

where:

$\mu_{\upsilon\alpha}$ = the one-sided confidence limit for a given degree of confidence α.

n = the number of samples recovered from the soil spread

$\bar{x}$ = the mean concentration of the analyte of concern in the samples recovered from the soil spread

s = the standard deviation of the concentrations of the analyte of concern detected in the samples recovered from the soil spread

α = the statistical false positive rate for the analyses of the soil samples

df = the number of degrees of freedom of the statistical data set (df = n-1)

$t_{1-\alpha,df}$ = statistical parameter, the value of which depends upon the percent confidence limit and the degrees of freedom (number of samples-1) of the statistical data set.

To confirm with the desired confidence level that nowhere in the soil spread is there any soil containing an analyte of concern at a concentration greater than the established clean-up criterion C_S, it is necessary that the value of $\mu_{\upsilon\alpha}$ is $< C_S$.

The appropriate value of $t_{1-\alpha,df\ can}$ be obtained from Table A.1 in Appendix A of the above-cited USEPA guidance document. That value will then be used with the statistical data from the results of analyses of the samples recovered from the soil spread.

If the computed value of $\mu_{\upsilon\alpha}$ is less than the clean-up criterion, it can be stated with the degree of confidence associated with the value of $t_{1-\alpha,df}$ obtained from the Table that, after treatment, none of the treated soil contained a concentration of the analyte of concern exceeding the applicable clean-up criterion.

In each case, when treatment of soil spread is completed, the results of the analyses of the soil samples recovered from the spread will be transmitted to ACEHCS together with the statistical analyses, so that the soil can be cleared for use as backfill on the site.

12.0 BACKFILLING OF REMEDIAL EXCAVATION

The remedial excavation will be backfilled either by clean soil that has been stockpiled on site, treated soil or by imported fill. As noted previously, to permit safe excavation, clean rock backfill will be placed in the excavation from the bottom of the excavation to the depth of the water table at the time soil affected by fuel hydrocarbons is removed from that zone of the subsurface. To prepare the rock already placed in the excavation for placement of this additional backfill, the front-end loader and excavator will be used to level its surface. It will then be thoroughly compacted using a 66-in., pad-footed, vibratory compactor.

To assess its properties for use as engineered fill, a representative 5-gal. sample will be recovered from off-site stockpile of backfill soil, or if applicable, the stockpile of treated soil and submitted to Inspection Consultants, Inc. of Emeryville, California (**Inspection Consultants)**. Inspection Consultants will develop a compaction curve for the material according to procedure D1557-00 published by the American Society for Testing and Materials (**ASTM**) (American Society for Testing and Materials 2000b) and will identify its maximum dry density and its optimum moisture content for use as backfill.

The front loader will then be used to place clean or treated soil over the rock in the remedial excavation and to spread in uniform, 6- to 8-in. high layers, each of which will be compacted using the vibratory compactor to achieve a minimum relative density of 90% (or such other density as might be specified by SNK's geotechnical engineer of record). Inspection Consultants will serve as independent testers of the compacted backfill and will use a nuclear density gauge, calibrated against the compaction curve issued by that company, to measure the relative density of the compacted backfill according to the procedure specified by ASTM Standard D2922 (American Society for Testing and Materials 2001b).

Placement of imported fill or treated soil in the remedial excavation will continue until its surface is at a level slightly above the elevation called for by the SNK Andante Project's site grading plan.

13.0 POST-REMEDIATION GROUNDWATER-QUALITY MONITORING

As was noted earlier, if the ACEHCS Case Officer determines that additional monitoring of the plume of affected groundwater emanating from the Celi's site is required after the remedial excavation on the SNK Andante project site has been backfilled, and if, by then, the ERDA has not met its obligations in that respect, or it appears that it will not do so in a timely manner, an array of wells will be installed to define and monitor the portions of the plume beneath the 3992 San Pablo Avenue property under the scope of this Work Plan.

13.1 Locations of Groundwater-Quality Monitoring Wells

If required, an array of four wells is planned. They will be located in the streets adjacent to the 3992 San Pablo Avenue property and, if appropriate and practicable, in open areas within the constructed development. Their proposed locations are shown on Figure 2. Each will have a total depth of 25 ft. Permits for installation of the proposed wells will be obtained from the ACDPW

Well SJC MW-1 is located in 40th Street to the east of the estimated up-gradient limit of the plume of affected groundwater emanating from the former Celi's service station site, the location of which is shown on Figure 4. It is expected that no detectable concentrations of analytes of concern, at least none that originated on the Celi's site, will be detected in samples recovered from this well

Well SJC MW-2 will be located just to the south of the sidewalk at the approximate mid-point between Well SJC MW-1 and San Pablo Avenue. It will monitor groundwater-quality in an area where, before remediation, the highest concentrations of analytes of concern on the SNK Andante Project site were found.

Well SJC MW-3 will be located in San Pablo Avenue along the approximate center line of the plume of affected groundwater, a short distance down gradient of the 3992 San Pablo Avenue property and the former Celi's site, on which property the petroleum hydrocarbons were discharged.

Well SJC MW-4 has been tentatively located to the south of the intersection of San Pablo Avenue and 40th Street at a location which is estimated to place it a moderate distance beyond the southern limit of the plume of affected groundwater. As is the case for Monitoring Well SJC MW-1, it is expected that no detectable concentrations of analytes of concern will be detected in samples recovered from this well.

The depths of the four monitoring wells will be guided by the presence or absence of visual and olfactory indicators of the presence of hydrocarbons in soil samples recovered from the well borings as they are drilled. Specifically, the depth of each well will be designed to penetrate at least 10 feet below the deepest point at which soil is affected by hydrocarbons. For planning purposes, it has been assumed that each well will be a minimum of 20 feet in total depth.

13.2 Installation of Monitoring Wells

Permits for proposed wells will be obtained from the ACDPW.

The well casings will be of 2-in. diameter PVC with 0.02-in., machine cut screen slots. The screen slots will extend from approximately one foot above the maximum elevation of groundwater that is known beneath the subject property down to the total depth of the well. These and other details of the well construction, including the bentonite well seals, the filter medium in the annular space between the well casing and the boring wall, and the arrangement of the well-head closure are shown on Figure 6.

The monitoring well borings will be advanced using an 8-in., open-stem auger drilling rig operated by a drilling contractor holding a C57 license issued by the CCSLB. A California-licensed geotechnical engineer will log the borings.

13.3 Recovery and Analysis of Soil Samples

While the borings for the proposed monitoring wells are being drilled, the drilling equipment will be used to recover soil samples in clean brass tubes from a depth of 5 ft. in each hole - and at 5 ft. intervals thereafter, to the bottom of the hole. However, the engineer may direct additional or alternate samples to be obtained if the conditions revealed by the boring indicate such to be appropriate.

Following sample recovery, each sample tube will be cleaned externally, its ends covered with Teflon foil and closed with tightly-fitting plastic caps secured with adhesive-less tape. Each sample tube will then be labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport to STL's laboratory in Pleasanton California within 24 hours.

Each soil sample submitted to the laboratory will be analyzed for the following suite of analytes.

Analyte	Method of Analysis
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Total Petroleum Hydrocarbons (quantified as Gasoline)	EPA Method 8260B
Benzene	EPA Method 8260B
Toluene	EPA Method 8260B
Ethyl benzene	EPA Method 8260B

Total Xylene Isomers EPA Method 8260B

13.4 Disposal of Drill Cuttings

The drill cuttings from the well borings will be retained at the well-heads in 50-gal. steel drums. When full, the drums will be closed and placed in secure storage on the 3992 San Pablo Avenue site until the analytical results performed on samples of soil and groundwater that will be recovered from the well borings and the completed wells are available. When the analytical results are obtained, the soil in the drums will be classified and, as appropriate, transported to Allied Waste Industries' Class II Forward Landfill in Manteca, California (or, in the case of clean cuttings, shipped to a local Class III landfill) for disposal.

13.5 Well Development

Following construction, the wells will be developed by pumping and surging and by bailing a minimum of 10 well volumes from each.

The development water will be retained at the well-head in closable 50-gal. open-topped, steel drums until the results of the analyses of samples of groundwater from the wells are received. Purge water from wells in which the groundwater is found to be clean will be discharged to the local sanitary sewer. Purge water affected by analytes of concern will be discharged into a close-topped storage tank for later transport to a recycling facility when sufficient contaminated well water has been accumulated to render such action economical.

In compliance with Sections 13700 through 13806 of the California Water Code regulatory requirements, a Well Closure Report (Form 188), together with attached boring logs and construction details, will be completed for each of the closed wells and filed with the California Department of Water Resources (**DWR**) with copies to the ACHCSA.

13.6 Survey of Well-head Locations and Elevations

The locations of the new wells will be surveyed and the elevations of both the top of casing and the well-head box cover frame of each will be determined relative to MSL by means of a leveling traverse that will use National Geodetic Survey Benchmark No. 7 as its primary elevational reference point, as was described in Section 7.6.1.

The locations of the well heads will be surveyed using a steel tape. In addition, to comply with Title 23, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 of the California Code of Regulations **(CCR**) the latitudes and longitudes of the well heads will be found using a Geographical Positioning System (GPS) instrument that is capable of a resolution of plus or minus one meter and that is approved for the purpose by the SWRCB.

13.7 Groundwater Sampling and Analysis

Following installation and development of the groundwater-quality monitoring wells, the depth to groundwater will be measured in each well, an initial round of samples will be recovered from them and the samples submitted for analysis. It is expected that more than one round of sampling and analysis may be required if it is found necessary to install the ground-water monitoring wells discussed in this section. The procedures described below will be used in each instance. (Note: If required, the groundwater monitoring described in this section will be in addition to the groundwater monitoring using temporary wells that was discussed in Section 7.6)

13.7.1 Determination of Groundwater Elevations

Prior to each round of groundwater sampling, the depth from the top of the casing to the water table will be measured using a water-depth meter. That data will be used to compute the groundwater table elevations relative to MSL. The computed groundwater table elevations will be used to produce contour maps of the groundwater table and to determine the direction and magnitude of the groundwater flow gradient.

13.7.2 Recovery and Analysis of Groundwater Samples

Prior to recovery of a groundwater sample, each well will be purged of a minimum of five casing volumes. The purge water will be temporarily held in 50-gallon steel drums until it can be economically disposed as described in Section 13.7.4.

Samples will be recovered from each monitoring well to be sampled using a dedicated bailer that will be left suspended in the well casing when not in use. Water brought to the surface in the bailers will be decanted so as to fill completely clean glassware supplied by the laboratory. The sample vials that will be used for analyses for volatile organic compounds will contain approximately 1.0 ml of Hydrochloric acid as a preservative. That preservative will have bean pre-dispensed into the glassware by the laboratory. The sample vials will then be tightly closed, labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport, within 24 hours, to STL's laboratory in Pleasanton, California.

Each groundwater sample will be analyzed for the following suite of analytes.

Analyte	**Method of Analysis**
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Total Petroleum Hydrocarbons (quantified as Gasoline)	EPA Method 8260B
Benzene	EPA Method 8260B

Toluene	EPA Method 8260B
Ethyl benzene	EPA Method 8260B
Total Xylene Isomers	EPA Method 8260B
tertiary-Butyl alcohol	EPA Method 8260B
Methyl-tertiary butyl ether	EPA Method 8260B
Di-isopropyl ether	EPA Method 8260B
Ethyl tertiary-butyl ether	EPA Method 8260B
Tertiary-amyl methyl ether	EPA Method 8260B
1,2 Dichloroethane	EPA Method 8260B

13.7.3 Disposal of Purge Water

When the results of the groundwater analyses are available, the concentration of contaminants, if any, in the purge water held in the 50-gallon drums will be determined. Clean water will be disposed to the municipal sewer. Contaminated water will be decanted into the 1,000-gallon tank that, as previously mentioned will be temporarily situated on the 3992 San Pablo Avenue property site. The accumulated purge water will be held in that tank until a sufficient amount has accumulated to render economical its disposal at a permitted treatment facility.

13.7.4 Well Completion and Other Reporting Requirements

In compliance with Sections 13700 through 13806 of the California Water Code regulatory requirements, Well Completion Reports (Form DWR 188) will be prepared for each well, if any such are required, that may be installed in the street adjacent to and on the subject property. The well completion reports, together with attached boring logs, well construction details and groundwater quality data will be filed, as is required by the regulations, with the California Department of Water Resources DWR and the ACDPW.

As required by California Assembly Bill 2886, in compliance with the SWRCB Underground Storage Tank Regulations under Title 23, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 of the California Code of Regulations (**CCR**), latitude and longitude, casing elevation, and depth to groundwater information regarding each installed well, and data regarding the quality of the water in each well, as well as a map of the site and its surrounding area, will be compiled in an electronic file and made available to the ERDA so that agency can upload them to the SWRCB's Geographic Environmental Information Management System database. The uploading will be ERDA's responsibly because, under

the applicable regulations, that agency, as owners of the former Celi's property (Global ID: T0600101794), has the sole authority to make such submissions for that discharge site, which was the source of the petroleum hydrocarbons that generated the plume of affected groundwater may have to be monitored under the scope of the Remediation Work Plan.

It is expected that if post-remediation groundwater quality monitoring wells must be installed they will be sampled, at least initially, on a quarterly schedule. Following each round of water-quality monitoring, the project engineer will prepare a Groundwater-quality Monitoring Report that will be submitted to ACEHCS.

14.0 REPORTING AND COORDINATION WITH ACEHCS

At least seven days before the remediation program is initiated, the remediation contractor will notify the ACEHCS Case Officer of the date and time that work will begin.

At least five days before any excavations are opened on the site that might expose soil affected by volatile organic compounds, the remediation contractor will notify the SFBAAQMD in writing as required that agency's Rule 40 (8-4-402).

The project engineer and remediation contractor will maintain close coordination with the ACEHCS Case Officer throughout the progress of the work. The results of soil analyses and other findings developed during the remediation program will be promptly transmitted to the Case Officer.

The results of all analyses of soil that are intended to demonstrate that clean-up standards have been met or that record successful treatment of affected soil, together with any other data pertinent to ACEHCS's oversight of the remediation, will be made available to the ACEHCS Case Officer as soon as practicable after they have been received by the remediation contractor and reviewed by the project engineer.

No part of the remedial excavation will be closed and no treated soil will be re-used on the site without the specific authorization of ACEHCS Case Officer. No treated or affected soil will be shipped off site except to a permitted facility that is approved by the ACEHCS Case Officer.

When the full scope of the remediation program is complete, the Engineer of Record will prepare a remediation report that will be submitted to ACEHCS for review.

15.0 AUTHORIZATION TO REDEVELOP THE PROPERTY

Following transmittal of the contractor's remediation report to the ACEHCS Case Officer upon completion of the backfilling of the remedial excavation, if she concurs, she will be requested to issue a timely notice to SNK, or the project engineer, that construction on the site may proceed. As soon as is practicable after receipt of that notice, SNK will initiate its construction program and will authorize its general contractor to remove the remaining concrete and bituminous macadam paving from the property and proceed with site grading.

16.0 REFERENCES

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TABLE 1

RESULTS OF ANALYSES OF SOIL SAMPLES FROM REMEDIAL EXCAVATION AT FORMER CELIS ALLIANCE SERVICE STATION 4000 SAN PABLO AVENUE

Sample ID	TRPH	TPHd (diesel)	TPHg (gasoline)	Benzene	Toluene	Ethyl-benzene	Total Xylenes
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Samples Recovered from Walls of Excavation [3]							
WC N-1	ND	21	920	2.6	21	11	57
WC N-2	ND	10	250	0.097	0.83	2.5	11
WC N-3	ND	96	390	0.38	3	3.6	17
WC N-4	160	310	85	0.16	ND	1	1.3
WC W-1 [5]	ND	ND	ND	ND	ND	ND	ND
WC W-2	ND	34	230	0.34	0.61	2.3	6.9
WC W-3	ND	180	20	0.012	0.01	0.029	0.043
WC W-4	150	500	80	ND	0.073	0.26	0.99
WC S-1 [5]	n/a	n/a	800	1.7	6	9.9	41
WC S-2 [5]	ND	60	430	0.4	0.2	4	12
WC S-3 [5]	n/a	n/a	730	1.4	ND	11	1.7
WC S-4 [5]	ND	25	560	ND	ND	5.6	13
WC E-1	n/a	n/a	240	0.33	3.5	3.4	16
WC E-2	ND	2	170	0.81	3.4	1.8	8.9
WC E-3	n/a	n/a	660	2.9	18	9.2	46
WC E-4 [5]	ND	5.2	380	2.6	12	4.9	24
Samples Recovered From Floor of Excavation [4]							
WC B-C-1	ND	68	260	0.081	0.11	2	8.4
WC B-O&G-1	ND	160	490	2.4	9.9	6.3	27
WC B-D-1	15,000	18,000	650	3.8	1.7	8.1	17
WC B-G-1 [5]	120	ND	540	0.64	ND	6.5	12
WC B-C-2 [5]	ND	75	1,000	2.4	10	11	49
WC B-C-3	ND	29	690	2.2	15	7.3	39

Notes:

(1) Data: Woodward-Clyde Consultants, Remediation Report, January 1995, Figure 4.
(2) ND = Not Detected above the Method Detection Limit (MDL).
(3) Soil samples recovered from approx. 8 ft. B.G.S.
(4) Floor of excavation approx. 9.5 ft. B.G.S.
(5) Sampling location near property boundary shared with 3992 San Pablo Avenue.
(6) n/a = Not Analyzed.

TABLE 2

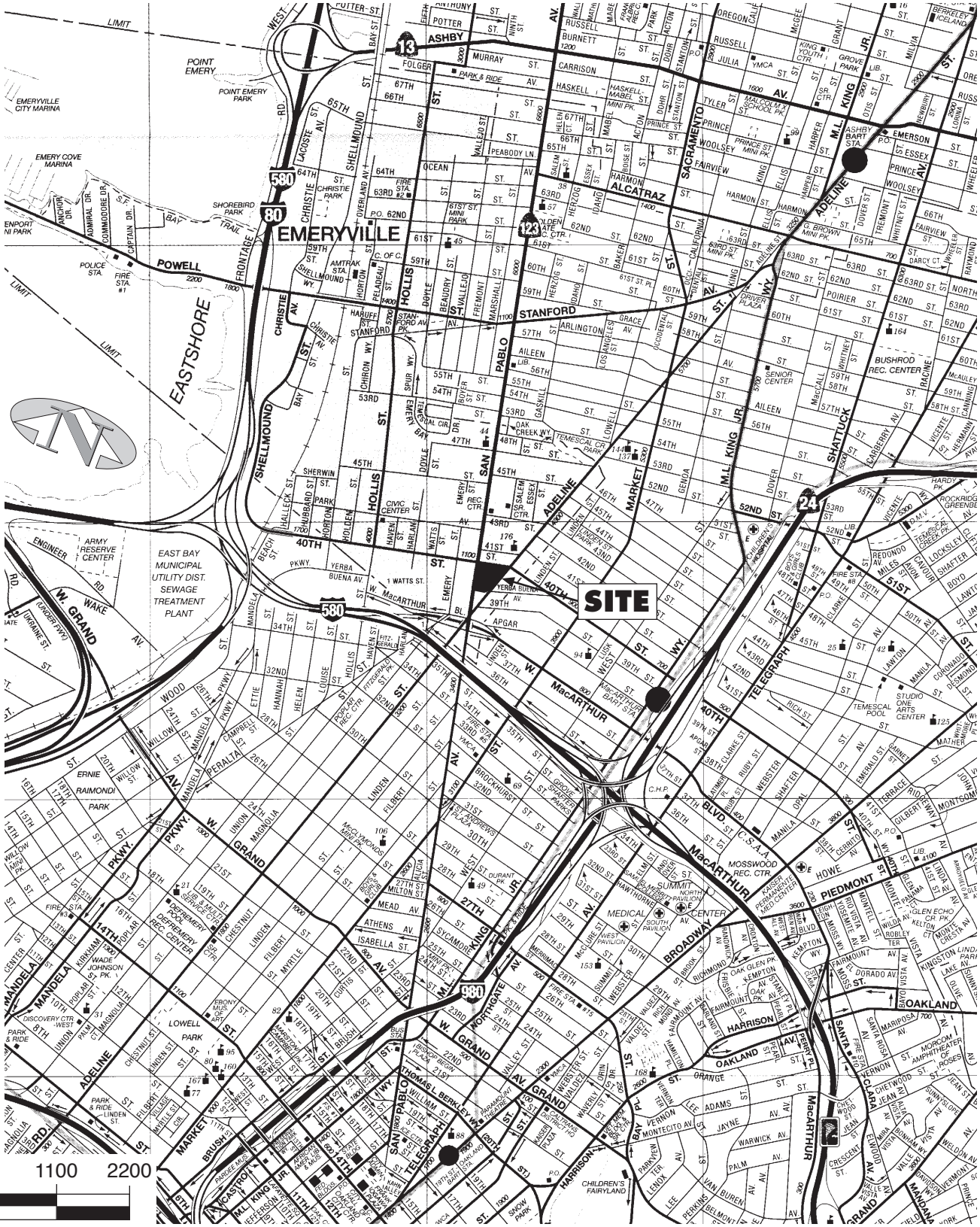
RESULTS OF ANALYSES OF SOIL SAMPLES FROM BORINGS [1]

Sample ID	Date Sampled	Depth BGS	TPHd (diesel)	TPHg (gasoline)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	Total Lead
		ft.	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
AE GP-1@5'	02/05/03	5	ND	ND	ND	ND	ND	ND	ND	6.35
AE GP-2@5'	02/05/03	5	ND	ND	0.0093	ND	ND	ND	ND	8.83
AE GP-2@8'	02/05/03	8	69	1,600	6.6	30	19	150	ND	4.16
AE GP-3@5'	02/05/03	5	1.6	ND	0.0081	ND	0.014	ND	ND	6.70
AE GP-4@8'	02/05/03	8	34	400	1.6	1.9	7.7	35	ND	4.58
AE GP-5@5'	02/05/03	5	130	42	0.17	0.013	0.69	0.48	ND	8.07
AE GP-5@10'	02/05/03	10	1.2	31	0.31	ND	0.53	1.7	0.0086	3.80
AE GP-6@5'	02/05/03	5	ND	ND	ND	ND	ND	ND	ND	10.3
AE GP-6@11'	02/05/03	11	ND	ND	ND	ND	ND	ND	ND	6.03
AE GP-7@5'	02/05/03	5	13	1.8	ND	0.0061	0.019	0.0055	ND	10.3
AE GP-7@10'	02/05/03	10	11	25	0.12	ND	1.2	0.23	0.0069	5.42
AE GP-8@10'	02/05/03	10	3.4	ND	ND	ND	ND	ND	ND	3.01
AE GP-9@5'	02/05/03	5	1,100	12,000	19	270	230	1,300	0.061	16.7
AE GP-10@6'	02/05/03	6	420	870	3.0	8.8	9.3	46	ND	8.41
AE GP-11@5'	02/05/03	5	6.2	4,900	3.3	61	92	590	ND	7.92
AE GP-11@10'	02/05/03	10	630	26	0.34	0.5	0.61	2.5	ND	6.84
AE GP-12@8'	02/05/03	8	ND	ND	ND	ND	ND	ND	ND	6.05
AE GP-13@8'	02/05/03	8	1.5	40	0.66	ND	1.6	3.2	0.0075	2.83
AE GP-16@5'	02/05/03	5	1.4	1.3	ND	ND	ND	ND	ND	5.57
AE GP-17@5'	02/05/03	5	ND	ND	ND	ND	ND	ND	ND	5.06
AE GP-18@5'	02/05/03	5	ND	ND	ND	ND	ND	ND	ND	6.52
AE GP-18@10'	02/05/03	10	15	ND	ND	ND	ND	ND	ND	2.17
AE GP-21@7'	02/05/03	7	ND	ND	ND	ND	ND	ND	ND	6.10
AE GP-22@7'	02/05/03	7	ND	ND	ND	ND	ND	ND	ND	4.46
AE GP-23@7'	02/05/03	7	41	ND	ND	ND	ND	ND	ND	4.58
AE GP-24@7'	02/05/03	7	140	ND	ND	ND	ND	ND	ND	4.28
AE GP-25@7'	02/05/03	7	54	ND	ND	ND	ND	ND	ND	4.58
AE GP-26@5'	02/05/03	5	ND	ND	ND	ND	ND	ND	ND	5.31
AE GP-27@5'	02/05/03	5	ND	ND	ND	ND	ND	ND	ND	4.14
AE GP-28@5'	02/05/03	5	ND	ND	ND	ND	ND	ND	ND	3.73
AE GP-29@5'	02/05/03	5	ND	ND	ND	ND	ND	ND	ND	5.05

Notes:

(1) Data Apex Envirotech, Inc. Subsurface Results Report, Table 1

(2) ND = Not Detected above the Method Detection Limit (MDL).



Basemap: AAA; Oakland-Berkeley-Alameda (12/02)

SITE LOCATION

SNK Andante - 3992 San Pablo Avenue
Emeryville, California

FIG 1	**The San Joaquin Company Inc.**	Project Number: 9401.204	
		Drawn by: GNM	Date: 03/02/03

40th Street Extension

Regional Direction of Groundwater Flow

TREE WELL (TYP.)

