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CORRECTIVE ACTION REPORT

SNK Andante Project

3992 San Pablo Avenue
Emeryville, California

Prepared for:

SNK CAPTEC ANDANTE LLC

August 2003

VOLUME I of V

Site Characterization and Remediation
Text and Appendices

Project No. 9401.205

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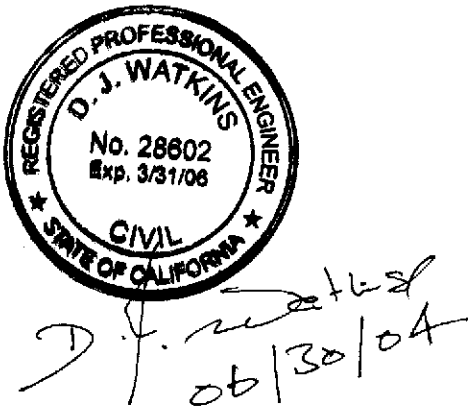
This report was prepared under the direction of the engineer whose seal and signature appear below. The work was performed in accordance with generally accepted standards of engineering practice based on information available to us at the time of its preparation and within the limits of the scope of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



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1.0 INTRODUCTION

This Corrective Action Report describes a program of environmental remediation that was performed at 3992 San Pablo Avenue, Emeryville, California for SNK Captec Andante LLC **(SNK Captec)** of Emeryville, California. The remediation program was conducted according to a work plan (The San Joaquin Company Inc. 2003) approved by Alameda County Environmental Health Care Services **(ACEHCS)** (Alameda County Environmental Health Care Services 2003c), which agency also oversaw the implementation of the remediation. This report was prepared by The San Joaquin Company Inc. **(SJC)** of Oakland, California, which served as the project engineers. The remediation contractor was Dietz Irrigation of Tracy, California.

The location of the subject property is shown on Figure I-1. Figure I-2 is a site plan and Figure I-3 is an architect's drawing showing a ground floor plan view of the development that is currently being constructed on the property.

The remediation program described herein was required to permit construction of a mixed-use commercial and multi-family residential development on the 3992 San Pablo Avenue property, the subsurface of which had been severely affected by releases of fuel hydrocarbons and other analytes of concern that had migrated from sources located beneath the portion of 40th Street that runs from Adeline Street to San Pablo Avenue, adjacent to and north of the SNK Captec property. That right-of-way is owned by the City of Emeryville's Emeryville Redevelopment Agency **(ERDA)**. It includes property that was the site of the former Celis' Alliance Service station **(Celis),** an automobile service station that had been located at 4000 San Pablo Avenue, where leakage occurred from a number of underground storage tanks. That right-of-way also encompasses other locations at which investigations performed by others have identified the presence of significant concentrations of analytes of concern in soil and groundwater. No source that would amount to an unauthorized release of regulated materials to the subsurface were found to be present on the 3992 San Pablo Avenue site itself, during either the extensive program of geotechnical and environmental site characterization or the remediation program conducted on that property.

This Corrective Action Report presents a description of the procedures used to remediate soil and to evaluate the quality of groundwater at the subject property, including: a summary of pre-remediation subsurface investigations; documentation of the excavation and off-site disposal of soil affected by fuel hydrocarbons and other analytes of concern; definition of the off-site sources of contamination that affected the subsurface; an expanded characterization of the geology and hydrogeology of the site based on the pre-remediation site investigations and geotechnical information obtained during the progress of the remediation work; the discovery and removal of three, very old, underground storage tanks beneath the site that did not discharge sufficient of their contents into the subsurface to amount to an unauthorized release of regulated material; the results of laboratory analyses of soil and groundwater samples recovered during the progress of the work; a description of the placement of engineered backfill to restore the site following remediation; the results of a Tier 2 Risk-

based Environmental Assessment of the remediated property; and details related to the impermeable barriers placed beneath the foundation slabs of structures built on the area of the site where remediation was necessary.

This report consists of five volumes. Volume I (this document) describes the various elements of the pre-remediation site characterization program, the remediation work performed, together with the results of analyses of confirmation samples and other relevant analytical data, and a summary of the results of the Tier 2 Health Risk Assessment. Volume II describes the development of site- and building-specific models, the selection of modeling parameters, the formulation of the mathematical procedures used in the models to evaluate risk, and the full results of the Tier 2 Health Risk Assessment. Volumes III-V are compilations of copies of the certificates of analysis issued by the laboratory for analyses of samples of soil and groundwater recovered during the progress of the pre-remediation site investigation, underground tank removals, and the progressive phases of the remediation process, as well as analyses of confirmation samples recovered from the completed remedial excavation.

The five-volume document has been prepared with the intention that it be read as a whole. However, Volume II includes a comprehensive summary of the complete remediation program, together with sufficient of the Figures and Tables that appear in Volume I that it can be read as a self-contained health risk assessment report.

1.1 Site Codes

The concerned regulatory agencies have issued the site codes noted below for the Celis site at which petroleum hydrocarbons were released to the subsurface and for the purposes of administrating the oversight of remediation of the property at 3992 San Pablo Avenue.

> **Note**:
>
> The automobile service station that was previously located at 4000 San Pablo Avenue was known as Celis' Alliance Service Station, which designation reflected the name of Constantino Celis, who owned the service station prior to the purchase of the property by the City of Emeryville. However, in many reports and regulatory citations prepared by others, it is variously named "Celi's Alliance Service Station" or "Celis Service Station." Based on the best information available to SJC at the time we prepared Volume II of this report, we believed the correct usage was Celi's (**Celi's**) and that designation was used in that volume. Based on review of additional regulatory files, we now conclude that the proper usage is Celis' Alliance Service Station. Accordingly, in this volume, that facility will be referred to as Celis' Alliance Service Station (**Celis**).

1.1.1 4000 San Pablo Avenue

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

The California State Water Resources Control Board (**SWRCB**) has established the following Global ID for the Celis site:

Global ID: T0600101794

The California Regional Water Quality Control Board - San Francisco Bay Region (**RWQCB**) has been assigned the following Case Number to the Celis site:

Case Number: 01-1938

The ACEHCS Local Oversight Program (**LOP**), which is the lead agency for the site, has assigned the following Case Number to the Celis 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 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 no discharge occurred on the 3992 San Pablo Avenue property itself.

1.2 Site History

Ohlone Indians were the principal inhabitants of the eastern shore of San Francisco Bay (**East Bay**) when, in 1820, the neighborhood of the subject property, like most of present-day Alameda County, was awarded by Spain to Luis Maria Peralta. The land grant specified that Peralta promote European settlement of the area, which the Spaniards called Encinal, the "grove of evergreen oaks," and which Peralta called Rancho San Antonio. By 1842, new settlers had established full-scale logging operations in the oak and redwood forests of the East Bay and the Ohlones and most of their culture had been obliterated by European diseases and settler hostility.

With the growth of population in the East Bay, particularly in the City of Oakland, which adjoins the City of Emeryville to the south, a number of industries developed in Emeryville and, by the late nineteenth century, were the principal economic basis for Emeryville's development. These industries included tanneries, a large steel works, paint factories and

chemical-manufacturing plants. Major industries continued to develop in Emeryville in the early twentieth century and expanded rapidly during World War II. However, by the 1980s the industrial facilities had begun to decay and increasingly were idle. In the 1990s the City of Emeryville, through its redevelopment agency, ERDA, began an ambitious undertaking to clean up and redevelop former industrial areas of the City and other tracts where commercial and residential properties had become run-down.

The industrial areas of Emeryville were located to the west of San Pablo Avenue, along the eastern shore of San Francisco Bay. None were on, or in the neighborhood of the subject property at 3992 San Pablo Avenue. In the late 1800s, Atchison, Topeka and Santa Fe Railroad tracks were constructed across the property along its northern boundary, but these were main line tracks headed west to transport materials and workers to the industrial areas of Emeryville. There were no rail yards or locomotive maintenance shops on the subject property. None of the environmental problems associated with such facilities have been discovered on the site or adjacent properties. During that period, the balance of the SNK Captec property was occupied by residences, which, by the early twentieth century, had been replaced by commercial property that included shops, restaurants and other small businesses, together with a warehouse serviced by a railroad spur. The Sanborn fire insurance map that shows the rail lines and structures present on the 3992 San Pablo Avenue in 1951 is included in Appendix I-A. By the late 20th Century, the rail lines passing through the site became disused, portions of the right-of-way were 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 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, by March 2003, when it was purchased by SNK Captec, it was a paved, empty lot.

2.0 SITE CHARACTERISTICS

The general geological, hydrologic and hydrogeological setting of the 3992 San Pablo Avenue property is discussed below, together with a description of subsurface contamination under adjacent properties that were the sources of contamination affecting the SNK Captec site. The results of several phases of pre-remediation environmental site characterization that were conducted on the subject property itself are also discussed.

2.1 Site North

As previously noted, Figures I-1 and I-2 and I-3 show the location of the subject property, a site plan of the property prior to the construction work that is presently in progress and an architect's site plan of the development as it will be configured when construction is complete. On those Figures, and others presented in this report, 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 Corrective Action Report, we have established a "Site North" that parallels the alignment of San Pablo Avenue, which runs along the western side of the property. Thus, 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 report should be interpreted in the context of that directional construction.

2.2 Topography

SNK's Emeryville site has a total area of some 79,360 sq. ft. (1.8 acres) and occupies a major part of a triangular city block that is bounded by 40th Street, Adeline Street, and San Pablo Avenue.

Prior to the initiation of the remediation program in March 2003, the site had a mean elevation close to 43 ft. above mean sea level (**MSL**). It was, for all practical purposes, flat, except for minor changes of elevation (typically less than one foot) that occurred where one paved area joined 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). When construction is complete, there will be some modifications to the detailed topography of the site, but because the new construction is designed to match substantially the original site topography without major changes in grading, its general topographic setting will remain unchanged.

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 I-2).

2.3 General 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.

Prior to the initiation of the remediation program, the entire area of the property was 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 bricks and concrete that formed building foundations. Except for the road base and other engineering materials, the fill material generally consists of soft to very stiff silty clay, sandy and clayey silts, and, in isolated areas, loose to medium-density sands and gravels. In some areas of the site, the concrete and brick foundations associated with the structures previously located on the site were extensive and included concrete floor slabs and brick rubble buried at depths between 1 and 5-10 ft. BGS.

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.

Additional details of the site-specific geology are discussed, in context, in later sections of this report.

2.4 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.

2.5 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, the piezometric level of the regional groundwater may be at elevations that vary between approximately 6 and 12 feet BGS. However, prior to the site's re-grading for construction, perched groundwater could be encountered over relatively wide areas where the surficial fill that covered the 3992 San Pablo Avenue property had moderate to high hydraulic conductivity. In those areas, and similar fill areas on adjacent property, during periods of unusually prolonged or intense precipitation, such as is discussed in Section 3.2.5 of this report, the depth to first groundwater could be as shallow as 1 to 5 ft. BGS. However, because the surficial fill was excavated from the entire area of the SNK Captec property as part of the remediation program and re-compacted to form a very low permeability engineered fill, localized zones of perched groundwater will not develop in the future.

Regionally, the general direction of groundwater flow is west toward San Francisco Bay. As is discussed in greater detail in Section 3.2.5, the local direction of groundwater flow beneath the 3992 San Pablo Avenue property itself is to the west-southwest at a gradient that is typically 0.02 ft/ft. It is influenced by the local hydrostratigraphy that includes a well-defined paleo-stream channel filled with coarse sand and gravel deposits (see Section 3.4.1).

2.6 Sources of Contamination Affecting the 3992 San Pablo Avenue Property

The components of fuel hydrocarbons and other analytes of concern found in soil and groundwater beneath the SNK Captec property at 3992 San Pablo Avenue migrated onto the site from adjacent property to the north that is, today, located beneath 40th Street. The principal source of the contamination was leakage from a number of underground storage tanks that were located on the Celis site that was previously located at 4000 San Pablo Avenue. That source and others are discussed below.

2.6.1 Environmental Conditions Beneath 40th Street

Subsurface investigations have been conducted by Science and Engineering Analysis Corporation (**SECOR**) Levine-Fricke, and Woodward Clyde, each of whom served as consulting engineers to the several parties that, over time, owned some or all of the property that is, today, occupied by the extension of 40th Street that runs between Adeline Street and San Pablo Avenue.

As can be seen on Figure I-4, the major source of the contamination found beneath the 40th Street right-of-way can be attributed to releases that occurred on the Celis site and, to some degree, to leakage from underground storage tanks that were located on property that was

owned by the San Francisco French Bread Company (see Section 2.6.1.2). However, analytes of concern were also detected in soil and groundwater beneath the 40th Street that, because of their hydrogeological juxtaposition relative to those sites at which underground storage tanks are known to have leaked, are difficult to explain without considering other potential sources of contamination. Such sources also appear to have been located in what is now the 40th Street right-of-way or, if not on that property itself, at hydrogeologicaly up-gradient locations.

Significant releases of paint thinner and other solvents are known to have occurred on property on both the north and south sides of 41st Street where it intersects with Adeline Street (Clayton Group Services 2003). The closest of those sites, the former Frank W. Dunne Company's paint manufacturing facility (**Frank Dunne**) at 4050 Adeline Street/1007 41st Street, is some 450 ft. to the northeast of 40th Street where it passes along the midpoint of the northern boundary of SNK Captec's 3992 San Pablo Avenue property. However, there is insufficient information available from the investigations that were conducted beneath 40th Street for a firm conclusion to be reached that some of the contamination present beneath that thoroughfare had its source at the Frank Dunne site, nor can the possibility that localized spills of such materials occurred there in the past when a major portion of the land on which the street has been constructed was occupied by railroad tracks be fully discounted.

Levine-Fricke investigated the environmental condition of the subsurface beneath what is now 40th Street for Catellus Development Corporation, the real-estate arm of the Southern Pacific Railroad (Levine-Fricke 1994a, 1994b, 1994c, 1993a, 1993b). Woodward Clyde conducted subsurface investigations in that street's right-of-way for the City of Emeryville's ERDA (Woodward Clyde International Americas 1998a, Woodward Clyde Consultants 1995, 1994). SECOR investigated groundwater quality beneath the street's right-of-way due to leakage from underground storage tanks previously located at the San Francisco French Bread Company (**SFFBC**) facility (Science and Engineering Analysis Corporation 1994), a portion of which was also incorporated into the 40th Street right of way when that extension was constructed in 1995. The locations of the borings and groundwater-quality monitoring wells that were drilled by the several consultants noted above are shown on Figure I-4. The depths to groundwater that have been measured in monitoring wells and the available results of analyses of samples of soil and groundwater recovered from them are compiled in Tables I-1, I-2 and I-3, respectively.

In Tables I-2 and I-3, concentrations of analytes that exceeded the Tier I Risk-based Screening Levels (**RBSL**s) published by the RWQCB that were in effect in 2003 are in **bold** font. The RBSLs cited are for soil and groundwater at sites where the water table is at a depth of less than 3 meters (9 ft.) BGS and the soil materials are assumed to be porous and groundwater beneath a site is not a source of drinking water. At sites where the concentrations of analytes of concern in soil or groundwater exceed the RBSLs, it is necessary to perform site-specific, or Tier II Risk Assessment before the property may be used for a given purpose (*e.g.*, residential construction or commercial development). See Volume II for an extended discussion of Tier I and Tier II risk assessment procedures and site-specific risk assessments for the SNK Captec property.

Note:

Subsequent to completion of the remediation program for the SNK Captec property, revisions were made to the site-screening procedures followed by the RWQCB and the screening criteria known as RBSLs were re-designated as Environmental Screening Levels - **ESLs**. To maintain historic consistency, the term "RBSL" will be used throughout this report to reflect the screening values and regulatory terminology in use in early 2003 when the remediation program for the 3992 San Pablo Avenue property was implemented.

At selected locations where concentrations of total petroleum hydrocarbons or BTEX compounds were detected in borings at high concentrations, soil was excavated to a depth of 10 ft. BGS from the 40th Street right-of-way and transported off-site for disposal. These remedial excavations included a 20 x 20 ft. area in the vicinity of LFB-4, a 15 x 15 ft. area in the vicinity of LFB-3, a 10 x 10 ft. area around LFSB12, LFSB15 and LFSB16, a 10 x 10 ft. area centered around LFSB18, and a 10 x 10 ft. area around LFSB19 (Levine-Fricke 1994a). The locations of the local remedial excavations, which were in addition to the major remediation of soil by excavation and off-site disposal that was conducted on the former Celis site (see Section 2.6.1.1 below), are shown on Figure I-5.

2.6.1.1 Celis' Alliance Service Station at 4000 San Pablo Avenue

As has been noted previously, a gas station, owned by a succession of petroleum companies and independent owners, operated from approximately 1936 until 1993 on the land that, over those years, had the address 4000 San Pablo Avenue, and which was adjacent to and north of SNK Captec's project site at 3992 San Pablo Avenue. The last owner of the service station was Constantino Celis and in the latter years of its operation, it was known as Celis' Alliance Service Station. The former location of the service station is shown on Figure I-5, which also shows the former locations of six underground fuel and waste oil tanks that were present on that site. Over their lifetime, those tanks leaked and diesel, gasoline and waste oil was released into the subsurface. The sizes and uses of the tanks are tabulated below (Woodward-Clyde Consultants 1994).

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

The tanks were removed from the former Celis site in May 1994 (Levine-Fricke 1994b). Prior to the construction of the 40th Street extension in 1995, 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 former Celis site at 4000 San Pablo Avenue.

In June 1994, at the direction of ERDA, Woodward-Clyde prepared a Remediation Work Plan for the 4000 San Pablo Avenue site (Woodward-Clyde International Americas 1994) that was approved by ACEHCS. 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 Celis 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 former Celis site, the remedial excavation on that property was backfilled with clean, engineered fill. The 40th Street extension now occupies the former Celis site and runs along the northern boundary of the SNK Captec property from Adeline Street to San Pablo Avenue.

To remove floating product that had been observed on the water table beneath the former Celis site, a recovery well was installed in the northwestern corner of the property. An ejector pump was installed in that well and it was pumped from September of 1996 through July of 1998, removing a total of 2,035 gallons of free product and water 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 Celis site are reproduced in Table I-4. The sampling locations are shown on Figure I-6.

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 Corrective Action Report is concerned. The concentrations of diesel in the samples recovered from those locations ranged from undetectable to 75 mg/kg. As can be seen in Table I-4, 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 I-6, 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 from the Celis 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.

As a matter of record, it should be noted that the Celis 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 Celis 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 the plume of affected groundwater emanating from that site was stable (Alameda County Health Care Services Agency 1997). A groundwater-quality monitoring program that would define adequately the lateral extent of the groundwater plume has not been implemented at the Celis site and it is for that reason, among others, that the site remains as an "open" case in ACEHCS records.

2.6.1.2 Underground Fuel Storage Tanks at 4070 San Pablo Avenue

Another site beneath 40th Street at which underground storage tanks are known to have leaked is the former location of the San Francisco French Bread Company (**SFFBC**) at 4070 San Pablo Avenue, which is located some 65 ft. north of the SNK Captec property. When used as a bakery by the SFFBC, which did business as the Toscana Baking Company, the property at that address was the site of two large structures, one of which, prior to its demolition to permit construction of the 40th Street extension, was occupied by Anderson Carpet. The other, which is still standing today and retains the 4070 San Pablo Avenue address, is currently used by the Oaks Club LP, a California limited partnership (**Oaks Club**) as a maintenance equipment warehouse. Prior to its purchase by the Oaks Club, that building had been occupied by the Tire Center Inc.

The SFFBC owned and operated two 10,000-gallon underground fuel storage tanks on its property. One held diesel and the other held gasoline. Those tanks were removed in May 1989 when SFFBC still owned the property. At the time they were removed, they were found to have leaked (Levine-Fricke 1994b).

At the direction of ACEHCS, a groundwater-quality monitoring well (SMW-1 on Figure I-4) was installed a short distance down-gradient from the former tank sites on the SFFBC property in September 1992 and groundwater samples were recovered from the well and analyzed at quarterly intervals from September 11, 1992 through March 8, 1994. The results of the analyses are included in Table I-3. During that period, concentrations of gasoline in the samples ranged from 700 to 5,800 µg/L. The concentration ranges for benzene, toluene, ethyl benzene and total xylene isomers were undetectable to 1,700 µg/L, undetectable to 430 µg/L, undetectable to 230 µg/L, and undetectable to 490 µg/L, respectively. It is notable that, in each case, the highest concentrations listed, all of which are very much greater than concentrations previously detected in the well, were present in the sample recovered on March 8, 1994, when the depth to groundwater was 5.09 ft., the shallowest depth at which the water table had been measured over the life of the groundwater monitoring program.

Through a series of mergers and corporate by-outs, the property at 4070 San Pablo Avenue passed from the SFFBC to the Metz Baking Company of Deerfield, Illinois, to Earth Grain of St. Louis, Missouri, and, finally, to Interstate Brands Corporation of Pomona, California before the property that including the former locations of the underground storage tanks passed into the ownership of the Oaks Club which does business at 4097 San Pablo Avenue in Emeryville, California. However, to construct the extension of 40th Street from Adeline Street to San Pablo Avenue, as is shown on Figure I-4, the City of Emeryville took ownership of the greater part of the former location of the underground storage tanks at the 4070 San Pablo Avenue property, by eminent domain. When that street extension was constructed by the City of Emeryville, Monitoring Well SMW-1 was destroyed and groundwater-quality monitoring ceased.

As noted previously, soil affected by concentrations of diesel and high concentrations of gasoline and the BTEX compounds were excavated from a 20 x 20 x 10 ft. deep area in the 40th Street right-of-way to the south of and adjacent to the former underground storage tank pit that, at the time the tanks were removed, had been located on SFFBC property at 4070 San Pablo Avenue.

Although, as has been documented above, tanks on the former SFFBC property at 4070 San Pablo Avenue had leaked and, at least for some period in 1994, groundwater in a monitoring well located a short distance down-gradient from the tank pit contained high concentrations of gasoline and the BTEX compounds, it is unclear whether or not analytes of concern in soil or groundwater discharged at that location made a significant contribution to the contamination at the SNK Captec property. If it did make such contribution, it is clear, based on the finding made during the site investigations and remedial excavations performed on the subject property, that it appears to be relatively minor compared to the contamination that migrated from the Celis site at 4000 San Pablo Avenue. Today, the former site of the tanks that had been located at the former SFFBC site is beneath the 40th Street right-of-way and, consequently, as the current property owner, the City of Emeryville is, at least for that portion of the affected site, a co-responsible party. The remaining portion of the former tank pit is on property that is today owned by the Oaks Club.

2.6.2 Environmental Conditions at Other Nearby Properties

In 2000, SJC completed a Phase I Environmental Site Assessment (**Phase I**) for the SNK Captec site at 3992 San Pablo Avenue (The San Joaquin Company 2000). Research for the Phase I included a search of available regulatory databases, including a file search at ACEHCS offices in Alameda, California. That search found numerous sites at which underground fuel storage tanks were or had been located in the general vicinity of, but not on, the subject property, together with some other sites where regulated materials had been manufactured or stored. Based on the information available at that time, SJC concluded that the former Celis and SFFBC sites, discussed in Sections 2.6.1.1 and 2.6.1.2, respectively, were identified as having the potential to be the source of contaminants migrating onto the 3992 San Pablo Avenue property. Migration from the Celis site was assessed to have been

significant based on the magnitude of the leakage that had occurred there, its proximity to the SNK Captec property and the shallow groundwater in the area. An earlier Phase I that was concerned with a major portion of the SNK Captec property at 3992 San Pablo Avenue property was conducted for the ERDA by Woodward Clyde in 1998, but that assessment, which was concerned with the King Midas Club site, which had the same address as is used today to identify the SNK Adaptec property, did not specifically identify any serious environmental impairment (Woodward-Clyde International Americas 1998b).

Sites that are close by the subject property and that were also specifically evaluated for the purposes of SJC's Phase I report included the Fidelity Roofing Company (**Fidelity**) property at 1075 40th Street, from which a leaking underground gasoline storage tank was removed in 1996. The Fidelity site is located to the east of the SNK Captec site beyond the residences that front onto the eastern side of Adeline Street between 40th Street and Yerba Buena Avenue (see Figure I-1 for street locations). Following exhumation of the underground storage tank, that site was remediated by excavation and off-site disposal of contaminated soil. At the time SJC prepared its Phase I report for the 3992 San Pablo Avenue property, it was judged that leakage from the former underground storage tank at the Fidelity site had not affected the SNK Captec property and no evidence for such was found at any stage of the site characterization and remediation programs that are described in this report.

As noted previously, significant releases of paint thinner and other solvents occurred on property on both the north and south sides of 41st Street where it intersects with Adeline Street (see Figure I-1 for street locations), including at the former Frank Dunne site at 4050 Adeline Street and on the former Boysen Paint site at 1001 41st Street. When SJC prepared its Phase I report in 2000 it was judged that, based on what was at that time known about the conditions at that site, the local hydrogeology of the area and its distance from the 3992 San Pablo Avenue property, that the Frank Dunne and Boysen Paint sites were unlikely to be sources of contamination affecting the SNK Captec site.

Since SJC's Phase I was prepared, the Frank Dunne site has been more fully characterized and contaminated soil and groundwater beneath that property have been, to a limited extent, remediated by excavation and off-site disposal of affected soil and by pumping and treatment of groundwater. In addition, SJC has gained access to City of Emeryville files that document the findings of the various subsurface investigations that were conducted beneath 40th Street.

As is documented in Table I-2, the records obtained from City of Emeryville show that soil samples recovered from boring LFSB-17, which, as is shown on Figure I-4, was located on the northern side of the 40th Street right-of-way, contained concentrations of methylene chloride at concentrations ranging from 0.66 to 2.6 mg/kg, napthalene at concentrations from 0.57 to 1.7 mg/kg, 2-methyl-napthalene at concentrations from 0.63 to 1.8 mg/kg, and 4-methyl-phenol at concentrations varying from undetectable to 0.4 mg/kg. Those chemicals are typical components of paint thinners and other solvents that are known to have been released at the Frank Dunne site. However, insufficient information is available about the distribution of, and areal extent to which the subsurface beneath the 40th Street right-of-way is affected by those chemicals to indicate whether those detected in boring LFSB-17

originated on the Frank Dunn site or at some other location. Similar data limitations make it difficult to asses clearly whether or not they migrated, in significant quantities, from beneath that Street onto the SNK Captec property at 3992 San Pablo Avenue.

2.7 Site Characterization Studies at the 3992 San Pablo Avenue Property

Prior to the implementation of the remediation program, documented in this report, geotechnical engineering and environmental investigations of the subsurface beneath the 3992 San Pablo Avenue property were conducted by others. SJC extended those investigations to assist in the design of the remediation program, to improve understanding of the hydrogeology of the site, the groundwater quality and the lateral and vertical extent to which soil and groundwater in the subsurface had been affected by contamination originating at the Celis site and other locations in the 40th Street right of way. In addition, during the progress of the remedial excavation on the SNK Captec site, important details of the geology and hydrogeology of the site were revealed that had not been evident based on the information obtained by the earlier investigations. The results of the various stages of site characterization are discussed below.

2.7.1 Phase I Environmental Assessments

As noted previously, a Phase I was conducted for the ERDA by Woodward Clyde in 1998 for the King Midas Club that at that time was present on, and occupied the greater part of what is today the SNK Captec site at 3992 San Pablo Avenue (Woodward-Clyde International Americas 1998b). However, while that Phase I indicated that the 3992 San Pablo Avenue property may have been affected by contaminants released at the Celis site, Woodward-Clyde appeared to have reached no definitive conclusion in that respect and did not characterize the severity of the contamination that might be present.

The high probability that the subsurface beneath a strip of land in the northwester corner of the 3992 San Pablo Avenue site was affected by petroleum hydrocarbons that were released from the Celis site at 4000 San Pablo Avenue was clearly identified in the Phase I Environmental Assessment prepared by SJC for the 3992 San Pablo Avenue property in September 2000 (The San Joaquin Company Inc. 2000). That report also noted the shallow depth to groundwater beneath the site and in conversations with SNK Development personnel SJC expressed concern that the site was likely to have been significantly impaired environmentally by releases of regulated materials that had occurred on the Celis site. SJC also cautioned that it would be prudent for new foundations constructed on the site to be restricted to shallow beneath the site grade as it existed at that time.

2.7.2 Geotechnical Engineering Investigation

Between July 28 and September 25, 2000, Harza Engineering Company, Inc. (**Harza**) of Oakland, California, which subsequently merged with Fugro West, Inc. (**Fugro**) also of Oakland, California, conducted a geotechnical engineering site investigation at the 3992 San Pablo Avenue property (Harza Engineering Company, Inc. 2000).

Harza drilled a total of twelve exploratory borings at the locations shown on Figure I-2. The maximum depth of exploration was reached in Boring HEB-11, which reached a total depth of approximately 81 ft. In addition, Harza also conducted three cone penetration tests that reached a maximum depth of 50 ft. The locations of those tests are also shown on Figure I-2 and copies of the boring logs and graphic logs from the CPT tests are included in Appendix I-B of this report.

2.7.3 Initial Environmental Subsurface Investigation

In early February 2003, in preparation for the anticipated construction of the Andante project, Apex Envirotech, Inc. (**Apex**) of Gold River, California was retained to drill small-diameter, exploratory borings and recover soil samples from the subsurface beneath 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 I-2 and in Table I-5, respectively. Copies of the boring logs are compiled in Appendix I-B. Due to refusal of the push-probe system used to open the borings 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.)

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 (other than the widespread random fill) are typical of those found in the Temescal Formation, which strata contain no Bay Mud.

2.7.4 Need for Additional Pre-Remediation Site Characterization

Together with the information gathered by Woodward-Clyde and others as part of the remediation program implemented at the Celis site to the north, SJC used the Harza and Apex data as the basis for a preliminary assessment of the likely 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. However, SJC recognized that the information provided by those studies was insufficient to assess reliably the depth to which soil beneath the subject property had been affected by chemicals of concern and no data was available regarding groundwater quality or the local direction of groundwater flow beneath the site. Accordingly,

SJC prepared an extended site characterization plan (The San Joaquin Company Inc. 2003) to resolve those issues and the specified scope of work, which was approved by ACEHCS on March 26, 2003. That plan was implemented as a preliminary phase of the site remediation program. The results of SJC's extended site characterization are described in Section 3.0 below.

3.0 PRE-REMEDIATION SITE CHARACTERIZATION

The site characterization information obtained from SJC's pre-remediation program of exploratory trenching and groundwater-quality monitoring are described below.

3.1 Excavation of Exploratory Trenches and Pits

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.

Thus, to gain additional information about the characteristics and lateral and vertical extent of the affected soil on the 3992 San Pablo Avenue property, three 5 ft.-wide exploratory trenches, designated Trench No. 1, Trench No. 2 and Trench No. 3, were excavated on March 24-25, 2003, at the locations shown on Figure I-7.

Exploratory Trench No. 1 was 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 was located so as to investigate the subsurface that appeared, based on information available prior to March 15, 2003, to be the most severely affected by fuel hydrocarbons that migrated southward onto the Andante project site. It also permitted exploration of the maximum depth of affected soil at that location, as well as assisting in the definition of the southern boundary of the area to be remediated.

Exploratory Trench No. 3 was located so that it could 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.

3.1.1 Observations Made in Exploratory Trenches

When the exploratory trenches were being excavated, visual and olfactory indicators were observed to assess the lateral and vertical extent of soil affected by hydrocarbons and project engineer determined from which locations soil in the floors and walls of the trenches were to be sampled to aid in refining understanding of the lateral and vertical extent and the characteristics of the affected area of the site. The engineer also prepared geotechnical logs of the exploratory trenches, copies of which are presented in Appendix I-B.

3.1.1.1 Exploratory Trench No. 1

After stripping away the surficial bituminous macadam, Trench No. 1, which was 63 ft. in length, was excavated to a depth of approximately 5.5 ft. BGS (see the Log for Trench No. 1 in Appendix I-B). Beneath the surficial macadam, there was aggregate paving-base material, which was approximately 1 ft. thick. Beneath that, there was a fill material consisting of brown, fine- to coarse sand with gravel and some silt and clay. A layer of dark gray-black or mottled brown, soft, silty clay with some sand and occasional gravel, also interpreted to be fill, was then encountered down to a depth of approximately 5 ft. BGS. Beneath the surficial materials described above, a moderately stiff to stiff and highly impermeable dark gray-black silty clay, typical of those seen in the undisturbed Temescal Formation, was reached. Excavation of Trench No. 1 was initiated at its northern end and excavation proceeded southward from there.

Olfactory indicators in the floor of Trench No. 1 over the first 40 ft. of its length showed soil at that depth to be affected by gasoline. During excavation of that length of the trench, a buried 12-in. diameter timber post in a vertical orientation was found with its top buried approximately 1 ft. BGS.

To explore efficiently the lateral extent of the area around the trench that was affected by fuel hydrocarbons, after the first section was excavated, a short section of soil was left in place and full-depth excavation reinitiated at full depth approximately 20 ft. from the south end of Trench No. 1. In that part of the excavation, a 2 ft. wide, buried brick wall was encountered with its top at a depth of 1 ft. BGS and its footing at an unknown depth greater than 6 ft. The floor of the trench in that portion of the excavation was, based on visual and olfactory indicators, also affected by gasoline. However, to the south of the wall, no visual or olfactory indicators of the presence of fuel hydrocarbons, or of any other contamination, was detected. As is documented in Section 3.1.2 below, this was confirmed by the results of the analysis of Sample ET1-S-6 (see Table I-6) recovered at a depth of 6 ft. beneath the floor at the southern end of the trench excavation.

When Trench No. 1 was excavated on March 25, 2003, other than for minor seep at the full depth of excavation, no groundwater flowed into it except at its southern end where a small pit was excavated to a depth of 6 ft. BGS for recovery of a soil sample. At that location, at that time, the groundwater level reached equilibrium at approximately 5.5 ft. BGS. However, heavy rain fell on the site in the days following March 25, and by April 1, 2003, water was present at a depth of 5 ft. BGS. (See Section 3.2.5 for further discussion of groundwater elevations and flow directions beneath the subject property.)

3.1.1.2 Exploratory Trench No. 2

Exploratory Trench No. 2 was excavated from north to south in a similar manner to Trench No. 1. It was 78 ft. in length. As is shown on the Trench Log, the fill materials and undisturbed natural soil exposed in this trench were generally similar to those shown in Trench No. 1. As is also shown on the Log, three buried brick walls were found in this

excavation. Over the greater part of its length, Trench No. 2 was excavated to a depth of approximately 5-6 ft. BGS. However, near its northern end, a deep pit was excavated in the floor of the trench to a depth of approximately 9.5 ft. BGS and a smaller pit penetrating to a depth of 6.5 ft. was excavated near its southern end.

Except at its extreme southern end, which was separated from the rest of Trench No. 2 by one of the three buried brick walls and where no visual or olfactory indicators of the presence of hydrocarbons in the soil were present, beneath a depth of approximately 5 ft. BGS, soil in the walls and floor of the trench emitted a strong odor of gasoline. As is shown in Table I-6, the absence of analytes of concern in the southern end of the excavation was confirmed by the results of an analysis of a soil sample recovered from a depth of approximately 7 ft. BGS from that location. Two other soil samples from depths of 6.5 and 9 ft. BGS from a pit at the northern end of the excavation contained significant concentrations of petroleum hydrocarbon compounds.

When the northern portion of Trench No. 2 was excavated on March 24, 2003, no groundwater was encountered at any point down to the full depth of excavation, which in that portion of the trench was approximately 9.5 ft. However, it was noted that the dark, gray-black silty clays exposed in the excavation beneath the surficial soil were highly impermeable. As the excavation moved south, groundwater began to flow into the trench in the section south of the northernmost of the three buried brick walls that are shown on the trench log. Here, by the end of the day, the groundwater appeared to reach equilibrium at a depth of approximately 5 ft. B.G.S, and that was the case from that location southward to the end of the trench. In those sections, through April 1, 2003, groundwater remained at an elevation of approximately 5 ft. BGS. However, although some water had accumulated at the bottom of the pit at the northern end of the trench by that date, its surface was some 1-2 ft. lower than the water in the southern portion of the trench. Because heavy rain had fallen between March 24th and April 1st, it was concluded that the water in the northern end of the trench had its source, at least in part, as surface water running off the site in the area around the trench. Although the pit at that end of the trench penetrated below the water table, it was excavated in soil so highly impermeable that groundwater seeped into it so slowly that it was all being lost to evaporation or that it would require at least several days for static water to appear in the trench bottom.

3.1.1.3 Exploratory Trench No. 3

Exploratory Trench No. 3 was excavated on March 25, 2003, on an approximate west to east alignment over a length of 40 ft. It was generally 5 ft. deep, except for deeper pits approximately 6.5 ft. and 8 ft. deep at the western and eastern end, respectively. The fill and underlying Temescal formation soils were generally the same as those encountered in Trench Nos. 1 and 2. An odor of gasoline was emitted from the soils in the floor of the trench throughout its length, except at its eastern extremity, where the soil was free of visual or olfactory indicators of the presence of analytes of concern. However, analysis of a soil sample recovered from a depth of 8 ft. at the bottom of a pit excavated at the eastern end of the trench contained very slight traces of components of gasoline and diesel.

By the end of the working day on March 25, 2003, groundwater had seeped into the pits excavated at each end of Trench No. 3 and the water table appeared to be stable at a depth of approximately 5.5 ft. BGS. When conditions in the trench were again observed on April 1, 2003, the floor of the trench in its central portion remained dry. However, in the pits at its eastern and western end, the surface of the groundwater had risen to approximately 4.75 ft. BGS.

3.1.2 Sampling of Soil and Groundwater in Trenches

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

Following sample recovery, each sample tube was cleaned externally, its ends covered with a Teflon sheet and closed with tightly-fitting plastic caps. The caps were secured with adhesive-less tape. Each sample tube was labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport, within 12 hours, to the Severn Trent-San Francisco laboratory (**STL**) in Pleasanton, California. STL is certified by the California Department of Health Services (**DHS**) to perform all chemical analyses described in this report.

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

Analyte	**Method of Analysis**
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Mineral Spirits	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 (TBA)	EPA Method 8260B
Methyl-tertiary butyl ether (MTBE)	EPA Method 8260B
Di-isopropyl ether (DIPE)	EPA Method 8260B
Ethyl tertiary-butyl ether (ETBE)	EPA Method 8260B
Tertiary-amyl methyl ether (TAME)	EPA Method 8260B
1,2-Dichloroethane (DCA)	EPA Method 8260B
Ethylene dibromide (EDB)	EPA Method 8260B
Ethanol	EPA Method 8260B

Note:

> The laboratory certificates of analysis for all of the analyses reported herein were provided to the ACEHCS Case Officer in submittals provided to that agency during the progress of the remediation program.

In addition to the recovery and analysis of soil samples from the exploratory trenches, a sample of the groundwater that flowed into Trench No. 2 was also recovered from the location shown on its trench log. That sample was recovered in a disposable plastic groundwater bailer submerged in the water that accumulated in the trench near its mid-length. Water brought to the surface in the bailer was decanted so as to completely fill clean glassware supplied by the laboratory. The sample vials were then tightly closed, labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport, within 12 hours, to STL's laboratory in Pleasanton, California.

When the groundwater sample reached the laboratory, it was analyzed for the same suite of analytes listed above for soil.

The results of the analyses of soil and groundwater recovered from the exploratory trenches are presented in Tables I-6, and I-7, respectively. Laboratory Certificates of Analysis for all analyses of samples recovered by SJC as part of the characterization and remediation work reported herein can be found in Volumes III, IV and V of this Corrective Action Report.

3.2 Temporary Groundwater-quality Monitoring Wells

Although SJC's Phase I Report (The San Joaquin Company Inc. 2000) had identified the water table to be at shallow depth in the neighborhood of the site and had warned of the likelihood that the groundwater beneath at least a portion of the property was likely affected by fuel hydrocarbons released from the Celis property, little or no groundwater was detected in any of the borings drilled on the 3992 San Pablo Avenue property by either Apex or Harza (Apex Envirotech, Inc. 2003, Harza Engineering Company, Inc. 2000). Although widely distributed over the site, many of the Apex borings did not penetrate to the depth of the groundwater table and, although the Harza borings and some of the Apex borings did, it appears that they were closed by grouting before sufficient time had elapsed for groundwater to flow into them through the generally low-permeability soils in the subsurface. Thus, prior to implementing the remediation program, it was necessary to obtain information regarding local groundwater gradients and flow directions and to assess the concentrations of analytes of concern in the groundwater beneath the site.

Permits to install the temporary groundwater-quality monitoring wells were obtained from the Alameda County Public Works Agency (**ACPWA**).

Gregg Drilling and Testing, Inc. of Martinez, California (**Gregg**), which holds a C-57 contractor's license issued by the California Contractors State License Board, mobilized to the site on April 11, 2003.

3.2.1 Location and Construction of Temporary Wells

To obtain the necessary groundwater data, on April 11, 2003, SJC installed ten small-diameter, temporary, groundwater-quality monitoring wells at the locations shown on Figure I-7. The geotechnical engineer responsible for the field work logged all of the borings drilled for the temporary wells and noted any visual and olfactory indicators of the presence of hydrocarbons and other chemicals of concern in the soil cores, which were removed from each boring in 4 ft. long, transparent, plastic core liners. (See Appendix I-B for Boring Logs.)

The wells were divided into two groups. The first, consisting of SJC MW-T1, SJC MW-T1, SJC MW-T2, SJC MW-T3, SJC MW-T4, SJC MW-T5, SJC MW-T6 and SJC MW-T7, were constructed as simple 0.75-in. diameter PVC standpipes with 0.01-in. aperture, machine cut slots over their whole length, with PVC casing caps at the top and bottom. They were set in 2-in. diameter borings opened by direct push technology that were drilled to depths between 8 and 12 ft. BGS. The annular space between the standpipes and the boring walls were left open, except for a hand-placed plug of clayey soil that was used to seal the top of the boring. That type of temporary standpipe was employed to accommodate the severe scheduling restraints of the project. Before the need for the remediation program and its preliminary investigative phases were recognized, SNK Captec had already engaged a general contractor to begin construction of the new development. To avoid liquidated damages and ensure project funding, it was necessary to proceed with the environmental engineering and remediation work with the maximum practical speed. The use of the type of temporary monitoring well described above enabled the project scheduling requirements to be met.

SJC MW-T1 was located close to the northern boundary of the site at a point sufficiently east of San Pablo Avenue that it was expected to be up-gradient from the affected area of the site. SJC MW-T3 was placed well to the south of the area that was suspected to be affected by fuel hydrocarbons and its location was selected so as to confirm that hypothesis. Wells numbered SJC MW-T4 and -T5 were located near the western boundary of the property to provide information regarding the condition of the subsurface in that area and to permit the groundwater flow direction to be identified. (Note: It was originally intended to install SCJ MW-T5 at a location some 30 ft. to the south of the location shown on Figure I-7; however, a hole could not be drilled at that location due to a subsurface obstruction, which was later found to be a 6-in. thick, buried floor slab. Accordingly, the site of SJC MW-T5 was moved to the location shown on the Figure.) Wells numbered SJC MW-T6 and -T7 were located to investigate conditions in areas where the early site investigation programs indicated that soil and groundwater might be severely affected by fuel hydrocarbons.

On the date the wells described above were first installed, they remained dry throughout the day. However, over the next several days, water accumulated in the wells. This is consistent with observations made in the exploratory trenches described in Section 3.1.1 above, where it was found that groundwater would not flow into the trenches for at least several days in those areas where the fill and natural materials in the subsurface consisted of highly-impermeable clayey soil, although, at other locations intersected by the trenches, where more permeable

strata were locally present, water would appear in the excavation a short time after they were opened.

The second group of wells, which included SJC MW-T2A, SJC MW-T4A and SJC MW-T5A, had total depths of 20 ft. BGS. They were also installed in 2-in. diameter push-probe borings, but, unlike the simple standpipe wells described above, these wells were screened, as is shown on their well logs in Appendix I-B, over only the bottom 5 ft. of the 0.75-in. diameter PVC well casing and were equipped with a prefabricated bentonite seal located approximately 2 ft. above the top of the screened interval. A few inches below the prefabricated seal there was a 3-in. thick foam plastic annulus, designed to prevent debris from falling down the hole from the surface before the bentonite was immersed in water and expanded to fill tightly the space between the casing and the boring wall. That design was used to ensure that groundwater piezometric levels in the natural soils beneath the surficial fill could be reliably measured. This was necessary because, from observations made in the exploratory trenches previously excavated at the site, SJC was concerned that, under some conditions, such as during periods of heavy rainfall, perched water conditions might develop due to surface water penetrating some of the locally permeable areas in the surficial fill that covered the site. Under such circumstances, groundwater elevations measured in shallow wells would not reflect the hydrogeological conditions at greater depth.

The locations of Monitoring Wells SJC MW-T2A, SJC MW-T4A and SJC MW-T5A were selected to permit computation of groundwater flow directions at depth beneath the site and to investigate groundwater quality at areas that appeared to be severely affected by the fuel hydrocarbons migrating to the 3992 San Pablo Avenue from the Celis site and other locations to the north of the SNK Captec property..

3.2.2 Soil Sampling in Temporary Wells

While the borings for the temporary monitoring wells were being drilled, the drilling equipment was used to recover soil cores, which were removed from the boring in 4 ft. long, transparent, plastic core liners. The engineer selected soil samples for analysis from sections of the continuous core for analysis. These were prepared for transport to the laboratory by cutting the plastic core liner at selected, typically 5 ft., depth intervals to yield an approximately 6-in. long core sample that remained within the liner. Each core sample was cleaned externally, its ends covered with Teflon foil and closed with tightly-fitting plastic caps secured with adhesive-less tape. Each sample was then labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport, within 12 hours, to the STL laboratory in Pleasanton, California.

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

Analyte	Method of Analysis
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Mineral Spirits	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 (TBA)	EPA Method 8260B
Methyl-tertiary butyl ether (MTBE)	EPA Method 8260B
Di-isopropyl ether (DIPE)	EPA Method 8260B
Ethyl tertiary-butyl ether (ETBE)	EPA Method 8260B
Tertiary-amyl methyl ether (TAME)	EPA Method 8260B
Polynuclear Aromatic Compounds*	EPA Method 8270C

***Note:**

In a first analysis of each sample, Polynuclear Aromatic Compounds (**PNA**) was omitted from the analytical protocol, but if any detectable concentrations of diesel were found in the sample, an analysis for PNA was made. Selected samples were also analyzed for 1,2-Dichloroethane (DCA), Ethylene dibromide (EDB) and Ethanol by EPA Method 8260B. None were detected.

The well drill cuttings were temporarily stockpiled on the site and later shipped off-site to a permitted facility with the affected soil removed from the remedial excavation, as is described in Section 4.6 below.

3.2.3 Well Development

Following installation of the temporary wells, they were developed by bailing and false bailing of the well using a 0.5-in. diameter bailer until a minimum of 20 casing volumes had been removed from each well. The well development water, which, due to the small diameter of the well casings, was limited in volume, was discharged onto the stockpiles of affected soil that had been excavated from the exploratory trenches. In this way, any water that did not evaporate was absorbed by the stockpiled soil and removed when that material was transported off-site for disposal at a permitted facility.

3.2.4 Well-head Survey

The locations of the temporary wells were established by a triangulation survey by which well-heads were located relative to site features established by the site survey conducted for

SNK Captec, from which the Site Plan shown on Figure I-2 was prepared. The elevations of the tops of the well casings were 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 used 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 well locations are shown on Figure I-7 and their casing elevations are recorded in Table I-1.

3.2.5 Groundwater Elevations, Gradient and Flow Direction

To permit groundwater elevations in the temporary wells to reach equilibrium, they were left undisturbed for three days following completion of development. However, within 24 hours of the installation of the wells, heavy precipitation had fallen on the site and, over the following two weeks, heavy rainfall recurred periodically, so that, by the end of the month, the National Weather Service reported the wettest conditions for the month of April ever recorded in the Oakland-Emeryville Area. Rainfall data for April 2003 are recorded in Table I-8. These conditions raised concern that depths to groundwater, particularly in the shallower wells, might reflect temporarily perched water that had percolated from the surface through local pockets of permeable fill material. If that had occurred, in the manner that was observed in some of the exploratory trenches, the perched water would have taken some time to dissipate, so that the depth to water measured in the wells a short period after the rain had fallen would not represent the static piezometric level of the groundwater.

To observe the fluctuations in the depth to groundwater following the storms that swept over the region in the days following the installation of the wells, the depths to groundwater in each temporary well was checked on April 14, 16 and 21, 2003. Those measurements are recorded in Table I-1. Over the one week period April 14-21, 2003, the groundwater elevations in each of the shallow standpipe-type wells fell some 1 to 2 ft. However, they remained some 1.5 to 2 ft. higher than the elevations in the deeper wells that had bentonite seals above their screened intervals, which were located between approximately 15 and 20 ft. BGS.

From the above observations, it was concluded that, due to the highly variable permeability of the surficial fill that overlay the site, during the wet season in the San Francisco Bay Area, rainfall seeping into the ground could produce local, but frequently interconnected, zones of perched water in what was otherwise nearly impermeable surficial soils. These observations were later confirmed by observations made during the progress of the remedial excavation work described in Section 4.0 below, when it was observed that very shallow groundwater encountered in some areas was no longer encountered after a short period of about one week, during and following which there was no further rainfall in the neighborhood of the site.

On April 21, 2003, a conductivity probe was used to measure the depth to the water table in each well. The depths to groundwater measured in only the deeper temporary wells (see below), together with the surveyed elevations of the tops of their casings, were used to construct the groundwater contours shown in Figure I-8 and to assess the direction and gradient of groundwater flow.

Under the rainfall conditions noted above, to permit accurate computations of the direction of groundwater flow, the groundwater elevations computed from the measurements made in the deeper wells (*i.e.*, SJC MW-2A, SJC MW-4A and SJC MW-5A) were used to characterize the prevailing groundwater regime beneath the site. Depths to groundwater in those wells on April 21, 2003, ranged from 4.53 to 5.0 ft. This compares to depths to groundwater that were measured to be as shallow as 0.18 ft. in the standpipe-type wells when measured on April 14, 2003.

The corresponding groundwater elevations in the deeper wells, which ranged from 34.70 to 36.99 ft. MSL, are consistent with elevations measured by others in wells on the property immediately adjacent and to the north of the subject property. For example, over the period December 12, 1997 to March 13, 1998, groundwater elevations in extraction well WC-EW-1, installed by Woodward Clyde at the northeast corner of the intersection of San Pablo Avenue and 40th Street, ranged from 31.80 to 33.12 ft. MSL. See Table I-1 for the elevational data and Figure I-4 for location.

The direction of groundwater flow computed from the depth measurements made in Monitoring Wells SJC MW-2A, SJC MW-4A and SJC MW-5A on April 21, 2003, was to the southwest, as is shown on Figure I-8, at a gradient of 0.02 ft/ft. As is shown on Figure I-9, this flow direction is in close agreement with the flow direction computed by others from measurements made on March 13, 1998, in wells that were then present on the property immediately to the north of 3992 San Pablo Avenue and at locations across San Pablo Avenue to the west. Although separated by five years, the groundwater flow directions were computed from the 1998 and 2003 data were very similar.

3.2.6 Groundwater Sampling and Analysis Procedure (Temporary Wells)

On April 16, 2003, groundwater samples were recovered from each of the temporary monitoring wells.

Prior to recovery of a groundwater sample from each well, the well was purged of a minimum of 5 casing volumes. The purge water was managed in the same manner as was the well development water (see Section 3.2.3 above).

Samples were recovered from each well using a disposable, 0.5-inch diameter bailer. Water brought to the surface was decanted so as to completely fill clean glassware supplied by the laboratory. Sub-samples that were to be analyzed for extractable hydrocarbons were contained in 1-liter amber jars, while the sub-samples to be analyzed for volatile organic compounds were contained in volatile organic analysis vials (**VOAs**) into which 1.0 ml. of

hydrochloric acid had been dispensed as a preservative The sample jars and VOAs were then tightly closed, labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport, within 10 hours, to STL's laboratory in Pleasanton, California.

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

Analyte	**Method of Analysis**
Total Petroleum Hydrocarbons (quantified as Diesel)	EPA Method 8015M
Mineral Spirits	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 (TBA)	EPA Method 8260B
Methyl-tertiary butyl ether (MTBE)	EPA Method 8260B
Di-isopropyl ether (DIPE)	EPA Method 8260B
Ethyl tertiary-butyl ether (ETBE)	EPA Method 8260B
Tertiary-amyl methyl ether (TAME)	EPA Method 8260B
1,2-Dichloroethane (DCA)	EPA Method 8260B
Ethylene dibromide (EDB)	EPA Method 8260B
Ethanol	EPA Method 8260B

The results of analyses of groundwater samples recovered from the temporary wells are presented in Table I-7.

In compliance with Sections 13700 through 13806 of the California Water Code regulatory requirements, when the geochemical data from the analyses of samples of groundwater recovered from the wells was received, Well Completion Reports (Form 188), together with attached boring logs, well construction details and groundwater quality data were completed for each of the temporary wells and filed with the California Department of Water Resources (**DWR**) and the ACPWD.

3.2.7 Closure of Temporary Wells

When groundwater-quality monitoring using the temporary wells was complete, they were closed by removing the casings and pressure grouting the boreholes with Type II Portland cement. The well closures were performed by Gregg Drilling on April 21, 2003, under the direction of SJC's Geotechnical Engineer in Responsible Charge, and in compliance with permits issued by the ACPWA.

In compliance with Sections 13700 through 13806 of the California Water Code regulatory requirements, Well Closure Reports (Form 188), together with attached boring logs, well construction details and groundwater quality data were completed for each of the wells and filed with the California Department of Water Resources (**DWR**) and the ACPWA.

3.3 Geotechnical and Groundwater-quality Data Obtained in Remedial Excavation

During the excavation work to remove affected soil from the subsurface, as is described in Section 4.0, the geology, hydrogeology and concentrations of analytes of concern in soil and groundwater were found to be generally consistent with the interpretations made from the data gathered by the several stages of site investigation performed previously on the subject property, including the exploratory trenches excavated and the groundwater-quality monitoring wells installed by SJC. However, during the progress of the remedial excavation work, several features of the subsurface were revealed that improved understanding of the hydrogeology and distribution of analytes of concern beneath the site. These are described below.

3.3.1 Channel of Streambed Deposits

The excavation work exposed a natural, buried channel filled with coarse sands with some gravel that cut across the northwest area of the site. It was found at depths varying between 6 and 8 ft. BGS and, as is shown on Figure I-10, crossed the 40th Street frontage of the site some 200 ft. east of San Pablo Avenue. From there it ran in a generally southwesterly direction and crossed the San Pablo Avenue frontage of the site some 120 ft. south of 40th Street. (See Section 4.2.2 for details of the discovery and management of this buried paleo streambed.)

It was apparent that the high-energy clastic materials in the channel were deposited by a paleo stream that had crossed the site during a late stage of the Holocene geological epoch. The paleo stream was judged to be of geological rather than historic age because there are no records of such a watercourse on any historical map of the area, some of which date back to the 1870s. On its southern side, the stream channel had a clearly delineable cut bank, while on its northern edge, the sands and gravels were inter-fingered with the silty clays that dominate the whole area of the subject property at that depth. These paleo-morphological features are consistent with a rapidly-flowing stream that was cutting its southern bank along the length of a slight curve (see Figure I-10 for geometry) as its alignment moved from approximately southwest on the northern boundary of the SNK Captec site to south-southwest on the western boundary of the site. While the southern side of the channel was being cut, the velocity of the water was generally slower on the northern bank, which, depending upon flood stage, permitted more fine-grained clastic materials to be deposited there. This is typical of the comparative depositional environment frequently observed on the cut banks and inner curve banks of modern streams.

3.3.2 Permeable Zones Associated with Buried Walls and Building Foundations

As soil was removed from the remedial excavation, a large number of masonry wall and massive step-masonry foundations supported on concrete strips were found. The walls were generally similar to those encountered in the exploratory trenches and which are shown in the logs of Trench Nos. 1 and 2 in Appendix I-B. The bottoms of the walls' foundations were at depths varying from 6 to 9 ft. BGS.

The locations of the walls coincided with the perimeters of buildings, some of which had been present on the site through the mid-1960s. A copy of the Sanborn Fire Insurance Map for 1951 is included in Appendix I-A. It shows that on the San Pablo Avenue frontage of the 3992 San Pablo Avenue site, there was a large wholesale facility, which included a railroad siding branching off the Atchison Topeka and Santa Fe railroad line that passed along what is today the extension of 40th Street. The wholesale facility included shipping docks along the siding and a large shipping dock used for trucks along the east side of the building. To the south of that facility was a row of shops, restaurants and other businesses that also fronted onto San Pablo Avenue. A few structures, including a restaurant, were also present on the eastern side of the site and a wood-working enterprise that manufactured butter molds and cutters was located in the northeastern corner with a frontage on Adeline Street. The locations of the masonry walls and foundations that were discovered in the subsurface were in good agreement with the alignments, as shown on the 1951 Sanborn Map, of those buildings. The more massive foundation structures that were exposed by the remedial excavation were located in the areas where the road and rail shipping docks are shown on the Sanborn Map. Lesser walls surrounding concrete basement slabs were discovered a few feet beneath the surface of the site in the area noted above where shops and restaurants had fronted onto San Pablo Avenue. In addition, a buried retaining wall that separated the back of the sidewalk on San Pablo Avenue from the basements of those buildings extended along a part of that frontage of the site. Examples of the buried foundations and retaining walls that were exposed during the remedial excavation are shown Plates 1 and 2.

As these buried masonry and concrete structures were being removed, it was evident from visual and olfactory indicators that the relatively permeable backfill that had been placed around the foundation masonry and beneath the basement slabs had acted as a preferential pathway for the migration of fuel hydrocarbons released from the Celis site, that is located immediately to the north of the 3992 San Pablo Avenue property.

It was also apparent at the time that the remedial excavation was first opened, in April 2003, when the groundwater table was at a high elevation, and over the following month when the groundwater table fell significantly, that when the groundwater table had, over many years, seasonally risen so as to be above the elevation of the bottom of the fill that covered the site, heavily-contaminated groundwater originating on the Celis site flowed freely along the preferential pathways associated with the old foundations and via other high-permeability channels within the surficial fill. Conversely, when the groundwater table fell below the level of the bottom of the fill, contaminant transport was considerably restricted by the low-permeability clays and silty clays at that depth. Similarly, the buried channel of coarse sands

and gravel streambed deposits described in Section 3.3.1 above contributed to the widespread distribution of contaminants in the northwestern portion of the SNK Captec site.

These site-specific hydrogeologic features resulted in the migration of contaminants to a considerably greater distance south and east from the point of discharge at the Celis site than might otherwise have been expected based on consideration of co-gradient and up-gradient dispersion at a typical fuel hydrocarbon release site where the subsurface usually has a less pronounced variability over the areas adjacent to the release site.

3.3.3 Groundwater Quality Beneath Floor of Remedial Excavation

On May 15, 2003, a pit was excavated to a total depth of 15 ft. below the original ground surface into the floor of the remedial excavation. The pit was located at a point 30 ft. south of the 40th Street frontage of the site and 40 ft. east of the San Pablo Avenue frontage. It was designed to check the maximum depth of affected soils in the area and permit a sample of groundwater to be recovered from beneath the bottom of the remedial excavation. Analysis of that groundwater sample showed it to contain 3,200 µg/L of diesel-range petroleum hydrocarbons and 23,000 µg/L of gasoline, with commensurate concentrations of the BTEX compounds. It also contained traces of MTBE and naphthalene (see data for Sample No. 30S-40E in Table I-7).

