SITE CHARACTERIZATION REPORT

City of Beverly Hills Maintenance Facility

331 North Foothill Road

Beverly Hills, California

Prepared for

CITY OF BEVERLY HILLS
455 North Rexford Drive
Beverly Hills, CA 90210

July 16, 2002

By
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PROFESSIONAL CERTIFICATION

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1. INTRODUCTION

Lindmark Engineering (LE) has prepared this report to summarize the results of all soil and groundwater assessments completed at the subject site, which is at 331 North Foothill Road in Beverly Hills, California. The site is shown on Figure 1, Vicinity Map (Figures section). This report includes the following information:

- Site description and location maps of the site and surrounding area;
- Regional geologic and hydrogeologic setting;
- Summary of soil and groundwater assessments;
- Plot plans showing soil sampling points, soil boring locations, vapor probe locations, and vapor, air-sparging, and groundwater monitoring well locations;
- Boring logs and well construction details;
- Geologic cross sections;
- Historical groundwater contour maps;
- Historical hydrocarbon plume maps;
- Summary of well completion details; and
- Summary of historical soil and groundwater analytical results.

2. SITE DESCRIPTION

The property at 331 North Foothill Road, located at the northwest corner of Foothill Road and West Third Street, is used by the City of Beverly Hills as a maintenance garage for City vehicles (Figure 2, Figures section). The site is concrete-paved, has two single-story buildings, and includes office areas and vehicle repair stations. The southern portion of the site, adjacent to Third Street, is lined with grass.

3. REGIONAL GEOLOGIC AND HYDROGEOLOGIC SETTING

3.1 Regional Geology

The subject site overlies the Hollywood Groundwater Basin, which is part of the coastal lowland area adjacent to the south flank of the Santa Monica Mountains (one of the east- to west-trending ridges of the Transverse Range geomorphic province). Although the area is included in the Transverse Ranges province, structural influence of the Peninsular Ranges geomorphic province is also present throughout the Los Angeles Basin. Lowlands and adjacent mountains are composed of igneous, sedimentary, and metamorphic rocks ranging in age from Jurassic to Holocene.

Prominent structural features in the area result from Pliocene to Holocene and continuing compression. The low-lying piedmont slope of the Hollywood Groundwater Basin represents a structural depression that continues to subside (Hill et al., 1978, 1979). Unconsolidated to moderately consolidated deposits of Pleistocene age have partly filled the structural depressions and constitute the principal water-bearing deposits. These deposits are penetrated to various depths by numerous wells in the basins. Sediments include alluvial deposits of Holocene age and the Lakewood and San Pedro Formations of Pleistocene age. Maximum total thickness of these Quaternary sediments in the site area occurs in the Hollywood Groundwater Basin and is 800 feet.

Older Pliocene and earlier rocks that underlie the water-bearing deposits at variable depths in the area are exposed in the foothills and form the mass of the Santa Monica Mountains. These rocks generally are either well cemented, well consolidated, or contain oil and/or gas and represent the bedrock formations that do not yield fresh water readily to wells. Sedimentary bedrock in the area ranges from Pico Formation of Pliocene age to the Miocene Topanga Formation. Basement rocks underlie the sedimentary rocks and include the intrusive Cretaceous quartz diorite and its host rock, Jurassic Santa Monica Slate.

Water-bearing formations and bedrock, as well as the general structural setting in the area, are summarized below.

Although several authors have assigned various depths, ages, and names to the strata in the area, the oil industry data have been the most complete for strata older than Late Pleistocene (Blake, 1991). For strata younger than Late Pleistocene, the interpretation of the California Department of Water Resources (DWR, 1961) is accepted herein.

The youngest deposits in the area are the recent (Holocene) alluvial materials. Alluvial gravel, sand, and silt with some clay form a relatively thin veneer over the older deposits and cover most of the ground surface of the Hollywood Groundwater Basin in the area. High concentrations of Santa Monica Slate and quartz diorite in these deposits found in gravels from monitoring wells indicate that the Santa Monica Mountains are the chief provenance for these deposits. Thickness of this deposit is essentially nil at the depositional contact with older rocks; at the thickest, recent deposits are on the order of 35 feet (DWR, 1961).

Late Pleistocene deposits in the area are assigned to the Lakewood Formation. Several previous authors have referred to the formation as unnamed upper Pleistocene deposits, terrace deposits, the Palos Verdes sand (Poland, 1946 and Hummon, 1994), and older surficial sediments (Dibblee, 1991). Because the aquifer association of the Lakewood Formation as described by the DWR (1961) has been followed and interpreted herein, the name of the Lakewood Formation has also been accepted.

Lakewood Formation deposits in the site vicinity are exposed at ground surface only in the northwestern portion of the Hollywood Basin along the Santa Monica Mountains. In the subsurface, the Lakewood Formation is present throughout the water-bearing strata of the site vicinity and is penetrated by most wells and test holes.

In the site vicinity, the Lakewood Formation is interpreted to be principally non-marine in origin. Boyle (1994) selected a depth of 108 feet for the base of the Lakewood Formation at the City of Beverly Hills Test/Production Well (No. 6) (see Figure 1). Correlation of geophysical and geologic logs in the area indicates that the depth of the Lakewood Formation (in the groundwater basin) ranges from about 220 feet below ground surface (bgs) in the eastern portion of the City of Beverly Hills to less than 60 feet in the western portion of the City.

Lakewood Formation sediments are characterized in the area by their dark yellow-brown color. The deposits generally are reported to consist of fine to coarse sand and gravel, and sandy clay to clay. As with the recent alluvial deposits, Lakewood Formation material consists of clasts derived from the Santa Monica Mountains, abundant in slate and quartz diorite. Geologic and geophysical logs generally indicate two fining upward sequences in this formation, likely indicative of a fluvial depositional environment. Tributaries to an ancestral Los Angeles River and streams draining the Santa Monica Mountains likely deposited this formation and its aquifers.

Older Late Pleistocene sediments in the area have been assigned to the San Pedro Formation as reported by Blake (1991). Previous investigators have generally agreed upon this nomenclature, although the ages, depths, and divisions have been subjects of dissent. The San Pedro Formation has not been mapped at ground surface in the site vicinity. In the subsurface, the San Pedro Formation is present throughout the groundwater basin.

Unconsolidated to semiconsolidated gravel, sand, silt and clay characterize the San Pedro Formation. Coarser, more permeable, and more electrically resistive units are present in the lower two-thirds of this formation in the area. Colors of the San Pedro Formation deposits are reported to range from a yellowish-brown to olive gray and gray, becoming grayer with depth. Geologic logs typically report the first (shallowest) occurrence of shells within the stratigraphic sequence in the middle part of this formation.

Poland (1959) described the formation as chiefly marine, beach, and lagoonal deposits in the site vicinity, and reported the base of the Pleistocene as the base of the San Pedro Formation. This correlation was followed by DWR (1961). Blake (1991) described the formation as non-marine to inner neritic but refers to the base of the San Pedro Formation as a portion of the Hallian benthic foram stage and Late Pleistocene. For simplicity, and to be consistent with the stratigraphy presented in most groundwater-related publications, the base of the San Pedro Formation is maintained to represent the base of the Pleistocene strata in the area.

Pliocene in age (Poland, 1959; DWR, 1961; Boyle, 1994), Pico Formation strata are not reported to outcrop at ground surface in the area. Rather, these deposits are referred to as the low-permeability, semiconsolidated silts and clays with occasional gravels and sands that underlie most of the younger water-bearing strata throughout the area.

It is useful to note that upper, middle, and lower members ranging in age from late Pliocene to late to early Pleistocene have been delineated based on benthic foram stages (Blake, 1991). According to this scenario, the upper member of the Pico

Formation would likely contain water-bearing zones that do yield water to wells and do correlate across the area. However, only Boyle (1994) has picked stratigraphic contacts in the immediate area. Oil industry data are too sparse and do not reveal detailed Quaternary stratigraphy in the area. Boyle followed the DWR (1961) nomenclature, assigning the Pico Formation to Pliocene age.

Repetto, Puente, and Topanga Formations are the marine sandstones, siltstones, shales and claystones that underlie the Pico Formation in the area. Largely the target of oil production in the region, these formations have been located with great detail in the stratigraphic column, based on fossil content and lithology.

Miocene strata, referred to as the Monterey shale by Poland (1959) and Puente and Topanga Formations by Blake (1991) are also presented in oil prospect well logs. These formations vary in thickness up to 4,500 feet beneath the Hollywood Groundwater Basin.

Jurassic Santa Monica Slate is the basement rock in the area. Thickness of this formation is unknown. It is metamorphosed schist derived from chert greywacke, basaltic volcanics, and gabbro.

3.2 Regional Hydrogeology and Water Well Production

Historical division of units within the Santa Monica and Hollywood Groundwater Basins has been undertaken by the U.S. Geological Survey (Poland, 1959) and the DWR (1961). A water-bearing versus nonwater-bearing status of strata was assigned, roughly coincident with the boundary between Quaternary and Tertiary units. Recent renewal of the Hollywood Basin as a source of water supply to the City of Beverly Hills places increased value on this information.

Water-bearing deposits

Quaternary units include the recent alluvium, the Pleistocene Lakewood Formation, and the Pleistocene San Pedro Formation. These represent a stratigraphic sequence from neritic to non-marine depositional environments, with some local unconformities due to the syndepositional folding of the Hollywood Syncline and uplift of the Santa Monica Mountains. Seven aquifers have been differentiated among the Quaternary strata in the site vicinity.

Relatively impermeable bedrock

Tertiary rocks, including the Pliocene Pico Formation, are considered nonwater-bearing and underlie the Quaternary water-bearing sediments. No aquifers have been differentiated within these units by the DWR, as these formations are largely impervious and any water within them is typically brackish to saline; additionally, these Tertiary units in the area are known to contain oil and gas.

Major aquifers

Seven aquifers that were delineated in the Los Angeles Coastal Plain by the DWR (1961) have been interpreted to exist in the vicinity. The Sunnyside Aquifer is present at the base of the San Pedro Formation and is overlain by the Silverado, Lynwood, Jefferson, and Hollydale Aquifers. Unconformably overlying the San Pedro Formation is the Lakewood Formation, in which the Gage Aquifer is present at the base and the Exposition Aquifer is overlying. Between each of these aquifers are variably present and/or thick aquitards.

Lakewood Formation aquifers

The shallowest delineated aquifer in the Upper Pleistocene Lakewood Formation is the Exposition Aquifer, which is approximately 20 feet thick where present in the site vicinity. It may be exposed at or near ground surface in the western portion of the area and reaches a maximum depth of 110 feet in the vicinity of the axis of the Hollywood Syncline. This aquifer is variably saturated due to its elevation.

The Gage Aquifer is the basal gravel of the Lakewood Formation. Correlations suggest a maximum depth of 150 feet for this aquifer, and it may be exposed at ground surface in the western and/or northern portion of the Hollywood Basin. The estimated thickness of the Gage Aquifer is 20 to 30 feet.

Both Lakewood Formation aquifers are composed of medium to coarse angular to subangular, well sorted, tan to brown sand in the area. Each exhibits a fining-upward sequence and was likely deposited by streams draining the Santa Monica Mountains that were tributaries to an ancestral Los Angeles River. Additionally, the relatively sharp, basal coarse contact indicates that each successive deposition was preceded by an erosional period.

San Pedro Formation aquifers

Pleistocene aquifers in the San Pedro Formation were delineated by the State of California DWR (1961). Interpretations of the aquifers in the area are based on the geophysical logs and lithology, on the description in DWR Bulletin 104, and on the picks presented by Boyle (1994).

An approximately 30- to 40-foot-thick unit, the Hollydale Aquifer is represented in the area by a clayey sand that grades into a sandy clay. These deposits have been eroded prior to the deposition of the overlying Lakewood Formation. Hollydale Aquifer materials, or its likely equivalent units, were probably deposited in a low-energy fluvial environment, as distal deposits from streams that drained the Santa Monica Mountains.

Jefferson Aquifer deposits are represented in the area by up to approximately 45 feet of brown sand with gravel and occasional silt. In key wells, this unit has been correlated to extend to a maximum depth of 350 feet. The Lynwood Aquifer is very similar in character to the Jefferson Aquifer, about 50 feet in maximum thickness, and also consisting of brown sand with gravel and silt. A brown clay separates the two aquifers, but this unit pinches out, and the two aquifers merge west of the site. Geologic logs report a lesser concentration of Santa Monica Slate in clasts in these aquifers.

Below the base of the Lynwood Aquifer, predominantly gray clay is persistent throughout the area. This moderate- to high-plasticity clay is reported to contain fossil shells, including gastropods. Thickness of this unit is on the order of 20 feet throughout, and it is interpreted to represent lagoonal mud deposits.

Sands with some clay represent the Silverado Aquifer in the area. This light- to dark-gray unit has fossil shells and angular to rounded sands with occasional gravels. Interpretation for depositional environment for this aquifer is a beach to upper shoreface. Units assigned to this aquifer are up to 120 feet thick in the area. Depth to the top of the Silverado sands ranges from 300 to as much as 520 feet bgs in the eastern portion of the Hollywood Basin (based on oil well correlations).

The Sunnyside Aquifer is represented by sandy clays and clayey sands and gravels that are up to 180 feet thick in the area. The maximum depth of the Sunnyside Aquifer as correlated here is on the order of 775 feet.

Groundwater movement and water levels

Groundwater enters the aquifers of the area from the northern and western portions, flowing from streams in the Santa Monica Mountains into the alluvial deposits and Lakewood Formation, eventually percolating into the aquifers of the San Pedro Formation. Once the groundwater enters the aquifers of the San Pedro Formation, it flows from west to east beneath the boundary of the Santa Monica and Hollywood Groundwater Basins. This flow is generally consistent with the variation in structure exhibited by the aquifers themselves. Because of the individual completions for the four monitoring wells at the CBH Site B, some water level and groundwater movement data can be obtained for the Gage, Lynwood and Jefferson (jointly completed), Sunnyside, and Silverado Aquifers. Other existing wells contain relatively long sets of perforations that permit water to enter the casing from virtually all strata encountered.

Each of the aquifers mentioned above contains water under confined conditions. Nearby irrigation wells and the El Rodeo School Well revealed February 1999 water levels that were nearly artesian to the west of the area, while depths to confined groundwater on the order of 70 to 100 feet were observed in City of Beverly Hills production wells at the same time.

3.3 Regional Groundwater Production Wells

Around December 2002 (upon completion of all ancillary facilities and testing), the City plans to extract groundwater for municipal use from three wells, Nos. 2, 4, and 5, with Well No. 6 on a standby status (personal communication with Vincent Chee, 2002). These wells were constructed and developed between 1994 and 2001 by rotary methods and are equipped with deep cement annular seals. Although pilot hole drilling and testing was conducted at a fifth site (referred to as Site No. 1) by Boyle in December 1999 and January 2000, the pilot hole was abandoned and a water well was not completed at that location.

It is critical to note that all four water wells (Nos. 2, 4, 5, and 6) for drinking water production are equipped by cement annular seals that are over 324 feet bgs. These seals are intended to work in conjunction with natural clay aquitards to prevent any potential vertical migration of contaminants downward toward the perforated intervals of these wells. Additionally, these wells extract their supply from the two deepest aquifers within the San Pedro Formation. Furthermore, it is useful to note that man-made conduits, such as active or abandoned water or oil wells, are not known to be present between the site and the four modeled receptors, CBH Well Nos. 2, 4, 5, and 6.

The nearest water-supply well to the site (less than 600 feet south) is CBH Well No. 6 (the proposed standby well). Construction details for this and other local wells are shown in Table 1, Summary of Drilling and Well Construction Data. CBH Well No. 6 is equipped with a 327-foot-deep cement annular seal, which augments approximately 125 feet of natural aquitard and seals out more than four named aquifers (including the Gage, Exposition, Jefferson, and Lynwood) above the production zones. These attributes led to a Physical Barrier Effectiveness score of 90 (out of a possible 100) in a Drinking Water Source Assessment Protection Program Vulnerability Assessment conducted by Boyle Engineering Corporation (August 2000) for CBH Well No. 6. A score greater than 70 in such an assessment signifies a "highly effective" physical barrier for a water-supply well.