Area to be Remediated

40th Street

SJC MW-1

SJC MW-2

SJC MW-3

SJC MW-4

SJC MW-T1

SJC MW-T2

SJC MW-T3

SJC MW-T4

SJC MW-T5

HCPT-1

HCPT-2

HCPT-3

AEGP-1

AEGP-2

AEGP-3

AEGP-4

AEGP-5

AEGP-6

AEGP-7

AEGP-8

AEGP-9

AEGP-10

AEGP-11

AEGP-12

AEGP-13

AEGP-14

AEGP-15

AEGP-16

AEGP-17

AEGP-18

AEGP-19

AEGP-20

AEGP-21

AEGP-22

AEGP-23

AEGP-24

AEGP-25

AEGP-26

AEGP-27

AEGP-28

AEGP-29

HEB-1

HEB-2

HEB-3

HEB-4

HEB-5

HEB-6

HEB-7

HEB-8

HEB-9

HEB-10

HEB-11

HEB-12

Trench 1

Trench 2

Trench 3

Soil Treatment Area

Clean Soil Stockpile Area

Affected Stockpile Area

San Pablo Avenue

Adeline Street

Bank Club
3900 San Pablo Ave.

6' C.L. FENCE

TREE

SSMH

TEL MH

EBMUD MH

MH USE UNKNOWN

CB

D/W

EXPLANATION

- AEGP-6 — APEX Envirotech , Inc. Boring (existing)
- HEB-5 — Harza Exploratory Boring (existing)
- HCPT-3 — Harza Cone Penetration Test (existing)
- SJC MW-T1 — Temporary Groundwater Monitoring Well (proposed)
- SJC MW-1 — Groundwater Monitoring Well (proposed)
- Exploratory Trench (proposed)

0 20 40

SCALE IN FEET

Base Map: Sandis Humber Jones
ALTA / ACSM Land Title Survey; San Pablo Ave. & 40th Street Extension
Drawing No. 600104.ALTA (7/25/01)

SITE PLAN
SNK Andante - 3992 San Pablo Avenue
Emeryville, California

FIG 2

The San Joaquin Company Inc.

Project Number: 9401.204
Drawn by: GNM | Date: 03/20/03

Former 550gal. Waste Oil UST

Location of Former Fuel UST

Former 7500gal. Diesel UST

Former Celi's Alliance Gas Station 4000 San Pablo Avenue

Former Anderson Linoleum and Carpet Sales Warehouse

Former San Francisco French Bread Bakery

Former Remedial Excavation

40th Street Extension

40th Street

Former 6000gal. Regular Gas UST

Former 2000gal. Unleaded Gas UST

Former 3500gal. Super Unleaded Gas UST

Former 4000gal. Unleaded Gas UST

WCN-4 WCN-3 WCN-2 WCN-1

WCW-4 WCW-3 WCW-2 WCW-1

WCB-D-1 WCB-O&G-1 WCB-C-3 WCB-C-1 WCB-G-1 WCB-C-2

WCE-1 WCE-2 WCE-3 WCE-4

WCS-4 WCS-3 WCS-2 WCS-1

AEGP-1 AEGP-2 AEGP-3 AEGP-4 AEGP-5 AEGP-6 AEGP-7 AEGP-8 AEGP-9 AEGP-10 AEGP-11 AEGP-12 AEGP-13 AEGP-14 AEGP-15 AEGP-16 AEGP-17 AEGP-18 AEGP-19 AEGP-20 AEGP-21 AEGP-22 AEGP-23 AEGP-24 AEGP-25 AEGP-26 AEGP-27 AEGP-28 AEGP-29

Trench 1 Trench 2 Trench 3

Regional Direction of Groundwater Flow

Area to be Remediated

Soil Treatment Area

Clean Soil Stockpile Area

Affected Stockpile Area

3992 San Pablo Avenue

San Pablo Avenue

Adeline Street

TREEWELL (TYP.)

SSMH SDMH EBMUD MH TEL MH CB TREE D/W

MH USE UNKNOWN

37' 53' 35' 45' 2' 5'

EXPLANATION

- WCW-1 Woodward-Clyde Soil Sample
- Exploratory Trench
- AEGP-6 APEX Envirotech , Inc. Boring

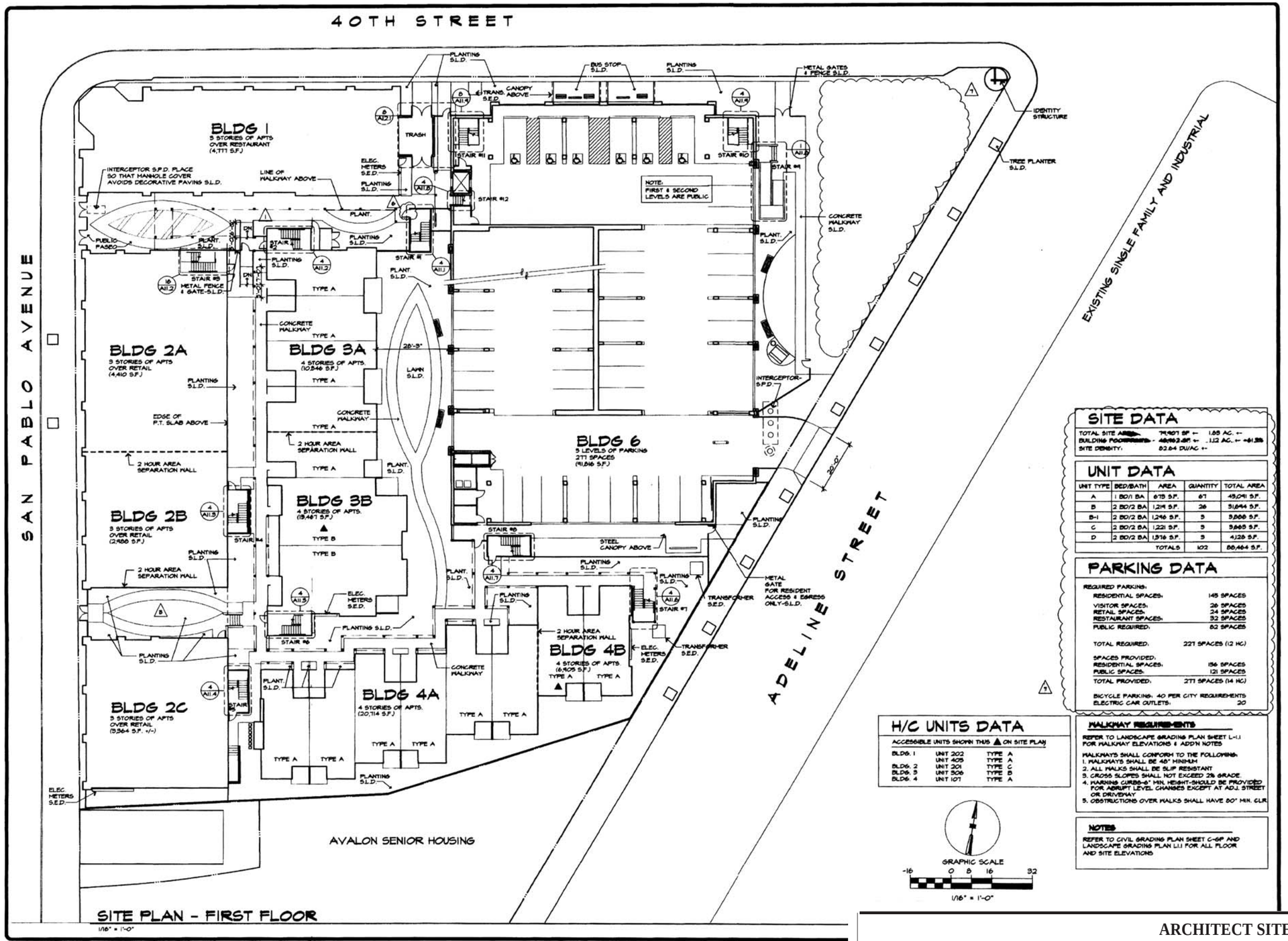
0 20 40

SCALE IN FEET

Base Map: Sandis Humber Jones
ALTA / ACSM Land Title Survey; San Pablo Ave. & 40th Street Extension
Drawing No. 600104.ALTA (7/25/01)

SAMPLING LOCATIONS AT FORMER CELI'S GAS STATION
SNK Andante - 3992 San Pablo Avenue
Emeryville, California

FIG 3	**The San Joaquin Company Inc.**	Project Number: 9401.204
		Drawn by: GNM Date: 03/09/03



SITE DATA			
TOTAL SITE AREA:	74,907 SF +-	1.69 AC. +-	
BUILDING FOOTPRINT:	48,962 SF +-	1.12 AC. +-	+61.3%
SITE DENSITY:	62.64 DU/AC +-		

UNIT DATA

UNIT TYPE	BED/BATH	AREA	QUANTITY	TOTAL AREA
A	1 BD/1 BA	675 S.F.	67	45,041 S.F.
B	2 BD/2 BA	1,214 S.F.	26	31,564 S.F.
B-1	2 BD/2 BA	1,246 S.F.	5	5,868 S.F.
C	2 BD/2 BA	1,221 S.F.	5	5,865 S.F.
D	2 BD/2 BA	1,376 S.F.	3	4,128 S.F.
		TOTALS	102	88,464 S.F.

PARKING DATA

REQUIRED PARKING:

RESIDENTIAL SPACES:	145 SPACES
VISITOR SPACES:	26 SPACES
RETAIL SPACES:	24 SPACES
RESTAURANT SPACES:	32 SPACES
PUBLIC REQUIRED:	82 SPACES
TOTAL REQUIRED:	227 SPACES (12 HC)
SPACES PROVIDED:	
RESIDENTIAL SPACES:	156 SPACES
PUBLIC SPACES:	121 SPACES
TOTAL PROVIDED:	277 SPACES (14 HC)

BICYCLE PARKING: 40 PER CITY REQUIREMENTS
ELECTRIC CAR OUTLETS: 20

H/C UNITS DATA

ACCESSIBLE UNITS SHOWN THUS ▲ ON SITE PLAN

BLDG. 1	UNIT 202	TYPE A
	UNIT 405	TYPE A
BLDG. 2	UNIT 201	TYPE C
BLDG. 3	UNIT 306	TYPE B
BLDG. 4	UNIT 107	TYPE A

WALKWAY REQUIREMENTS

REFER TO LANDSCAPE GRADING PLAN SHEET L-1.1 FOR WALKWAY ELEVATIONS & ADD'N NOTES

WALKWAYS SHALL CONFORM TO THE FOLLOWING:
1. WALKWAYS SHALL BE 48" MINIMUM
2. ALL WALKS SHALL BE SLIP RESISTANT
3. CROSS SLOPES SHALL NOT EXCEED 2% GRADE.
4. WARNING CURBS-6" MIN. HEIGHT-SHOULD BE PROVIDED FOR ABRUPT LEVEL CHANGES EXCEPT AT ADJ. STREET OR DRIVEWAY
5. OBSTRUCTIONS OVER WALKS SHALL HAVE 80" MIN. CLR.

NOTES

REFER TO CIVIL GRADING PLAN SHEET C-GP AND LANDSCAPE GRADING PLAN L1.1 FOR ALL FLOOR AND SITE ELEVATIONS

GRAPHIC SCALE
-16 0 8 16 32
1/16" = 1'-0"

revisions	
1 PLAN CHANGE 10/25/02	BR
2 PLAN CHANGE 12/16/02	BR
3 PLAN CHANGE 2/18/03	BR
4 COORDINATION 4/01/03	BR
5 CONSTRUCTION SET 7/28/03	BR
6 OWNER COMMENTS 10/08/03	BR
7 OFFICE DELETION 10/29/03	BR
8 UNIT PLAN REV. 2/11/03	BR

HDO
architects - planners
2480 camino diablo
suite 110
walnut creek, ca
94596
(925) 934-4306

ANDANTE EMERYVILLE
102 UNIT MIXED USE COMMUNITY
FOR:
SNK DEVELOPMENT INC.

[redacted]

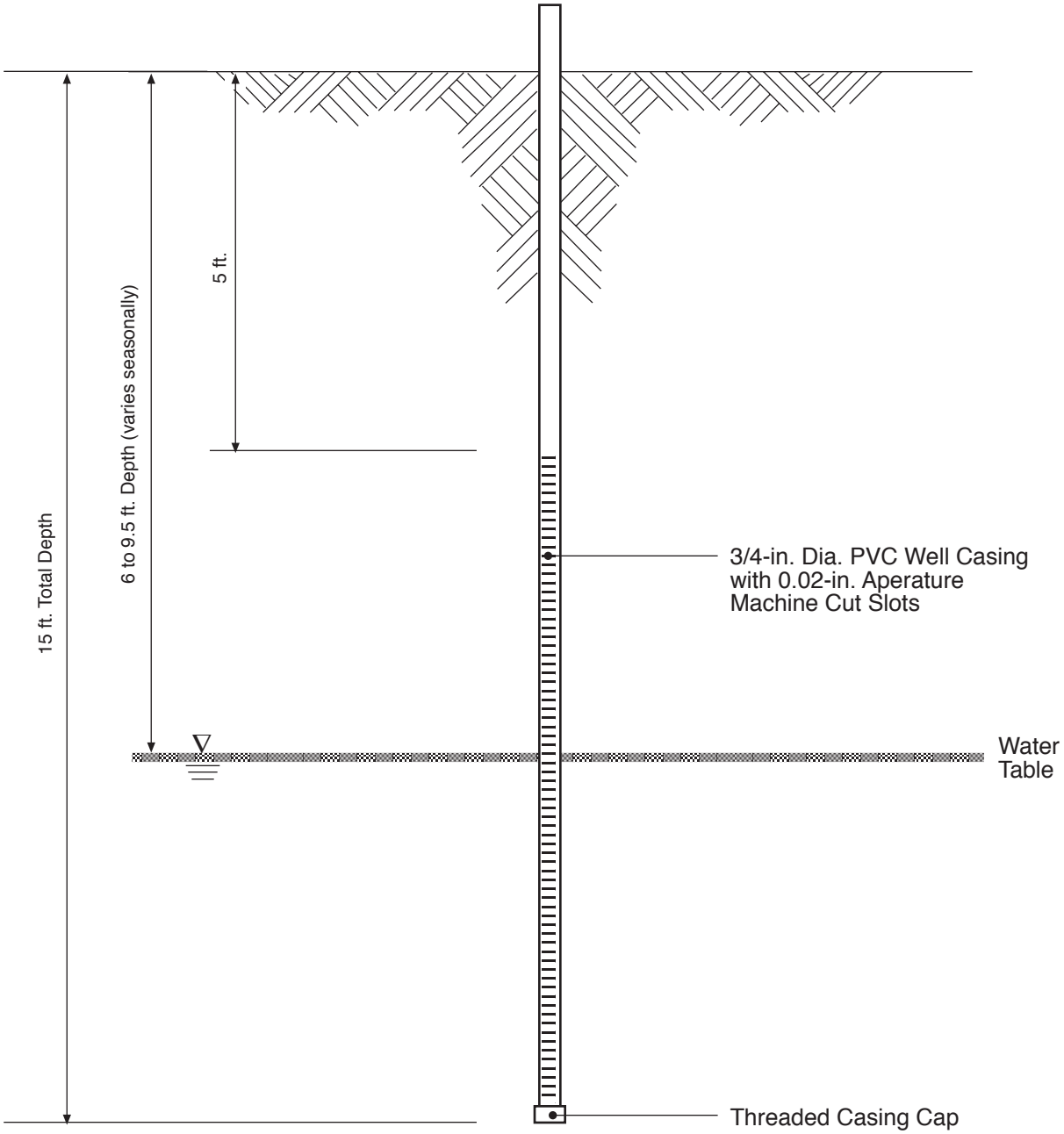
drawing
SITE PLAN
FIRST FLOOR

drawn TJ
checked RH
date 7/3/01
scale 1/16" = 1'-0"
job no 9915
sheet A2.1

Base Map: HDO Architects, Planners
Site Plan, 1s Floor - Andante Emeryville, 102 Unit Mixed Use Community
Job No. 9915 • Drawing No. Sheet A2.1 of 67 (rev.2/11/03)

ARCHITECT SITE PLAN
SNK Andante - 3992 San Pablo Avenue
Emeryville, California

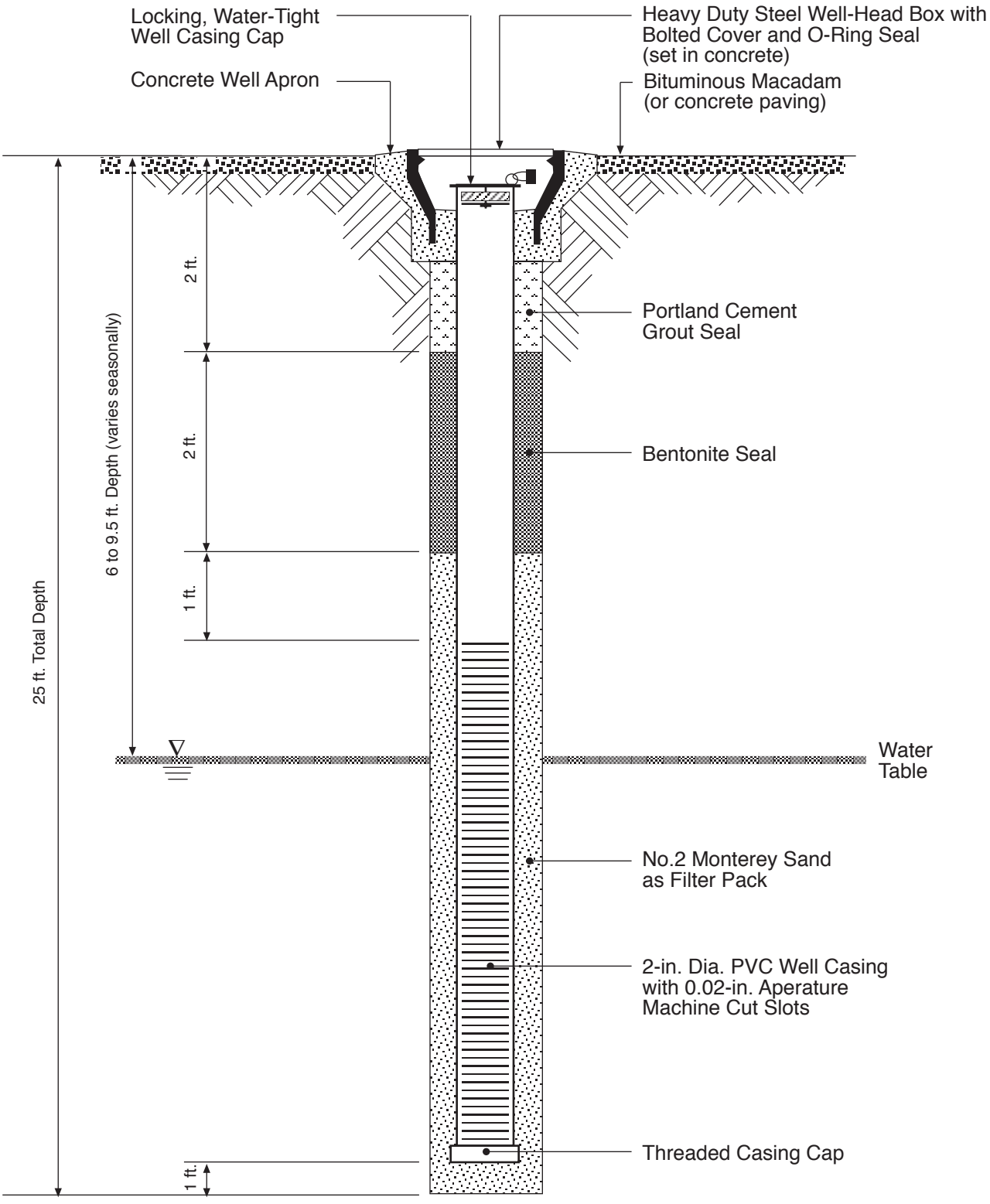
FIG 4	**The San Joaquin Company Inc.**	Project Number: 9401.204	
		Drawn by: GNM	Date: 03/19/03



NOT TO SCALE

TEMPORARY GROUNDWATER MONITORING WELL
SNK Andante - 3992 San Pablo Avenue
Emeryville, California

FIG 5	**The San Joaquin Company, Inc.**	Project Number: 9401.204	
		Drawn by: GNM	Date: 03/20/03



STANDARD GROUNDWATER MONITORING WELL
SNK Andante - 3992 San Pablo Avenue
Emeryville, California

FIG 6	**The San Joaquin Company, Inc.**	Project Number: 9401.204
		Drawn by: GNM | Date: 03/20/03

APPENDIX A

Boring Logs

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
PAVEMENT: 3 inches of AC over 8 inches of AB									
FILL: CLAY (CL), dark brown to black, silty, trace gravel (fine, angular), moist	Very Stiff				37				PP > 4.5 tsf
some silt below 3 feet					28	22	104		PP = 2.25 tsf
CLAY (CL), light brown, moist	Very Stiff		5		16				
mottled orange & black, some sand (fine-grained) below 8½ feet			10		41				PP = 1.75 tsf
brown, mottled black, some sand (fine- & medium-grained) below 13½ feet	Hard		15		64				PP > 4.5 tsf
CLAY (CL), rusted brown, with sand (fine- to coarse-grained), moist to wet	Very Stiff		20		40	22	106		PP = 1.75 tsf
some sand, moist within this sample	Hard				50/6"				

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-1

File Name: G:\ENGINEER\GINTW\PROJECTS\17762-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Hard								
SAND (SC), rusted brown, mottled black, fine- to coarse-grained, with clay, trace gravel (fine, subangular), wet to saturated	Medium Dense		30		24				
interbedded layers of fine-grained sand and clay within this sample			35		50	25	99		Gradation Test Passing No.200 Sieve = 78%
			40		15				

Bottom of Boring = 40 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-1

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	18.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
PAVEMENT: 3 inches of AC over 8 inches of AB									
FILL: CLAY (CL), black, silty, moist	Very Stiff				39	25	96		PP = 2.5 tsf LL=40, PI=21, Passing No.200 Sieve = 75% PP = 2.5 tsf
					38				
CLAY (CL), light brown, some sand (fine- to coarse-grained), trace gravel (fine, angular), moist	Very Stiff		5		20				
mottled orange & black, some gravel (fine, angular to subangular) below 8 ½ feet					44	19	111		PP = 3.25 tsf
			10						
brown, mottled black below 13½ feet	Hard				90				PP > 4.5 tsf
			15						
SAND (SC), rusted brown, fine- to coarse-grained, with clay, trace gravel (fine, angular to subangular)	Dense				52	▽			
			20						
mottled black below 23½ feet					50				

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-2

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	18.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
SAND (SC), continued	Dense								
clayey below 28½ feet	Medium Dense		30		24				
CLAY (CL), brown, mottled red	Hard		35		36				

Bottom of Boring = 35 Feet

Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 18 ½ feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet
7. LL = Liquid Limit, PI = Plasticity Index.

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-2

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	20 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
PAVEMENT: 4 inches of AC over 8 inches of AB									
FILL: CLAY (CL), black, mottled dark brown, trace sand (fine-grained), moist	Stiff				20				PP = 0.75 tsf
					24				
			5		22	26	98	2.3	
SAND (SC), light brown, mottled orange, fine- to coarse-grained, with clay, moist	Medium Dense								
some clay, trace gravel (fine, angular to subangular), wet below 8½ feet					32	22	103		
			10						
					22				
CLAY (CL), light brown, mottled orange, some sand (fine- to coarse-grained), moist	Very Stiff		15						
SAND (SC), rusted brown, mottled black, fine- to coarse-grained, with clay, moist	Medium Dense				31	▽			
			20						
	Dense				43				

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-3

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	20 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
SAND (SC), continued	Dense								
CLAY (CL), rusted brown, some sand (fine- to coarse-grained)	Very Stiff		30		22				
trace sand below 33½ feet			35		26				

Bottom of Boring = 35 Feet

Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 20 feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-3

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
PAVEMENT: 2 inches AC over 10 inches AB									
FILL: CLAY (CL), mottled black and orange, with sand (fine- to coarse-grained), some silt, damp	Very Stiff				46				
	Stiff				13				
FILL: CLAY (CL), dark brown, mottled orange, some sand (fine- to coarse-grained), damp	Very Stiff		5		26				
CLAY (CL), mottled light brown and orange, some sand (fine- to coarse-grained), trace roots, moist	Hard		10		57				
(rusted brown, with fine- to coarse-grained sand below 13½ feet)			15		33				
(rusted brown, some fine-grained sand below 18½ feet)	Stiff		20		41	28	93		PP = 2.0 tsf
	Hard				33				

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-4

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	---	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
CLAY (CL), continued	Hard								
(trace fine-grained sand, wet below 28½ feet)	Stiff		30		25				

Bottom of Boring = 30 Feet

Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-4

File Name: G:\ENGINEERING\TWPROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	---	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
PAVEMENT: 1 inches of AC over 6 inches of AB	Hard								
FILL: CLAY (CL), dark gray & brown, sandy (fine- to coarse-grained), trace gravel (fine, subangular), moist					50/6"				
gravelly below 2 feet	Very Stiff				19				
FILL: CLAY (CL), dark gray, mottled brown, some silt, moist	Stiff		5		12				
CLAY (CL), greenish gray, mottled orange, moist	Very Stiff								
gasoline and other contaminants present below 8½ feet					30				
			10						

Bottom of Boring = 10 Feet

Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-5

File Name: G:\ENGINEERING\NTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
PAVEMENT: 2 inches of AC over 10 inches of AB									
FILL: SAND (SC), brown, fine- to coarse-grained, some clay, trace gravel (fine, angular), moist	Loose				14				
CLAY (CL), dark gray, mottled brown, trace gravel (fine, angular), moist	Stiff				14				PP = 1.0 tsf
	Very Stiff		5		19	28	94	1.7	
CLAY (CL), greenish gray, mottled brown, some silt, trace sand (fine-grained), trace gravel (fine, subangular), with gasoline smell, moist	Very Stiff				44				PP =3.75 tsf
			10						

Bottom of Boring = 10 Feet

Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-6

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	35 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Very Stiff								PP = 2.75 tsf
(silty at 29 feet)			30		47				
	Hard		35		33	▽			
									Gradation Test Passing No.200 Sieve = 16%
SAND (SW-SC), brown, fine- to coarse-grained, trace clay	Dense		40		41				

Bottom of Boring = 40 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 35 feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-7

File Name: G:\ENGINEERING\NTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	---	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
PAVEMENT: 3 inches of AC over 9 inches of AB									
FILL: CLAY (CL), dark gray,trace sand (fine- to coarse-grained), wet	Soft				3	36	85	0.2	
	Firm				12				
FILL: BRICKS, with chemical contaminants present	Dense				50/5"				
clay at 5 feet	Stiff		5		25				

Bottom of Boring = 6 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	**December 2000**	**EB-8**

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	---	LOGGED BY	VWC
DEPTH TO GROUND WATER	Not Encountered	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
PAVEMENT: 3 inches of AC over 9 inches of AB									
FILL: BRICKS, red									
concrete debris at 4½ feet			5		18				
CLAY (CL), dark gray, some silt, moist	Very Stiff								
CLAY (CL), greenish gray, some silt, with chemical contaminant smell, moist	Very Stiff		10		29				

Bottom of Boring = 10 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was not encountered during drilling.
5. The boring was grouted with neat cement immediately upon completion.