3.4 Hydrogeologic Cross Sections

The geological and hydrogeological information gathered from various stages of site characterization and remedial excavation were used to develop the hydrostratigraphic sections along the lines A-A', B-B' and C-C' that are located as shown on Figure I-10. The sections are shown on Figures I-11, I-12 and I-13, respectively.

The hydrostratigraphy shown in the cross sections is an interpretation of the stratigraphic data from the boring, trench and monitoring well logs. The sections show the fill material that covers the site and the underlying alluvial sediments, which are divided into four classes: the very low permeability clays and silty clays, the somewhat more permeable sandy and clayey silt, the permeable sands, silty sands and silts with some gravel, and the highly permeable course sand and gravel stream-bed deposits found in the paleo-channel that crosses the northwestern portion of the site (see Section 3.3.1). That presentation makes it possible to reduce the details of the stratigraphy to a tractable degree of complexity by distinguishing between the different soil types based on the properties that are of importance to the understanding of the distribution and transport of analytes of concern in the subsurface.

Also shown on the cross sections are the locations from which soil samples were recovered from the borings and monitoring wells that were located on, or close to, the section lines. The concentrations of TPH(g), TPH(d) and the critical analyte, benzene, that were detected in those samples are also noted on the cross sections.

3.5 Analytes of Concern Beneath the SNK Captec Property

As can be seen from inspection of Tables I-2 and I-3, borings and groundwater-quality monitoring wells installed in 40th Street for the City of Emeryville and others had shown that soil and groundwater beneath that thoroughfare had been affected by fuel hydrocarbons and other contaminants released at the Celis gas station and other possible sources. See Figure I-4 for boring and well locations.

Analytes of concern in soil included Total Recoverable Petroleum Hydrocarbons (**TRPH**) at concentrations up to 4,600 mg/kg (in soil boring LFSB12 at a depth of 1 ft. BGS); motor oil up to 400 mg/kg (in soil boring LFSB at a depth of 1 ft. BGS); diesel up to 790 mg/kg (in soil boring LFSB2 at a depth of 7 ft. BGS); gasoline up to 8,800 mg/kg (in soil boring LF-B4 at a depth of 5 ft. BGS) with associated concentrations of benzene, toluene, ethyl benzene and total xylene isomers at concentrations up to 190 mg/kg in LFSB17 at a depth of 12 ft., 50 mg/kg in LFSB3 at a depth of 9.5 ft., 190 mg/kg in LF-B4 at a depth of 5 ft., and 870 mg/kg in LF-B4 at a depth of 5 ft., respectively; concentrations of methylene chloride up to 2.6 mg/kg in LFSB17 at 4.5 ft.; Alaclor 1260 up to 0.22 mg/kg in LFSB14 at 2 ft.; naphthalene up to 1.7 mg/kg in LFSB17 at 12 ft.; 2-methylnaphthalene at 1.8 mg/kg in LFSB17 at both 4.5 and 12.0 ft.; and a trace of 4-methylphenol, which was detected at a concentration of 0.4 mg/kg in boring LFSB17 at a depth of 4.5 ft. BGS.

The results of laboratory tests on samples of groundwater recovered from beneath the 40th Street Right-of-way were also affected by high concentrations of components of fuel hydrocarbons. As is recorded in Table I-3, the sample of groundwater recovered from Well WCEW-1 in the northwestern corner of the former Celis site contained 41,000 μ/L of diesel; 180,000 μ/L of gasoline, with associated high concentrations of the BTEX compounds; and up to 570 μ/L of MTBE, which was detected in the sample recovered from that well on March 13, 1998. The polynuclear aromatic compound naphthalene was also present in samples recovered from well WCEW-1, and, on June 2, 1998, rose to a concentration of 1,000 μ/L.

In a group of wells (LF-1AG - LF-3AG) located across San Pablo Avenue and down-gradient from the Celis site, similar high concentrations of components of fuel hydrocarbons were detected in groundwater, with the concentration of diesel reaching as high as 41,000 μ/L and gasoline reaching 100,000 μ/L.

High concentrations of gasoline, with associated elevated concentrations of the BTEX compounds, were also detected in samples of groundwater recovered from well SMW-1 in the period September 1992 through March 1994. As is shown on Figure I-4, that well is a short distance down-gradient from the former location of underground storage tanks that were used by the SFFBC, which was located across what is today 40th Street from the SNK Captec site.

Although, as has been previously noted (see Section 2.6.1), contaminated soil within the boundaries of the former Celis site had been removed to a depth of approximately 9.5 ft. BGS, and limited pumping was used to partially remove light non-aqueous-phase liquid (**LNAPL** or "floating product") from the surface of the groundwater beneath that property, high concentrations of contaminants were left beneath the remedial excavation that was opened at that site. As is shown in Table I-4, fuel hydrocarbons in the floor of that excavation remained at concentrations of up to 15,000 mg/kg of TRPH, 18,000 mg/kg of TPH(d) and 1,000 mg/kg of TPH(g). (Similar to Tables I-2 and I-3, concentrations of analytes that exceeded the Tier I RBSLs that were in effect in 2003 are in **bold** font in the Table I-4.)

Unfortunately, the site characterization and remediation work performed along 40th Street for the City of Emeryville and others was not extended to include the whole area of soil and the plume of groundwater affected by the major releases of contaminants that emanated from the Celis site and such other sources that may have been present to its east along 40th Street. The contaminated land under 40th Street is separated from the SNK Andante site only by the property boundary, which is, of course, nothing more than an anthropogenic artifice having no influence whatsoever on contaminant transport. This becomes clear when the concentrations and distribution of analytes of concern discovered in soil and groundwater beneath the SNK Captec site are reviewed.

As can be seen in Tables I-5, I-6 and I-7, which show the concentrations of analytes of concern detected in samples of soil and groundwater recovered from the borings and wells drilled on the 3992 San Pablo Avenue site at the various stages of pre-remedial site characterization (see Figure I-10 for locations), high concentrations of contaminants were found to be present in the northwestern area of the SNK Captec site.

In the affected area, the concentrations of diesel-range fuel hydrocarbons were, locally, as high as 1,100 mg/kg in a sample of soil recovered from a depth of 5 ft. BGS in Boring AE GP-9. Gasoline was detected in the same sample at 12,000 mg/kg. In that northwestern area of the site, the concentrations of the BTEX compounds in soil were commensurate with the detected concentrations of gasoline, with a high concentration of benzene of 9.1 mg/kg found in the sample recovered from the boring for groundwater-quality monitoring well SJC-MWT-7 at a depth of 7.5 ft. BGS. Traces of MTBE and TBA were also detected in soil samples recovered from the affected area.

As was noted previously, the subsurface investigations conducted by Apex Environmental, Inc. and Harza consisted only of soil borings that were not left open for sufficient time to allow the groundwater to reach equilibrium in the impermeable soil. In fact, with minor exception, no groundwater was detected by those consultants in any of their borings during the time that they were left open. This deficiency was corrected by SJC's excavation of exploratory trenches and the installation of temporary groundwater-quality monitoring wells, the locations of which are also shown on Figure I-7.

A grab sample of groundwater, designated ET2-C-W, recovered from exploratory Trench No. 2 contained 20,000 μ/L of compounds in the diesel range, 510,000 μ/L of TPH(g), with 1,100

µ/L, 3,700 µ/L, 10,000 µ/L and 65,000 µ/L of benzene, toluene, ethyl benzene and total xylene isomers, respectively. In the temporary groundwater-quality monitoring wells installed in the northwestern area of the subject property, the highest concentration of diesel-range compounds in the groundwater was 7,900 µ/L in SJC-MWT-2, which monitoring well was 8 ft. deep. The highest concentration of gasoline was 63,000 µ/L detected in monitoring well SJC-MWT-2A, which well was 20 ft. deep. The highest concentration of the BTEX compounds were benzene, at 2,400 µ/L in monitoring well SJC-MWT-7; toluene at 4,800 µ/L in monitoring well SJC-MWT-7; ethyl benzene at 3,300 µ/L in well SJC-MWT-2A; and total xylene isomers at 9,300 µ/L in monitoring well SJC-MWT-7. The fuel oxygenate MTBE was also detected in some of the temporary wells and, in SJC-MWT-4A, was present at a concentration of 78 µ/L.

Although the Celis property had been the site of an automobile fuel dispensing station since the early part of the 20th Century, the presence of MTBE in fuels that migrated from that site onto the SNK Captec property is not inconsistent with the operating life of that fueling station because, as is noted in Section 2.6.1.1, it did not close until 1993, well after the first use of MTBE in fuels that began in the late 1980s and later than October 1992, when use of it in gasoline was mandated in California (California Environmental Protection Agency 1997).

3.5.1 Lateral Extent of Subsurface Affected by Analytes of Concern

Based on the data gathered from the several stages of pre-remediation site investigation conducted at the 3992 San Pablo Avenue property, SJC made a preliminary estimate of the area of the site that was affected by contaminants that had migrated from the Celis site and other sources present beneath or to the north of 40th Street. That interpretation is shown on Figure I-7. As can be seen on the Figure, the area initially estimated to require remediation has a shape and dimension consistent with the type of up-gradient dispersion (to the east in the case of the Celis site) and lateral dispersion (to the south and north in the Celis case) that is commonly seen at sites where fuel hydrocarbons have been released from underground storage tanks, although, in this case, the extent of up-gradient dispersion from the tank sites is somewhat greater than is normally seen.

At the time that the estimate of the area of contamination shown on Figure I-7 was prepared, it was speculated that the somewhat unusually large distance that analytes of concern had appeared to have traveled up-gradient from the Celis site to the eastern portion of the SNK Captec site may have not been entirely due to dispersion but might have in part been accounted for by co-mingling of contaminants originating on the Celis site with those from other sources beneath 40th Street or sites located somewhere to the north of that thoroughfare. However, when the paleo streambed deposits described in Section 3.3.1 above were found, it became clear that this high permeability pathway had, particularly during seasonal high groundwater, served as a preferential pathway for migration of contaminants from the Celis site and from the western contaminated area of the SNK Captec site to a greater distance in an eastward direction than would be the case on a site with a more uniform hydrostratigraphy. This interpretation does not exclude the possibility that contaminants migrated from other areas beneath 40th Street (*e.g.*, the SFFBC) or to the north of that street,

but it explains the presence of high concentrations of fuel hydrocarbons and their components in soil and groundwater further to the east of the Celis site than might otherwise be expected. In addition, as the remedial excavation advanced, it became clear that co-gradient migration of contaminants originating on the Celis site due to the presence of preferential pathways of relatively high permeability associated with the presence of buried foundation structures had affected soil and groundwater to a moderate distance further south than had been anticipated based on the results of the earlier phases of the site characterization program.

As finally exposed in the remedial excavation, the significantly affected area of soil and groundwater beneath the SNK Captec site was that shown on Figure I-10, which also shows the paleo streambed that crosses the site. The contaminated soil was found to extend 125 ft. southward from the northwest corner of the subject property along its San Pablo Avenue frontage, where its migration was aided by relatively low permeability zones associated with a basement wall associated with commercial buildings that were historically present along that frontage and eastward from that corner some 230 ft. to a point just beyond the eastern cut bank of the paleo stream. This approximately triangular portion of the site had an area of some 14,975 sq. ft.

As is recorded in Table I-5, soil samples recovered by Apex from the area of the site to the south and west of the affected area of the 3992 San Pablo Avenue property (see Figure I-14 for locations) contained no significant concentrations of petroleum hydrocarbons. However, samples from several of those borings did contain very low concentrations of compounds within the diesel range, though none were of a magnitude sufficient to be of more than *de minimus* environmental significance. It is also noted that the concentrations of diesel-range compounds detected in those examples were typical of those commonly found in soils containing organic matter and that can usually be attributed to vegetative sources. However, unless samples are prepared using the EPA Method 3630 silica gel clean-up procedure before they are introduced into the chromatograph, such compounds, as they are reflected in a chromatogram, cannot be reliably specified to have either a petroleum hydrocarbon or natural organic source. The soil samples recovered by Apex that are listed in Table I-5 were not prepared using silica gel cleanup.

3.5.2 Vertical Extent of Subsurface Affected by Fuel Hydrocarbons

Unfortunately, the borings drilled by Apex on the 3992 San Pablo Avenue site for SNK Captec as part of the first environmental subsurface investigation of the property, did not penetrate below a maximum of 11 ft. BGS and many had a total depth of 5 ft. or less. These limitations appear to have been imposed by Apex's scope of work for that investigation, but their field notes also indicate that, at several locations, their light drilling equipment 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. Consequently, in the area of the SNK Captec site that was most severely affected by contaminants released from the Celis site and other possible sites beneath 40th Street or northward, the Apex borings failed to determine the total vertical extent to which the subsurface was affected by analytes of concern and, apparently because the borings were not left open for a sufficient period to permit the groundwater to

flow into them, the degree to which groundwater beneath the site was affected was not explored.

However, from study of records of site investigations conducted by Levine-Fricke and Woodward-Clyde on the Celis site and areas beneath the 40th Street right-of-way to the east of that property (Levine-Fricke 1994a, 1994c, 1993a; Woodward-Clyde International Americas 1998b, 1997a, 1997b, 1995, 1994), the results of which are summarized in Tables I-2 and I-4, it is apparent that analytes of concern could be detected at depths as great as 14.5 ft. BGS in the subsurface immediately to the north of the northern boundary of SNK Captec's property. Furthermore, the groundwater data gathered by those consulting engineers clearly indicated, as is recorded in Table I-1, that groundwater was present at depths between 6 and 10 ft., depending upon the season in which it was measured. Accordingly, SJC designed its temporary groundwater-quality monitoring wells on the 3992 San Pablo Avenue property to be installed in borings that penetrated to depths greater than those that had been drilled by Apex. The SJC wells included an array with a total depth of 20 ft., which were designed to penetrate below the expected maximum depth to which soil was affected by the contaminants that had been released on the Celis site, as well as to detect the piezometric levels of groundwater in the strata well below the surficial fill that covered the site.

As can be seen by inspection of Table I-6, if less than *de minmus* concentrations of diesel-range compounds of the type discussed in Section 3.5.1 above are discounted, soil and groundwater samples recovered from SJC's array of monitoring wells successfully demonstrated that the maximum vertical extent of analytes of concern in the subsurface below the SNK Captec site was limited to a zone having its lowest elevation at a depth between 10 and 15.5 ft. BGS. The maximum depth at which any significant concentration of contaminants of concern was detected was 11.5 ft. in well SJC MWT-7, where gasoline was present in soil at a concentration of 1,600 mg/kg. As has been previously noted, because SJC's exploratory trenches and borings were held open for a sufficient time (*i.e.*, four weeks for the trenches and one week for the monitoring wells) for the water table to reach equilibrium in them, it was possible to recover groundwater samples from them. The analyses of those samples yielded the results shown in Table I-7.

As was to be expected, when the remedial excavation was opened (see Section 4.0 for details), it was found that the maximum depth at which soil affected by analytes of concern was detected varied locally within the area of the excavation, but, in no case, was the maximum depth established by the analyses conducted in samples from SJC's groundwater-quality monitoring wells exceeded.

3.5.3 Apparent Mineral Spirits in Groundwater

Following excavation of the exploratory trenches and analysis of the sample of groundwater that flowed into exploratory Trench No. 1, the ACEHCS Case Officer requested that SJC investigate whether or not any of the diesel-range petroleum hydrocarbons found in the groundwater beneath the Andante site were components of mineral spirits. This request was made because potential discharges of mineral spirits were suspected to have occurred at off-site locations in the neighborhood of the subject property. Mineral spirits is a solvent that is still in use in industrial applications and, historically, was the principal cleaning agent used by dry cleaners. In the latter industry the commonly used name for that petroleum product is Stoddard Solvent. In addition, mineral spirits was frequently associated with the manufacture and use of paint. Because of its low cost and effectiveness as a solvent and degreaser, it was also widely distributed by paint shops, hardware store, and other retail outlets. Through the 1950s and 1960s, it was also stored in bulk at many gasoline and service stations for purchase in small lots by the general public.

In response to the request made by the ACEHCS Case Officer, SJC studied the diesel chromatogram from the analysis of the grab groundwater sample recovered from exploratory Trench No. 2 (see Appendix I-C for a copy). The results of the analysis of sample ET2-C-W, presented in Table I-7, show that it contained 20,000 μ/L of a diesel-range petroleum hydrocarbon material. Inspection of the chromatogram for the TEPHs, however, when compared with standard chromatograms for diesel and mineral spirits, reveals that the diesel-range compounds detected in that sample were dominantly those found in mineral spirits rather than those that typify diesel fuel.

Following the finding that the semi-volatile petroleum hydrocarbon found in sample ET2-C-W was, in fact, largely composed of the compounds that are found in mineral spirits, the suite of analyses specified for samples of groundwater recovered from SJC's temporary groundwater-quality monitoring wells was revised to include specific detection of mineral spirits as well as diesel. The results of those analyses are also presented in Table I-7. As is shown in the Table, the laboratory detected no material that could be specifically identified as mineral spirits in any of those samples. However, it is noted that, in each case, the array of compounds in the samples that were, for the purposes of data presentation, quantified as being in the diesel range did not actually match the laboratory's standard for diesel.

Such lack of precise matching between the diesel standard and the chromatogram from samples of soil or groundwater that have been affected by diesel is not uncommon. The divergences from the standard chromatographic pattern that are commonly seen are those associated with biodegradation of diesel that has been present in the subsurface for long periods following its release from underground storage tanks. Such diesel is sometimes described as "weathered" diesel, but variations from the standard chromatogram can also occur due to that fuel being mixed with other biodegraded petroleum hydrocarbons. Similarly, it may not be possible to identify reliably degraded mineral spirits in samples of soil or groundwater. As is noted in Table I-7, the laboratory could not assign specifically the compounds in the diesel range in the samples recovered from the temporary monitoring wells

to be mineral spirits or as diesel that matched the laboratory standards for those materials even though, for the purpose of data presentation, the extractable petroleum hydrocarbons present in the samples were quantified as diesel.

Additional examples of chromatograms from samples recovered from the temporary groundwater-quality monitoring wells - those from Samples SJCMWT-2A and SJCMWT-5A included in Appendix I-C. For comparison that appendix also includes chromatograms from laboratory standards for gasoline, mineral spirits Stoddard Solvent and other petroleum products.

As is discussed in Section 4.3 below, selected samples of soil recovered from the floor and walls of the remedial excavation were also analyzed for mineral spirits, but none were detected that could be reliably designated as such by the laboratory based on comparison of their chromatograms with the mineral spirits standard.

There was no known source of mineral spirits that might have been discharged into soil or groundwater on the 3992 San Pablo Avenue site. However, given the extended period over which it operated (1936 - 1993), it is plausible that mineral spirits was stored, used and dispensed at the Celis service station and was released to the subsurface on that site, subsequently migrating to the SNK Andante property. Due to its ubiquitous use in association with paints, it is also possible that mineral spirits may have migrated to the subject property from the paint manufacturing facilities situated at the intersection of Adeline and 41st Streets where solvents are known to have been released to the subsurface. Such migration may have occurred through the paleo streambed deposits which were found crossing the Andante property and which appear to cross 40th Street to the north on an alignment, which if the stream deposits are continuous in that direction, would also be present near the intersection of Adeline and 41st Street where the paint manufacturing facilities were historically located. However, it would not be possible reliably to assign a source to the mineral spirits on the SNK Captec property without undertaking a major hydrogeologic and contaminant transport study over a wide area of the surrounding urban neighborhood.

4.0 REMEDIAL EXCAVATION

On April 21, 2003, Dietz Irrigation of Tracy, California, an experienced remediation contractor holding a Class A Engineering license with Hazardous Waste operations endorsement issued by the California Contractors State License Board mobilized to the SNK Captec site to implement the soil excavation phases of the remediation work plan approved in March 2003, by ACEHCS. For the excavation work to proceed, a permit for excavation of contaminated soil was obtained from the San Francisco Bay Area Air Quality Management District (**SFBAAQMD**) in compliance with that Agency's Regulation 8, Rule 40.

The principal equipment used by Dietz Irrigation to implement the remedial excavation included a Case 940B Excavator, a Komatsu PC200LC-5 excavator, a Caterpillar 318 excavator equipped with a heavy 3,000 lb. hydraulic breaker, a Case 921 front loader with a 6-cu. yd. bucket, and a Caterpillar vibratory compactor with a 66-in. drum.

4.1 Removal of Pavement and Clean Shallow Soil

To allow excavation of the affected soil at depth beneath the surface of the site, bituminous macadam and concrete paving covering the affected area of the site were broken up and stockpiled on-site for later transport to recycling facilities, where, after processing, they were returned to beneficial use in the construction industry.

Clean, unaffected soil was then stripped from the surface of the site to depths that generally varied between 1 and 3 ft. BGS, but which, depending upon the environmental condition of the soil, locally extended down to 4-5 ft. BGS. This material was stockpiled in the northeastern area of the 3992 San Pablo Avenue property. Plate 3 shows the shallow, clean soils being removed from the remediated area, with the clean soil stockpile in the background.

It was also necessary to remove large volumes of buried masonry foundations and structural walls that had been constructed on the site in the early part of the 20th Century when the property was the site of warehouses and other commercial structures. The remnants of the brick foundations were typically 4-8 ft. high and 12 in. thick near the ground surface, but widened into step-type foundations that were typically 40 in. wide at the base where they were supported by 4 ft. wide and 20 in. thick concrete strip footings. Concrete basement slabs were also exposed in the remedial excavation. In addition, a masonry basement wall that supported the back of the sidewalk of San Pablo Avenue was exposed. These structures were broken up by the hydraulic breaker and removed from the subsurface. Plate 4 shows the hydraulic breaker used to demolish the mass masonry and concrete slabs found buried beneath the site. As was the case for the concrete paving slabs at the site, the concrete components of these foundation and slab systems were disposed for recycling in beneficial use. However, because no recycling facility could be found that could accept such large volumes of the mass masonry material, it was shipped off-site for disposal at a permitted landfill.

4.2 Removal of Affected Soil from the Subsurface

After the clean overburden and the buried masonry foundations and concrete floor slabs described above were removed, excavation of the hydrocarbon-affected soil was initiated. To comply with the requirements of the newly-enacted SFBAAQMD Rule 40 regulations, the soil excavated from the subsurface was, in large measure, directly loaded into end-dump trucks by the excavators for off-site disposal at the facilities as described in Section 4.6 below. When use of small temporary stockpiles was necessary to balance the excavation operations with the arrivals of trucks, the working stockpiles were held at the site for no more than one or two hours before they were loaded into arriving trucks by the front loader.

The general operational procedure adopted for the Andante project site was to advance the excavation southward and eastward from the north and west boundaries of the site, respectively. With the excavators standing at the original ground surface, they excavated below the level of their tracks over a lateral distance that was within the reach of their bucket arms. Plate 5 shows excavation in progress at an early stage of the work along the northern boundary of the site, which is adjacent to 40th Street. However, it quickly became apparent that, over much of the site, the soft surficial silty-clay soils had insufficient bearing strength to support the wheel loads of the end-dump trucks used to off-haul the affected soil. Consequently, it was necessary to construct a number of haul roads across the area to be excavated. This was done by excavating to the full required depth of the remedial excavation over a width of approximately 15 ft. and back-filling that excavation with 2 in to 6 in. sieve-sized crushed rock containing no fines, which was then thoroughly compacted by the vibratory roller. By routing the end-dump trucks along these haul roads, it was then possible to excavate affected soil from either side of a road without risk that the loaded trucks would become mired.

Using the procedures described above, the remedial excavation was expanded both laterally and vertically as the work proceeded. Visual and olfactory indicators of the presence of fuel hydrocarbons in the soil and observation of stratigraphic markers, as well as the data previously obtained from the exploratory trenches and groundwater-quality monitoring wells were used to preliminarily asses the required depth and lateral extent of the excavation.

To provide for stability, the walls of the excavation were sloped to an angle necessary to ensure safety while the excavation was open. The California-registered Geotechnical Engineer in Responsible Charge of the remediation program determined the required slope based on the soil characteristics, the depth to the water table, and the anticipated rate of excavation. However, the dominantly clayey soils on the site permitted the excavation slopes to be either vertical or very steep, so that affected soil could be removed right up to the property boundaries or to within no more than 1-3 ft. of the boundaries. Plate 6 shows the northern wall of the excavation running along the 40th Street frontage of the site.

4.2.1 Excavation Below the Groundwater Table

The depth of the remedial excavation generally ranged between 8 ft. and 13 ft. BGS. Locally,

the depth of excavation was controlled by the depth required to reach soil unaffected by analytes of concern or the limiting depth beneath which additional excavation would have rendered the Andante redevelopment project economically unviable.

Although, following cessation of the record rainfall that was experienced at the site in April 2003, the elevation of the water table fell significantly over the period that the excavation work was underway, over the greater part of the remedial excavation, to achieve the program's objectives, it was necessary to remove soil from below the depth of groundwater.

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 was applied. That technique involves use of large-sized crushed or river-run rock to stabilize the submerged walls and floor of small excavation cells opened within the area of the final large-scale excavation. These cells are left open for only the minimum time necessary for spoil to be removed from them and a conformational soil sample to be recovered from the bottom of the cell. They are then backfilled with clean crushed rock, which, at the SNK Captec project site, was in the 2 in to 6 in gradation range. The rock backfill is raised to an elevation such that excavators and other earth-moving equipment can operate over it without their tracks or wheels being under water. The cells are excavated so as to overlap to achieve complete excavation over the whole of the hydrocarbon-affected area. When it can be conveniently scheduled during the earth-moving excavations, the rock fill is thoroughly compacted using a vibratory roller. The use of crushed rock with no fines backfill is made so that adequate compaction of the material can be achieved and that in its final condition, the material will have a high shear strength and a very high permeability, which properties permit it to bear heavy foundation loads and be immune to liquefaction under earthquake loading.

Plate 7 shows a typical open excavation cell at the 3992 San Pablo Avenue site. It extends from an area of merged cells that have already been filled with rock fill.

Conceptually, it is possible to apply the technique described above to considerable depth below the water table. However, SJC prefers to limit the maximum depth of rock fill in the cells to no more than 3-4 ft. This is because it is difficult to ensure reliably that greater thicknesses of rock fill can be compacted adequately by the type of vibratory compactor usually available to a remediation contractor. Furthermore, by limiting the depth of the cell excavation below the groundwater table, it obviates the need for excavator buckets to be submerged fully during the excavation progress so that the excavator arm bearing remain in the dry. If the bearings are repeatedly submerged, it is difficult to maintain proper lubrication and bearings and other components of the machine's hydraulic system can be degraded rapidly, with associated very high equipment maintenance costs.

4.2.2 Removal of Paleo Streambed Deposits

When affected soil in the eastern end of the excavation close to the 40th Street frontage of the SNK Captec property was in progress, a subsurface zone characterized by the presence of coarse sands with some gravels was encountered. At first, operations to remove the affected

soil and selection of the required depth of excavation in this area proceeded in the same manner as had been adopted over the rest of the excavation that had been completed by that time. However, when an attempt was made to compact the rock placed to fill the excavation cell opened at that location, it became apparent that the local geology was significantly different from that which had been encountered on the site previously. As the compactor first advanced over the rock fill, its vibratory mode was not activated and, under these conditions, the compaction work proceeded as normal. Immediately after the compactor was set to vibrate, it began to sink into the rock backfill and jets of water rose vertically from the fill and sand boils rapidly accumulated around the equipment. Based on these observations it was quickly realized that severe liquefaction of the formation beneath the rock fill was occurring in response to the compression waves transmitted through the ground from the vibratory compactor. To prevent the compactor from becoming submerged, its vibratory mode was turned off and, with the aid of the excavators and by means of a tow line connected to the Case 921 front loader, it was dragged out of the danger area.

Further exploration in the subsurface around the location of that excavation cell revealed that the excavation had encountered a buried paleo streambed, which crossed onto the site from the up-gradient area beneath 40th Street. Later, as the excavation work proceeded, the full extent of the paleo stream deposits is shown in plan on Figure I-10 and in section on Figures I-11, I-12, and I-13, became apparent.

It could be easily seen in the field that the paleo streambed deposits represented a major pathway for transport of contaminants from areas to the north of the 3992 San Pablo Avenue property beneath 40th Street and for the extensive distribution of fuel hydrocarbons that had leaked into the subsurface at the Celis site over a wide area in the northwestern portion of the SNK Captec property. Plate 8 shows the permeable streambed deposits as they were exposed in the western wall of the remedial excavation at the San Pablo Avenue frontage of the site. In addition, as had been so dramatically demonstrated by the liquefaction of those deposits and the near-submersion of the vibratory compactor, the streambed posed an extremely high risk to the stability of building foundations subject to seismic loading. For these reasons, the sands and gravels in the paleo steam channel were excavated over its whole length beneath the 3992 San Pablo Avenue property and shipped off-site for disposal at a permitted facility. Plate 9 shows a section of the stream bed deposits being excavated near the center of the remediated area. Plate 10 shows the northern end of the paleo streambed excavation where the channel of course sand and gravel deposits leaves the SNK Captec Andante site and passes under 40th Street.

Because the streambed deposits were located beneath the groundwater table, after the sands and gravels were removed it was necessary to backfill the channel with rock in the manner described in Section 4.2.1 above. As this backfill is, by design, highly permeable and, without measures being taken to prevent it, would permit the streambed excavation to continue to be a major pathway by which contaminated groundwater migrating from 40th Street could be transported across the Andante property and to emerge beneath San Pablo Avenue to the west and to redistribute contaminants over a wide area of the portion of the site that had been remediated. To prevent this, clay plugs were placed across the full width of the backfilled

streambed at the point where it entered the site along the 40th Street frontage and where it left the site along the San Pablo Avenue frontage. These clay plugs extended to a depth at least 2 ft. beneath the bed of the paleo channel and to an elevation at least 2 ft. above the highest elevation of the sand and gravel deposits where they were exposed in the remedial excavation walls and to a minimum width of 4 ft. beyond either bank of the buried stream channel. To ensure that the clay plugs were highly impermeable, a small initial plug of conditioned clay was placed and thoroughly kneaded and compacted by a 24 in. diameter compacting wheel mounted on an excavator arm. When this small plug had been fully compacted, it was expanded in size by additional clay material laid down in 6 in. maximum lifts, which was compacted using the vibratory sheep's-foot roller.

Because the coarse sand and gravel deposits in the streambed were unusually deep at the point where the stream had crossed onto the site from what is today the 40th Street right-of-way, it was necessary to dewater that area before the clay plug could be placed. This was achieved by suctioning water from a temporary coffer dam constructed from the local clays into a vacuum truck. To ensure that most contaminated water contained in the pit being dewatered was evacuated and to prevent any LNAPL that may have been present in a scum of windblown soil and hydrocarbon sheen that formed on its surface from settling onto the bottom of the dewatered pit, this dewatering was performed by maintaining the vacuum truck suction pipe at all times at, or close to, the surface of the water. This operation is shown in Plate 11. Although this procedure reduces the pumping efficiency of the vacuum truck, it ensures that scum and water affected by high concentrations of fuel hydrocarbons does not settle on the bottom of the dewatered pit.

The contaminated water extracted during the dewatering operation described above amounted to some 2,000 gallons, which was shipped off-site for recycling under control of a hazardous waste manifest. (Copies of all waste manifests generated during the remediation program are included in the Contractor's Report of Remediation, which was submitted to ACEHCS [Dietz Irrigation 2003a]).

Having dewatered the area around the exposure of the streambed deposits in the northern area of the site, the clay was then rapidly imported to the location to construct a clay plug in the dry. This plug was of similar design to the plug placed along the western frontage of the site. Plate 12 shows the compacted clay in the plugged steam channel at the northern boundary of the site.

4.3 Soil Sampling in Remedial Excavation

As the remedial excavation was deepened and extended laterally, visual and olfactory indicators, together with stratigraphic markers were used to make preliminary judgments as to whether or not the excavation had reached sufficient depth or was sufficiently extensive to have removed substantially all of the affected soil in the subsurface beneath the Andante site. Confirmatory samples were then recovered from the floor and walls of the remedial excavation

The remediation work plan set an optimal goal that called for all contaminated soil to be excavated from the subsurface until no detectable concentrations of any of the analytes of concern remained within the boundaries of the site, or, if that was impracticable, to remove sufficient material that any remaining traces of analytes of concern were at concentrations less than the applicable site-screening concentrations. The work plan further recognized that, in some circumstances, particularly when it was necessary to excavate to considerable depth beneath the groundwater table, it might be necessary to leave some localized areas of soil affected by higher concentrations of analytes of concern in situ if they could not be safely removed by the mobilized remediation equipment or if the cost of such removal would imperil the economic viability of the redevelopment project. Accordingly, if the results of analyses of confirmatory samples indicate the presence of contaminants at higher concentrations than those specified in the work plan, the excavation was continued to greater depth or lateral extent until the preferred criteria were met or, if that were found to be impracticable, due either to limitations of the equipment or excessive cost, the remaining pockets of affected soil were left in place.

When the remedial excavation was judged to have reached a depth and lateral extent at which the concentration of analytes of concern remaining in the soil were undetectable or were sufficiently low that it would not be cost-effective to continue deepening or extending the excavation, soil samples were recovered from its walls and floor..

Confirmation samples were recovered from the walls at points located approximately one foot above the floor of the excavation at 20 ft. intervals along each sidewall. Confirmatory soil samples were generally recovered from the floor of the excavation at points located at the intersections of a 20 ft. by 20 ft. grid that extended to the east and to the south over the remedial excavation and had its point of origination at the extreme northwestern corner of the site at the location shown on Figure I-15. However, as is shown on that Figure, in some instances, variations occurred in the gridded sampling pattern at the direction of the project engineer to permit adequate characterization of local areas of the floor or to account for the geometry of the southern limit of the remedial excavation.

When the floor of the excavation remained dry for a sufficient period for sampling locations to be accessed safely by the engineer, samples were recovered by driving a 2-in. diameter by 6-in. long, brass sampling tube into the floor or walls of the excavation until the tube was completely filled with soil.

When groundwater rapidly flowed into the excavation, or the excavation was unsafe for entry, samples were recovered using the excavator bucket. An intact block of soil was excavated from the target location in the floor of the excavation (or, in the case of perimeter sidewall sampling just above the floor) and raised in the bucket to the surface. A face of the block of soil in the bucket was cut with a shovel to expose an undisturbed surface and a clean, 2-in. diameter by 6-in. long, brass sampling tube was driven into the cut soil face until the tube was completely filled with soil.

Following sample recovery, each sample tube was cleaned externally, its ends covered with a

Teflon sheet and closed with tightly-fitting plastic caps. The caps were secured with adhesive-less tape. Each sample tube was labeled for identification, entered into chain-of-custody control and packed on chemical ice for transport to STL's laboratory in Pleasanton, California.

All soil sampling and the sample preparation of samples for analysis were performed by, or under the personal direction of, the California Registered Geotechnical Engineer in responsible charge of the remediation program.

All soil samples submitted to the laboratory was 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

To ensure that no more than trace concentrations of fuel oxygenates and lead scavengers were present in the subsurface soil, as had been indicated by the data obtained from the site characterization investigations described in Section 3.0, selected samples were also analyzed for

Ethanol	EPA Method 8260B
Tertiary-Butyl alcohol (TBA)	EPA Method 8260B
Methyl-tertiary butyl ether (MTBE)	EPA Method 8260B
Di-isopropyl ether (DIPE)	EPA Method 8260B
Ethyl tertiary-butyl ether (ETBE)	EPA Method 8260B
Tertiary-amyl methyl ether (TAME)	EPA Method 8260B
1,2-Dichloroethane (DCA)	EPA Method 8260B
Ethylene dibromide (EDB)	EPA Method 8260B

In addition, during the early phases of the excavation work, some soil samples were also analyzed for the following

Mineral Spirits	EPA Method 8015M
Polynuclear Aromatic Compounds	EPA Method 8270

The analyses for mineral spirits were performed in response to a request made by the ACEHCS Case Officer because, as has been noted in Section 3.5.3 above, after examination of the chromatogram from the grab groundwater sample recovered from exploratory Trench

No. 2, it was concluded that the diesel-range compound present in that sample appeared to contain components of mineral spirits. However, of the soil samples from the remedial excavation that were analyzed for mineral spirits, only one contained compounds in the diesel range that could be identified reliably to be mineral spirits and that occurrence did not amount to more than a trace of that solvent.

In the case of the PNAs, analysis was performed only in cases where diesel-range petroleum hydrocarbons had been detected in a specific sample. The only PNA detected in the samples analyzed for those compounds was naphthalene, at extremely low concentrations, which was present in only two samples.

After a substantial number of soil samples had been recovered from the remedial excavation and had been analyzed for PNAs and mineral spirits as well as the suite of analytes described previously, it was concluded that continuing to analyze samples for PNAs and mineral spirits was not cost-effective and that it would be prudent to reduce the analytic costs to make more funds available for removal of affected soil from the subsurface. Accordingly, with the concurrence of the ACEHCS Case Officer, analysis of samples for those compounds was discontinued.

To confirm that sufficient soil had been removed from the subsurface of the Andante Project site to meet the remediation objectives, 100 samples of soil were recovered from the floor and walls of the remedial excavation.

The completed remedial excavation is shown in plan on Figure I-15. That drawing also shows the concentrations of diesel-range compounds, gasoline and benzene detected in samples from the soil remaining in situ in the floor of the excavation.

Views of the completed excavation showing portions that were partially backfilled with rock fill because, at the time they were excavated, they were submerged beneath the water table can be seen in Plates 13 and 14.

4.4 Results of Analyses of Confirmation Samples from Remedial Excavation

The laboratory certificates of analysis for all of the analyses reported herein were provided to the ACEHCS Case Officer during the progress of the remediation work. The results of the analyses of confirmation samples recovered from the remedial excavation are presented in Table I-9. Where data in the Table is in **gray script**, that data applies to soil samples recovered at locations where it was possible to deepen the excavation or extend it laterally after analysis of the sample initially taken from the location indicated that, when possible, additional soil should be removed to match more closely the preferred cleanup standards set in the work plan. Thus, such **grayed data** does not represent analytes of concern left in situ beneath the site.

The analytical results shown in **bold script** in Table I-9 are those that exceed the RBSLs established by the RWQCB that were in effect in mid-2003 (California Regional Water

Quality Control Board - San Francisco Bay Region 2001). The RBSL criteria applied in Table I-9 are, as was appropriate at this stage of the remediation program, those related to human health risks at sites where surficial soils are of low permeability, the depth to groundwater is less than 3 meters (9 ft.) BGS and the groundwater is not a source of drinking water. Those limits, as they apply to soil and groundwater at residential sites are summarized in Table I-11.

As can be seen by inspection of Tables I-9 and I-10, when the remedial excavation was complete, any analytes of concern remaining in the subsurface soils, at the great majority of sampling locations, were either undetectable or at concentrations less than the applicable RBSL. However, in a few local areas, it had not been possible to excavate entirely all of the affected soil. When the results of analyses of soil recovered from the northern and western walls of the excavation, which material was inaccessible due to its being located off-site and beneath 40th Street and San Pablo Avenue, are eliminated, analytes of concern at concentrations higher than the applicable RBSLs remained in situ at only 17 isolated sampling points out of the 86 locations checked. It should also be noted that, as is discussed further in Section 6.0, sites where some analytes of concern remain in situ at concentrations greater than the applicable RBSLs, does not eliminate them from future human occupancy. The screening levels are used simply to identify the need for additional evaluation before the risks imposed by the environmental condition of the site can be evaluated adequately.

4.5 Utilities Crossing the Perimeter of the Remedial Excavation

Except for a few electrical conduits found at a shallow depth along the San Pablo Avenue frontage of the site, which were well above the high groundwater level and play no role in contaminant transport, only one utility was found penetrating through the walls of the remedial excavation. This was an 8-in. diameter malleable iron sewer pipe. This pipe appears to have served the warehouse that was formerly located on the property and that is shown on the Sanborn Fire Map from 1951 (see Appendix I-A). The pipe, which crossed the property boundary at a point 95 ft. south of the intersection of San Pablo Avenue and 40th Street, extended, prior to its removal, some 60 ft. in a easterly direction from the back of the sidewalk on San Pablo Avenue. Its appearance as it was exposed in the walls of the remedial excavation is shown in Plate 15.

The sewer pipe was sealed with an iron closure plug equipped with an O-ring. After placing the plug, impermeable clay was carefully placed in maximum 6 in. lifts around the end of the pipe and compacted using the vibratory compactor to a minimum distance of 3 ft. below, 6 ft. on each side and 4 ft. above the pipe invert. This construction ensured that the pipe and any disturbed backfill around it would not serve as a future preferential pathway for migration of contaminated groundwater.

Except at the location of the sewer pipe described above, no other areas of disturbed soil were seen in the natural material exposed in the walls of the remedial excavation at elevations below the groundwater table.

because, due to the very low permeability of the soil in which the tanks had been situated, water from the surrounding formations did not flow into the pit when the tanks were removed.

Based on its location on the site, it is surmised that Tank No. 1 was used to store heating oil for the warehouse facility that had previously been located on the part of the SNK Captec site and can be seen on the 1951 Sanborn Map included in Appendix I-A. The former use of the small 100 gallon Tank No. 2 was not apparent, but, due to its size and location, it was speculated that it may have been used to fuel forklifts used in the warehouse operations.

After soft material was removed from the Tank Nos. 1 and 2 pit, and samples were taken from its floor, it was partially backfilled with crushed rock and then brought to the grade of the surrounding area of the site with thoroughly compacted, low permeability silty clay.

As is also documented in the contractor's report of the tank closures, the mixture of water and heating oil in Tank No. 1 was transported off-site for treatment and disposal at a permitted recycling facility under a Hazardous Waste Manifest. The soft contaminated soil that was removed from around the tanks was shipped off-site for disposal at a permitted landfill under the control of a Special Waste Manifest. The storage tanks and piping were also shipped off-site under a Hazardous Waste Manifest to a permitted facility where they were decontaminated and the waste metal recycled in beneficial use.

On May 20, 2003, when the remedial excavation was nearing completion, a large block of concrete, which was initially assessed to be a foundation structure, was discovered, as shown on Figure I-10, just to the south of the remedial excavation on the San Pablo Avenue frontage of the site. However, further investigation revealed that the massive block of concrete actually contained a 1,500 gallon storage tank that contained a mixture of Bunker-C heating oil and water. Bunker-C is a heavy oil that, prior to 1945, was commonly used to fire boilers. Plate 16 shows the Bunker-C tank after the surrounding mass of concrete had been broken away. As can be seen in the Plate, this tank was of an obsolescent design and constructed from riveted steel plates. These features indicate that it had been installed in the 1920s or 1930s and is believe to have supplied heating fuel to one or more of the restaurants and stores that fronted onto San Pablo Avenue in the first half of the 20th Century.

Following a similar procedure to that used to manage the removal of Tank Nos. 1 and 2, the remediation contractor prepared a tank closure plan for the tank described above, which was designated Tank No. 3 and, on May 22, 2003, it was removed under the permit and oversight of ACEHCS and the City of Emeryville Fire Department. It was not necessary to excavate soil from beneath Tank No. 3 and, due to its location close to the walls of the remedial excavation, the void left after its mass concrete enclosure was removed was backfilled as part of the remedial excavation described in Section 4.8 below.

The Bunker-C oil and water that had been present in the tank and the tank itself (no piping was found at the site) were shipped to permitted disposal facilities in the same manner used to dispose of Tank Nos. 1 and 2. The applicable waste manifests were included in the

addendum to the contractor's report of tank closure prepared by the remediation contractor and submitted to ACEHCS (Dietz Irrigation 2003b).

After Tank No. 3 was removed from the subsurface and the concrete that surrounded it had been broken up and loaded for shipping off-site for recycling in beneficial use, a single soil sample was recovered from the soil that had underlain the concrete encasement at the direction of the ACEHCS field representative,. The results of the analyses of that sample, which was given the sample number Tank 3, are also recorded in Table I-6.

After the tanks described above had been removed and the results of the analyses of the soil samples recovered from their pit bottoms were available, Dietz Irrigation filed tank closure reports with ACEHCS (Dietz Irrigation 2003b, 2003c). Because the soil samples contained no significant concentrations of analytes of concern and the tanks had been located in highly-impermeable clayey soils, it was clear that none of the tanks could have been the source of an unauthorized release of fuel hydrocarbons to the subsurface and had not, in any way, contributed to the extensive contamination that had been found affecting the northwestern portion of the 3992 San Pablo Avenue property. Accordingly, the contractor's reports included recommendations that the tank sites be closed without further action. ACEHCS concurred with those recommendations and no unauthorized release filings were issued for the subject tanks.

4.8 Backfilling of Remedial Excavation

When the remedial excavation was complete and all confirmation samples had been recovered, the site was, with the approval of the ACEHCS Case Officer, returned to the control of SNK Captec's earthworks contractor so that the site could be graded according to the redevelopment plan. To plan for the backfilling, SJC sampled the clean overburden soil that had been stockpiled in the northeastern area of the site, as was described in Section 4.1, to evaluate its suitability for use as engineered backfill for the remediated area of the site that would also serve as a low permeability cap over that portion of the property.

The five-gallon sample of the stockpiled material was transported to Fugro West's laboratory in Hayward, California, where a compaction curve was developed and its maximum dry density and optimum moisture content measured according to procedure D1557-00 published by the ASTM (American Society for Testing and Materials 2000c). That test demonstrated that the stockpiled material was suitable for placement as a low permeability backfill in the remedial excavation. To investigate its hydraulic properties, a portion of the sample was compacted to 90% relative density in a laboratory mold and a constant-head permeability test was conducted on a 3 in. diameter by 6 in. long core of the compacted material. The permeability of the compacted fill material as measured in that test was 5.65×10^{7} cm/sec. (Additional details of the compaction and permeability test are discussed in VII Section 3.4.1.1 and the results are presented in Appendix II-C, both of which are in Volume II of this report.)

After SJC established that the stockpiled clean soil was suitable for use as an engineered backfill for the remedial excavation and would provide a low permeability cap over that area, SNK Captec's earthworks contractor backfilled the excavation by placing that soil in shallow lifts and compacting it to a relative density of 95%.

Because the off-site disposal of affected soil removed from the northwestern area of the site generated an imbalance in the cut and fill volumes required to comply with the development project's grading plan, shallow clay soil having the same properties as the clean soil that had been stockpiled was used to bring the remediated area up to grade. The excess borrow that was required in the southern portion of the site to provide material for the engineered cap over the remediated area was restored by importation of off-site material having suitable engineering properties. In that way, the low permeability characteristics of the cap were maintained. The completed cap varied in thickness between 7 ft. and 13 .5 ft., depending on the local depth of the remedial excavation. Plate 17 shows the compacted backfill in the western portion of the remediated area after it had been brought up to final grade.

Figures I-16, I-17 and I-18 show cross sections through the backfilled and graded remedial excavation. The cross sections show the locations of exploratory borings and groundwater-quality monitoring wells created on or close to the section line and, where applicable, the concentrations of diesel, gasoline and benzene that were detected in samples recovered from beneath the floor of the remedial excavation are also noted on those Figures.

4.9 Affected Soil Remaining In Situ after Completion of Remedial Excavation

After the remedial excavation was complete, only minor quantities of soil affected by petroleum hydrocarbons remained in the subsurface beneath the Andante Project site. As noted previously, these included localized areas at depth in the floor of the remedial excavation. The concentrations are recorded in Table I-9 and the associated sampling locations are identified on Figure I-15. Concentrations of petroleum hydrocarbons left in situ at the locations of wells and borings where the soil was not fully excavated as part of the remediation program are noted in Table I-10 and the well and boring locations are shown on Figure I-10. As can be seen in the tables, soil containing analytes of concern at concentrations slightly above the applicable RBSLs for human health risks were left at depth beneath the site at only a few locations.

5.0 INSTALLATION OF IMPERMEABLE MEMBRANES

As originally designed, the ground floor slabs of each of the buildings currently under construction on the SNK Captec site were to be underlain by a 10-mil. thick, impermeable membrane with watertight sealed joints overlapped a minimum of 6 inches. The Visqueen™ brand of polyethylene film was to be used throughout for that purpose. However, at the request of ACEHCS and the RWQCB (Alameda County Environmental Health Care Services 2003b), under the ground floor slab of each building, or portion of a building (except for the parking garage), that was within the remediated area of the site, the Visqueen™ membrane was replaced by a special membrane that is impermeable to the gaseous phases of the analytes of concern, small volumes of soil affected by which had been left in situ at depth beneath the site after the remedial excavation was complete (see Section 4.9 above for details).

Figure I-15 shows the footprints of the buildings currently under construction on the northern portion of the 3992 San Pablo Avenue site. Each building has a designated number. As can be seen on the Figure, the whole of Building 1 is within the remediated area of the site, as is part of the slab beneath the ground floor of the two northern-most commercial units in Building 2-A. A portion of the slab beneath the two northern-most "Type A" residential units on the ground floor of Building 3-A also encroaches onto the remediated area.

The placement of the Visqueen™ membrane beneath the floor slabs of the buildings is shown on Figure I-19. Visqueen™ is an effective barrier to migration of moisture and vapor upward into the interior space of the building and provides a significant barrier to gases migrating along the same pathway. However, it is not designed as a gas-proof membrane, and therefore cannot be relied upon to exclude 100% of any analytes of concern that might migrate into building interiors.

Beneath the whole of the ground floor slab under Building 1 and under the floor slab of the most northerly units in Buildings 2-A and 3-A, the Visqueen™ membrane was replaced by a 60 mil. thickness of Liquid Boot®. The arrangement of the Liquid Boot® membrane is illustrated in Figure I-20. To ensure full coverage of any sub-floor areas that might serve as pathways for gases or vapors migrating from the subsurface, the areas beneath Buildings 2-A and 3-A that are underlain by Liquid Boot® extend further to the south than the southern limit of the remediated area of the property.

Liquid Boot® membrane is a seamless, elastomeric material that is impermeable to the gaseous phases of petroleum hydrocarbons. It has been tested according to ASTM Standard D542-95 and found to be resistant to deterioration in the presence of components of fuel hydrocarbons such as benzene (American Society for Testing and Materials 2001). As applied beneath the floor slabs of buildings on the Andante project site, it was sprayed over a geotechnical fabric substrate by a qualified subcontractor approved by LBI Technologies, Inc. of Santa Ana, California, the manufacturer of Liquid Boot®. The membrane was also installed vertically along the sides of buildings' exterior strip footings, column bases and

around each utility pipe or other penetration passing through the floor slabs, all of which were installed prior to its application. That application technique ensures that the membrane formed a complete seal against ingress of vapors or gases into the buildings' interior spaces. Plate 18 shows the geotextile fabric which served as a substrate for the membrane. Plate 19 shows the Liquid Boot® being applied prior to the pouring of the concrete floor slab of Building 1. Plate 20 shows a typical membrane seal around a utility duct that passes through the floor slab.

Additional details of the Visqueen™ and Liquid Boot® membranes beneath the floor slabs of the buildings being constructed on the Andante Project site, together with an explanation that no account was taken for the presence of these barriers when building-specific health risk assessments were made to evaluate the suitability of the site for use as residential property, can be found in Volume II, Sections 3.5.2.8 and 4.0 of this Corrective Action Report..

6.0 TIER 2 RISK-BASED ENVIRONMENTAL ASSESSMENT

The risks associated with exposure of persons to Chemicals of Concern (**COC**) in the environment are assessed by a tiered protocol. In a Tier 1 evaluation, concentrations of COC present in soil or groundwater beneath a site are compared to limiting screening values such as the previously described RBSLs published by the RWQCB in its guidance documents. If COC concentrations are lower than the Tier 1 screening values for a given usage and such use is not otherwise contraindicated, the site passes the Tier 1 screening process and no active remediation is required. However, if concentrations of COC affecting a site exceed the Tier 1 screening levels, this does not necessarily indicate that the site is unsuitable for a proposed use. What it does indicate is that additional investigation and analysis is required before risk to site occupants can be evaluated reliably and the site's suitability for its proposed use adjudicated. The investigation and analyses that are required for that evaluation to be made are known as a Tier 2 risk assessment.

Because, as is described in Sections 4.4 and 4.9 of this report, it was necessary to leave some small, isolated volumes of affected soil in place in the floor and walls of the remedial excavation, where concentrations were somewhat elevated above the RWQCB's Tier 1 RBSLs, highly conservative models of the geology, hydrogeology and the structures to be built on the site were developed by SJC so that the suitability of the remediated site for redevelopment for residential and commercial use could be assessed by performing a Tier 2 Risk-based Health Risk Assessment. The Tier 2 health risk assessments were performed in compliance with ASTM Standard E2081-00, the 2000 edition of the American Society for Testing and Materials' *Standard Guide for Risk-Based Corrective Action.*

Health risks at a site that is the subject of analysis by the ASTM Standard E2081-00 protocol are expressed in two forms: carcinogenic risk factor and toxic hazard quotient. The carcinogenic risk is expressed as the projected increase in the number of persons that become affected by cancer due to extended exposure to the conditions on the subject site compared to the general population not exposed to the site conditions. For example, a carcinogenic risk factor of 1.0×10^{-6} expresses the risk where there would be one additional occurrence of cancer in a population of one million persons exposed to the conditions at the site, compared to the number of incidents of cancer found in a reference population of one million persons not exposed to the environmental conditions at the site.

The toxic hazard quotient is a measure of the severity of exposure for a period of time to a given COC that can be tolerated by a person exposed to that chemical by any pathway (*e.g.*, inhalation of contaminated air, ingestion of contaminated soil, or dermal contact with contaminated soil) or combination of pathways without suffering any toxicological symptoms due to that exposure. It is expressed as a ratio between the severity of exposure to a given COC compared to an established reference dose below which no adverse health effects are experienced even when exposure is prolonged. A closely related parameter is the "toxicity hazard index" which is the sum of the toxic hazard quotients of two or more COC at a given site due to the exposure of a particular receptor. A toxicity hazard index of 1.0 reflects the

maximum tolerable limit to which a person can be exposed without suffering negative health effects. A toxic hazard index of less than 1.0 reflects the degree to which the anticipated exposure is less than that required to induce negative health effects. As the toxic hazard index rises above 1.0, its value reflects the severity of the toxicity of the environment to which a receptor is exposed.

On a given site, persons may be exposed to risks due to the presence of more than one carcinogenic and/or toxic chemical and the exposures may be via more than one pathway. Accordingly, to assess health risk properly, it is necessary to consider the cumulative affect on health due to the presence of all of the COC present and, if multiple pathways between the source and the receptor are present, their cumulative effects must also be considered.

6.1 Risk Assessment Software

The *RBCA Toolkit for Chemical Releases, Version 1.3a* computer software, published by Groundwater Services, Inc. of Houston, Texas, was used to perform the mathematical computations necessary to derive the carcinogenic risk factors and toxic hazard quotients at the SNK Captec property (Groundwater Services, Inc. 2000).

6.2 Building-specific Models

To assess reliably the risk to the occupants of the different types of buildings that are being constructed on the remediated area of the 3992 San Pablo Avenue property, SJC developed separate building-specific models for Building 1, 2-A, 3-A and 6, which, as shown on Figure I-15, are either in whole or in part located on the remediated area of the site. In each case, as is shown in Table I-12, the use of the first floor of each of those buildings, either residential or commercial, was considered in the risk assessment models to reflect the duration and frequency to which their occupants might, theoretically, be exposed to indoor air affected by COCs. However, regardless of the use of a specific building, the models were designed so that any person at any outdoor location on the redeveloped site would be treated as a permanent resident on the property. That conservative assumption was made so that common access to all outdoor areas of the site will be freely available to its residents and was so modeled, regardless of the use of a specific building. In addition, for the purpose of making a conservative check of any health risks to which a person may be exposed by use of the parking structure on the site (Building 6) that might be related to the environmental condition of the subsurface, that building was modeled as though it were a commercial structure with an enclosed perimeter, although, in fact, it is a multi-story parking garage with nearly-continuous large openings in the outer walls on each floor.

The environmental modeling procedures, the input parameters selected for the risk assessment analyses, including discussion of the reasoning behind the selection of parameters applicable to the site-specific conditions, and the geotechnical, geochemical and contaminant transport equations and protocols employed by the software used to perform the calculations are fully documented in Volume II of this report.

It is intended that all volumes of this report be read as a single integral document. However, to assist the reader when reviewing the modeling, analytical procedures and results of the Tier 2 health risk assessments, Volume II includes summaries of the project background, the pre-remedial site characterizations, the implementation of the remedial program in the field as well as full documentation of the models and parameters used to perform the health risk computations. As is described in that volume, computations of cumulative carcinogenic risk and toxic hazard quotients were made for a conservative model of each of the building-specific situations on the SNK Captec site. In addition, sensitivity studies were performed to assess the effect of varying key model parameters, such as seasonal changes in the depth of affected groundwater beneath the site. The sensitivity studies included analyses of limit conditions where it was assumed that certain key parameters might range from extreme low to extreme high values, which were not actually anticipated to occur in the natural environment of the subject property. For example, conditions where the groundwater was at unusually low elevations during a period of extreme drought or at extremely shallow depth during a period of extraordinary high precipitation were investigated.

6.3 Results of Health Risk Assessments

Table I-12 presents the principal results of the Tier 2 health risk assessment performed for the 3992 San Pablo Avenue property. It includes identification of the indoor and outdoor uses, either residential or commercial, that were assumed when modeling each specific building. In each case the cumulative cancer risk and toxic hazard values for persons exposed to outdoor air is presented. The cumulative cancer risk and toxic hazard values for persons exposed to indoor air in the buildings is also tabulated, but in that case, the results obtained from the analysis of two models of each building are cited. One set of results is for the "Conservative" model, which was based on the highly-conservative assumptions and parametric values used in performing the primary health risk assessments documented in Volume II, which values were used to evaluate the suitability of the subject property for its proposed residential and commercial uses. Results in Table 12 for the "Limit" model, in which it was assumed that the groundwater might rise to a rarely, if ever, anticipated high level so that it would be between 3.5 ft. to 5 ft. BGS, depending upon the area of the site being considered. That limiting condition (which for the purpose of the modeling calculations was assumed to be permanent) generated the highest numerical values of cumulative cancer risk and toxic hazard index produced from the range of model conditions used to investigate the sensitivity of the assessments to changes in key input parameters.

To evaluate whether or not the numerical values of the health risks computed from the site-specific building models were sufficiently low to safely permit use of the 3992 San Pablo Avenue site as mixed commercial and residential property, they were compared with the conservatively-selected "target limits" of 1.0×10^{-6} for cumulative carcinogenic risk and 2.0×10^{-1} for the toxic hazard index. Those are the values established by the RWQCB in its applicable guidance document (California Regional Water Quality Control Board - San Francisco Bay Region 2001).