4. SUMMARY OF SOIL AND GROUNDWATER ASSESSMENTS

4.1 1989

Between September 7 and 8, 1989, LE conducted a preliminary site assessment to evaluate for the possibility of soil contamination from underground storage tanks (USTs) that were present at the subject site. Borings B1 and B2 were drilled near the 5,000-gallon-capacity gasoline UST (T2); B3 near the fuel island; and B4, B5, and B6 adjacent to the 10,000-gallon-capacity gasoline UST (T1). Borings B1, B2, and B4 were drilled to approximately 14 feet bgs, B3 to 11 feet bgs, and B5 and B6 to 13 feet bgs. See Figures 2 and 3, Figures section, for boring locations and Appendix A for boring logs. Based on laboratory analytical results of soil samples collected at the bottom of each boring, contamination by total petroleum hydrocarbons as gasoline (TPH[g]) was found in Boring B2 and B3 at 14,600 and 7.0 mg/kg, respectively. No TPH(g) was detected in Borings B1 or B4 through B6. Soil sampling results are summarized in Table 2, Tables section. LE recommended closure of UST T2 and additional site assessment to determine the extent of contamination in soil. See LE's *Preliminary Site Assessment at Five Underground Tank Facilities Owned by the City of Beverly Hills*, dated October 27, 1989.

Note that following the preliminary site assessment, Tanks T1 and T2 were taken out of operation.

4.2 1990

On January 17, 1990, LE drilled five additional soil borings (B10 through B14). Boring B10 was drilled to the south of Tank T2 to approximately 41 feet bgs. Borings B11 and B12 through B14 were drilled to approximately 16 feet and 21 feet bgs, respectively (see Figures 2 and 3). Significantly elevated PID readings were observed during drilling in soil samples collected from Borings B10 below 15 feet (maximum reading of 1,500 ppm at 30 feet bgs) and B11 (all readings greater than 2,000 ppm). Laboratory analytical results of soil samples collected from Boring B10 at 10, 20 and 30 feet bgs indicated contamination by TPH(g) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). TPH(g) and benzene concentrations in Boring B10 ranged from nondetectable to 3,310 mg/kg and 0.06 to 89.4 µg/kg, respectively, with the highest concentrations observed in samples collected at 30 feet bgs. Concentration of TPH(g) and BTEX were also detected in Boring B11 at 4 feet bgs, with TPH(g) and benzene concentrations at 3,700 mg/kg and 30.5 µg/kg, respectively. No TPH(g) or BTEX compounds were detected in soil samples collected from Boring B12 through B14. See Table 2 for soil analytical results. Laboratory analysis of a grab groundwater sample collected from Boring B10 indicated concentrations of TPH(g) and the four BTEX compounds at 117,000 µg/l, 9,560, 34,900, 22,600, and 4,100 µg/l, respectively (see Table 3, Tables section). In LE's *Site Assessment* report, dated April 3, 1990, LE recommended further site assessment to include research to determine if off-site sources of groundwater contamination might exist for adjacent sites; installation of groundwater monitoring wells to determine groundwater flow direction and extent of groundwater contamination; additional borings to define the lateral extent of contamination in soil; and preparation of a remedial action plan.

On April 27, 1990, USTs T1 and T2 failed the tank integrity tests and were recommended to be either taken out of service or repaired and retested.

Between May 22 and June 15, 1990, LE drilled six borings (B18, B19, GW1, GW2, GW3, and GW4) and installed four groundwater monitoring wells (GW1 through GW4) (see Figure 2). See Appendix A for boring logs and well construction details. Based on laboratory analytical results of soil samples, no TPH(g), BTEX, or organic lead concentrations were detected at or above detection limits in Borings B18 at 35 feet bgs, B19 at 15 and 35 feet bgs, GW1 at 29 feet bgs, or composite samples from GW2 and GW3 at 15 and 30 feet bgs, respectively. However, TPH(g) and BTEX compounds were detected in Boring B18 and GW4 at 30 feet bgs. TPH(g) was detected at 17.5 and 2,300 mg/kg and benzene at 3,700 and 75,800 µg/kg, respectively (see Table 2). Following well installation, free product was observed in Well GW4 and no groundwater samples were collected from the well. Groundwater samples collected from Wells GW1 and GW3 indicated no

concentrations of TPH(g) or BTEX. However, concentrations of TPH(g) and benzene, toluene, and xylenes were detected in samples collected from Well GW2 at 80, 27.7, 2.55, and 3.74 µg/l, respectively (see Table 3). In the *Soil and Groundwater Assessment* report dated November 14, 1990, LE included recommended options for remediating soil and groundwater.

4.3 1991

Based on the *Soil and Groundwater Assessment* report, the Los Angeles County Department of Public Work (DPW) directed additional site assessment to further define the extent of soil and groundwater contamination and to address potential sources of contamination from an on-site waste-oil UST (T7).

In accordance with the DPW letter, free-product recovery was begun from Well GW4. See Table 4, Tables section, for historical free-product recovery data.

4.4 1992

In accordance with the DPW letter, interim groundwater monitoring was conducted using Wells GW1 through GW4 on April 23, 1992. See Table 5, Tables section, for historical groundwater elevations. Free product was observed in Well GW4, which therefore was not sampled. Laboratory analytical results of samples collected from Wells GW1 and GW3 indicated no concentrations of TPH(g) or BTEX compounds. Benzene was detected in Well GW2 at 3 µg/l; no TPH(g), toluene, ethylbenzene, or xylenes were detected.

On May 14, 1992, Well GW3 was repaired and returned to use. Following well repair, Well GW3 was redeveloped and interim groundwater monitoring was again conducted using all on-site wells.

Between July 7 and 12, 1992, LE drilled four additional borings (B24 through B28) and drilled and installed four groundwater monitoring wells (GW9 through GW12) (see Figures 2 and 3). Borings logs and well construction details are included in Appendix A. All groundwater monitoring well construction details are summarized in Table 6, Tables section. Based on laboratory analytical results of soil samples, no TPH(g) was detected in Borings B24 or B25 at 5, 10, and 15 feet bgs; B26 at 5, 10, 15, 20, and 35 feet bgs; B27 between 5 and 25 feet bgs and at 35 feet bgs; or B28, GW9, GW10, or GW12. Concentrations of TPH(g) were detected in Boring B26 at 25 and 30 feet bgs (7.5 and 6.4 mg/kg, respectively) and in B27 at 30 feet bgs (1.6 mg/kg). Benzene was also detected in soil samples from Borings B25, B26, and B27, ranging up to 890 µg/kg. The highest concentrations were observed between 20 and 30 feet bgs (see Table 2). Note that during the drilling of Boring B24, the augers used for drilling grazed the side of the 550-gallon-capcity waste oil UST (T7). Approximately 4 gallons of waste oil leaked from the tank into the borehole. The tank was subsequently taken out of service and scheduled for removal and replacement. Boring B28 was drilled adjacent to B24 to determine if the waste oil release had affected the surrounding soil. The samples collected from Boring B24 at 5, 10, and 15 feet bgs were also analyzed for total recoverable petroleum hydrocarbons (TRPH); no concentrations of TRPH were detected.

Groundwater monitoring was also conducted on July 23, 1992, using Wells GW1 through GW4 and GW9 through GW12. Based on laboratory analytical results of groundwater samples, no concentrations of TRPH, TPH(g), or BTEX were detected in Wells GW1 or GW9 through GW12. Free product was detected in Well GW4, which was therefore not sampled. TPH(g) was detected in Well GW2 at 70 µg/l and benzene in Well GW3 at 12 µg/l (Tables 3 and 4). No other volatile organic compounds (VOCs) were detected in the sampled wells.

LE recommended in the *Soil and Groundwater Assessment* report dated October 12, 1992 that quarterly groundwater monitoring be conducted, periodic free-product recovery be continued, and a remediation system implemented that would include vapor extraction in conjunction with air sparging.

4.5 1995

In October 1995, five USTs were removed from the site: two 280-gallon new oil USTs, one 280-gallon transmission fluid UST, one 280-gallon solvent UST, and one 550-gallon waste oil UST. One confirmation soil sample was collected from beneath the tank invert location of each removed UST. Based on laboratory analytical results of soil samples, concentrations of TRPH were detected in samples LE1A-3´, LE2A-3´, LE3A-3´, and LE4A-3´ ranging from 88 to 2,600 mg/kg, with the highest concentrations observed in sample LE3A-3´. Total petroleum hydrocarbons by fuel characterization (TPH[fc]) and xylenes were also detected in LE3A-3´ at 1,200 mg/kg and 9 µg/kg, respectively. No BTEX compounds were detected in any of the other samples; no VOCs were observed in Sample LE4A-3´ or TRPH in LE5A-3´ (Table 2). LE recommended in the *Underground Storage Tank Closure* report (dated February 28, 1996) and the *Groundwater Investigation and Remedial*

Action Feasibility Tests report (dated February 5, 1996) that the heavy hydrocarbons be left in place as they were not expected to reach the water table and would biodegrade over time.

Additionally, LE conducted quarterly groundwater monitoring with Wells GW1 through GW4 and GW9 through GW12 and continued free-product recovery from Well GW4.

4.6 1996

In the *Remedial Investigation/Feasibility Study and Remedial Action Plan* dated September 10, 1996, LE concluded, based on the findings of the previous site assessments, that

- the lateral and vertical extent of TPH(g) and BTEX in soil had been defined;
- the product lines south of USTs T1 and T2 were believed to be the source of contamination;
- contamination extended to the groundwater table, and the sand and silty sand layer at the groundwater table contained most of the dissolved-phase hydrocarbons;
- the mass of gasoline hydrocarbons above the groundwater table was calculated to be approximately 1,310 pounds;
- the lateral extent of the free-product and dissolved-phased TPH(g) plume had been defined; and
- vapor extraction and air sparging would be a suitable remediation approach.

LE subsequently recommended installation of vapor extraction and air-sparging wells and a vapor extraction system (VES) to assist in the remediation of the soil and groundwater, as well as continuation of free-product recovery from Well GW4. Following the site assessments, the 10,000-gallon gasoline UST was brought back into service.

4.7 1997

Drilling and installation of air-sparging Wells AW3 and AW4 and vapor extraction Wells VE4, VE5, and VE6 were completed in July 1997. Also during 1997, piping and a sound enclosure were installed and permits obtained for operation of the VES.

4.8 1998

Between December 1 and 4, 1998, the 5,000- and 10,000-gallon gasoline USTs and two associated dispensers were removed from the site. Product, vent, and return piping lines were abandoned in place. No concentrations of TPH(g) were detected below the tank invert samples (T1-1-14´, T1-2-14´, T2-3-10´, and T2-4-10´), beneath the northern dispenser (D2-2´), or beneath the piping (Samples P2-4´ or P3-4´). However, significant concentrations of TPH(g), BTEX, and MTBE were detected in soil samples P1-2´ and D1-2´, collected beneath the remote fill port and southern fuel dispenser, respectively. TPH(g), benzene, and MTBE concentrations in Sample P1-2´ were detected at 20,100 mg/kg, 61,600 µg/kg, and 490,000 µg/kg, respectively; and in Sample D1-2´ at 26,200 mg/kg, 33,000 µg/kg, and 145,000 µg/kg, respectively. Low concentrations of benzene were detected in Sample T1-1-14´ (5 µg/kg) and of MTBE in Samples T1-1-14´, T1-2-14´, and P2-4´ (222, 65, and 915 µg/kg, respectively) (Table 2). See Figures 2 and 3 for sampling locations.

Based on LE's *Underground Storage Tank Closure Report, City Vehicle Shop*, dated March 1, 1999, the contamination detected near the fill port was believed to be of recent origin. LE recommended a soil boring investigation in the area of the remote fill port to assess the extent of soil contamination, and if necessary, installation of another vapor extraction and air-sparging well to address the contamination. See Figures 2 and 3 for former locations of the USTs.

4.9 1999

On April 16, 1999, LE drilled one boring each (LE1 and LE2) at the former remote fill port and fuel island locations, respectively (see Figures 2 and 3). Laboratory results indicated the highest TPH(g), BTEX, and MTBE concentrations in soil collected from Boring LE1. TPH(g), benzene, and MTBE concentrations ranged up to 3,480 mg/kg, 744 µg/kg, and 163,000 µg/kg, respectively (Table 2). In addition, the groundwater sample obtained from Boring LE1 indicated concentrations of TPH(g) and MTBE at 5,490 µg/l and 5,570 µg/l, respectively (Table 3). LE's *Additional Soil and Groundwater Investigation and Third Monitoring Report (January 26 through April 19, 1999) for Vapor Extraction System*, dated May 24, 1999, recommended expanding the VES to include the area where the UST fill ports were formerly located and installing an additional vapor extraction and air-sparging well in the same area.

In May 1999, LE drilled one soil boring near the former UST fill port locations and converted it to a clustered vapor extraction and air-sparging well (VE7/AW5). Well locations are indicated on Figure 2. Following well installation, LE connected the new vapor extraction and air-sparging well to the VES, tying the VES piping for Well VE7 into that for Well VE4.

4.10 2000

On November 1, 2000, LE drilled one soil boring and converted it to a clustered vapor extraction and air-sparging well (VE8/AW6). The well was installed to address the persistent elevated concentrations of MTBE in groundwater observed in Well GW2. Based on laboratory analytical results of soil samples, no TPH(g), BTEX, MTBE, di-isopropyl ether, ethyl tertiary butyl ether, tertiary amyl methyl ether, or tertiary butyl alcohol was detected (see LE's *Ninth Monitoring Report (October 12, 2000 through January 11, 2001) for Vapor Extraction System*, dated February 22, 2001. See Figure 2 for well locations.

Based on LE's *Second Semiannual 2000 Groundwater Monitoring Report*, as well as findings from operation of the VES through January 11, 2001, LE concluded that the VES had been effective in reducing the volume of hydrocarbons beneath the site. LE recommended, based on the operational data, the fact that the asymptotic point had been reached, and the stability or reduction of the groundwater plume, that rebound testing be initiated and quarterly groundwater monitoring conducted. The California Regional Water Quality Control Board. Los Angeles Region, subsequently issued a letter (dated March 16, 2001) concurring with LE's recommendations.

4.11 2001

In March 2001, LE conducted groundwater monitoring using Wells GW2 through GW4 and GW9 through GW12. Based on the analytical results of groundwater samples and the findings and conclusions from the VES operation at the site, LE requested that the RWQCB allow the residual contamination to remain in place and grant closure of the site with no further action related to further site assessment and remediation of hydrocarbon contamination by VES in soils and groundwater. See LE's *Groundwater Monitoring and Rebound Testing Report and Request for Site Closure* report dated August 30, 2001.

4.12 2002

Based on the RWQCB letter dated March 8, 2002, the City was directed to

- continue conducting semiannual groundwater monitoring;
- prepare a preliminary site conceptual model (to be updated quarterly) due to the proximity of the site to the City's production wells and the potential impact that MTBE contamination from the site could cause;
- estimate plume travel time using RWQCB accepted modeling methods; and
- prepare a comprehensive site characterization report summarizing the results of all soil and groundwater assessments completed at the site.

5. ADDITIONAL SITE INFORMATION

Based on the soil and groundwater information gathered from site assessments at the subject property, LE has included the following referenced items:

- Figures 4–8: Groundwater contour maps from the July 23, 1992, December 15, 1995, March 10, 1998, July 2, 1999, and March 4, 2001 groundwater monitoring events
- Figures 9–11: Groundwater isoconcentration contour maps for March 10, 1998, July 2, 1999, and March 21, 2001
- Figures 12–14: Cross sections A-A′, B-B′, C-C′
- Figure 15: Location map
- Table 7: Summary of Well Construction Details

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TABLES

Tables 1 through 7

Table 1
Summary of Drilling and Well Construction Data

Well Name or Number	Drill Date	Drill Depth (ft)	Casing Depth (ft)	Internal Casing Diameter (in)	Seal Depth (ft)	Perforation Depth; Intervals (ft)	Pump Intake Depth (ft)	Total Length of Perforated Casing (ft)	Type of Perforations	Representative Aquifers
CBH Well No. 2	1999	836	740	12	361	399–426; 466–518; 566–608; 721–730	NA	130	0.075-inch Ful-Flo Louvers	Silverado, Sunnyside
CBH Well No. 4	1999	685	640	12	343	391–427; 465–495; 521–550; 566–588; 613–630	NA	134	0.075-inch Ful-Flo Louvers	Silverado, Sunnyside
CBH Well No. 5	2001	697	650	12	324	360–400; 440–470; 490–630	NA	210	0.070-inch Ful-Flo Louvers	Silverado, Sunnyside
CBH Well No. 6	1994	688	670	12	327	380–440; 480–650	360	330	Louvers	Silverado, Sunnyside
El Rodeo School Well	1940s	436	436	12	None	150–210	NA	60	Mill Slot Perforations	Gage, Lynwood
LACC Well No. 1*	Dec. 1989	665	400	12	100	130–230; 300–360	283	160	0.060-inch mill slot	Gage, Lynwood, Silverado
LACC Well No. 2	Sep. to Nov. 1994	427	356	12	150	161–241; 286–306; 326–346	262	120	0.060-inch louvered	Gage, Lynwood, Silverado
LACC Well No. 3	Aug. to Sept. 1997	400	360	12	110	130–220; 300–340	260–280	130	0.050-inch louvered	Gage, Lynwood, Silverado

* LACC Well No. 1 was destroyed in Spring 1988.