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-9

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	15 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
PAVEMENT: 3 inches of AC over 10 inches of AB									
FILL: CLAY (CL), dark grey, mottled brown, some silt, moist	Very Stiff				39				
					30				
CLAY (CL), grey-brown, some silt, moist	Stiff		5		12				
(dark brown at 9 feet)	Very Stiff				34				
SAND (SC), brown, fine- to coarse-grained, with clay, moist	Dense		10						
					75	19	112		
CLAY (CL), brown, some silt, trace sand (fine- to coarse-grained), trace gravel (fine, subangular), wet	Stiff		15						
			20		14				
	Hard				55	21	109		

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-10

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	13.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
PAVEMENT: 2 inches of AC **FILL: GRAVEL (GC)**, gray, fine to coarse, angular, some sand (fine- to coarse-grained), some clay and silt, damp	Medium Dense				28				
	Loose				15				
CLAY (CL) dark brown, mottled orange, some silt, trace sand (fine-grained), moist to wet	Firm		5		6				
CLAY (CL), dark brown and orange, with sand (fine- to coarse-grained), trace gravel (fine, angular to subangular), moist	Very Stiff		10		42				PP = 3.0 tsf
CLAY (CL), light brown, mottled orange, some silt, trace fine-grained sand)	Very Stiff		15		34	20	110	7.7	PP = 2.75 tsf
CLAY (CL), rusted brown, with sand (fine- to coarse-grained sand)	Very Stiff		20		29				
(some sand below 23½ feet)					58				

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-11

File Name: G:\ENGINEERING\INTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	13.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
CLAY (CL), continued	Very Stiff								PP = 2.25 tsf
			30		35	24	104		PP = 3.50 tsf
(trace fine-grained sand below 33½ feet)	Stiff				14				
			35						
(silty at 39 feet)					45				
(sandy, fine- to coarse-grained, at 40 feet)			40						PP = 2.0 tsf
			45						
(mottled black, trace fine-grained sand below 48½ feet)					35	24			

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-11

File Name: G:\ENGINEER\GINTWAPROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	---	LOGGED BY	VWC
DEPTH TO GROUND WATER	13.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE							
CLAY (CL), continued	Stiff								
			55						
(sandy at 59 feet)					53				
			60						
SAND (SC), rusted brown, fine- to coarse-grained, with clay	Very Dense								
			65		53				
CLAY (CL), mottled brown and black, some sand (fine-grained)	Hard								
			70		52				

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-11

File Name: G:\ENGINEER\GINTWPROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	13.5 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Hard		80		85/11"				

Bottom of Boring = 80 Feet

Notes:

1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 13 ½ feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-11

File Name: G:\ENGINEERING\NTWPROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	30 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
FILL: GRAVEL (GM), grey, fine to coarse, angular, some sand (fine- to coarse-grained), trace silt, damp									
FILL: CLAY (CL), black, mottled brown, some silt, moist to wet	Very Stiff				31	26	97	3.4	PP = 1.0 tsf LL=48, PI=31, Passing No.200 Sieve = 96%
(dark gray, trace coarse-grained sand below 4 feet)			5		18				
SILT (ML), gray-brown, some clay, some sand (fine- to coarse-grained), moist	Very Stiff				45	16	116		
			10						
CLAY (CL), brown, mottled black, some silt, trace sand (fine-grained), moist	Very Stiff				33				PP = 4.0 tsf
			15						
(rusted brown below 18½ feet)					26				
			20						
(some fine-grained sand, trace fine and subangular gravel below 23½ feet)	Hard				60				

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-12

File Name: G:\ENGINEER\GINTW\PROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

DRILL RIG	Mobile B-53, HSA	SURFACE ELEVATION	—	LOGGED BY	VWC
DEPTH TO GROUND WATER	30 feet	BORING DIAMETER	8-inch	DATE DRILLED	8/2/00

DESCRIPTION AND CLASSIFICATION			DEPTH	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
CLAY (CL), continued	Hard		30			▽			
SAND (SW-SC), brown, fine- to coarse-grained, trace grvel (fine, subangular), trace clay	Very Dense				59				

Bottom of Boring = 31½ Feet

Notes:
1. The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.
2. For an explanation of penetration resistance values, see the first page of Appendix A.
3. A Safety Hammer was used to drive samplers.
4. Ground water was encountered at 30 feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.
6. PP = Pocket Penetrometer, tsf = tons per square feet
7. LL = Liquid Limit, PI = Plasticity Index

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	EB-12

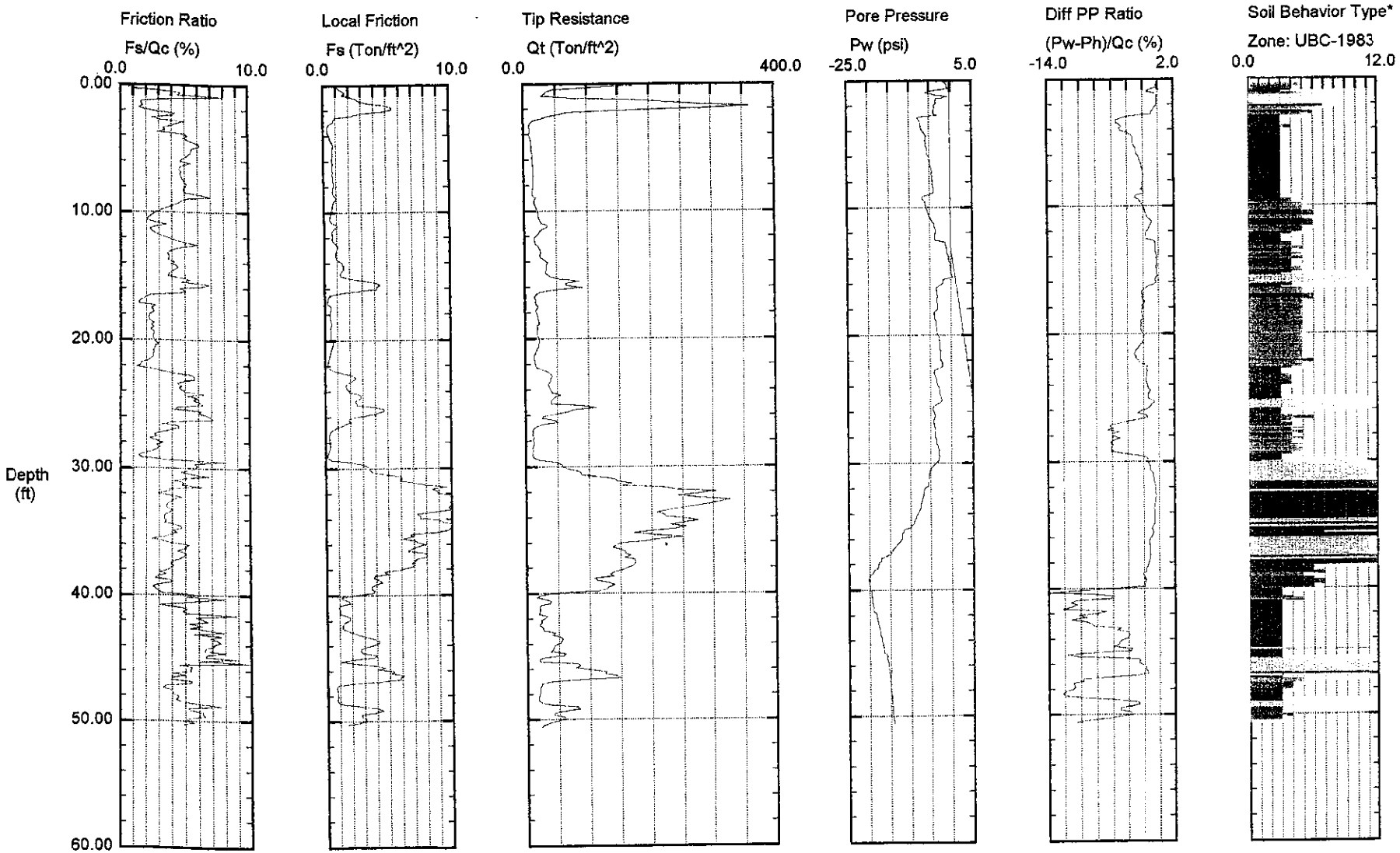
File Name: G:\ENGINEERING\WPROJECTS\17752-CA.GPJ Report Template: H Output Date: 12/1/00

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z266
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 10:13
Location: CPT-1
Job Number:



Maximum Depth = 50.69 feet

Depth Increment = 0.16 feet

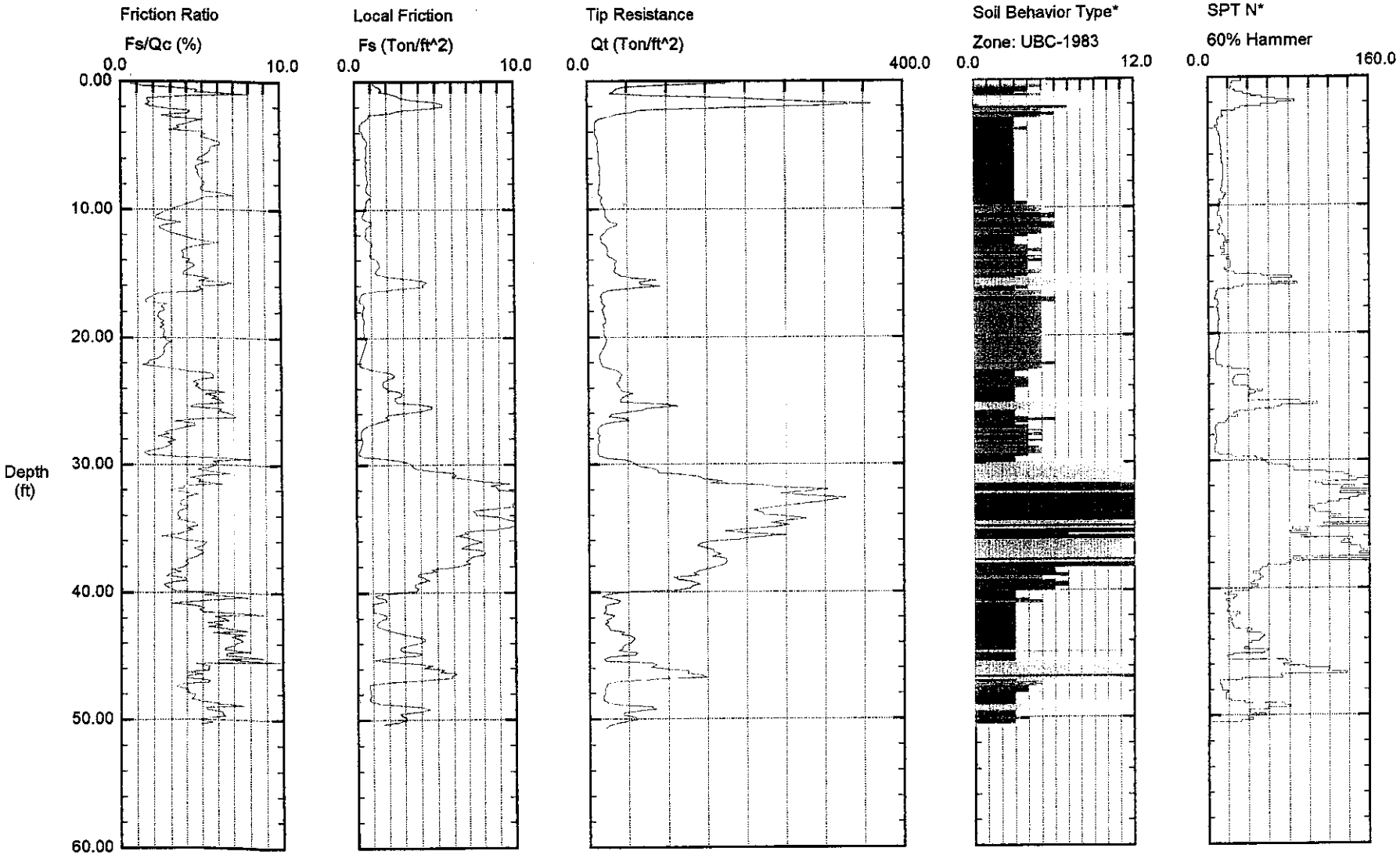
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z266
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 10:13
Location: CPT-1
Job Number:



Maximum Depth = 50.69 feet

Depth Increment = 0.16 feet

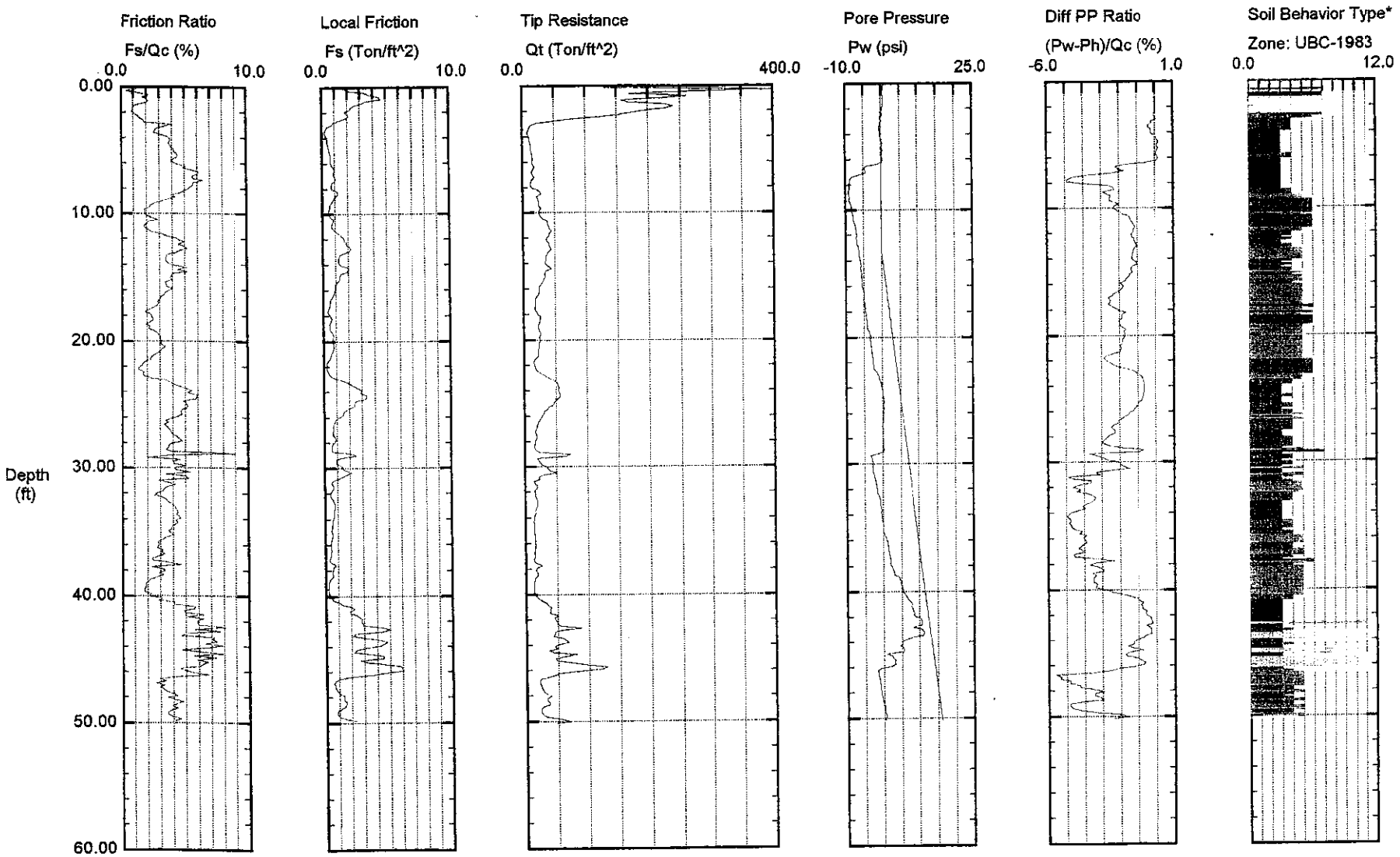
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z267
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 11:47
Location: CPT-2
Job Number:



Maximum Depth = 50.20 feet

Depth Increment = 0.16 feet

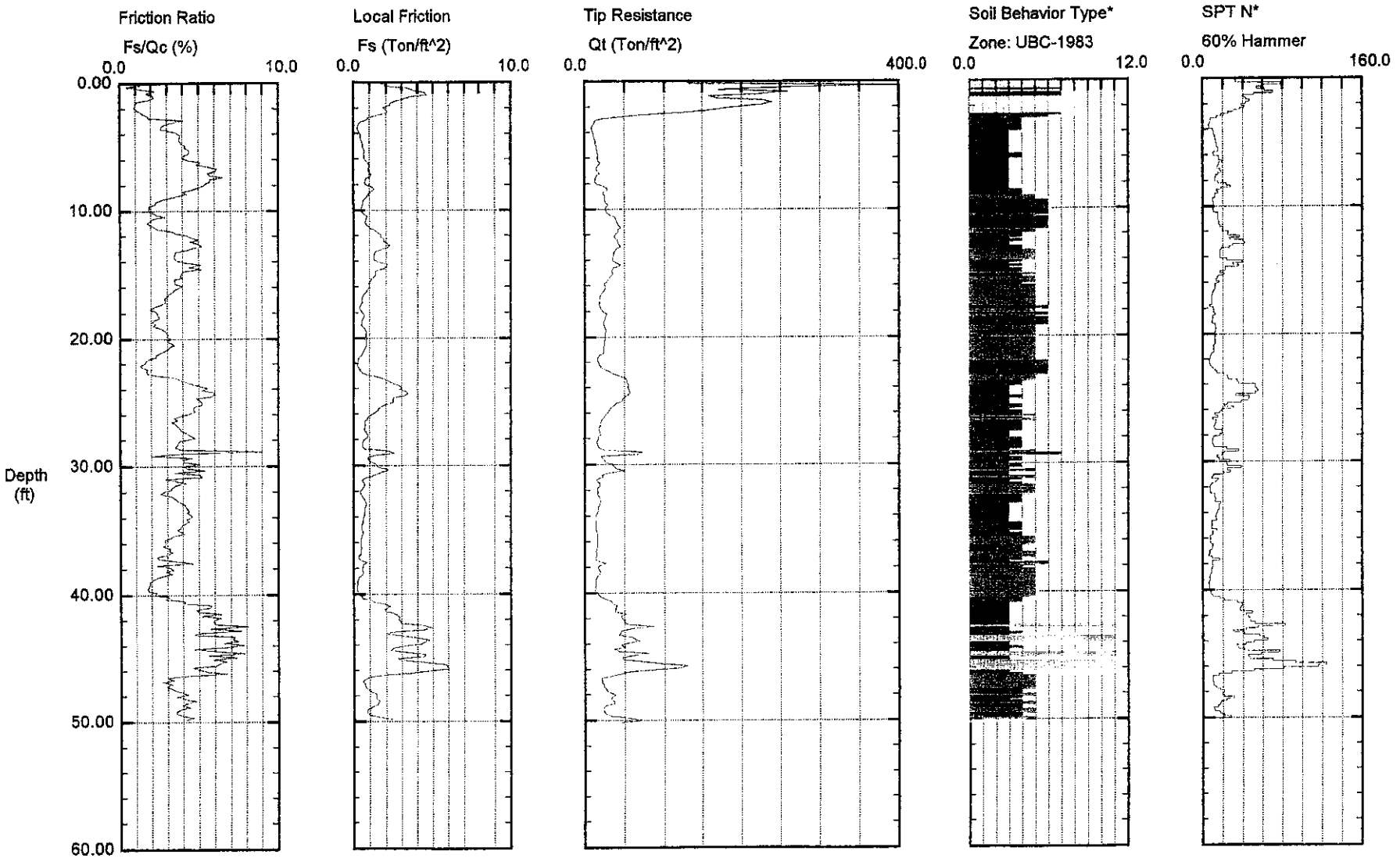
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

oil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z267
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 11:47
Location: CPT-2
Job Number:



Maximum Depth = 50.20 feet

Depth Increment = 0.16 feet

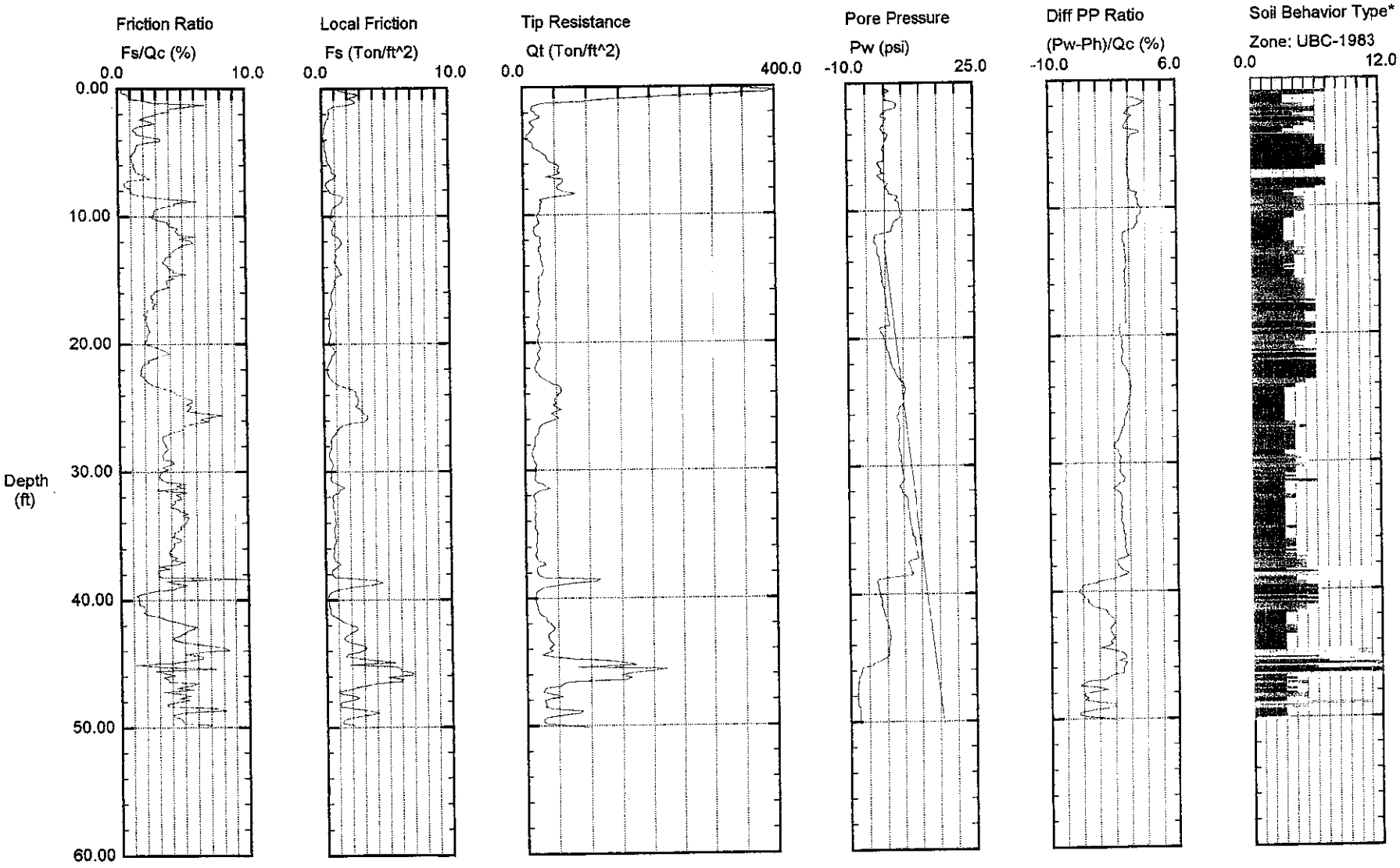
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil behavior type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z268
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 14:21
Location: CPT-3
Job Number:



Maximum Depth = 50.20 feet

Depth Increment = 0.16 feet

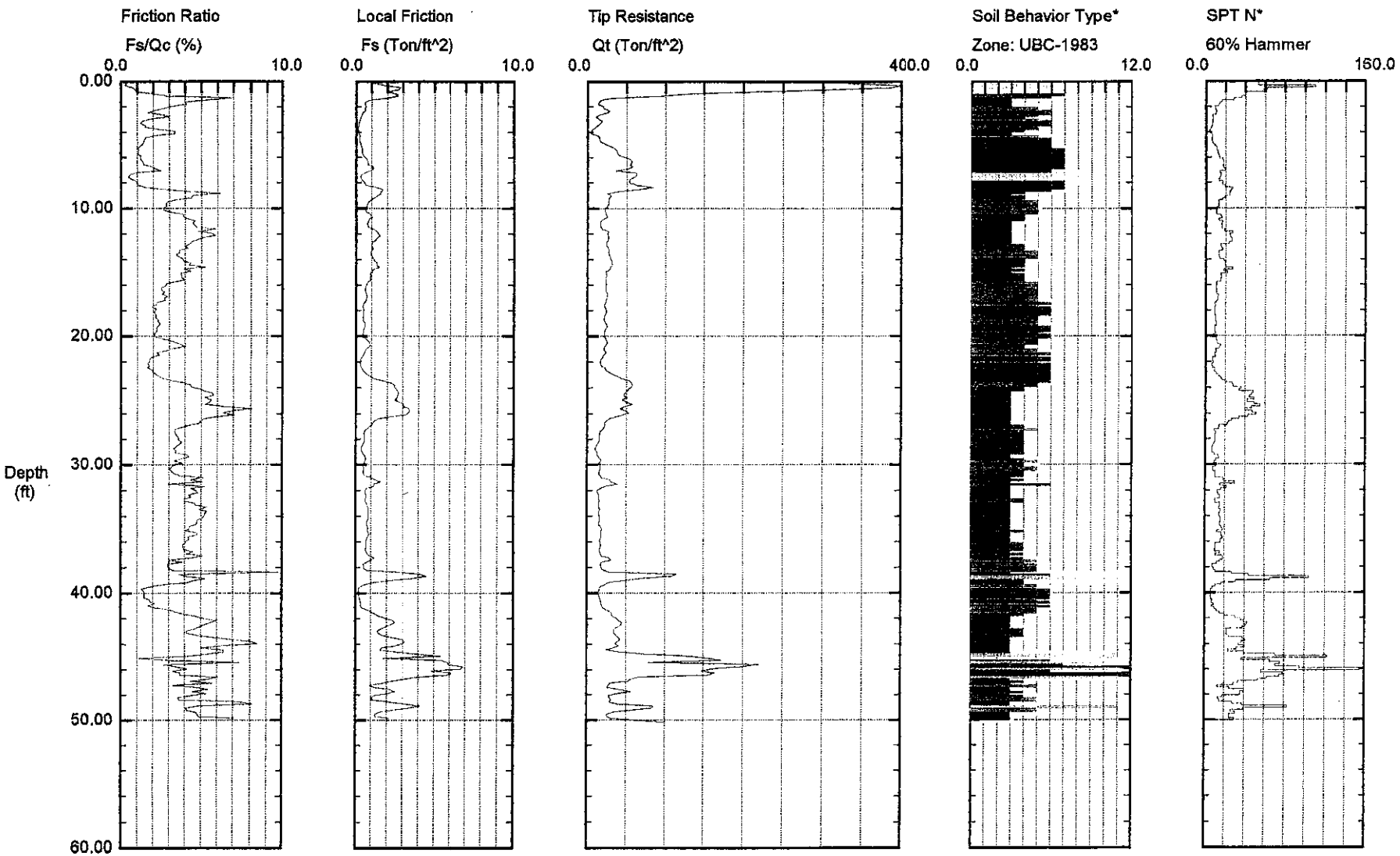
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*Soil Behavior Type and SPT based on data from UBC-1983

VBI In-Situ Testing

Operator: VIRGIL A. BAKER
Sounding: 00Z268
Cone Used: HO 738 TC - U2

CPT Date/Time: 09-25-00 14:21
Location: CPT-3
Job Number:



Maximum Depth = 50.20 feet

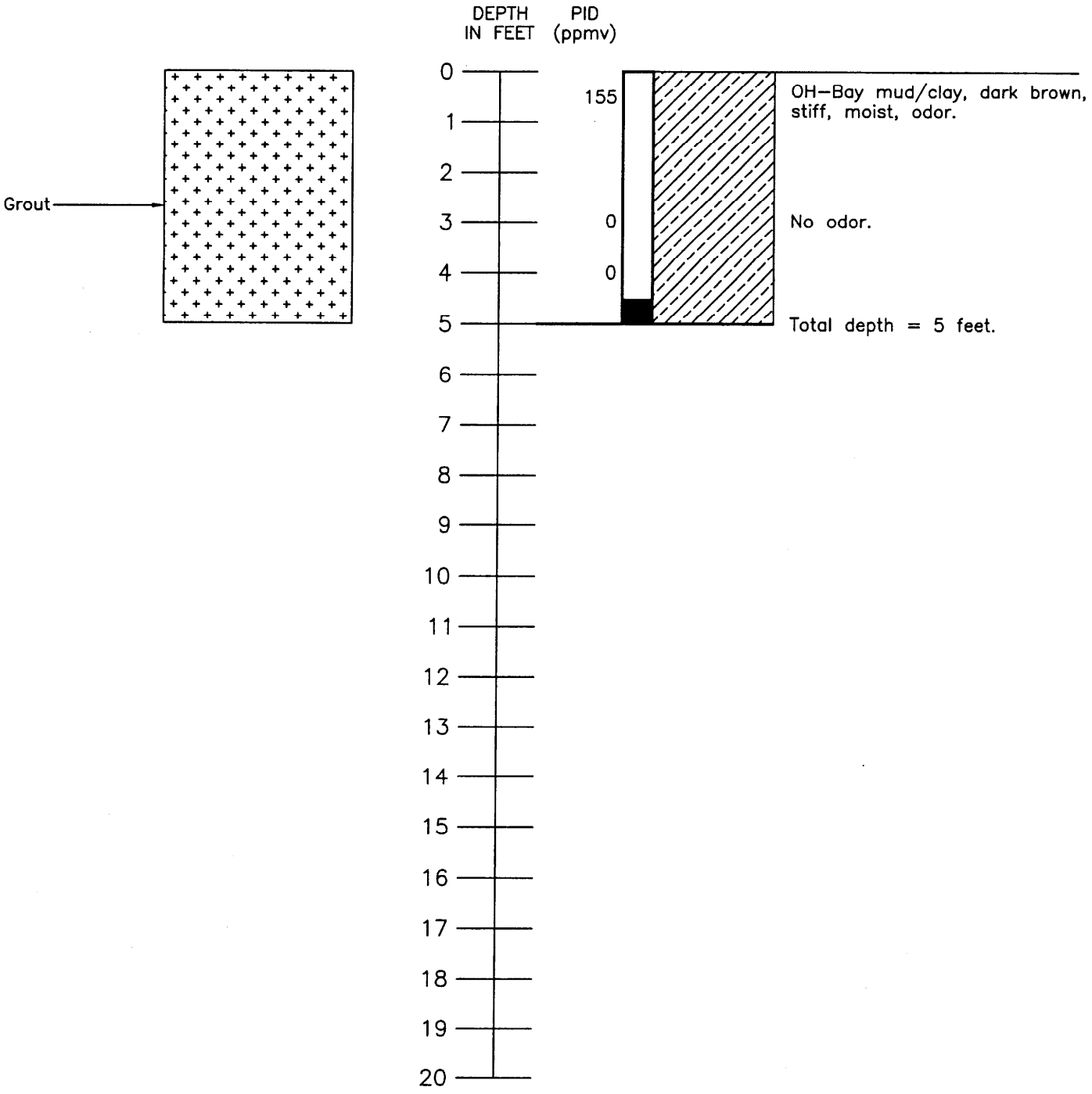
Depth Increment = 0.16 feet

1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

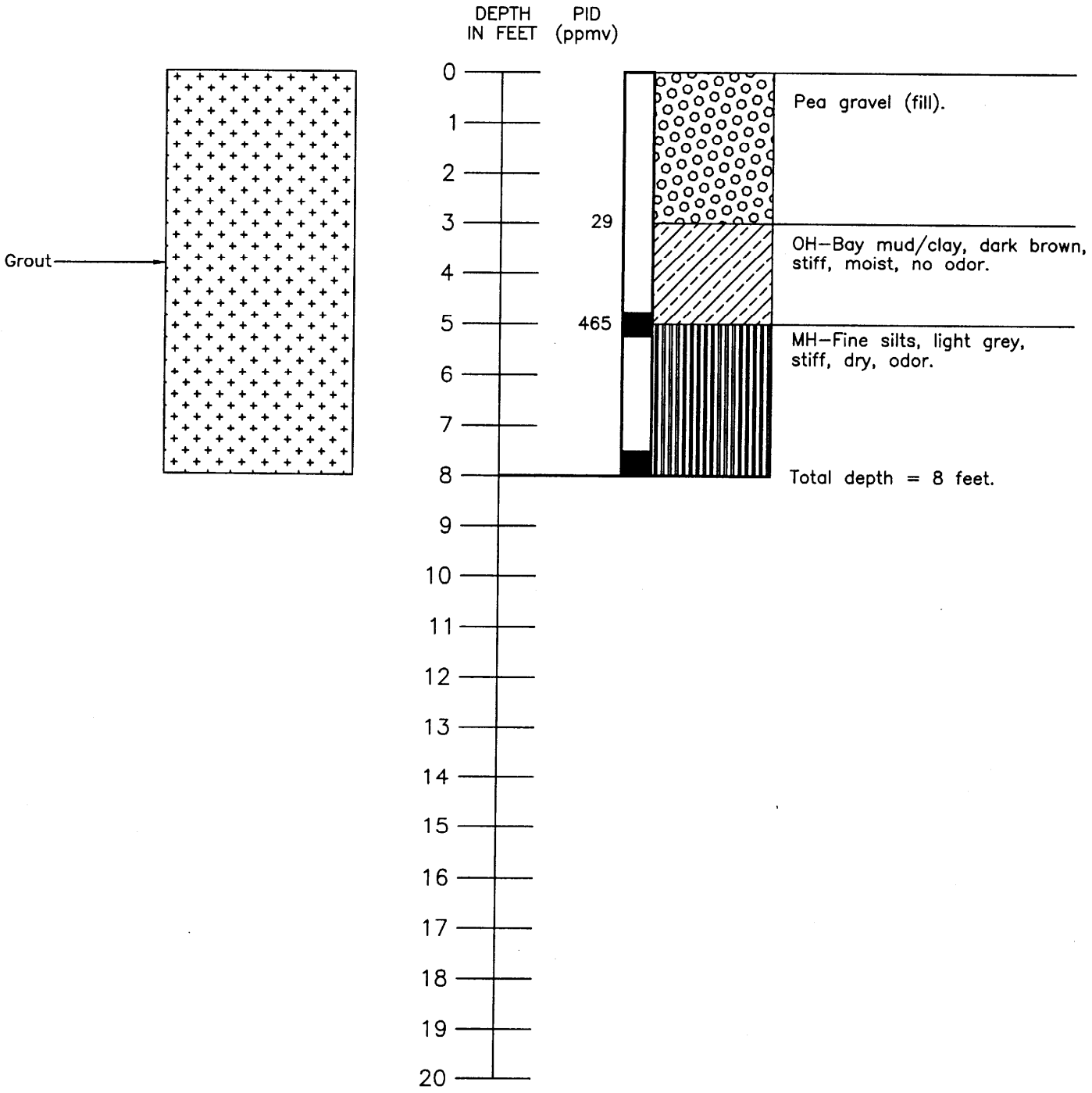
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–1	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-1**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

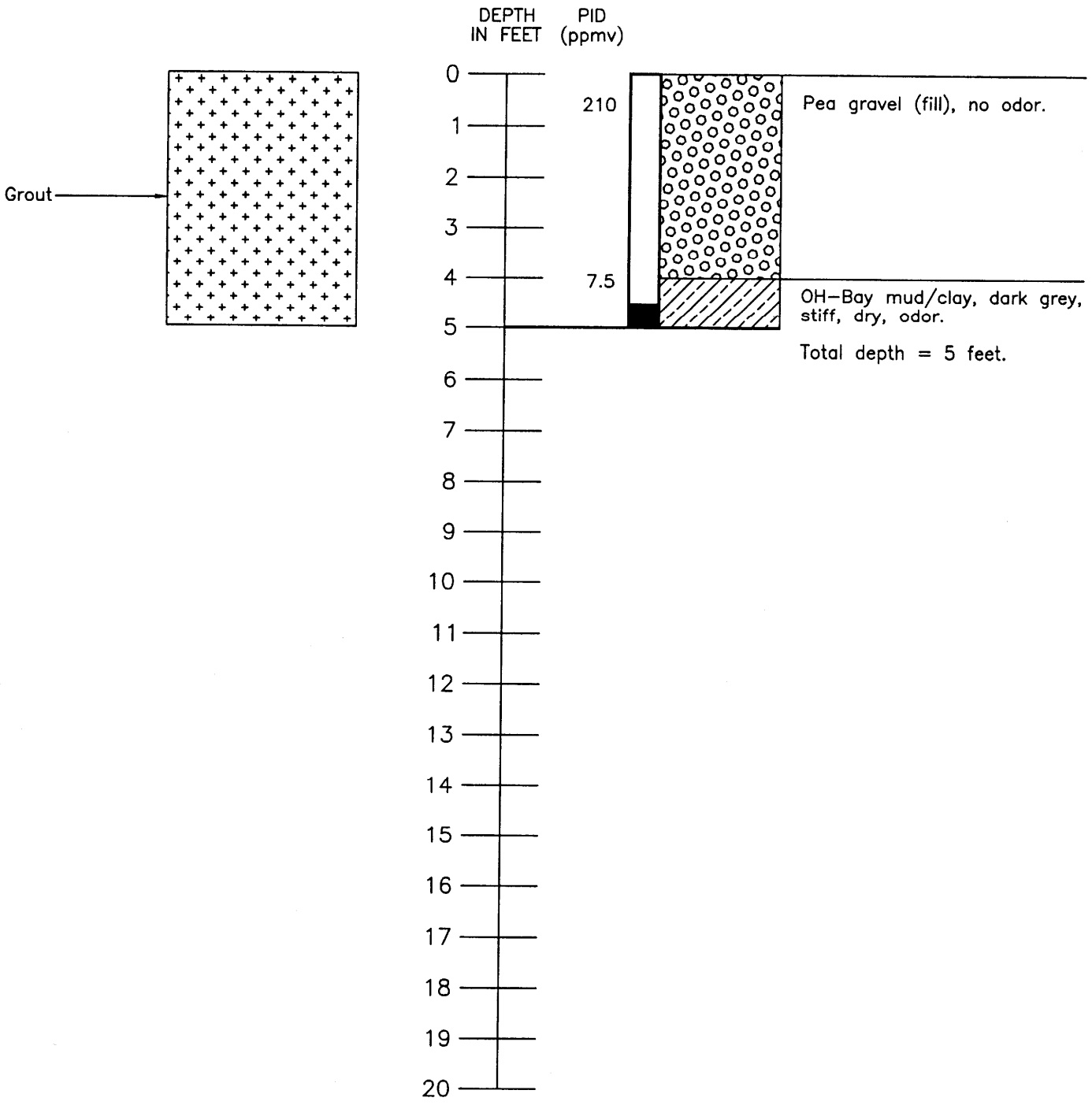
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–2	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-2**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

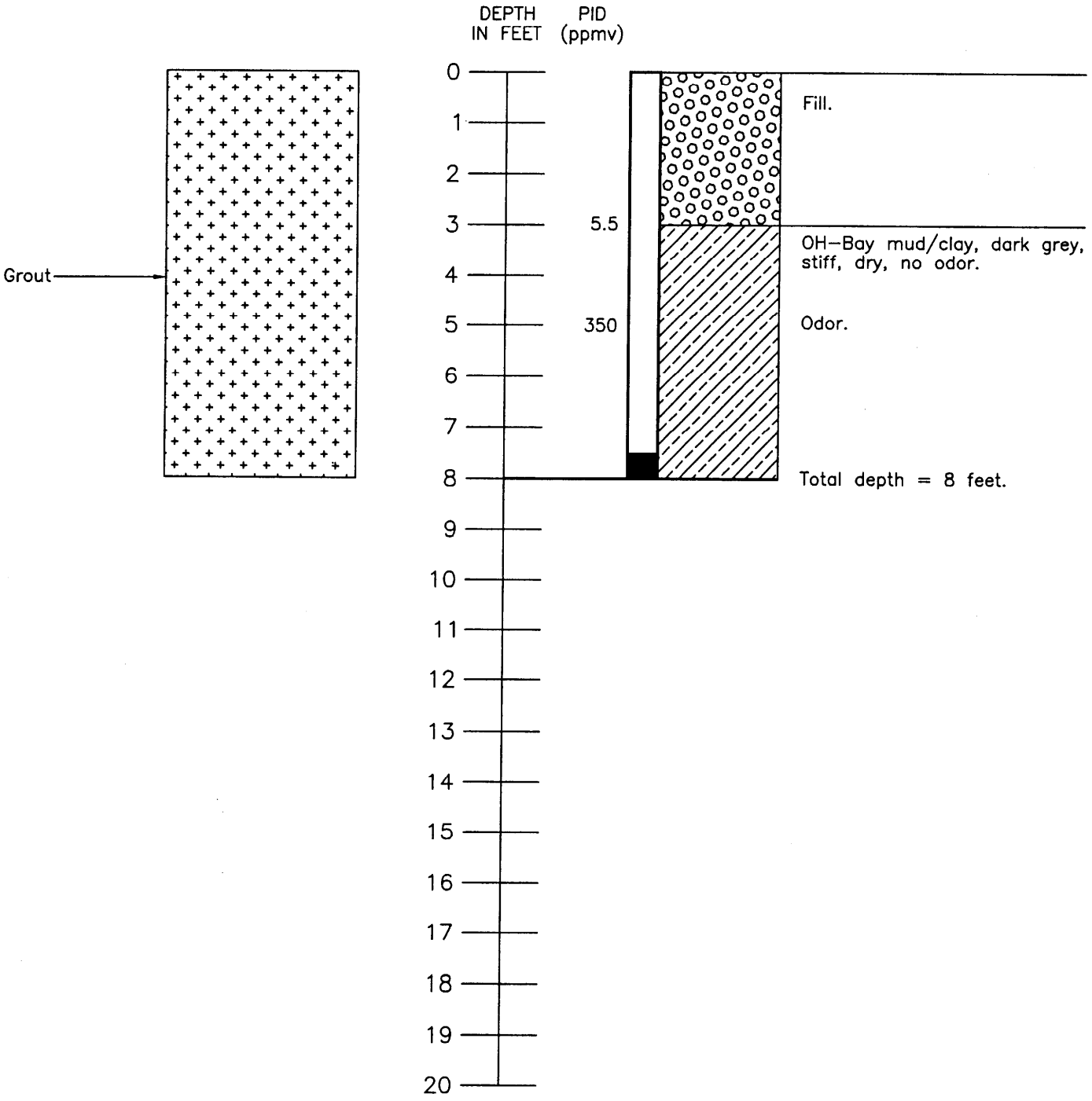
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–3	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-3**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

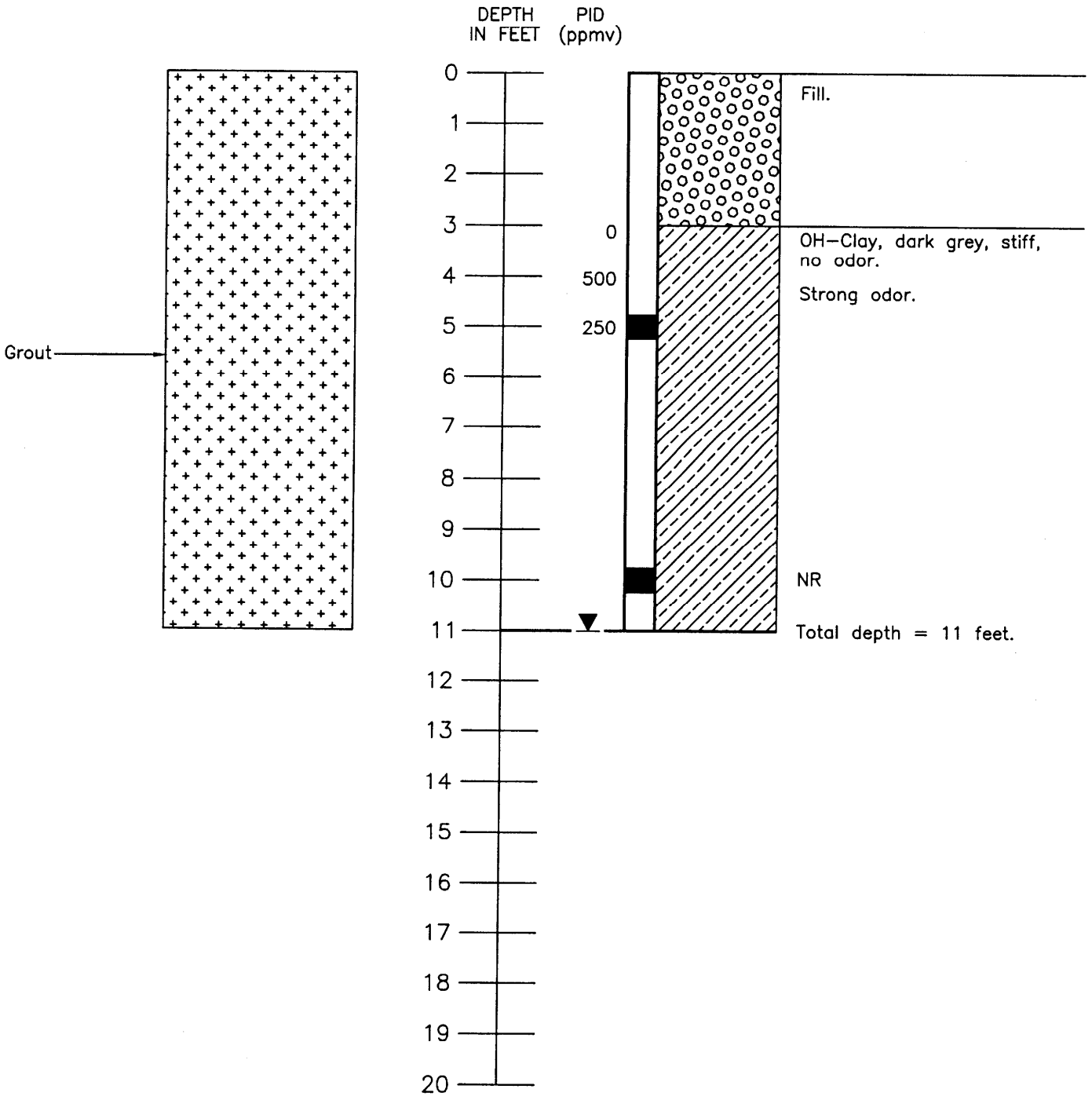
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–4	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-4**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