The unusually conservative nature of the target limits used to assess the SNK Captec property can be judged in the context of the values set for those target levels by Federal, State and local agencies. For non-carcinogenic health effects, the results of most health risk assessments are compared with a toxic hazard quotient of 1.0, which represents the threshold value below which no adverse health effects are experienced by exposed populations and is the ASTM default value for Tier 2 risk assessments. This value is based on the precedents set by the US-EPA in its Risk Assessment Guidance for Superfund (**RAGS**) (United States Environmental Protection Agency 1989). It was also adopted by the City of Oakland, but with a requirement to address cumulative risk, if necessary (*i.e.*, to consider the toxic hazard *index*), when it developed its guidelines for Tier 2 health risk assessments for sites in that City (Spence and Gomez 1999). The target limit of 2.0×10^{-1} for the toxic hazard index that was used to evaluate the safety of the 3992 San Pablo Avenue property was five times more stringent than the target used by those agencies.

With respect to the potential health effects of carcinogenic COC, there is a general perception that a risk factor of 1.0×10^{-6} represents an established upper limit of acceptable carcinogenic health risk promulgated in State and Federal regulations. That is not, in fact, the case. The USEPA has indicated that the appropriate risk limit applicable to a specific site or a specific form of exposure should fall within the range 1.0×10^{-6} to 1.0×10^{-4}. ASTM recommends a target carcinogenic health risk of 1.0×10^{-5} for risk-based assessments at petroleum release sites and describes that value as representative of *de minimus* risk (American Society for Testing and Materials 2002).

California State Proposition 65 (The Safe Drinking Water and Toxic Enforcement Act of 1986) enforcement is also based on a limiting target risk of 1.0×10^{-5}. Proposition 65 requires the governor of California to publish annually a list of chemicals known to the State to cause cancer or reproductive toxicity. All businesses that might expose individuals to a listed chemical must post a clear warning of such risk on the business premises, unless there is "no significant risk" posed by the chemical in question. The State of California has defined "no significant risk" as less than one excess case of cancer per one-hundred thousand individuals, which corresponds to target risk of 1.0×10^{-5}.

The origin of the 1.0×10^{-6} limit appears to have been a recommended risk-based limit for residues of animal drugs found in human food-grade meat (United States Food and Drug Administration 1973). That target risk level represents, essentially, a zero risk (Malander 2002).

In practical terms, when carcinogenic risk factors of 1.0×10^{-6} or lower are computed for a site, these numerical values have no quantitative meaning other than to indicate that use of a site for a specified purpose carries no risks whatsoever to human health beyond those that are routinely present in the general environment.

As can be seen by inspection of Table I-12, all of the cumulative carcinogenic risk and toxic hazard index parameters produced by the building-specific health risk assessments are well below the respective target limits of 1.0×10^{-6} and 2.0×10^{-1}, respectively. In fact, the

computed values are more than an order of magnitude lower than the target limits. This is not only the case for calculations based on the very conservative model, but also for the model that assumed that the groundwater would permanently be at extreme high elevations beneath the site. As has been noted above, the computed carcinogenic risk values show that the environmental condition of the site, when it is placed in residential and commercial use, will pose no human health risk whatsoever.

6.4 Redundant Protection Provided by Impermeable Membranes Beneath Buildings

As was discussed in Section 5.0, even though the health risk analyses described above demonstrated that there would be no health risk posed by residential and commercial occupancy of the remediated SNK Captec property, at the request of ACEHCS, a 60-mil. Liquid Boot® impermeable barrier was placed beneath the ground floors of Buildings 1, 2-A and 3-A, which barrier acts to exclude any gasses or vapors that might otherwise, however improbably, penetrate upward into the interior spaces of the redevelopment project.

It is important to note that the Liquid Boot® barriers were not represented in the building-specific models that were used to perform the Tier 2 health risk assessments described herein. Accordingly, their presence beneath the buildings provides an extraordinarily high level of redundancy with respect to elimination of any site-specific environmental risk to the occupants.

7.0 SUMMARY

In 2003, SNK Captec LLC purchased property at 3992 San Pablo Avenue in Emeryville, California and planned to redevelop the site for mixed residential and commercial use. The site location is shown on Figure I-1. Figure 2 is a plan of the site prior to its re-development. Figure I-3 is a ground floor plan of the proposed redevelopment project.

7.1 Pre-remediation Site Characterization

A Phase I Environmental Site Assessment conducted by SJC in 2002 indicated the probability that at least a portion of the northwestern area of the site might be affected by discharges of hydrocarbons that occurred at the former Celis Service Station, which site had been located in an area across the northern boundary of SNK Captec's property on land that is, today, an extension of 40th Street that was constructed in the mid-1990s between Adeline Street and San Pablo Avenue.

The presence of fuel hydrocarbons in the subsurface beneath the 3992 San Pablo Avenue property was confirmed by a limited subsurface investigation performed by Apex Envirotech, Inc. in early 2003, which found high concentrations of components of gasoline and diesel in the soil situated between the northern boundary of the subject property where it fronts onto 40th Street and a northern portion of the western boundary of that property where it fronts onto San Pablo Avenue. SJC extended the site characterization work and defined the full lateral and vertical extent of the contamination beneath the SNK Captec property. The locations of exploratory trenches and groundwater-quality monitoring wells opened by SJC on the site are shown on Figure I-10, together with the locations of borings drilled by Apex and others drilled by Harza, as part of the latter company's geotechnical site investigation at the property. The results of analyses of samples of soil and groundwater recovered from the trenches, borings and wells are compiled in Tables I-5, I-6 and I-7. Figure I-10 also shows the area of the 3992 San Pablo Avenue property that was significantly affected by off-site releases of petroleum hydrocarbons.

7.2 Sources of Contamination

Subsurface investigations have been conducted by Science and Engineering Analysis Corporation (**SECOR**) Levine-Fricke, and Woodward Clyde, each of whom served as consulting engineers to the several parties that, over time, owned some or all of the property that is, today, occupied by the extension of 40th Street that runs between Adeline Street and San Pablo Avenue.

7.2.1 Celis Alliance Service Station

It was clear from the site characterization investigations performed by SJC and others that the principal source of the contamination found beneath the SNK Captec property had been located at the former Celis site beneath 40th Street.

After purchasing the site of the former Celis service station and removing the underground tanks formerly located there, the City of Emeryville retained Woodward-Clyde, which engineering company directed a program of soil remediation on that property. The remediation involved excavation to a depth of approximately 9.5 ft. within the boundaries of the former Celis service station and disposal of the contaminated material off site. Woodward-Clyde also undertook a pilot study preparatory to recovery of LNAPL (also known as floating product) from beneath the site, but a full-scale program of groundwater remediation was not completed. As of this writing, the lateral and vertical extent of the plume of contaminants emanating from the Celis site has not been determined.

Figure I-6 shows the locations of samples recovered by Woodward-Clyde for their remedial excavation at the Celis site and the results of their analyses are presented in Table I-4. As can be seen by inspection of the Table, because the remedial excavation did not extend below the groundwater table, and because it did not extend beyond the site boundaries, soil affected by components of fuel hydrocarbons remained present at depth beneath 40th Street in the area where the Celis service station had been located.

7.2.2 Other Possible Sources

Study of materials available in the files of ACEHCS revealed that the extensive subsurface investigations had been made along the right-of-way beneath 40th Street by Levine-Fricke and others and those indicated that some portion of the contamination on the SNK Captec property may have migrated from other locations beneath that thoroughfare or north or northeast there from.

Identified sites that may have contributed to the contamination include an underground fuel storage tank site that was operated by the San Francisco French Bread Bakery, which company removed those tanks from its property before it was purchased by the City Of Emeryville for construction of the 40th Street extension. Locations of borings and groundwater-quality monitoring wells that were located in 40th Street by Levine-Fricke and others are shown on Figure I-4 and the concentrations of analytes of concern detected in samples of soil and groundwater recovered from them are recorded in Tables I-2 and I-3, respectively.

7.3 Excavation and Off-site Disposal of Affected Soil on Andante Project Site

In March of 2003, SJC submitted a work plan for the remediation of the SNK Captec property at 3992 San Pablo Avenue to ACEHCS. The plan was approved by that agency. In April 2003, the remediation program was initiated by Dietz Irrigation of Tracy, California, an experienced remediation contractor holding a Class A Engineering license with Hazardous Waste Operations endorsement issued by the California Contractors State License Board. To remediate the site, affected soil was excavated to varying depths between 8 ft. and 13 ft. BGS over the area shown on Figure I-10. To achieve the full depth of excavation, it was necessary to excavate beneath the groundwater table using a technique developed by SJC that involved

sequentially opening a series of overlapping pits, each of which was, before the next pit was opened, partially backfilled with crushed rock to an elevation sufficient to permit heavy equipment to travel over it without submerging the equipment's tracks or wheels.

7.3.1 Preferential Pathways Beneath the Site

During opening of the remedial excavation, a large number of heavy masonry foundations were found buried beneath the 3992 San Pablo Avenue property and it was apparent that disturbed soil adjacent to them had served as permeable pathways for contaminant transport across the site. In addition, a paleo streambed channel containing coarse sand and gravels was discovered. It ran along a curved path that trended in a generally southwesterly direction as it passed through the SNK Captec property from its northern boundary at 40th Street to its western boundary at San Pablo Avenue. The paleo streambed is shown in plan on Figure I-10 and in cross section on Figures I-11, I-12, and I-13. The preferential pathways associated with the streambed channel and the buried foundation structures had served as major conduits that permitted contaminants to spread to the south and east of the Celis site.

7.3.2 Innocuous Underground Storage Tanks

Three underground fuel storage tanks of extreme age were found during the excavation work. They were each removed under the permit and oversight of ACEHCS and the Emeryville Fire Department. After the tanks and their contents had been removed, appropriate soil samples were taken from the floors of the tank pits. When the results of the analyses of the soil samples recovered from their pit bottoms were available, the remediation contractor filed tank closure reports with ACEHCS.

Because the soil samples contained no significant concentrations of analytes of concern and the tanks had been located in highly-impermeable clayey soils, it was clear that none of the tanks could have been the source of an unauthorized release of fuel hydrocarbons to the subsurface and had not, in any way, contributed to the extensive contamination that had been found affecting the northwestern portion of the 3992 San Pablo Avenue property. Accordingly, ACEHCS directed that the tank sites be closed without further action and no unauthorized release filings were issued for the subject tanks.

7.3.3 Confirmation Sampling

The remedial excavation was extended vertically and laterally until, except in a few localized areas where deeper excavation was technically or economically impracticable, any affected soil remaining in situ at depth beneath the site contained concentrations of analytes of concern that were less than the applicable RBSLs that were published in the then-current guidance documents issued by the RWQCB. The results of confirmation samples recovered from the floor and walls of the excavation at the locations shown on Figure I-15 are presented in Table I-9.

7.3.4 Disposal of Affected Soil

A total of some 8,000 cubic yards, as measured in bulk after it had been excavated and weighing approximately 7,000 tons, was transported, in 410 truckloads, to permitted Class II landfills. Each truckload was transported for disposal under control of a Special Waste Manifest, copies of which are compiled in an appendix to the contractor's report of remediation that was submitted to ACEHCS.

7.4 Backfilling

SJC arranged for compaction and density tests to establish that stockpiled clean soil that had been removed from the surface of the 3992 San Pablo Avenue property was suitable for use as an engineered backfill for the remedial excavation. That backfill was designed to provide a low permeability cap over the remediated area, to further protect against the migration of any trace concentrations of analytes of concern left at depth in situ to the surface of the site. The tests demonstrated that the cap would be sufficiently impermeable at a relative density of 90%. SNK Captec's earthworks contractor backfilled the excavation by placing the stockpiled clean soil in shallow lifts and conservatively compacting it to a relative density of 95%.

Because the off-site disposal of affected soil removed from the northwestern area of the site generated an imbalance in the cut and fill volumes required to comply with the development project's grading plan, shallow clay soil, having the same properties as the clean soil that had been stockpiled, was imported and used to bring the remediated area up to final grade. In that way, the low permeability characteristics of the cap were maintained. The completed cap varied in thickness between 7 ft. and 13 .5 ft., depending on the local depth of the remedial excavation.

7.5 Tier 2 Health Risk Assessment

Because it was necessary to leave some small, isolated volumes of affected soil in place in the floor and walls of the remedial excavation, where concentrations were somewhat elevated above the RWQCB's Tier 1 RBSLs, highly conservative models of the geology, hydrogeology and the structures to be built on the site were developed by SJC so that the suitability of the remediated site for redevelopment for residential and commercial use could be assessed. The health risk assessments were performed in compliance with ASTM Standard E2081-00, the 2000 edition of the American Society for Testing and Materials' *Standard Guide for Risk-Based Corrective Action.*

Table I-12 shows the computed cumulative cancer risk and toxic hazard values for each building that is wholly or partially located within the remediated area of the site. That Table includes the results from building-specific risk analyses made for the standard conservative models used for the primary risk assessments and for the risks computed for an extreme condition that was postulated to occur in an abnormally wet winter when groundwater levels might rise to unusually shallow depth beneath the site.

Details of the health risk assessment procedure and the results are included in Volume II of this report. The results demonstrate that the health risks posed by use of the site, even when extremely conservative modeling techniques are used and no account is taken in the models for the gas-tight membranes installed beneath the floor slabs located on the remediated area, are much lower than the very conservatively-selected target limits of 1.0×10^{-6} for cumulative carcinogenic risk and 2.0×10^{-1} for the toxic hazard index. In practical terms, when computed health risks are at or below those values, residents or workers on a site are exposed to no health risks beyond those that are routinely present in the general environment.

7.6 Impermeable Barriers

Visqueen™ is an effective barrier to migration of moisture and vapor upward into the interior space of a building and also provides a significant barrier to gases migrating along the same pathway. It was to be installed beneath the ground floor slabs of the buildings under construction on the SNK Captec property; however, because Visqueen™ is not designed as a gas-proof membrane, it cannot be relied upon to exclude 100% of any analytes of concern remaining in situ that might migrate into building interiors. At the request of ACEHCS, the Visqueen™ membrane was replaced by a 60 mil. thickness of Liquid Boot® beneath the whole of the ground floor slab under Building 1 and under the floor slabs of the most northerly units in Buildings 2-A and 3-A. To ensure full coverage of any sub-floor areas that might serve as pathways for gases or vapors migrating from the subsurface, the areas beneath Buildings 2-A and 3-A that are underlain by Liquid Boot® extend further to the south than the southern limit of the remediated area of the property.

It should be noted that because all of the cumulative carcinogenic risk and toxic hazard index values produced by the building-specific health risk assessments described in Section 6.2, above, are more than an order of magnitude below the respective target limits of 1.0×10^{-6} and 2.0×10^{-1}, the impermeable barriers placed beneath the ground floors of building on the site are, as a practical matter, extremely redundant safety systems..

7.7 Release of Site for Construction

Throughout the progress of the remediation program, SJC maintained close communication and coordination with the ACEHCS Case Officer for the property and supplied that officer with the results of all the soil and groundwater analyses and the geological and hydrogeological details of the site as they were developed. In July 2003, ACEHCS authorized SNK Captec to begin construction of its redevelopment project on the 3992 San Pablo Avenue property and the site was released to SNK Captec's general construction contractor.

8.0 RECOMMENDATIONS

As has been documented in this report, the remediation program implemented at the SNK Captec Andante property at 3992 San Pablo Avenue was successful in removing substantially all soil affected by analytes of concern from the subsurface beneath the site. Tier 2 health risk assessments performed according to the protocols specified in ASTM Standard E2081-00 have been performed and the results demonstrate that any affected soil or groundwater remaining in the subsurface beneath the property will pose no risk to human health when the site is placed in residential and commercial use. In addition, to provide a highly-redundant safety feature, each building located above the remediated area that will be placed in residential or commercial use is underlain by a gas-proof impermeable membrane that is resistant to breakdown in the presence of components of fuel hydrocarbons. These membranes were excluded from the analytic model so that no account was taken for them when the health risk assessments were performed.

It is the professional opinion of the author of this report that no further site characterization or corrective action work is required at the subject property before it is placed, without restriction, in residential and commercial use.

We note, however, that all of the contamination found beneath the 3992 San Pablo Avenue property had migrated there from releases of petroleum hydrocarbons that had occurred at the former Celis site, which was, historically, the location of an automobile serve station, or to a lesser degree, from other sites that may have been present beneath or to the north of the 40th Street extension, which adjoins the SNK Captec property along its northern boundary. Although affected soil to a depth of approximately 9.5 ft. BGS over the whole area of the Celis site was removed in late 1994 and a limited pilot test to remove LNAPL from the groundwater beneath that site was conducted in late 1997, no further active site remediation has been conducted since that time.

SJC's investigations to support the characterization of the 3992 San Pablo Avenue property also revealed that the lateral and vertical extent of the plume of contamination emanating from the Celis site has not been investigated, nor has the former Celis property been "closed" by the RWQCB as the site of an unauthorized release of regulated materials to the subsurface. There are no groundwater-quality monitoring wells along San Pablo Avenue to the north or south of the Celis site and the down-gradient extent of the plume is apparently unknown. What is known from the geology and hydrogeology of the Celis site and its adjacent areas is that contamination migrating in groundwater has severely affected the subsurface beneath the property immediately to the north of 40th Street and can be expected to be present beneath San Pablo Avenue and the properties on the west side of that thoroughfare.

In order that the full extent of the plume of contamination can be assessed and the risks that it poses to human health and the environment on properties to the north and west of the Celis site, site characterization work related to that site should be completed. The co-responsible parties for implementing that work are the City of Emeryville and any prior owners or lessees

of the Celis site that have legal responsibility as the dischargers of the petroleum hydrocarbons released there. SNK Captec is prepared to provide appropriate access to their property and to accommodate consulting engineers or others employed by the responsible parties who may need access to its property for such site characterization or groundwater remediation work that would not be disruptive to the occupants and infrastructure of its redeveloped property. However, the cost of any such work should be born by the parties responsible for the discharges that caused the SNK property to be, prior to its remediation, affected by chemicals of concern.

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TABLE I-1

DEPTHS TO GROUNDWATER

Well No.	Date Measured	Casing Elevation	Ground Elevation	Depth below Top of Well Casing	Depth below Ground Level	Groundwater Elevation
		ft. MSL	ft. MSL	ft.	ft.	ft. MSL
SMW-1 [1]	09/11/92	n/a [2]		9.10	n/a	n/a
	12/03/92	n/a		9.55	n/a	n/a
	03/04/93	n/a		7.82	n/a	n/a
	06/04/93	n/a		5.15	n/a	n/a
	09/02/93	n/a		8.00	n/a	n/a
	12/01/93	n/a		11.82	n/a	n/a
	03/08/94	n/a		5.08	n/a	n/a
WC-EW-1		39.04	n/a			
	12/05/97			6.00	n/a	33.04
	09/26/97			8.06	n/a	30.98
	06/02/98			7.24	n/a	31.80
	03/13/98			5.92	n/a	33.12
LF-LF-1		38.95	n/a			
	08/08/93			9.40	n/a	29.55
	08/20/93			10.00		28.95
LF-LF-2		40.25	n/a			
	08/08/93			7.97	n/a	32.28
	08/20/93			8.29	n/a	31.96
LF-LF-3		39.35	n/a			
	08/08/93			8.90	n/a	30.45
	08/07/93			9.18	n/a	30.17
LF-LF-4		38.08	n/a			
	06/02/98			6.99	n/a	31.09
	03/13/98			6.58	n/a	31.50
	12/05/97			6.28	n/a	31.80
	09/26/97			8.25	n/a	29.83
	01/28/94			6.77	n/a	31.31
SJC-MW-T1		46.99	43.51			
	04/14/03			6.69	3.21	40.30
	04/16/03			6.84	3.36	40.15
	04/21/03			8.14	4.66	38.85
SJC-MW-T2		43.26	41.54			
	04/14/03			2.83	1.11	40.43
	04/16/03			3.42	1.70	39.84
	04/21/03			4.22	2.50	39.04
SJC-MW-T2A		43.99	41.52			
	04/14/03			7.49	5.02	36.50
	04/16/03			7.52	5.05	36.47
	04/21/03			7.00	4.53	36.99

Well No.	Date Measured	Casing Elevation	Ground Elevation	Depth below Top of Well Casing	Depth below Ground Level	Groundwater Elevation
		ft. MSL	ft. MSL	ft.	ft.	ft. MSL
SJC-MW-T3		46.01	42.50			
	04/14/03			7.77	4.26	38.24
	04/16/03			7.89	4.38	38.12
	04/21/03			8.12	4.61	37.89
SJC-MW-T4		41.01	39.73			
	04/14/03			3.32	2.04	37.69
	04/16/03			3.54	2.26	37.47
	04/21/03			5.14	3.86	35.87
SJC-MW-T4A		42.70	39.69			
	04/14/03			8.81	5.80	33.89
	04/16/03			8.10	5.09	34.60
	04/21/03			8.00	4.99	34.70
SJC-MW-T5		41.79	39.64			
	04/14/03			2.33	0.18	39.46
	04/11/02			3.52	1.37	38.27
	04/21/03			5.22	3.07	36.57
SJC-MW-T5A		42.30	39.52			
	04/14/03			4.20	1.42	38.10
	04/16/03			6.62	3.84	35.68
	04/21/03			7.56	4.78	34.74
SJC-MW-T6		44.02	40.73			
	04/14/03			5.28	1.99	38.74
	04/16/03			5.99	2.70	38.03
	04/21/03			7.07	3.78	36.95
SJC-MW-T7		44.10	40.55			
	04/14/03			5.86	2.31	38.24
	04/16/03			6.24	2.69	37.86
	04/21/03			6.86	3.31	37.24

Notes: (1) Data from groundwater-quality monitoring in Well SMW-1 that is included in this Table became available after Table II-13 of Volume II of this Corrective Action Report, which includes an otherwise similar data compilation, had been completed.
(2) n/a = Data not available.

TABLE I-2

RESULTS OF ANALYSES OF SOIL SAMPLES RECOVERED FROM 40TH STREET RIGHT-OF-WAY [1]

Sample ID	Date Sampled	Depth BGS	TRPH [2]	TPHd Diesel	TPHg (gasoline)	TPHmo (motor oil)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Methylene Chloride	Aroclor 1260	Naphthalene	2-Methylnaphthalene	4-Methylphenol
		ft.	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*
LFSB1-7.0	08/08/93	7	290	240	**850**	27	**5.4**	ND [4]	**25**	**42**	n/a [3]	n/a	n/a	n/a	n/a
LFSB1-9.5	08/08/93	9.5	130	220	180	ND	**0.89**	1.1	4.3	**18**	n/a	n/a	n/a	n/a	n/a
LFSB1-14.5	08/08/93	14.5	60	ND	7.4	ND	**0.44**	0.44	0.14	0.61	n/a	n/a	n/a	n/a	n/a
LFSB2-7.0	08/08/93	7	160	**790**	**780**	57	**8**	ND	**31**	**140**	n/a	ND	n/a	n/a	n/a
LFSB2-9.5	08/08/93	9.5	210	200	**720**	ND	**2.4**	5.2	15	**59**	n/a	n/a	n/a	n/a	n/a
LFSB2-14.5	08/08/93	14.5	43	ND	1.0	12	**0.2**	0.21	0.021	0.12	n/a	ND	n/a	n/a	n/a
LFSB3-9.5	08/07/93	9.5	37	11	**580**	ND	**9.7**	**50**	15	**90**	n/a	ND	n/a	n/a	n/a
LFSB3-14.5	08/07/93	14.5	37	ND	0.9	ND	0.092	0.16	0.031	0.17	n/a	ND	n/a	n/a	n/a
LFSB4-7.0	08/08/93	7	70	13	380	ND	**3**	5.2	8.2	**18**	n/a	n/a	n/a	n/a	n/a
LFSB4-14.5	08/08/93	14.5	210	ND	ND	ND	0.026	0.005	0.019	0.023	n/a	n/a	n/a	n/a	n/a
LFSB5-7.0	08/08/93	7	37	15	**410**	ND	**2.4**	0.6	16	**6.3**	n/a	n/a	n/a	n/a	n/a
LFSB5-14.5	08/08/93	14.5	93	ND	ND	ND	0.011	ND	0.008	0.008	n/a	n/a	n/a	n/a	n/a
LFSB6-9.5	08/08/93	9.5	67	51	**490**	ND	**2.7**	ND	15	**15**	n/a	n/a	n/a	n/a	n/a
LFSB6-14.5	08/08/93	14.5	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LFSB7-9.5	08/07/93	9.5	170	52	**750**	66	**2.5**	**8.5**	22	**93**	n/a	n/a	n/a	n/a	n/a
LFSB7-14.5	08/07/93	14.5	ND	ND	2.8	ND	ND	ND	0.029	0.03	n/a	n/a	n/a	n/a	n/a
LFSB8-9.5	08/08/93	9.5	130	110	**2,800**	ND	**22**	**9.5**	**62**	**290**	n/a	n/a	n/a	n/a	n/a
LFSB8-14.5	08/08/93	14.5	37	ND	ND	11	0.009	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LFSB9-7.0	08/07/93	7	ND	14	210	ND	**2.8**	**13**	5.1	**29**	n/a	n/a	n/a	n/a	n/a
LFSB9-9.5	08/07/93	9.5	n/a	n/a	**1,200**	n/a	**14**	**81**	**26**	**140**	n/a	n/a	n/a	n/a	n/a
LFSB9-14.5	08/07/93	14.5	77	ND	ND	ND	0.079	0.059	0.011	0.041	n/a	n/a	n/a	n/a	n/a
LFSB10-7.0	08/07/93	7	n/a	n/a	73	n/a	**2.6**	4.7	1.6	**7.7**	n/a	n/a	n/a	n/a	n/a
LFSB10-9.5	08/07/93	9.5	40	ND	**1,100**	ND	ND	7.8	ND	**22**	n/a	n/a	n/a	n/a	n/a
LFSB10-14.5	08/07/93	14.5	ND	ND	8.6	ND	**0.48**	0.29	0.1	0.48	n/a	n/a	n/a	n/a	n/a

Sample ID	Date Sampled	Depth BGS	TRPH [2]	TPHd Diesel	TPHg (gasoline)	TPHmo (motor oil)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Methylene Chloride	Alaclor 1260	Naphthalene	2-Methylnaphthalene	4-Methylphenol
		ft.	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*
LFSB11-14.5	08/09/93	14.5	40	ND	ND	11	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LFSB12-1.0	08/09/93	1	**4,600**	ND	ND	400	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB12-3.0	08/09/93	3	420	**560**	**6,500**	64	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB13-5.0	08/09/93	5	63	ND	23	ND	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB13-6.5	08/09/93	6.5	37	ND	13	ND	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB14-2.0	08/09/93	2	**2,200**	ND	42	480	n/a	n/a	n/a	n/a	n/a	**0.22**	n/a	n/a	n/a
LFSB14-4.5	08/09/93	4.5	47	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB15-4.5	08/09/93	4.5	480	140	**4,700**	12	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB15-6.0	08/09/93	6	120	59	**3,700**	14	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB16-4.5	08/09/93	4.5	60	ND	9	ND	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB16-6.0	08/09/93	6	53	ND	8	ND	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB17-4.5	08/09/93	4.5	70	40	260	ND	ND	**22**	12	**69**	**2.6**	ND	1.6	**1.8**	0.4
LFSB17-6.0	08/09/93	7	50	70	**440**	ND	ND	**27**	8	**43**	**2.0**	ND	0.57	**0.63**	ND
LFSB17-12.0	08/09/93	12	47	130	**500**	190	**190**	9	4	**23**	**0.660**	ND	**1.7**	**1.8**	ND
LFSB18-1.0	08/09/93	1	**2,200**	ND	1	320	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB18-3.0	08/09/93	3	**1,100**	ND	ND	390	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB19-1.5	08/09/93	1.5	**2,200**	ND	ND	530	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LFSB19-3.0	08/09/93	3	**3,600**	ND	1	**740**	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a	n/a
LF-1-4.5	08/07/93	4.5	77	220	**550**	16	**0.84**	1.2	5.6	**2.7**	n/a	n/a	n/a	n/a	n/a
LF-1-9.5	08/07/93	9.5	ND [4]	18	**470**	ND	**0.97**	ND	6.6	**8.9**	n/a	n/a	n/a	n/a	n/a
LF-1-14.5	08/07/93	14.5	60	16	8.4	ND	0.14	0.17	0.081	0.37	n/a	n/a	n/a	n/a	n/a
LF-2-9.5	08/07/93	9.5	30	14	**740**	ND	**4.70**	**35**	13	**68**	n/a	n/a	n/a	n/a	n/a
LF-2-14.5	08/07/93	14.5	ND	ND	ND	ND	0.009	0.012	ND	0.015	n/a	n/a	n/a	n/a	n/a
LF-3-9.5	08/07/93	9.5	37	ND	75	ND	0.062	0.28	1.1	**1.1**	n/a	n/a	n/a	n/a	n/a
LF-3-14.5	08/07/93	14.5	ND	ND	ND	ND	0.014	ND	0.01	0.007	n/a	n/a	n/a	n/a	n/a
LF-B1-2	08/30/94	2	ND	ND	0.8	n/a	0.008	ND	0.016	0.085	n/a	n/a	n/a	n/a	n/a
LF-B1-5	08/30/94	5	30	ND	110	n/a	**0.840**	0.520	3.200	**12**	n/a	n/a	n/a	n/a	n/a
LF-B1-10	08/30/94	10	30	ND	**690**	n/a	**12**	**50**	18	**99**	n/a	n/a	n/a	n/a	n/a
LF-B2-2	08/30/94	2	10	ND	110	n/a	**0.6**	2.9	3.3	**16**	n/a	n/a	n/a	n/a	n/a
LF-B2-5	08/30/94	5	10	1	66	n/a	**0.37**	0.8	0.79	**3.5**	n/a	n/a	n/a	n/a	n/a
LF-B2-10	08/30/94	10	30	ND	**830**	n/a	**13**	**52**	21	**110**	n/a	n/a	n/a	n/a	n/a
LF-B3-2	08/30/94	2	80	ND	440	n/a	**8.5**	36	12	**58**	n/a	n/a	n/a	n/a	n/a
LF-B3-5	08/30/94	5	200	8	**810**	n/a	**14**	**62**	22	**100**	n/a	n/a	n/a	n/a	n/a

Sample ID	Date Sampled	Depth BGS	TRPH [2]	TPHd Diesel	TPHg (gasoline)	TPHmo (motor oil)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Methylene Chloride	Aiaclor 1260	Naphthalene	2-Methylnaphthalene	4-Methylphenol
		ft.	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*
LF-B3-10	08/30/94	10	50	ND	390	n/a	**7.1**	**22**	7.2	**38**	n/a	n/a	n/a	n/a	n/a
LF-B4-2	08/30/94	2	40	ND	49	n/a	0.14	0.12	2.3	**11**	n/a	n/a	n/a	n/a	n/a
LF-B4-5	08/30/94	5	**1,300**	28	**8,800**	n/a	**6.8**	7.3	**190**	**870**	n/a	n/a	n/a	n/a	n/a
LF-B4-10	08/30/94	10	110	3	**510**	n/a	**1.1**	0.96	3.4	**13**	n/a	n/a	n/a	n/a	n/a
LF-B5-2	08/30/94	2	10	ND	0.4	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B5-5	08/30/94	5	**2,400**	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B5-10	08/30/94	10	ND	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B6-2	08/30/94	2	20	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B6-5	08/30/94	5	10	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B6-10	08/30/94	10	ND	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B7-2	08/30/94	2	10	ND	27	n/a	**0.42**	ND	0.75	0.05	n/a	n/a	n/a	n/a	n/a
LF-B7-5	08/30/94	5	ND	ND	16	n/a	**0.67**	ND	ND	0.025	n/a	n/a	n/a	n/a	n/a
LF-B7-10	08/30/94	10	20	ND	**520**	n/a	**7.4**	**30**	14	78	n/a	n/a	n/a	n/a	n/a
LF-B8-2	08/30/94	2	50	5	3.4	n/a	**0.2**	ND	0.56	0.02	n/a	n/a	n/a	n/a	n/a
LF-B8-5	08/30/94	5	ND	ND	14	n/a	**0.3**	0.01	0.26	ND	n/a	n/a	n/a	n/a	n/a
LF-B8-10	08/30/94	10	20	ND	140	n/a	**2.1**	5.8	4	**21**	n/a	n/a	n/a	n/a	n/a
LF-B9-2	08/30/94	2	20	ND	2.8	n/a	**0.33**	0.005	0.41	0.07	n/a	n/a	n/a	n/a	n/a
LF-B9-5	08/30/94	5	ND	ND	40	n/a	**1.2**	0.013	2.6	0.15	n/a	n/a	n/a	n/a	n/a
LF-B9-10	08/30/94	10	20	ND	190	n/a	**4.3**	**11**	5.5	**28**	n/a	n/a	n/a	n/a	n/a
LF-B10-2	08/30/94	2	150	ND	29	n/a	0.038	0.048	0.18	**1.2**	n/a	n/a	n/a	n/a	n/a
LF-B10-5	08/30/94	5	30	ND	13	n/a	ND	0.02	0.05	ND	n/a	n/a	n/a	n/a	n/a
LF-B10-10	08/30/94	10	ND	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B11-2	08/30/94	2	20	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B11-5	08/30/94	5	ND	ND	1	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B11-10	08/30/94	10	40	ND	250	n/a	**1.1**	0.35	4.4	**21**	n/a	n/a	n/a	n/a	n/a
	08/30/94	2	30	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B12-5	08/30/94	5	ND	ND	0.9	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B12-10	08/30/94	10	30	ND	160	n/a	**0.97**	0.19	4.1	20	n/a	n/a	n/a	n/a	n/a
LF-B13-2	08/30/94	2	**600**	220	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B13-5	08/30/94	5	40	10	4.2	n/a	ND	ND	0.02	ND	n/a	n/a	n/a	n/a	n/a
LF-B13-10	08/30/94	10	20	3	6.9	n/a	**0.36**	ND	0.45	0.13	n/a	n/a	n/a	n/a	n/a
LF-B14-2	08/30/94	2	410	ND	ND	n/a	ND	ND	ND	ND	0.670	n/a	n/a	n/a	n/a
LF-B14-5	08/30/94	5	ND	ND	1.6	n/a	0.01	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B14-10	08/30/94	10	ND	ND	2.9	n/a	0.006	ND	0.01	ND	**1.1**	n/a	n/a	n/a	n/a
LF-B15-2	08/30/94	2	420	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a

Sample ID	Date Sampled	Depth BGS	TRPH [2]	TPHd Diesel	TPHg (gasoline)	TPHmo (motor oil)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Methylene Chloride	Alaclor 1260	Naphthalene	2-Methylnaphthalene	4-Methylphenol
		ft.	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*	*mg/Kg*
LF-B15-5	08/30/94	5	ND	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B15-10	08/30/94	10	20	ND	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B16-2	08/30/94	2	50	10	ND	n/a	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
LF-B16-5	08/30/94	5	ND	ND	28	n/a	0.16	ND	0.96	0.037	n/a	n/a	n/a	n/a	n/a
LF-B16-10	08/30/94	10	20	ND	130	n/a	**2.5**	5.4	2.6	**15**	n/a	n/a	n/a	n/a	n/a

Notes:

(1) Data Source: Levine-Fricke (1994a)
(2) TRPH = Total Recoverable Petroleum Hydrocarbons
(3) n/a = Not Analyzed
(4) ND = Not Detected above the Method Detection Limit (MDL).
(5) Concentrations in **bold** script exceed the San Francisco Bay Area RWQCB's RBSL limits for residential sites were groundwater is at less than 3 meters BGS in porous soils where groundwater is not a source of drinking water (Interim Final Edition De

TABLE I-3

RESULTS OF ANALYSES OF GROUNDWATER SAMPLES RECOVERED FROM 40TH STREET RIGHT-OF-WAY [1]

Sample ID	Date Sampled	TRPH [2] µg/L	TPHd (diesel) µg/L	TPHg (gasoline) µg/L	TPHmo (motor oil) µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L	MTBE µg/L	PNA (Napthalene) µg/L
SMW-1 [6]	09/11/92	n/a	n/a	**1,400**	n/a	**470**	45	43	**100**	n/a	n/a
	12/03/92	n/a	n/a	ND	n/a	ND	ND	1.6	ND	n/a	n/a
	03/04/93	n/a	n/a	**700**	n/a	**1.1**	ND	ND	1.1	n/a	n/a
	06/04/93	n/a	n/a	**2,900**	n/a	**340**	58	50	**140**	n/a	n/a
	09/02/93	n/a	n/a	**1,500**	n/a	**340**	ND	ND	**140**	n/a	n/a
	12/01/93	n/a	n/a	**810**	n/a	**170**	23	22	**39**	n/a	n/a
	03/08/94	n/a	n/a	**5,800**	n/a	**1,700**	**430**	230	**490**	n/a	n/a
LF-1AG	08/07/93	**11,000**	**41,000**	**100,000**	ND	**13,000**	**9,400**	**3,100**	**14,000**	n/a	n/a
LF-2AG	08/07/93	ND [3]	95	**13,000**	ND	**2,400**	**2,900**	**500**	**2,000**	n/a	n/a
LF-3AG	08/07/93	ND	**780**	**11,000**	ND	**1,500**	**170**	**2,900**	**5,100**	n/a	n/a
WCEW-1	09/26/97	n/a [4]	**41,000**	**180,000**	ND	**2,800**	**4,900**	**3,100**	**12,000**	ND	**120**
	12/05/97	n/a	95	**4,700**	ND	**2,100**	**1,800**	**2,500**	**10,000**	340	**170**
	03/13/98	n/a	**780**	**7,700**	ND	**2,500**	**1,300**	**1,000**	**3,400**	570	**420**
	06/02/98	n/a	**780**	**3,400**	**550**	**2,100**	**460**	**910**	**2,990**	350	**1,000**

Notes:

(1) Data Sources: Levine-Fricke (1994c), Woodward-Clyde International-Americas (1998a)
(2) TRPH = Total Recoverable Petroleum Hydrocarbons
(3) ND = Not Detected above the Method Detection Limit (MDL).
(4) n/a = Not Analyzed.
(5) Concentrations in **bold** script exceed the San Francisco Bay Area RWQCB's RBSL limits for residential sites were groundwater is at less than 3 meters BGS in porous soils where groundwater is not a source of drinking water. (Interim Final Edition December 2001).
(6) Data from groundwater-quality monitoring in Well SMW-1 that is included in this Table became available after Table II-5 of Volume II of this Corrective Action Report, which includes an otherwise similar data compilation, had been completed.

TABLE I-4

RESULTS OF ANALYSES OF SOIL SAMPLES FROM REMEDIAL EXCAVATION
AT FORMER CELIS' ALLIANCE SERVICE STATION
4000 SAN PABLO AVENUE [1]

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 [2]	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 [6]	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.
(7) Concentrations in **bold** script exceed the San Francisco Bay Area RWQCB's RBSL limits for residential sites were groundwater is at less than 3 meters BGS in porous soils where groundwater is not a source of drinking water (Interim Final Edition December 2001).

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TABLE I-5

RESULTS OF ANALYSES OF SOIL SAMPLES FROM BORINGS [1]
ON ANDANTE PROJECT SITE

Sample ID	Date Sampled	Depth BGS ft.	TPHd (diesel) mg/Kg	TPHg (gasoline) mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl-benzene mg/Kg	Total Xylenes mg/Kg	MTBE mg/Kg	Total Lead mg/Kg
AE GP-1@5'	02/05/03	5	ND [2]	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., (2003) *Results of Limited Subsurface Invesigation*, Table 1

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

(3) Concentrations in **bold** script exceed the San Francisco Bay Area RWQCB's RBSL limits for residential sites were groundwater is at less than 3 meters BGS in porous soils where groundwater is not a source of drinking water (Interim Final Edition December 2001).

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TABLE I-6

RESULTS OF ANALYSES OF SOIL SAMPLES RECOVERED FROM EXPLORATORY TRENCHES, TANK PITS AND TEMPORARY WELLS ON ANDANTE PROJECT SITE

Sample ID	Date Sampled	Depth BGS ft.	TPHd (diesel) mg/Kg	Mineral Spirits mg/Kg	TPHg (gasoline) mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl-benzene mg/Kg	Total Xylenes mg/Kg	TBA mg/Kg	MTBE mg/Kg	TAME mg/Kg	DIPE mg/Kg	ETBE mg/Kg	1,2-DCA mg/Kg	EDB mg/Kg	Ethanol mg/Kg	PNA (Napthalene) mg/Kg	Total Lead mg/Kg
ET2-N-6.5	03/24/03	6.5	110 [3]	n/a [2]	**510** [5]	**1.1**	3.7	10	**65**	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a
ET2-N-9	03/24/03	9.0	46 [3]	n/a	**400**	**2.8**	8.2	7.9	**45**	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a
ET2-S-7	03/24/03	7.0	ND [1]	n/a	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a
ET1-S-6	03/25/03	6.0	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ET3-E-8	03/25/03	8.0	1.2	n/a	1.2	0.030	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tank 1 - N	04/29/03	10.0	ND	54	31 [4]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	5.6
Tank 1 - S	04/29/03	10.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	2.4
Tank 1P - 20N	04/29/03	3.0	230 [3]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a
Tank 1P - 40N	04/29/03	3.0	1.2 [3]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a
Tank 3	05/22/03	7.8	ND	ND	n/a	ND	ND	ND	ND	0.0080	0.0081	ND	ND	ND	ND	ND	n/a	n/a	n/a
SJC-MW-T1-7.5	04/11/03	7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T1-11.5	04/11/03	11.5	3.5 [3]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T2-8	04/11/03	8.0	18 [3]	ND	250	**1.4**	3.5	5.2	**27**	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T2A-5	04/11/03	5.0	130 [3]	ND	**660**	ND	1.4	9.9	**75**	ND	ND	ND	ND	ND	n/a	n/a	n/a	**1.8**	n/a
SJC-MW-T2A-9	04/11/03	9.0	8.3 [3]	ND	**500**	**0.5**	0.5	0.5	**2**	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T2A-15.5	04/11/03	15.5	6.1 [3]	ND	ND	ND	ND	ND	0.012	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T2A-19.5	04/11/03	19.5	1.2 [3]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T3-8	04/11/03	8.0	2.4 [3]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T3-12	04/11/03	12.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
SJC-MW-T4-8	04/11/03	8.0	12 [3]	ND	ND	ND	ND	ND	**1.8**	0.01	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a

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Sample ID	Date Sampled	Depth BGS ft.	TPHd (diesel) mg/Kg	Mineral Spirits mg/Kg	TPHg (gasoline) mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl-benzene mg/Kg	Total Xylenes mg/Kg	TBA mg/Kg	MTBE mg/Kg	TAME mg/Kg	DIPE mg/Kg	ETBE mg/Kg	1,2-DCA mg/Kg	EDB mg/Kg	Ethanol mg/Kg	PNA (Napthalene) mg/Kg	Total Lead mg/Kg
SJC-MW-T4A-5	04/11/03	5.0	2.9 [3]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T4A-12	04/11/03	12.0	14 [3]	ND	76	ND	ND	0.98	**3.1**	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T4A-15.5	04/11/03	15.5	4.2 [3]	ND	ND	ND	ND	ND	ND	ND	0.0052	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T4A-20	04/11/03	20.0	4.6 [3]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T5-5	04/11/03	5.0	34 [3]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T5-7.5	04/11/03	7.5	12 [3]	ND	ND	ND	ND	0.57	**2.4**	ND	ND	ND	ND	ND	n/a	n/a	n/a	ND	n/a
SJC-MW-T5A-5	04/11/03	5.0	9.3 [3]	ND	ND	0.0086	ND	0.019	ND	0.0068	ND	ND	ND	ND	n/a	n/a	n/a	0.29	n/a
SJC-MW-T5A-10	04/11/03	10.0	71 [3]	ND	**1,500**	**4.40**	**17.0**	**26.0**	150.0	ND	ND	ND	ND	ND	n/a	n/a	n/a	0.35	n/a
SJC-MW-T5A-15.5	04/11/03	15.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a
SJC-MW-T5A-19.5	04/11/03	19.5	ND	ND	ND	ND	ND	ND	0.011	ND	0.014	ND	ND	ND	n/a	n/a	n/a	n/a	n/a n/a
SJC-MW-T6-5	04/11/03	5.0	48 [3]	ND	**1,300**	**4.2**	**15**	23	**140**	ND	ND	ND	ND	ND	n/a	n/a	n/a	1.1	n/a
SJC-MW-T6-11.5	04/11/03	11.5	20 [3]	ND	180	ND	ND	2.3	**120**	ND	ND	ND	ND	ND	n/a	n/a	n/a	0.50	n/a
SJC-MW-T7-7.5	04/11/03	7.5	37 [3]	ND	**2,000**	**9.1**	**41**	**35**	**230**	ND	ND	ND	ND	ND	n/a	n/a	n/a	0.91	n/a
SJC-MW-T7-11.5	04/11/03	11.5	150 [3]	ND	**1,600**	**8.2**	**33**	**31**	**200**	ND	ND	ND	ND	ND	n/a	n/a	n/a	**2.1**	n/a

Notes:

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

(2) n/a = Not analyzed

(3) The laboratory reports that the detected hydrocarbon does not match its Diesel standard. The hydrocarbon detected appears to be a mixture of Diesel and Mineral Spirits, but the components of the mixture, all of which were in the Diesel range, were insufficiently distinct to quantify them separately.

(4) Does not match laboratory's standard for gasoline.

(5) Concentrations in **bold** script exceed the San Francisco Bay Area RWQCB's RBSL limits for residential sites were groundwater is at less than 3 meters BGS in porous soils where groundwater is not a source of drinking water (Interim Final Edition December 2001).

TABLE I-7

RESULTS OF ANALYSES OF GROUNDWATER SAMPLES RECOVERED FROM EXPLORATORY TRENCHES AND TEMPORARY WELLS ON ANDANTE PROJECT SITE

Sample ID	Date Sampled	TPHd (diesel) µg/L	Mineral Spirits µg/L	TPHg (gasoline) µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L	TBA µg/L	MTBE µg/L	TAME µg/L	DIPE µg/L	ETBE µg/L	1,2-DCA µg/L	EDB µg/L	Ethanol µg/L	PNA (Naphthalene) µg/L
ET2-C-W	03/24/03	**20,000** [3]	n/a	**510,000**	**1,100**	**3,700**	**10,000**	**65,000**	ND [1]	ND	ND	ND	ND	ND	ND	ND	n/a [2]
SJC-MW-T1	04/16/03	380 [4]	ND	280	1.7	ND	0.54	ND	ND	6.3	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T2	04/16/03	**7,900** [4]	ND	**33,000**	**460**	**1,200**	**1,300**	**8,300**	ND	15	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T2A	04/16/03	**6,700** [4]	ND	**63,000**	**1,400**	**2,000**	**3,300**	**17,000**	ND	ND	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T3	04/16/03	320 [4]	ND	ND	ND	0.71	ND	ND	ND	0.59	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T4	04/16/03	360 [4]	ND	670	**94**	1.9	83	**120**	ND	0.93	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T4A	04/16/03	740 [4]	ND	**5,700**	**120**	4	**630**	**790**	ND	78	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T5	04/16/03	320 [4]	ND	610	**130**	2.1	54	**90**	ND	1.4	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T5A	04/16/03	**5,400** [4]	ND	**34,000**	**2,700**	**2,200**	**2,100**	**9,000**	ND	ND	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T6	04/16/03	4,500 [4]	ND	**24,000**	**1,900**	**1,900**	**1,100**	**6,200**	ND	ND	ND	ND	ND	ND	ND	ND	n/a
SJC-MW-T7	04/16/03	**6,100** [4]	ND	**45,000**	**3,400**	**4,800**	**1,700**	**9,300**	ND	ND	ND	ND	ND	ND	ND	ND	n/a
30S-40E (Water)	05/15/03	**3,200** [4]	ND	**23,000**	**1,500**	**2,400**	**730**	**3,700**	ND	74	ND	ND	ND	ND	ND	ND	**140**

Notes:

(1) ND = Not Detected above the Method Detection Limit (MDL).
(2) n/a = Not Analyzed.
(3) Chromatogram for this sample indicates that the only analyte in the C_9 to C_{24} range is Mineral Spirits.
(4) The laboratory reports that the detected hydrocarbon does not match its Diesel Standard.
(5) Concentrations in **bold** script exceed the San Francisco Bay Area RWQCB's RBSL limits for residential sites were groundwater is at less than 3 meters BGS in porous soils where groundwater is not a source of drinking water (Interim Final Edition December 2001).

TABLE I-8

EMERYVILLE PRECIPITATION APRIL 2003 [1,2]

Date	Rainfall in inches
4/1/2003	0
4/2/2003	0.04
4/3/2003	0.01
4/4/2003	0.47
4/5/2003	0
4/6/2003	0
4/7/2003	0
4/8/2003	0
4/9/2003	0
4/10/2003	0
4/11/2003	0
4/12/2003	1.01
4/13/2003	0.75
4/14/2003	0
4/15/2003	0
4/16/2003	0.02
4/17/2003	0
4/18/2003	0
4/19/2003	0
4/20/2003	0
4/21/2003	0.02
4/22/2003	0.03
4/23/2003	0.01
4/24/2003	0.55
4/25/2003	0.64
4/26/2003	0
4/27/2003	0.71
4/28/2003	0.08
4/29/2003	0.01
4/30/2003	0
Total	4.35

Monthly Summary Information

Month of Apr-03	4.35 in. *
Average for Month of April	2 in.

*Highest April percipitation on record.

Notes:

1) Source: California Data Exchange Center Website

2) Source: Weatherbase™ Website

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TABLE I-9

RESULTS OF ANALYSES OF CONFIRMATION SOIL SAMPLES RECOVERED FROM REMEDIAL EXCAVATION ON SNK ANDANTE SITE

Sample ID	Date Sampled	Elevation MSL ft.	Depth BGS ft.	TPHd (diesel) mg/Kg	Mineral Spirits mg/Kg	TPHg (gasoline) mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl-benzene mg/Kg	Total Xylenes mg/Kg	TBA mg/Kg	MTBE mg/Kg	TAME mg/Kg	DIPE mg/Kg	ETBE mg/Kg	1,2-DCA mg/Kg	EDB mg/Kg	Etha-nol mg/Kg	PNA (Naphthalene) mg/Kg
0S-40E	05/09/03	30.90	9.62	110 [3]	n/a	150	ND [1]	ND	ND	13	n/a [2]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-40E Wall (N)	05/15/03	31.90	8.62	3.9 [3]	n/a	540	ND	ND	8.8	45	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-60E	05/09/03	32.40	8.08	69 [3]	n/a	2,300	ND	**37**	44	**240**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-60E Wall (N))	05/15/03	33.40	7.08	10 [3]	n/a	320	ND	ND	4.2	14	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-80E	05/09/03	31.90	8.94	8.1	n/a	870	**6.0**	15	16	79	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-80E Wall (N)	05/15/03	32.90	7.94	31 [3]	n/a	630	ND	13	11	74	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-100E	05/16/03	30.84	10.21	21 [3]	n/a	890	ND	20	17	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-100E Wall (N)	05/16/03	31.84	9.21	21 [3]	n/a	1,200	ND	**30**	29	160	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-120E	05/14/03	31.10	10.16	7.2	n/a	1.74	0.031	ND	0.037	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-120E Wall (N)	05/15/03	32.10	9.16	66 [3]	n/a	1,100	**8.1**	ND	17	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-140E	05/14/03	31.29	10.35	140 [3]	n/a	90 [4]	ND	ND	2.3	1.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-180E	05/12/03	33.99	8.51	37 [3]	n/a	110 [4]	ND	ND	1.6	1.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
0S-200E	05/06/03	33.95	8.96	2.9 [3]	ND	5.9	0.036	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
0S-220E	05/06/03	34.20	8.75	2.5 [3]	ND	9.6	**0.21**	ND	0.68	0.058	ND	ND	ND	ND	ND	ND	ND	ND	ND
0S-230E Wall(N)	05/28/03	33.20	9.89	34 [3]	ND	450	ND	0.76	0.86	37	ND	ND	ND	ND	ND	ND	ND	ND	3.8
10S-225E Wall (E)	05/27/03	33.20	9.83	ND	n/a	ND	ND	ND	0.013	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-10E	05/09/03	30.44	10.78	2.1 [3]	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-10E Wall (N)	05/09/03	31.44	9.78	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-20E	05/13/03	33.86	5.80	69 [3]	n/a	350	ND	2.0	6.0	30	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-40E	05/11/03	31.25	9.27	28	n/a	200	**2.3**	8.1	3.9	19	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a
20S-60E	05/11/03	32.75	7.73	40	n/a	860	**9.9**	30	14	79	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-100E	05/16/03	30.44	10.64	48 [3]	n/a	2,000	**18**	43	39	190	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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Sample ID	Date Sampled	Elevation MSL ft.	Depth BGS ft.	TPHd (diesel) mg/Kg	Mineral Spirits mg/Kg	TPHg (gasoline) mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl-benzene mg/Kg	Total Xylenes mg/Kg	TBA mg/Kg	MTBE mg/Kg	TAME mg/Kg	DIPE mg/Kg	ETBE mg/Kg	1,2-DCA mg/Kg	EDB mg/Kg	Etha-nol mg/Kg	PNA (Naphthalene) mg/Kg
20S-120E	05/12/03	31.15	10.14	16 [3]	n/a	1,100	**6.4**	22	19	93	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-140E	05/14/03	31.29	10.81	120 [3]	n/a	2,000 [4]	ND	ND	62	110	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-140E (Deep)	05/27/03	30.45	11.65	70 [3]	n/a	2,000	**7.8**	ND	38	87	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-160E	05/13/03	31.10	11.00	84 [3]	n/a	460	ND	ND	7.2	32	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-160E (Deep)	05/13/03	28.26	13.50	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-180E	05/12/03	34.18	8.01	6.5 [3]	n/a	730	5	ND	14	49	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-180E(A)	05/27/03	33.26	8.93	2.8 [3]	n/a	ND	ND	ND	ND	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-200E	05/07/03	35.44	7.50	2.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20S-220E	05/09/03	34.48	8.50	1.7	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20S-220E Wall (E)	05/09/03	35.48	7.50	2.1 [3]	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
30S-40E (13.6) [7]	05/15/03	26.92	13.60	2.1 [3]	ND	ND	ND	ND	ND	ND	0.0051	ND	ND	ND	ND	ND	ND	ND	ND
30S-40E (15.0)	05/15/03	24.52	15.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
35S-200E	05/09/03	34.45	8.46	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
35S-200E Wall (S)	05/09/03	35.45	7.47	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-0E	05/09/03	34.73	4.97	1.5 [3]	n/a	ND	ND	ND	ND	0.057	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-0E Wall (W)	05/09/03	35.73	3.97	ND	n/a	ND	ND	ND	ND	0.018	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-20E	05/13/03	32.46	7.67	140 [3]	n/a	840	3.3	19	14	74	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-20E (A)	05/14/03	32.13	7.95	13 [3]	n/a	200	**1.9**	3.0	3.5	18	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-60E	05/15/03	31.64	8.83	75 [3]	n/a	1,100	**6.7**	15	18	110	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-80E	05/14/03	31.10	9.62	110 [3]	n/a	2,400	15	35	46	250	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-80E(Deep)	05/27/03	28.00	12.73	1.0 [3]	n/a	ND	ND	ND	ND	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-100E	05/27/03	30.00	11.04	ND	n/a	78	**0.72**	ND	1.8	8.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-120E	05/27/03	30.69	10.56	4.9 [3]	n/a	440	**3.6**	3.7	8.4	39	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-140E	05/12/03	31.31	10.32	21 [3]	n/a	65	ND	ND	1.1	6.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-140E	05/21/03	30.21	11.39	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-160E	05/08/03	35.56	6.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a
40S-160E Wall(S)	05/08/03	36.56	5.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a
40S-160E	05/21/03	35.05	6.50	3.7 [3]	n/a	ND	ND	ND	0.0097	0.018	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-160E Wall(S)	05/21/03	35.05	5.50	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
40S-180E	05/06/03	33.99	8.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a
40S-180E Wall(E)	05/06/03	34.99	7.16	1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Andante Project, 3992 San Pablo Ave., Emeryville, CA

Sample ID	Date Sampled	Elevation MSL ft.	Depth BGS ft.	TPHd (diesel) mg/Kg	Mineral Spirits mg/Kg	TPHg (gasoline) mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl-benzene mg/Kg	Total Xylenes mg/Kg	TBA mg/Kg	MTBE mg/Kg	TAME mg/Kg	DIPE mg/Kg	ETBE mg/Kg	1,2-DCA mg/Kg	EDB mg/Kg	Etha-nol mg/Kg	PNA (Naphthalene) mg/Kg
40S-200E	05/07/03	36.40	6.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a
40S-200E Wall(E)	05/07/03	37.40	5.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a
50S-180E	05/06/03	33.47	8.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a
50S-180E Wall(S)	05/06/03	34.47	7.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a
60S-0E	05/09/03	31.90	7.47	91 [3]	n/a	1,100	**3.4**	20	22	120	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-20E	05/16/03	30.93	8.92	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-40E	05/16/03	31.59	8.26	20 [3]	n/a	1,500	**12**	12	28	140	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-60E	05/13/03	31.94	8.81	150 [3]	n/a	600	ND	ND	8.0	37	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-80E	05/14/03	31.94	8.50	17 [3]	n/a	240	2.0	ND	3.0	11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-80E(A)	05/14/03	30.74	9.70	110 [3]	n/a	2,500	12	16	41	230	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-80E(Deep)	05/27/03	27.61	12.83	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-100E	05/20/03	30.40	10.35	1.3 [3]	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-100E Wall (S)	05/20/03	29.40	9.35	ND	n/a	ND	ND	ND	0.011	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-120E	05/20/03	28.81	12.15	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-140E	05/21/03	30.21	11.13	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
60S-140E Wall (S)	05/21/03	31.21	10.13	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
70S-135E	05/20/03	28.81	12.15	ND	n/a	ND	ND	ND	0.012	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
70S-135E Wall (S)	05/20/03	29.81	11.15	1.3 [3]	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-0E	05/05/03	32.31	6.43	68 [3]	ND	470	ND	ND	7.1	21	ND	ND	ND	ND	ND	ND	ND	n/a	0.46
80S-0E Wall (W)	05/05/03	33.31	7.43	8.1	ND	100	ND	ND	1.4	1.4	ND	ND	ND	ND	ND	ND	ND	n/a	ND
80S-0E (DEEP)	05/19/03	28.15	10.80	6.5 [3]	n/a	ND	ND	ND	0.0068	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-20E	05/13/03	32.02	8.11	3.3 [3]	n/a	51	ND	ND	0.91	2.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-40E	05/20/03	29.04	11.58	14 [3]	n/a	1,100	ND	ND	22	98	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-40E (DEEP)	05/23/03	26.80	13.82	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-60E	05/23/03	26.75	13.09	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-80E	05/19/03	28.70	11.40	4 [3]	n/a	95	0.77	ND	2.3	7.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-80E Wall (S)	05/19/03	29.70	10.40	47 [3]	n/a	77	**0.81**	ND	1.7	7.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-80E(Deep)	05/27/03	28.01	12.09	2.8 [3]	n/a	1.0	ND	ND	0.017	0.0079	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-100E	05/13/03	28.41	12.00	69 [3]	n/a	500	ND	ND	8.8	28	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
80S-120E	05/15/03	32.42	8.20	1.4 [3]	n/a	90	**1.6**	ND	3.3	2.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Sample ID	Date Sampled	Elevation MSL ft.	Depth BGS ft.	TPHd (diesel) mg/Kg	Mineral Spirits mg/Kg	TPHg (gasoline) mg/Kg	Benzene mg/Kg	Toluene mg/Kg	Ethyl-benzene mg/Kg	Total Xylenes mg/Kg	TBA mg/Kg	MTBE mg/Kg	TAME mg/Kg	DIPE mg/Kg	ETBE mg/Kg	1,2-DCA mg/Kg	EDB mg/Kg	Etha-nol mg/Kg	PNA (Naphthalene) mg/Kg
80S-120E Wall (S)	05/15/03	33.42	7.20	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100S-0E	05/05/03	31.08	7.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a
100S-0E Wall (W)	05/05/03	32.08	6.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	n/a
100S-20E	05/16/03	30.24	8.91	71 [3]	n/a	1,000	ND	ND	27	70	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100S-20E (A)	05/19/03	26.91	12.24	9.6 [3]	1.8 [4]	ND	ND	ND	0.035	0.0074	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100S-40E	05/21/03	26.45	12.80	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100S-60E	05/22/03	29.06	9.33	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100S-60E Wall (S)	05/23/03	30.03	8.33	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100S-80E	05/22/03	29.06	10.78	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100S-80E Wall (S)	05/22/03	30.06	9.78	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
100S-100E	05/13/03	32.65	8.65	ND	n/a	ND	0.087	ND	0.091	0.052	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
115S-60E	05/22/03	29.06	10.38	1.6 [3]	n/a	2.2	ND	ND	0.023	0.034	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
115S-60E Wall (S)	05/22/03	30.06	9.38	4.3 [3]	n/a	180	ND	ND	2.3	3.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
120S-0E	05/05/03	29.69	8.80	5.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	ND
120S-0E Wall (W)	05/05/03	30.69	7.80	ND	ND	1.4	ND	ND	0.0083	ND	ND	0.0053	ND	ND	ND	ND	ND	n/a	n/a
120S-0E Wall (S)	05/05/03	30.69	7.80	ND	n/a	ND	ND	ND	0.014	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
120S-20E	05/15/03	29.23	9.72	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
120S-40E	05/16/03	29.33	9.73	6.8 [3]	n/a	130 [4]	ND	ND	3.2	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
120S-40E Wall (S)	05/16/03	30.33	8.73	ND	n/a	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
120S-40E Wall (S)	05/22/03	30.06	9.00	ND	n/a	ND	ND	ND	0.014	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

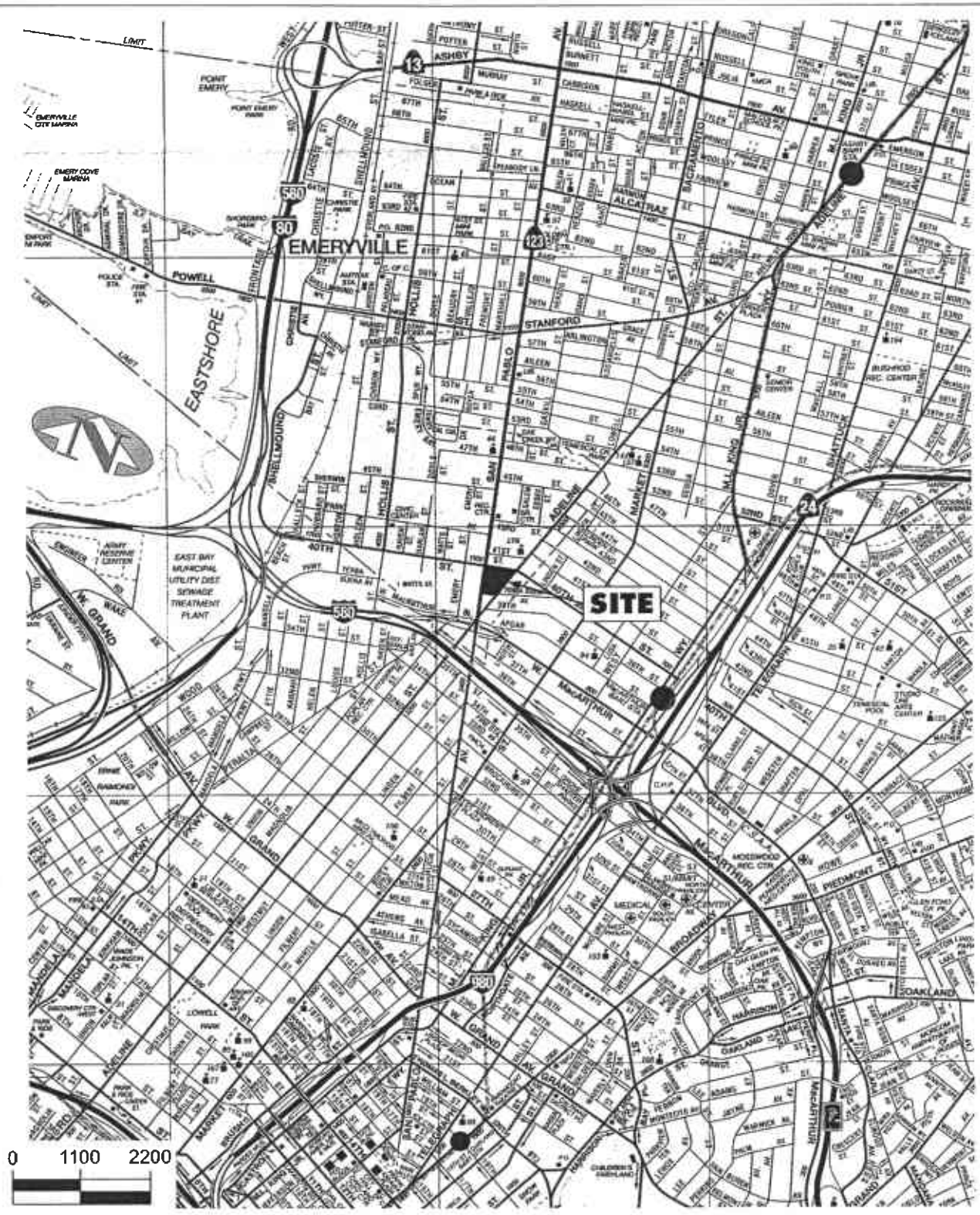
Notes:

(1) ND = Not Detected above the Method Detection Limit (MDL).
(2) n/a = Not analyzed
(3) The laboratory reports that the detected hydrocarbon does not match its Diesel Standard.
(4) The laboratory reports that the detected hydrocarbon does not match its Gasoline Standard.
(5) Concentrations in **bold** script exceed the San Francisco Bay Area RWQCB's limits for human health risk for indoor air impacts used to establish residential RBSLs for chemicals in fine-grained soils at sites where groundwater is not a source of drinking water (Interim Final Edition December 2001).
(6) Sample data in gray script are for samples recovered from locations where the excavation was later deeped or widened.
(7) Samples recovered from sampling location 30S-40E were taken from the bottom of a small pit dug beneath the local elevation of the floor of the remedial excavation.