Table 2 Historical Soil Sampling Results										
Sample	Sample Date	TRPH (mg/kg)	TPH(fc) (mg/kg)	TPH(g) (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Xylenes (µg/kg)	MTBE (µg/kg)	VOCs (µg/kg)
B1-10′	9/7/89	NA	NA	ND	NA	NA	NA	NA	NA	NA
B2-13′	9/7/89	NA	NA	14,600	NA	NA	NA	NA	NA	NA
B3-10′	9/7/89	NA	NA	7.0	NA	NA	NA	NA	NA	NA
B4-12′	9/7/89	NA	NA	ND	NA	NA	NA	NA	NA	NA
B5-13′	9/8/89	NA	NA	ND	NA	NA	NA	NA	NA	NA
B6-12′	9/8/89	NA	NA	ND	NA	NA	NA	NA	NA	NA
B10@10′	1/17/90	NA	NA	ND	60	120	<70	190	NA	NA
B10@20′	1/17/90	NA	NA	3.6	1,390	1,460	<70	550	NA	NA
B10@30′	1/17/90	NA	NA	3,310	89,400	673,000	126,000	761,000	NA	NA
B11@4′	1/17/90	NA	NA	3,700	30,500	580,000	179,000	1,040,000	NA	NA
B12@10′	1/17/90	NA	NA	ND	<50	<70	<70	<140	NA	NA
B18-30′	6/15/90	NA	NA	17.5	3,710	5,930	410	2,640	NA	NA
B18-35′	6/15/90	NA	NA	ND	<50	<70	<70	<140	NA	NA
B19-15′	6/15/90	NA	NA	ND	<50	<70	<70	<140	NA	NA
B19-35′	6/15/90	NA	NA	ND	<50	<70	<70	<140	NA	NA
GW1-29′	6/7/90	NA	NA	ND	<50	<70	<70	<140	NA	NA
GW2-15′/30′	5/22/90	NA	NA	ND	<50	<70	<70	<140	NA	NA
GW3-15′/30′	5/22/90	NA	NA	ND	<50	<70	<70	<140	NA	NA
GW4-30′	5/22/90	NA	NA	2,300	75,800	566,000	94,100	561,000	NA	NA
B24-5′	7/7/92	ND	NA	ND	ND	ND	ND	ND	NA	NA
B24-10′	7/7/92	ND	NA	ND	ND	ND	ND	ND	NA	NA
B24-15′	7/7/92	ND	NA	ND	ND	ND	ND	ND	NA	NA
B25-5′	7/10/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B25-10′	7/10/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B25-15′	7/10/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B25-20′	7/10/92	NA	NA	ND	49	ND	ND	<15	NA	NA
B25-25′	7/10/92	NA	NA	ND	41	ND	7	33	NA	NA
B25-30′	7/10/92	NA	NA	ND	10	ND	ND	<15	NA	NA
B25-35′	7/10/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B26-5′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B26-10′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B26-15′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B26-20′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B26-25′	7/9/92	NA	NA	7.5	580	10	36	230	NA	NA

(Table continued on next page)

Table 2
(Continued)
Historical Soil Sampling Results

Sample	Sample Date	TRPH (mg/kg)	TPH(fc) (mg/kg)	TPH(g) (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Xylenes (µg/kg)	MTBE (µg/kg)	VOCs (µg/kg)
B26-30′	7/9/92	NA	NA	6.4	480	410	27	160	NA	NA
B26-35′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B27-5′	7/13/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B27-10′	7/13/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B27-15′	7/13/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B27-20′	7/13/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B27-25′	7/13/92	NA	NA	ND	110	ND	9	22	NA	NA
B27-30′	7/13/92	NA	NA	1.6	890	32	85	170	NA	NA
B27-35′	7/13/92	NA	NA	ND	23	18	ND	19	NA	NA
B28-18′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B28-20′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B28-25′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
B28-30′	7/9/92	NA	NA	ND	ND	45	17	110	NA	NA
GW9-29′	7/7/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
GW9-35′	7/7/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
GW10-30′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
GW12-30′	7/9/92	NA	NA	ND	ND	ND	ND	<15	NA	NA
LE1A-3′	10/19/95	230	NA	NA	ND	ND	ND	ND	NA	NA
LE2A-3′	10/19/95	88	NA	NA	ND	ND	ND	ND	NA	NA
LE3A-3′	10/19/95	2,600	1,200	NA	ND	ND	ND	9	NA	NA
LE4A-3′	10/19/95	110	NA	NA	ND	ND	ND	ND	NA	ND
LE5A-3′	10/19/95	ND	NA	NA	ND	ND	ND	ND	NA	NA
T1-1-14′	12/1/98	NA	NA	ND	5	21	ND	25	222	NA
T1-2-14′	12/1/98	NA	NA	ND	ND	ND	ND	ND	65	NA
T2-3-10′	12/1/98	NA	NA	ND	ND	ND	ND	ND	ND	NA
T2-4-10′	12/1/98	NA	NA	ND	ND	ND	ND	ND	ND	NA
D1-2′	12/4/98	NA	NA	26,200	33,000	605,000	300,000	2,340,000	145,000	NA
D2-2′	12/4/98	NA	NA	ND	ND	ND	ND	ND	ND	NA
P1-2′	12/4/98	NA	NA	20,100	61,600	810,000	266,000	1,650,000	490,000	NA
P2-4′	12/4/98	NA	NA	ND	ND	ND	ND	ND	915	NA
P3-4′	12/4/98	NA	NA	ND	ND	ND	ND	ND	ND	NA
LE1-10′	4/16/99	NA	NA	3,480	501	163,000	60,600	373,000	61,500	NA
LE1-20′	4/16/99	NA	NA	3,010	744	143,000	52,500	309,000	109,000	NA

(Table continued on next page)

Table 2
(Continued)
Historical Soil Sampling Results

Sample	Sample Date	TRPH (mg/kg)	TPH(fc) (mg/kg)	TPH(g) (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethylbenzene (µg/kg)	Xylenes (µg/kg)	MTBE (µg/kg)	VOCs (µg/kg)
LE1-30′	4/16/99	NA	NA	3,370	739	145,000	57,300	367,000	163,000	NA
LE1-40′	4/16/99	NA	NA	ND	ND	ND	ND	<10	53	NA
LE2-10′	4/16/99	NA	NA	ND	ND	ND	ND	<10	35	NA
LE2-20′	4/16/99	NA	NA	21	ND	ND	ND	<10	32,000	NA
LE2-30′	4/16/99	NA	NA	ND	ND	ND	ND	<10	6,640	NA
LE2-35′	4/16/99	NA	NA	ND	ND	ND	ND	<10	2,510	NA
PCL		10	10	1.0	5	5	5	5	20	–

TRPH = Total recoverable petroleum hydrocarbons
TPH(fc) = Total petroleum hydrocarbons, fuel characterization
TPH(g) = Total petroleum hydrocarbons as gasoline
MTBE = Methyl tertiary butyl ether
VOCs = Volatile organic compounds
PQL = Practical quantitation limit
ND = Not detected at the detection limit
NA = Not analyzed

Table 3
Historical Groundwater Analytical Results
(µg/l)

Sample #	Date	TPH(g)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA
GW1	06/20/90	ND	ND	ND	ND	ND	NA	NA
	04/23/92	ND	ND	ND	ND	ND	NA	NA
	07/23/92	ND	ND	ND	ND	ND	NA	NA
	03/08/95	ND	ND	ND	ND	ND	NA	NA
	06/07/95	ND	ND	ND	ND	ND	NA	NA
	09/06/95	ND	ND	ND	ND	ND	NA	NA
	12/15/95	ND	ND	ND	ND	ND	NA	NA
	04/17/96	NA	NA	NA	NA	NA	NA	NA
	07/03/96	ND	ND	ND	ND	ND	ND	NA
	09/27/96	NA	NA	NA	NA	NA	NA	NA
	12/20/96	NA	NA	NA	NA	NA	NA	NA
	03/19/97	NA	NA	NA	NA	NA	NA	NA
	06/27/97	NA	NA	NA	NA	NA	NA	NA
	09/26/97	NA	NA	NA	NA	NA	NA	NA
	12/24/97	ND	ND	1.2	ND	1.9	ND	NA
	03/10/98	NA	NA	NA	NA	NA	NA	NA
	06/23/98	NA	NA	NA	NA	NA	NA	NA
	09/30/98	NA	NA	NA	NA	NA	NA	NA
	12/30/98	NA	NA	NA	NA	NA	NA	NA
	03/31/99	NA	NA	NA	NA	NA	NA	NA
	07/02/99	NA	NA	NA	NA	NA	NA	NA
	12/16/99	NA	NA	NA	NA	NA	NA	NA
	06/16/00	NA	NA	NA	NA	NA	NA	NA
	11/15/00	NA	NA	NA	NA	NA	NA	NA
	03/21/01	NA	NA	NA	NA	NA	NA	NA
GW2	06/14/90	80	27.7	2.55	ND	3.74	NA	NA
	04/23/92	ND	3	ND	ND	ND	NA	NA
	07/23/92	70	ND	ND	ND	ND	NA	NA
	03/08/95	ND	ND	ND	ND	ND	NA	NA
	06/07/95	ND	ND	ND	ND	ND	NA	NA
	09/06/95	ND	ND	ND	ND	ND	NA	NA
	12/15/95	ND	ND	ND	ND	ND	NA	NA
	04/17/96	ND	ND	ND	ND	ND	28	NA
	07/03/96	ND	2.6	1.9	ND	1.8	270	NA
	09/27/96	ND	ND	ND	ND	ND	64	NA
	12/20/96	ND	ND	ND	ND	ND	46	NA
	03/19/97	ND	ND	ND	ND	ND	94	NA
	06/27/97	ND (52)	ND (ND)	1.5 (ND)	ND (ND)	1.1 (ND)	45 [190]	NA
	09/26/97	80	2.2	ND	0.6	ND	48	NA
	12/24/97	ND	ND	ND	ND	ND	260 [260]	NA
	03/10/98	130	ND	ND	ND	ND	660 [550]	NA
	06/23/98	ND	ND	ND	ND	ND	560	NA
	09/30/98	ND	ND	ND	ND	ND	160	NA
	12/30/98	ND	ND	ND	ND	ND	73	NA
	03/31/99	ND	ND	ND	ND	ND	1,130	NA
	07/02/99	ND	ND	ND	ND	ND	1,400 [1,300]	NA
	12/16/99	ND	ND	ND	ND	ND	677 [884]	NA
	06/16/00	ND	ND	ND	ND	ND	948 [872]	NA
	11/15/00	205	ND	ND	ND	ND	[184]	ND
	03/21/01	ND	ND	ND	ND	ND	[ND]	ND

(Table continued on next page.)

Table 3
(Continued)
Historical Groundwater Analytical Results
(µg/l)

Sample #	Date	TPH(g)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA
GW3	06/14/90	ND	ND	ND	ND	ND	NA	
	04/23/92	ND	ND	ND	ND	ND	NA	NA
	07/23/92	ND	12	ND	ND	ND	NA	NA
	03/08/95	ND	ND	ND	ND	ND	NA	NA
	06/07/95	ND	ND	ND	ND	ND	NA	NA
	09/06/95	ND	ND	ND	ND	ND	NA	NA
	12/15/95	ND	ND	ND	ND	ND	NA	NA
	04/17/96	NA	NA	NA	NA	NA	NA	NA
	07/03/96	ND	ND	ND	ND	ND	ND	NA
	09/27/96	NA	NA	NA	NA	NA	NA	NA
	12/20/96	NA	NA	NA	NA	NA	NA	NA
	03/19/97	NA	NA	NA	NA	NA	NA	NA
	06/27/97	NA	NA	NA	NA	NA	NA	NA
	09/26/97	NA	NA	NA	NA	NA	NA	NA
	12/24/97	NA	NA	NA	NA	NA	NA	NA
	03/10/98	NA	NA	NA	NA	NA	NA	NA
	06/23/98	NA	NA	NA	NA	NA	NA	NA
	09/30/98	NA	NA	NA	NA	NA	NA	NA
	12/30/98	NA	NA	NA	NA	NA	NA	NA
	03/31/99	NA	NA	NA	NA	NA	NA	NA
	07/02/99	NA	NA	NA	NA	NA	NA	NA
	12/16/99	ND	ND	ND	ND	ND	ND	NA
	06/16/00	ND	ND	ND	ND	ND	ND	NA
	11/15/00	ND	ND	ND	ND	ND	[ND]	ND
	03/21/01	ND	ND	ND	ND	ND	[ND]	ND
GW4	06/14/90	**	**	**	**	**	**	NA
	04/23/92	**	**	**	**	**	**	NA
	07/23/92	**	**	**	**	**	**	NA
	03/08/95	**	**	**	**	**	**	NA
	06/07/95	**	**	**	**	**	**	NA
	09/06/95	**	**	**	**	**	**	NA
	12/15/95	**	**	**	**	**	**	NA
	04/17/96	**	**	**	**	**	**	NA
	07/03/96	**	**	**	**	**	**	NA
	09/27/96	**	**	**	**	**	**	NA
	12/20/96	**	**	**	**	**	**	NA
	03/19/97	**	**	**	**	**	**	NA
	04/15/97†	600,000‡	16,000,000	93,000,000	22,000,000	120,000,000	< 5,000,000	NA
	06/27/97	**	**	**	**	**	**	NA
	09/26/97	**	**	**	**	**	**	NA
	12/24/97	**	**	**	**	**	**	NA
	03/10/98	NA	NA	NA	NA	NA	NA	NA
	06/23/98	250,000	33,000	57,000	4,000	25,000 32,000	47,000 [48,000]	NA
	09/30/98	210,000	27,000 [24,000]	53,000 [47,000] [1]	4,300 [3,900]	[26,000]	24,000 [19,000]	NA
	12/30/98	165,000	16,500	32,900	3,050	22,100	21,900 [22,500]	NA
	03/31/99	182	0.5	ND	0.3	2.5	481 [403]	NA
	07/02/99	55,200	7,150	15,000	1,110	8,340	13,400 [12,000]	NA
	12/16/99	85,600	13,500	14,700	1,650	5,900	18,900 [18,000]	NA
	06/16/00	2,710	384	52	36	520	1,840 [1,380]	NA
	11/15/00	2,310	ND	ND	ND	ND	[1,820]	516
	03/21/01	104	ND	ND	2.5	ND	[49.7]	ND

(Table continued on next page.)