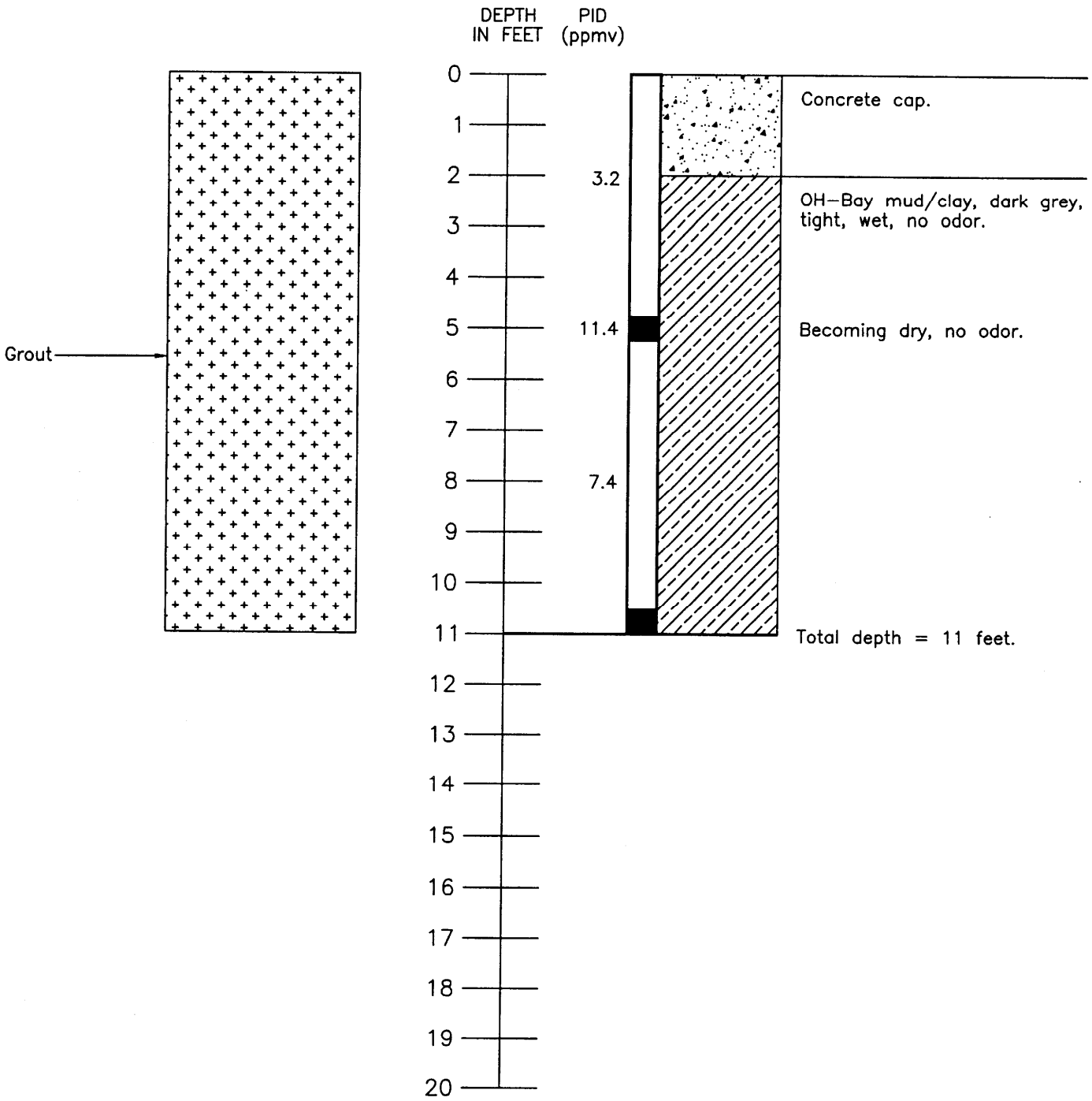
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–5	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-5**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

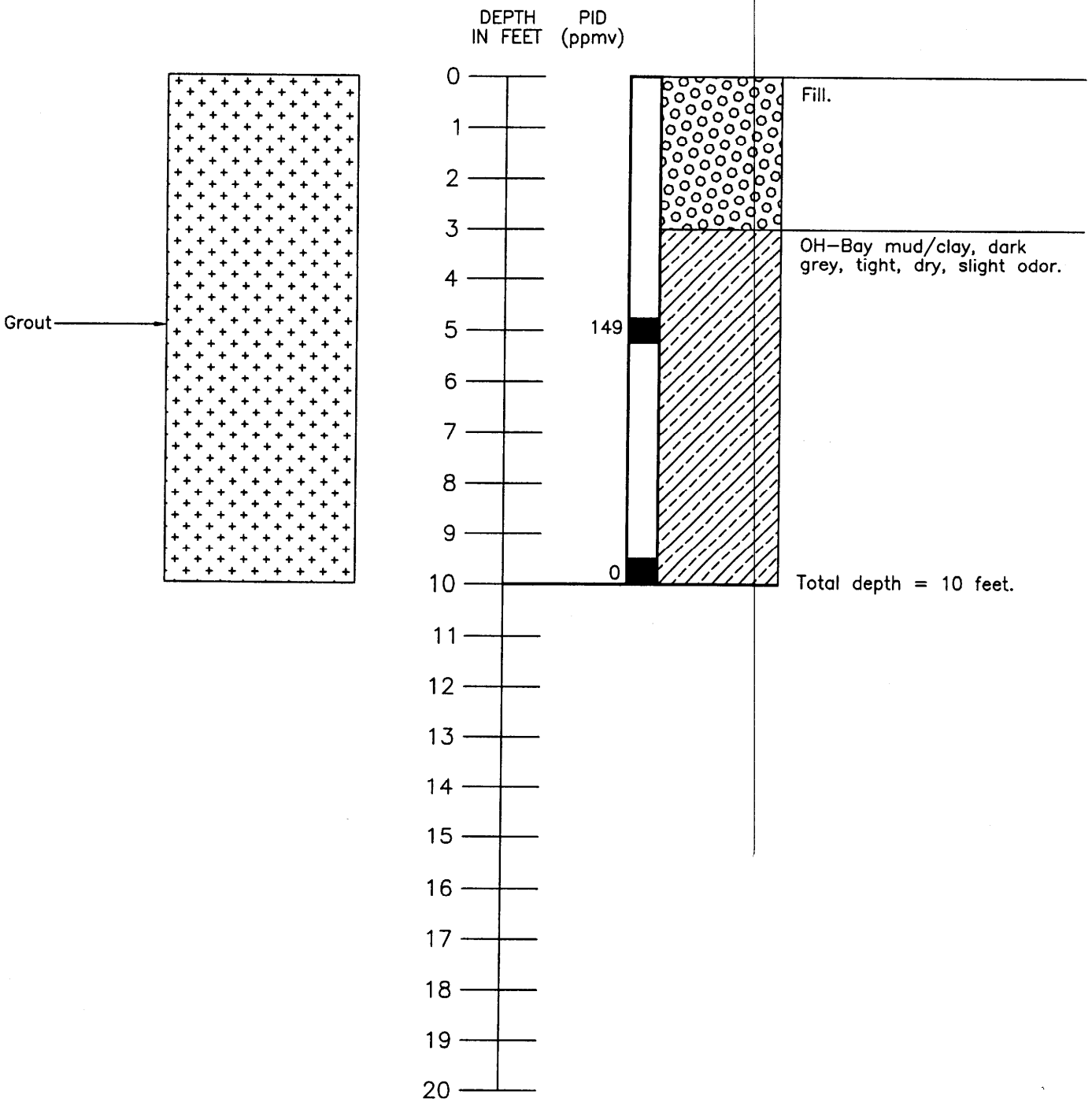
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–6	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-6**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

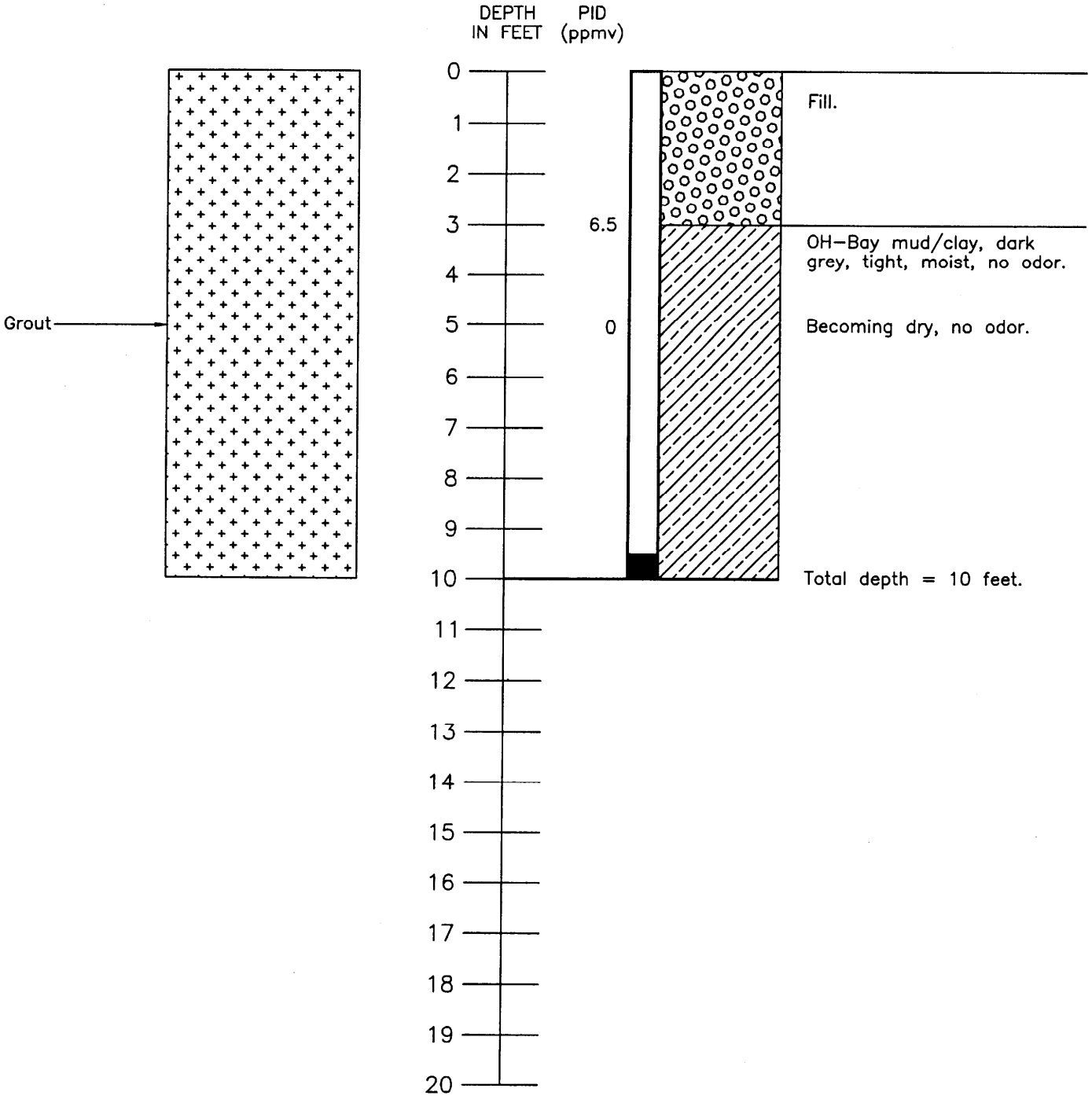
- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

APEX ENVIROTECH, INC.

Boring/Well Log Details GP–7	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-7**



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

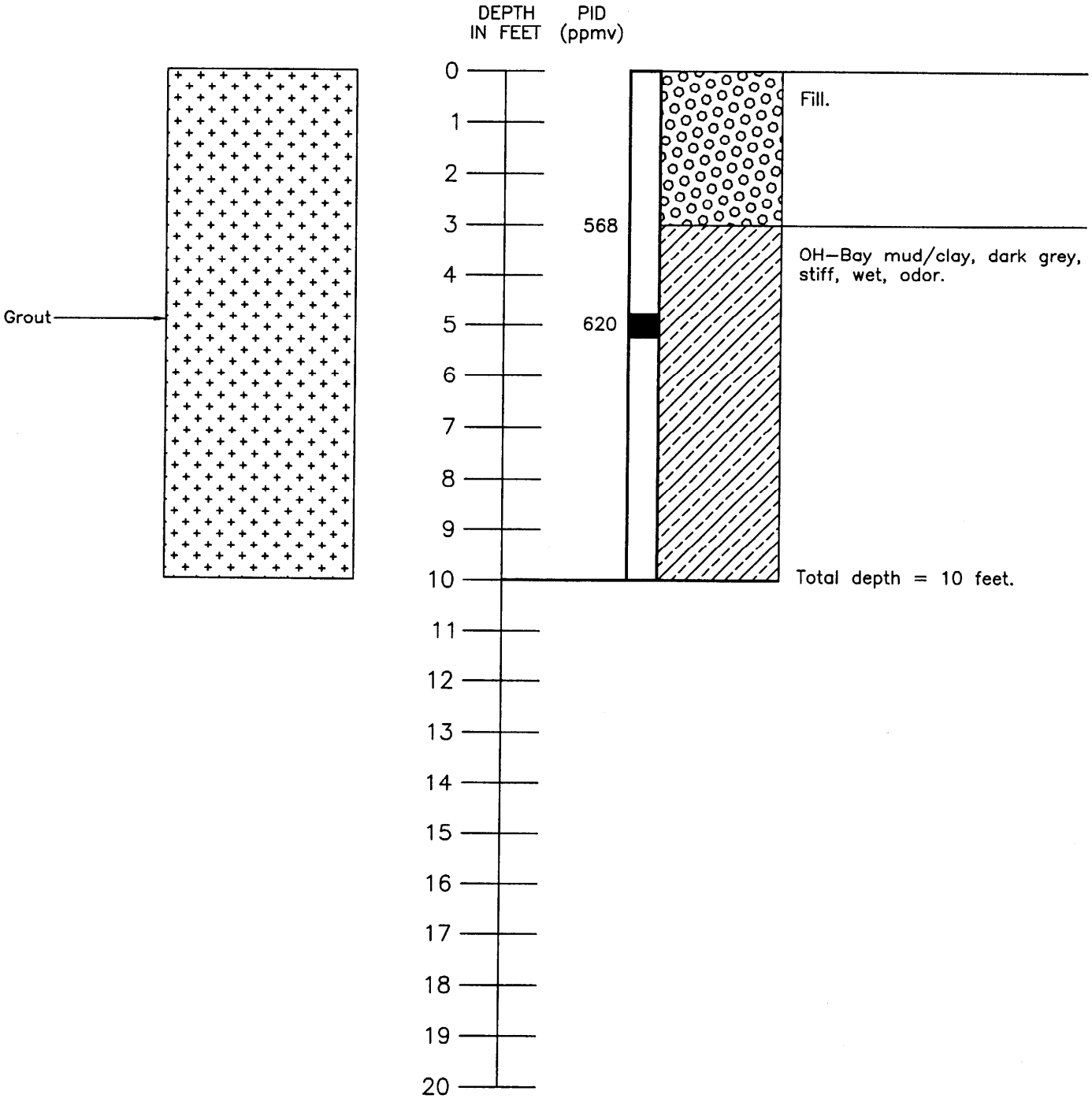
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–8	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-8**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

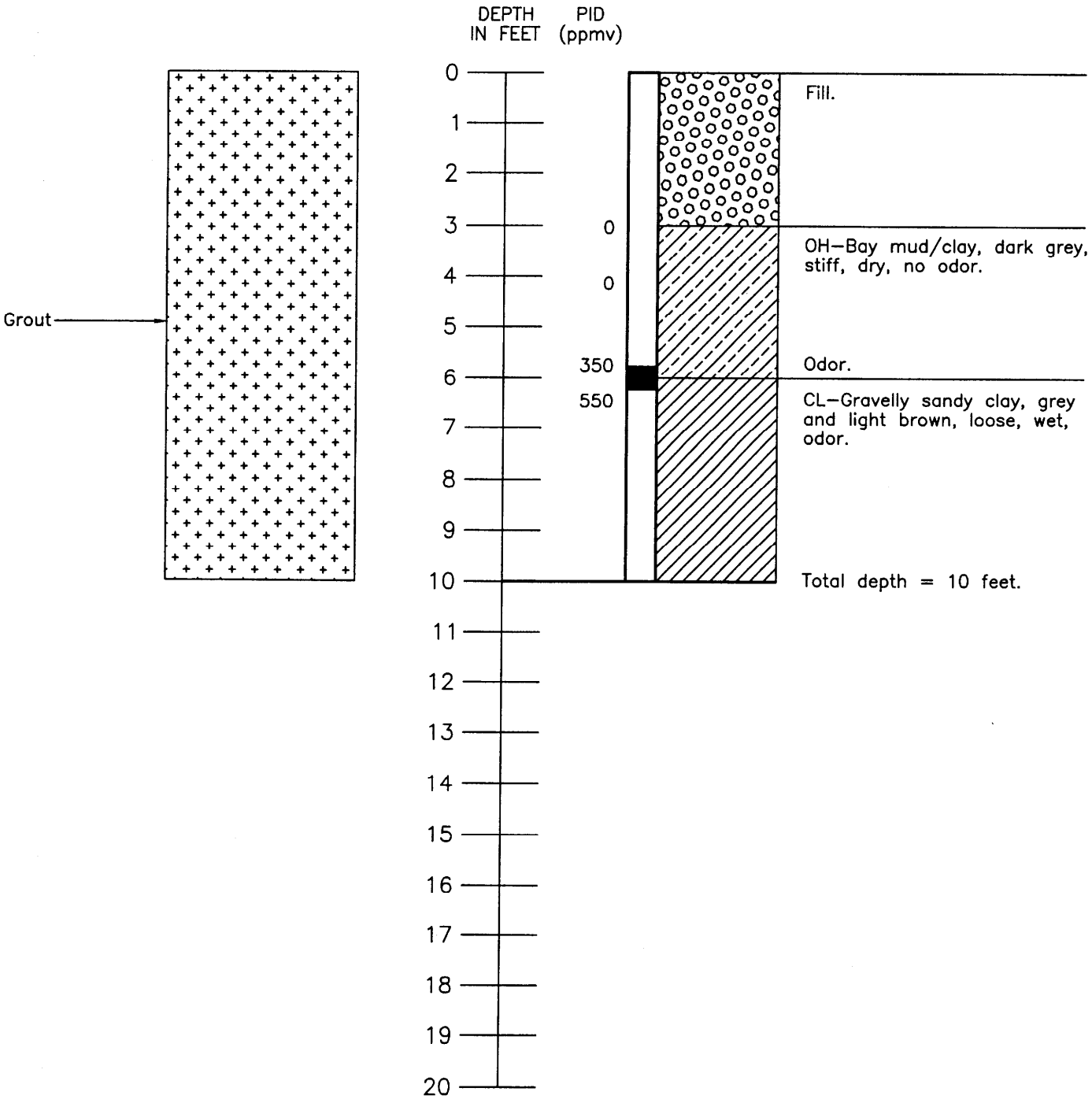
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–9	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-9**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

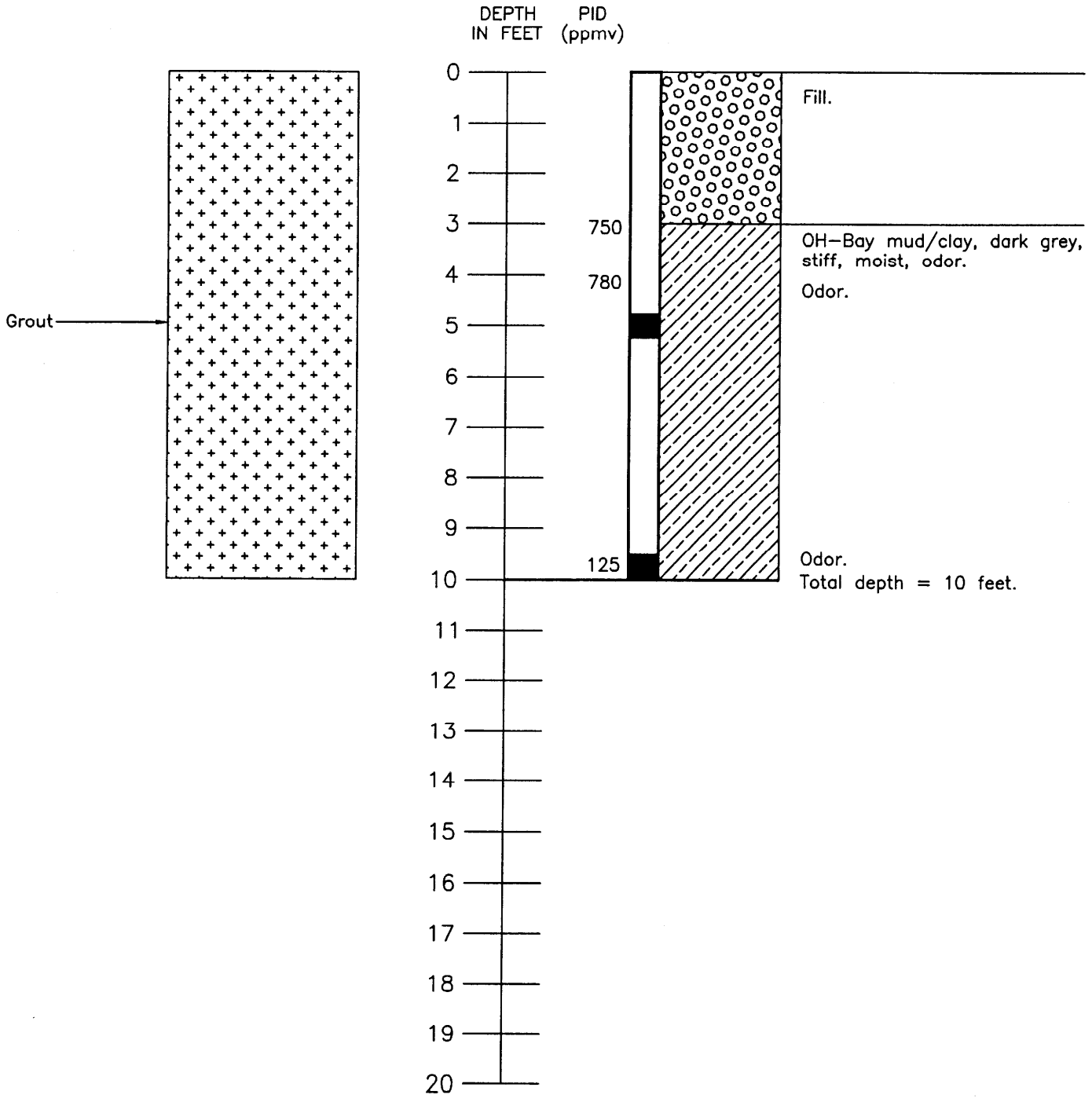
APEX ENVIROTECH, INC.