TABLE I -12

TIER 2 HEALTH RISK ASSESSMENT RESULTS

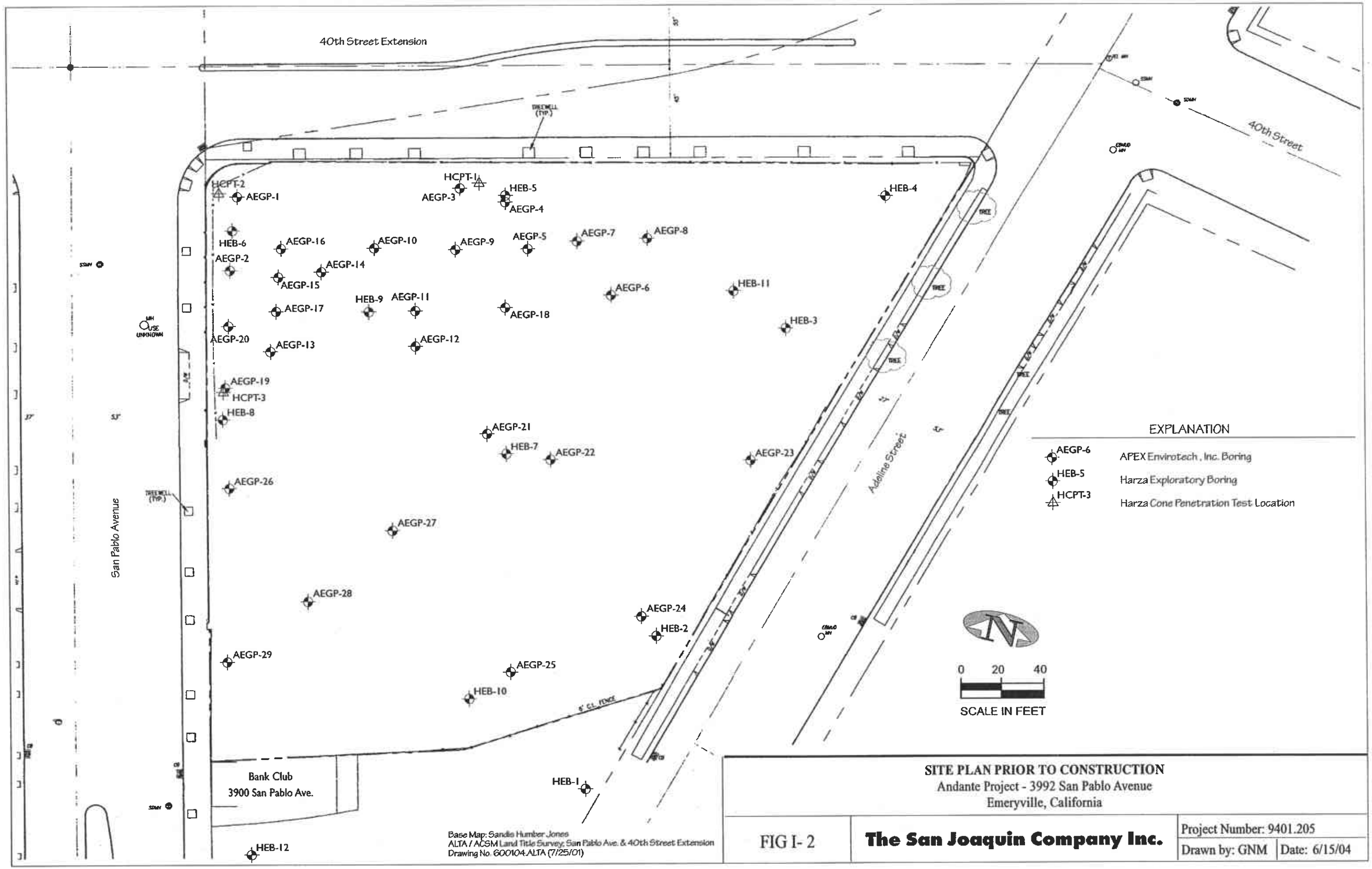
Building	Outdoor Exposure Environment Classification	Indoor Exposure Environment Classification	Cumulative Carcinogenic Risk			Toxic Hazard Index		
			Outdoor Air	Indoor Air		Outdoor Air	Indoor Air	
				Conservative Model	Limit Model for Extreme High GW		Conservative Model	Limit Model for Extreme High GW
1	Residential	Commercial	4.0×10^{-9}	7.4×10^{-8}	8.9×10^{-8}	1.9×10^{-4}	4.3×10^{-3}	5.2×10^{-3}
2A	Residential	Commercial	4.0×10^{-9}	8.8×10^{-8}	1.0×10^{-7}	1.9×10^{-4}	5.1×10^{-3}	5.9×10^{-3}
3A	Residential	Residential	3.9×10^{-9}	4.3×10^{-7}	4.5×10^{-7}	1.9×10^{-4}	2.1×10^{-2}	2.2×10^{-2}
6	Residential	Commercial	4.0×10^{-9}	1.1×10^{-7}	1.5×10^{-7}	2.0×10^{-4}	6.5×10^{-3}	8.8×10^{-3}



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

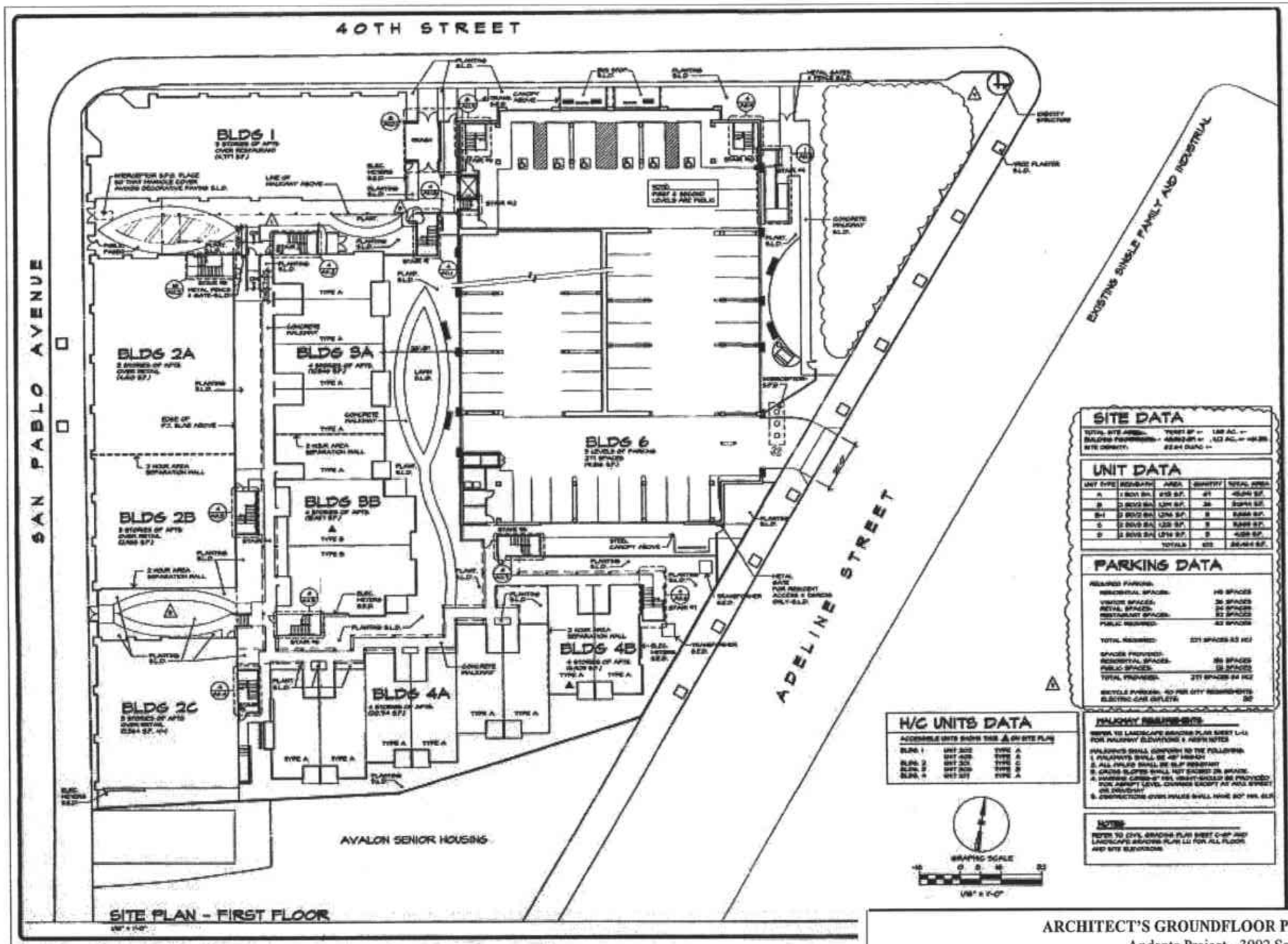
SITE LOCATION
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-1	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 6/15/04



SITE PLAN PRIOR TO CONSTRUCTION
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I- 2	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 6/15/04



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)

SITE DATA

UNIT DATA

UNIT TYPE	BEDRM/BATH	AREA	QUANTITY	TOTAL AREA
A	1 BDR/1 BA	610 S.F.	41	25,010 S.F.
B	2 BDR/2 BA	1,241 S.F.	36	44,676 S.F.
B-1	2 BDR/2 BA	1,274 S.F.	5	6,370 S.F.
C	2 BDR/2 BA	1,325 S.F.	5	6,625 S.F.
D	2 BDR/2 BA	1,214 S.F.	5	6,070 S.F.
		TOTALS	102	88,751 S.F.

PARKING DATA

H/C UNITS DATA

GRAPHIC SCALE

1/16" = 1'-0"

ARCHITECT'S GROUNDFLOOR PLAN OF DEVELOPMENT
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-3	**The San Joaquin Company Inc.**	Project Number: 9401.205	
		Drawn by: GNM	Date: 6/15/04

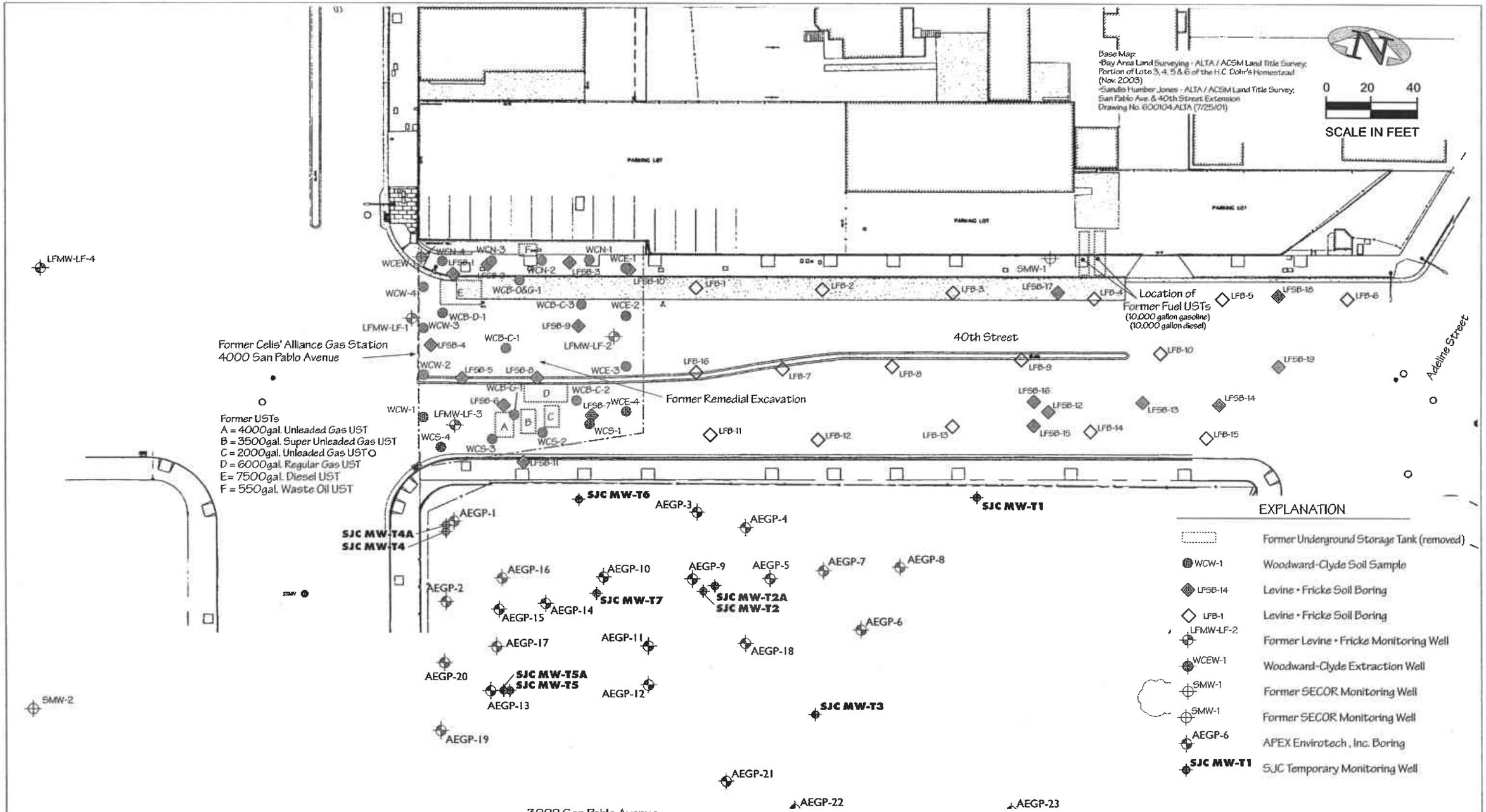
HDO architects · planners

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

SITE PLAN
FIRST FLOOR

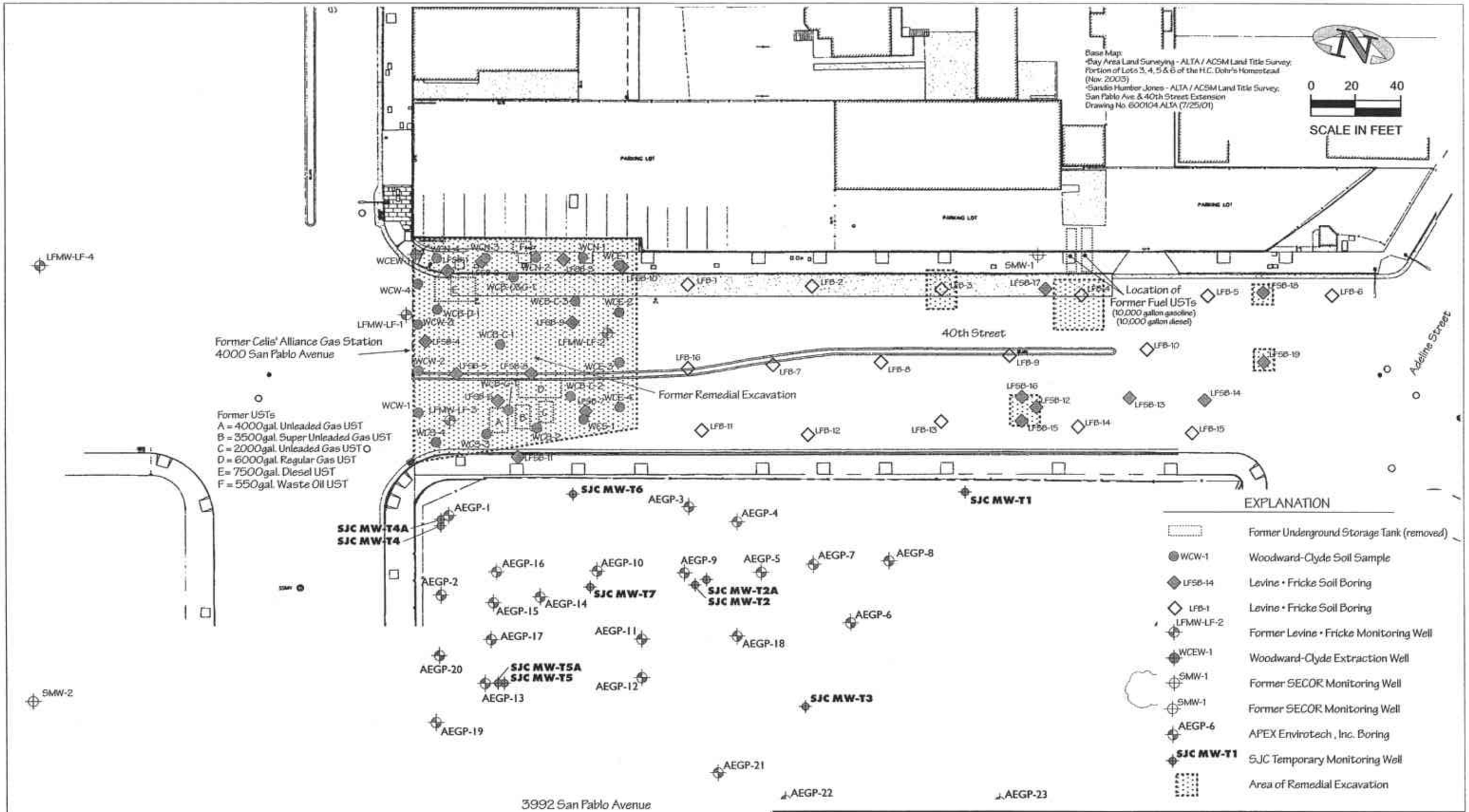
1/16" = 1'-0"

A2.1



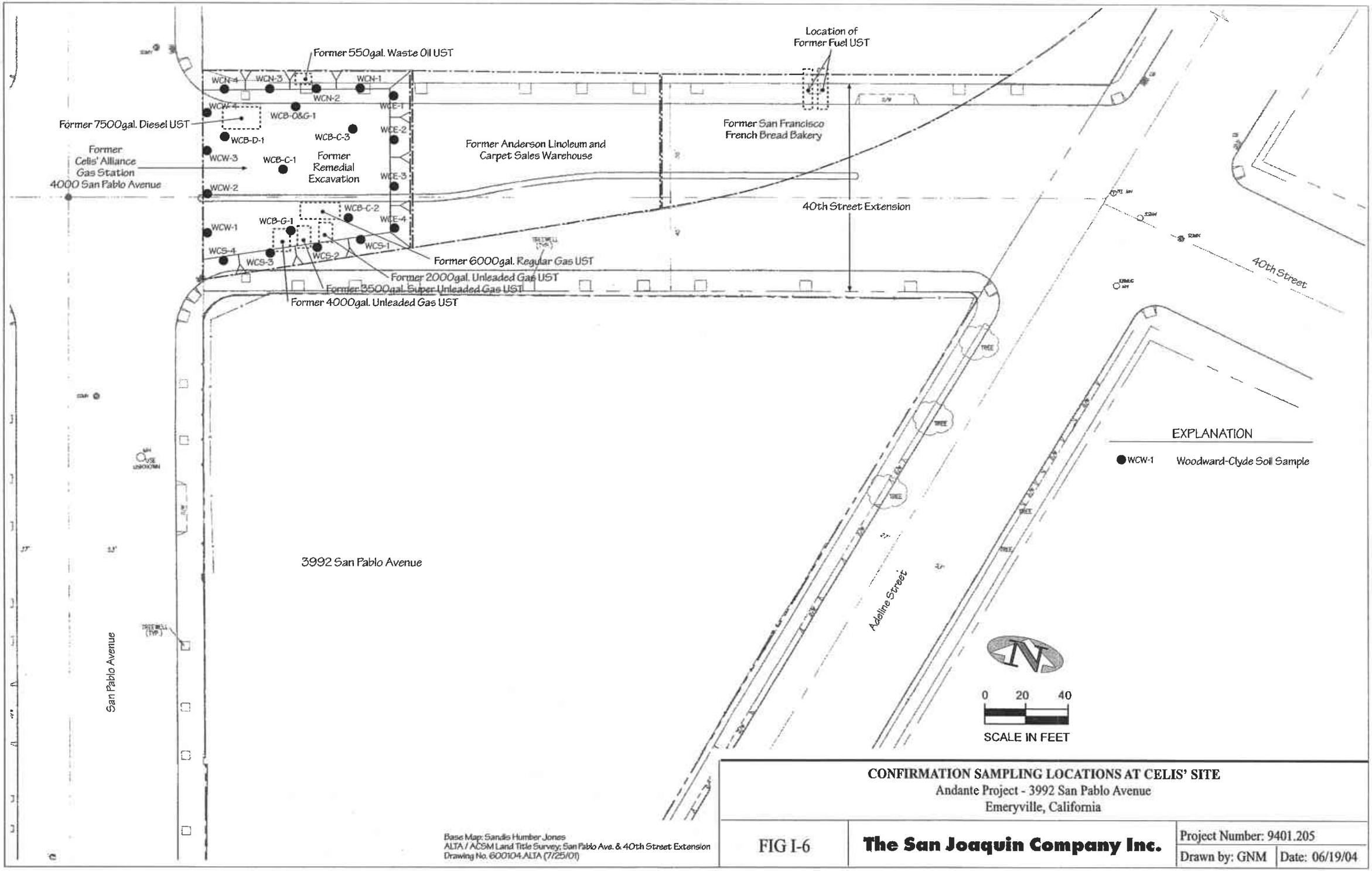
LOCATIONS OF EXPLORATORY TRENCHES, BORINGS & MONITORING WELLS IN 40th STREET
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-4	**The San Joaquin Company Inc.**	Project Number: 9401.205	
		Drawn by: GNM	Date: 06/12/04



REMEDIAL EXCAVATIONS IN 40th STREET
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-5	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 06/19/04



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

CONFIRMATION SAMPLING LOCATIONS AT CELIS' SITE
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-6	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 06/19/04

R0171

Former Celis' Alliance Gas Station
4000 San Pablo Avenue

Former USTs
A = 4000gal. Unleaded Gas UST
B = 3500gal. Super Unleaded Gas UST
C = 2000gal. Unleaded Gas UST
D = 6000gal. Regular Gas UST
E = 7500gal. Diesel UST
F = 550gal. Waste Oil UST

Former San Francisco French Bread Bakery

Location of Former Fuel UST

Former Anderson Linoleum and Carpet Sales Warehouse

Former Remedial Excavation

40th Street Extension

40th Street

Adeline Street

San Pablo Avenue

3992 San Pablo Avenue

8in. dia. Cast Iron Sewer Pipe Plugged at San Pablo Ave. Property Boundary

Former Location of Tank 3: 1500gal. UG Heating Oil Tank

Former Location of Tank 1: 1500gal. UG Heating Oil Tank
Former Location of Tank 2: 100gal. UG Gasoline Tank

Former Location of 1.5" Steel Pipe From Heating Oil Tank

Initial Area to be Remediated

WCW-4 WCW-3 WCW-2 WCW-1 WCEW-1 WCN-4 WCN-3 WCN-2 WCN-1 WCE-1 WCE-2 WCE-3 WCE-4 WCS-4 WCS-3 WCS-2 WCS-1 WCB-C-3 WCB-D-1 WCB-C-1 WCB-C-2 WCB-G-1 WCB-0&G-1

LFMW-LF-1 LFMW-LF-2 LFMW-LF-3

LFSB-1 LFSB-2 LFSB-3 LFSB-4 LFSB-5 LFSB-6 LFSB-7 LFSB-8 LFSB-9 LFSB-10 LFSB-11

LFB-1 LFB-2 LFB-3 LFB-4 LFB-5 LFB-6 LFB-7 LFB-8 LFB-9 LFB-10 LFB-11 LFB-12 LFB-13 LFB-14 LFB-15 LFB-16

LFSB-12 LFSB-13 LFSB-14 LFSB-15 LFSB-16 LFSB-18 LFSB-19

SMW-1

SJC MW-T1 SJC MW-T2 SJC MW-T2A SJC MW-T3 SJC MW-T4 SJC MW-T4A SJC MW-T5 SJC MW-T5A SJC MW-T6 SJC MW-T7

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

ET1-S-6 ET2-S-7 ET2-C-W ET2-N-6.5 ET2-E-B

EXPLANATION

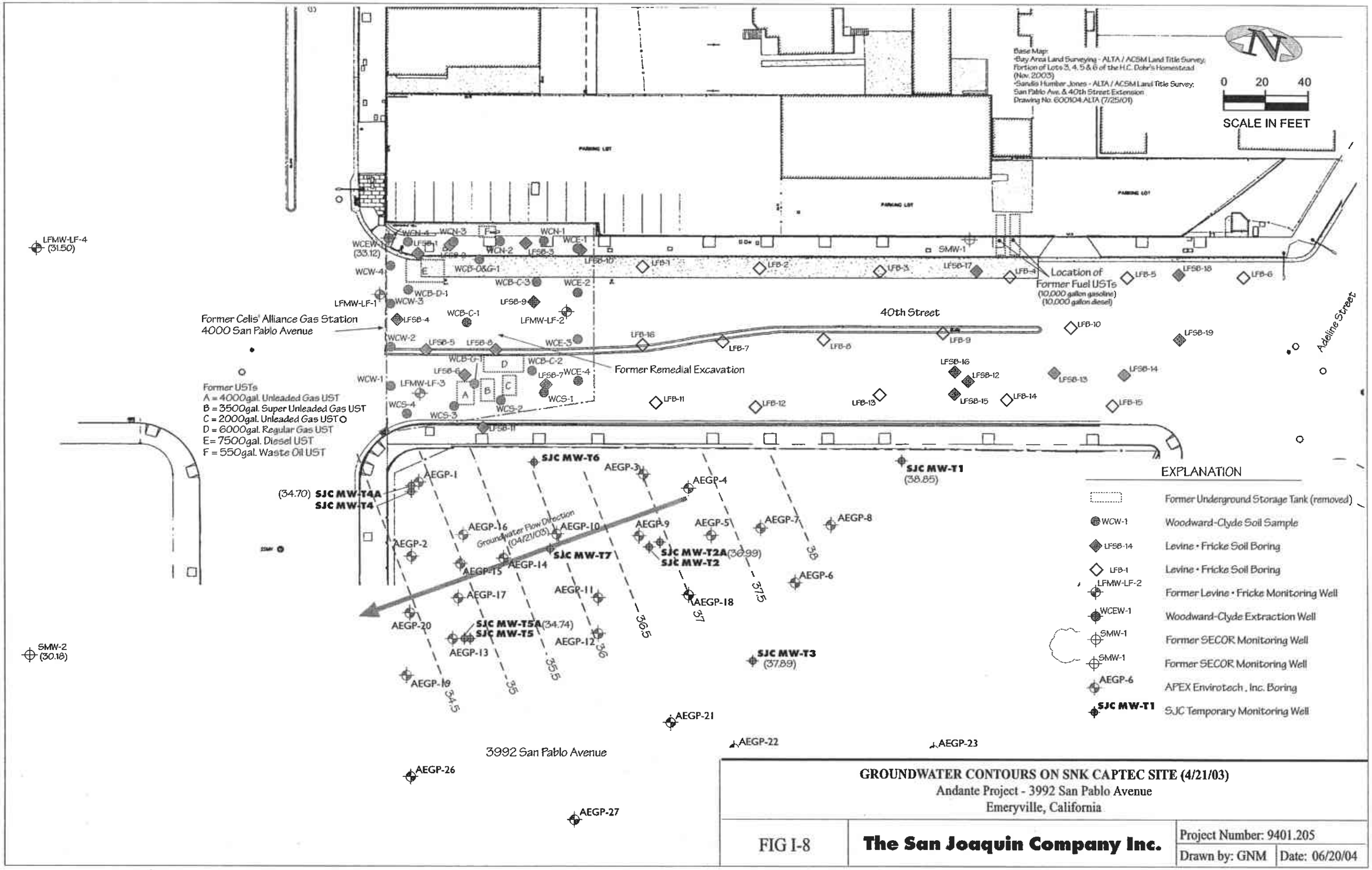
- WCW-1 Woodward-Clyde Soil Sample
- LFSB-14 Levine • Fricke Soil Boring
- Exploratory Trench
- ET2-N-6.5 Trench Soil Sample Location
- AEGP-6 APEX Envirotech, Inc. Boring
- LFMW-LF-2 Former Levine • Fricke Monitoring Well
- WCEW-1 Woodward-Clyde Extraction Well
- SMW-1 Former SECOR Monitoring Well
- SJC MW-T1 SJC Temporary Monitoring Well
- Former Underground Storage Tank (removed)
- Initial Area of Remediation

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)

INITIAL ESTIMATE OF AREA TO BE REMEDIATED
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-7	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM Date: 06/19/04



GROUNDWATER CONTOURS ON SNK CAPTEC SITE (4/21/03)
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-8	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 06/20/04

Former USTs
A = 4000gal. Unleaded Gas UST
B = 3500gal. Super Unleaded Gas UST
C = 2000gal. Unleaded Gas UST
D = 6000gal. Regular Gas UST
E = 7500gal. Diesel UST
F = 550gal. Waste Oil UST

Base Map:
-Bay Area Land Surveying - ALTA / ACSM Land Title Survey:
Portion of Lots 3, 4, 5 & 6 of the H.C. Dohr's Homestead
(Nov. 2003)
-Sandis Humber Jones - ALTA / ACSM Land Title Survey:
San Pablo Ave. & 40th Street Extension
Drawing No. 600104.ALTA (7/25/01)

0 20 40
SCALE IN FEET

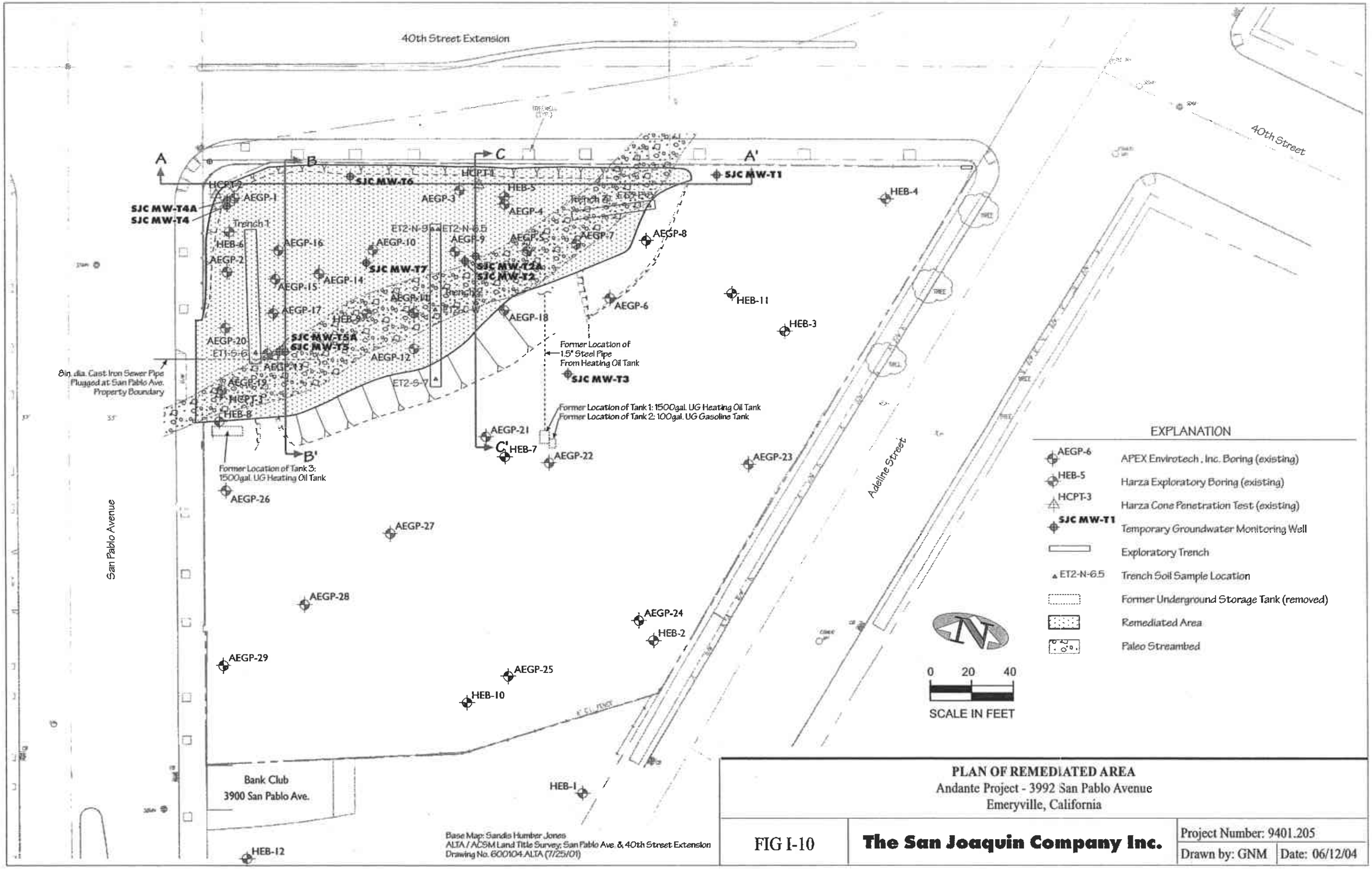
LFMW-LF-4 (31.50)
WCEW-1 (33.12)
Groundwater Flow Direction (03/13/98)
Former Celis' Alliance Gas Station
4000 San Pablo Avenue
Former Remedial Excavation
Location of Former Fuel USTs
(10,000 gallon gasoline)
(10,000 gallon diesel)
40th Street
Adeline Street
3992 San Pablo Avenue
Groundwater Flow Direction (04/21/03)
SMW-2 (30.18)
(34.70) SJC MW-T4A
SJC MW-T4
SJC MW-T6
SJC MW-T1 (38.85)
SJC MW-T7
SJC MW-T2A (36.99)
SJC MW-T2
SJC MW-T5A (34.74)
SJC MW-T5
SJC MW-T3 (37.89)

EXPLANATION

- Former Underground Storage Tank (removed)
- WCW-1 Woodward-Clyde Soil Sample
- LFSB-14 Levine • Fricke Soil Boring
- LFB-1 Levine • Fricke Soil Boring
- LFMW-LF-2 Former Levine • Fricke Monitoring Well
- WCEW-1 Woodward-Clyde Extraction Well
- SMW-1 Former SECOR Monitoring Well
- SMW-1 Former SECOR Monitoring Well
- AEGP-6 APEX Envirotech , Inc. Boring
- SJC MW-T1 SJC Temporary Monitoring Well

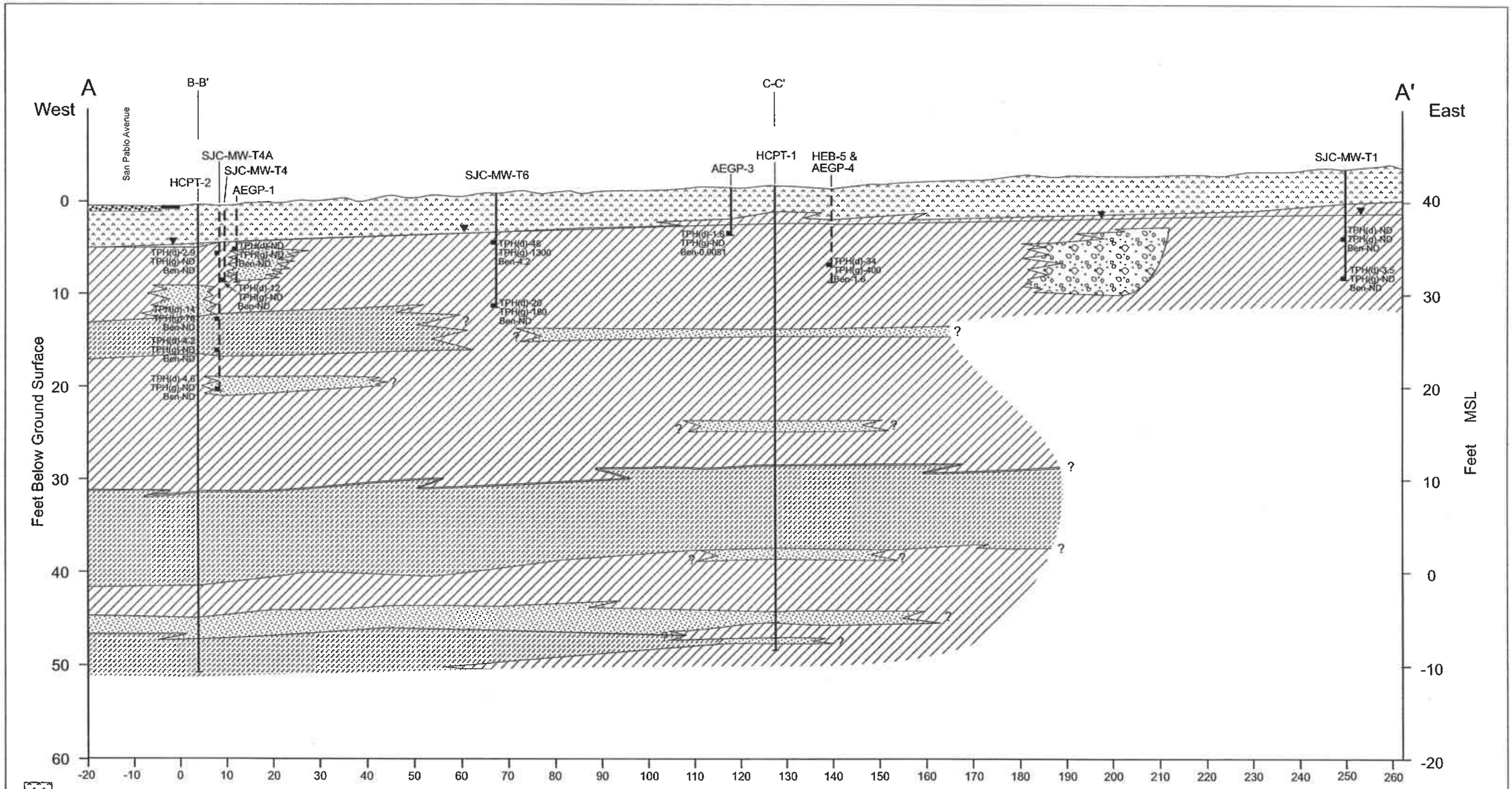
GROUNDWATER CONTOURS ON SOUTH SIDE (4/21/03) & NORTH SIDE (3/13/98) OF 40TH STREET
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-9	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM Date: 06/22/04



PLAN OF REMEDIATED AREA
Andante Project - 3992 San Pablo Avenue
Emeryville, California

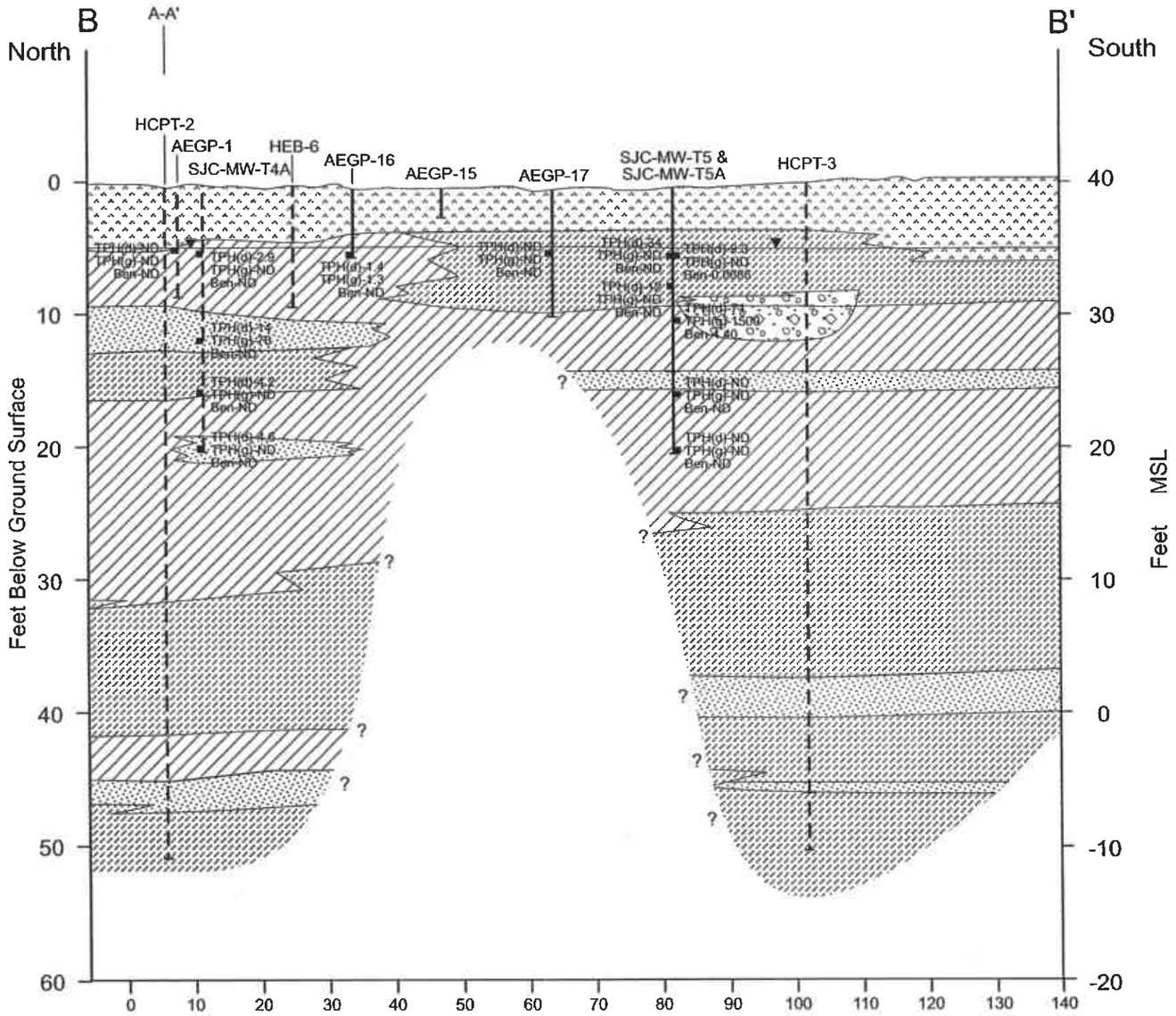
FIG I-10	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM Date: 06/12/04



HYDROSTRATIGRAPHIC CROSS SECTION A-A' PRIOR TO EXCAVATION

Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-11	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM Date: 06/22/04



FILL - mixture of loose Silty Sand and Gravel, with soft Silty Clay and Clay

Sandy Silt and Clayey Silt, with some Silty Clay

Sands, Silty Sands, Silts and some Gravel, with some Clayey Silt

Clay and Silty Clay

Sand and Gravel stream bed deposits

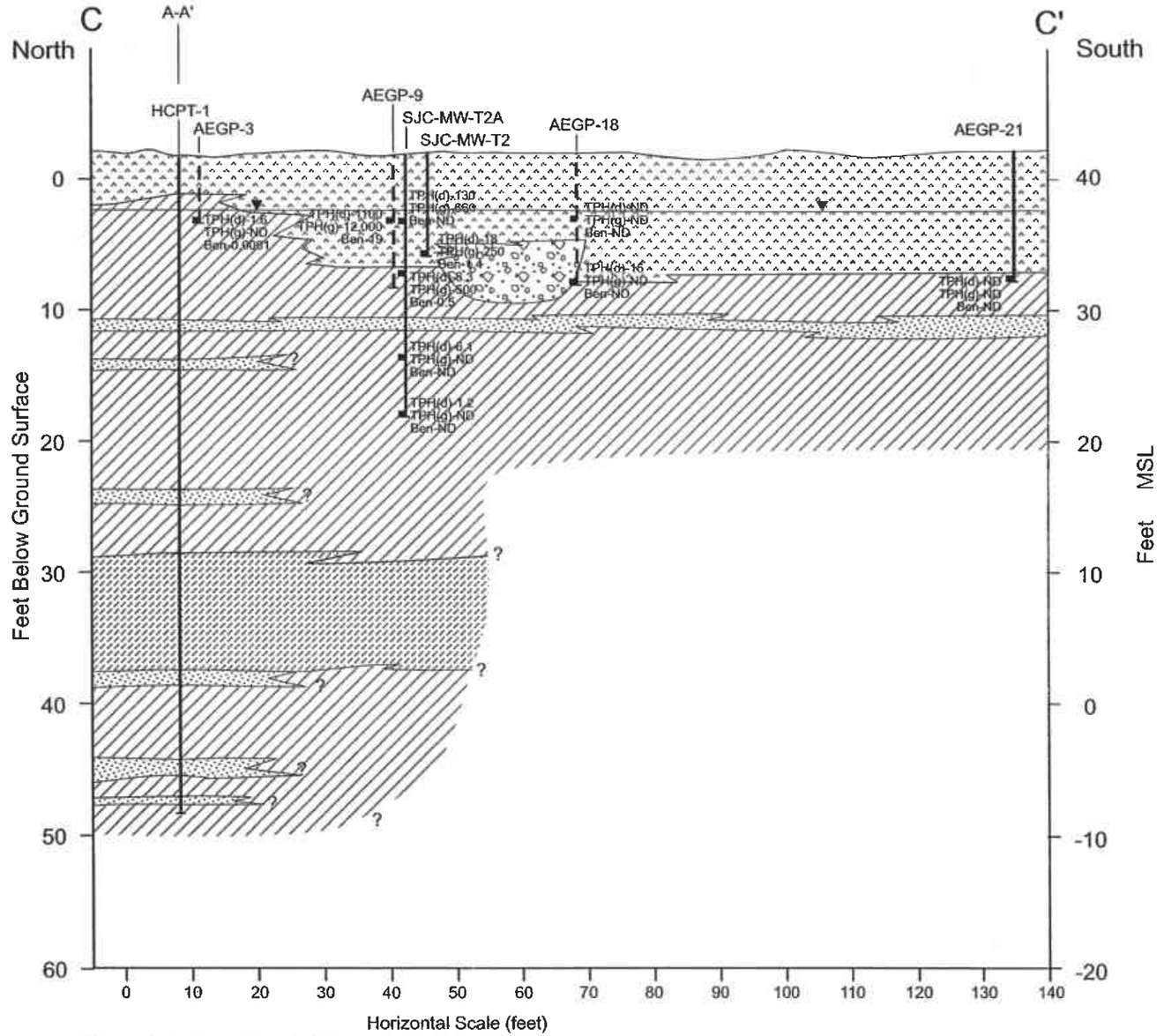
AEGP-1	APEX Envirotech, Inc Boring (existing)
HCPT-3	Harza Cone Penetration Test (existing)
HEB-6	Harza Exploratory Boring (existing)
SJC-MW-T5	San Joaquin Co. Inc Temporary Groundwater Monitoring Well
▼	Water Table (4/21/03)
TPH(d)-150 TPH(g)-150 Ben-ND	Soil Sample Analysis Results (mg/kg)

HYDROSTRATIGRAPHIC CROSS SECTION B-B' PRIOR TO EXCAVATION

Andante Project - 3992 San Pablo Avenue

Emeryville, California

FIG I-12	**The San Joaquin Company Inc.**	Project Number: 9401.205	
		Drawn by: GNM	Date: 06/22/04



FILL - mixture of loose Silty Sand and Gravel, with soft Silty Clay and Clay

Sandy Silt and Clayey Silt, with some Silty Clay

Sands, Silty Sands, Silts and some Gravel, with some Clayey Silt

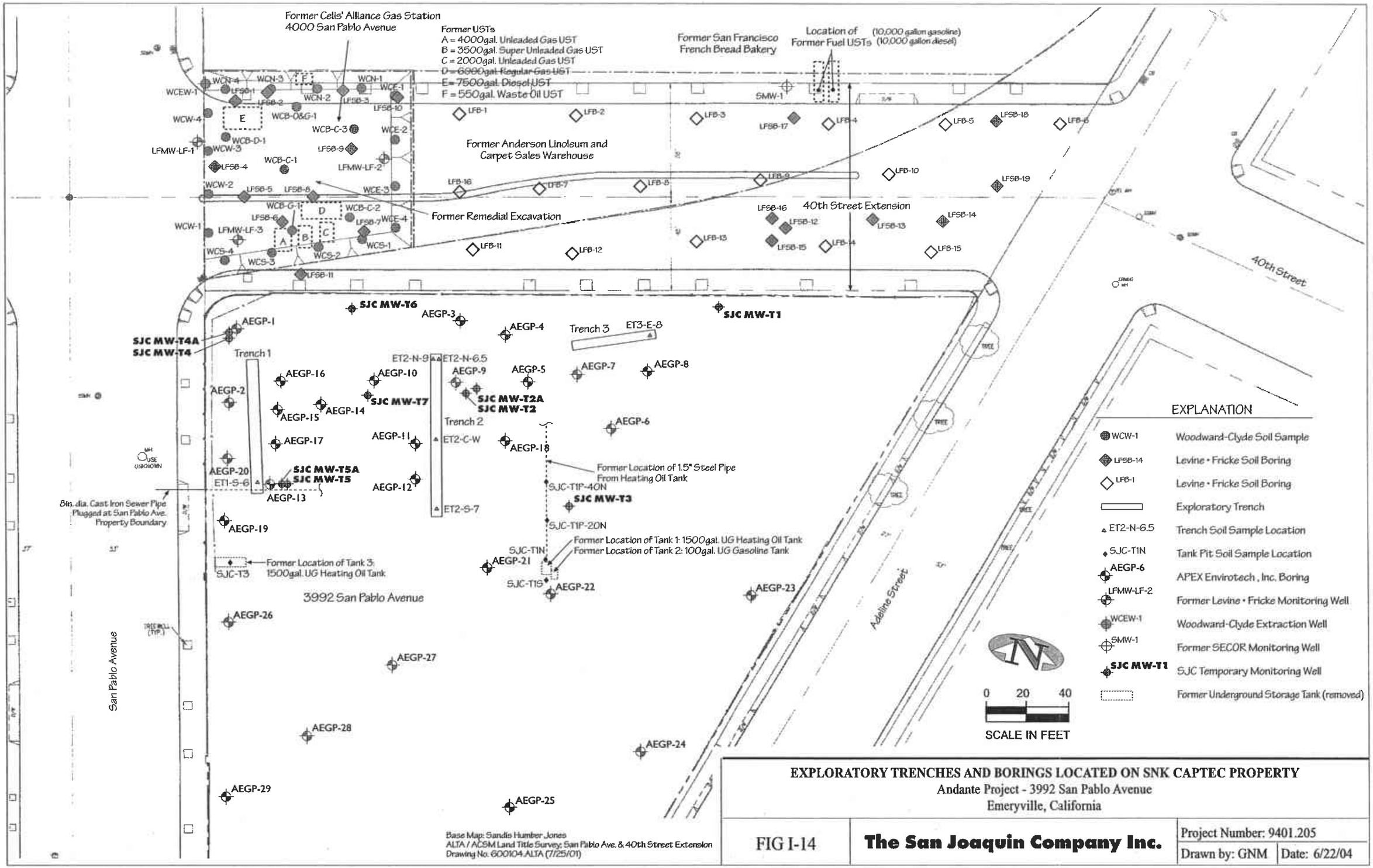
Clay and Silty Clay

Sand and Gravel stream bed deposits

AEGP-3	APEX Envirotech, Inc Boring (existing)
HCPT-1	Harza Cone Penetration Test (existing)
SJC-MW-T2	San Joaquin Co. Inc Temporary Groundwater Monitoring Well
▼	Water Table (4/21/03)
TPH(d)-150 TPH(g)-150 Ben-ND	Soil Sample Analysis Results (mg/kg)