Table 3
(Continued)
Historical Groundwater Analytical Results
(µg/l)

Sample #	Date	TPH(g)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA
GW9	07/23/92	ND	ND	ND	ND	ND	NA	NA
	03/08/95	ND	ND	ND	ND	ND	NA	NA
	06/07/95	ND	ND	ND	ND	ND	NA	NA
	09/06/95	ND	ND	ND	ND	ND	NA	NA
	12/15/95	ND	ND	ND	ND	ND	NA	NA
	04/17/96	NA	NA	NA	NA	NA	NA	NA
	07/03/96	ND	ND	ND	ND	ND	ND	NA
	09/27/96	NA	NA	NA	NA	NA	NA	NA
	12/20/96	NA	NA	NA	NA	NA	NA	NA
	03/19/97	NA	NA	NA	NA	NA	NA	NA
	06/27/97	ND	ND	ND	ND	ND	ND	NA
	09/26/97	ND	ND	ND	ND	ND	ND	NA
	12/24/97	63	ND	ND	ND	ND	ND	NA
	03/10/98	62	ND	ND	ND	ND	ND	NA
	06/23/98	ND	ND	1.2	ND	ND	ND	NA
	9/30/98	ND	ND	ND	ND	ND	ND	NA
	12/30/98	NA	NA	NA	NA	NA	NA	NA
	03/31/99	ND	ND	ND	ND	ND	ND	NA
	07/02/99	ND	ND	ND	ND	ND	ND	NA
	12/16/99	ND	ND	ND	ND	ND	2.0 [ND]	NA
	06/16/00	ND	ND	ND	ND	ND	ND	NA
	11/15/00	ND	ND	ND	ND	ND	[ND]	ND
	03/21/01	ND	ND	ND	ND	ND	[ND]	ND
GW10	07/23/92	ND	ND	ND	ND	ND	NA	NA
	03/08/95	ND	ND	ND	ND	ND	NA	NA
	06/07/95	ND	ND	ND	ND	ND	NA	NA
	09/06/95	ND	ND	ND	ND	ND	NA	NA
	12/15/95	ND	ND	ND	ND	ND	NA	NA
	04/17/96	NA	NA	NA	NA	NA	NA	NA
	07/03/96	ND	ND	ND	ND	ND	ND	NA
	09/27/96	NA	NA	NA	NA	NA	NA	NA
	12/20/96	NA	NA	NA	NA	NA	NA	NA
	03/19/97	NA	NA	NA	NA	NA	NA	NA
	06/27/97	72	ND	ND	ND	ND	ND	NA
	09/26/97	ND	ND	ND	ND	ND	ND	NA
	12/24/97	NA	NA	NA	NA	NA	NA	NA
	03/10/98	ND	ND	ND	ND	ND	ND	NA
	06/23/98	ND	ND	1.4	ND	1.4	ND	NA
	09/30/98	ND	ND	ND	ND	ND	ND	NA
	12/30/98	ND	ND	ND	ND	ND	ND	NA
	03/31/99	ND	ND	ND	ND	ND	39.4	NA
	07/02/99	ND	ND	ND	ND	ND	ND	NA
	12/16/99	ND	ND	ND	ND	ND	ND	NA
	06/16/00	ND	ND	ND	ND	ND	ND	NA
	11/15/00	ND	ND	ND	ND	ND	[ND]	ND
	03/21/01	ND	ND	ND	ND	ND	[ND]	ND

(Table continued on next page.)

Table 3
(Continued)
Historical Groundwater Analytical Results
(µg/l)

Sample #	Date	TPH(g)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA
GW11	07/23/92	ND	ND	ND	ND	ND	NA	NA
	03/08/95	ND	ND	ND	ND	ND	NA	NA
	06/07/95	ND	ND	ND	ND	ND	NA	NA
	09/06/95	ND	ND	ND	ND	ND	NA	NA
	12/15/95	ND	ND	ND	ND	ND	NA	NA
	04/17/96	NA	NA	NA	NA	NA	NA	NA
	07/03/96	ND	ND	ND	ND	ND	ND	NA
	09/27/96	NA	NA	NA	NA	NA	NA	NA
	12/20/96	NA	NA	NA	NA	NA	NA	NA
	03/19/97	NA	NA	NA	NA	NA	NA	NA
	06/27/97	ND	ND	ND	ND	ND	ND	NA
	09/26/97	93	4.9	ND	ND	ND	ND	NA
	12/24/97	ND	ND	ND	ND	ND	ND	NA
	03/10/98	320	ND	ND	ND	ND	ND	NA
	06/23/98	ND	ND	ND	ND	ND	ND	NA
	09/30/98	ND	ND	ND	ND	ND	ND	NA
	12/30/98	ND	ND	ND	ND	ND	ND	NA
	03/31/99	ND	ND	ND	ND	ND	ND	NA
	07/02/99	ND	ND	ND	ND	ND	ND	NA
	12/16/99	ND	ND	ND	ND	ND	ND	NA
	06/16/00	ND	ND	ND	ND	ND	ND	NA
	11/15/00	ND	ND	ND	ND	ND	[ND]	ND
	03/21/01	ND	ND	ND	ND	ND	[ND]	ND
GW12	07/23/92	ND	ND	ND	ND	ND	NA	NA
	03/08/95	ND	ND	ND	ND	ND	NA	NA
	06/07/95	ND	ND	ND	ND	ND	NA	NA
	09/06/95	ND	ND	ND	ND	ND	NA	NA
	12/15/95	ND	ND	ND	ND	ND	NA	NA
	04/17/96	ND	ND	ND	ND	ND	ND	NA
	07/03/96	ND	ND	ND	ND	ND	ND	NA
	09/27/96	ND	ND	ND	ND	ND	ND	NA
	12/20/96	ND	ND	ND	ND	ND	ND	NA
	03/19/97	ND	ND	ND	ND	ND	ND	NA
	06/27/97	ND	ND	ND	ND	ND	ND	NA
	09/26/97	ND	ND	ND	ND	ND	ND	NA
	12/24/97	ND	ND	ND	ND	ND	ND	NA
	03/10/98	ND	ND	ND	ND	ND	ND	NA
	06/23/98	ND	ND	ND	ND	ND	ND	NA
	09/30/98	ND	ND	ND	ND	ND	ND	NA
	12/30/98	ND	ND	ND	ND	ND	ND	NA
	03/31/99	ND	ND	ND	ND	ND	ND	NA
	07/02/99	ND	ND	ND	ND	ND	ND	NA
	12/16/99	ND	ND	ND	ND	ND	ND	NA
	06/16/00	ND	ND	ND	ND	ND	ND	NA
	11/15/00	ND	ND	ND	ND	ND	[ND]	ND
	03/21/01	ND	ND	ND	ND	ND	[ND]	ND

(Table continued on next page.)

Table 3
(Continued)
Historical Groundwater Analytical Results
(µg/l)

Sample #	Date	TPH(g)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA
B10	1/17/90	117,000	9,560	34,900	4,100	22,600	NA	NA
LE1-W	04/16/99	5,490	<3	730	116	741	5,570 [3,890]	NA
PQL		50	1.0	1.0	1.0	2.0	2.0	10
Detection Limits*		50	0.5	0.5	0.5	1.0	10	–
Detection Limits[1]		50	0.3	0.3	0.3	0.6	2.0	–

* Detection limit for samples collected April 17, 1996 through September 30, 1998

** Indicates the presence of free product; see Table 2.

µg/L = Micrograms per liter (parts per billion)
NA = Not analyzed
ND = Not detected at or above detection limits
MTBE = Methyl tertiary butyl ether
TBA = Tertiary butyl alcohol
PQL = Practical quantitation limit (current sampling event)
† = Indicates free-product sample analyzed for TPH fuel characterization; concentration in C_4–C_{12} range (gasoline-range organics).
‡ = Concentration reported in milligrams per kilogram (parts per million).
( ) = Concentrations in parentheses indicate samples collected before well purging.
[ ] = Concentrations in brackets indicate sample analyzed by EPA Method 8260.
1 = Detection limits for samples collected December 30, 1998 through June 16, 2000.
2 = Tertiary butyl alcohol

Table 4 Product Recovery for GW4						
	Adjusted Depth	Product	Volume Bailed		Accumulated Volume	
Date	to Groundwater* (ft)	Thickness (ft)	Water (gal)	Product (gal)	Water (gal)	Product (gal)
12/03/91	31.89	2.44	2.2	1.0	2.2	1.0
12/11/91	31.91	2.12	1.0	3.8	3.2	4.8
12/19/91	31.92	1.11	3.8	1.2	7.0	6.0
12/27/91	31.97	0.71	3.2	1.8	10.2	7.8
01/02/92	31.94	0.53	4.8	0.2	15.0	8.0
01/09/92	31.86	0.64	4.0	1.0	19.0	9.0
01/14/92	31.78	0.56	4.5	0.1	23.5	9.1
01/23/92	31.93	0.91	4.1	0.8	27.6	9.9
02/31/92	31.96	0.56	4.6	0.4	32.2	10.3
02/06/92	31.99	0.45	4.2	0.7	36.4	11.0
02/13/92	31.66	0.36	4.2	0.2	40.6	11.2
02/20/92	31.54	0.44	3.9	0.9	44.5	12.1
02/27/92	31.57	0.75	3.7	0.7	48.2	12.8
03/12/92	31.47	1.55	2.8	1.7	51.0	14.5
03/26/92	31.34	1.02	9.2	0.7	60.2	15.2
04/13/92	31.22	1.31	9.2	0.7	69.4	15.9
04/23/92	31.21	1.00	4.3	0.7	73.7	16.6
05/11/92	31.34	1.05	4.3	0.7	78.0	17.3
05/29/92	31.14	1.12	4.3	0.7	82.3	18.0
06/05/92	31.16	0.57	4.7	0.3	87.0	18.3
06/16/92	31.13	0.50	4.7	0.3	91.7	18.6
06/29/92	31.09	0.44	4.8	0.2	96.5	18.8
07/13/92	31.07	0.28	4.9	0.1	101.4	18.9
08/06/92	31.09	0.03	4.9	0.1	106.3	19.0
08/24/92	30.95	0.15	4.9	0.1	111.2	19.1
09/10/92	30.88	0.12	4.9	0.1	116.1	19.2
03/08/95	30.60	0.60	30	0.65	146.1	19.85
04/07/95	30.02	0.32	7	0.46	153.1	20.31
05/10/95	29.71	0.20	2	0.38	155.1	20.69
06/07/95	29.39	0.16	90	0.36	245.1	21.05
07/28/95	28.90	0.19	10	0.38	255.1	21.43
08/25/95	28.64	0.11	4	0.32	259.1	21.75
09/06/95	28.55	0.06	5	0.29	264.1	22.04
10/06/95	28.44	0.05	4.5	0.03	268.6	22.07
11/02/95	28.46	0.04	4.5	0.05	273.1	22.12
12/15/95	28.66	0.07	80	0.1	353.1	22.22
04/17/96	29.10	0.07	10	0.2	363.1	22.42
07/03/96	29.60	0.07	50	0.1	413.1	22.52
09/27/96	30.16	0.08	0.25	0.5	413.35	23.02
12/20/96	30.47	0.05	0.25	0.25	413.60	23.27
03/19/97	31.66	0.49	5.0	3.0	418.60	26.27

(Table continued on next page.)

Table 4
(continued)
Product Recovery for GW4

Date	Adjusted Depth to Groundwater* (ft)	Product Thickness (ft)	Volume Bailed		Accumulated Volume	
			Water (gal)	Product (gal)	Water (gal)	Product (gal)
04/14/97	33.11	3.62	9.0	9.0	427.60	35.27
04/15/97	32.88	0.92	5.0	0.75	432.60	36.0
04/25/97	33.37	2.55	3.0	8.0	435.60	44.0
05/08/97	33.49	3.20	–	–	435.60	44.0
05/12/97	33.98	3.32	13.0	4.0	443.60	48.0
05/23/97	33.52	4.19	8.0	5.0	451.60	53.0
05/27/97	33.87	3.07	5.0	5.0	456.60	58.0
06/04/97	NM	NM	5.0	0.75	461.60	58.75
06/11/97	34.28	0.60	5.0	0.75	466.60	59.50
06/18/97	34.34	0.45	5.0	0.20	471.60	59.70
06/27/97	34.46	0.61	5.0	2.0	476.60	61.70
07/03/97	34.49	0.48	1.05	0.10	477.65	61.80
07/10/97	34.63	0.40	4.6	0.66	482.45	62.46
07/22/97	34.74	0.31	1.3	0.5	483.75	62.96
07/23/97	34.72	0.09	0.33	0.12	484.08	63.08
08/01/97	34.95	0.21	0.30	0.09	484.38	63.17
08/07/97	35.17	0.22	0.50	0.25	484.88	63.42
08/20/97	35.19	0.12	1.2	0.07	486.08	63.49
09/09/97	35.32	0.19	2.0	0.08	488.08	63.57
09/15/97	35.53	0.11	2.0	0.06	490.08	63.63
10/03/97	35.89	0.19	2.0	0.08	492.08	63.71
10/10/97	36.15	0.31	2.5	0.08	494.58	63.79
11/25/97	36.89	0.35	1.5	0.08	496.08	63.87
12/15/97	37.07	0.10	1.5	0.03	497.58	63.90
12/24/97	37.16	0.06	20.0	<0.01	517.60	63.90
01/15/98	37.25	–	0.0	0.0	517.60	63.90
01/22/98	37.18	SHEEN	0.0	0.0	517.60	63.90
03/10/98	35.09	–	0.5	<0.01	518.10	63.90
06/23/98	33.46	–	–	–	518.10	63.90
09/30/98	32.40	–	–	–	518.10	63.90
12/30/98	32.20	–	–	–	518.10	63.90
03/31/99	32.22	–	–	–	518.10	63.90
07/02/99	33.17	–	–	–	518.10	63.90
12/16/99	33.97	–	–	–	518.10	63.90
06/16/00	34.23	–	–	–	518.10	63.90
11/15/00	34.35	–	–	–	518.10	63.90

Note: GW4 is a 4-inch well.
* Adjusted depth to groundwater = depth to groundwater - 0.70 (product thickness)
NM = Not measured
– = No product detected
SHEEN = Sheen of product detected in bailer; no product detected on interface probe.

Table 5
Historical Groundwater Elevations

Well Number	Date	Depth to Groundwater (ft)	Top of Casing Elevation (ft)	Groundwater Elevation (ft)	Depth to Floating Product (ft)	Product thickness (ft)
GW1	07/23/92	29.98	236.64	206.66	–	NA
	03/08/95	29.15		207.49	–	NA
	06/07/95	28.29		208.35	–	NA
	09/06/95	27.57		209.07 (H)	–	NA
	12/15/95	27.68		208.96	–	NA
	04/17/96	28.04		208.60	–	NA
	07/03/96	28.61		208.03	–	NA
	09/27/96	29.12		207.52	–	NA
	12/20/96	29.50		207.14	–	NA
	03/19/97	30.75		205.89	–	NA
	06/27/97	33.58		203.06	–	NA
	09/26/97	35.08		201.56	–	NA
	12/24/97	36.32		200.32 (L)	–	NA
	03/10/98	–[1]		–[1]	–	–[1]
	06/23/98	32.60		204.04	–	NA
	09/30/98	31.58		205.06	–	NA
	12/30/98	31.37		205.27	–	NA
	03/31/99	31.86		204.78	–	NA
	07/02/99	32.31		204.33	–	NA
	12/16/99	–[1]		–[1]	–	–[1]
	06/16/00	33.34		203.30	–	NA
	11/15/00	–		–	–	–
	03/21/01	–		–	–	–
GW2	07/23/92	30.31	236.94	206.63	–	NA
	03/08/95	29.50		207.44	–	NA
	06/07/95	28.64		208.30	–	NA
	09/06/95	27.85		209.09 (H)	–	NA
	12/15/95	28.00		208.94	–	NA
	04/17/96	28.39		208.55	–	NA
	07/03/96	28.94		208.00	–	NA
	09/27/96	29.20		207.74	–	NA
	12/20/96	29.71		207.23	–	NA
	03/19/97	31.05		205.89	–	NA
	06/27/97	33.88		203.06	–	NA
	09/26/97	35.36		201.58	–	NA
	12/24/97	36.56		200.38	–	NA
	03/10/98	34.44		202.50	–	NA
	06/23/98	32.87		204.07	–	NA
	09/30/98	31.84		205.10	–	NA
	12/30/98	31.62		205.32	–	NA
	03/31/99	32.12		204.82	–	NA
	07/02/99	32.55		204.39	–	NA
	12/16/99	33.31		203.63	–	NA
	06/16/00	33.57		203.37	–	NA
	11/15/00	33.73		203.21	–	NA
	03/21/01	37.05		199.89	–	NA
	07/11/01	41.81		195.13	–	NA
	08/02/01	42.14	236.92	194.78 (L)	–	
GW3	07/23/92	33.50	240.64	207.14	–	NA
	03/08/95	32.72		207.92	–	NA
	06/07/95	31.82		208.82	–	NA
	09/06/95	30.57		210.07 (H)	–	NA
	12/15/95	31.03		209.61	–	NA
	04/17/96	32.62		208.02	–	NA
	07/03/96	32.10		208.54	–	NA
	09/27/96	32.69		207.95	–	NA
	12/20/96	33.12		207.52	–	NA
	03/19/97	33.81		206.83	–	NA
	06/27/97	35.95		204.69	–	NA
	09/26/97	37.28		203.36	–	NA
	01/02/98	38.65		201.99	–	NA
	03/10/98	36.85		203.79	–	NA
	06/23/98	35.02		205.62	–	NA
	09/30/98	33.98		206.66	–	NA
	12/30/98	33.83		206.81	–	NA
	03/31/99	34.42		206.22	–	NA
	07/02/99	34.92		205.72	–	NA
	12/16/99	35.79		204.85	–	NA
	06/16/00	36.08		204.56	–	NA
	11/15/00	36.19		204.45	–	NA
	03/21/01	40.42		200.22	–	NA
	08/02/01	44.10	240.71	196.61 (L)	–	NA

(Table continued on next page.)