Boring/Well Log Details GP-10	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-10**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

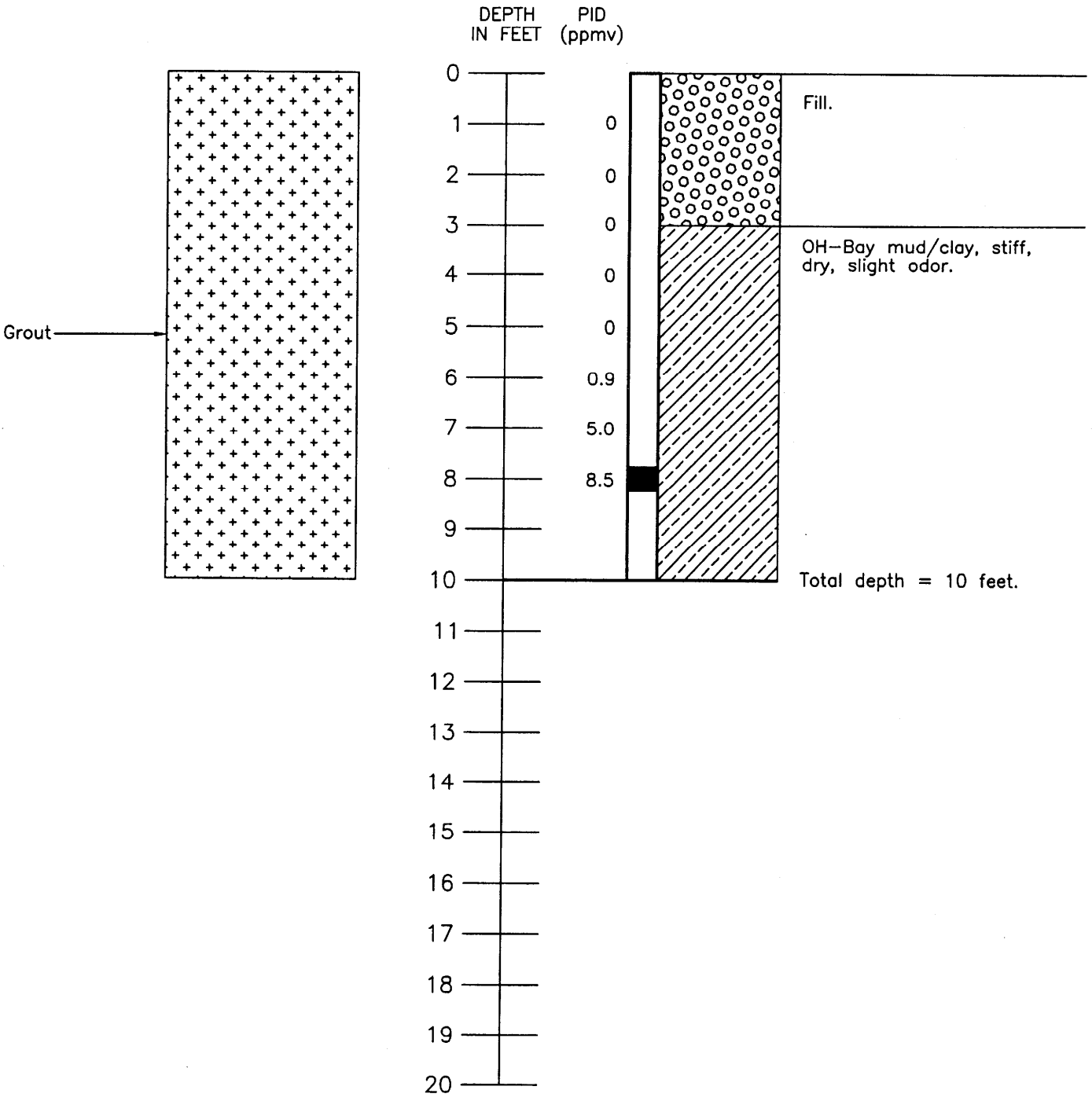
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–11	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-11**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

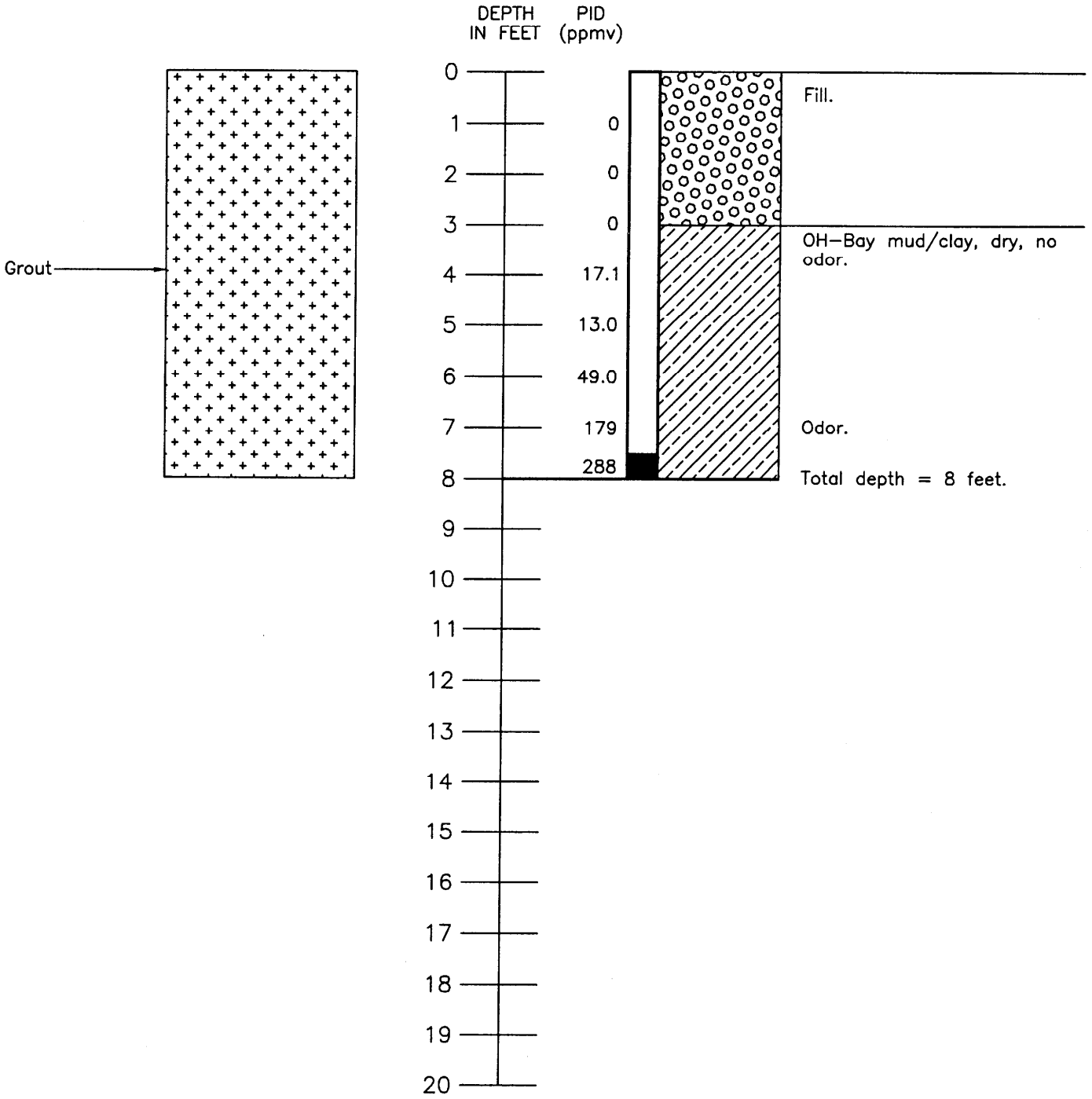
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–12	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-12**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

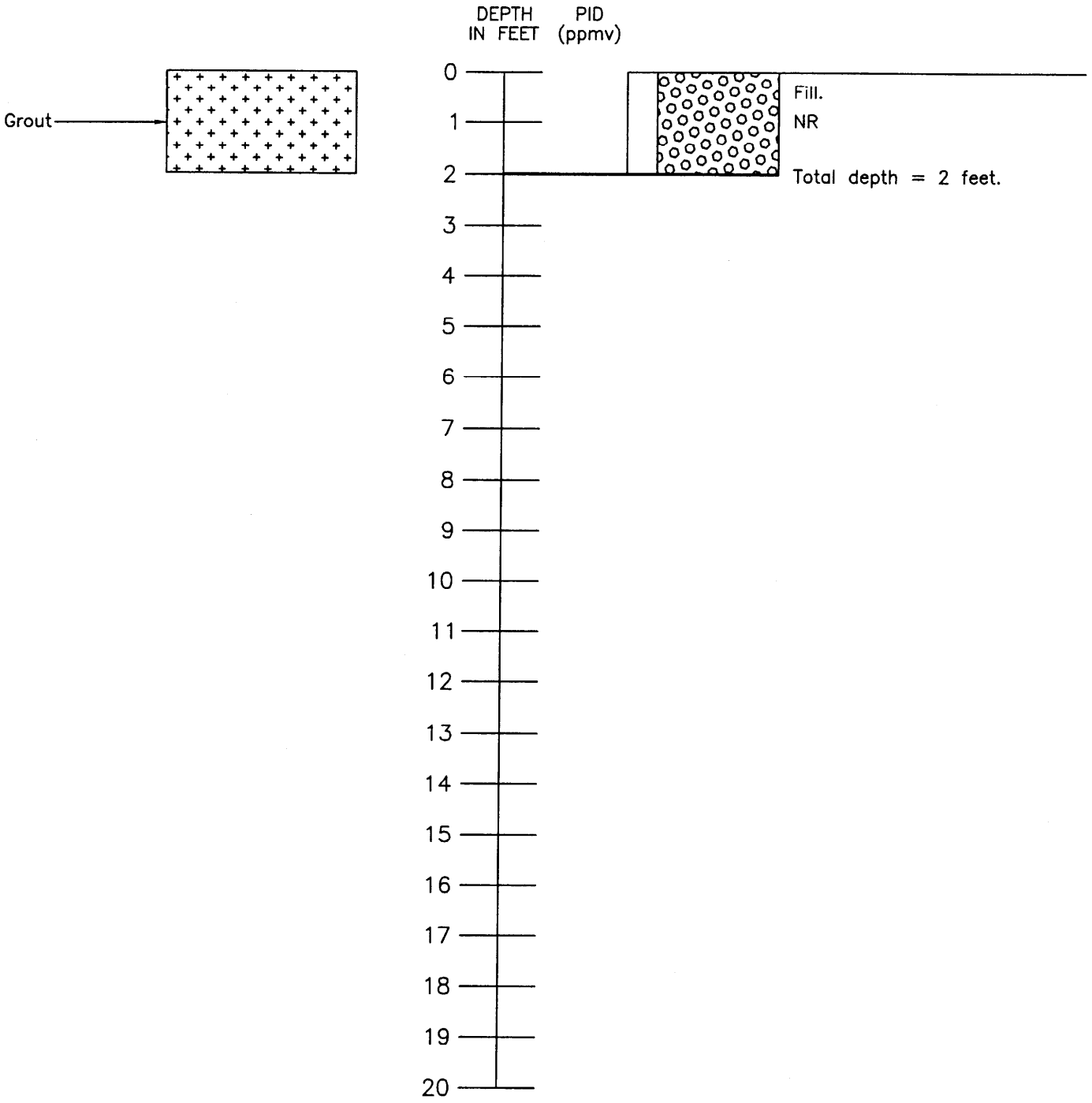
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–13	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-13**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

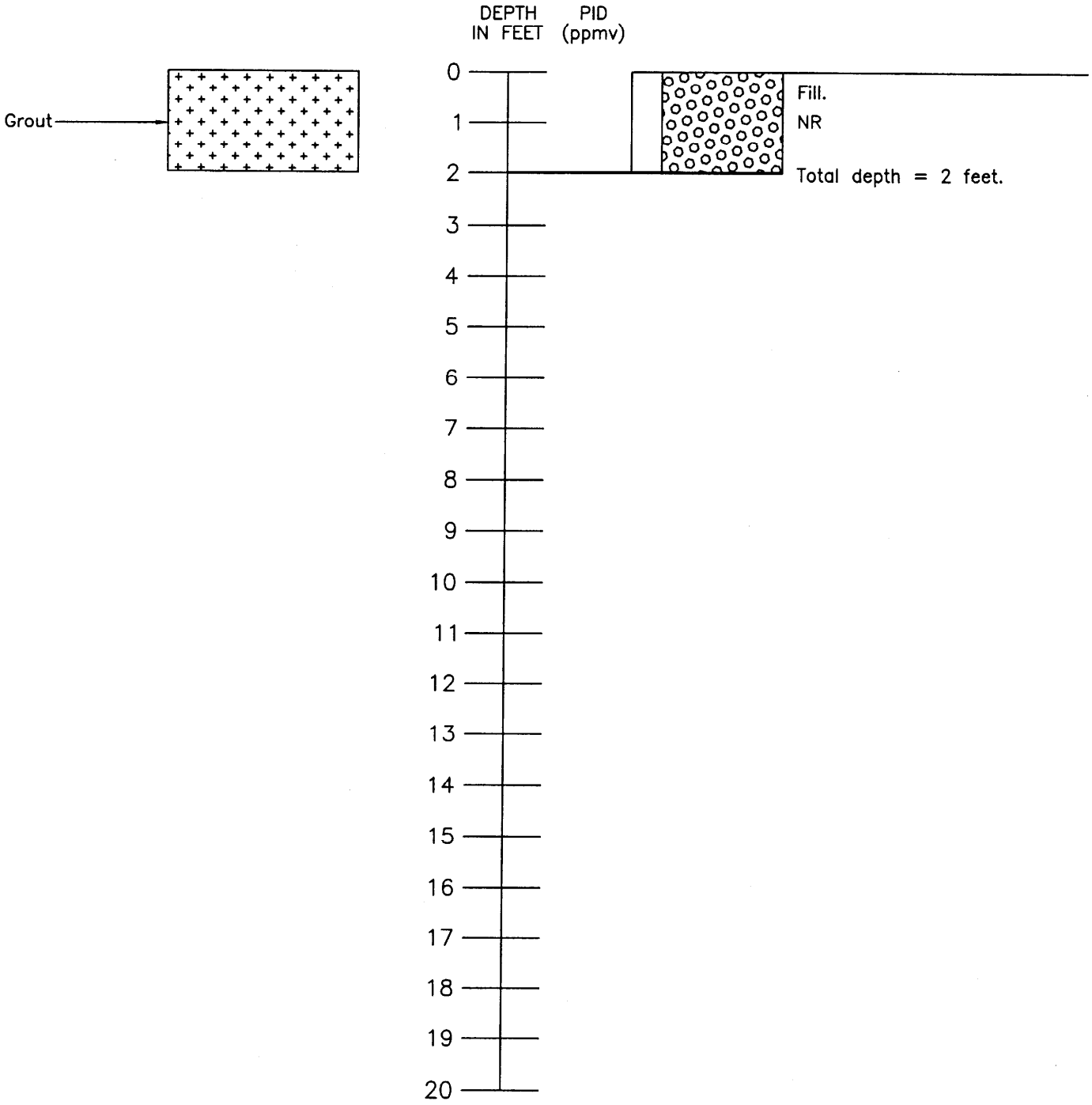
APEX ENVIROTECH, INC.

Boring/Well Log Details GP-14	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-14**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

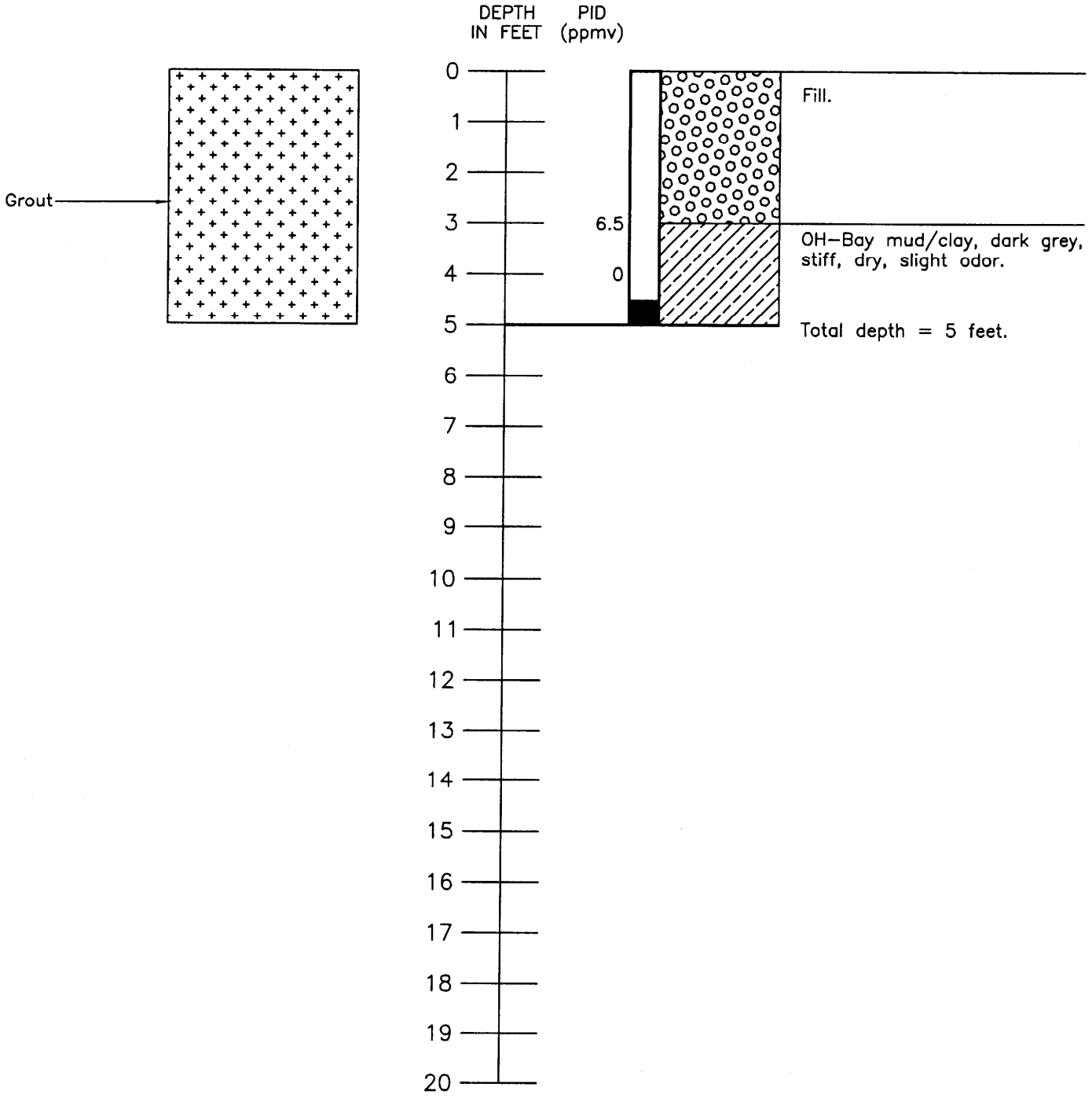
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–15	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-15**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

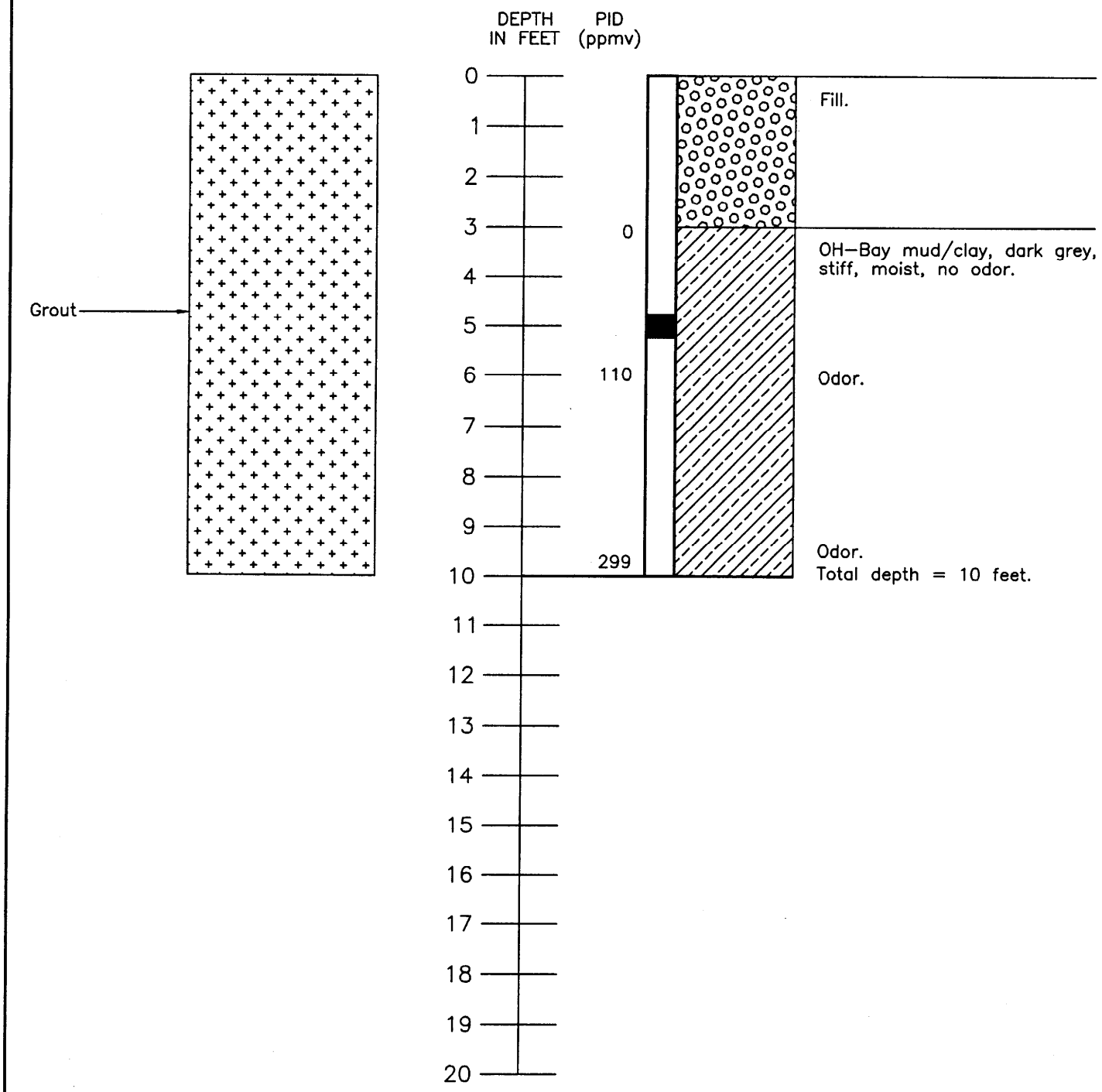
- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

APEX ENVIROTECH, INC.

Boring/Well Log Details GP–16	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-16**



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

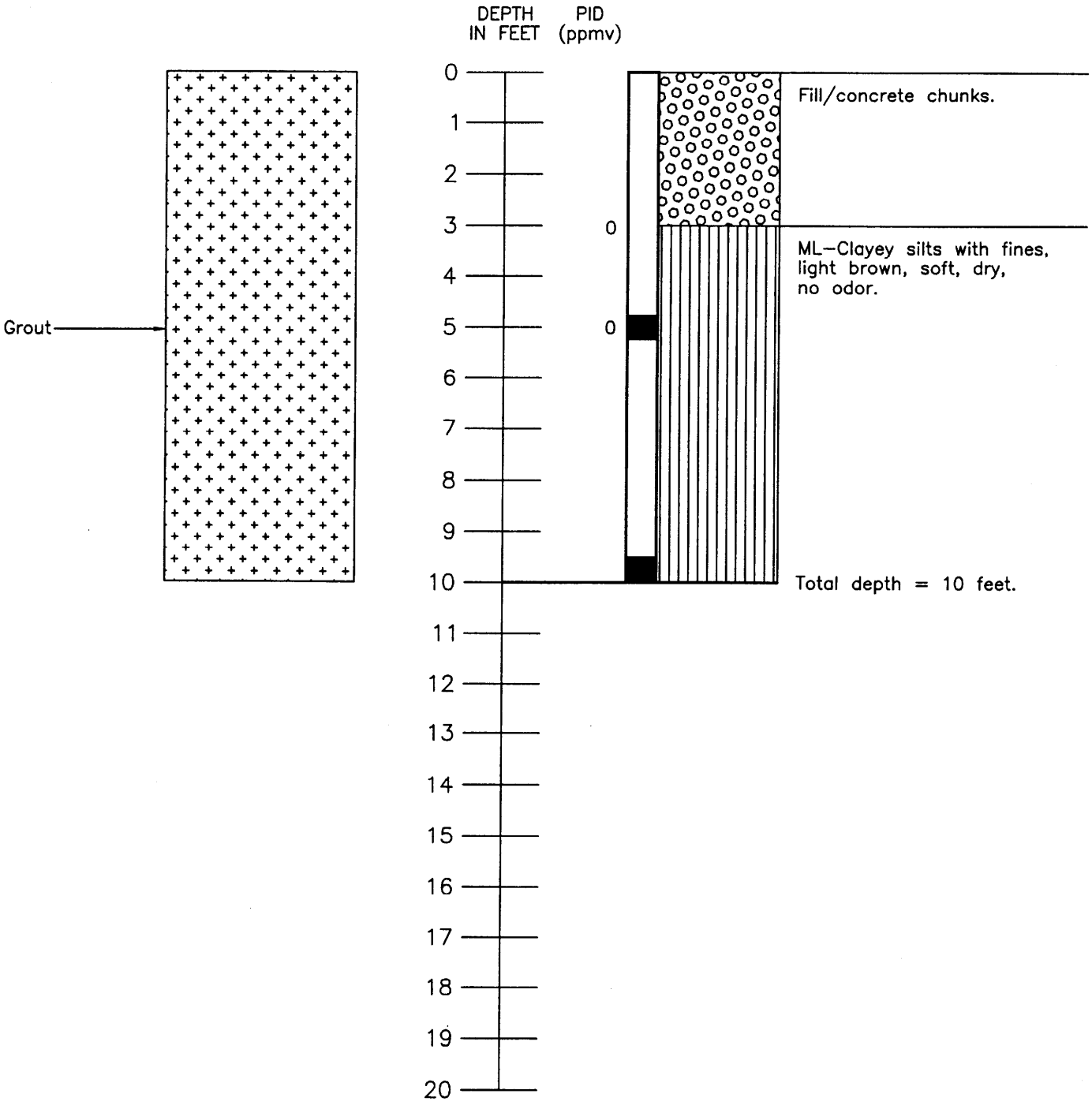
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–17	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-17**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