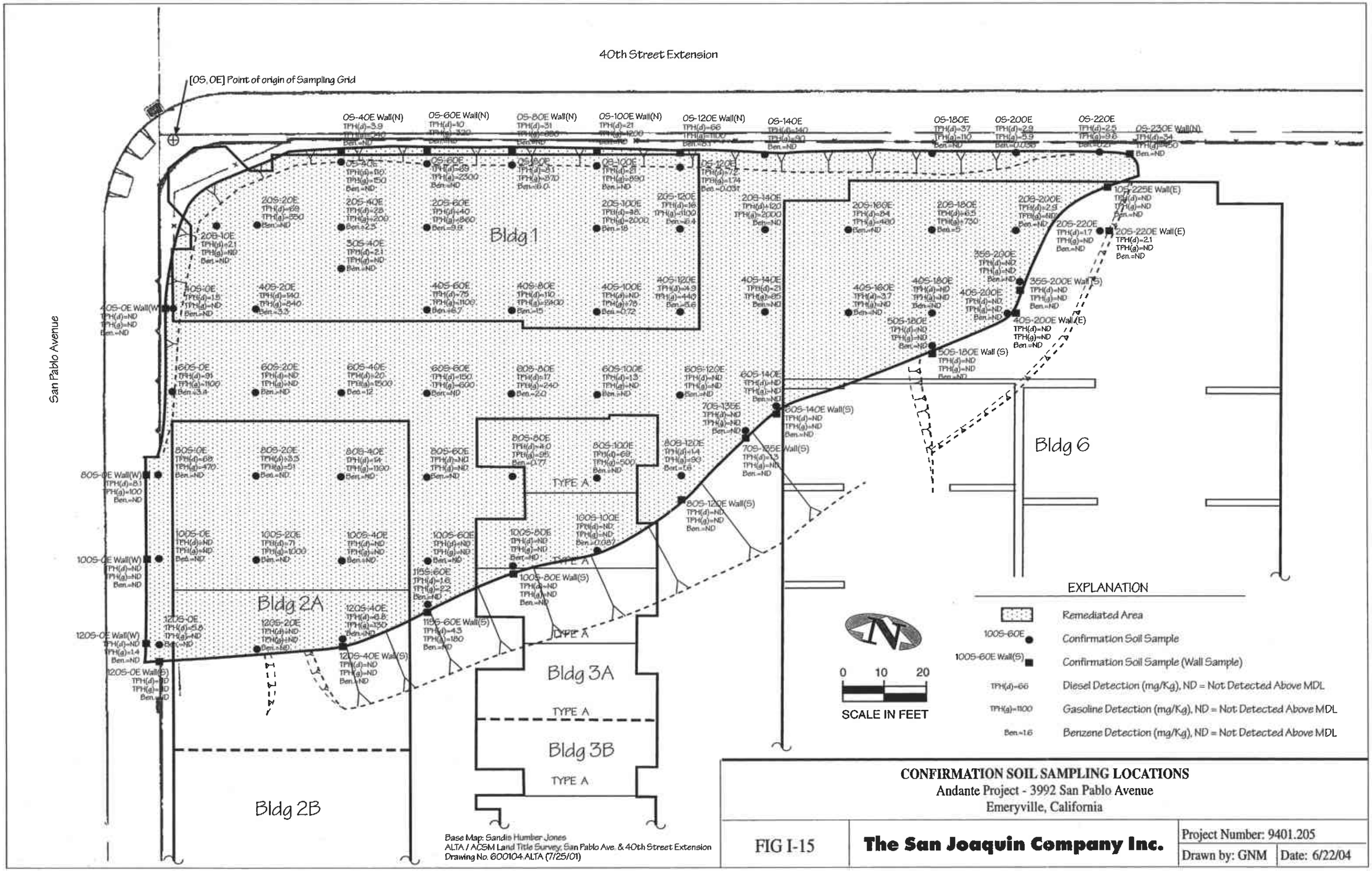
HYDROSTRATIGRAPHIC CROSS SECTION C-C' PRIOR TO EXCAVATION
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-13	**The San Joaquin Company Inc.**	Project Number: 9401.205 Drawn by: GNM | Date: 06/22/04



EXPLORATORY TRENCHES AND BORINGS LOCATED ON SNK CAPTEC PROPERTY
Andante Project - 3992 San Pablo Avenue
Emeryville, California

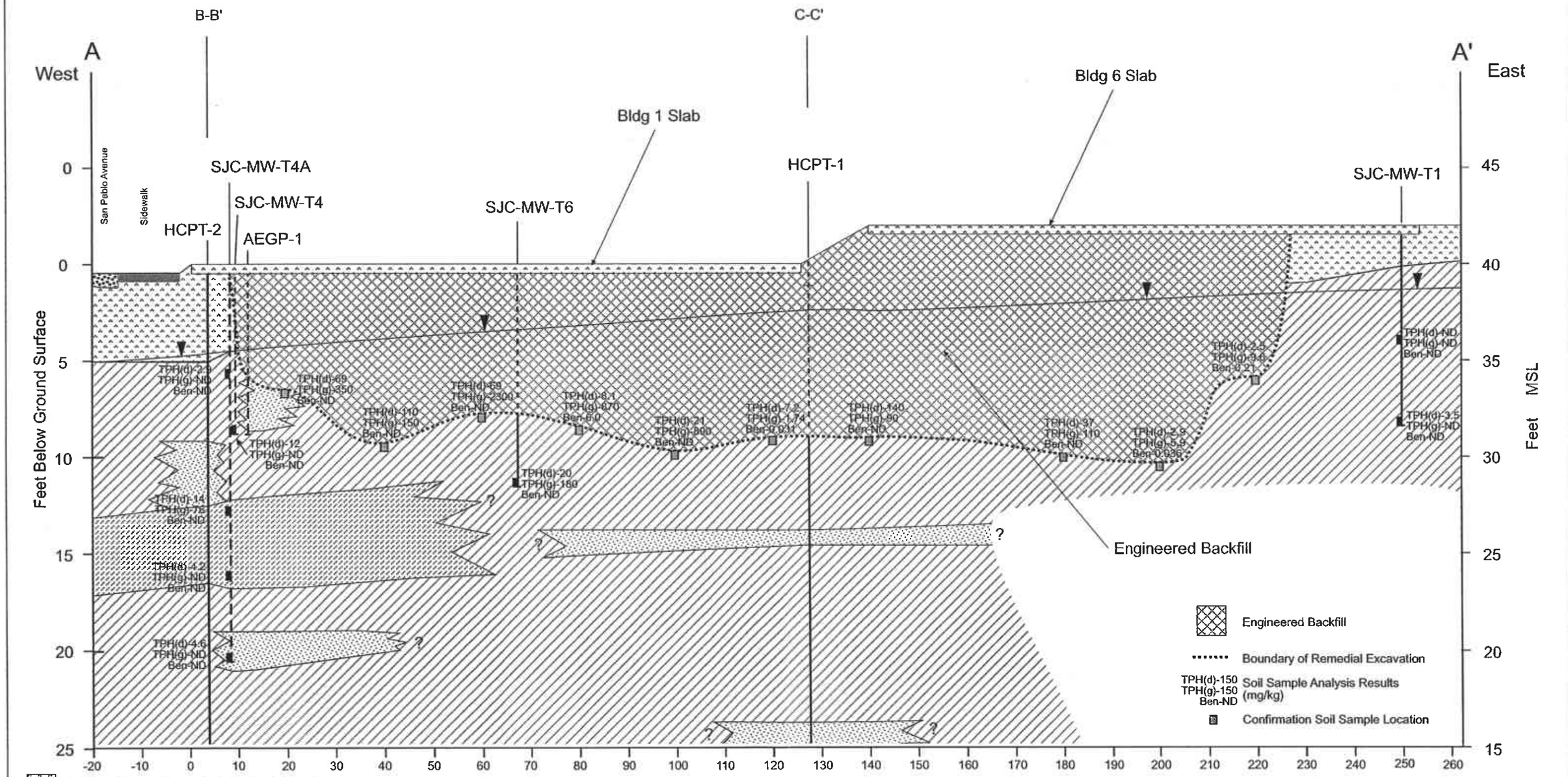
FIG I-14	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 6/22/04



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

CONFIRMATION SOIL SAMPLING LOCATIONS
Andante Project - 3992 San Pablo Avenue
Emeryville, California

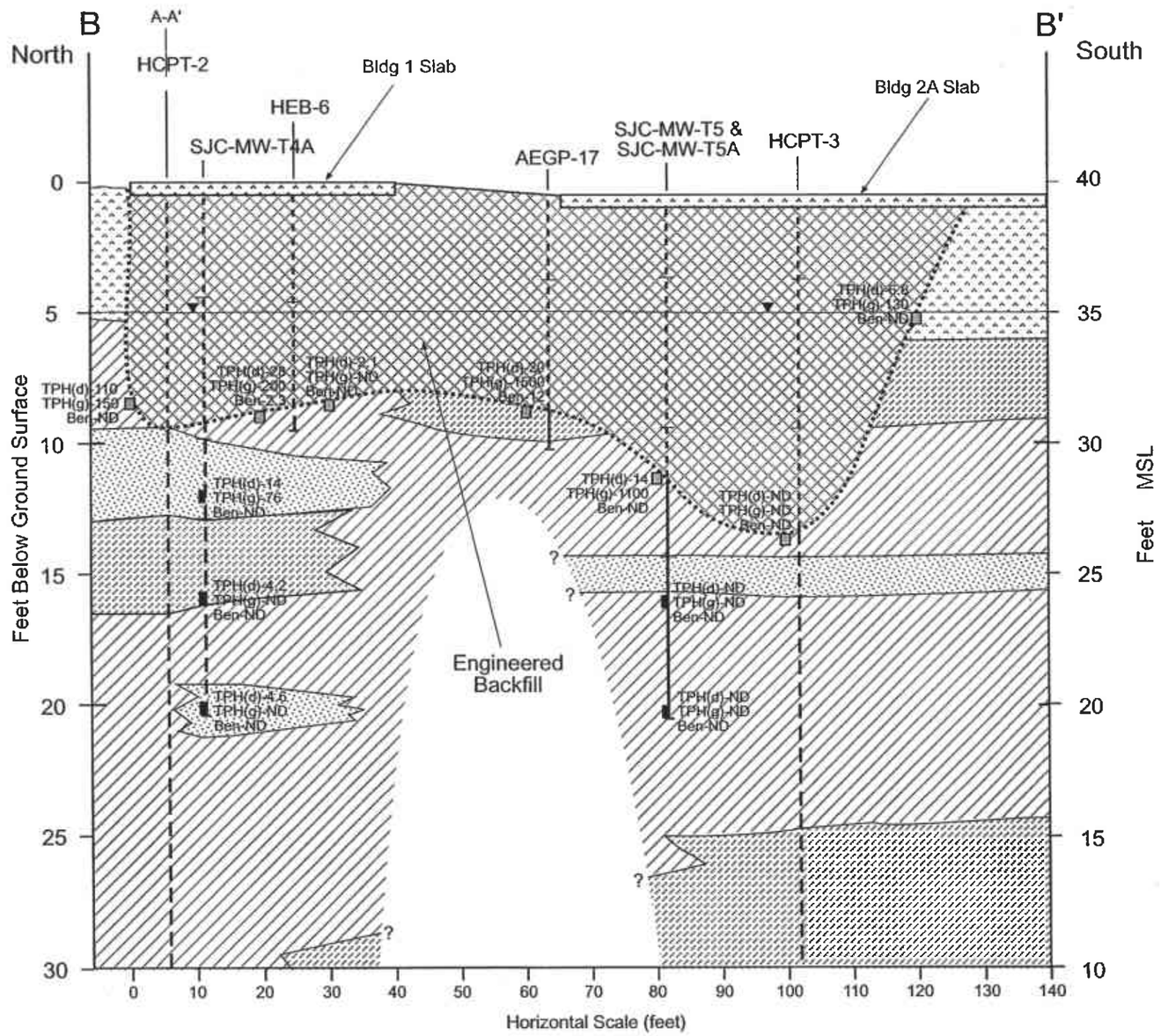
FIG I-15	**The San Joaquin Company Inc.**	Project Number: 9401.205	
		Drawn by: GNM	Date: 6/22/04



HYDROSTRATIGRAPHIC CROSS SECTION A-A' THROUGH BACKFILLED REMEDIAL EXCAVATION

Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-16	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM Date: 6/23/04



Engineered Backfill

Boundary of Remedial Excavation

TPH(d)-150 / TPH(g)-150 / Ben-ND — Soil Sample Analysis Results (mg/kg)

Confirmation Soil Sample Location

FILL - mixture of loose Silty Sand and Gravel, with soft Silty Clay and Clay

Sandy Silt and Clayey Silt, with some Silty Clay

Sands, Silty Sands, Silts and some Gravel, with some Clayey Silt

Clay and Silty Clay

Sand and Gravel stream bed deposits

AEGP-1 APEX Envirotech, Inc Boring (existing)

HCPT-3 Harza Cone Penetration Test (existing)

HEB-6 Harza Exploratory Boring (existing)

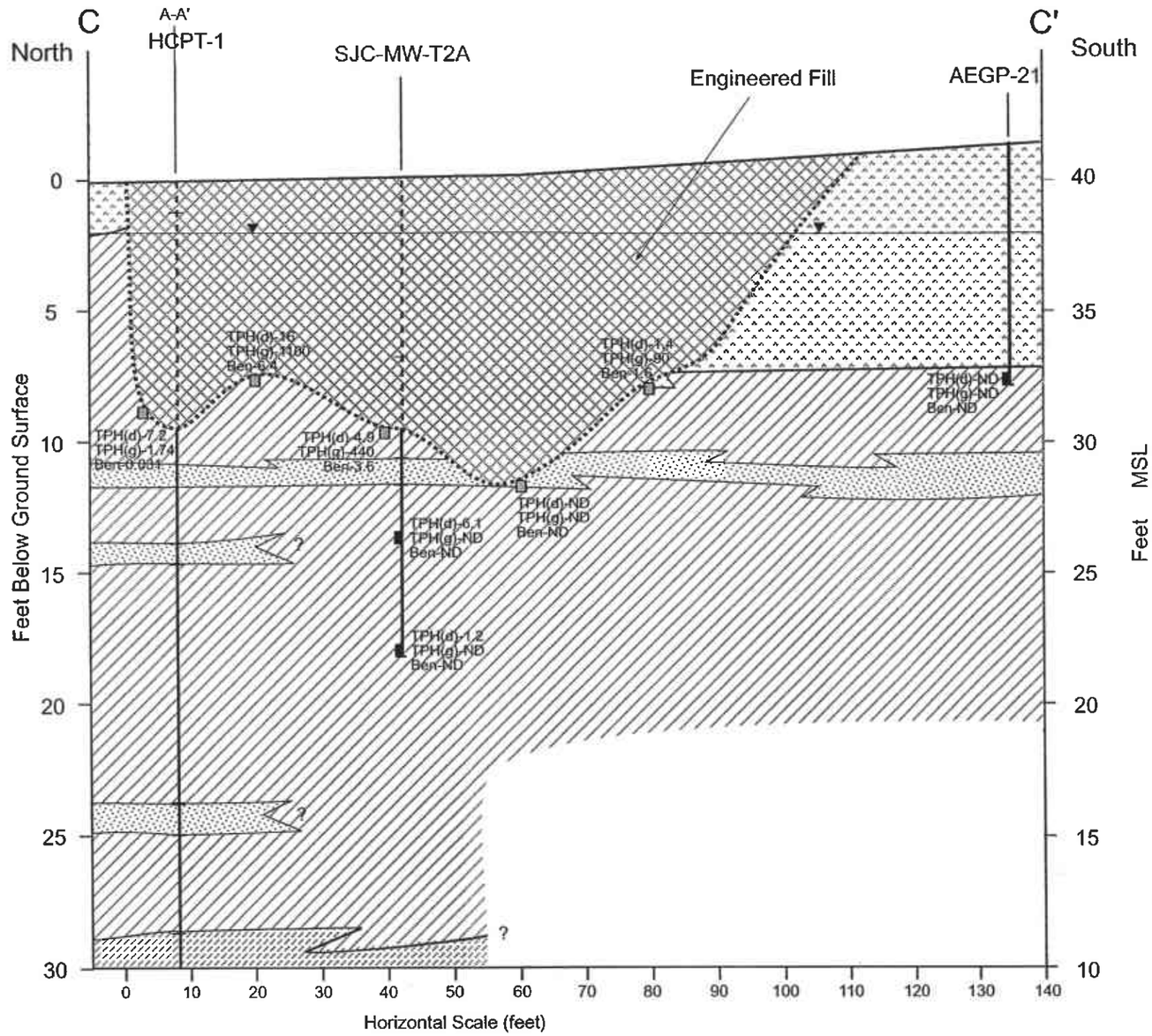
SJC-MW-T5 San Joaquin Co. Inc Temporary Groundwater Monitoring Well

Water Table (4/21/03)

HYDROSTRATIGRAPHIC CROSS SECTION B-B' THROUGH BACKFILLED REMEDIAL EXCAVATION

Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-17	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 6/23/04



Engineered Backfill

Boundary of Remedial Excavation

TPH(d)-150 TPH(g)-150 Ben-ND — Soil Sample Analysis Results (mg/kg)

Confirmation Soil Sample Location

FILL - mixture of loose Silty Sand and Gravel, with soft Silty Clay and Clay

Sandy Silt and Clayey Silt, with some Silty Clay

Sands, Silty Sands, Silts and some Gravel, with some Clayey Silt

Clay and Silty Clay

Sand and Gravel stream bed deposits

AEGP-3 APEX Envirotech, Inc Boring (existing)

HCPT-1 Harza Cone Penetration Test (existing)

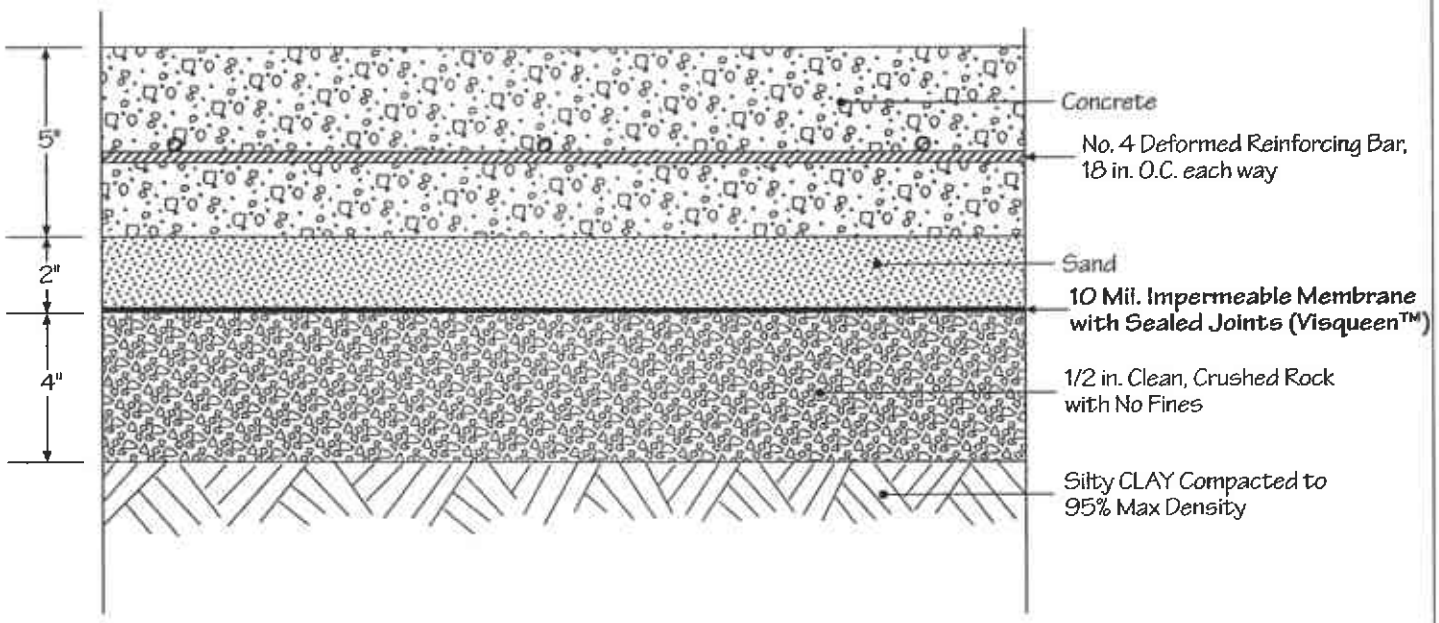
SJC-MW-T2 San Joaquin Co. Inc Temporary Groundwater Monitoring Well

Water Table (4/21/03)

HYDROSTRATIGRAPHIC CROSS SECTION C-C' THROUGH BACK-FILLED REMEDIAL EXCAVATION

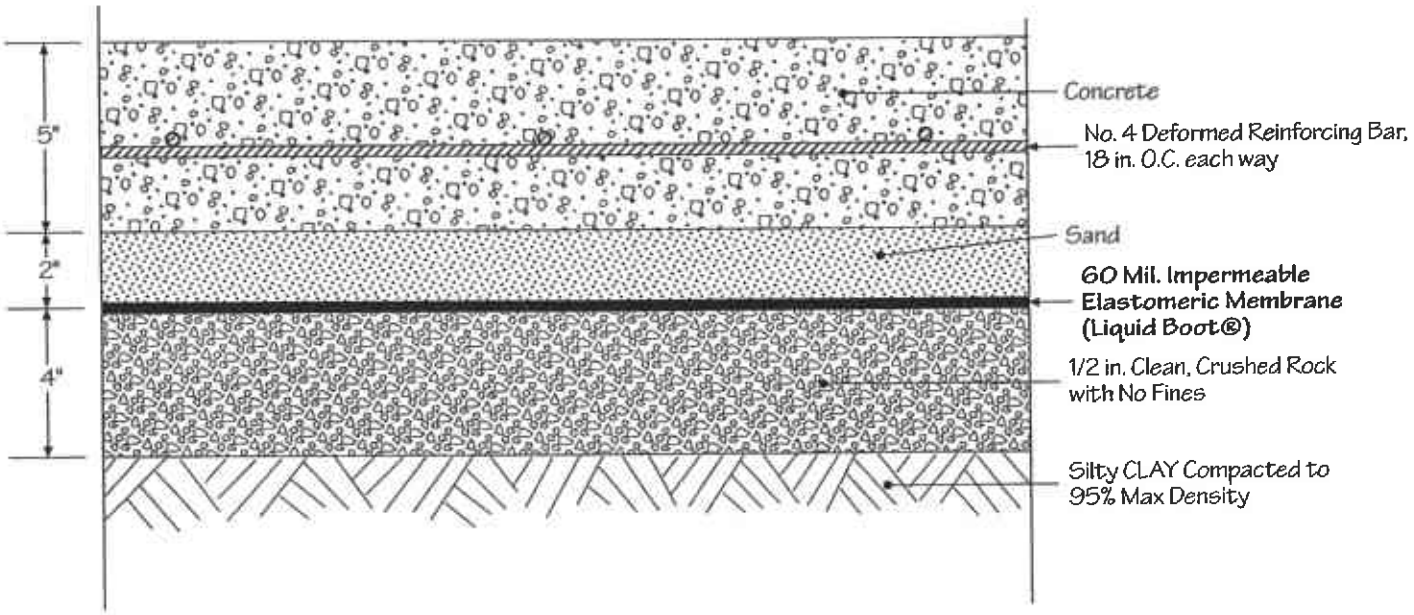
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-18	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 6/23/04



FLOOR SLAB WITH VISQUEEN™ MEMBRANE
Andante Project - 3992 San Pablo Avenue
Emeryville, California

FIG I-19	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 6/23/04



FLOOR SLAB WITH LIQUID BOOT® MEMBRANE

Andante Project - 3992 San Pablo Avenue

Emeryville, California

FIG I-20	**The San Joaquin Company Inc.**	Project Number: 9401.205
		Drawn by: GNM | Date: 6/23/04

Plate 1: Example of Buried Mass Masonry Foundation Structures

Plate 2: Exposed Basement Retaining Wall Along San Pablo Avenue Frontage

Plate 3: Clearing Clean Surficial Soil from Remediated Area
Note: Clean soil stockpile is seen in background

Plate 4: Hydraulic Breaker Demolishing Buried Masonry and Concrete

Plate 5: First Stages of Removal of Affected Soil Along 40th Street Frontage

Notes: 1) Excavator is directly loading end-dump truck for off-site transport. 2) Bench in north wall of excavation seen on left is at bottom of initial excavation made to remove clean overburden. 3) Excavation will be deepened during later stages of remediation.

Plate 6: Northern Wall of Remedial Excavation

Note: Portion of remedial excavation below groundwater table is filled with rock backfill

Plate 7: Typical Excavation Cell
Notes: 1) Rock fill in foreground will be pushed into open cell and compacted by vibration. 2) Merged cells that have been completely backfilled to provide dry standing above water table are seen in mid-field.

Plate 8: Streambed Deposits Exposed in Western Wall of Remedial Excavation
Note: Streambed deposits are the darker material seen on the left.

Plate 9: Excavation to Remove Paleo Streambed Deposits
Note: Affected soil in island where personnel are standing was later removed.

Plate 10: View of Northern End of Paleo Streambed Excavation
Note: Clay plug is beyond rock backfill in front of pickup truck.

Plate 11: De-watering Paleo Streambed Excavation to Permit Placement of Clay Cap

Notes: 1) Red vacuum truck hose can be seen at left in use as a skimming device. 2) As can be seen from coloration of pit wall, a late stage of de-watering is shown. 3) Affected groundwater pumped into the vacuum truck was transported off-site to a permitted disposal facility.

Plate 12: Transition between Backfilled Paleo Stream Channel and Clay Plug
Note: Engineer is standing on clay in plug compacted by vibratory sheep's-foot compactor.

Plate 13: The Remedial Excavation Viewed from the East
Note: Gravel fill is located in areas where excavation extended below the water table.

Plate 14: The Remedial Excavation Viewed from the South
Note: Gravel fill is located in areas where excavation extended below the water table.

Plate 15: Sewer Pipe in West Wall of Remedial Excavation

Note: Pipe was later plugged and, after deepening, excavation around pipe was filled with compacted impermeable clay.

Plate 16: Tank No. 3 Shown After Concrete Casing Was Removed
Note: Obsolescent design of tank and riveted plate construction.

Plate 17: Western Portion of Remediation Backfilled to Grade
Note: Soil for backfilling is seen stockpiled in right of photograph.

Plate 18: Geotextile Fabric Laid Down to Receive Liquid Boot® Membrane

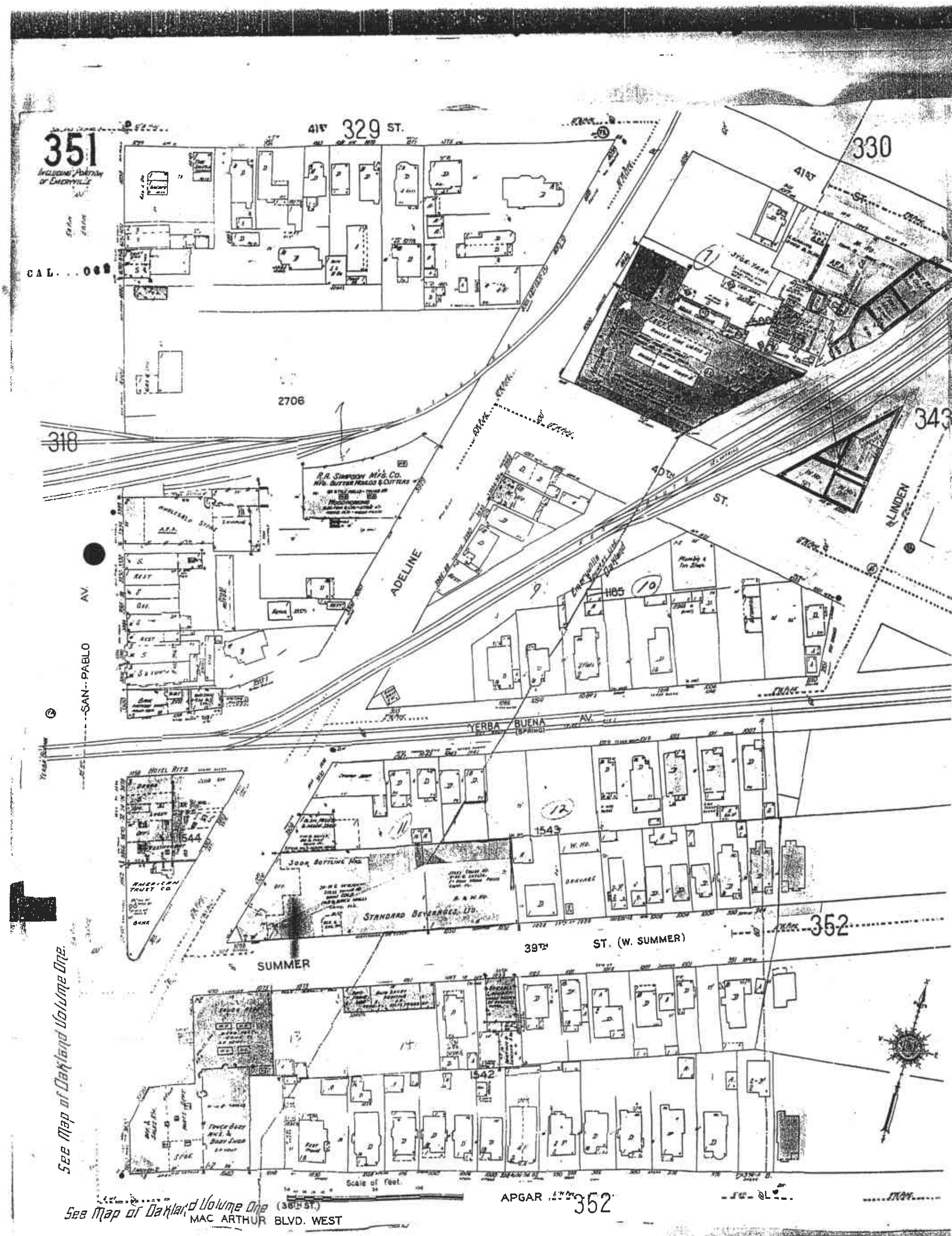
Plate 19: Application of Liquid Boot® Membrane

Note: Application of membrane has been completed in bay on the right of the photograph.

Plate 20: Membrane Seal Around Utility Duct Passing Through Floor Slab of Building 1

APPENDIX I-A

1951 Sanborn Map



1951

APPENDIX I-B

Trench, Boring and Well Logs

The San Joaquin Company Inc.

Trench Log

Surface Elevation: — ft.

Trench Length at Surface: 63 ft.

Trench Width at Surface: 4.5 ft.

Maximum Depth of Trench: 7.2 ft.

Depth to First Water: 6 ft.

Depth to Water on 04/01/03 @ 1500hrs : 5.1 ft.

NOTE:
Uniform Soil Classifications are from field observations only.
No geotechnical engineering laboratory tests were performed.

Trench ID: **Trench 1**

Project: SNK Andante

Project No.: 9401.205

Owner: SNK Captec Andante LLC

Location: 3992 San Pablo Avenue, Emeryville, California

Date Excavated: 03/25/03

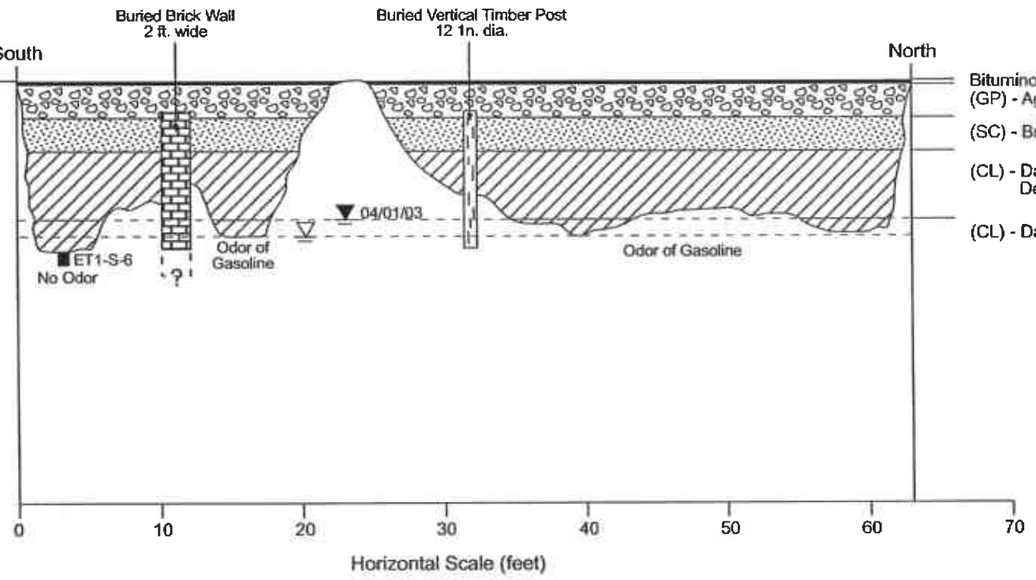
Excavation By: Dietz Irrigation

Logged By: D J Watkins

Equipment Operator: H B Dietz

Equipment Used: Komatsu PC200LC-5 Excavator

Depth (Feet)	Sample	Trench Log / Description
0		Bituminous Macadam 1.5 in. (GP) - Aggregate Paving Base
2		(SC) - Brown, fine to coarse SAND with GRAVEL, and some Silt and Clay (FILL)
4		(CL) - Dark gray/black or mottled brown, soft, Silty CLAY with occasional GRAVEL, soft to firm, stiffening with depth. Decreasing Silt and Sand with depth (FILL)
6	soil	(CL) - Dark gray/black Silty CLAY, moderately stiff to stiff, highly impermeable
8		
10		
12		
14		
16		
18		
20		
22		
24		
26		
28		
30		



Exploratory Trench 1
Average trench width 5 feet, Trench Length 63 feet

The San Joaquin Company Inc.

Trench Log

Surface Elevation: — ft.

Trench Length at Surface: 78 ft.

Trench Width at Surface: 5.0 ft.

Maximum Depth of Trench: 9.2 ft.

Depth to First Water: 6 ft.

Depth to Water on 04/01/03 @ 1500hrs : 4.8 ft.

NOTE:
Uniform Soil Classifications are from field observations only.
No geotechnical engineering laboratory tests were performed.

Trench ID: **Trench 2**

Project: SNK Andante

Project No.: 9401.205

Owner: SNK Captec Andante LLC

Location: 3992 San Pablo Avenue, Emeryville, California

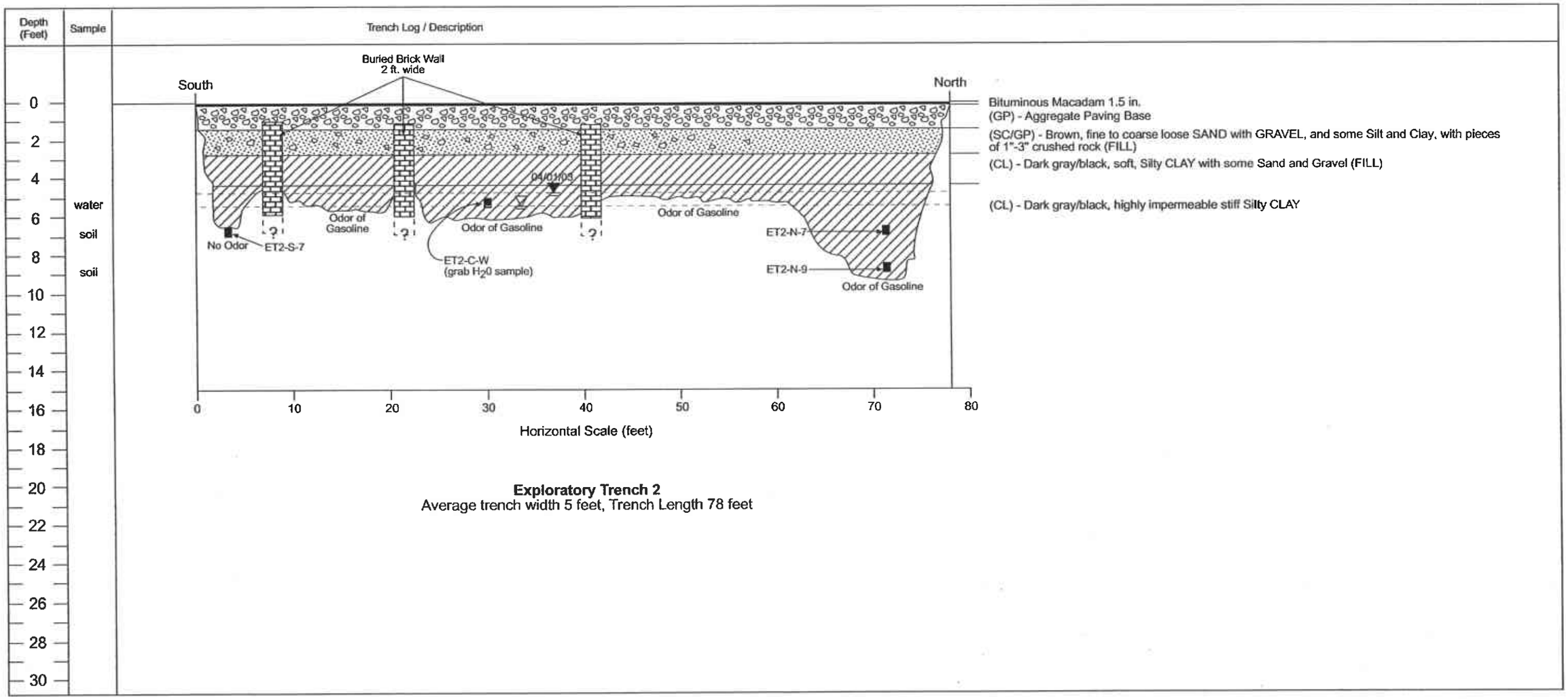
Date Excavated: 03/24/03

Excavation By: Dietz Irrigation

Logged By: D J Watkins

Equipment Operator: H B Dietz

Equipment Used: Komatsu PC200LC-5 Excavator



Exploratory Trench 2
Average trench width 5 feet, Trench Length 78 feet

The San Joaquin Company Inc.

Trench Log

Surface Elevation: — ft.

Trench Length at Surface: 40 ft.

Trench Width at Surface: 4.5 ft.

Maximum Depth of Trench: 8 ft.

Depth to First Water: 6 ft.

Depth to Water on 04/01/03 @ 1500hrs : 5.0 ft.

NOTE:
Uniform Soil Classifications are from field observations only.
No geotechnical engineering laboratory tests were performed.

Trench ID: **Trench 3**

Project: SNK Andante

Project No.: 9401.205

Owner: SNK Captec Andante LLC

Location: 3992 San Pablo Avenue, Emeryville, California

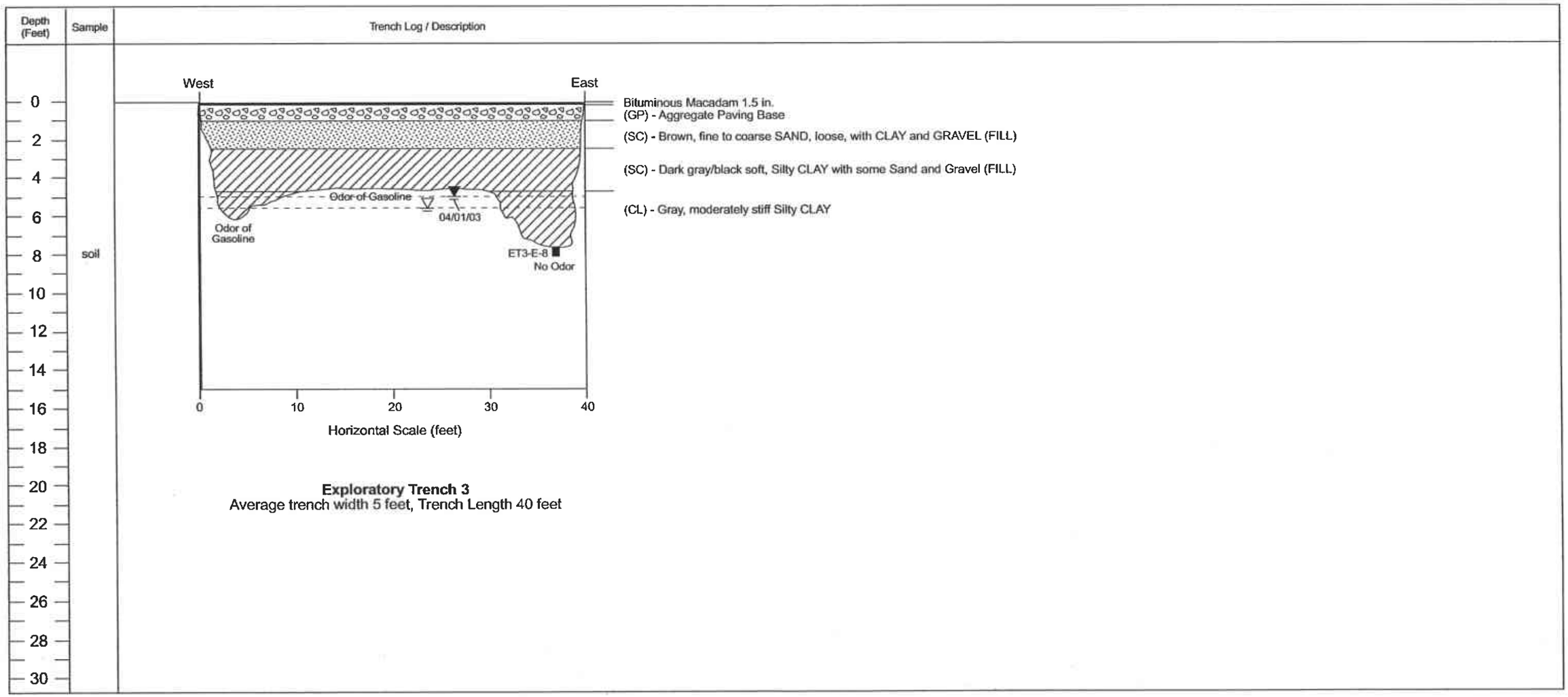
Date Excavated: 03/25/03

Excavation By: Dietz Irrigation

Logged By: D J Watkins

Equipment Operator: H B Dietz

Equipment Used: Komatsu PC200LC-5 Excavator



Exploratory Trench 3
Average trench width 5 feet, Trench Length 40 feet

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T1** Project: SNK Andante Project No.: 9401.205

Owner: SNK CapTec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 46.99 ft. Surface Elevation: 43.51 ft. Depth to Water: 4.66 ft.

Date Installed: 04/11/03 Total depth of Boring: 12 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 12 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No Geotechnical Engineering laboratory tests were performed.

Depth (Feet)	Sample (3.0 | 2.5 | 0.75)	Graphic Log	Description	Well Construction
0	SJCMW-T1-7.5 (Core Loss)		(GP) Paving base material. GRAVEL with Sand	PVC casing cap
2			(GP) Dark brown/black Silty CLAY with some Sand (fill), no odor	
4				(04/21/03)
6			(CL) Grey, stiff Silty CLAY with some Sand (fill?), no odor	0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots used as standpipe
8				
10	SJCMW-T1-11.5		(CL) Light brown, medium soft Silty CLAY with some Sand, no odor	
12				PVC casing cap
14				T.D. Boring at 12 feet
16				Note: Well dry when installed 04/11/03
18				
20				
22				
24				
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T2** Project: SNK Andante Project No.: 9401.205

Owner: SNK CapTec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 43.26 ft. Surface Elevation: 41.54 ft. Depth to Water: 2.50 ft.

Date Installed: 04/11/03 Total depth of Boring: 8 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 8 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No Geotechnical Engineering laboratory tests were performed.

Depth (Feet)	Sample 3.0 | 2.5 | 0.75	Graphic Log	Description	Well Construction
0	SJCMW-T2-8		1.5 in. bituminous macadam paving	PVC casing cap
2			(GP) Paving base material. GRAVEL with Sand	(04/21/03)
4			(CL) Black, medium soft Silty CLAY with Sand, odor of gasoline. Sand and Gravel (fill)	0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots used as standpipe
6				
8			Odor of gasoline	PVC casing cap
10				T.D. Boring at 8 feet
12				Note: Well dry when installed 04/11/03
14				
16				
18				
20				
22				
24				
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T2A** Project: SNK Andante Project No.: 9401.205

Owner: SNK CapTec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 43.99 ft. Surface Elevation: 41.52 ft. Depth to Water: 4.53 ft.

Date Installed: 04/11/03 Total depth of Boring: 20 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 20 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No Geotechnical Engineering laboratory tests were performed.

Depth (Feet)	Sample (3.0 | 2.5 | 0.75)	Graphic Log	Description	Well Construction
0	SJCMW-T2A-5 (Core Loss)		1.5 in. bituminous macadam (GP) Aggregate paving base	PVC casing cap
2			(SP) Brown, loose, fine to coarse SAND, with Silt and Clay and occasional Gravel (fill)	
4			strong odor of gasoline	▼ (04/21/03)
6	SJCMW-T2A-9		(CL) Dark grey/black Silty CLAY, medium soft	0.75-inch diameter blank PVC well casing used as standpipe
8			slight odor of gasoline	
10				
12	SJCMW-T2A-15.5		(CL) Light brown with grey mottling, wet Silty CLAY with Sand and Gravel,soft to very soft, stiffening with depth	▽ (04/11/03) Prefabricated bentonite seal
14				3-inch thick foam plastic centralizer
16			no odor	0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots
18	SJCMW-T2A-19.5		(CL) as above, 1 foot stratum of GRAVEL	
20			no odor	PVC casing cap
22				T.D. Boring at 20 feet
24				
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T3** Project: SNK Andante Project No.: 9401.205

Owner: SNK CapTec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 46.01 ft. Surface Elevation: 42.50 ft. Depth to Water: 4.61 ft.

Date Installed: 04/11/03 Total depth of Boring: 12 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 12 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No Geotechnical Engineering laboratory tests were performed.

Depth (Feet)	Sample 3.0 | 2.5 | 0.75	Graphic Log	Description	Well Construction
0	SJCMW-T3-8 (Core Loss); SJCMW-T3-12 (Partial Core Loss)		(GP) Aggregate paving base material	PVC casing cap
2			(GP) Silty Sandy GRAVEL with some Clay, loose (fill) no odor	
4				(04/21/03)
6			(CL) Brown, medium stiff Silty CLAY with some Sand and Gravel	0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots used as standpipe
8			no odor	
10			(CL) Light brown, stiff, wet Silty CLAY with some Sand and Gravel no odor	
12				PVC casing cap
14				T.D. Boring at 12 feet
16				Note: Well dry when installed 04/11/03
18				
20				
22				
24				
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T4** Project: SNK Andante Project No.: 9401.205

Owner: SNK CapTec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 41.01 ft. Surface Elevation: 39.73 ft. Depth to Water: 3.86 ft.

Date Installed: 04/11/03 Total depth of Boring: 8 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 8 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No Geotechnical Engineering laboratory tests were performed.

Depth (Feet)	Sample (3.0 | 2.5 | 0.75)	Graphic Log	Description	Well Construction
0	SJCMW-T4-8		1.5 in. bituminous macadam paving	PVC casing cap
2	No Core Recovery		(GP) Aggregate paving base material no odor	0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots used as standpipe
4			(CL) Dark grey/black Silty CLAY with Sand and Gravel (fill) odor of gasoline	(04/21/03)
6			(CL) Light brown, very stiff Silty CLAY	
8				PVC casing cap
10				T.D. Boring at 8 feet
12				Note: Well dry when installed 04/11/03
14				
16				
18				
20				
22				
24				
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T4A** Project: SNK Andante Project No.: 9401.205

Owner: SNK CapTec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 42.70 ft. Surface Elevation: 39.69 ft. Depth to Water: 4.99 ft.

Date Installed: 04/11/03 Total depth of Boring: 20 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 20 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No Geotechnical Engineering laboratory tests were performed.

Depth (Feet)	Sample (3.0 | 2.5 | 0.75)	Graphic Log	Description	Well Construction
0	SJCMW-T4A-5 (No Core Recovery)		1.5 in. bituminous macadam (GP) Aggregate paving base	PVC casing cap
2				
4			(CL) Dark grey/black Silty CLAY, medium soft, with some Sand and Gravel (fill)	▼ (04/21/03)
6				0.75-inch diameter blank PVC well casing used as standpipe
8			(CL) Light grey, soft Silty CLAY	
10	SJCMW-T4A-12		(CL) Dark grey/black with light grey mottling, stiff Silty CLAY	
12			(CL) Light brown with grey mottling, moderately stiff Silty Sandy CLAY, with Gravel slight odor of gasoline	Prefabricated bentonite seal
14	SJCMW-T4A-15		(CL) Brown, very stiff Silty Sandy CLAY	3-inch thick foam plastic centralizer
16				0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots
18	SJCMW-T4A-20		(CL) Light brown, medium stiff Silty Sandy CLAY with some Gravel	
20				PVC casing cap
22				T.D. Boring at 20 feet
24				Note: Well was dry when completed 04/11/03
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T5** Project: SNK Andante Project No.: 9401.205

Owner: SNK CapTec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 41.79 ft. Surface Elevation: 39.64 ft. Depth to Water: 3.07 ft.

Date Installed: 04/11/03 Total depth of Boring: 8 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 8 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No Geotechnical Engineering laboratory tests were performed.

Depth (Feet)	Sample (3.0 | 2.5 | 0.75)	Graphic Log	Description	Well Construction
0	SJCMW-T5-7.5 / SJCMW-T5-5		1.5 in. bituminous macadam paving (GP) Aggregate paving base material no odor (SP) Loose SAND and Gravel with some Clay (fill) slight odor of gasoline (CL) Dark brown/black, soft to medium stiff CLAY (fill) (CL) Dark brown/black,stiff Sandy CLAY (fill) no odor	PVC casing cap (04/21/03) 0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots used as standpipe PVC casing cap
2				
4				
6				
8				T.D. Boring at 8 feet Note: Well dry when installed 04/11/03
10				
12				
14				
16				
18				
20				
22				
24				
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T5A** Project: SNK Andante Project No.: 9401.205

Owner: SNK CapTec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 42.30 ft. Surface Elevation: 39.52 ft. Depth to Water: 4.78 ft.

Date Installed: 04/11/03 Total depth of Boring: 20 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 20 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No Geotechnical Engineering laboratory tests were performed.

Depth (Feet)	Sample (3.0 | 2.5 | 0.75)	Graphic Log	Description	Well Construction
0	SJCMW-T5A-5 (No Core Recovery)		1.5 in. bituminous macadam (GP) Aggregate paving base	PVC casing cap
2			(CL) Dark grey/black Silty CLAY (fill)	
4			no odor	▼ (04/21/03)
6			slight odor of gasoline (CL) dark brown, soft to medium stiff Silty CLAY slight odor of gasoline	0.75-inch diameter blank PVC well casing used as standpipe
8	SJCMW-T5A-10			
10			(CL) Grey/green, soft Silty CLAY	
12			(CL) Brown with light grey mottling, stiff Silty CLAY, with Sand and Gravel	Prefabricated bentonite seal
14	SJCMW-T5A-15.5		(CL) Dark grey with light grey mottling Silty Sandy CLAY	3-inch thick foam plastic centralizer
16				0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots
18	SJCMW-T5A-19.5 (No Recovery)		(CL) Light brown Silty Sandy CLAY with some Gravel	
20			slight odor of gasoline	PVC casing cap T.D. Boring at 20 feet Note: Well was dry when completed 04/11/03
22				
24				
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T6** Project: SNK Andante Project No.: 9401.205

Owner: SNK Captec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 44.02 ft. Surface Elevation: 40.73 ft. Depth to Water: 3.78 ft.

Date Installed: 04/11/03 Total depth of Boring: 12 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 12 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

Note: Unified Soil Classifications are from field observations only. No geotechnical engineering laboratory tests were performed.

Depth (Feet)	Sample (3.0 / 2.5 / 0.75)	Graphic Log	Description	Well Construction
0	SJCMW-T6-5		1.5 in. bituminous macadam (GP) Aggregate paving base	PVC casing cap
2			(CL) Dark grey/black with light grey mottling, medium stiff Silty CLAY with some fine Gravel (FILL)	
4			No Odor	(04/21/03)
6			(CL) Grey, stiff Silty Sandy CLAY with some Gravel (FILL?)	0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots used as standpipe
8				
10	SJCMW-T6-11.5		(CL) Grey/green, moderately stiff Silty Sandy CLAY	
12			No Odor	PVC casing cap
14				T.D. Boring at 12 feet
16				Note: Well dry when installed 04/11/03
18				
20				
22				
24				
26				
28				
30				

The San Joaquin Company Inc.

Monitoring Well Log

WELL No.: **SJCMW-T7** Project: SNK Andante Project No.: 9401.205

Owner: SNK Captec Andante LLC Location: 3992 San Pablo Avenue, Emeryville, California

Top of Casing Elevation: 44.10 ft. Surface Elevation: 40.55 ft. Depth to Water: 3.31 ft.

Date Installed: 04/11/03 Total depth of Boring: 12 ft. Boring Diameter: 2 in.

Well Casing Diameter: 0.75 in. Total depth of Well: 12 ft. Casing Material: PVC

Drilling Company: Gregg Drilling & Testing Drilling Method: Direct Push

Driller: Don Pearson Logged By: Dai Watkins

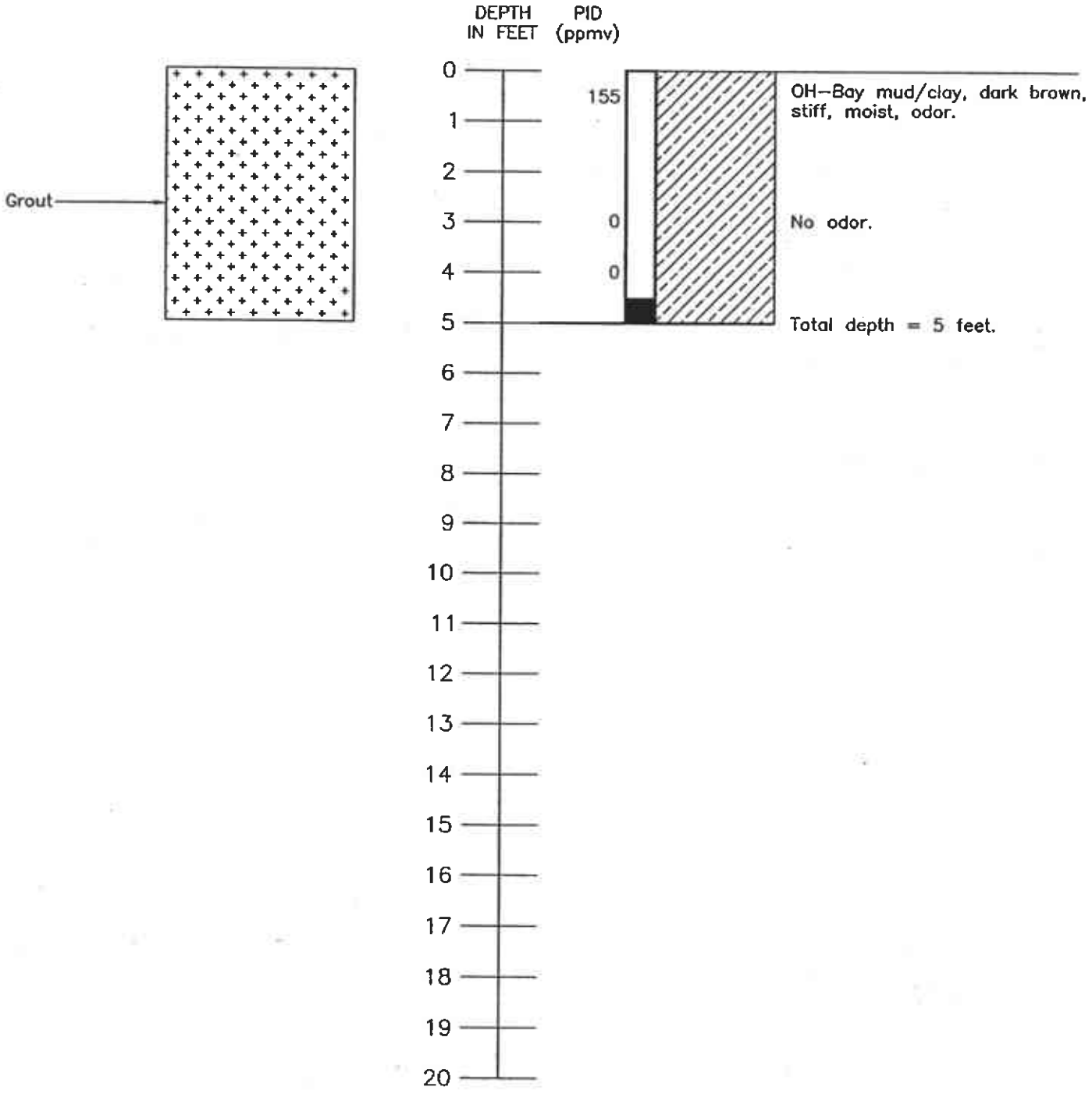
Note: Unified Soil Classifications are from field observations only. No geotechnical engineering laboratory tests were performed.

Depth (Feet)	Sample (2.0 / 2.5 / 0.75)	Graphic Log	Description	Well Construction
0			1.5 in. bituminous macadam (GP) Aggregate paving base	PVC casing cap
2			(CL) Dark Grey CLAY with GRAVEL, SILT and SAND (FILL)	(04/21/03)
4			No Odor	
6	SJCMW-T7-7.5		(CL) Light grey, moderately stiff Silty CLAY	0.75-inch diameter PVC well casing with 0.01-inch aperature machine-cut slots used as standpipe
8			Odor of Gasoline	
10	SJCMW-T7-11.5		(CL/GP) Grey, medium stiff CLAY with GRAVEL (CL) Light grey Silty CLAY Slight Odor of Gasoline	
12				PVC casing cap
14				T.D. Boring at 12 feet Note: Well dry when installed 04/11/03
16				
18				
20				
22				
24				
26				
28				
30				

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

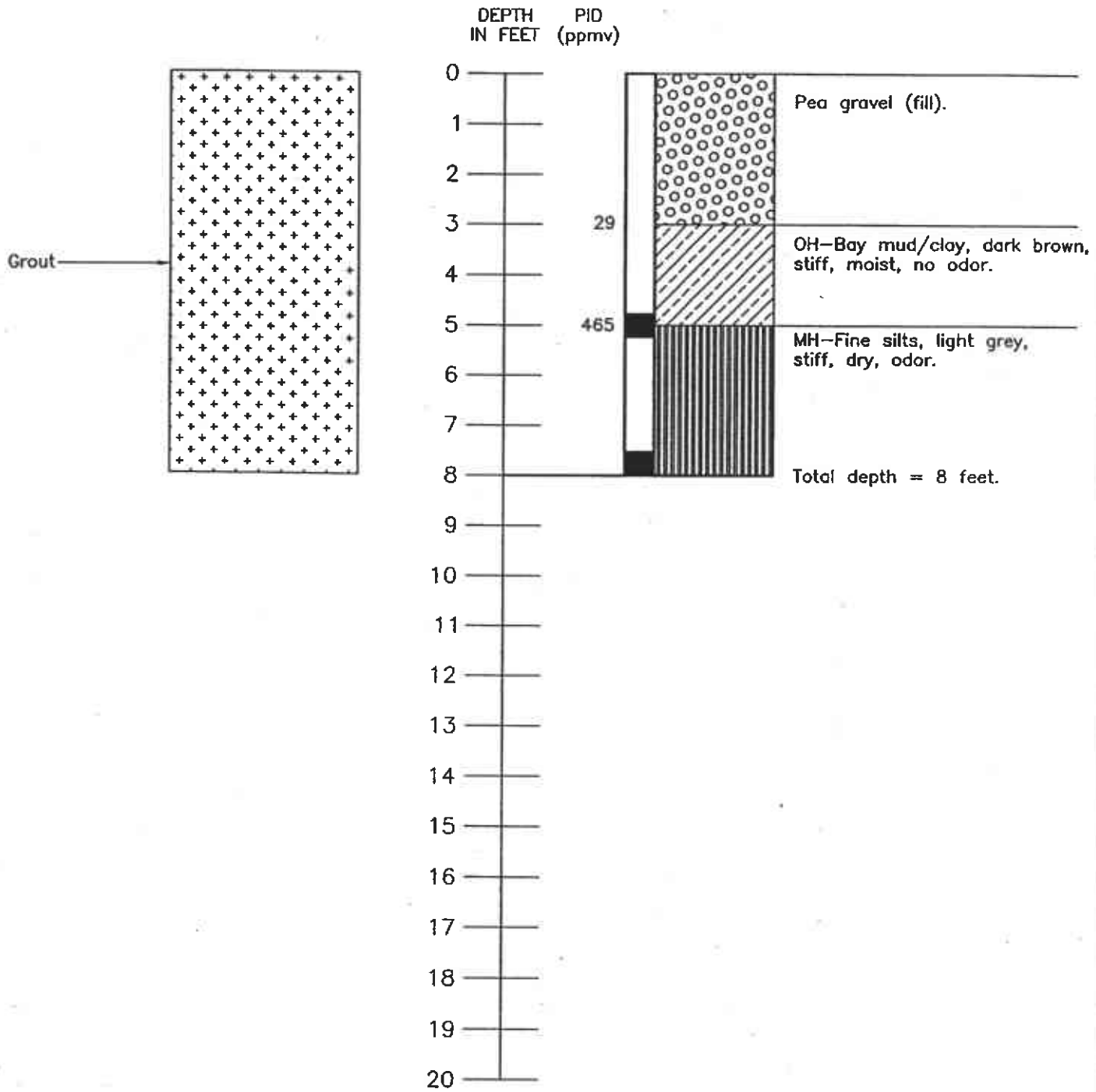
APEX ENVIROTECH, INC.