Table 5
(continued)
Historical Groundwater Elevations

Well Number	Date	Depth to Groundwater (ft)	Top of Casing Elevation (ft)	Groundwater Elevation (ft)	Depth to Floating Product (ft)	Product thickness (ft)
GW4	12/03/91	**	231.37	**	31.39	2.44
	09/10/92	**		**	30.84	0.12
	03/08/95	30.60		**	30.00	0.60
	06/07/95	29.39		**	29.23	0.16
	09/06/95	28.55		**	28.49	0.06
	12/15/95	28.70		**	28.63	0.07
	04/17/96	29.14		**	29.07	0.07
	07/03/96	29.64		**	29.57	0.07
	09/27/96	30.20		**	30.12	0.08
	12/20/96	30.51		**	30.46	0.05
	03/19/97	32.00		**	31.51	0.49
	04/14/97	35.65		**	32.03	3.62
	04/15/97	33.52		**	32.60	0.92
	04/25/97	35.15		**	32.60	2.55
	05/08/97	35.73		**	32.93	3.20
	05/12/97	36.30		**	32.98	3.32
	05/23/97	36.45		**	32.26	4.19
	05/27/97	36.02		**	32.95	3.07
	06/11/97	34.70		**	34.10	0.60
	06/18/97	34.65		**	34.20	0.45
	06/27/97	34.89		**	34.28	0.61
	07/03/97	34.83		**	34.35	0.48
	07/10/97	34.91		**	34.51	0.40
	07/22/97	34.96		**	34.65	0.31
	07/23/97	34.78		**	34.69	0.09
	08/01/97	35.10		**	34.89	0.21
	08/07/97	35.32		**	35.10	0.22
	08/20/97	35.27		**	35.15	0.12
	09/09/97	35.45		**	35.26	0.19
	09/15/97	35.61		**	35.50	0.11
	10/03/97	36.02		**	35.83	0.19
	10/10/97	36.37		**	36.06	0.31
	11/25/97	37.13		**	36.78	0.35
	12/15/97	37.14		**	37.04	0.10
	12/24/97	37.20		**	37.14	0.06
	01/15/98	37.25			–	NA
	01/22/98	37.18			–	NA
	03/10/98	35.09			–	NA
	06/23/98	33.46			–	NA
	09/30/98	32.40			–	NA
	12/30/98	32.20			–	NA
	03/31/99	32.22			–	NA
	07/02/99	33.17			–	NA
	12/16/99	33.97			–	NA
	06/16/00	34.23			–	NA
	11/15/00	34.35			–	NA
	03/21/01	37.66			–	NA
	07/11/01	42.26			–	NA
	08/02/01	42.61	237.79	195.18	–	NA
GW9	07/23/92	32.22	239.20	206.98	–	NA
	03/08/95	31.37		207.83	–	NA
	06/07/95	30.45		208.75	–	NA
	09/06/95	29.67		209.53 (H)	–	NA
	12/15/95	29.80		209.40	–	NA
	04/17/96	30.24		208.96	–	NA
	07/03/96	30.78		208.42	–	NA
	09/27/96	31.35		207.85	–	NA
	12/20/96	31.70		207.50	–	NA
	03/19/97	32.85		206.35	–	NA
	06/27/97	35.60		203.60	–	NA
	09/26/97	37.04		202.16	–	NA
	12/24/97	38.35		200.85	–	NA
	03/10/98	36.23		202.97	–	NA
	06/23/98	34.53		204.67	–	NA
	09/30/98	33.47		205.73	–	NA
	12/30/98	–[1]		–[1]	–	NA
	03/31/99	33.85		205.35	–	NA
	07/02/99	34.30		204.90	–	NA
	12/16/99	35.19		204.01	–	NA
	06/16/00	35.40		203.80	–	NA
	11/15/00	35.56		203.64	–	NA
	03/21/01	38.73		200.47	–	NA
	08/02/01	43.48	239.20	195.72 (L)	–	NA

(Table continued on next page.)

Table 5
(continued)
Historical Groundwater Elevations

Well Number	Date	Depth to Groundwater (ft)	Top of Casing Elevation (ft)	Groundwater Elevation (ft)	Depth to Floating Product (ft)	Product thickness (ft)
GW10	07/23/92	30.40	236.94	206.54	–	NA
	03/08/95	29.57		207.37	–	NA
	06/07/95	28.77		208.17	–	NA
	09/06/95	28.04		208.90 (H)	–	NA
	12/15/95	28.17		208.77	–	NA
	04/17/96	28.49		208.45	–	NA
	07/03/96	29.06		207.88	–	NA
	09/27/96	29.55		207.39	–	NA
	12/20/96	29.91		207.03	–	NA
	03/19/97	31.18		205.76	–	NA
	06/27/97	34.15		202.79	–	NA
	09/29/97	35.78		201.16	–	NA
	01/02/98	37.36		199.58	–	NA
	03/10/98	35.03		201.91	–	NA
	06/23/98	33.39		203.55	–	NA
	09/30/98	32.28		204.66	–	NA
	12/30/98	32.05		204.89	–	NA
	03/31/99	32.56		204.38	–	NA
	07/02/99	32.92		204.02	–	NA
	12/16/99	33.68		203.26	–	NA
	06/16/00	33.93		203.01	–	NA
	11/15/00	34.08		202.86	–	NA
	03/21/01	37.13		199.81	–	NA
	08/02/01	41.69	236.97	195.28 (L)	–	NA
GW11	07/23/92	28.32	233.99	205.07	–	NA
	03/08/95	27.52		206.47	–	NA
	06/07/95	26.80		207.19	–	NA
	09/06/95	26.17		207.82 (H)	–	NA
	12/15/95	26.27		207.72	–	NA
	04/17/96	26.50		207.49	–	NA
	07/03/96	27.06		206.93	–	NA
	09/27/96	27.52		206.97	–	NA
	12/20/96	27.80		206.19	–	NA
	03/19/97	29.41		204.58	–	NA
	06/27/97	32.78		201.21	–	NA
	09/29/97	34.70		199.29	–	NA
	12/24/97	36.19		197.80	–	NA
	03/10/98	33.92		200.07	–	NA
	06/23/98	32.39		201.60	–	NA
	09/30/98	31.22		202.77	–	NA
	12/30/98	30.91		203.08	–	NA
	03/31/99	31.23		202.76	–	NA
	07/02/99	31.57		202.42	–	NA
	12/16/99	32.13		201.86	–	NA
	06/16/00	32.37		201.62	–	NA
	11/15/00	32.53		201.46	–	NA
	03/21/01	35.62		198.37	–	NA
	08/02/01	40.23	233.97	193.74 (L)	–	NA
GW12	07/23/92	28.78	234.80	206.02	–	NA
	03/08/95	27.98		206.82	–	NA
	06/07/95	27.20		207.60	–	NA
	09/06/95	26.50		208.30 (H)	–	NA
	12/15/95	26.63		208.17	–	NA
	04/17/96	26.96		207.84	–	NA
	07/03/96	27.47		207.33	–	NA
	09/27/96	28.00		206.80	–	NA
	12/20/96	28.32		206.48	–	NA
	03/19/97	29.75		205.05	–	NA
	06/27/97	32.85		201.95	–	NA
	09/26/97	34.46		200.34	–	NA
	12/24/97	35.72		199.08	–	NA
	03/10/98	33.60		201.20	–	NA
	06/23/98	32.03		202.77	–	NA
	09/30/98	31.01		203.79	–	NA
	12/30/98	30.77		204.03	–	NA
	03/31/99	31.15		203.65	–	NA
	07/02/99	31.56		203.24	–	NA
	12/16/99	32.15		202.65	–	NA
	06/16/00	32.43		202.37	–	NA
	11/15/00	32.58		202.22	–	NA
	03/21/01	35.83		198.97	–	NA
	08/02/01	40.93	234.78	193.85 (L)		

(Table notes on next page)

** Indicates presence of free product.
NA = Not applicable
1 = Well not accessible
— = No product detected
(H) = Historical high
(L) = Historical low

Table 6
Analytical Results of Groundwater Samples
Biodegradation Parameters

EPA Method		352.1	375.4	SM3500-D	Probe	Meter
Units		mg/l			mg/l	mV
Well I.D.	Sampling Date	Nitrate	Sulfate	Ferrous Iron	D.O.	ORP
GW2	11/15/00	2.1	257	ND	2.79	-363
	03/21/01	2.4	275	0.24	6.41	-257
GW3	11/15/00	5.3	220	ND	3.42	-352
	03/21/01	16.9	167	ND	5.10	-406
GW4	11/15/00	0.9	245	ND	0.60	-367
	03/21/01	1.8	290	ND	0.56	-275
GW9	11/15/00	0.5	129	ND	4.30	-357
	03/21/01	1.9	210	ND	7.58	-402
GW10	11/15/00	2.6	284	ND	4.94	-353
	03/21/01	2.5	281	ND	7.51	-406
GW11	11/15/00	1.9	250	ND	3.30	-354
	03/21/01	2.6	262	0.11	6.15	-407
GW12	11/15/00	2.7	287	ND	4.22	-358
	03/21/01	2.4	317	0.11	6.53	-397
Detection Limit		0.10	10	0.10	—	—

D.O. = Dissolved oxygen
ORP = Oxygen reduction potential, data recorded represents final reading during purging
ND = None detected at or above the detection limit
– = Not analyzed or not applicable
mg/l = Milligrams per liter
mV = Milli-Volts

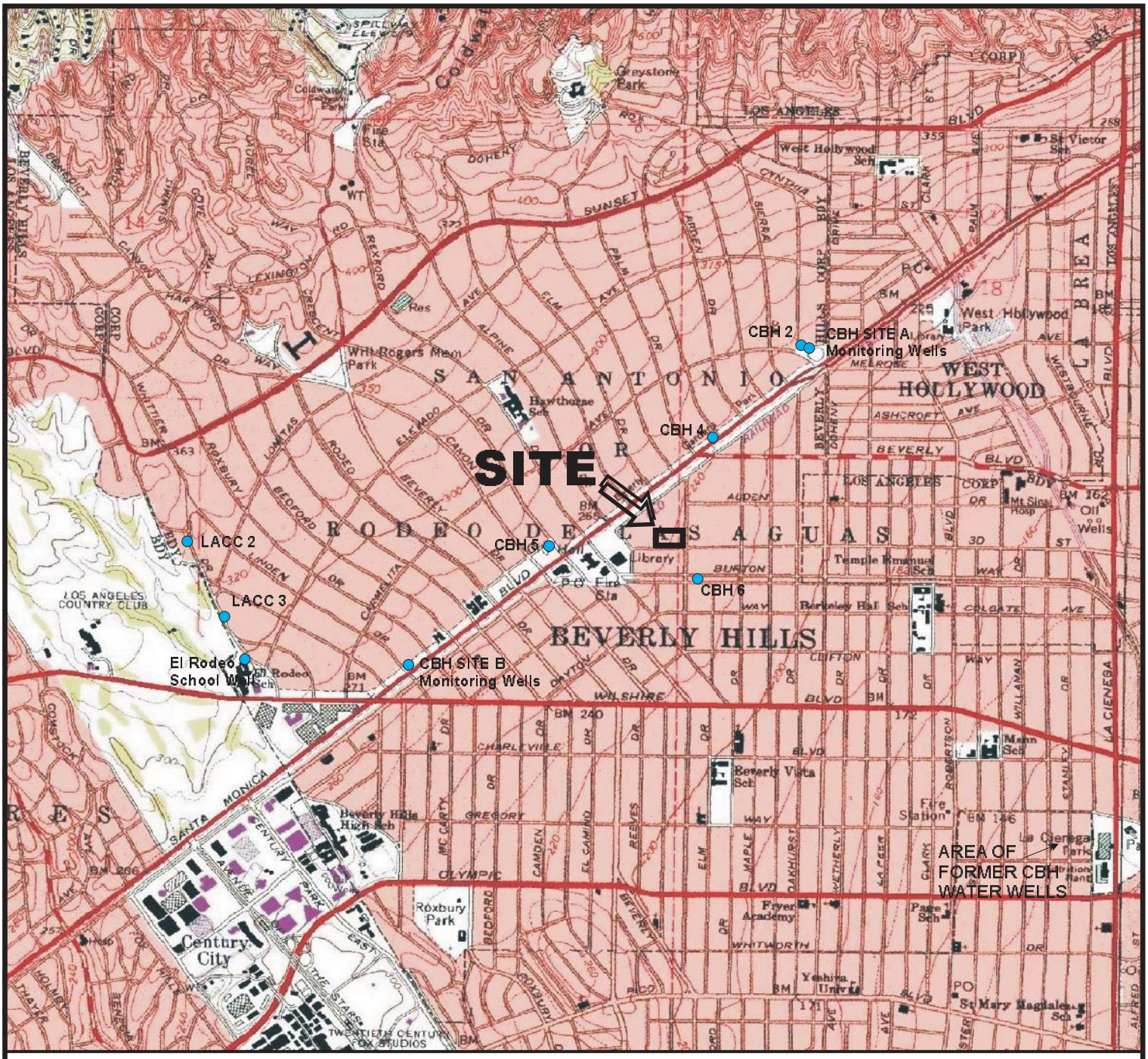
Table 7
Summary of Well Construction Details

Well ID	Screen Intervals (ft bgs)	Blank Intervals (ft bgs)	Total Well Depth (in ft bgs)	TOC Well Elevation (ft asl)	Survey Reference Point	Slot Size (inches)	Annular Seal Intervals (ft bgs)	DTGW Range (ft asl)	Free-product thickness (ft)
GW1	19.5 to 44.5	0 to 19.5	44.5	236.64	City of Beverly Hills BM 230B, Elev = 235.24′	0.02	0 to 14.5 14.5 to 16.5	27.57 to 36.32	NA
GW2	24 to 49	0 to 24	49	236.91	City of Beverly Hills BM 230B, Elev = 235.24′	0.02	0 to 20 20 to 22	27.85 to 42.14	NA
GW3	30 to 55	0 to 30	55	240.64	City of Beverly Hills BM 230B, Elev = 235.24′	0.02	0 to 25 25 to 27	30.57 to 44.10	NA
GW4	23 to 53	0 to 23	40	237.80	City of Beverly Hills BM 230B, Elev = 235.24′	0.02	0 to 21 21 to 23	28.55 to 42.61	0.06 to 4.19
GW9	15 to 50	0 to 15	50	239.20	City of Beverly Hills BM 230B, Elev = 235.24′	0.02	0 to 3 3 to 13	29.67 to 43.48	NA
GW10	20 to 50	0 to 20	50	236.95	City of Beverly Hills BM 230B, Elev = 235.24′	0.02	0 to 3 3 to 18	28.04 to 41.69	NA
GW11	20 to 50	0 to 20	50	233.98	City of Beverly Hills BM 230B, Elev = 235.24′	0.02	0 to 1 1 to 13	26.17 to 40.23	NA
GW12	20 to 49.5	0 to 20	50	234.78	City of Beverly Hills BM 230B, Elev = 235.24′	0.02	0 to 2 2 to 17	26.50 to 40.93	NA
AW6	43 to 45	0 to 43	45	—	—	—	0 to 13 3 to 14 30 to 41 41 to 42	—	NA
AW5	33 to 35	0 to 33	35	—	—	—	0 to 2 2 to 3 25 to 32	—	NA
AW3	33 to 35	0 to 33	35	—	—	—	0 to 10 10 to 32	—	NA
AW4	33 to 35	0 to 33	35	—	—	—	0 to 10 10 to 32	—	NA
VE4	7 to 24	0 to 7	24	—	—	—	0 to 3 3 to 6	—	NA
VE6	7 to 24	0 to 7	24	—	—	—	0 to 3 3 to 6	—	NA
VE5*	10	—	5	—	—	—	—	—	NA
VE7	4 to 24	0 to 4	24	—	—	—	0 to 2 2 to 30	—	NA
VE8	15 to 30	0 to 15	30	—	—	—	0 to 13 13 to 14	—	NA

ft = feet
bgs = below ground surface
asl = above mean sea level
TOC = Top of casing
DTGW = Depth to groundwater
NA = Not applicable
* = Horizontal well