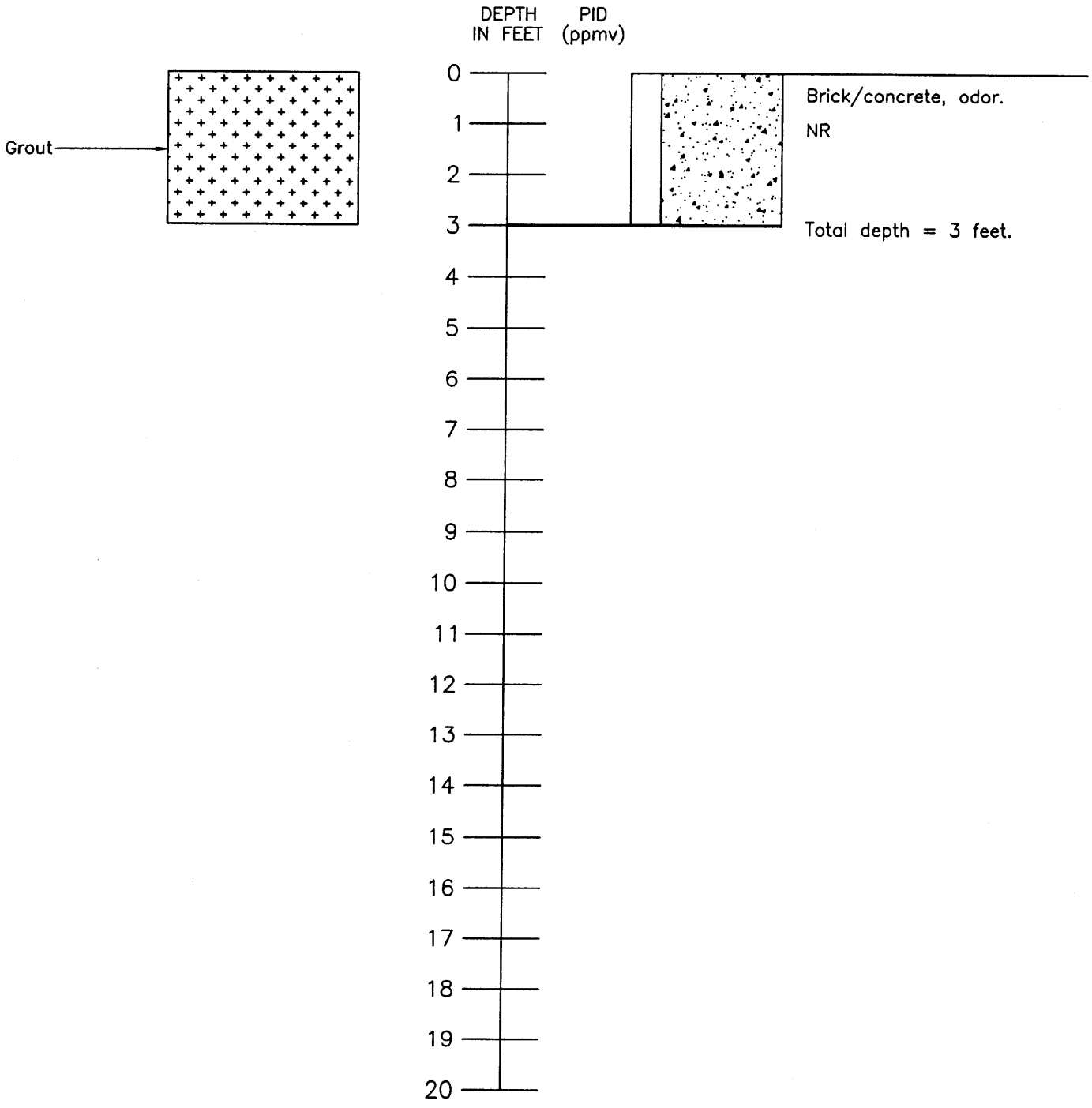
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–18	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-18**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

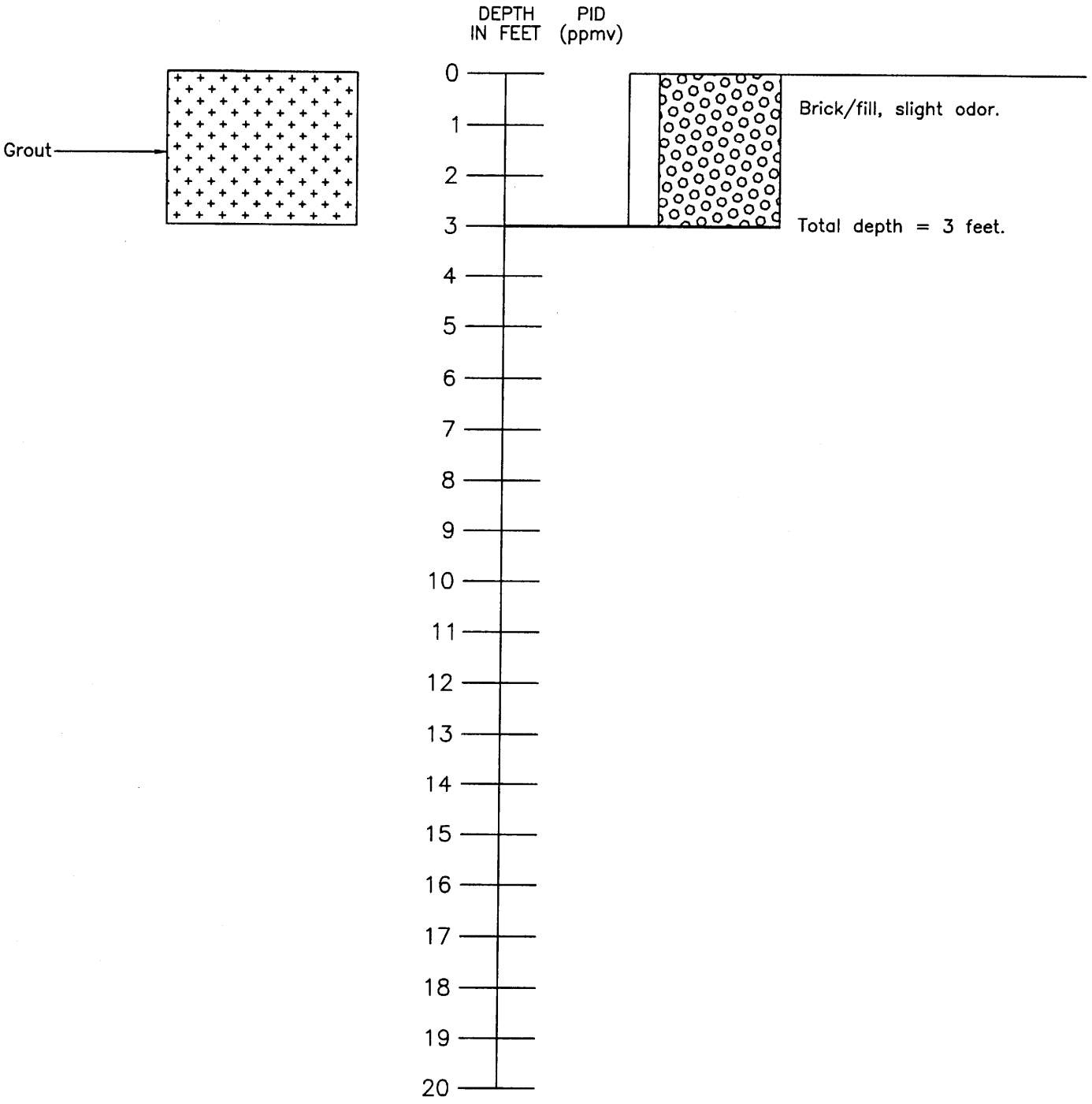
APEX ENVIROTECH, INC.

Boring/Well Log Details GP-19	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-19**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

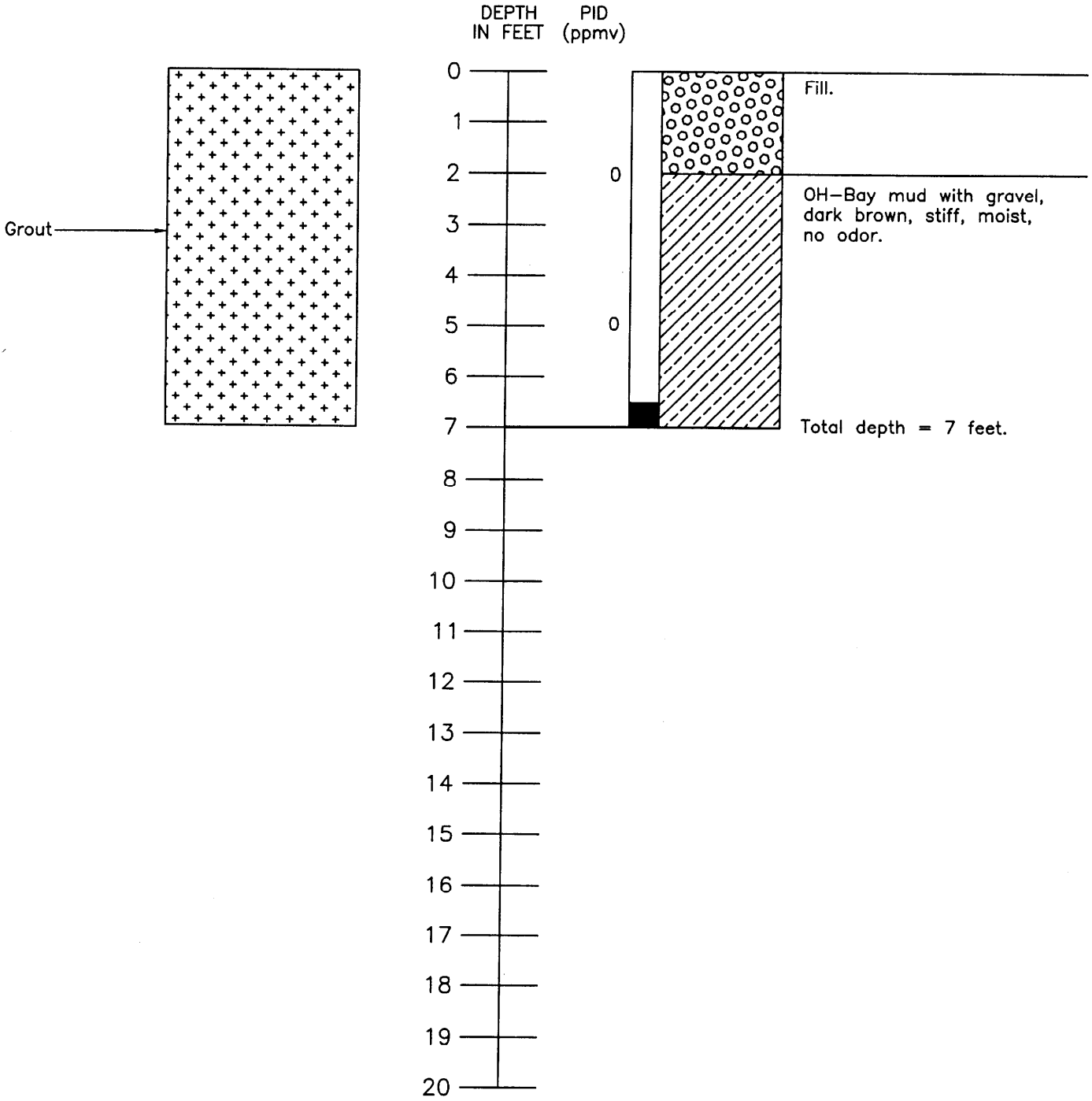
APEX ENVIROTECH, INC.

Boring/Well Log Details GP-20	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-20**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

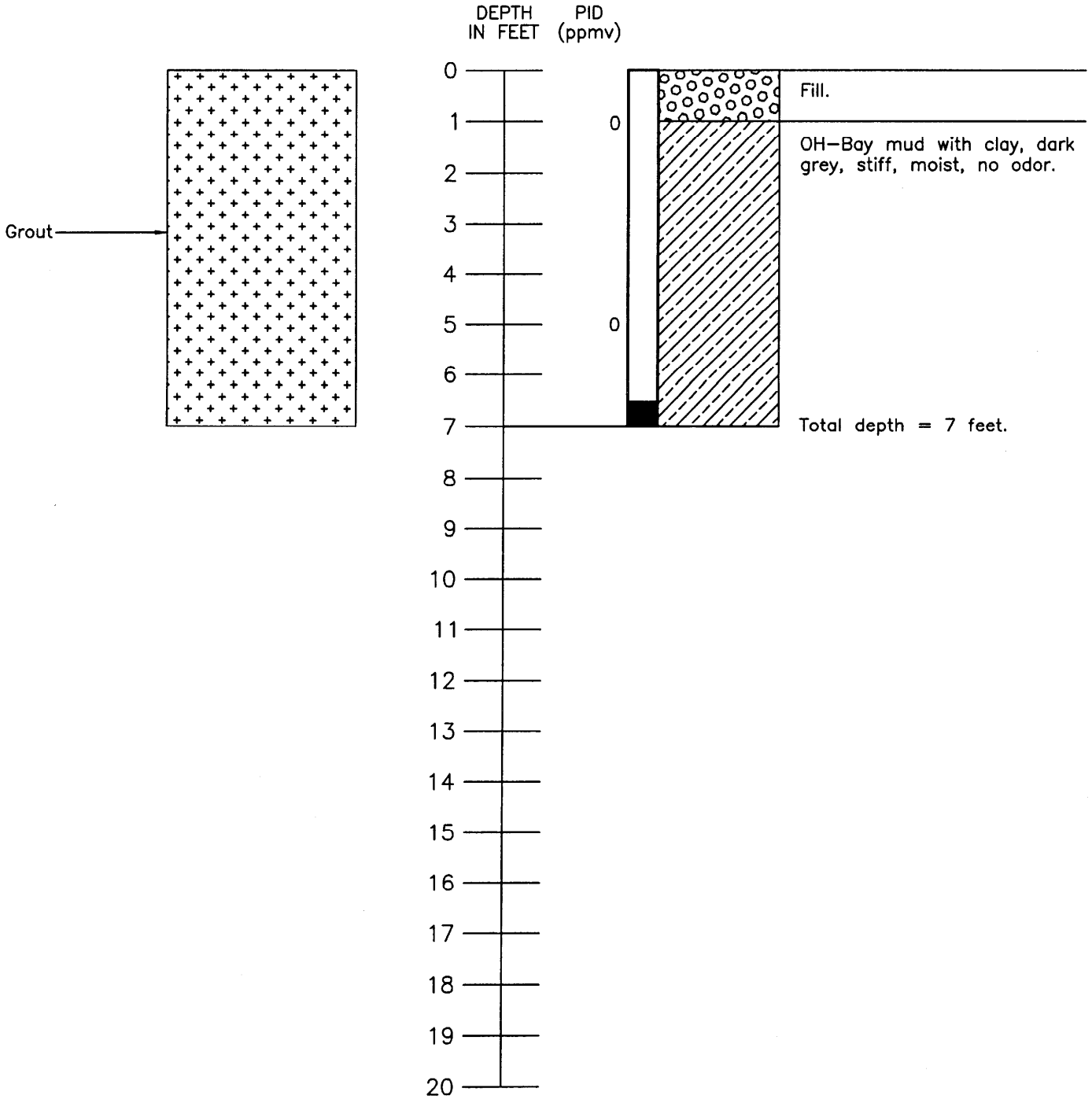
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–21	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-21**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

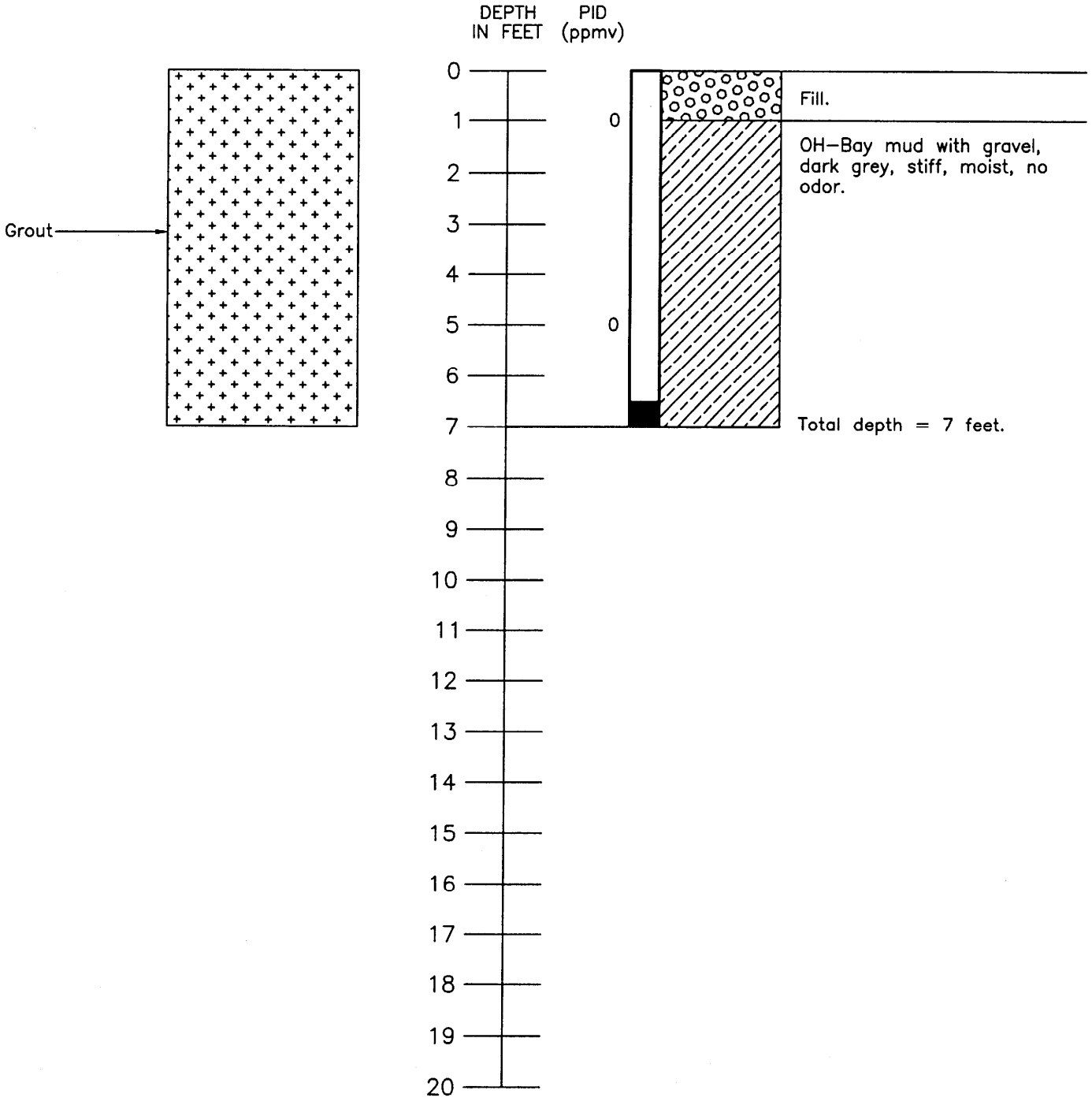
APEX ENVIROTECH, INC.

Boring/Well Log Details GP-22	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-22**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

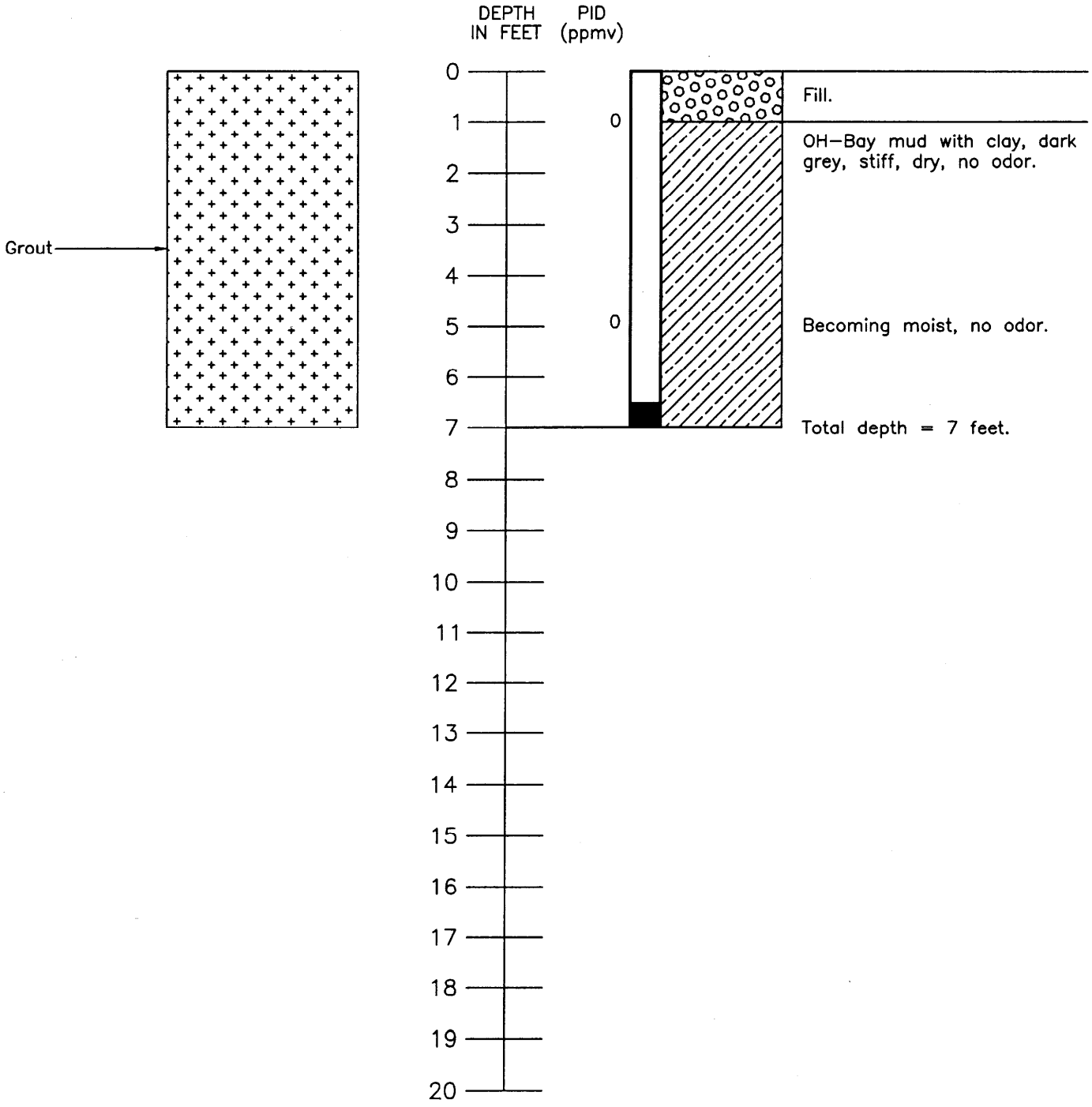
APEX ENVIROTECH, INC.

Boring/Well Log Details GP-23	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-23**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

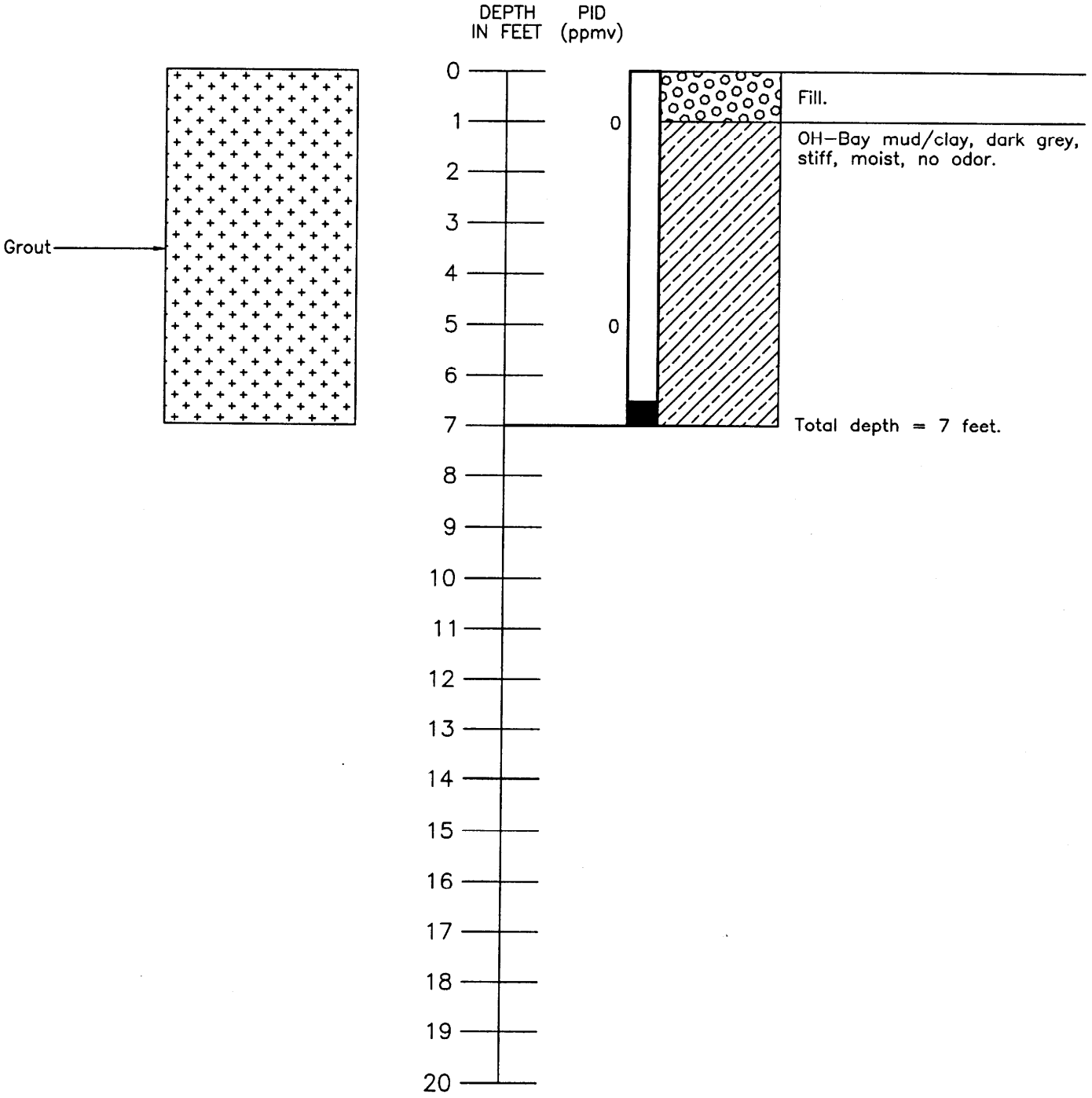
APEX ENVIROTECH, INC.