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

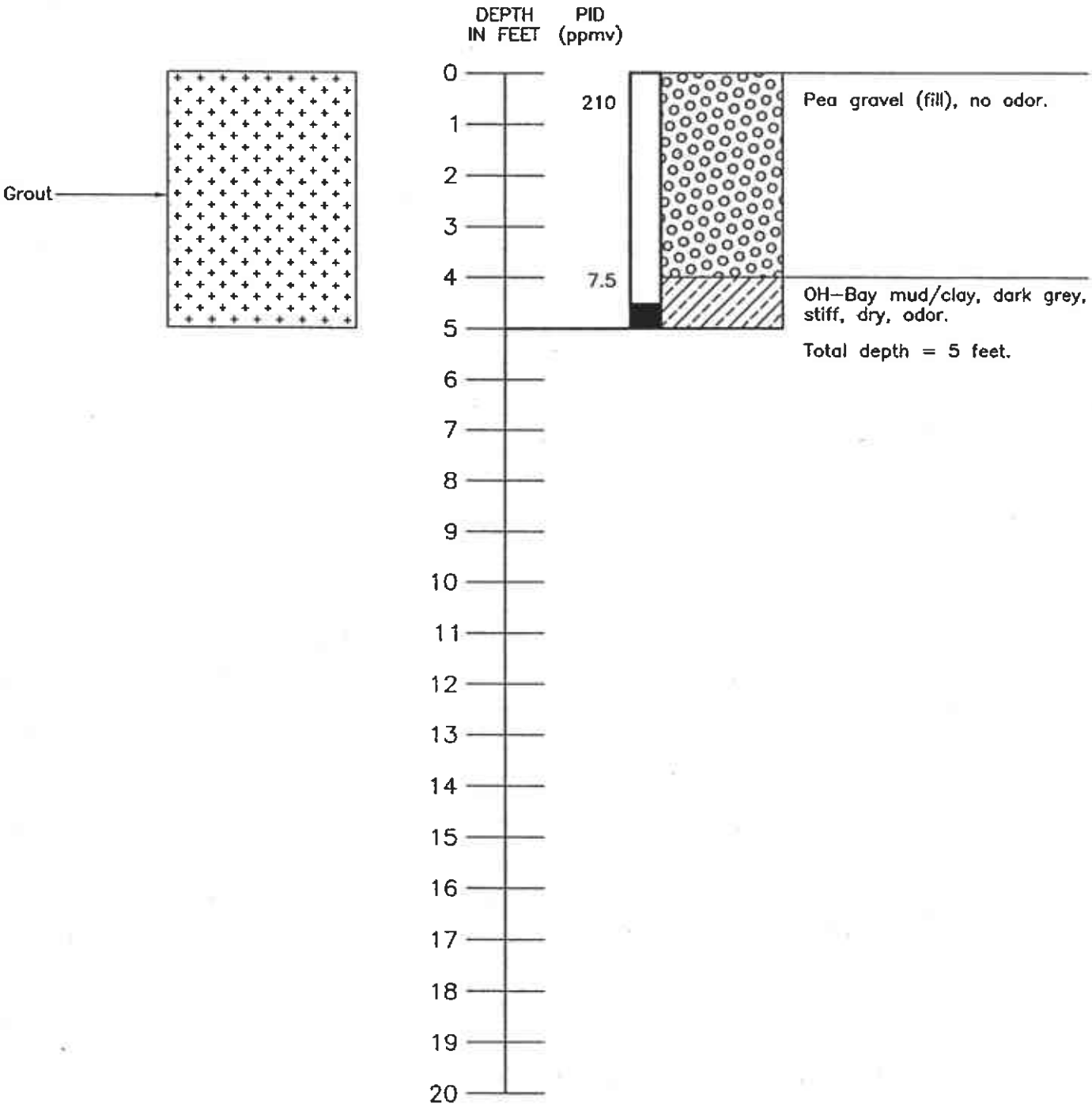
APEX ENVIROTECH, INC.

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

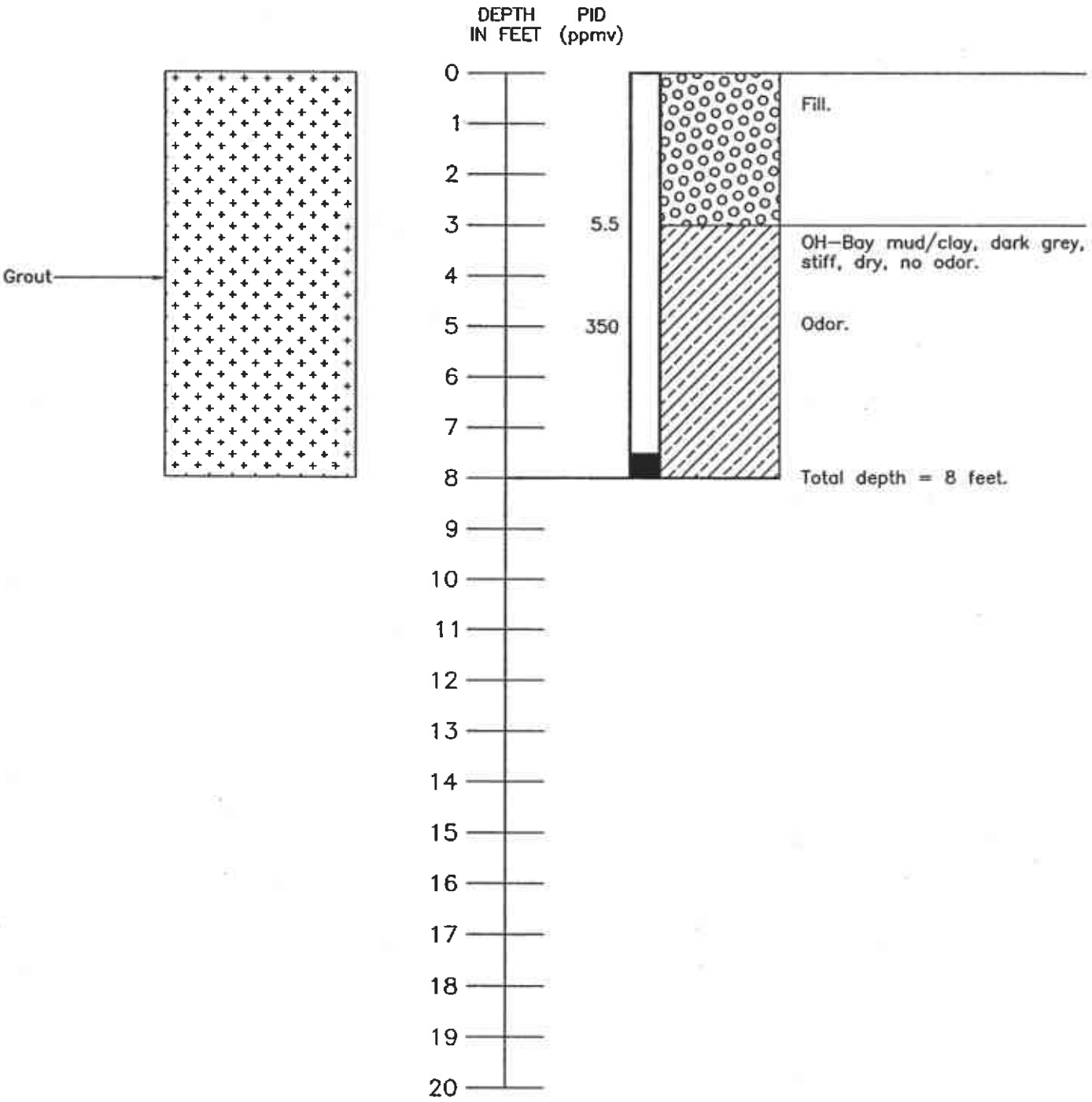
APEX ENVIROTECH, INC.

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

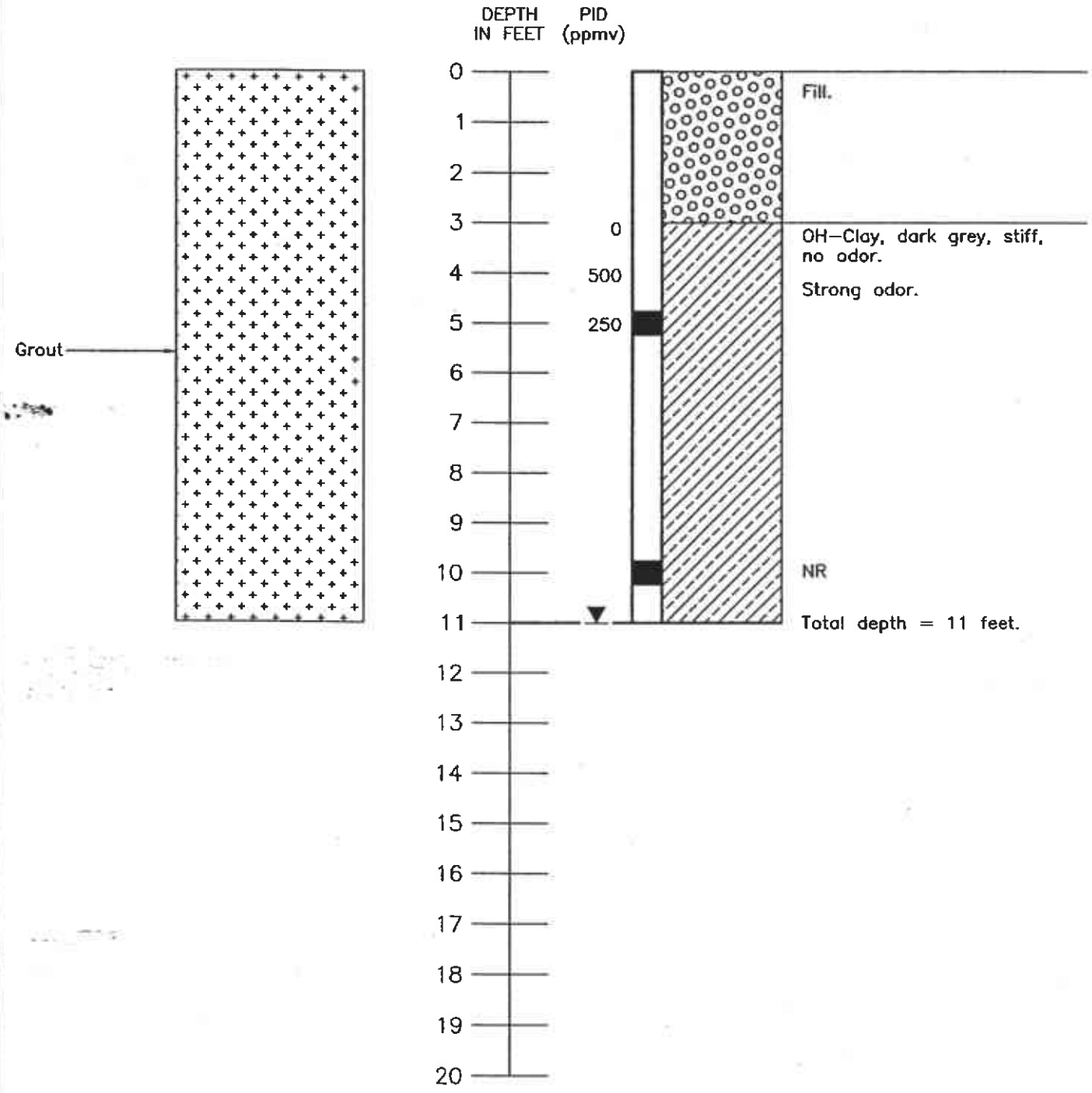
APEX ENVIROTECH, INC.

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

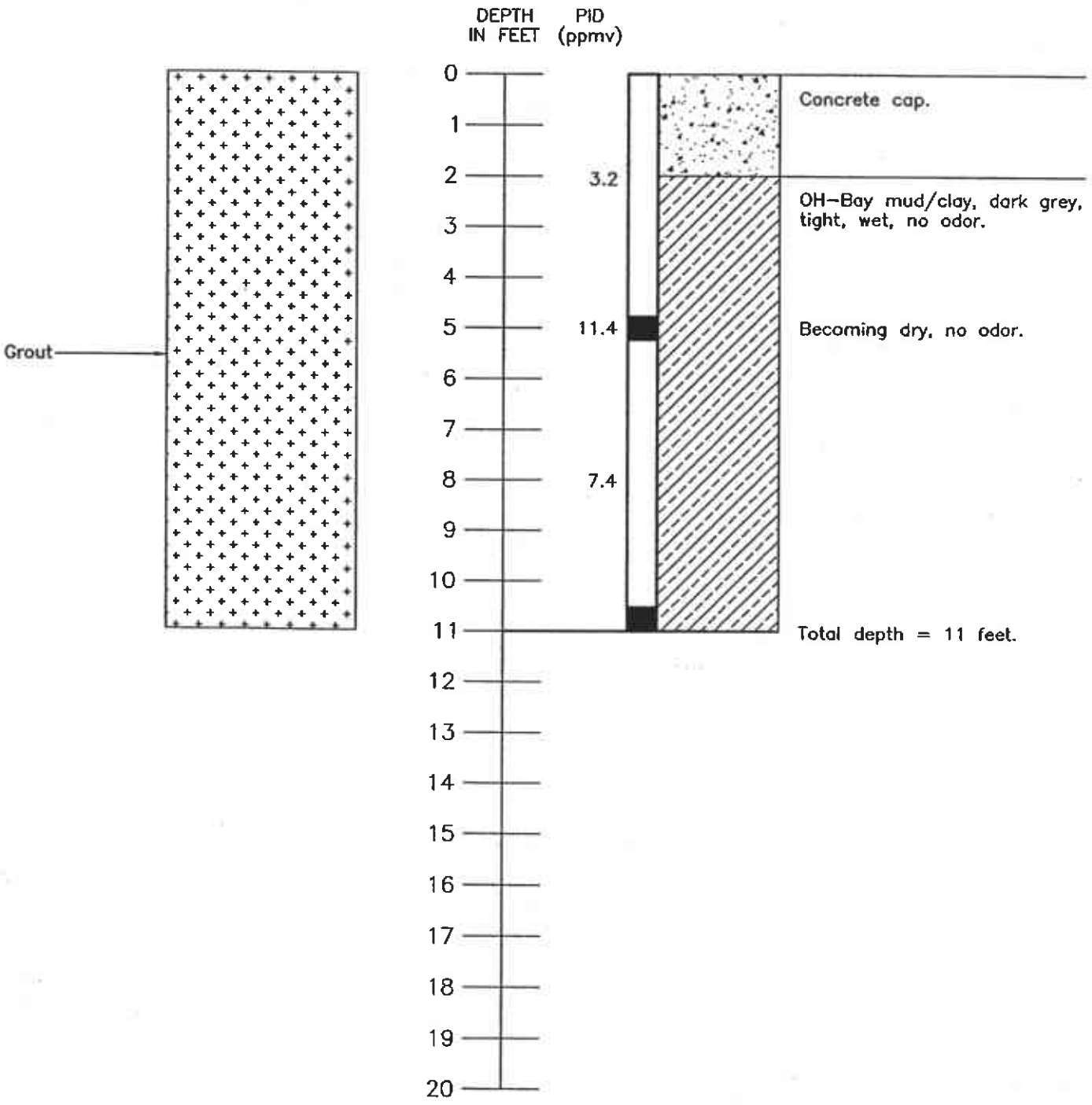
APEX ENVIROTECH, INC.

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

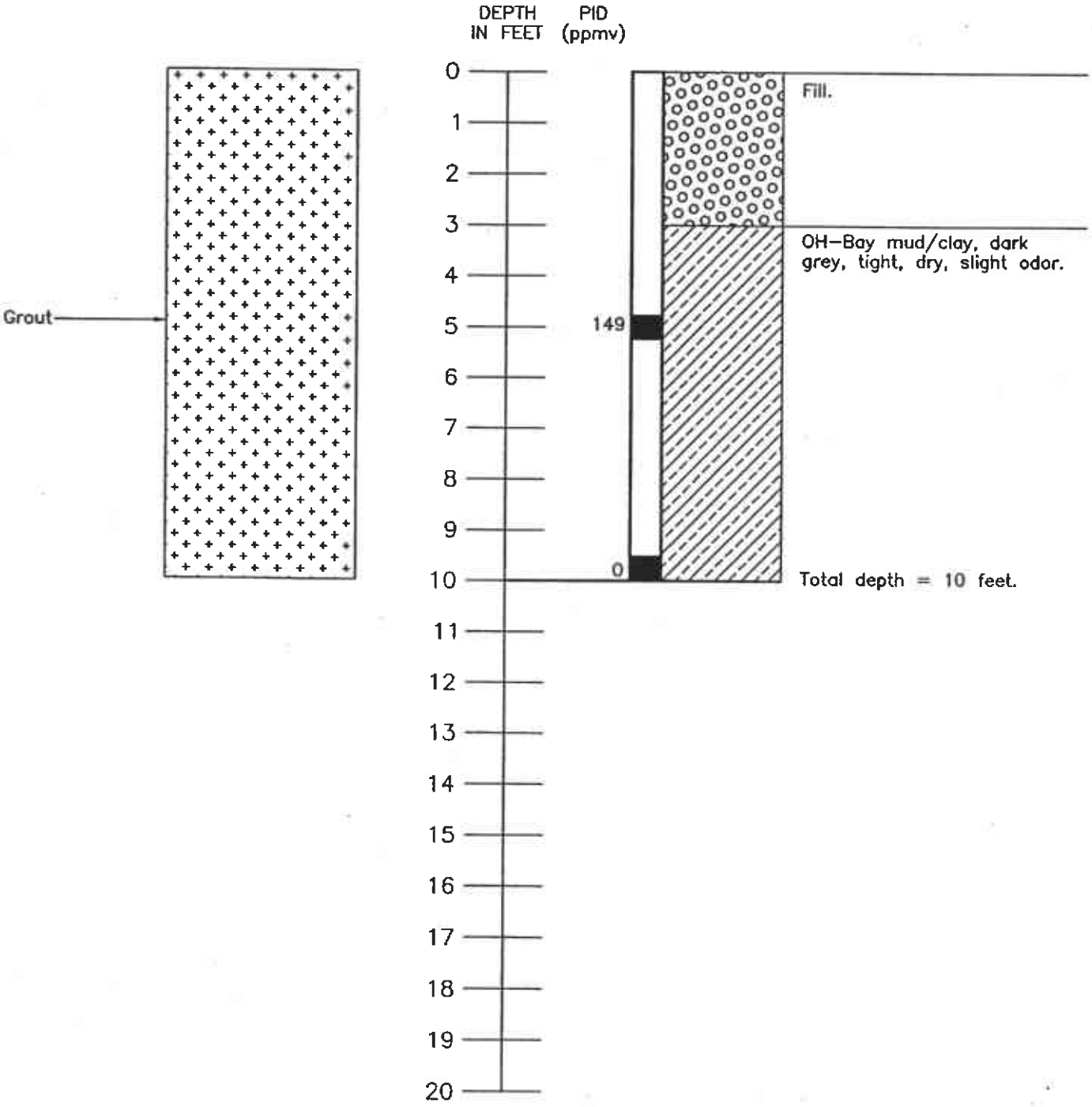
APEX ENVIROTECH, INC.

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

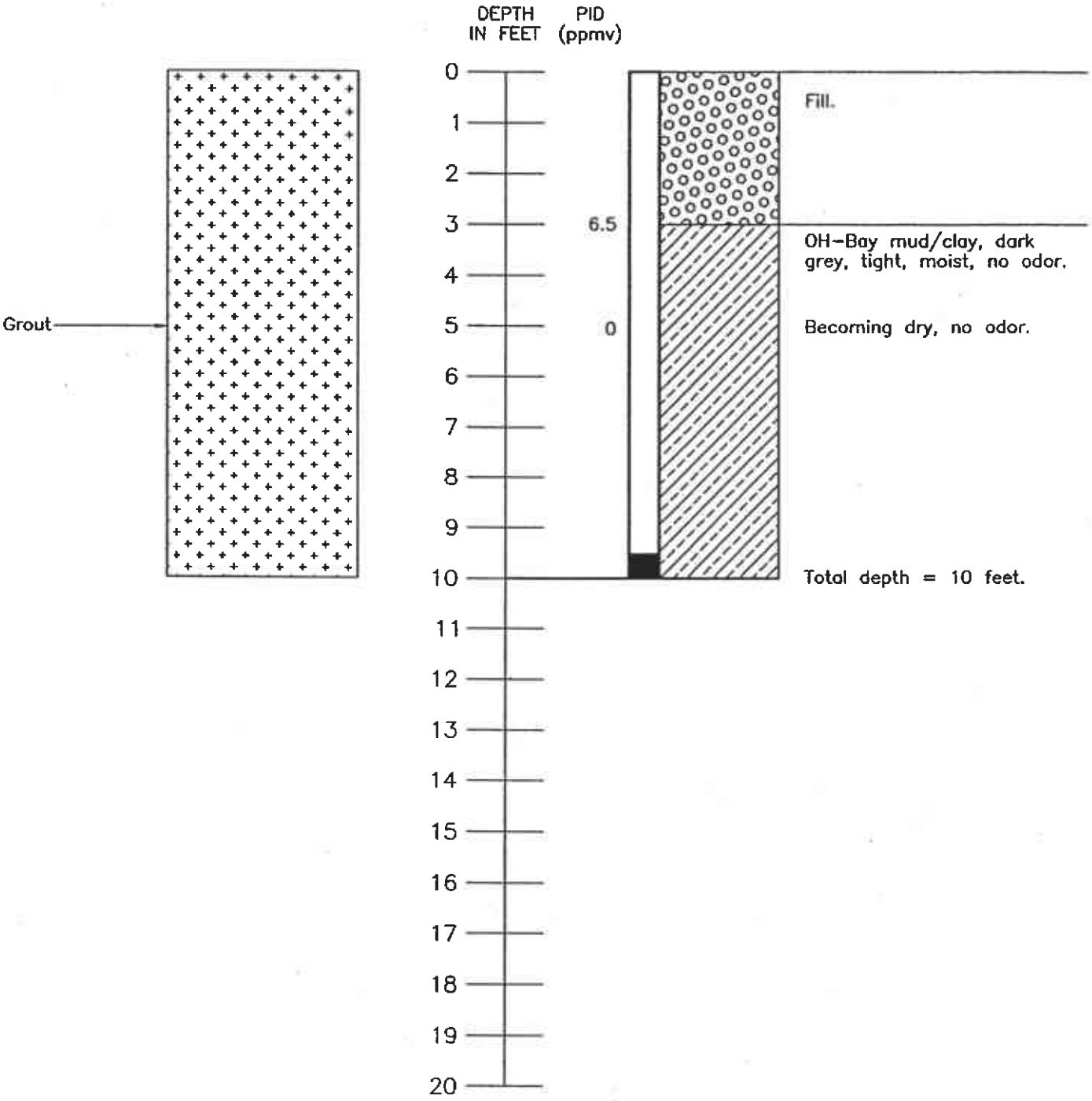
APEX ENVIROTECH, INC.

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**

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

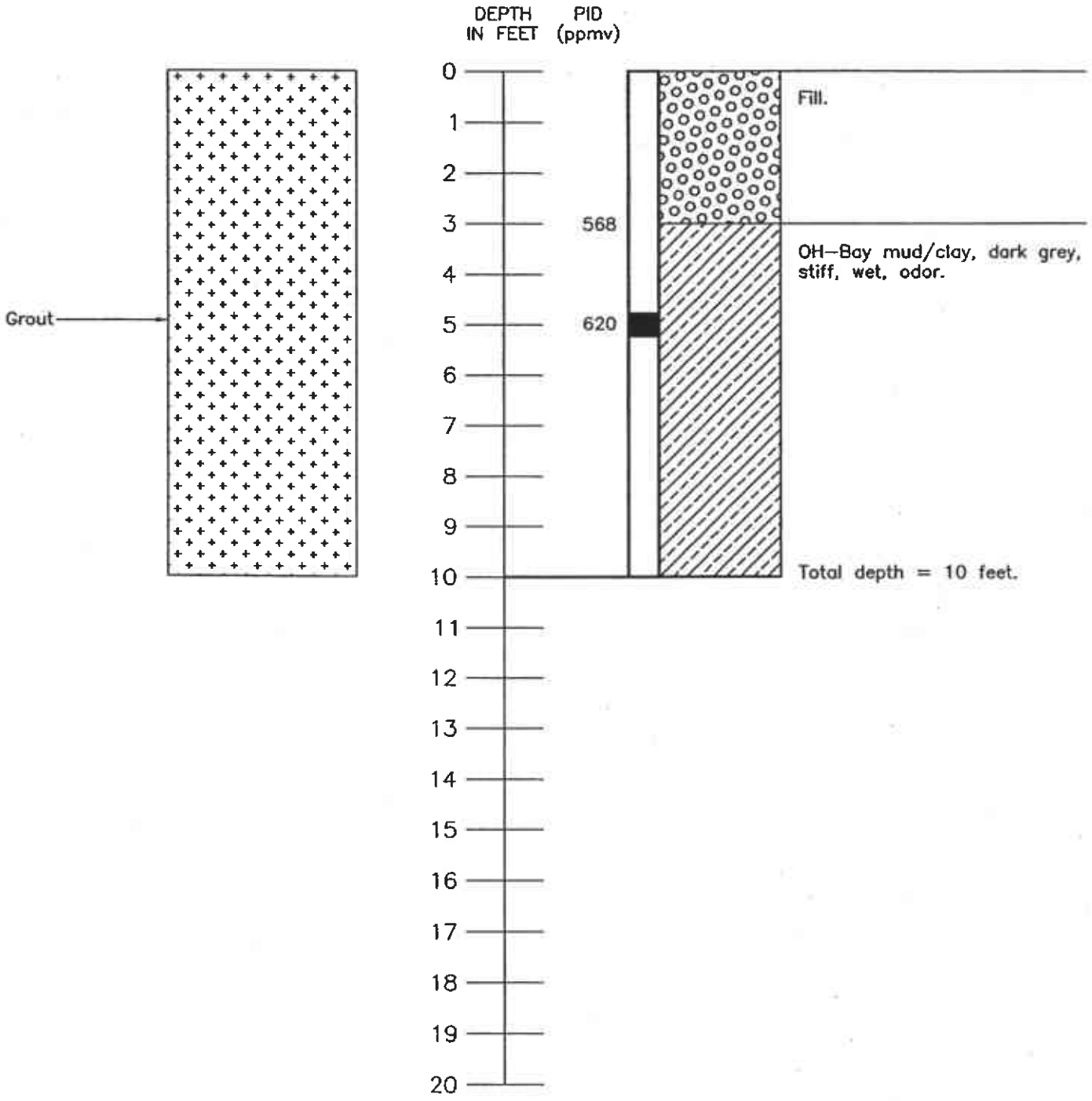
APEX ENVIROTECH, INC.

Boring/Well Log Details GP-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:

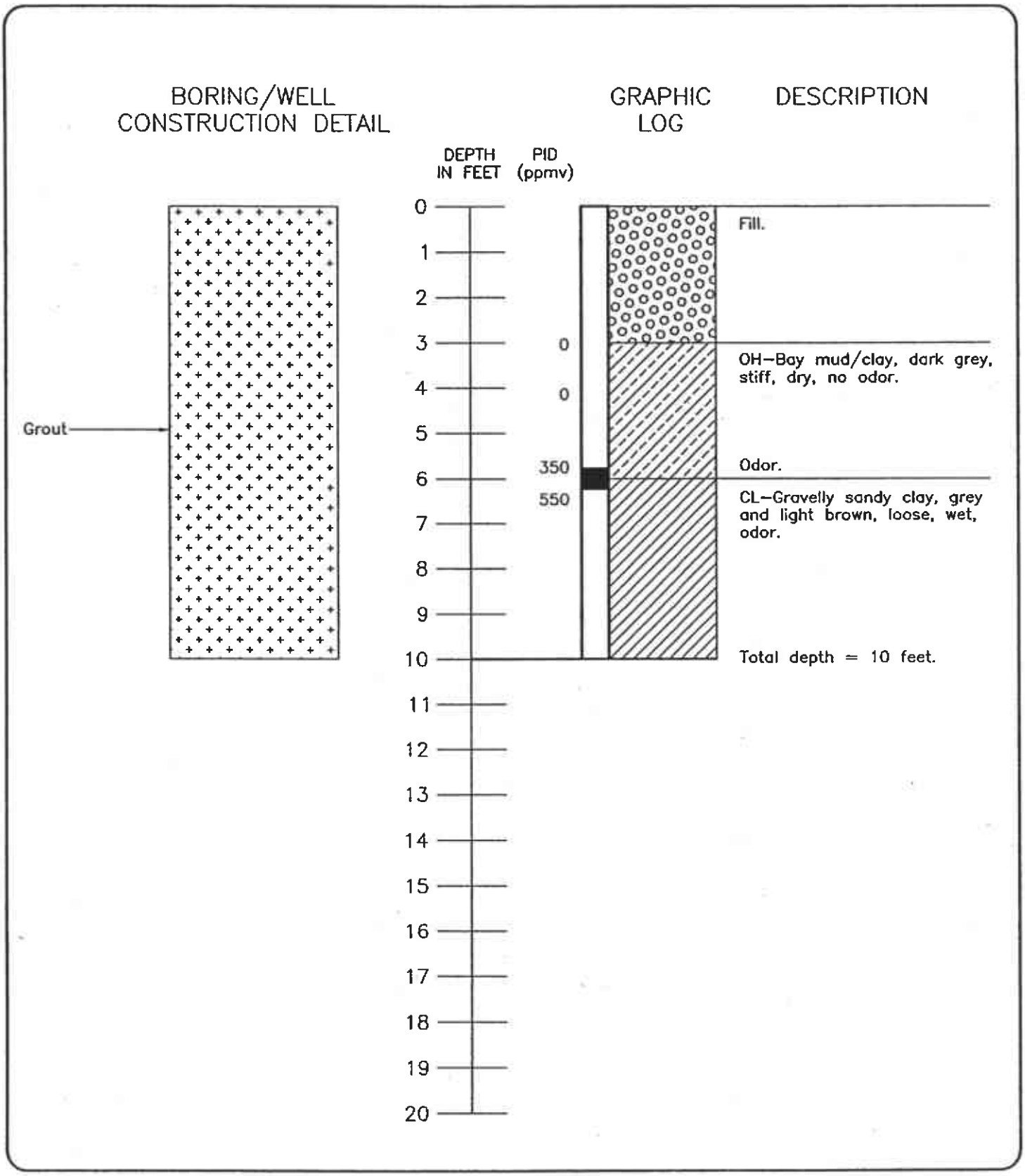
- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K — Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR — No recovery

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**



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

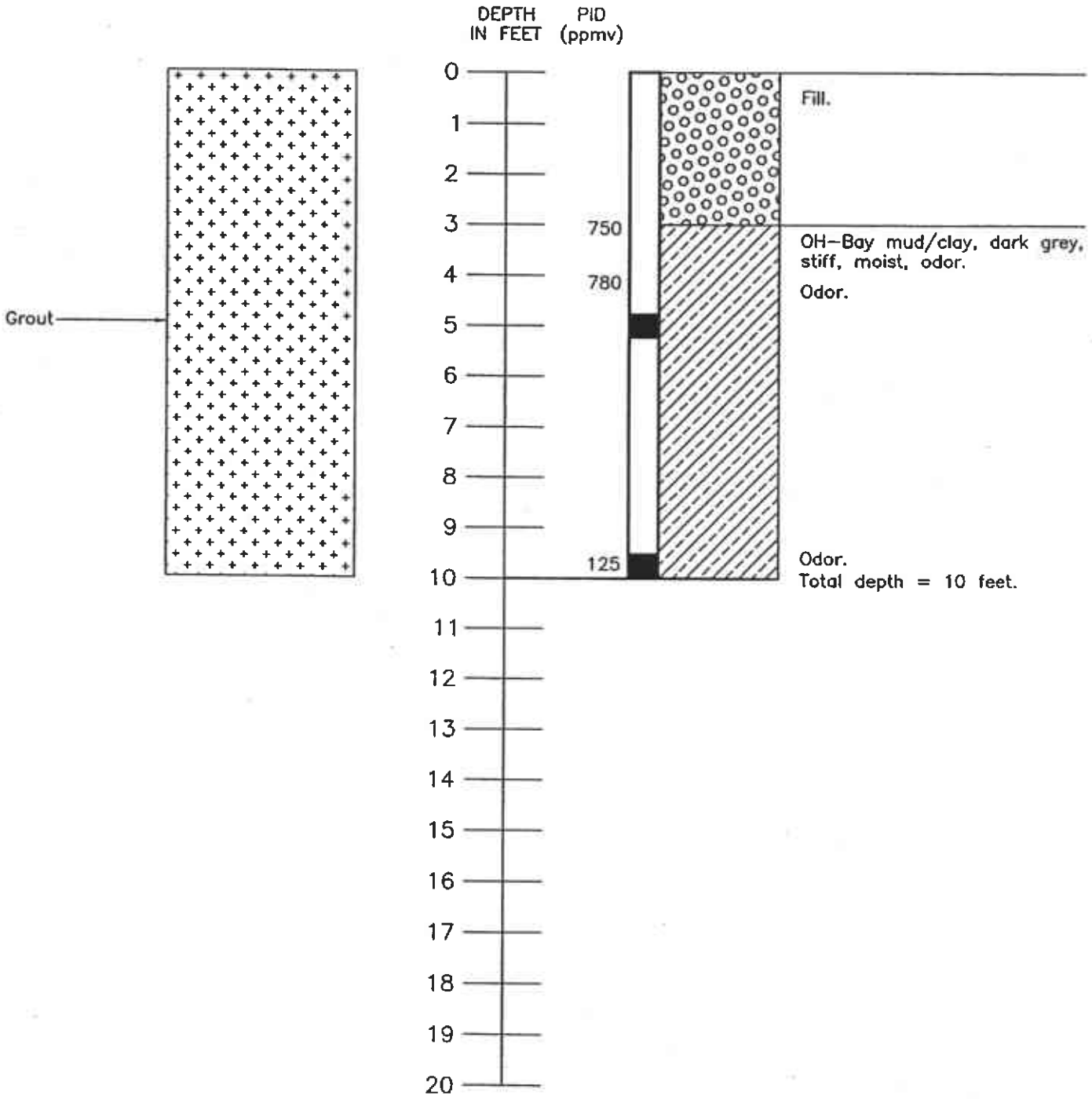
APEX ENVIROTECH, INC.

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

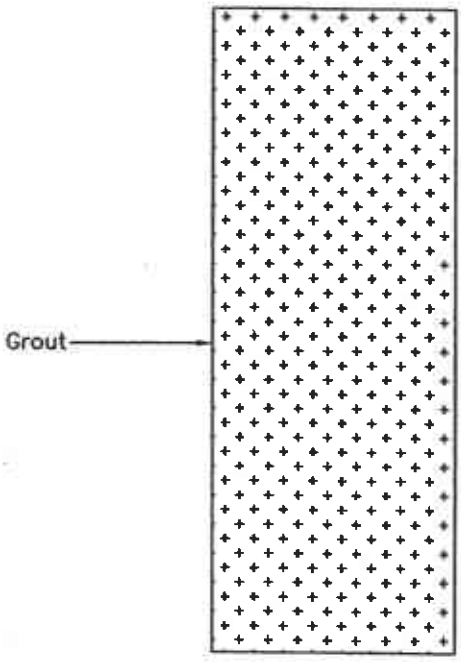
CONTACTS:

- 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



DEPTH IN FEET	PID (ppmv)	GRAPHIC LOG	DESCRIPTION
0			
1	0		Fill.
2	0		
3	0		
4	0		OH–Bay mud/clay, stiff, dry, slight odor.
5	0		
6	0.9		
7	5.0		
8	8.5		
9			
10			Total depth = 10 feet.
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

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

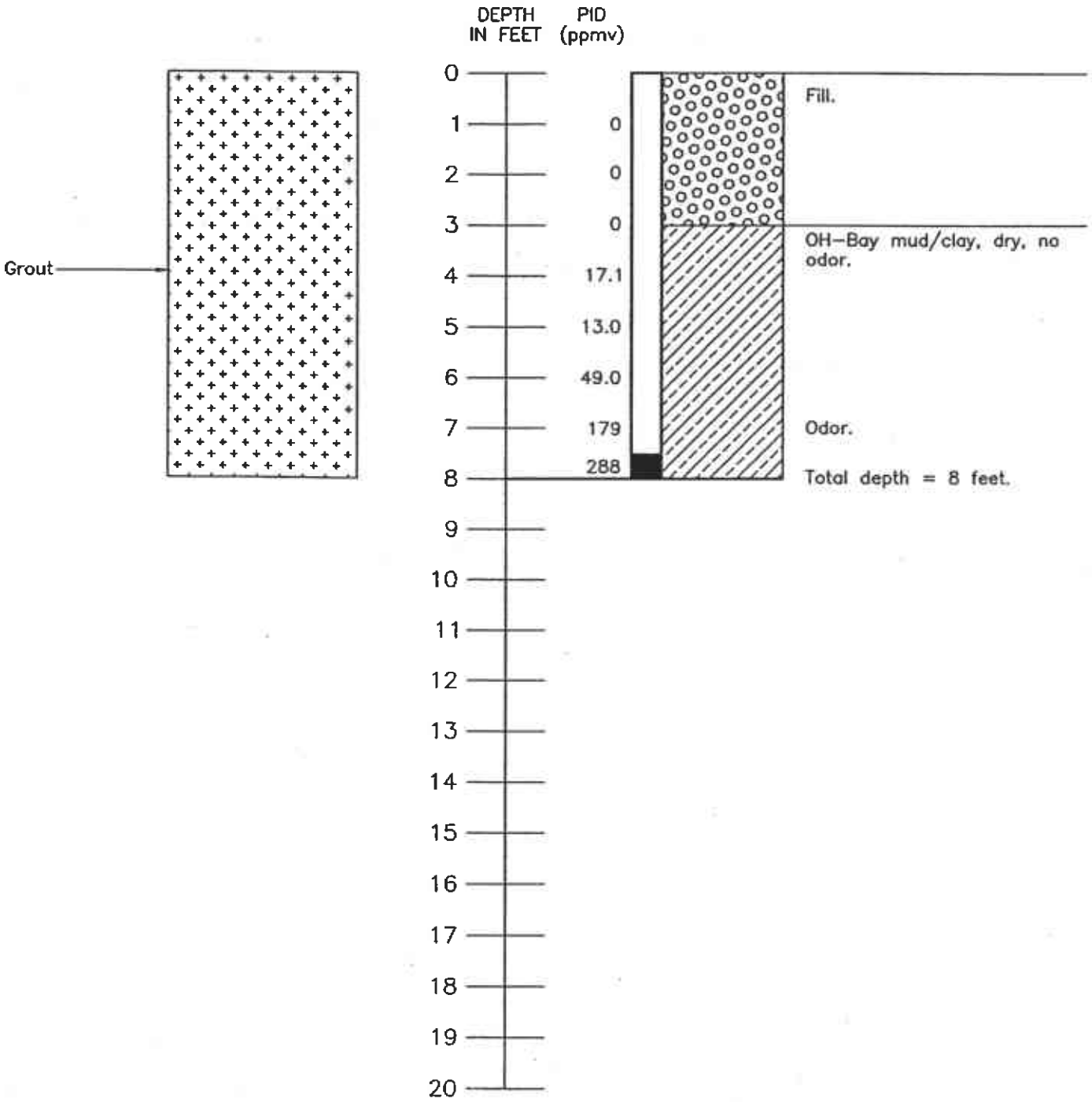
APEX ENVIROTECH, INC.

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

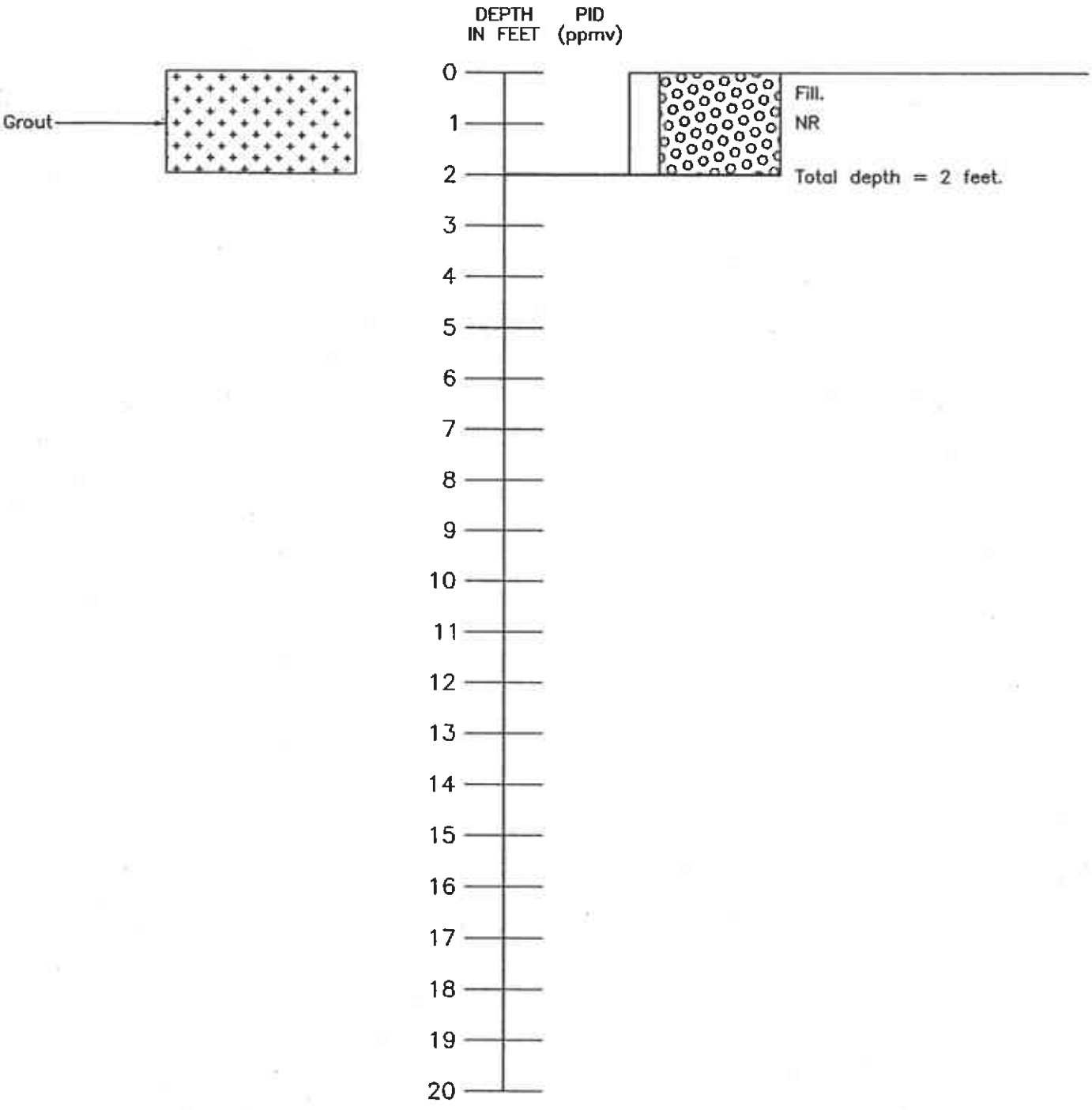
APEX ENVIROTECH, INC.

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

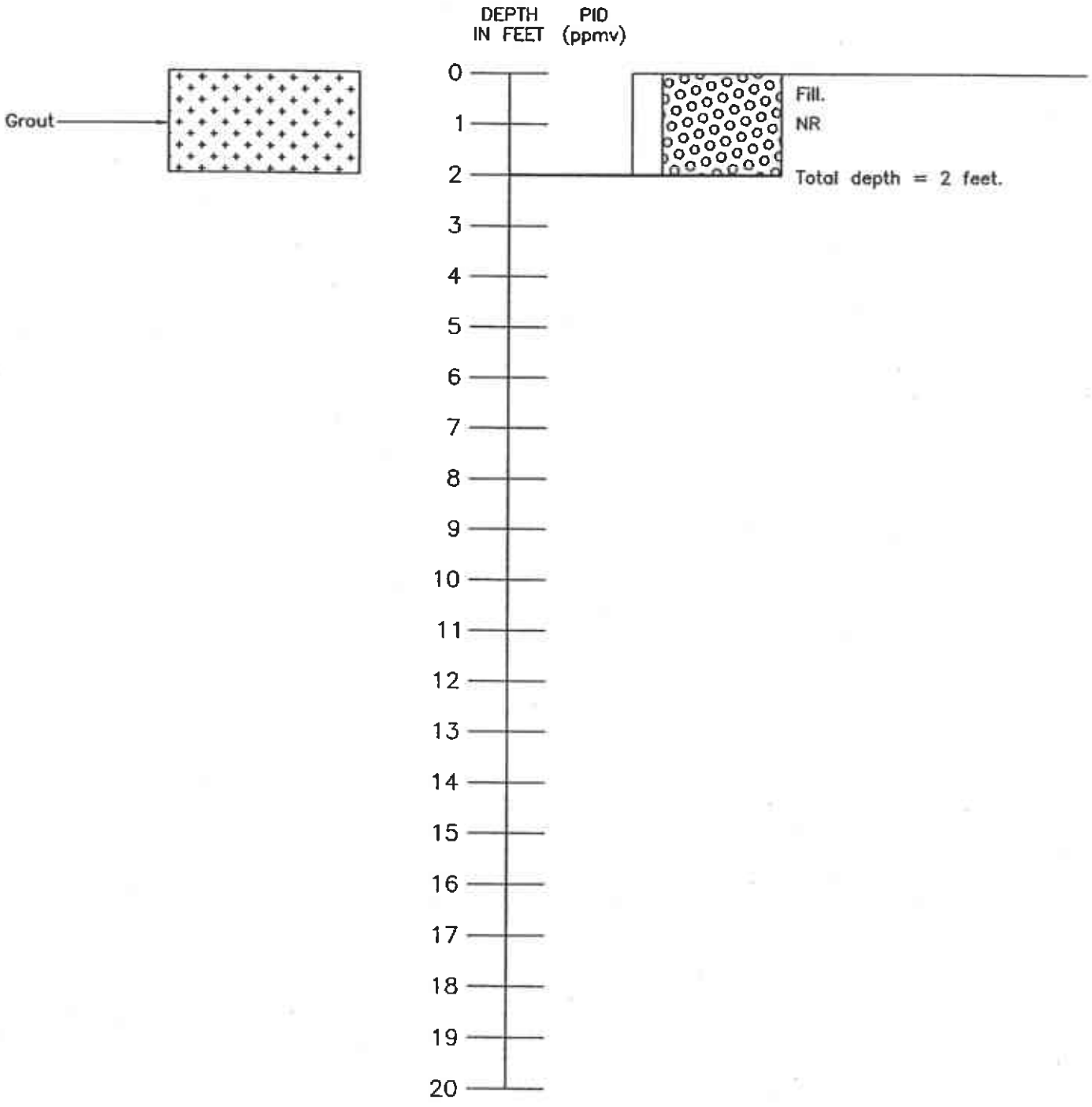
APEX ENVIROTECH, INC.

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

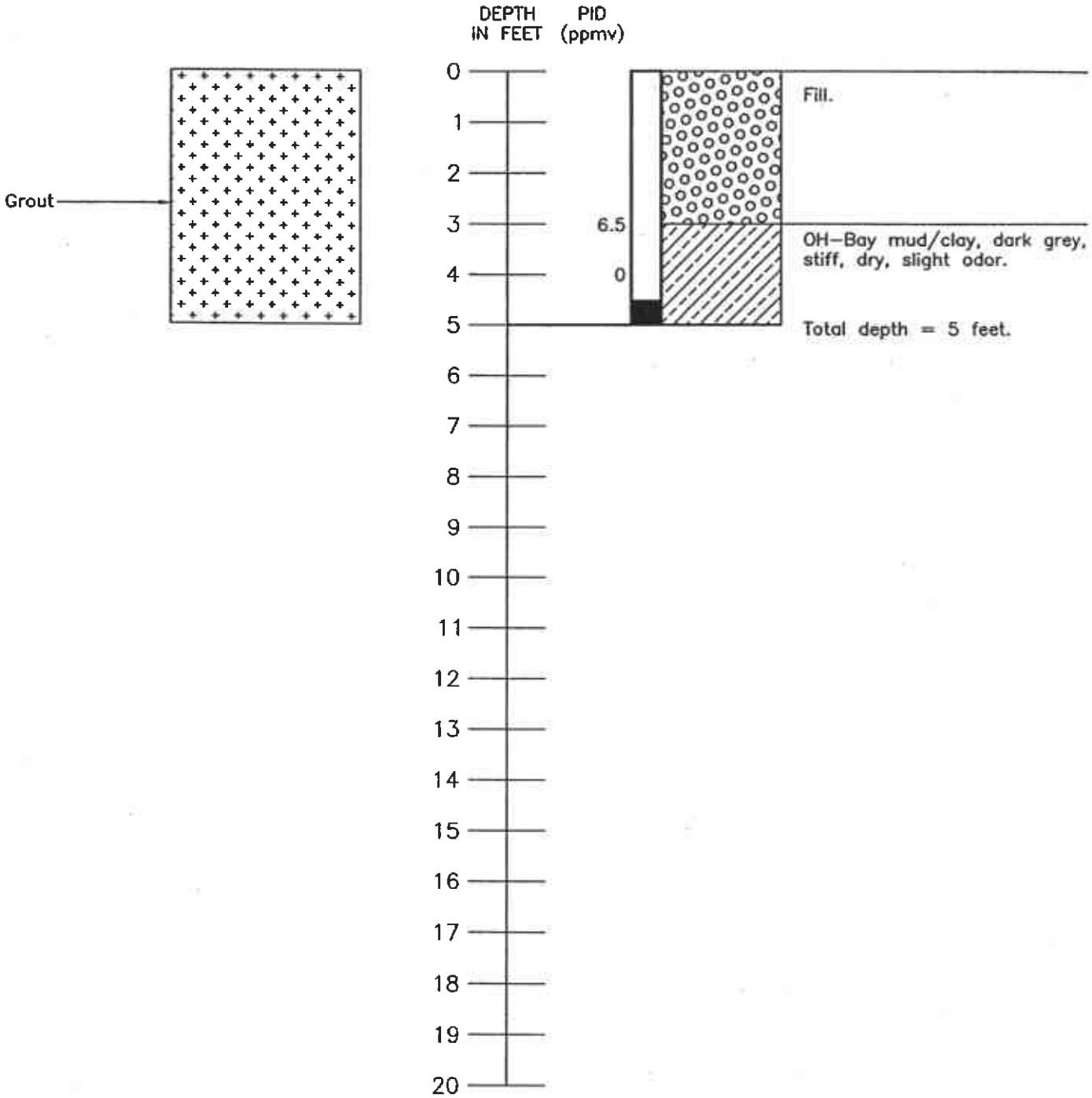
APEX ENVIROTECH, INC.

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:

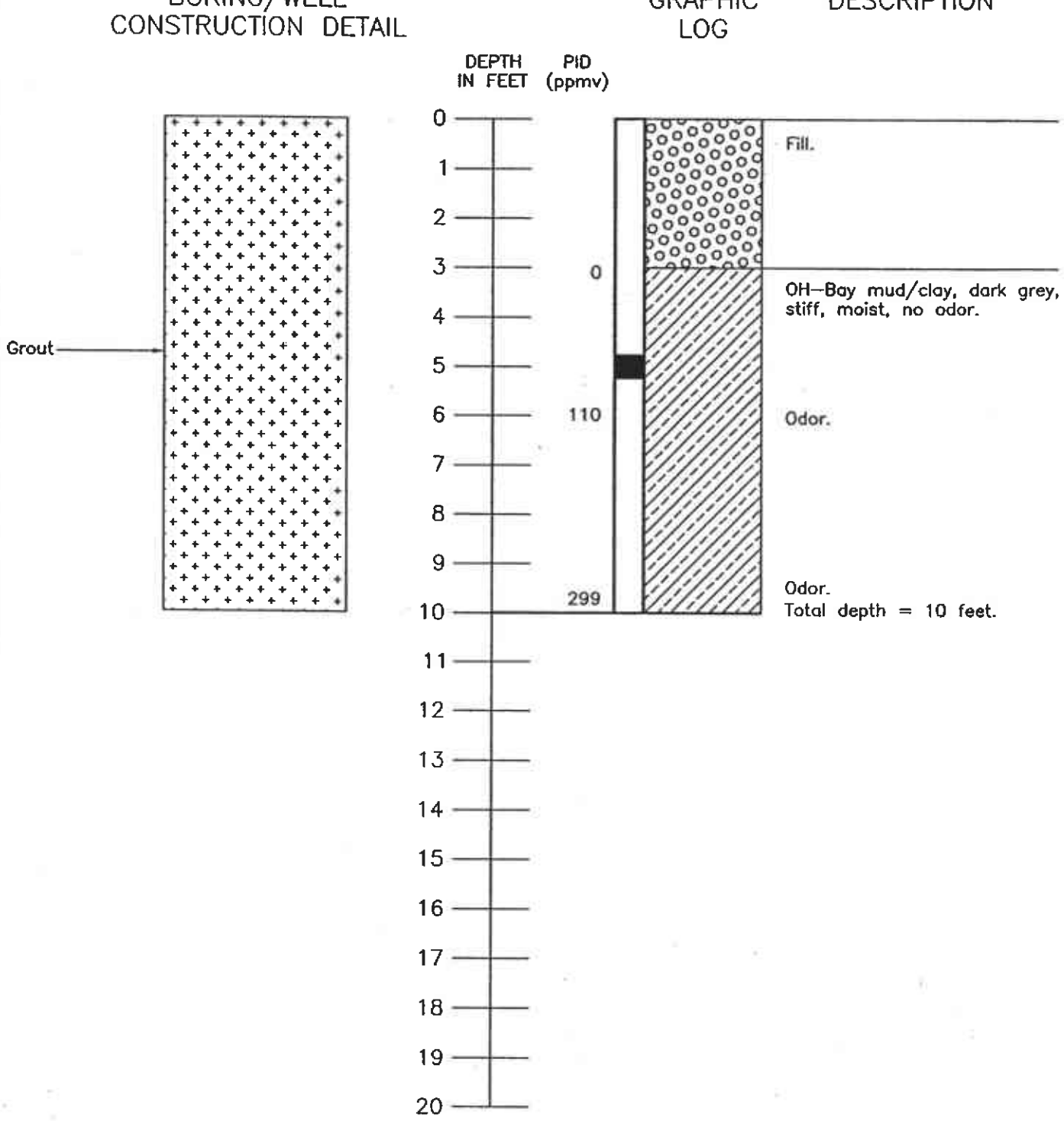
- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- est K Estimated permeability (hydraulic conductivity) 1K=primary, 2K=secondary
- NR No recovery

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

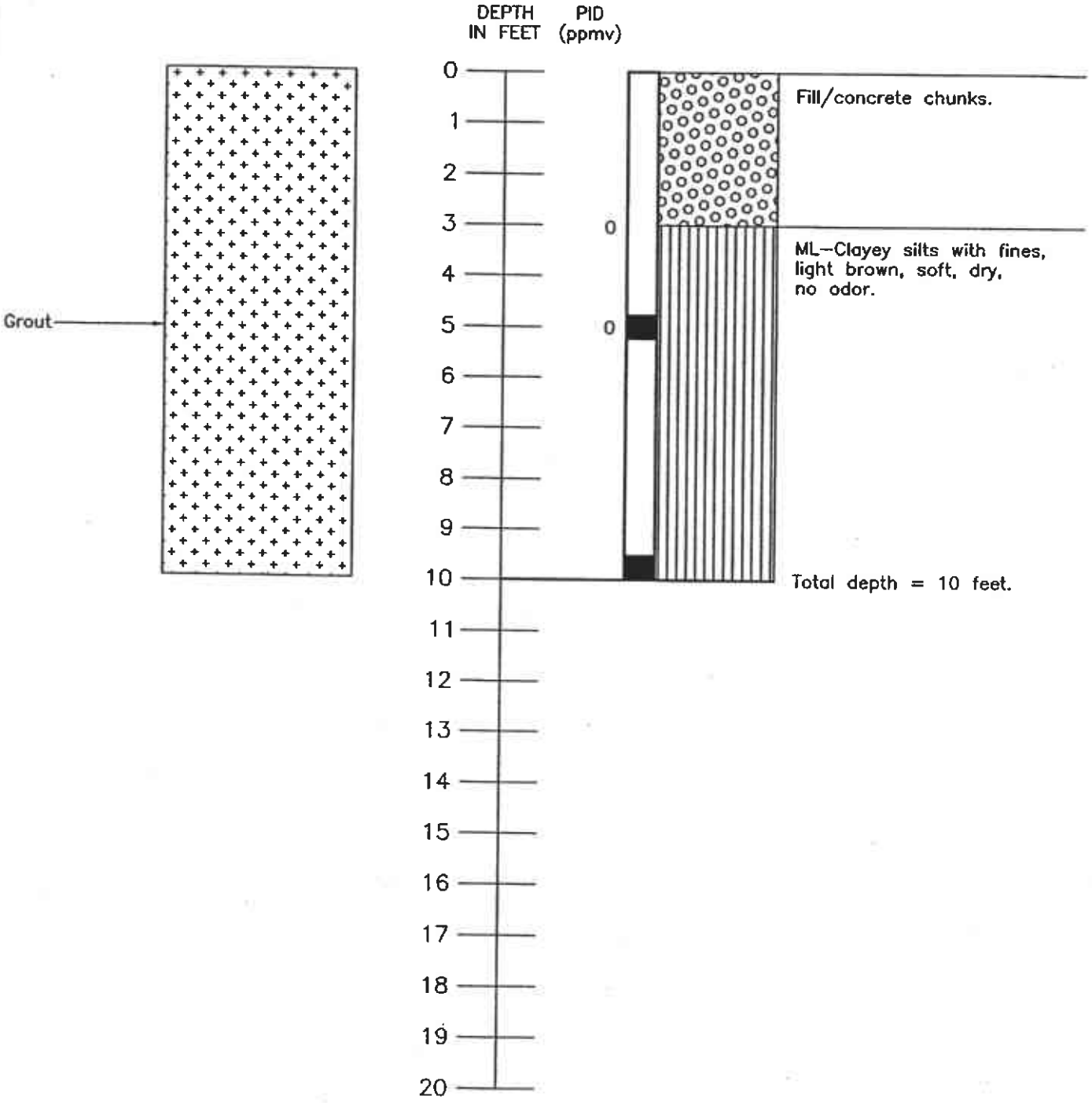
APEX ENVIROTECH, INC.