FIGURES

Figures 1 through 15



REFERENCES:
USGS
BEVERLY HILLS QUADRANGLE
LOS ANGELES COUNTY, CALIFORNIA, 1976

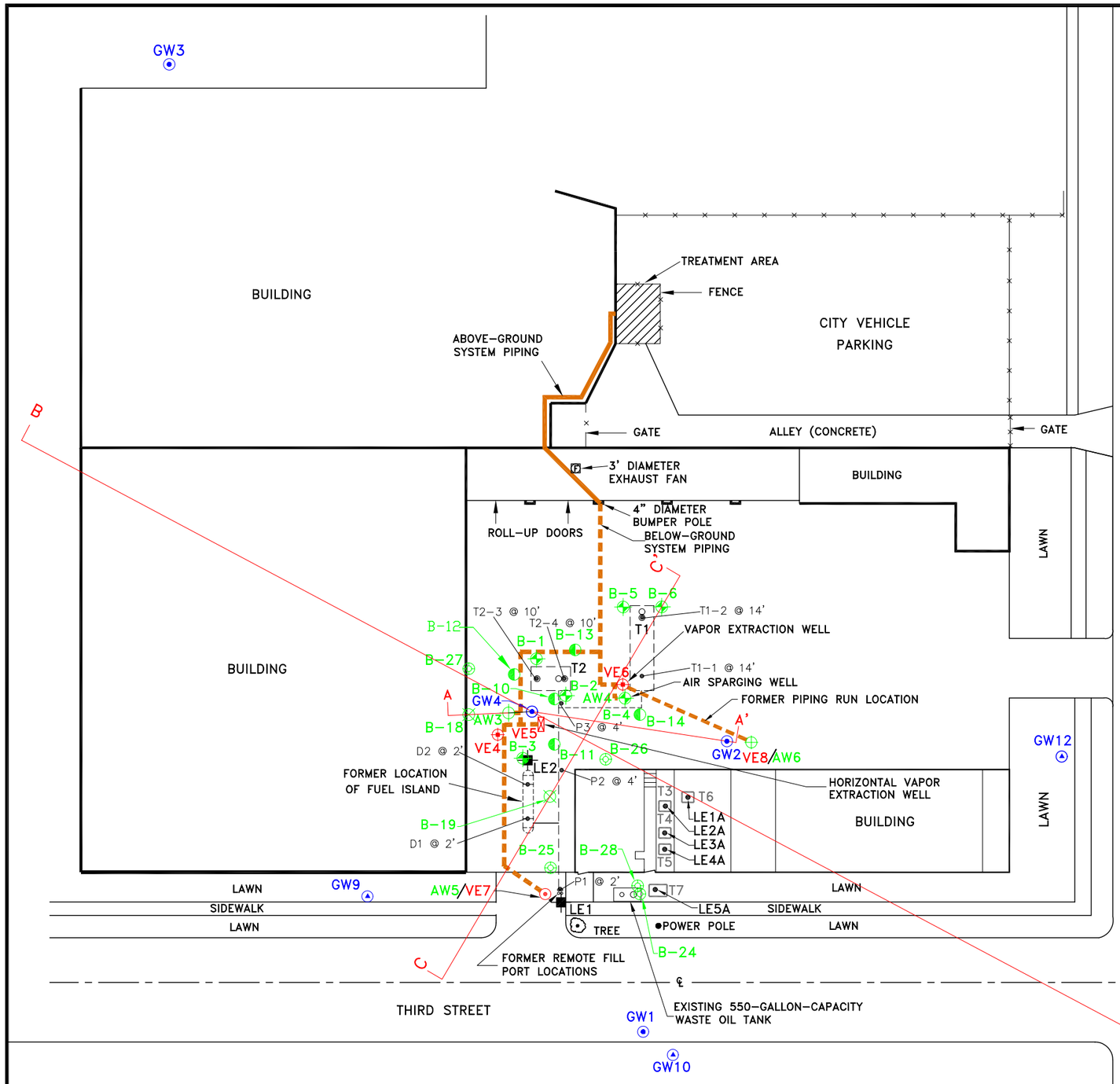
● CBH 2 Groundwater Well

LINDMARK ENGINEERING
5900 CHERRY AVENUE
LONG BEACH, CA 90805
(562) 423-0600
FAX: (562) 423-0607

PROJECT: City of Beverly Hills
331 North Foothill Road
Beverly Hills, California

TITLE: VICINITY MAP
SHOWING WELL LOCATIONS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.:	FIGURE NO.:
JLK	JLK	SRR	6/01	AS NOTED	97-707.1	1



LEGEND:

- T2 — FORMER GASOLINE UNDERGROUND STORAGE TANKS (REMOVED 12/98)
- AW5/VE7 — VAPOR EXTRACTION/AIR SPARGING WELL (5/99)
- GW4 — GROUNDWATER MONITORING WELL (6/90)
- GW12 — GROUNDWATER MONITORING WELL (7/92)
- VE8/AW6 — VAPOR EXTRACTION/AIR SPARGING WELL (11/00)
- VE4 — EXISTING VAPOR EXTRACTION WELL
- LE2 — SOIL BORING (4/99)
- B-6 — SOIL BORING (9/89)
- B-14 — SOIL BORING (1/90)
- B-19 — SOIL BORING (6/90)
- B-26 — SOIL BORING (7/92)
- T1-1 @ 14' — SOIL BORING (12/98)
- LE5A — TANK EXCAVATION SOIL SAMPLE (10/19/95)
- — — FORMER PIPING RUN LOCATION
- C — C' CROSS SECTION

FORMER TANK SCHEDULE

CITY NO.	TANK NO.	CAPACITY	CONTENTS
1	T1	10,000 GALLON	GASOLINE
2	T2	5,000 GALLON	GASOLINE
22	T3	280 GALLON	MOTOR OIL
23	T4	280 GALLON	MOTOR OIL
24	T5	280 GALLON	MOTOR OIL
25	T6	280 GALLON	MOTOR OIL
17	T7	550 GALLON	WASTE OIL

SCALE: 1" = 40'

0 — 1" — 2"

0 — 40' — 80'

LINDMARK ENGINEERING
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(562) 423-0600
FAX: (562) 423-0607
WWW.LINDMARKENGINEERING.COM

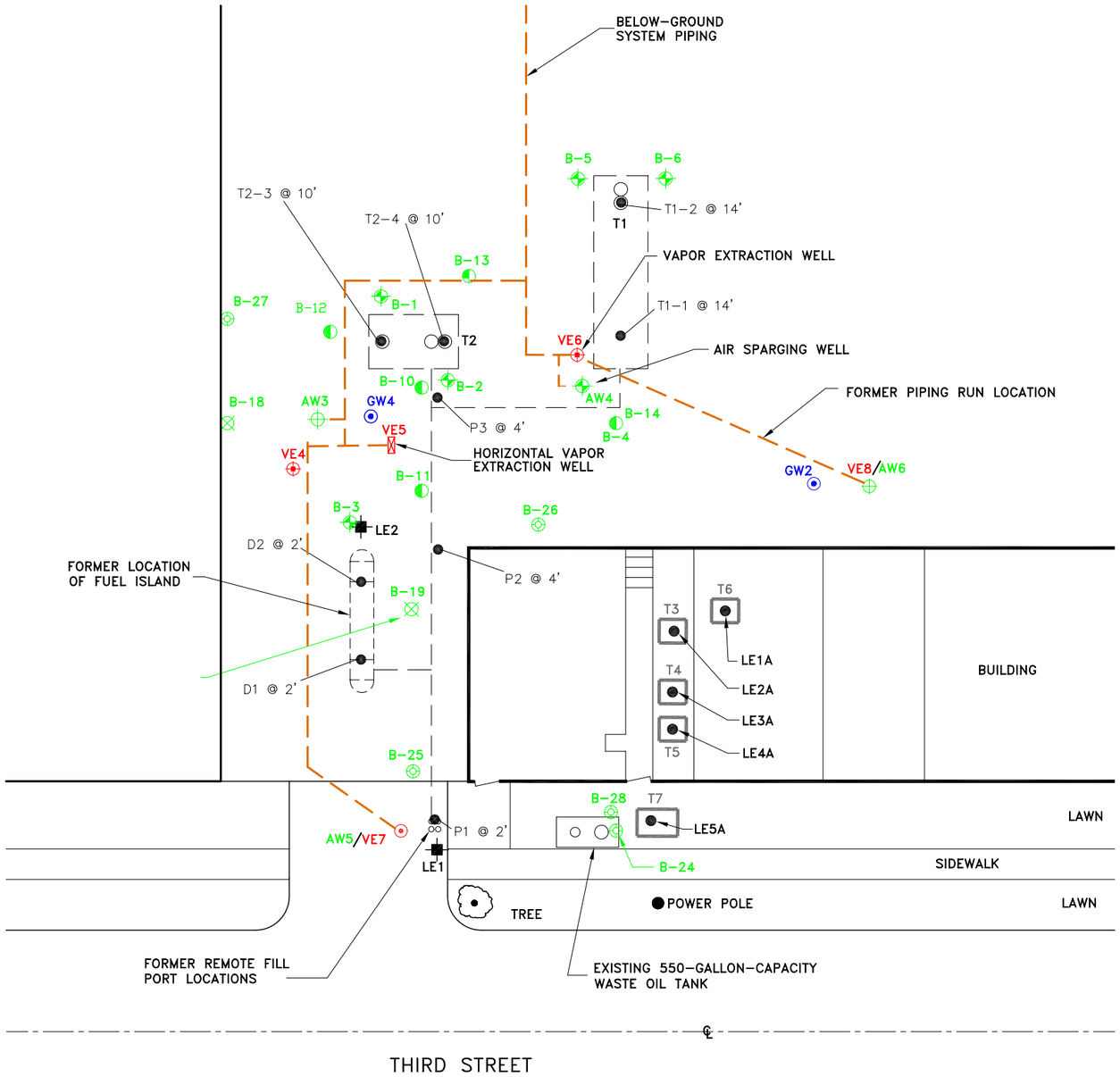
DESIGNED BY:	DRAWN BY:	CHECKED BY:
WSA	ST	UML

PROJECT:
CITY OF BEVERLY HILLS

TITLE: PLOT PLAN WITH WELL AND BORING LOCATIONS
331 N. FOOTHILL RD., BEVERLY HILLS, CA

DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
7/02	AS NOTED	97-707.1		2

F:\DRAWING\97\707COMBO



LEGEND:

- T2 — FORMER GASOLINE UNDERGROUND STORAGE TANKS (REMOVED 12/98)
- AW5/VE7 — VAPOR EXTRACTION/AIR SPARGING WELL (5/99)
- GW4 — GROUNDWATER MONITORING WELL (6/90)
- GW12 — GROUNDWATER MONITORING WELL (7/92)
- VE8/AW6 — VAPOR EXTRACTION/AIR SPARGING WELL (11/00)
- VE4 — EXISTING VAPOR EXTRACTION WELL
- LE2 — SOIL BORING (4/99)
- B-6 — SOIL BORING (9/89)
- B-14 — SOIL BORING (1/90)
- B-19 — SOIL BORING (6/90)
- B-26 — SOIL BORING (7/92)
- T1-1 @ 14' — SOIL BORING (12/98)
- LE5A — TANK EXCAVATION SOIL SAMPLE (10/19/95)
- FORMER PIPING RUN LOCATION

FORMER TANK SCHEDULE

CITY NO.	TANK NO.	CAPACITY	CONTENTS
1	T1	10,000 GALLON	GASOLINE
2	T2	5,000 GALLON	GASOLINE
22	T3	280 GALLON	MOTOR OIL
23	T4	280 GALLON	MOTOR OIL
24	T5	280 GALLON	MOTOR OIL
25	T6	280 GALLON	MOTOR OIL
17	T7	550 GALLON	WASTE OIL

SCALE: 1" = 20'

0 1" 2"

0 20' 40'

LINDMARK ENGINEERING
5900 CHERRY AVENUE
LONG BEACH, CA 90805-4408
(562) 423-0600
FAX (562) 423-0607
WWW.LINDMARKENGINEERING.COM

PROJECT: CITY OF BEVERLY HILLS
331 NORTH FOOTHILL RD., BEVERLY HILLS, CALIFORNIA

TITLE: WELL AND BORING LOCATION

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
WSA	ST	WSA	7/02	AS NOTED	97-707.1		3

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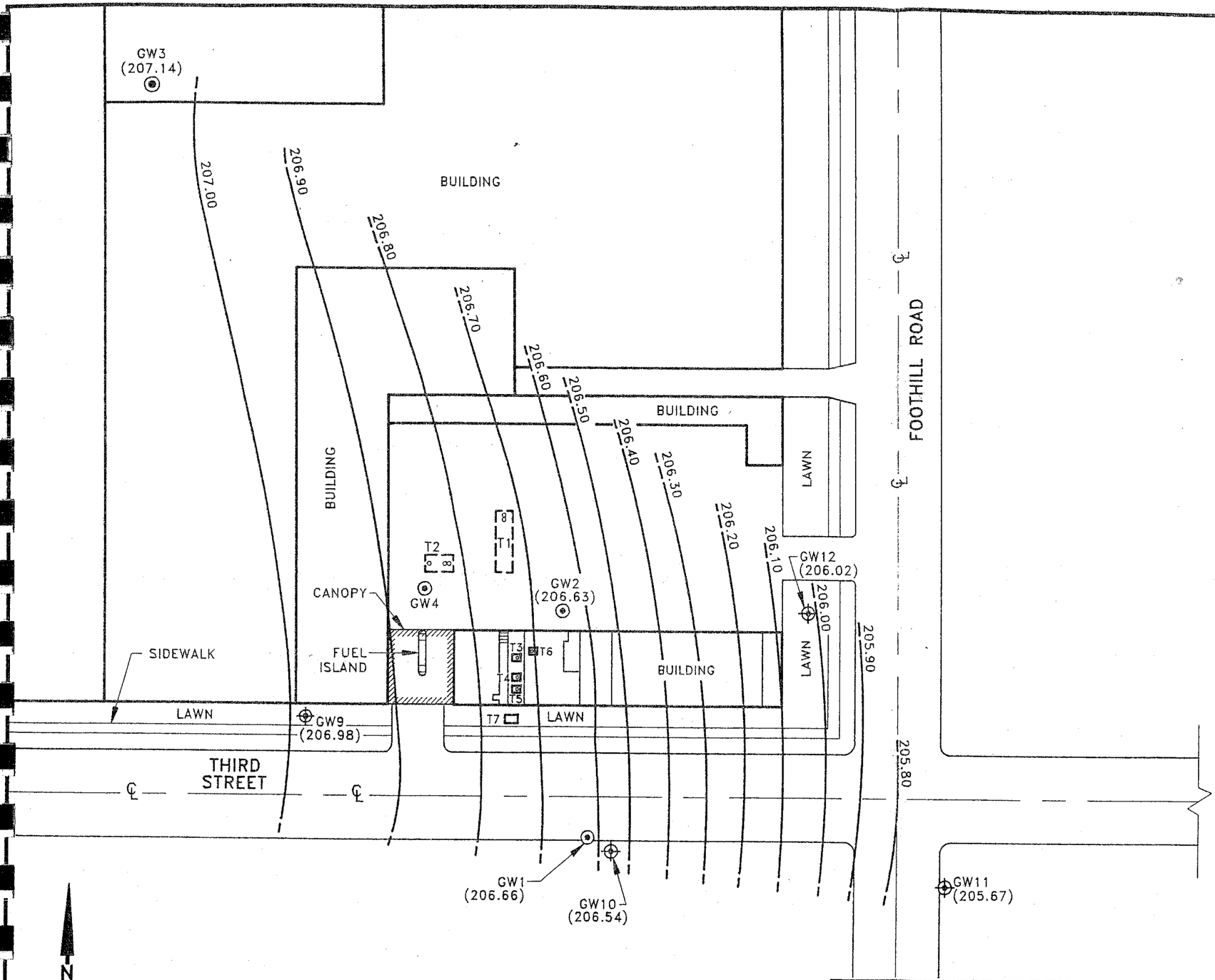

WELL I.D.	TOC	DTW	GWE
GW-1	236.64	29.98	206.66
GW-2	236.94	30.31	206.63
GW-3	240.64	33.50	207.14
GW-4	231.37	--	--
GW-9	239.20	32.22	206.98
GW-10	236.94	30.40	206.54
GW-11	233.99	28.32	205.67
GW-12	234.80	28.78	206.02

LEGEND:

GW4 — GROUNDWATER MONITORING WELL DRILLED ON JUNE 7 & 15, 1990.