Boring/Well Log Details GP-24	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-24**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

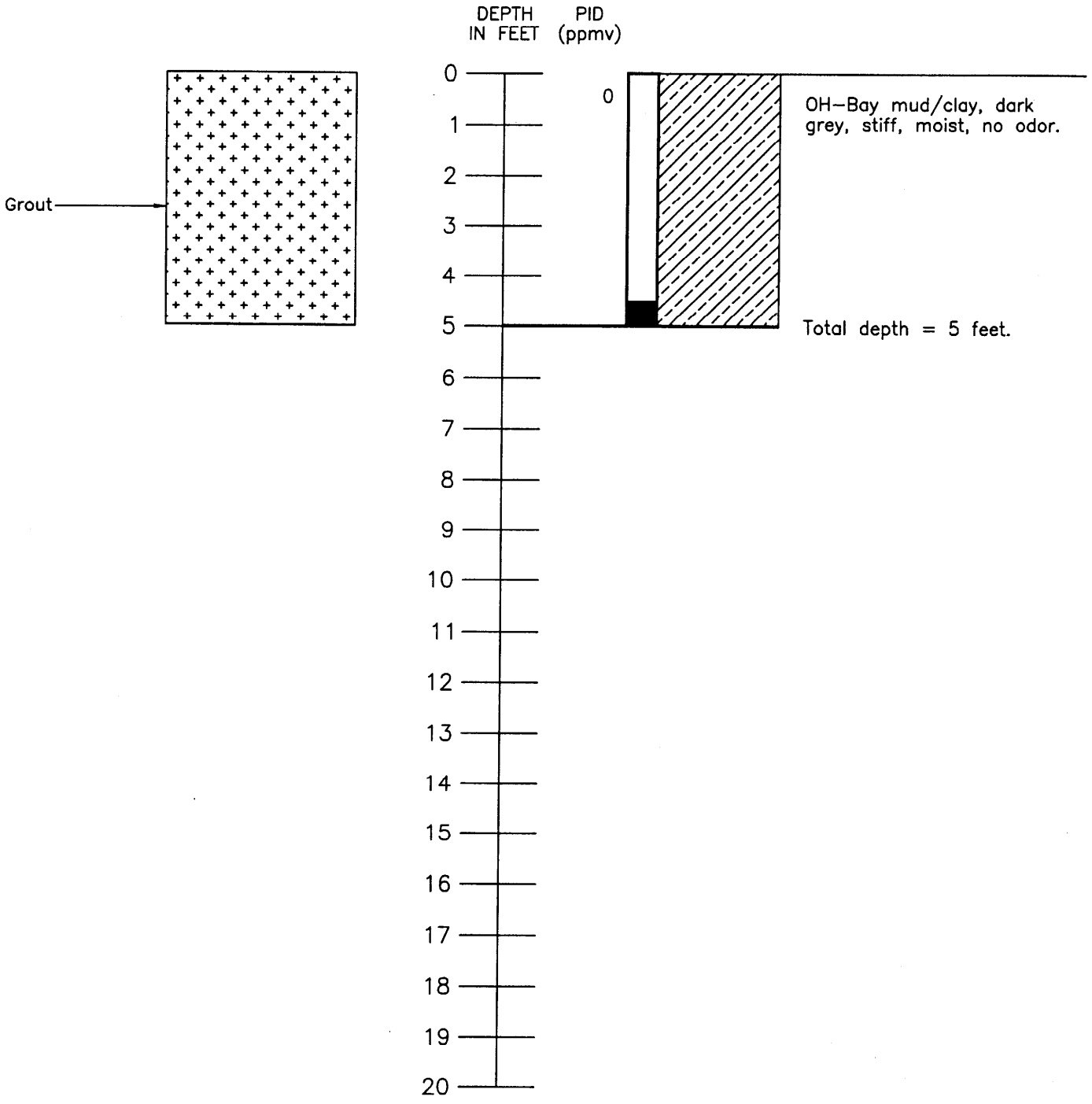
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–25	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-25**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

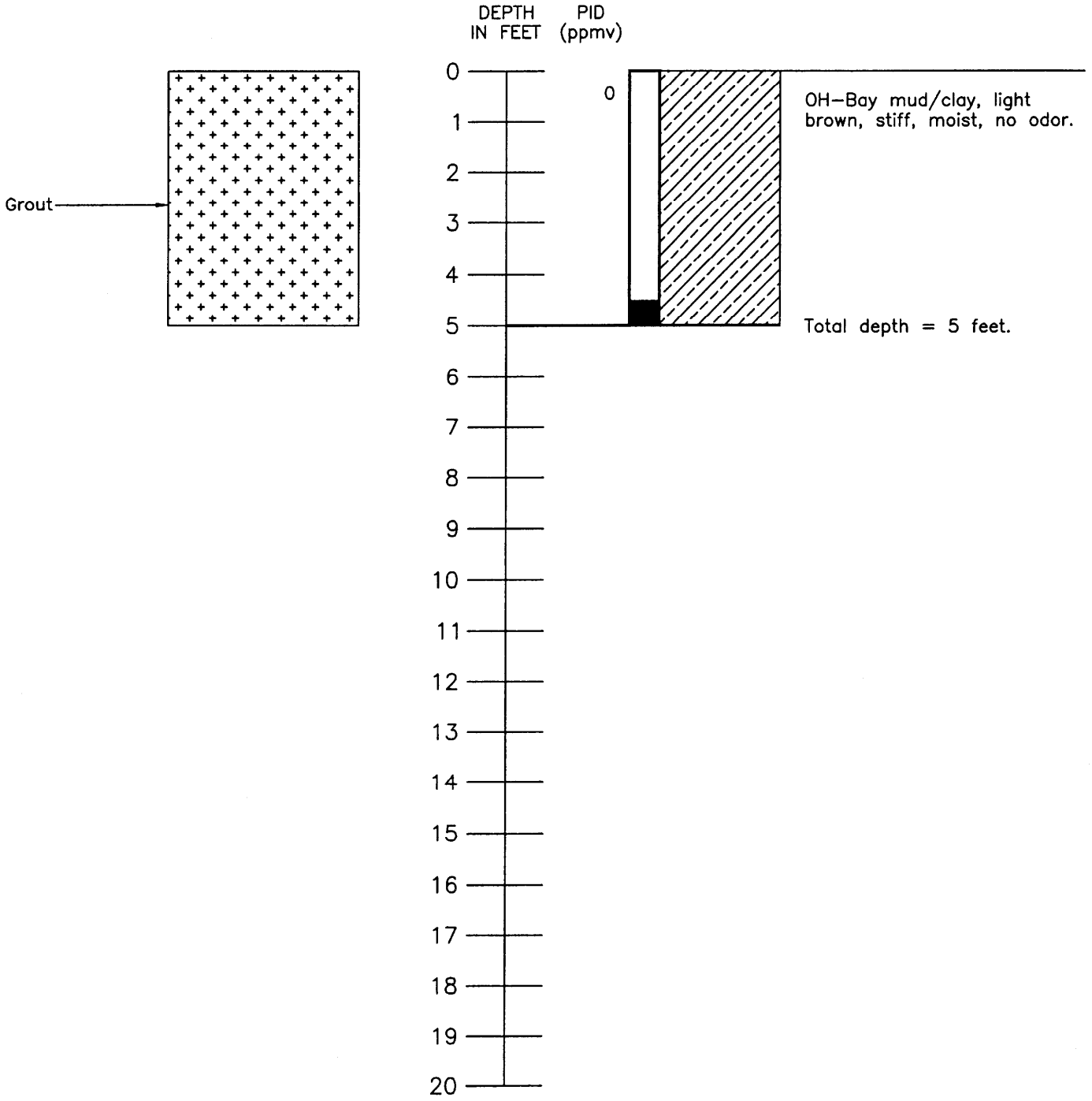
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–26	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-26**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

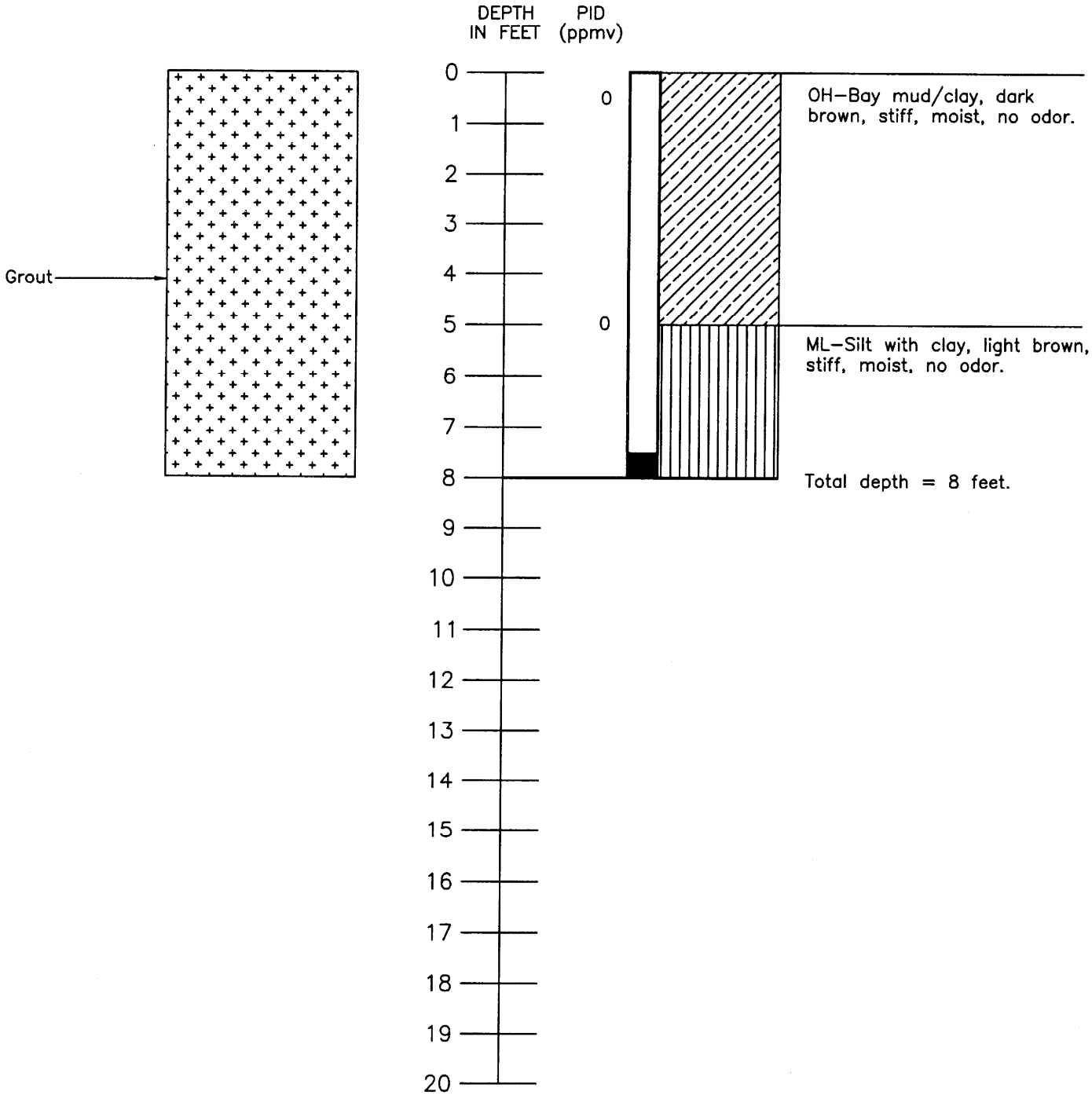
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–27	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-27**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

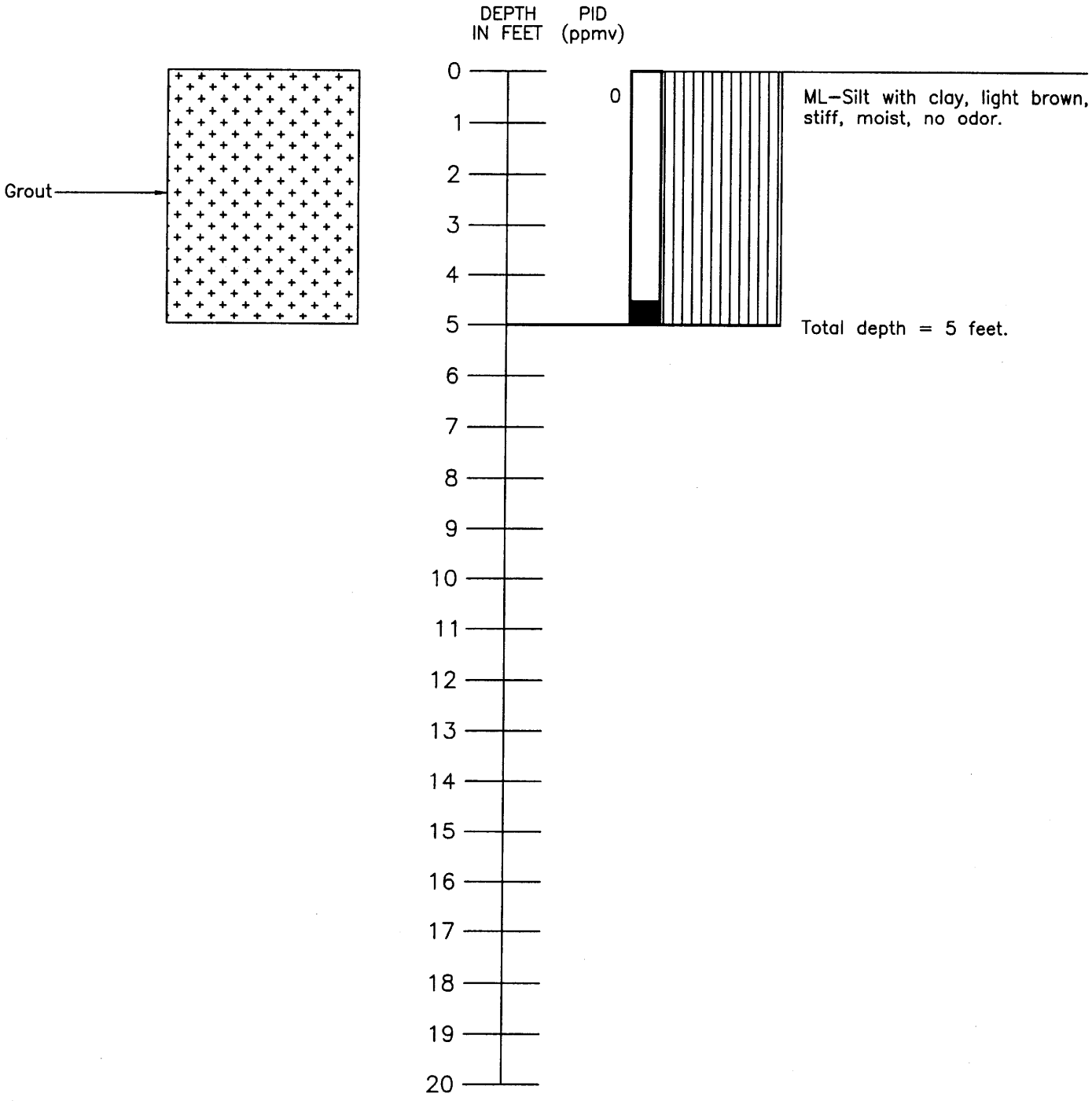
APEX ENVIROTECH, INC.

Boring/Well Log Details GP–28	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-28**

BORING/WELL CONSTRUCTION DETAIL

GRAPHIC LOG

DESCRIPTION



EXPLANATION:

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

CONTACTS:

- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

APEX ENVIROTECH, INC.

Boring/Well Log Details GP–29	Job No. SNK01.001
Andante Project 3992 San Pablo Avenue Emeryville, California 2/5/03	BORING/ WELL **GP-29**

APPENDIX B

Health and Safety Plan

PROJECT-SPECIFIC HEALTH AND SAFETY PLAN

for

REMEDIATION: SNK ANDANTE PROJECT

at

3922 San Pablo Avenue
Emeryville, California

Prepared for:

SNK DEVELOPMENT INC.

March 2003

Project No. 9401.204

PROJECT-SPECIFIC HEALTH AND SAFETY PLAN

Project Name: Remediation - SNK Andante Project

Project No.: 9401.204

Client: SNK Development Inc.

Project Manager: H. B. Dietz , REA II
The San Joaquin Company Inc.

Project Location: 3922 San Pablo Avenue, Emeryville, California.

Project Description:

Remediation by excavation and off-site disposal or on-site treatment of soil affected by moderate concentrations of components of diesel and gasoline, including concentrations of benzene, toluene, ethyl benzene, xylene polymers and methyl tertiary butyl ether).

The scope of work includes excavation of affected soil, stockpiling soil on site, sampling and analysis of soil samples in the walls and floor of the remedial excavation, sampling and analysis of stockpiled soil. The stockpiles of affected soil will be either loaded into trucks for disposal off site at a permitted facility or it will be spread on site and treated by aeration (and if found to be necessary by bioremediation) before being returned to the remedial excavation. When the remedial excavation is complete, it is expected that its bottom will be below the water table. It will be backfilled by rock until the surface of the material is above the water table. The remainder of the excavation will be backfilled with engineered fill or treated soil that is returned to the excavation to project specifications. In addition, temporary water-quality monitoring wells will be drilled and sampled. The Scope of Work also provides for installation of standard water-quality monitoring wells, if necessary.

The work performed will be performed in accordance with the *Remediation Work Plan, SNK Andante Project, 3992 San Pablo Avenue, Emeryville, California,* to which this site-specific health and safety plan is an Appendix. This health and safety plan includes by reference The San Joaquin Company's *Master Health and Safety Plan*, a copy of which is on file at ACEHCS.

The site location and the location of the closest hospital with full-service emergency treatment facilities are shown on Figure 1. Figure 2 is a site plan that shows the area of the site that is to be remediated.

Remediation Contactor

The remediation work will be performed by Dietz Irrigation of Tracy, California, which holds a Class A Contractor's License with Hazardous Waste Endorsement issued the California State Contractors Licensing Board.

Engineer of Record

The Engineer of Record for the project is D. J. Watkins Ph.D., CE, GE of The San Joaquin Company Inc. of Oakland, California.

Known Hazards

The principal hazards expected to be encountered on this project are those common to construction work involving excavation using heavy equipment. Low to moderate concentrations of components of fuel hydrocarbons will be encountered in the subsurface beneath the site and will be present in excavated soil. Underground utilities will be identified by USA alert and disconnected prior to the start of work, but any utilities that remain in service will be searched and located before excavation work begins.

Construction Hazards

Typical hazards associated with excavation, well-drilling and use of heavy equipment are suffocation or crushing trauma by sidewall failure of unsupported excavations, crushing injuries due to being overrun by machinery, pinching injuries of the extremities, entanglement of extremities and clothing in moving parts drilling rigs or heavy machinery, exposure to noise from machinery, tripping hazards, and strains due to lifting heavy objects.

Chemical Hazards

Soil in the subsurface beneath the subject property is known to be contaminated by moderate to very low concentrations of components of gasoline and diesel. These mixtures of hydrocarbon compounds contain components that are known human carcinogens. They are chemicals that may injure human respiratory, hepatic and renal functions, as well as the central nervous system. If there is exposure to high concentrations of the components' vapors for long periods, dermal and eye injuries can also be sustained, especially if contact is made with the compounds in liquid form or with waste materials that are highly saturated with these materials.

Currently available information shows that in one limited area beneath the site, soil is affected by diesel at concentrations up to 1,100 mg/Kg, gasoline at concentrations up to 12,000 mg/Kg and the following components of gasoline at the concentrations noted in parentheses following the citation in the following list. Benzene (19 mg/Kg), Toluene (270 mg/Kg), Ethyl benzene (230 mg/Kg), Xylene Isomers (1,300 mg/Kg), Methyl tertiary butyl ether (0.069 mg/Kg).

Specific Health and Safety Requirements

The work required for this project is not known to involve special hazards beyond those covered by the standard requirements of The San Joaquin Company Inc.'s (**SJC**) *"Master Heath Health and Safety Plan,"* which is incorporated herein by reference. All work will be conducted in compliance with the applicable policies, safety rules and safe working practices set out in that Master Plan. However, for emphasis, the following specific requirements are cited.

Site Access Control

A chain link fence, 6 ft. in height, with lockable gates, shall secure the work site at all times until the project is completed.

No personnel, other than workers directly engaged in the remediation work or authorized representatives of the project engineers, the property owners or concerned regulatory agencies, shall be permitted to enter the property while the work is in progress. All visitors shall comply with the applicable requirements of SJC's *Master Health and Safety Plan.*

Safety in and Around Excavations

It is intended that this project be completed without need for personnel to enter the remedial excavation except when it is less than 5 five feet deep. Under no circumstances shall personnel be permitted to enter any excavation that is deeper than five feet, as measured at any side wall, unless the excavation has been shored in compliance with Cal-OSHA regulations or one or more of the following have been implemented and the project engineer in responsible charge of the work has approved the methods used. (**Note:** No personnel shall enter any excavation deeper than three feet until the contractor's site manager, after consulting with the project engineer, has determined that it is safe to do so.)

1) All walls of the excavation have been sloped back at an angle approved by the project engineer.

2) The side walls of the excavation are supported by an engineered shoring system designed for the specific site and geotechnical conditions and approved by the project engineer.

3) Personnel entering the excavation are protected by a steel box that has been specifically designed and manufactured for that purpose and attached to an excavator or other earth-moving equipment.

4) No excavated soil, spoil or other material shall be stockpiled within five feet of the edge of any excavation. Except when being worked, all excavations deeper than one and one half feet shall be isolated by suitable posts or supports connected by yellow caution tape.

Protective Clothing and Equipment

Based on the hazards known to be present, personal protective equipment requirements for this project correspond to Level D (ref. The San Joaquin Company's *Master Health and Safety Plan*).

The following clothing and protective equipment will be used by personnel engaged in the work.

- Steel-toed boots.
- Safety glasses when performing any operation in which a hazard to the eyes exists (*e.g.* welding, cutting, burning, sandblasting, drilling, grinding or hammering).
- Strong, non-slip gloves.
  (Note: Gloves need not be worn when no identified risk to the hands exists, or when wearing gloves could cause a greater risk.)
- Lightweight cotton or cotton and synthetic fiber work shirt and pants.
  (Note: Neckties, scarves or any loose clothing that could become caught in machinery will not be permitted.)

Note: All personnel engaged in the remediation work must have available a personally fitted, half-face respirator equipped with clean filter cartridges capable of removing components of fuel hydrocarbons from breathed air. The respirators must be worn if the area being worked exposes workers to airborne concentrations of components of hydrocarbon fuels in excess of the limits set by the State of California, or at any time their use is directed by the project engineer, project manager, or the representative of a regulatory agency having jurisdiction over the project site.

Upgrade of Protective Clothing and Equipment

If, during the progress of the work, the presence of any contaminant is found in the subsurface, or detected in the air, of a type or concentration that would require, or is suspected to require, a higher level of personal protection than is specified above, all work will be halted, all personnel withdrawn and the site shall be secured until the requisite level of protection has been determined in accordance with The San Joaquin Company's *Master Health and Safety Plan.* Similarly, if any other adverse condition on the site becomes evident, the protection level will be upgraded soil as to provide conservatively designed health protection for all persons engaged in the work.

Sanitary Facilities

Portable toilet facilities will be provided on the site that will include facilities for hand washing.

Emergency Services

The telephone numbers of services and persons to call in case of emergency are listed below. Use the following address when calling for emergency services.

Job Site: 3992 San Pablo Avenue, Emeryville, Alameda County, California

Telephone locations:

1. Dietz Irrigation's on-site cellular telephone. Tel. No. (209) 482 7769
2. The San Joaquin Company's on-site cellular telephone. Tel. No. (510) 701-8933
3. At any of several businesses across San Pablo Avenue from the site.

Emergency Telephone Numbers

Fire:	911
Paramedic:	911
(Ambulance)	
Police:	911
Hospital	(510) 869-6600

Hospital:

Summit Medical Center
350 Hawthorne St.
Oakland, CA
Note: Emergency Room Entrance is on 34th Street

Emergency:	(510) 869-6600
Non Emergency:	(510) 655-4000

Utility Services:

Pacific Gas & Electric:	(800) 743-5000
East Bay Municipal Utility District:	(510) 835-3000
(Municipal Water Supply and Sewers)	
City of Emeryville Sewer System	(510) 596-3700
(Emergency Number and After Hours))	

City of Emeryville:

Public Works Department/City Engineer:	(510) 596-4332
Fire Department:	(510) 596-3753
Police Department:	(510) 596-3700

The San Joaquin Company Inc. (Project Engineers)**:**

Oakland Office: (510) 336-9118

Engineer of Record: Dai Watkins:

Direct Line: (510) 336-1772
Cell Phone: (510) 701-8933
Fax: (510) 336-9119

Dietz Irrigation (Remediation Contractor):

Tracy Office (209) 832-2910

Superintendent: Bernie Dietz

Direct Line: (209) 832-2910
Cell Phone : (209) 482 7769 or (209) 601-3736
Fax: (209) 833-1288

Alameda County Environmental Health Care Services

Case Officer: Eva Chu

Office Tel. (510) 567-6762