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

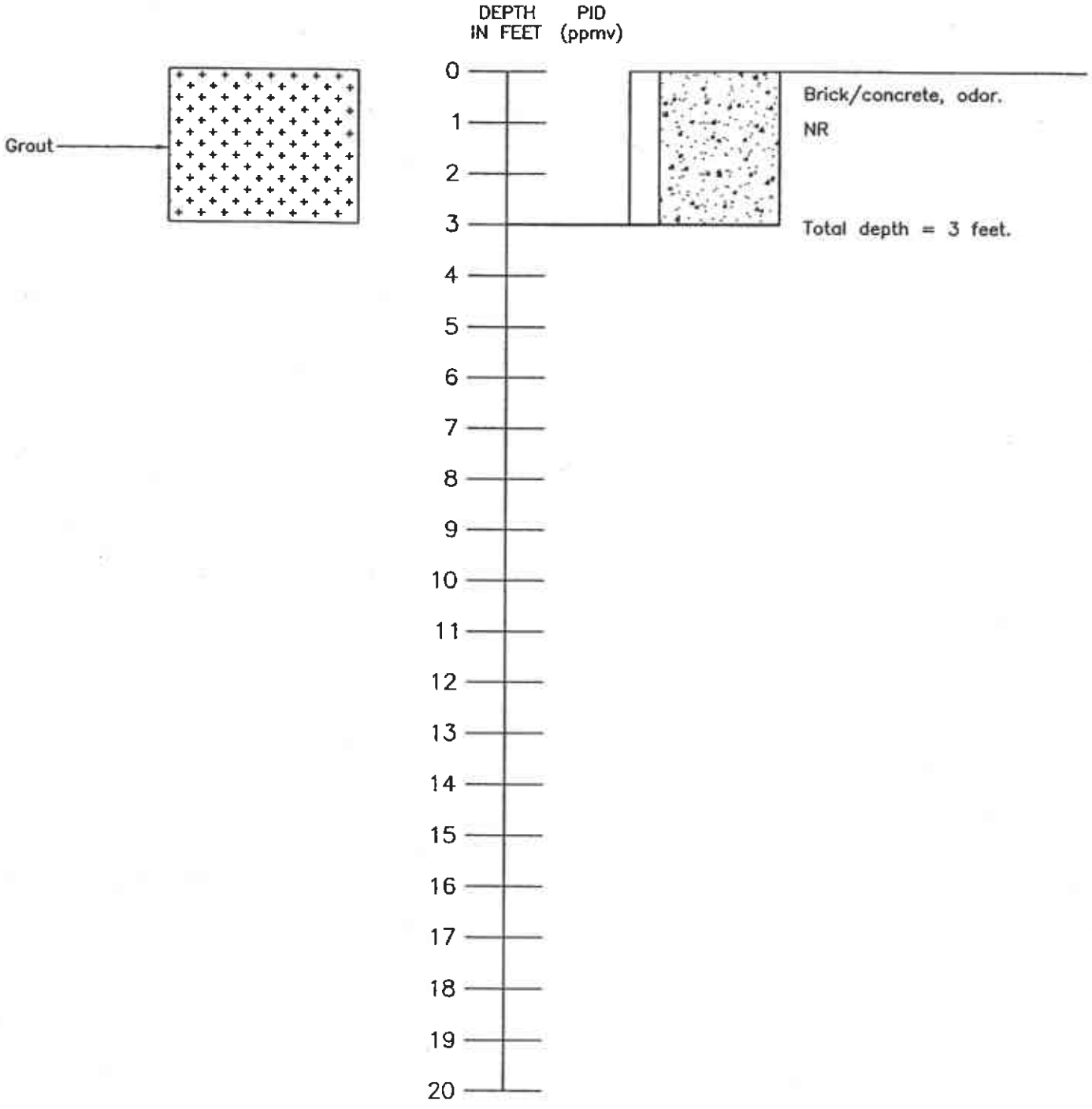
APEX ENVIROTECH, INC.

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

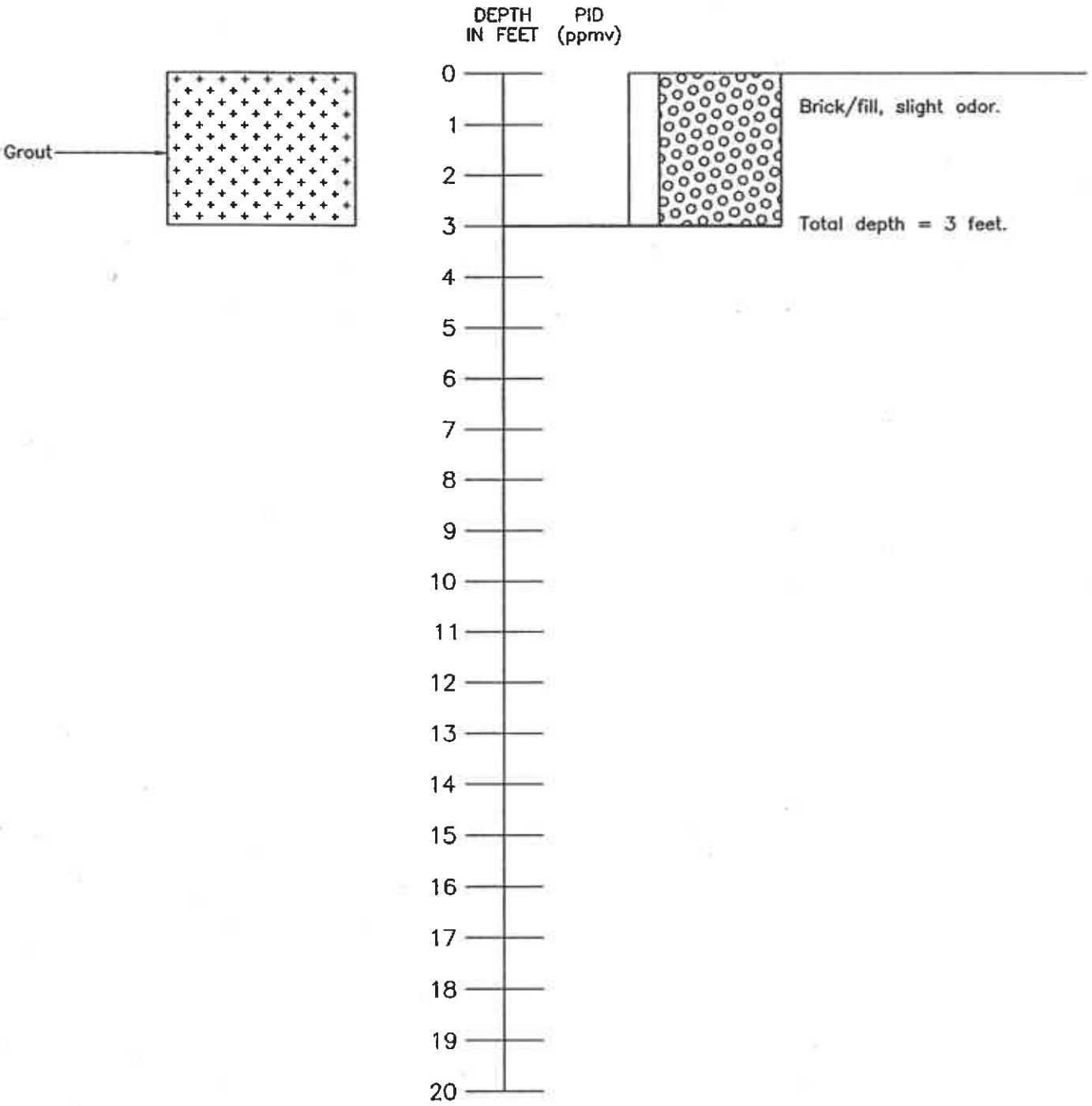
APEX ENVIROTECH, INC.

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

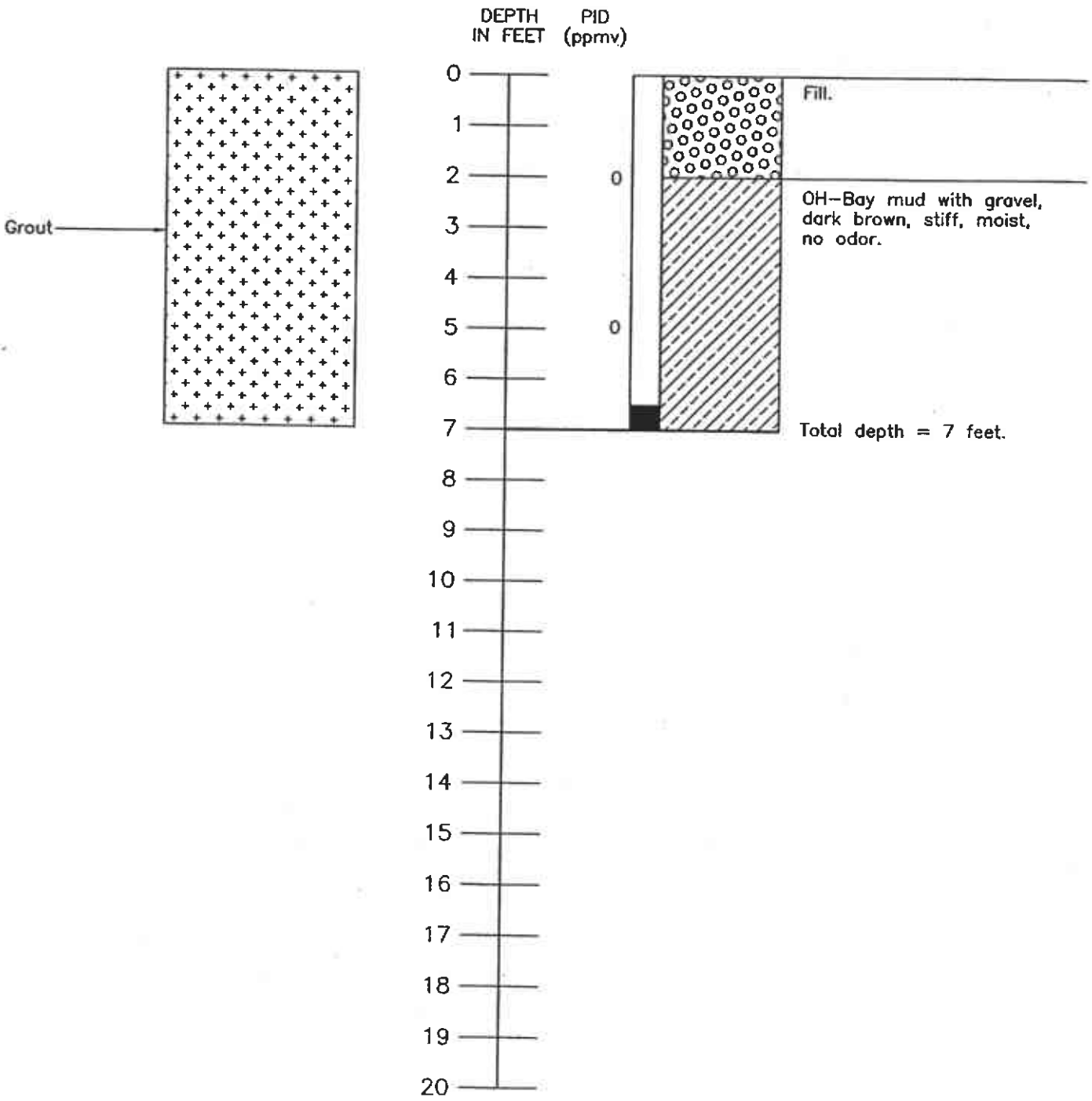
APEX ENVIROTECH, INC.

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

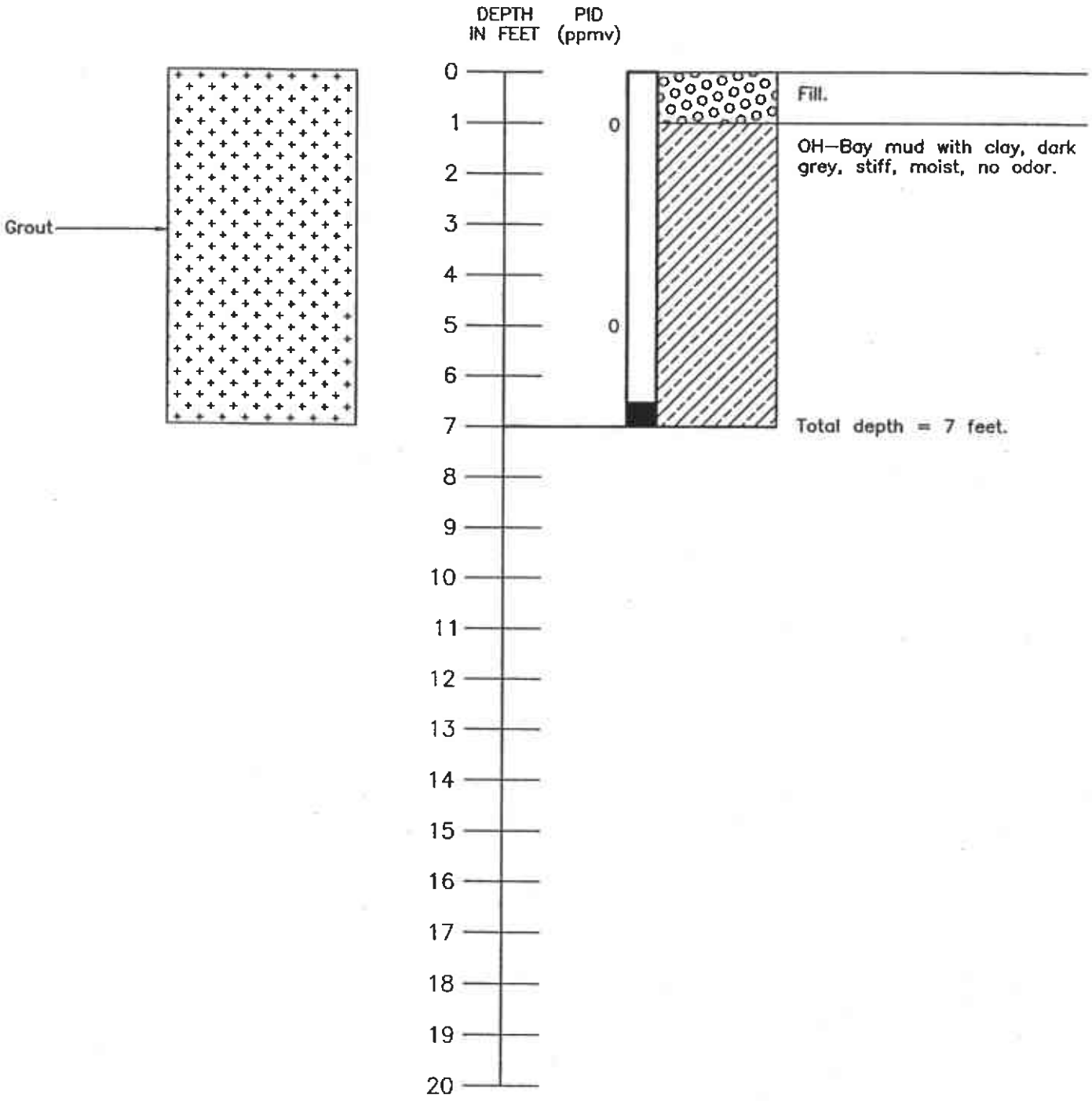
APEX ENVIROTECH, INC.

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

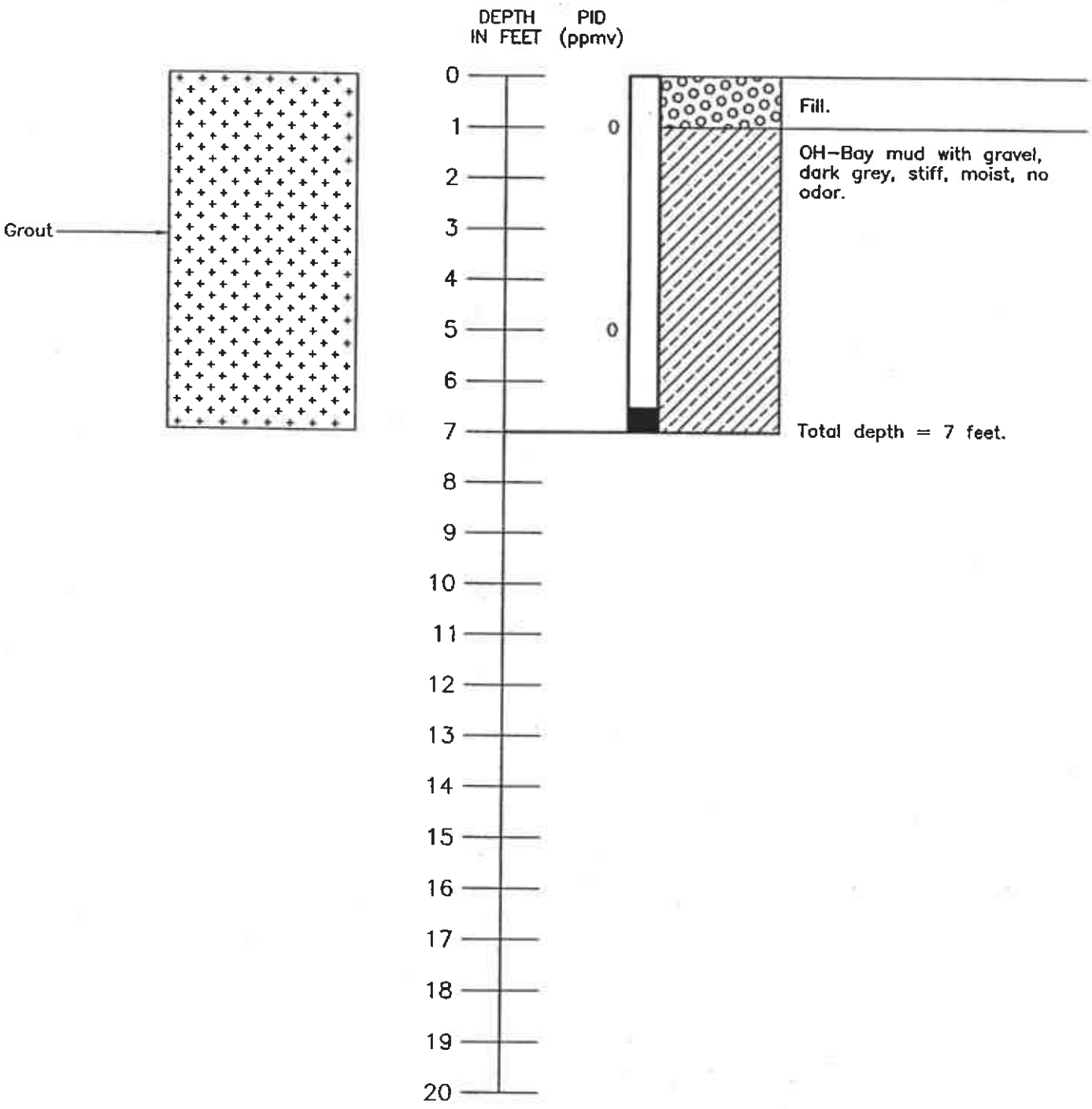
APEX ENVIROTECH, INC.

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

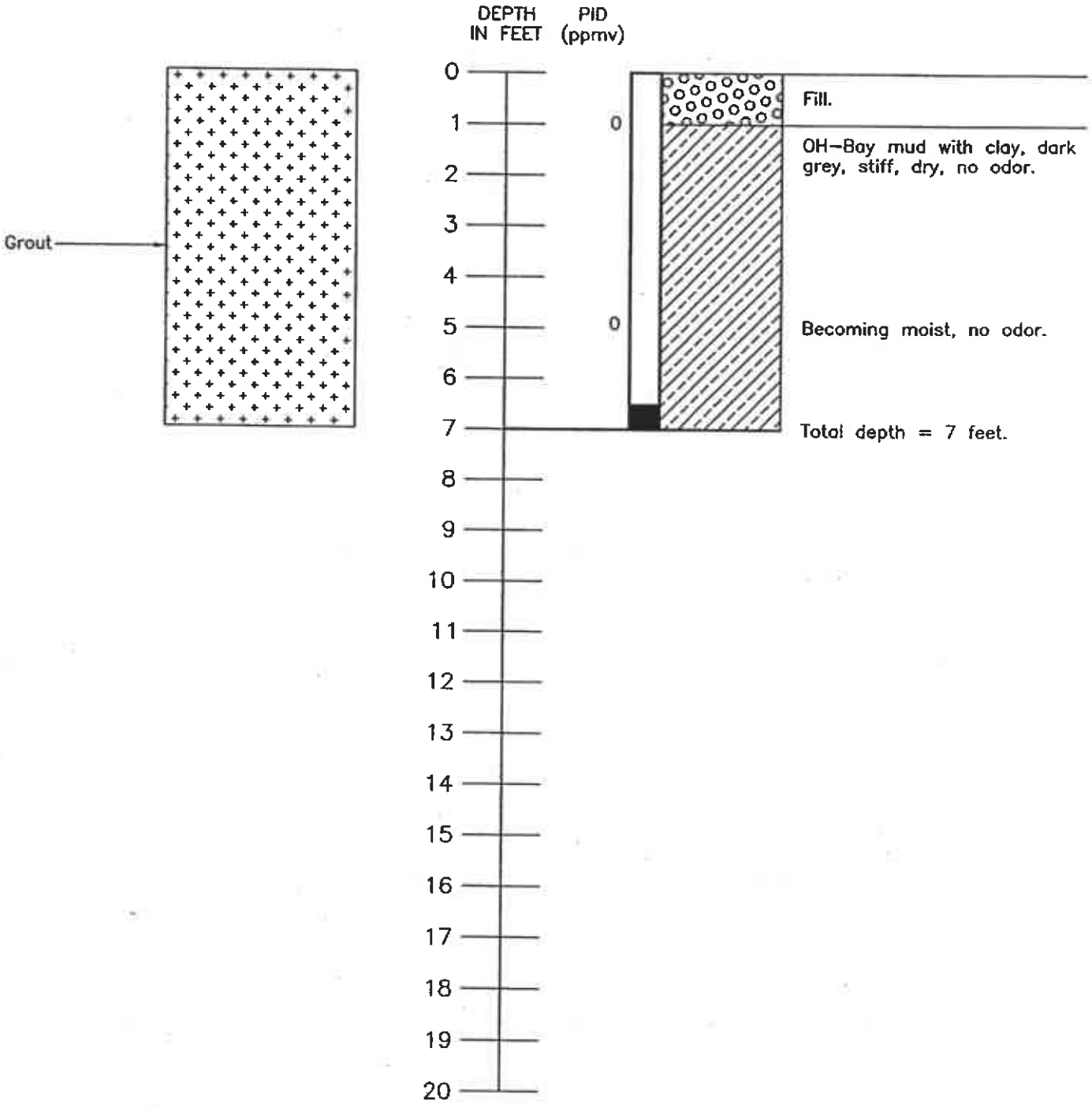
APEX ENVIROTECH, INC.

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

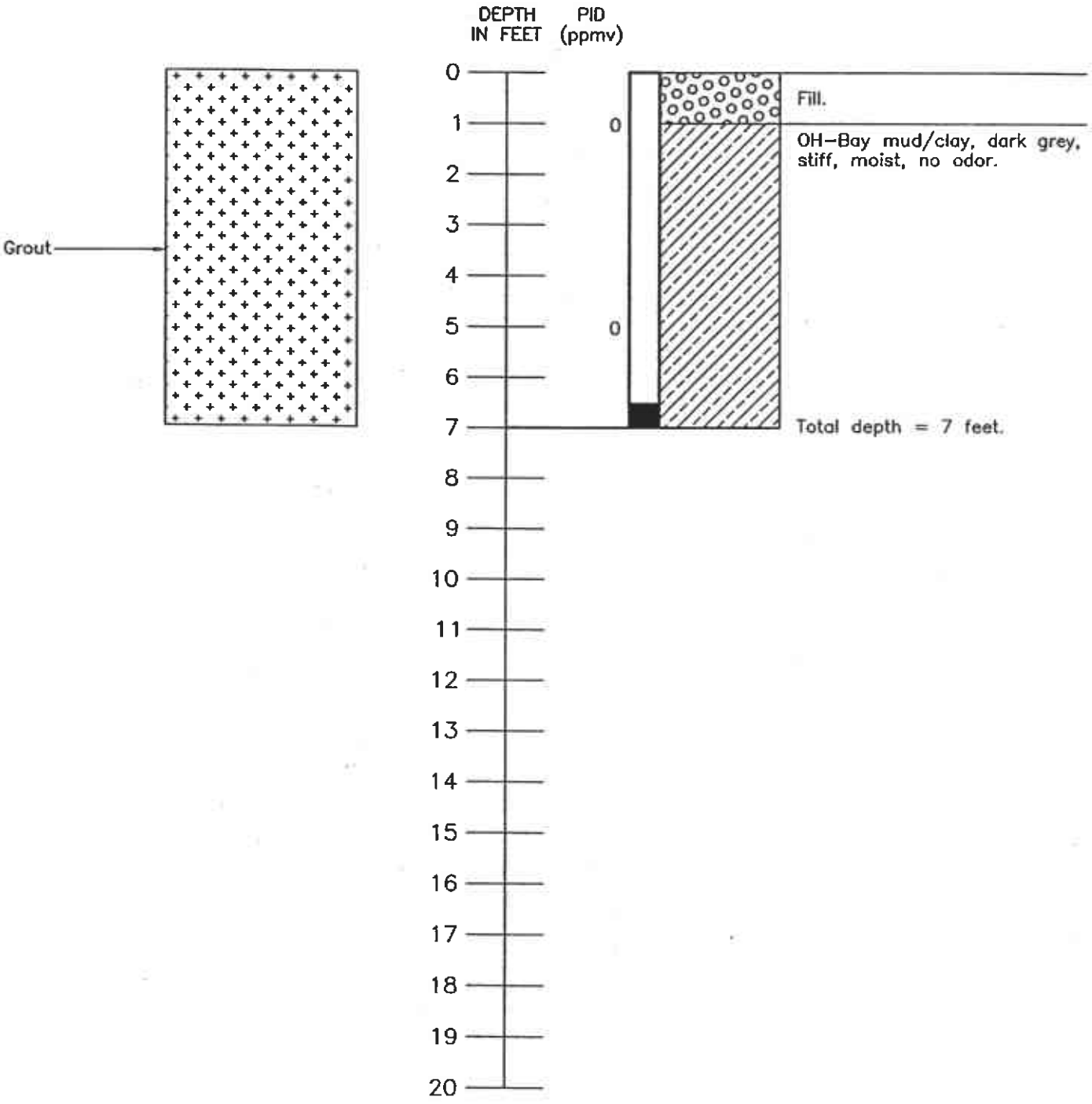
APEX ENVIROTECH, INC.

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

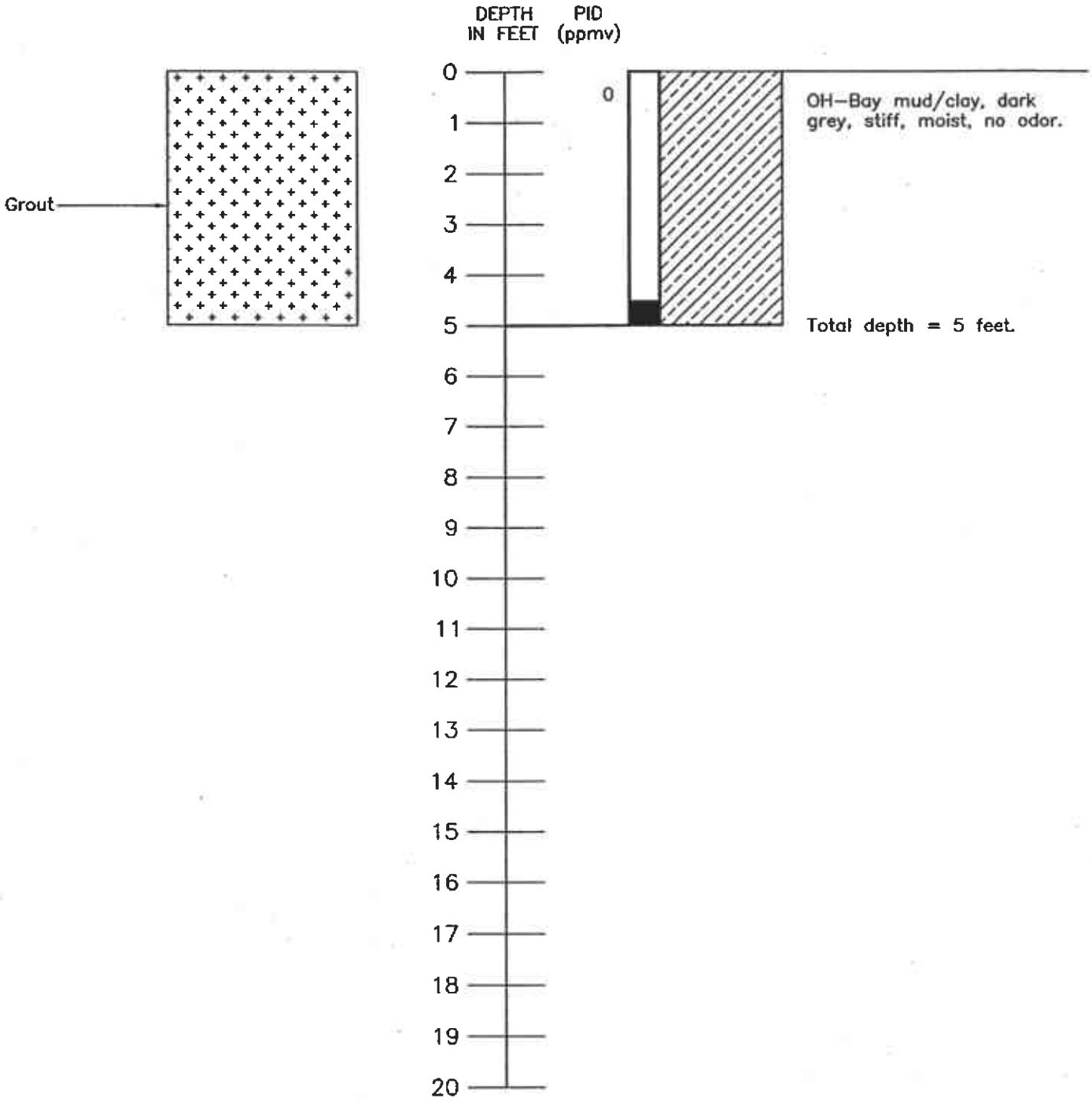
APEX ENVIROTECH, INC.

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

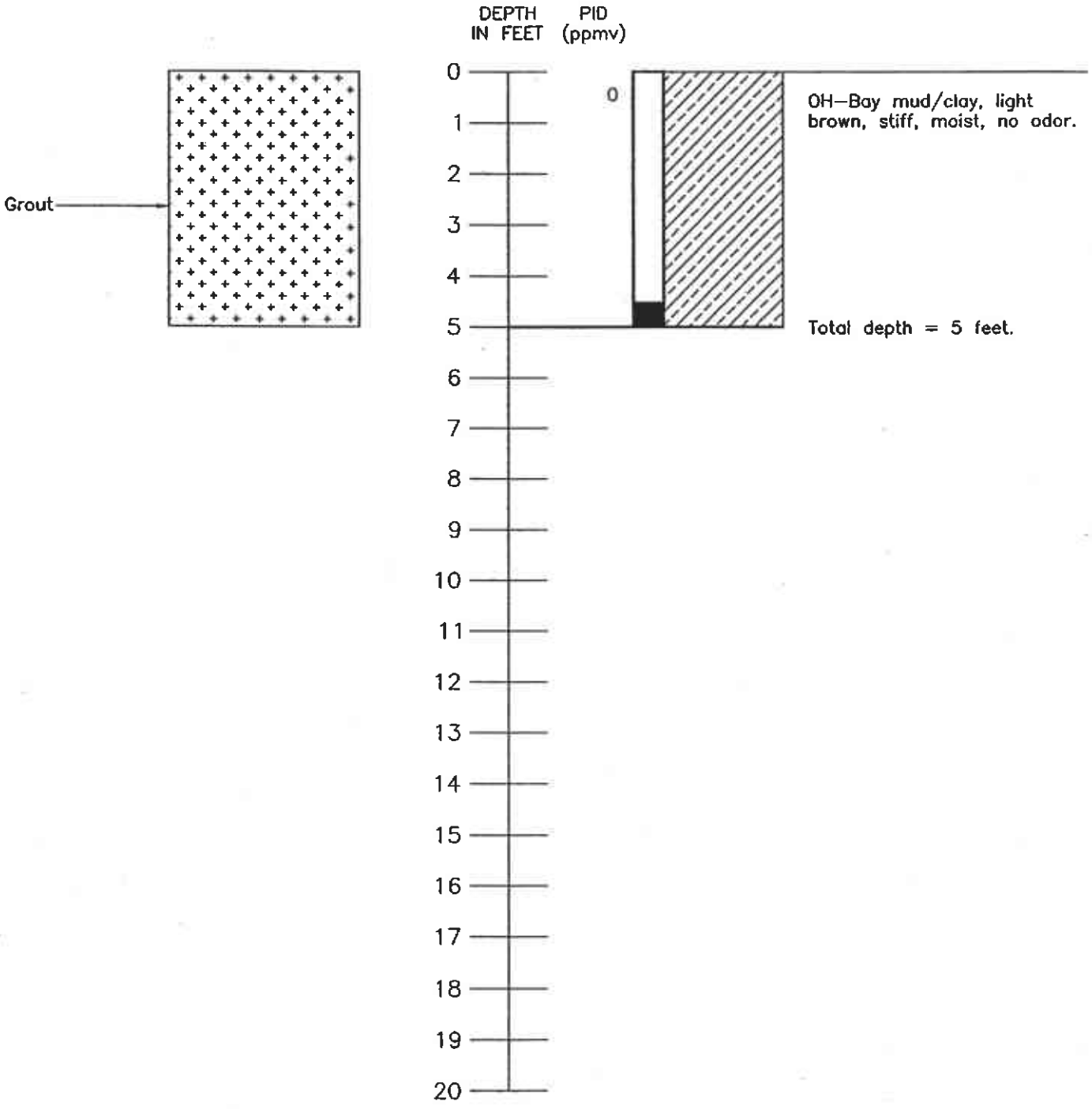
APEX ENVIROTECH, INC.

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

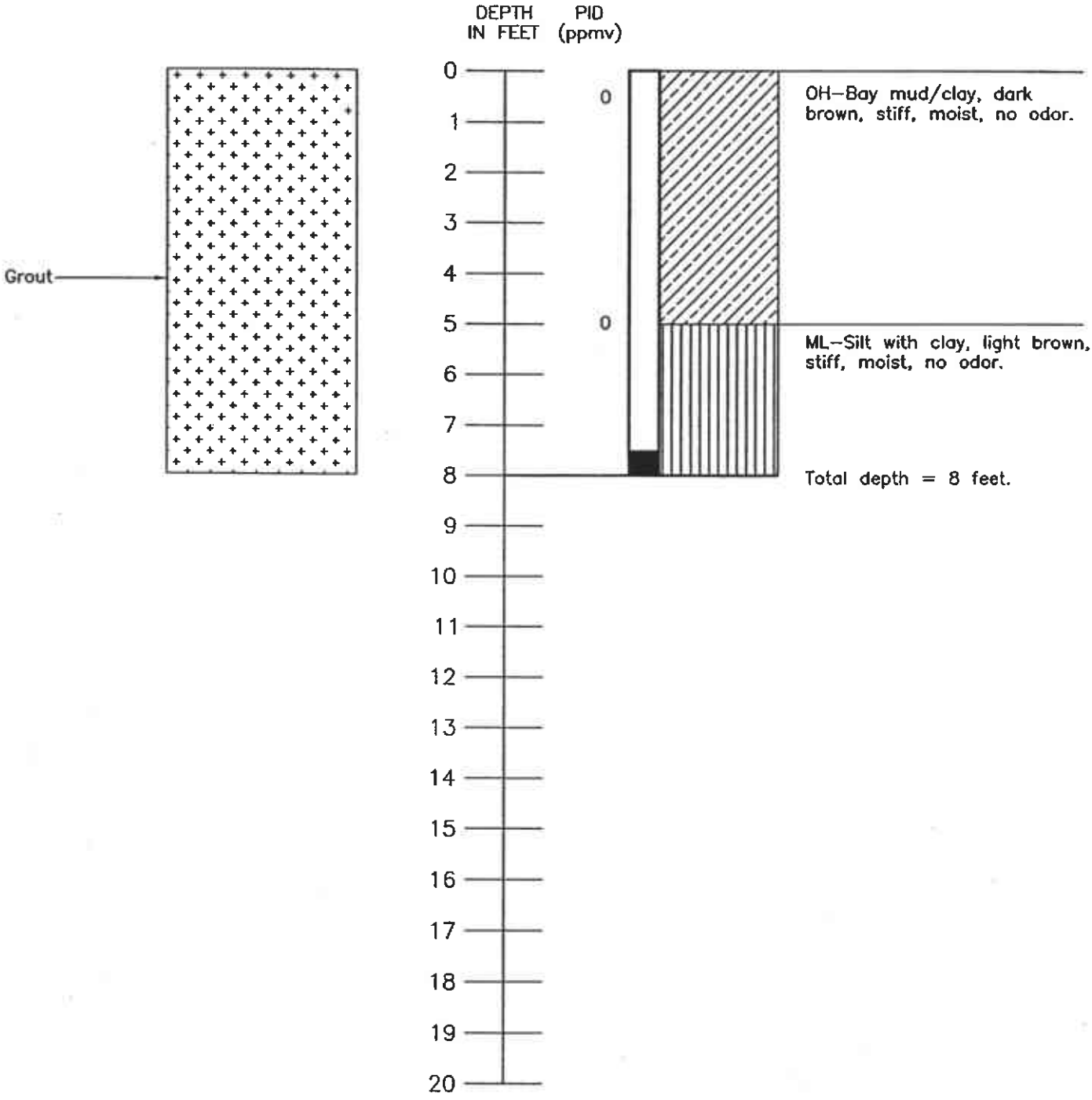
APEX ENVIROTECH, INC.

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

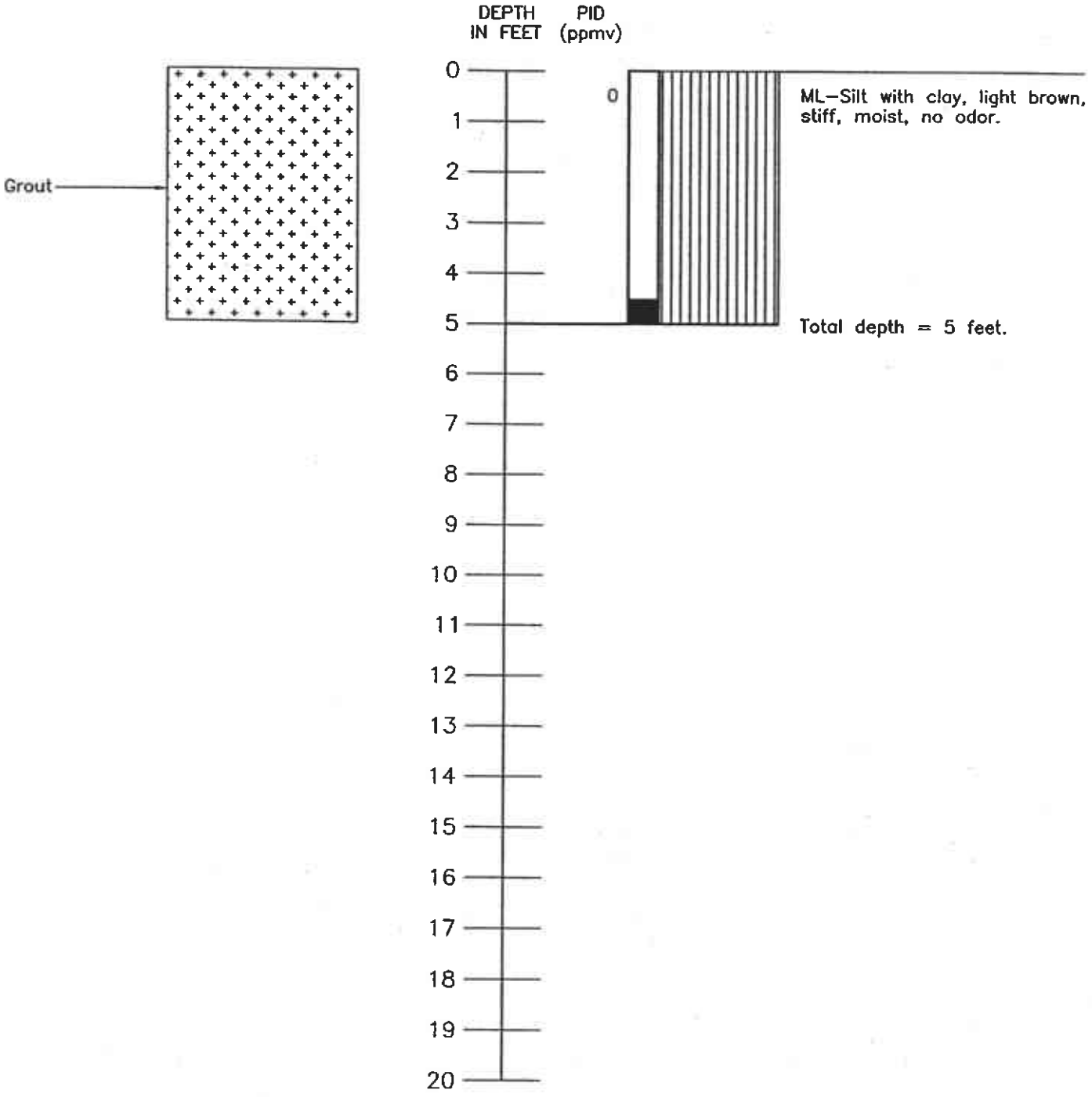
APEX ENVIROTECH, INC.

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**

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:\ENGINEERING\TW\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								
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	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 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			10		44	19	111		PP = 3.25 tsf
brown, mottled black below 13½ feet	Hard		15		90				PP > 4.5 tsf
SAND (SC), rusted brown, fine- to coarse-grained, with clay, trace gravel (fine, angular to subangular)	Dense		20		52				
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\GINTV\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							
SAND (SC), continued	Dense								
clayey below 28½ feet	Medium Dense		30		24				
CLAY (CL), brown, mottled red	Hard				36				
			35						

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	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT(%)	DRY DENSITY (PCF)	UNCONFINED COMPRESSIVE STRENGTH (KSF)	OTHER TESTS
DESCRIPTION AND REMARKS	CONSIST	SOIL TYPE	(FEET)						
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				
					22	26	98	2.3	
SAND (SC), light brown, mottled orange, fine- to coarse-grained, with clay, moist	Medium Dense		5						
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				

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

HARZA
Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

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

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	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 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\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	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								
(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

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

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

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

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				50/6"				
FILL: CLAY (CL), dark gray & brown, sandy (fine- to coarse-grained), trace gravel (fine, subangular), moist									
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

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 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:\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	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				
SAND (SW-SC), brown, fine- to coarse-grained, trace clay	Dense		40		41				Gradation Test Passing No.200 Sieve = 16%

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:\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	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	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: 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.

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

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

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

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				12				
			5						
	Very Stiff				34				
(dark brown at 9 feet)									
SAND (SC), brown, fine- to coarse-grained, with clay, moist	Dense		10						
					75	19	112		
			15						
CLAY (CL), brown, some silt, trace sand (fine- to coarse-grained), trace gravel (fine, subangular), wet	Stiff								
					14				
			20						
	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:\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	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)						
CLAY (CL), continued	Hard								
(some sand below 28½ feet)	Very Stiff		30		24				
			35		24				

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 15 feet during drilling.
5. The boring was grouted with neat cement immediately upon completion.

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

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

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

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

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	Very Stiff								PP = 2.25 tsf
			30		35	24	104		PP = 3.50 tsf
(trace fine-grained sand below 33½ feet)	Stiff		35		14				
(silty at 39 feet)					45				PP = 2.0 tsf
(sandy, fine- to coarse-grained, at 40 feet)			40						
			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\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 (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)			60		53				
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				

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

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Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

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

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

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

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

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

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)					18				
			5						
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 (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		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

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

HARZA Engineering Company

EXPLORATORY BORING LOG

ANDANTE EMERYVILLE DEVELOPMENT
Emeryville, California

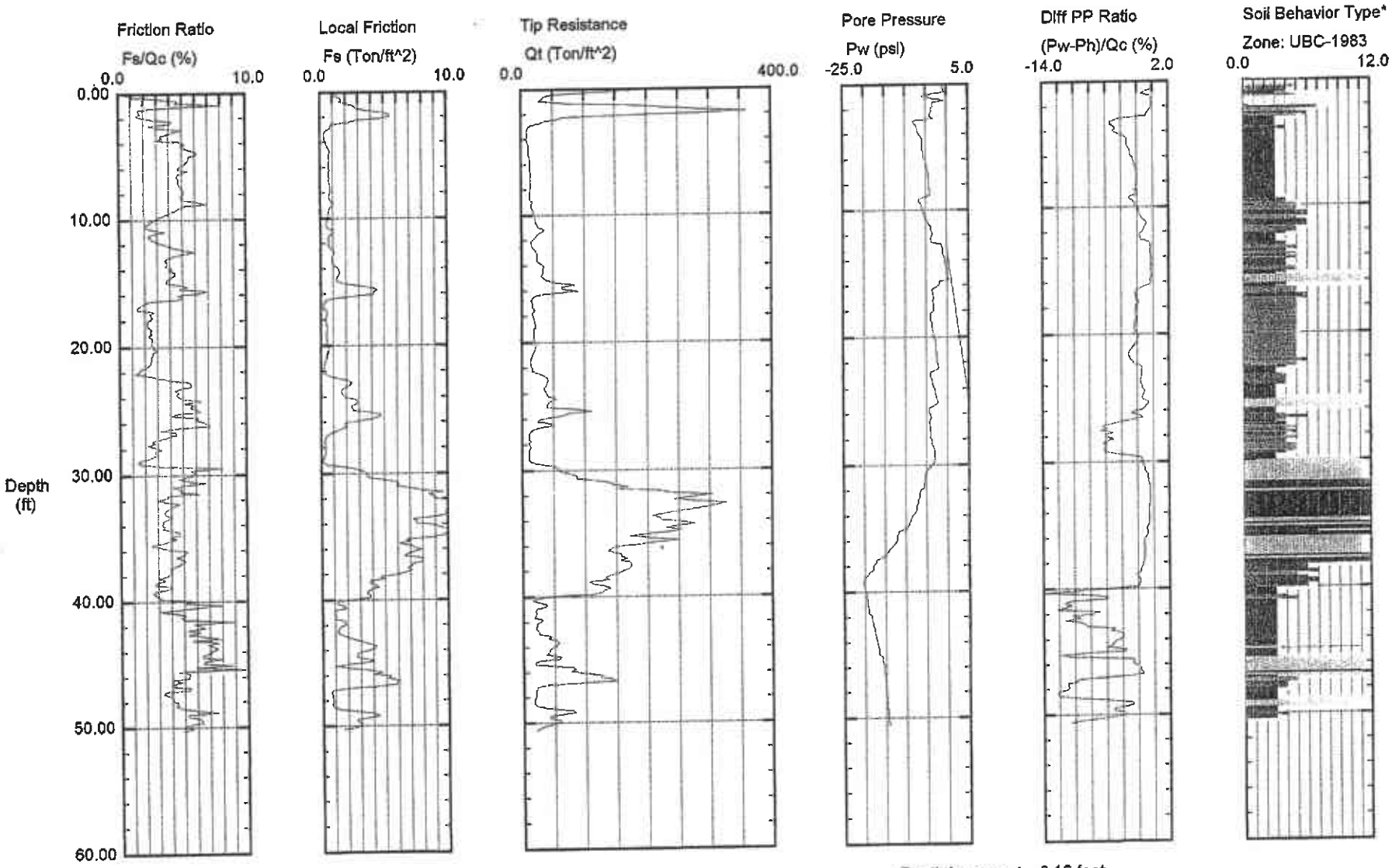
PROJECT NO.	DATE	BORING NO.
17752-CA	December 2000	**EB-12**

*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

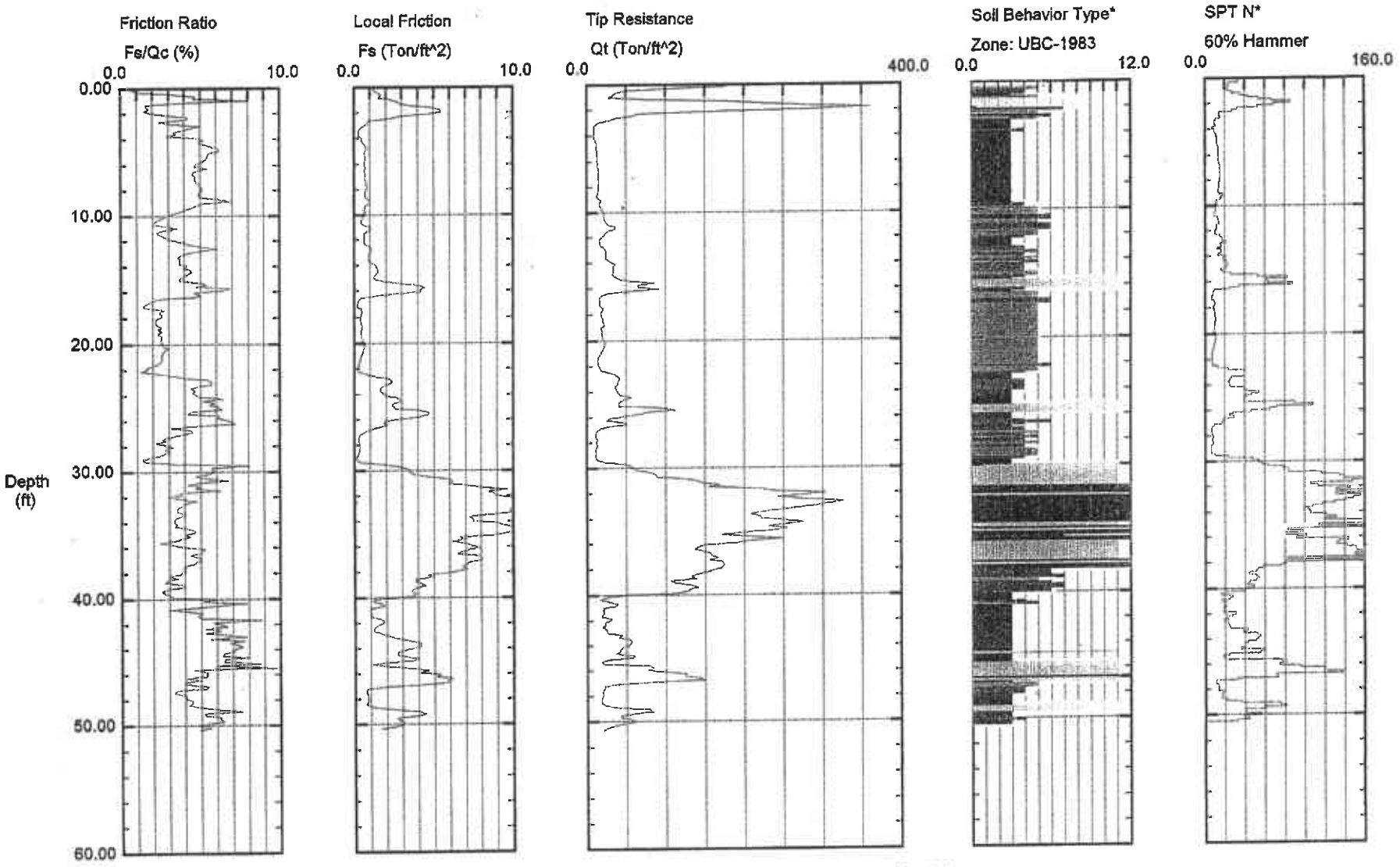
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*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

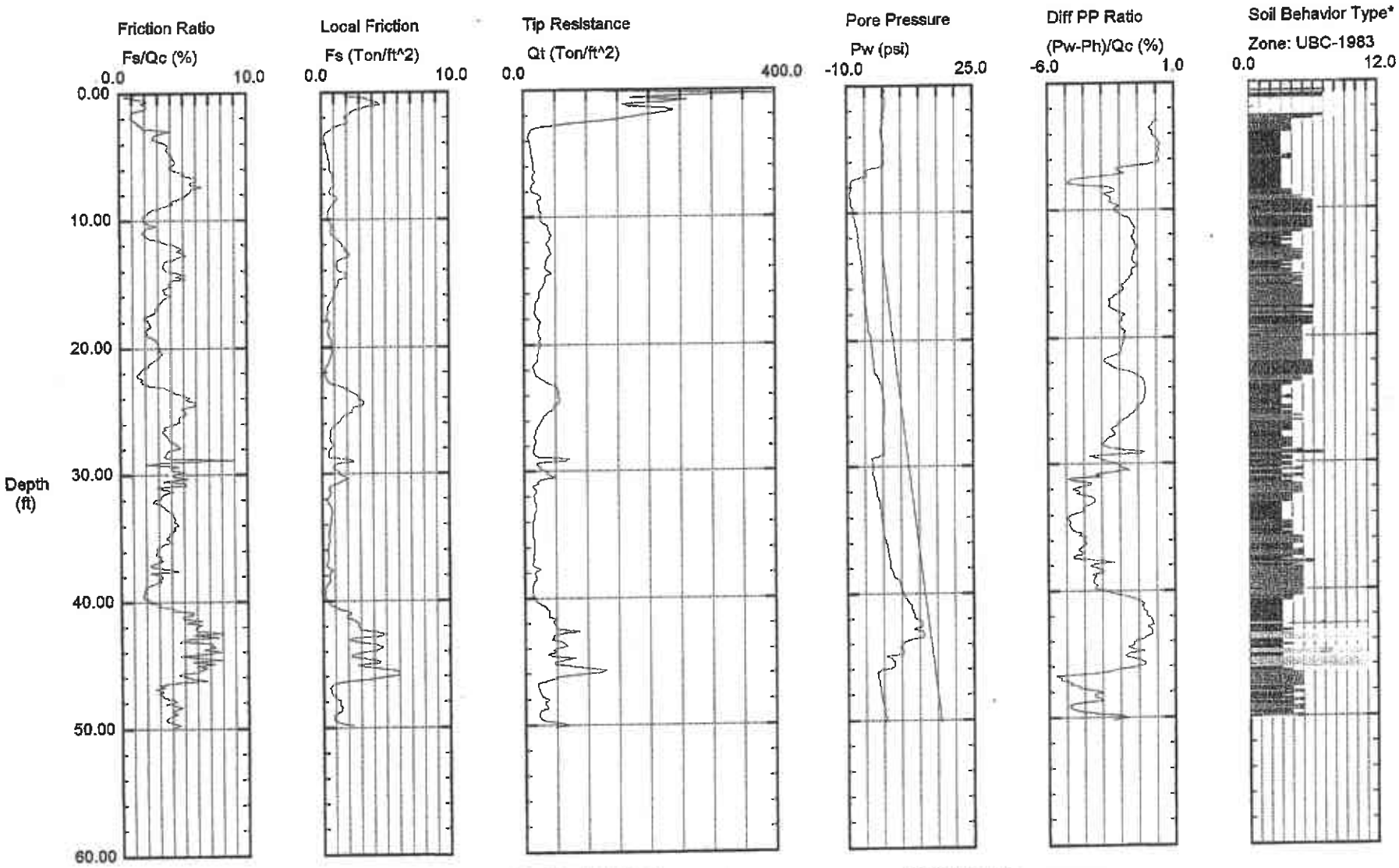
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*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

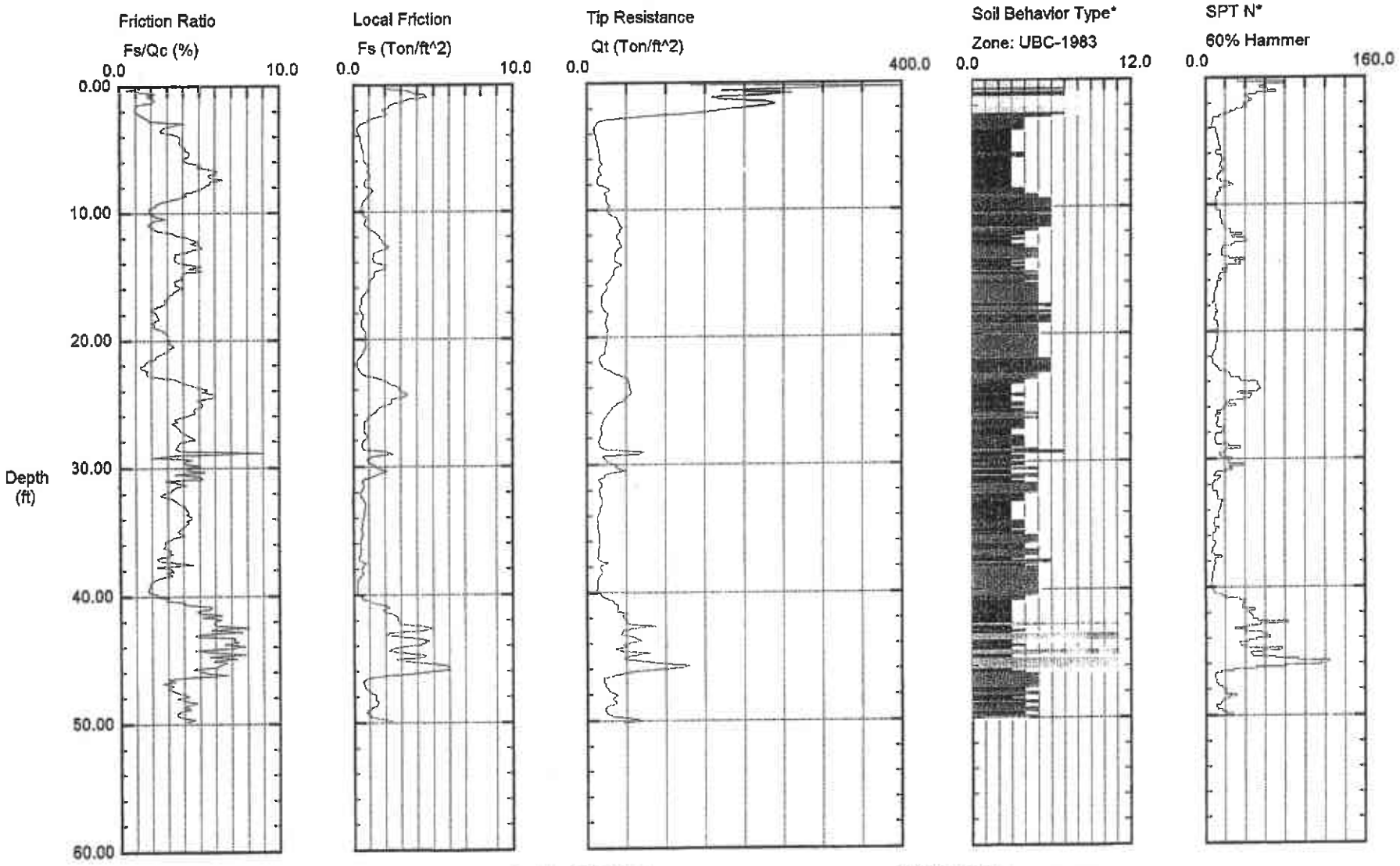
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