GW9 — GROUNDWATER MONITORING WELL DRILLED ON JULY 7-10, 1992

(206.98) GROUNDWATER ELEVATION

GROUNDWATER CONTOUR LINE

TANK SCHEDULE			
CITY NO.	TANK NO.	CAPACITY	CONTENTS
1	T1	10,000 GALLON	GASOLINE
2	T2	5,000 GALLON	GASOLINE
22	T3	280 GALLON	MOTOR OIL
23	T4	280 GALLON	MOTOR OIL
24	T5	280 GALLON	MOTOR OIL
25	T6	280 GALLON	MOTOR OIL
17	T7	280 GALLON	WASTE OIL

N

SCALE: 1" = 50'-0"

0 1 2"

0 60 120'

LINDMARK ENGINEERING, INC.
314 CHATSWORTH DRIVE
SAN FERNANDO, CALIFORNIA 91340
(818) 365-1170
FAX: (818) 365-0296

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CALIFORNIA

TITLE: GROUNDWATER CONTOUR MAP
(JULY 23, 1992)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
TDS	A.D.		10/12/92	AS NOTED	92-384.1		4

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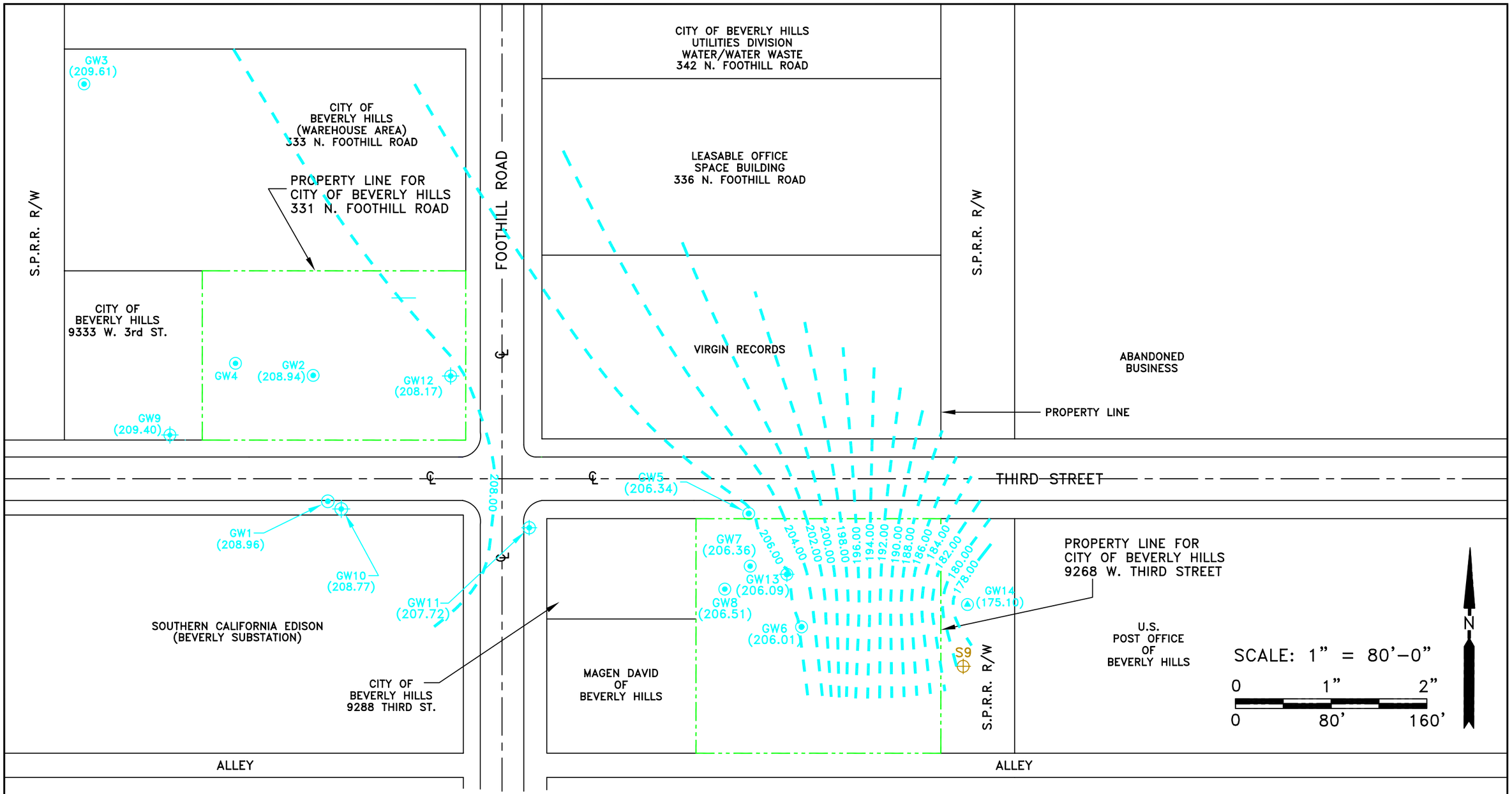

LEGEND:

- GW14 ▲ GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING, INC. (3/95)
- GW13 ⊕ GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING, INC. (7/92)
- GW8 ◉ GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING, INC. (6/90)
- S9 ⊕ DRY SOIL BORING TO 50'
- (209.61) GROUNDWATER ELEVATION (12/15/95)
- 208.00 GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED) ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL (12/15/95)

LINDMARK ENGINEERING, INC.
314 CHATSWORTH DRIVE
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FAX: (818) 365-0296

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CALIFORNIA
9268 W. THIRD ST., BEVERLY HILLS, CALIFORNIA

TITLE: GROUNDWATER CONTOUR MAP

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
JLK	PSP	UML	1/96	1"=80'	94-571.1		5

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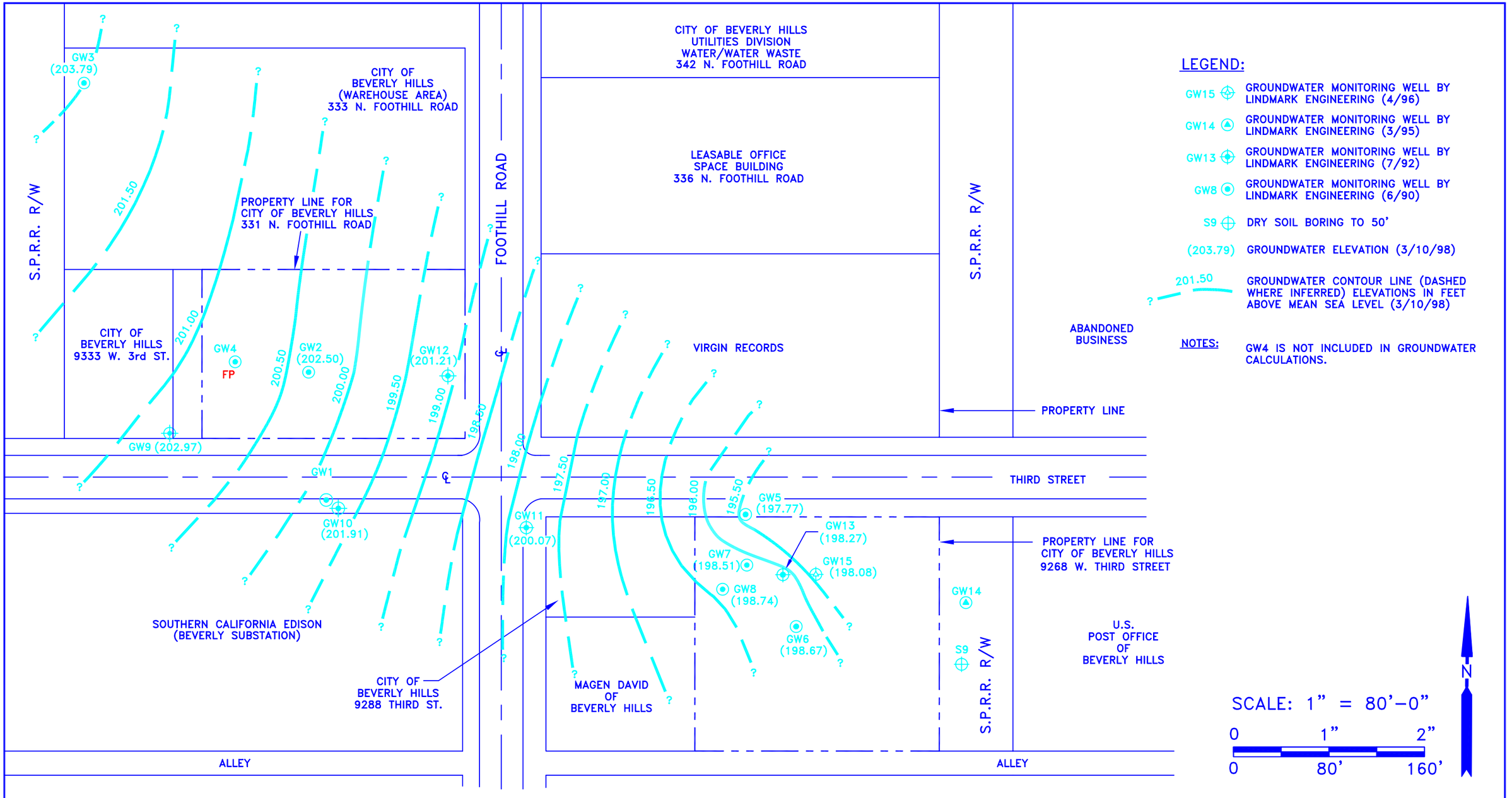

LEGEND:

- GW15 — GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING (4/96)
- GW14 — GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING (3/95)
- GW13 — GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING (7/92)
- GW8 — GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING (6/90)
- S9 — DRY SOIL BORING TO 50'
- (203.79) — GROUNDWATER ELEVATION (3/10/98)
- 201.50 — GROUNDWATER CONTOUR LINE (DASHED WHERE INFERRED) ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL (3/10/98)

NOTES: GW4 IS NOT INCLUDED IN GROUNDWATER CALCULATIONS.

LINDMARK ENGINEERING
314 CHATSWORTH DRIVE
SAN FERNANDO, CALIFORNIA 91340
(818) 365-1170
FAX: (818) 365-0296

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CALIFORNIA
9268 W. THIRD ST., BEVERLY HILLS, CALIFORNIA

TITLE: GROUNDWATER CONTOUR MAP

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
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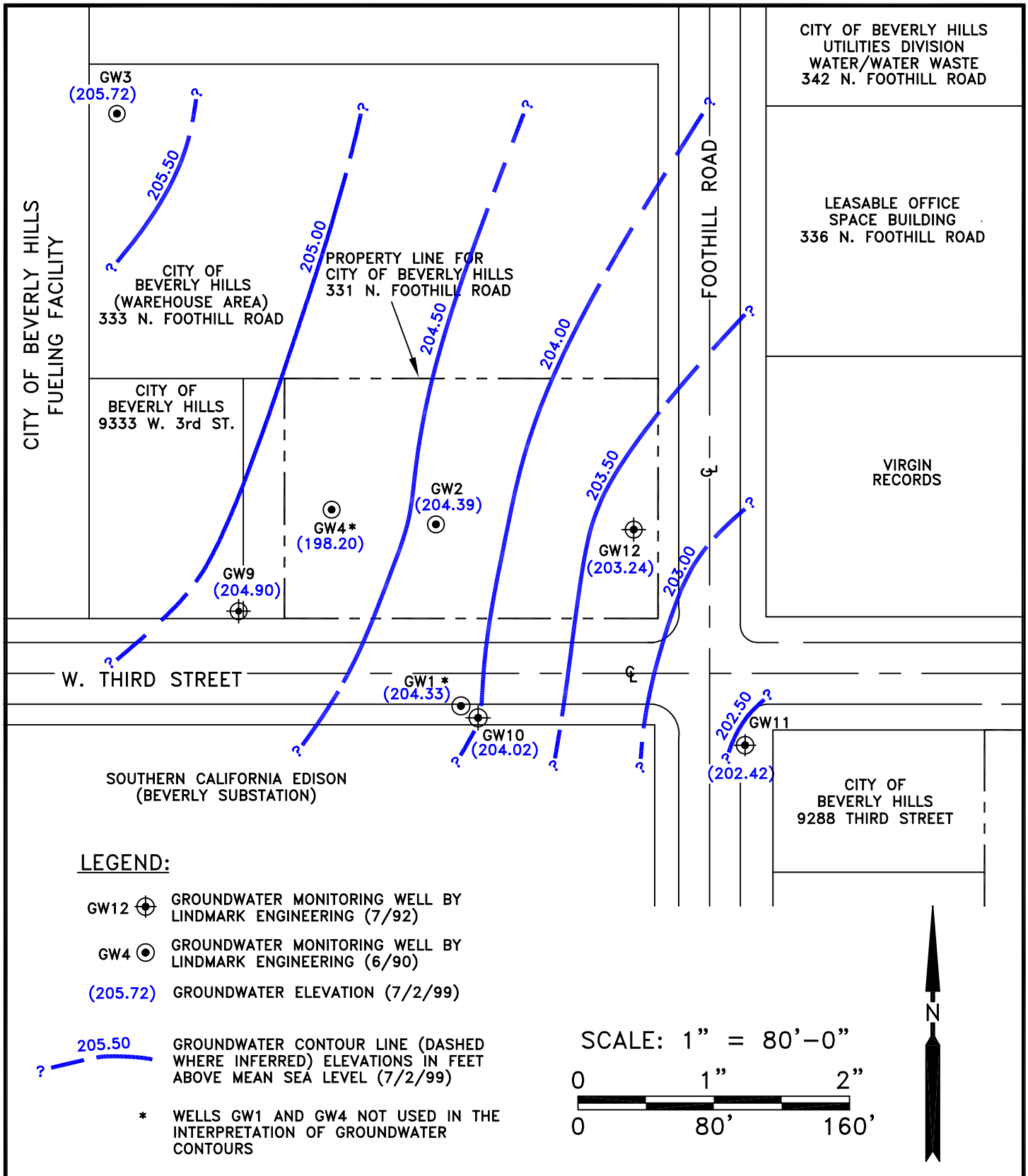

LINDMARK ENGINEERING
314 CHATSWORTH DRIVE
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(818) 365-1170
FAX: (818) 365-0296

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CALIFORNIA

TITLE: GROUNDWATER CONTOUR MAP

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	FIGURE NO.:
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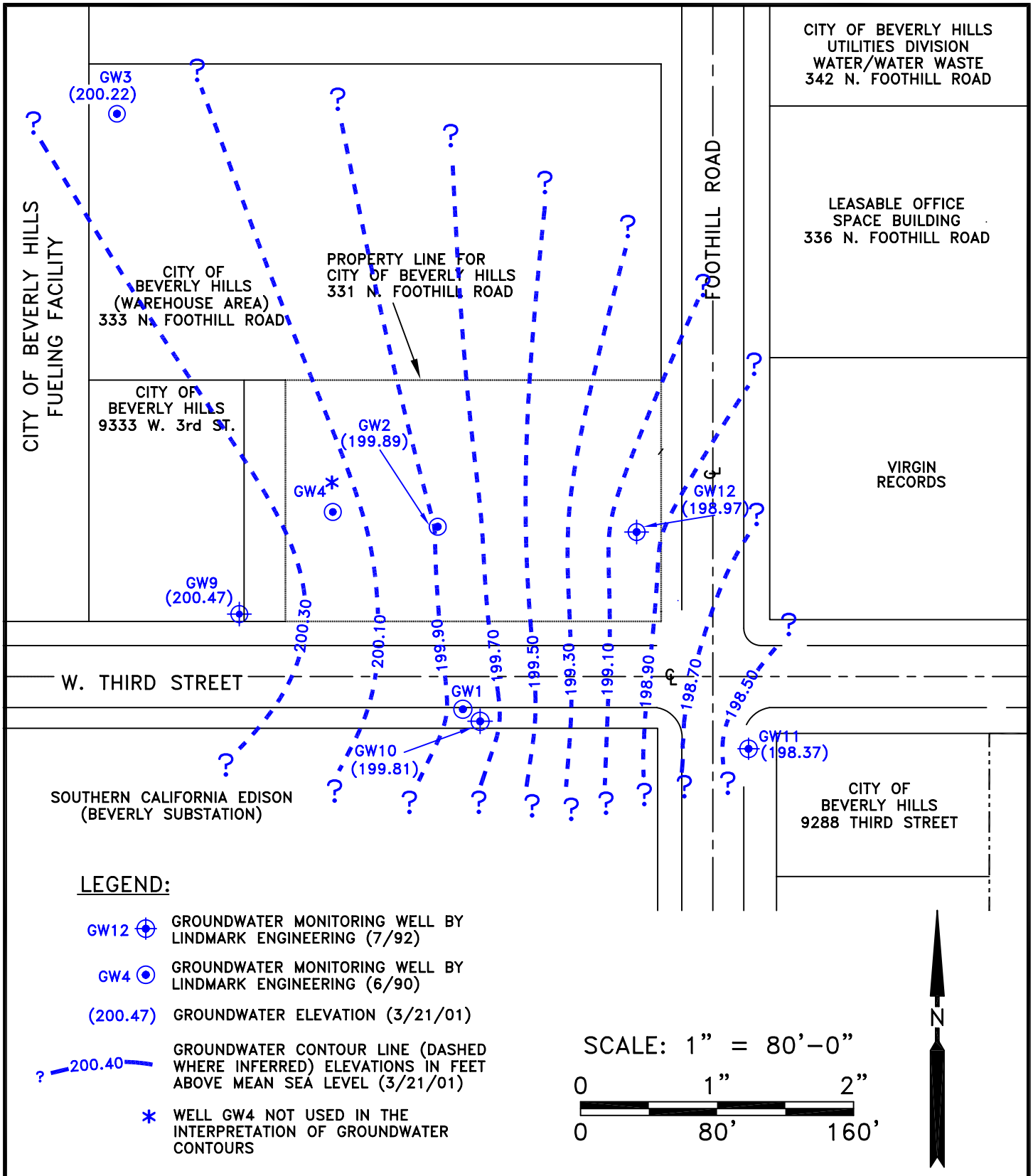