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

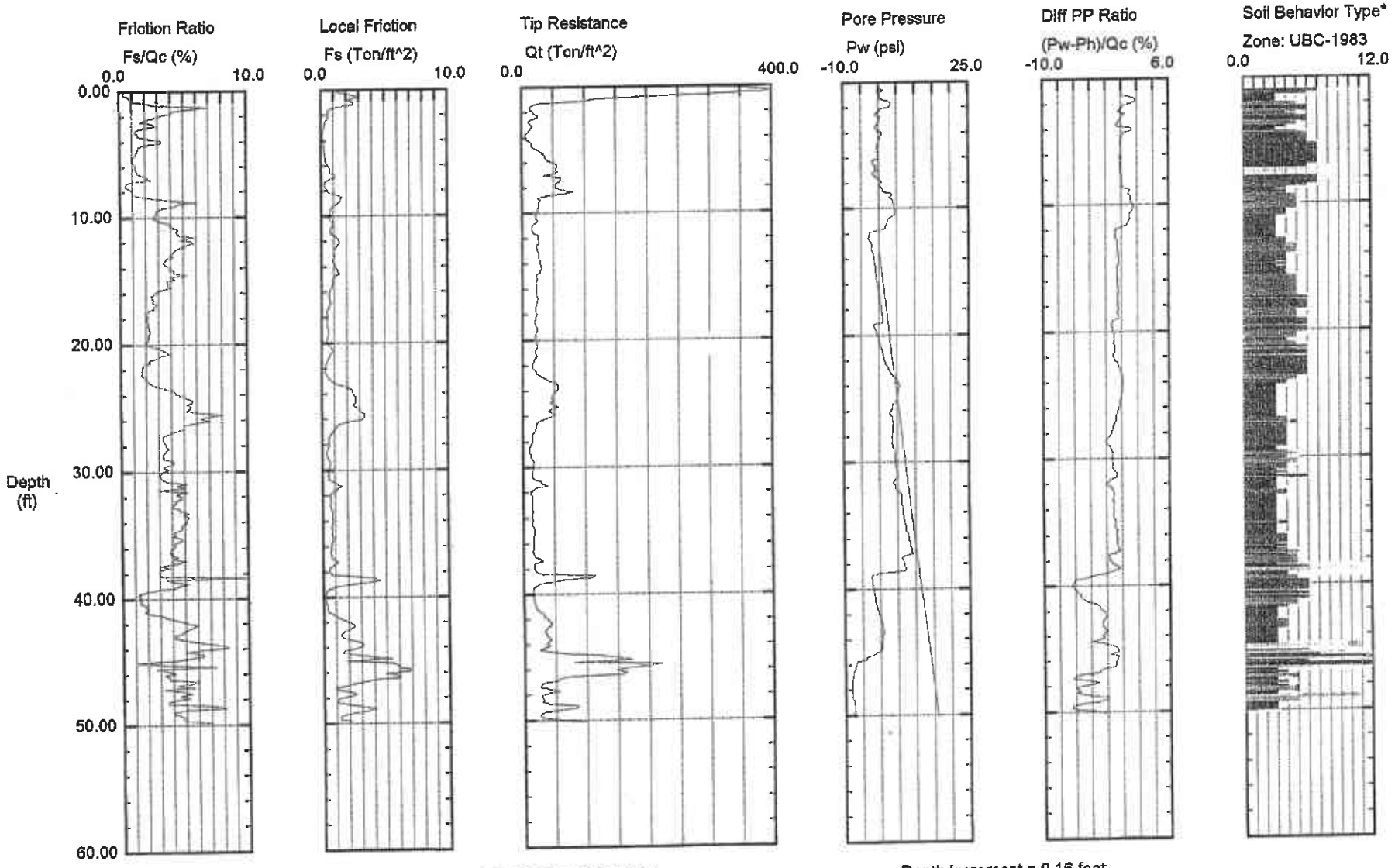
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*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

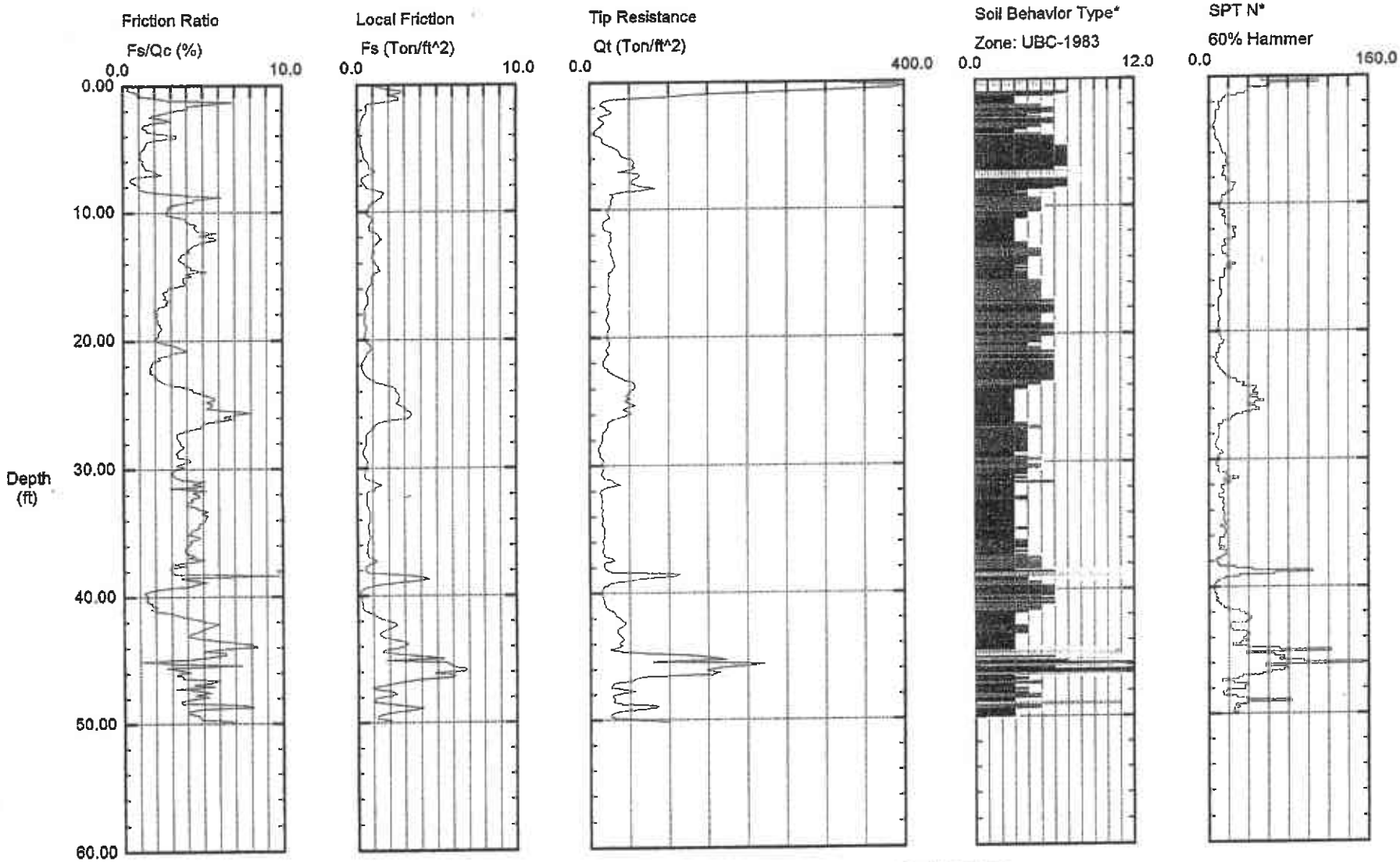
1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*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 (*)

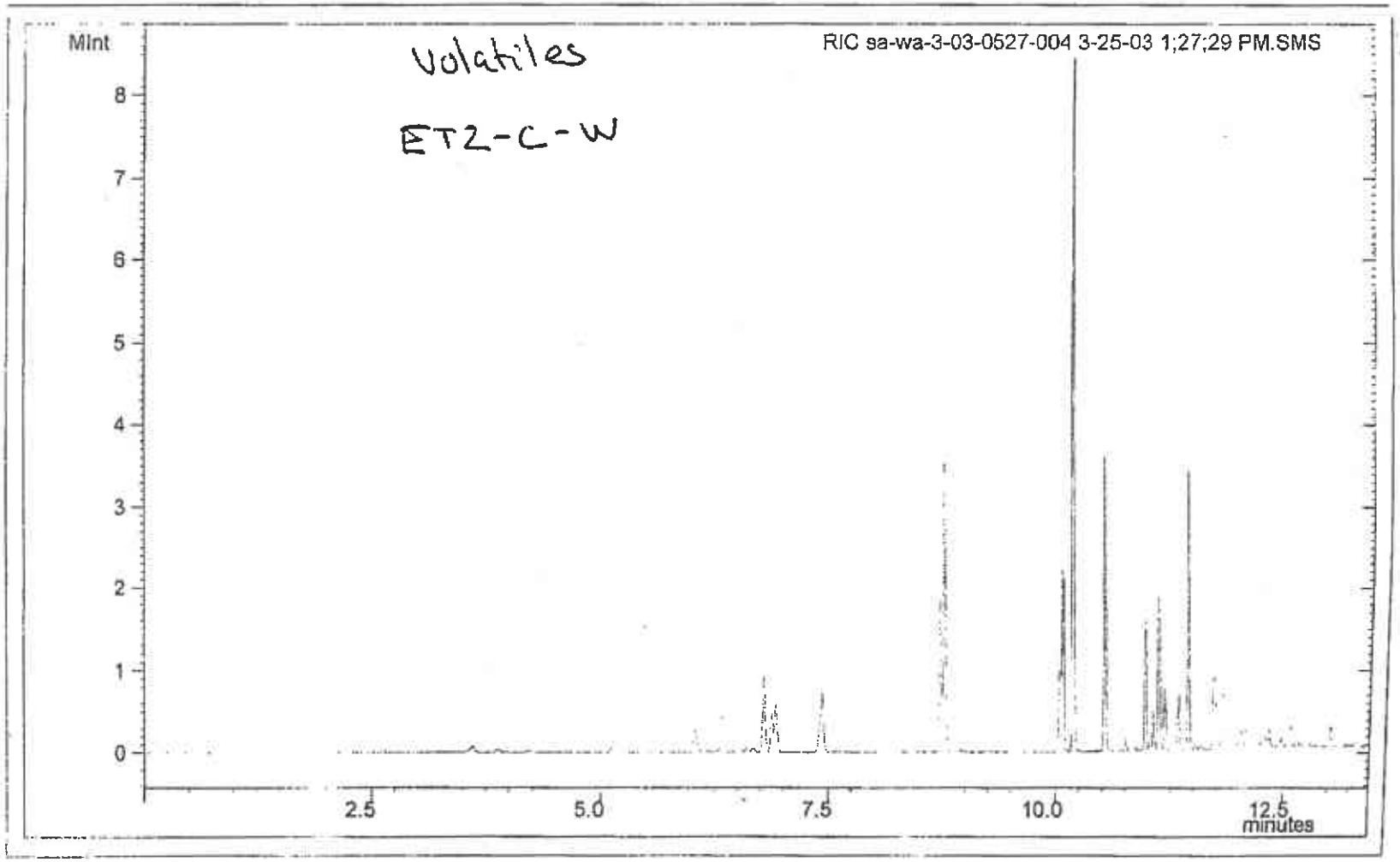
APPENDIX I-C

Chromatograms

CHROMATOGRAM REPORT

EPA Method 8260A

Lab File ID:	d:\data\200303\032503\sa-wa-3-03-0527-004 3-25-03 1;27;29 PM.SM	Calibration File:	D:\DATA\200301\010703\blk 1-7-03 6;35;30 PM.SMS
Acquisition Date:	3/25/03 13:27	Calibration Date Range:	1/29/03 14:23 1/29/03 17:00
EPA Sample No:	sa-wa-3-03	Operator:	ac
Lab Sample ID:	sa-wa-3-03-0527-004	Dilution:	1

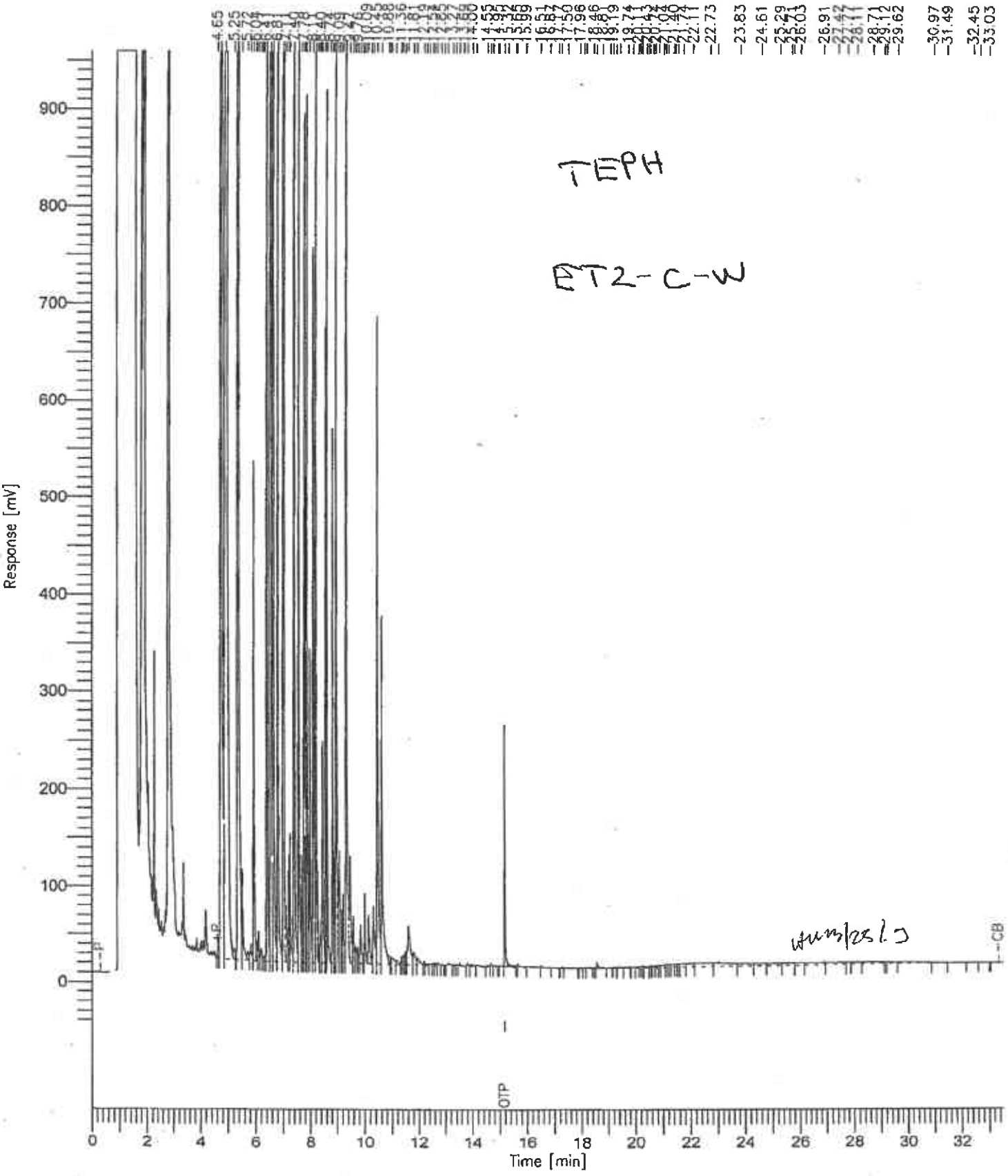


Approved_____ Date_____

Chromatogram

Sample Name : 030527-004-10X
FileName : M:\200303\DATA\6325012.raw
Method : 6TPH0228
Start Time : 0.00 min End Time : 33.50 min
Scale Factor: -1.0 Plot Offset: -40 mV

Sample #: 032501 Page 1 of 1
Date : 03/25/2003 12:10
Time of Injection: 03/25/2003 11:36
Low Point : -40.47 mV High Point : 959.53 mV
Plot Scale: 1000.0 mV



TEPH

ET2-C-W

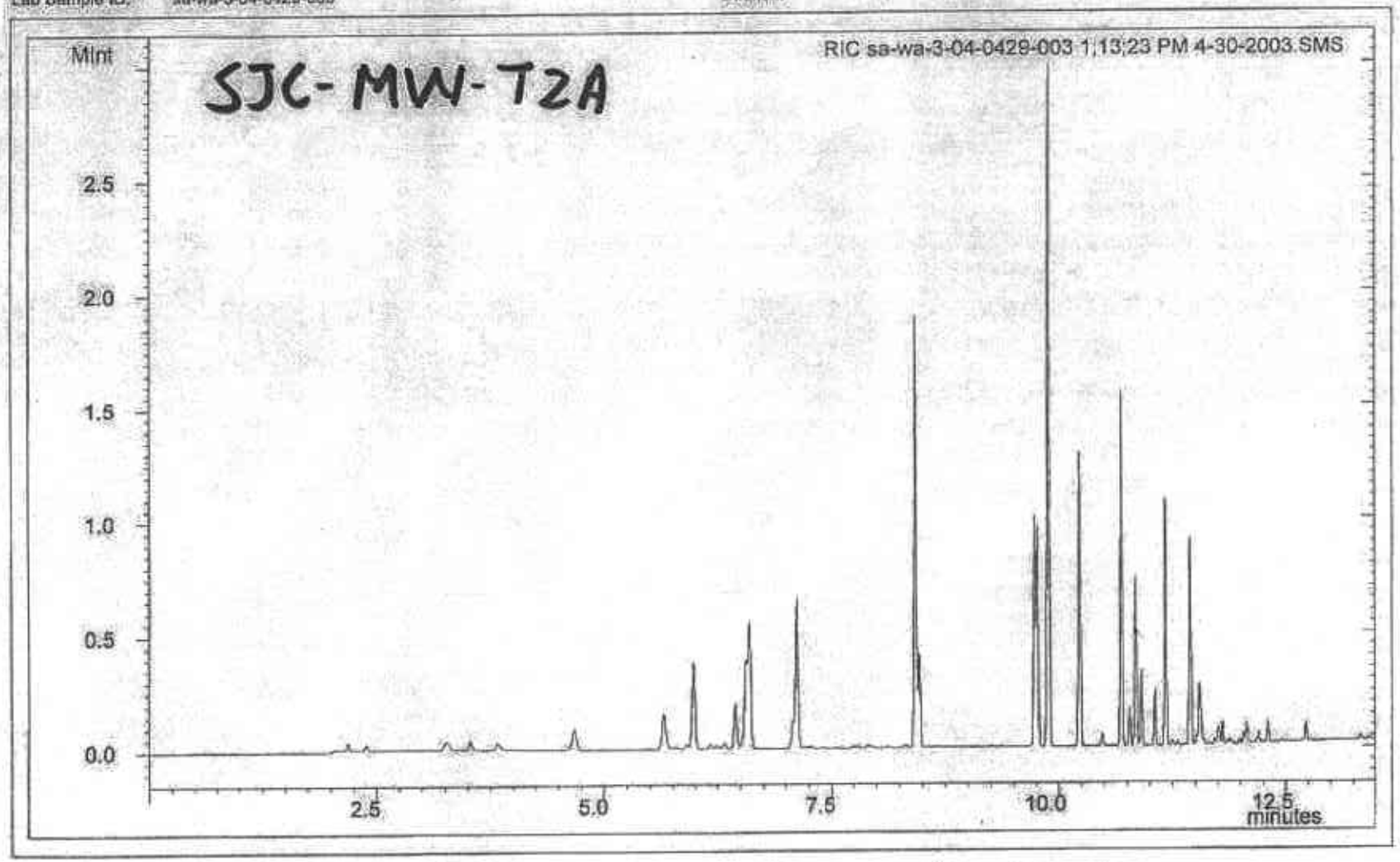
wm 3/28/03

CHROMATOGRAM REPORT

EPA Method 8260B FUOXY 041703

Lab File ID: c:\saturnws\data\200304\043003\sa-wa-3-04-0429-003 1;13;23 PM 4-
Acquisition Data: 4/30/2003 13:13
EPA Sample No: sa-wa-3-04
Lab Sample ID: sa-wa-3-04-0429-003

Calibration File: C:\SaturnWS\DATA\200304\041703\5_25NG FUOXY 4-17-2003 12
Calibration Date Range: 4/17/200: 12:43 4/17/2003 15:16
Operator:
Dilution: 1



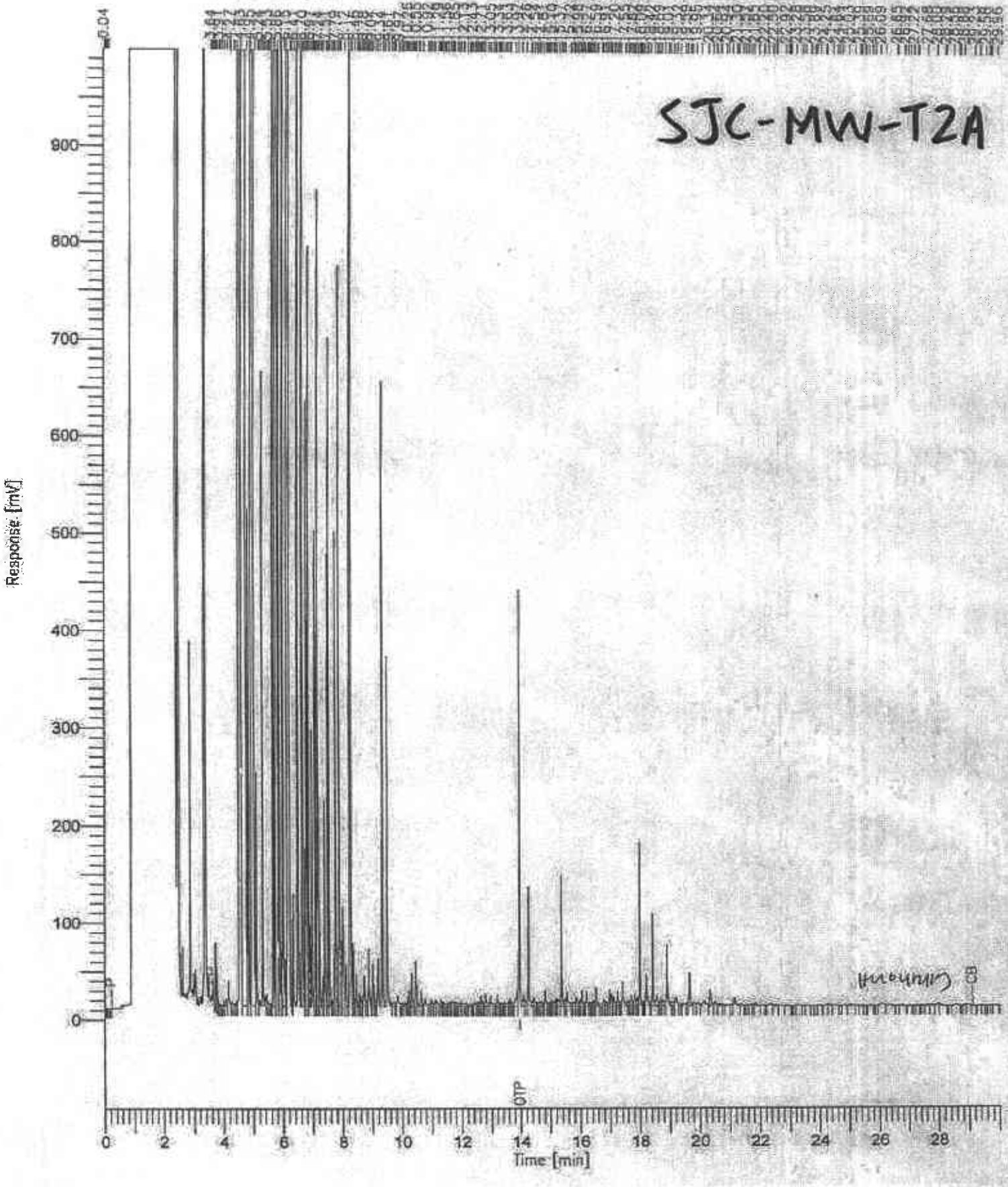
Approved _____ Date _____

Chromatogram

Sample Name : 040429-003
FileName : O:\200304\DATA\5417067.raw
Method : 3TPH0326
Start Time : 0.00 min End Time : 30.00 min
Scale Factor: 0.0 Plot Offset: 0 mV

Sample #: 041702 Page 1 of 1
Date : 04/19/2003 05:09
Time of Injection: 04/19/2003 04:38
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000.0 mV

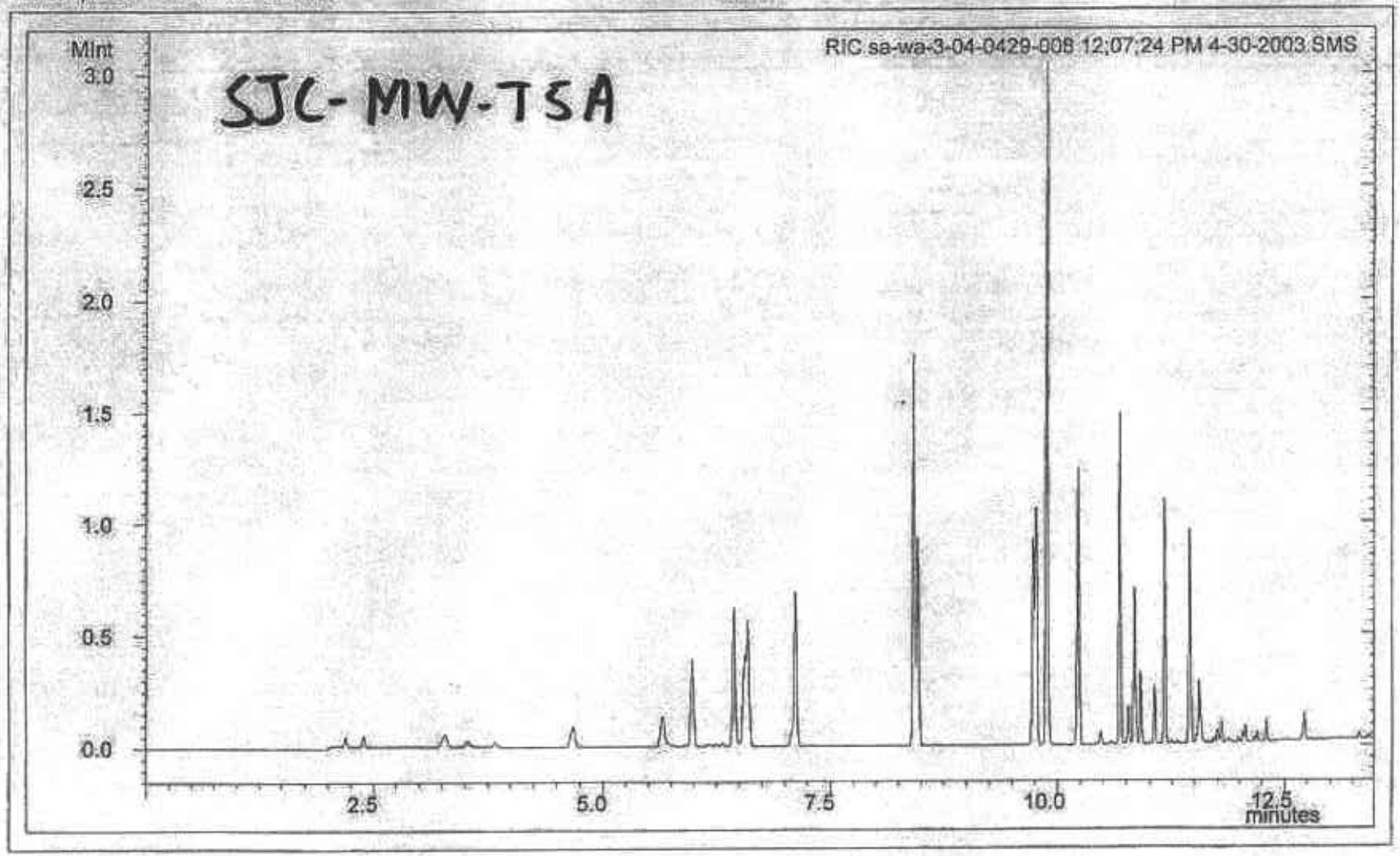
SJC-MW-T2A



CHROMATOGRAM REPORT

EPA Method 8260B FUOXY 041703

Lab File ID:	c:\saturnws\data\200304\043003\sa-wa-3-04-0429-008 12;07;24 PM 4	Calibration File:	C:\SaturnWS\DATA\200304\041703\5_25NG FUOXY 4-17-2003 12
Acquisition Date:	4/30/2003 12:07	Calibration Date Range:	4/17/200: 12:43 4/17/2003 15:16
EPA Sample No:	sa-wa-3-04	Operator:	
Lab Sample ID:	sa-wa-3-04-0429-008	Dilution:	1



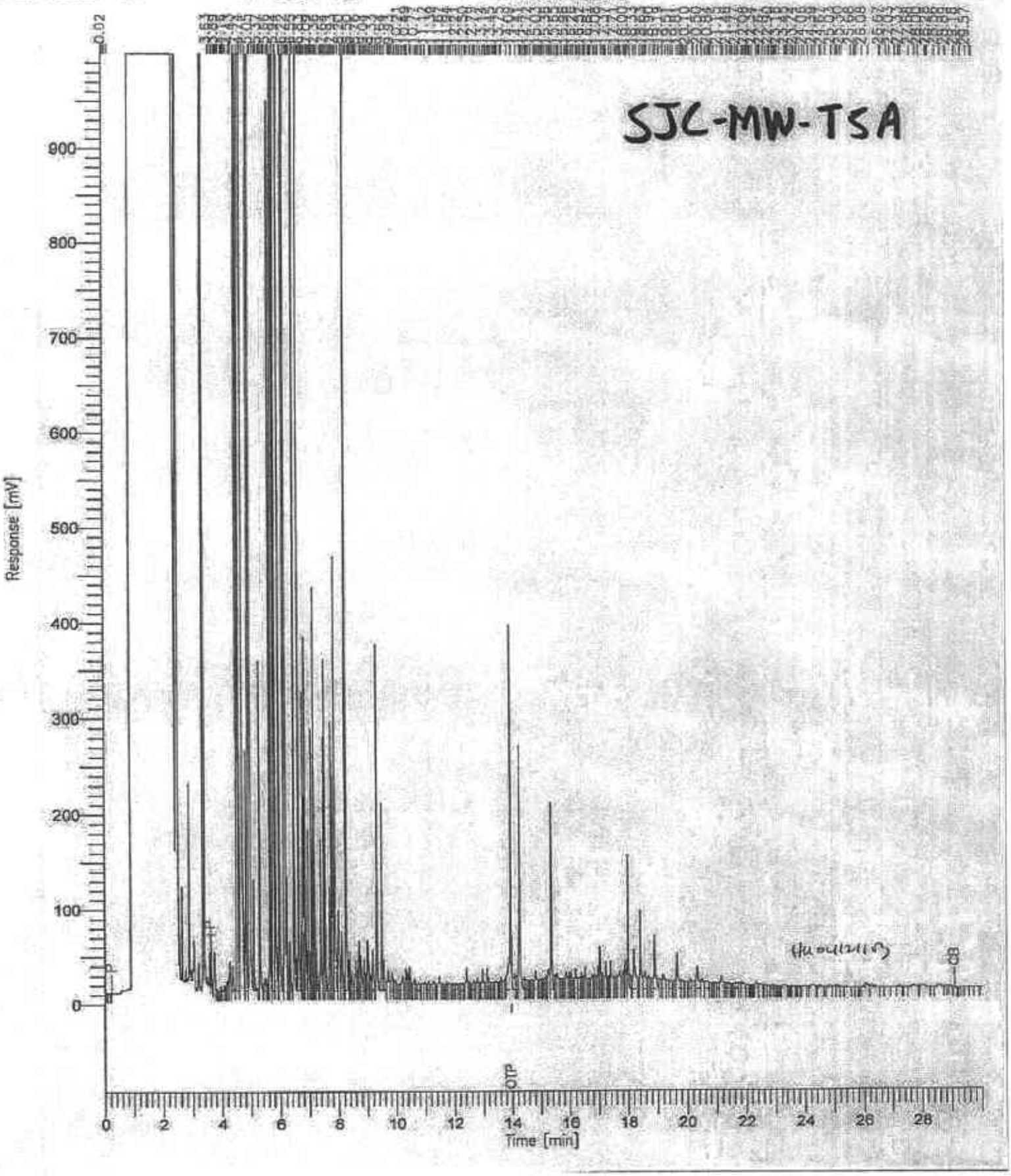
Approved_____ Date_____

Chromatogram

Sample Name : 040429-008
FileName : O:\200304\DATA\5417074.raw
Method : 37PH0326
Start Time : 0.00 min End Time : 30.00 min
Scale Factor: 0.0 Plot Offset: 0 mV

Sample #: 041702 Page 1 of 1
Date : 04/19/2003 09:28
Time of Injection: 04/19/2003 08:58
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000.0 mV

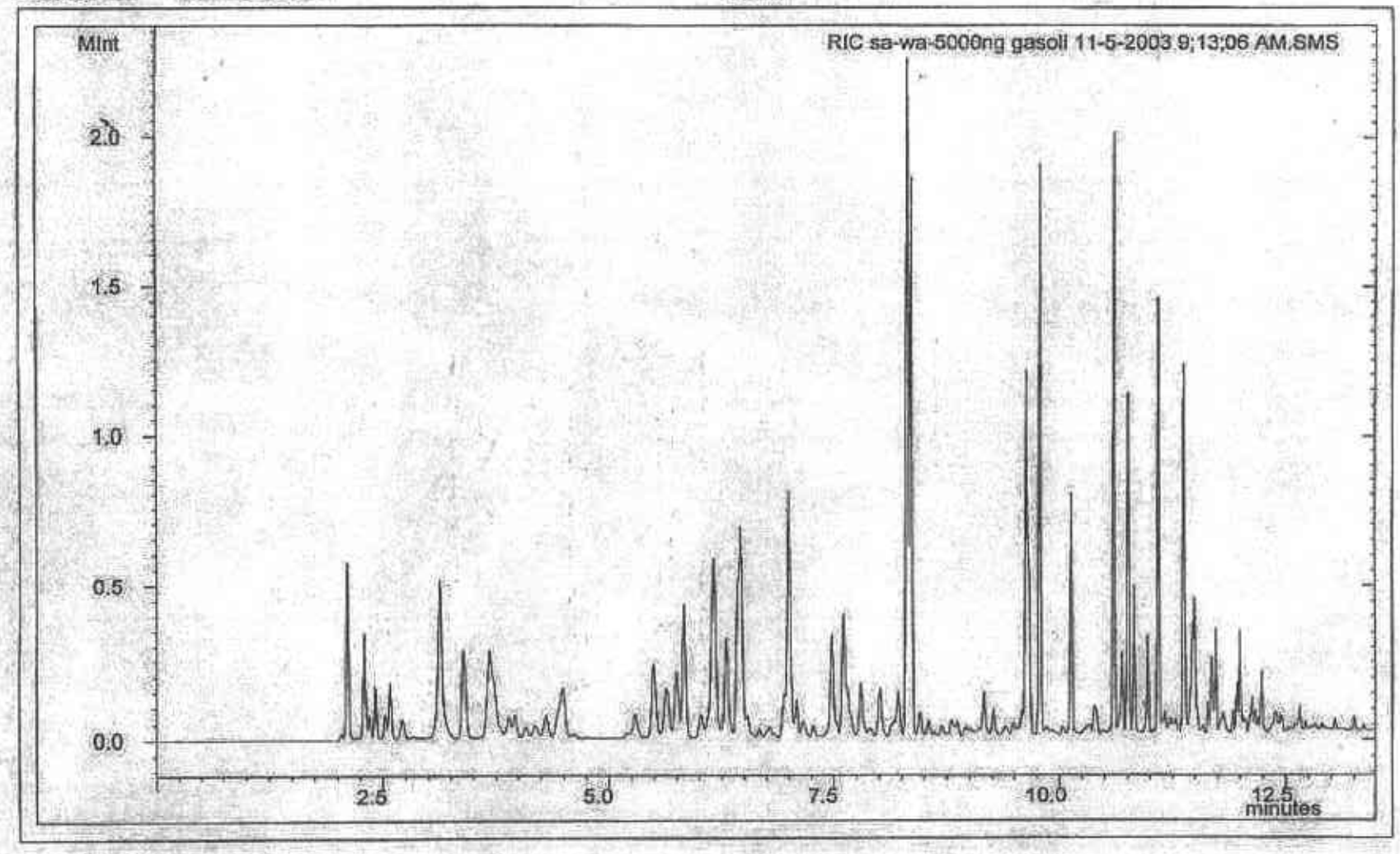
SJC-MW-TSA



CHROMATOGRAM REPORT

EPA Method 8260B FUOXY 041703

Lab File ID:	c:\saturnws\data\200311\110503\sa-wa-5000ng gasoil 11-5-2003 9;13	Calibration File:	C:\SaturnWS\data\200304\041703\5_25NG FUOXY 4-17-2003 2;1
Acquisition Date:	11/5/2003 9:13	Calibration Date Range:	4/17/200 14:13 4/17/2003 16:47
EPA Sample No:	sa-wa-5000	Operator:	
Lab Sample ID:	sa-wa-5000ng gasoil	Dilution:	1



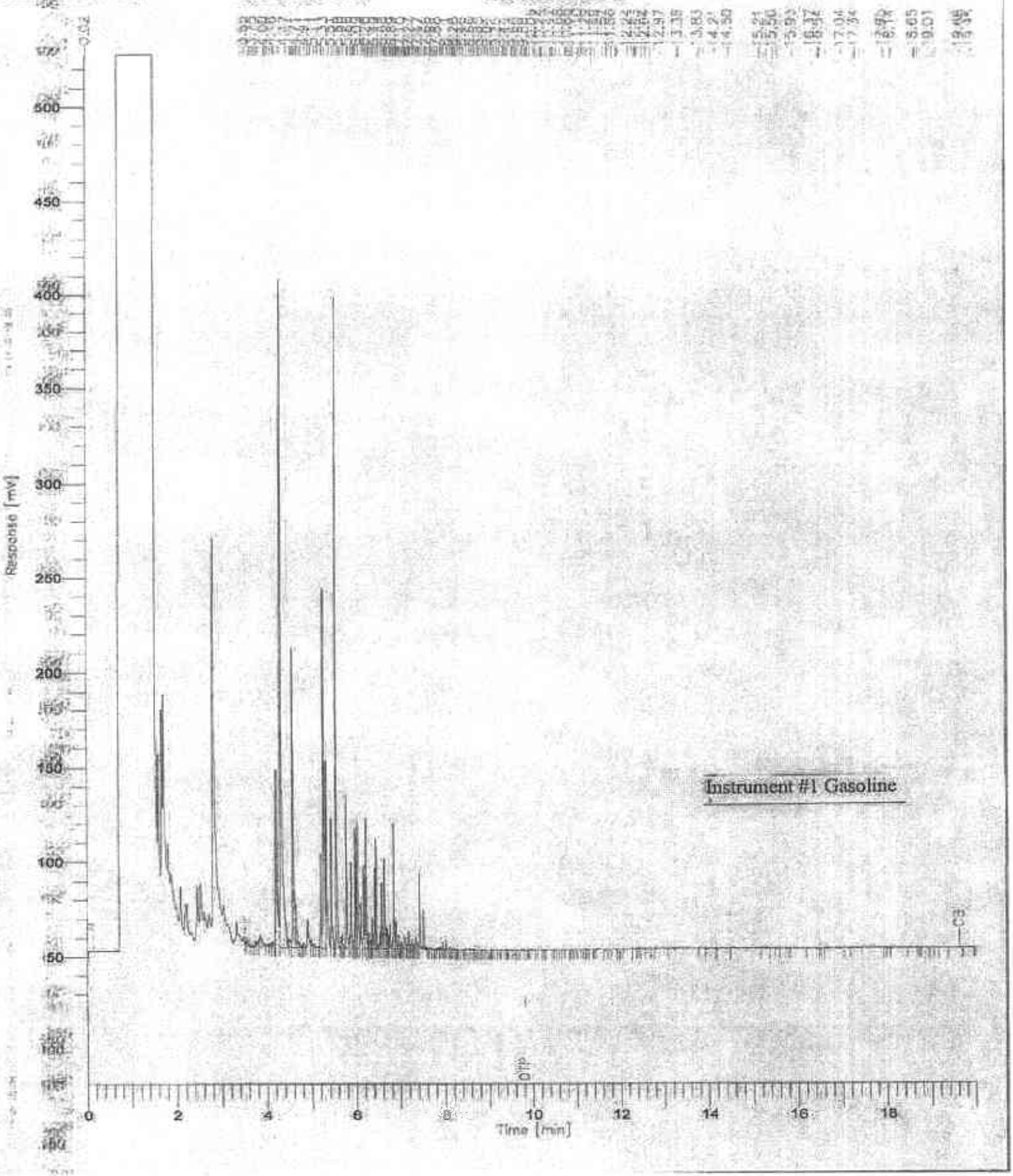
Approved_____ Date_____

GAS STD

TEPH Chromatogram

Sample Name : gas std 1000ppm
FileName : N:\200401\DATA\1114019.RAW
Method : 1TPH1204.MTH
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: -1.0 Plot Offset: 28 mV

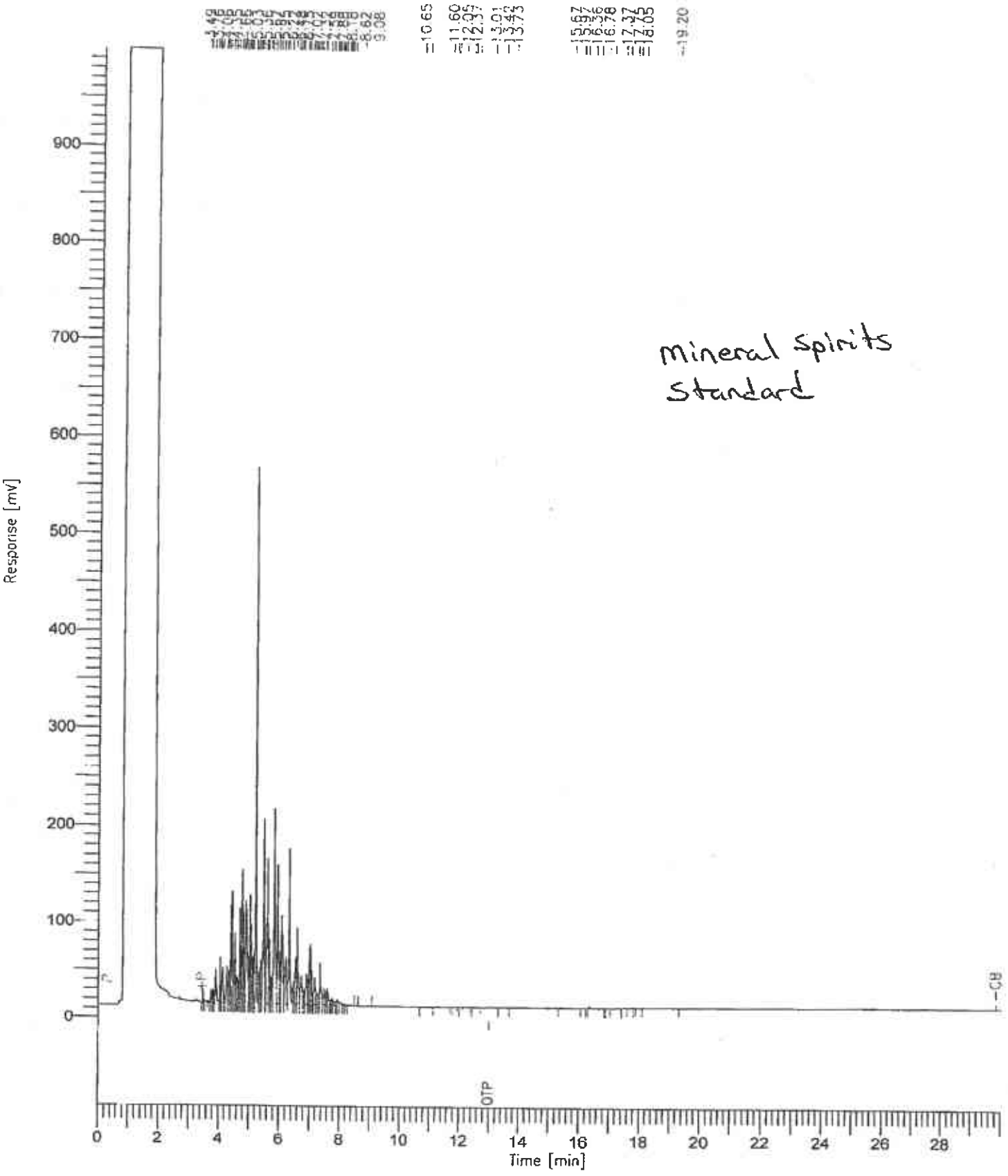
Sample #: Page 1 of 1
Date : 02/06/2095 09:05
Time of Injection: 01/14/2004 16:01
Low Point : 28.05 mV High Point : 526.05 mV
Plot Scale: 500.0 mV



Chromatogram

Sample Name : ms 200ppm
FileName : O:\200302\DATA\3224012.RAW
Method : 3TPH1218.MTH
Start Time : 0.00 min End Time : 30.00 min
Scale Factor: 0.0 Plot Offset: 0 mv

Sample #: gc6417 Page 1 of 1
Date : 03/27/2003 15:48
Time of Injection: 02/24/2003 10:22
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000.0 mV

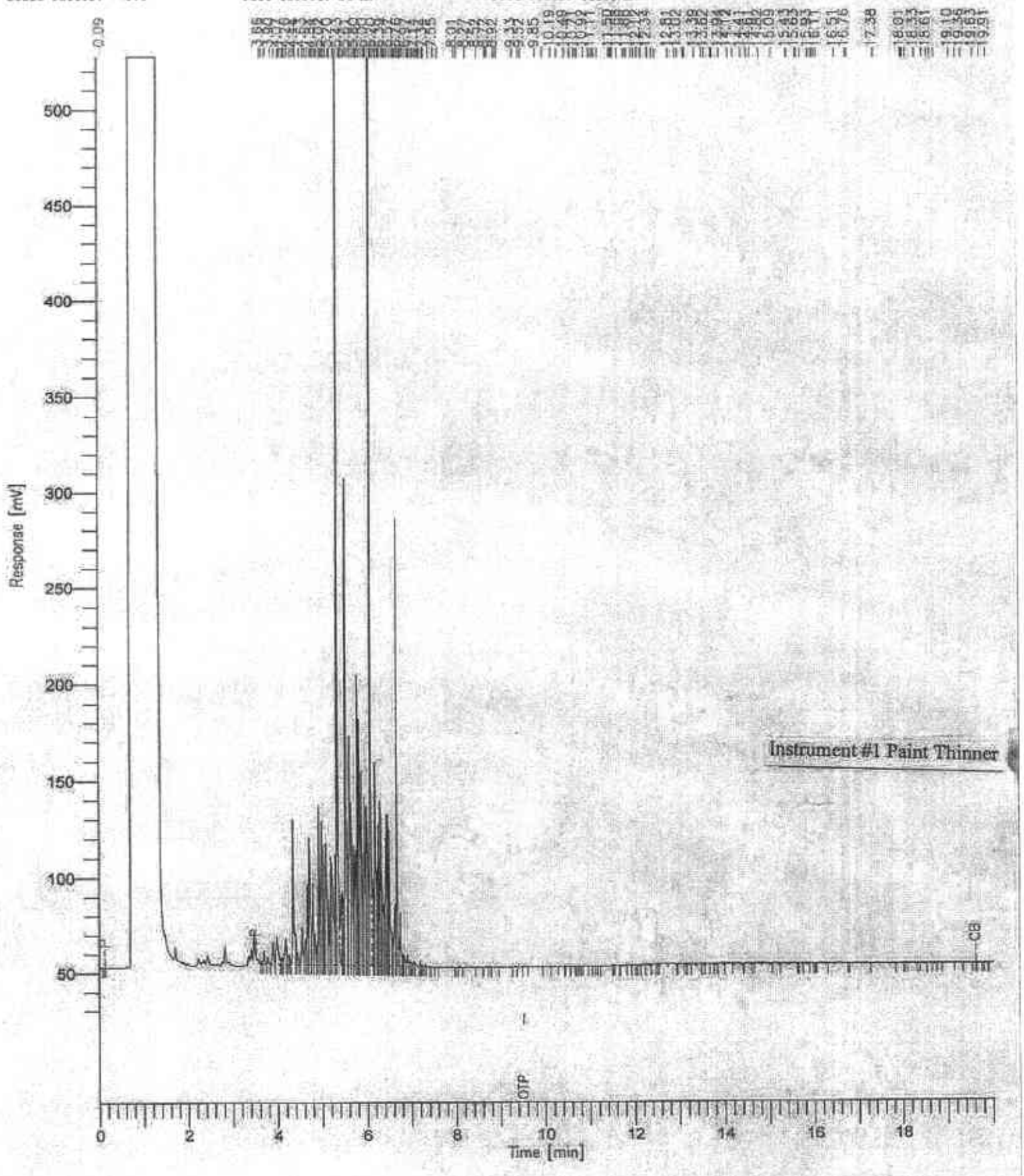


Mineral Spirits Standard

TEPH Chromatogram

Sample Name : Paint thinner 1000ppm ref
FileName : N:\2003l2\DATA\1017023.raw
Method : 1TPH1204
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: -1.0 Plot Offset: 28 mV

Sample #: Page 1 of 1
Date : 12/17/2003 14:50
Time of Injection: 12/17/2003 14:30
Low Point : 28.06 mV High Point : 528.06 mV
Plot Scale: 500.0 mV



TEPH Chromatogram

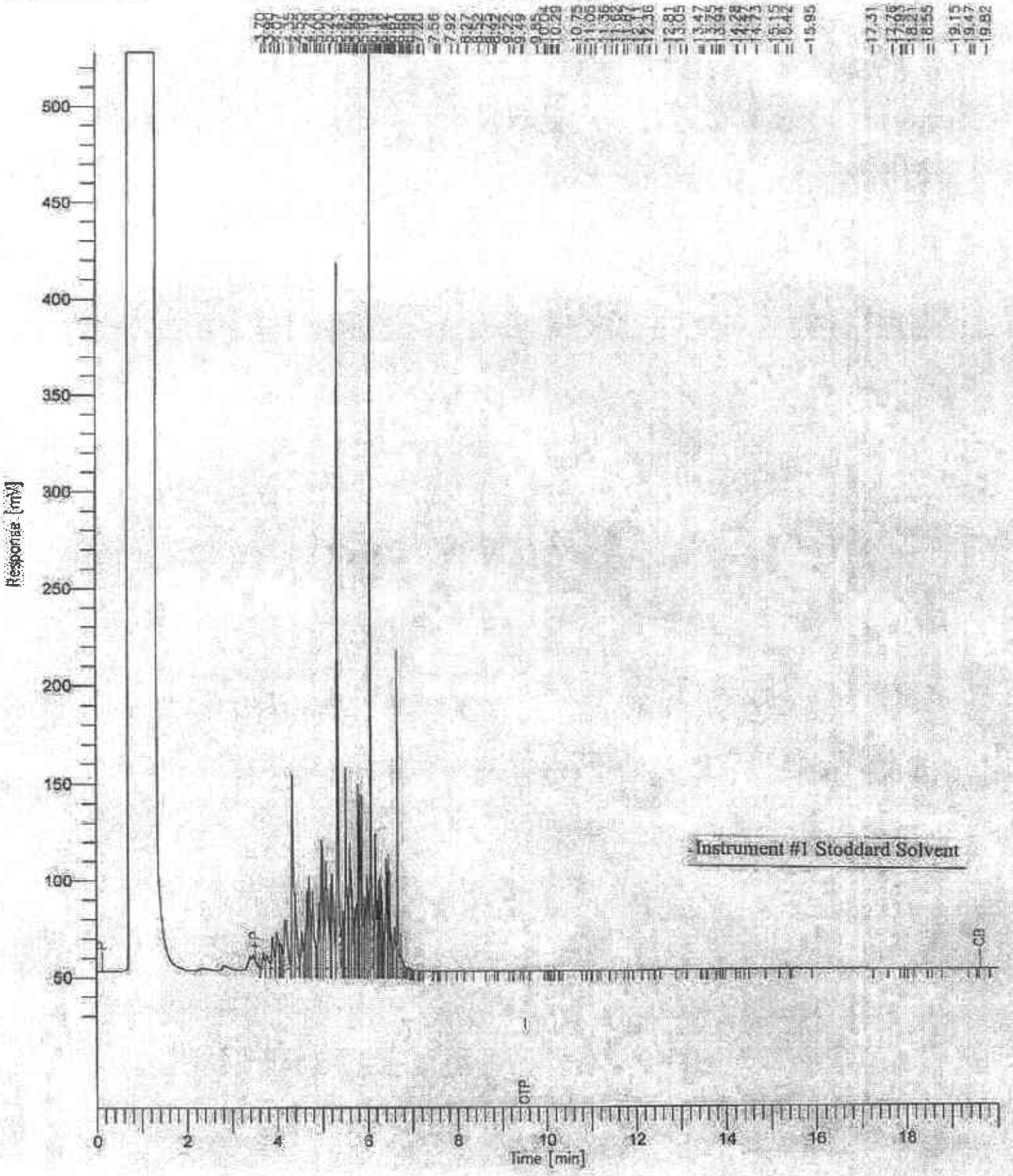
Sample Name : stoddard 500ppm ref
FileName : N:\200312\DATA\1DI7020.raw
Method : 1TPH1204
Start Time : 0.00 min
Scale Factor: -1.0

End Time : 20.00 min
Plot Offset: 28 mV

Sample #:
Date : 12/17/2003 13:34
Time of Injection: 12/17/2003 13:14
Low Point : 28.02 mV
Plot Scale: 500.0 mV

High Point : 528.02 mV

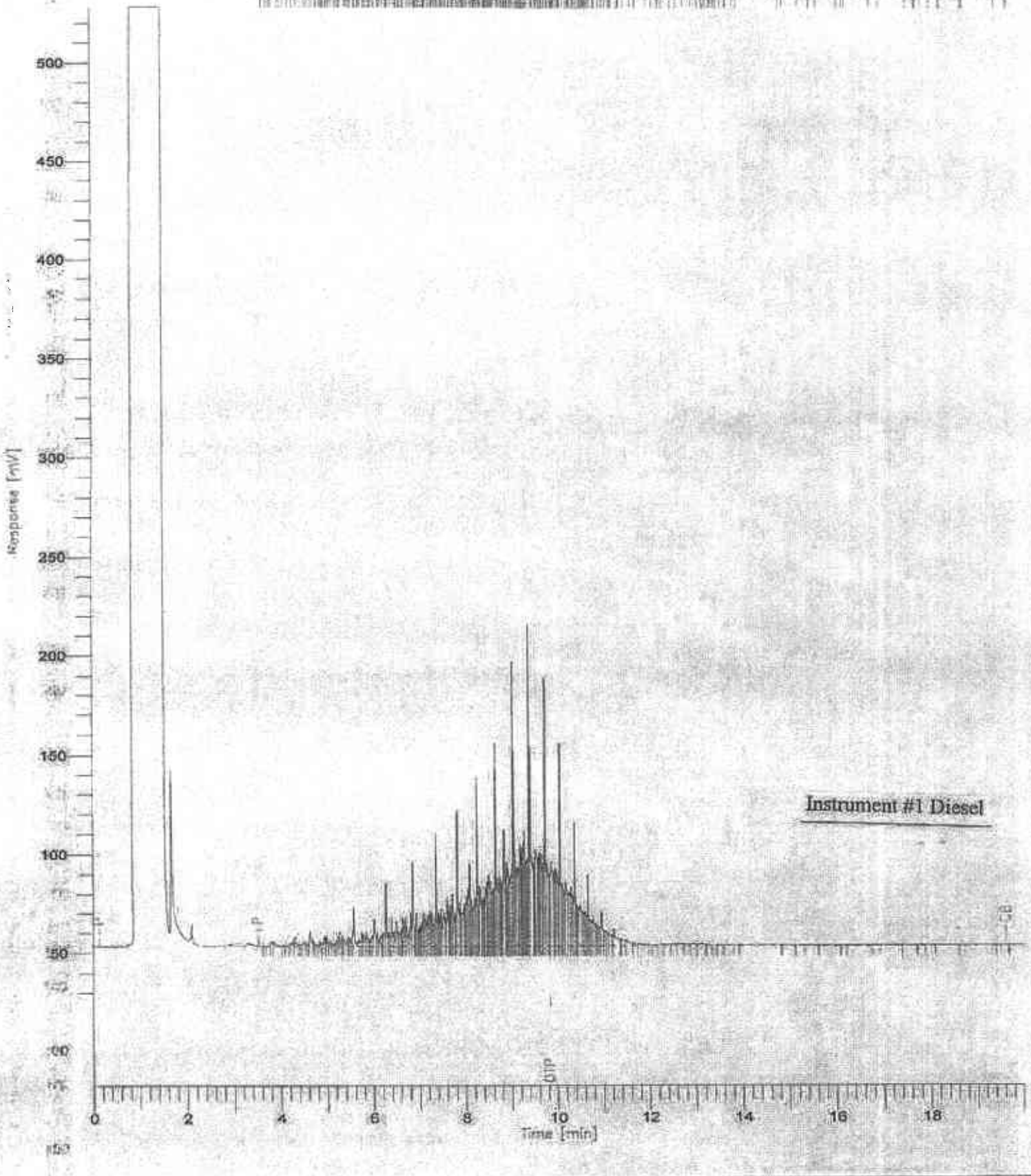
Page 1 of 1



TEPH Chromatogram

Sample Name : diesel 1000ppm
FileName : R:\200402\DATA\1205004.RAW
Method :
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: -1.0 Plot Offset: 28 mV

Sample #: qc6968 Page 1 of 1
Date : 02/05/2095 17:10
Time of Injection: 02/05/2004 07:19
Low Point : 28.12 mV High Point : 528.12 mV
Plot Scale: 500.0 mV



TEPH Chromatogram

Sample Name : Bun C 1000ppm ref
FileName : N:\2003\2\DATA\1D17021.raw
Method : 1TPH1204
Start Time : 0.00 min End Time : 20.00 min
Scale Factor: -1.0 Plot Offset: 28 mV

Sample #:
Date : 12/17/2003 13:59
Time of Injection: 12/17/2003 13:39
Low Point : 28.12 mV High Point : 528.12 mV
Plot Scale: 500.0 mV