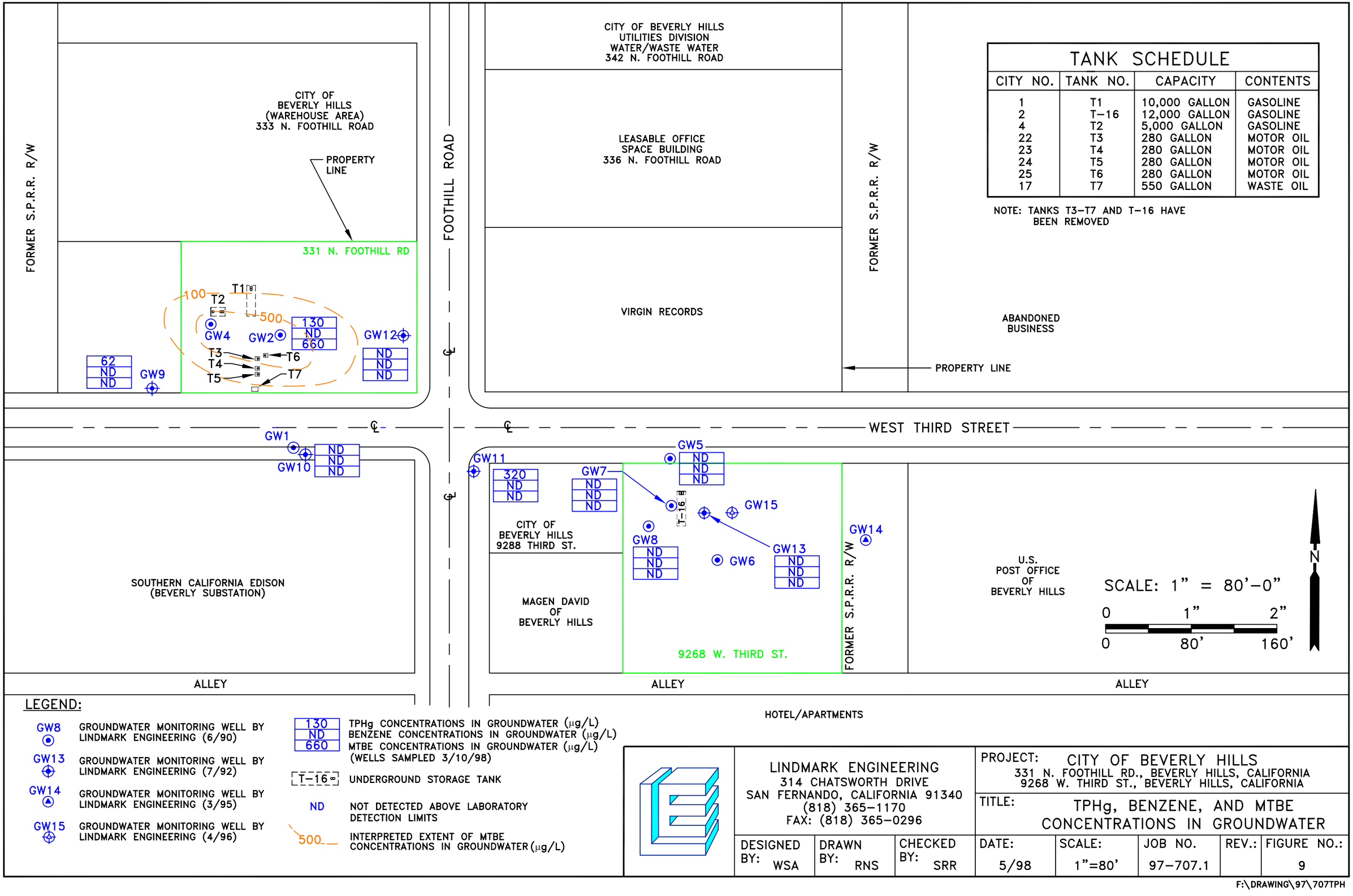
LINDMARK ENGINEERING
5900 CHERRY AVE.
LONG BEACH, CA 90805
(562) 423-0600
FAX: (562) 423-0607

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CALIFORNIA

TITLE: GROUNDWATER CONTOUR MAP
(MARCH 2001)

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	FIGURE NO.:
WSA	ST	SRR	3/01	AS NOTED	97-707.1	8

F:\DRAWING\97\707gw11



TANK SCHEDULE

CITY NO.	TANK NO.	CAPACITY	CONTENTS
1	T1	10,000 GALLON	GASOLINE
2	T-16	12,000 GALLON	GASOLINE
4	T2	5,000 GALLON	GASOLINE
22	T3	280 GALLON	MOTOR OIL
23	T4	280 GALLON	MOTOR OIL
24	T5	280 GALLON	MOTOR OIL
25	T6	280 GALLON	MOTOR OIL
17	T7	550 GALLON	WASTE OIL

NOTE: TANKS T3-T7 AND T-16 HAVE BEEN REMOVED

LEGEND:

- GW8 — GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING (6/90)
- GW13 — GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING (7/92)
- GW14 — GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING (3/95)
- GW15 — GROUNDWATER MONITORING WELL BY LINDMARK ENGINEERING (4/96)
- 130 / ND / 660 — TPHg CONCENTRATIONS IN GROUNDWATER (µg/L); BENZENE CONCENTRATIONS IN GROUNDWATER (µg/L); MTBE CONCENTRATIONS IN GROUNDWATER (µg/L) (WELLS SAMPLED 3/10/98)
- T-16 ∞ — UNDERGROUND STORAGE TANK
- ND — NOT DETECTED ABOVE LABORATORY DETECTION LIMITS
- 500 — INTERPRETED EXTENT OF MTBE CONCENTRATIONS IN GROUNDWATER (µg/L)

LINDMARK ENGINEERING
314 CHATSWORTH DRIVE
SAN FERNANDO, CALIFORNIA 91340
(818) 365-1170
FAX: (818) 365-0296

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CALIFORNIA
9268 W. THIRD ST., BEVERLY HILLS, CALIFORNIA

TITLE: TPHg, BENZENE, AND MTBE CONCENTRATIONS IN GROUNDWATER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
WSA	RNS	SRR	5/98	1"=80'	97-707.1		9

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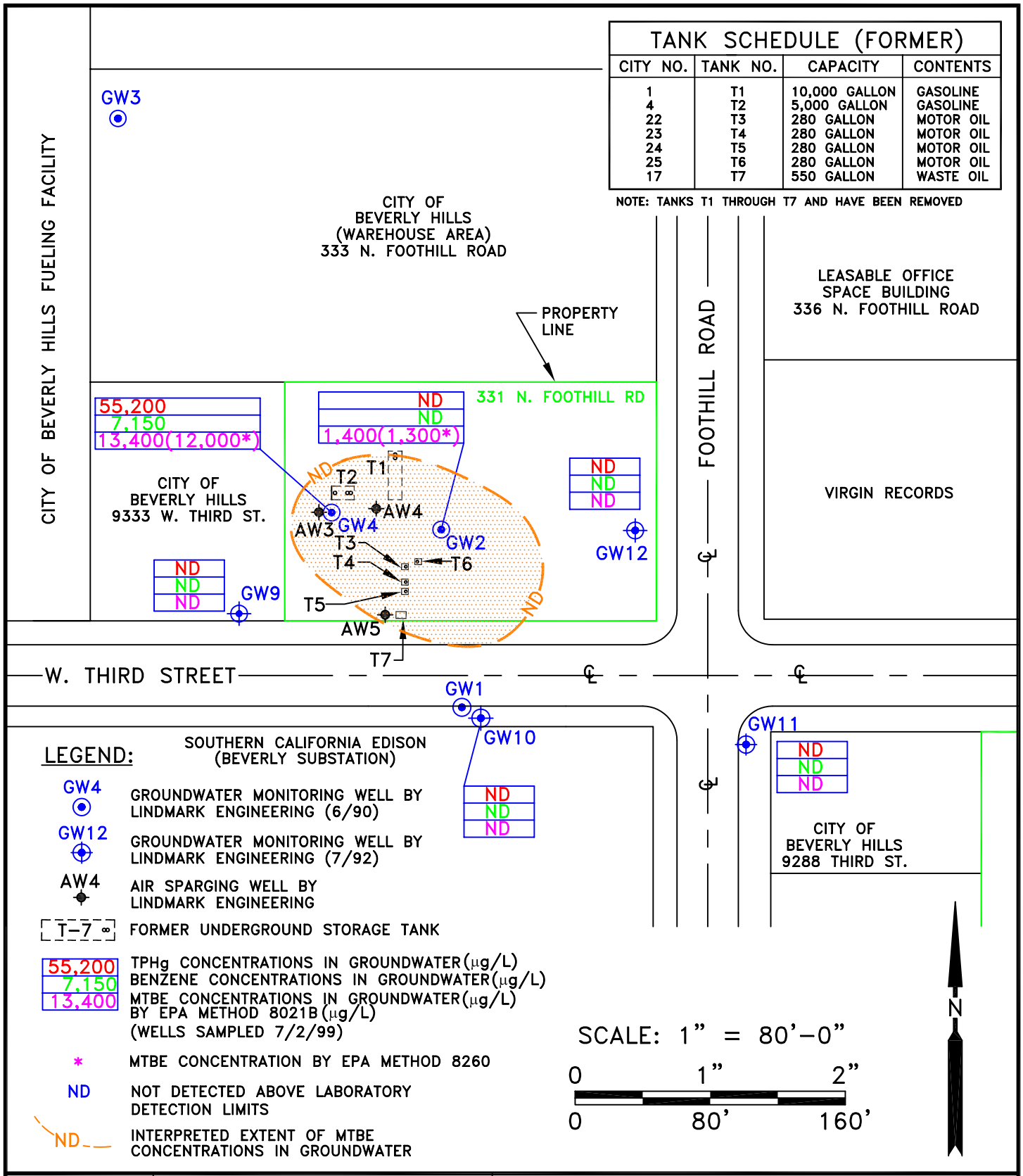

LINDMARK ENGINEERING
314 CHATSWORTH DRIVE
SAN FERNANDO, CALIFORNIA 91340
(818) 365-1170
FAX: (818) 365-0296

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CALIFORNIA

TITLE: TPHg, BENZENE, AND MTBE CONCENTRATIONS IN GROUNDWATER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	FIGURE NO.:
WSA	RNS	SRR	7/99	AS NOTED	97-707.1	10

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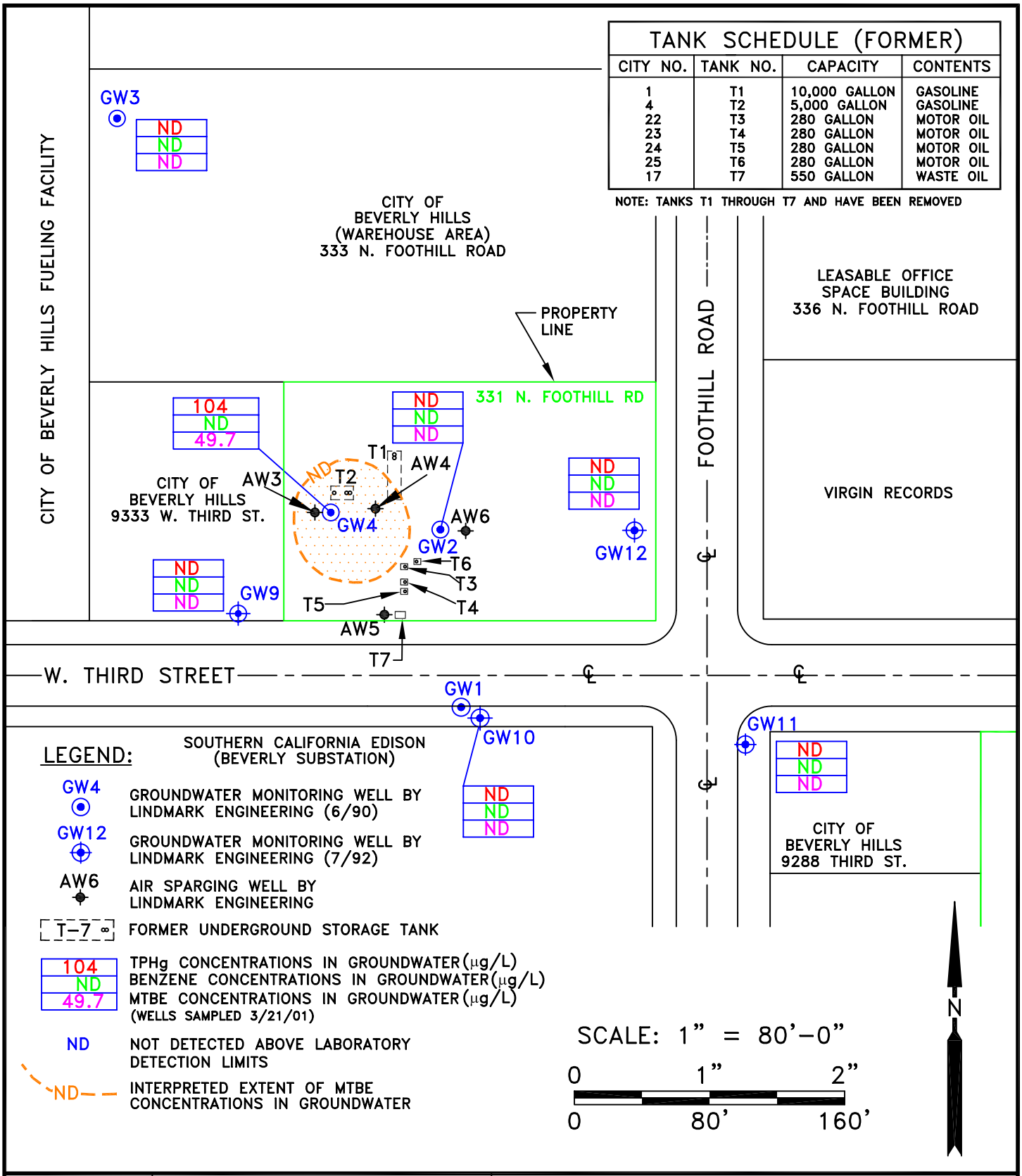

LINDMARK ENGINEERING
5900 CHERRY AVE.
LONG BEACH, CA 90805
(562) 423-0600
FAX: (562) 423-0607

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CALIFORNIA

TITLE: TPHg, BENZENE, AND MTBE CONCENTRATIONS IN GROUNDWATER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	FIGURE NO.:
WSA	ST	SRR	3/01	AS NOTED	97-707.1	11

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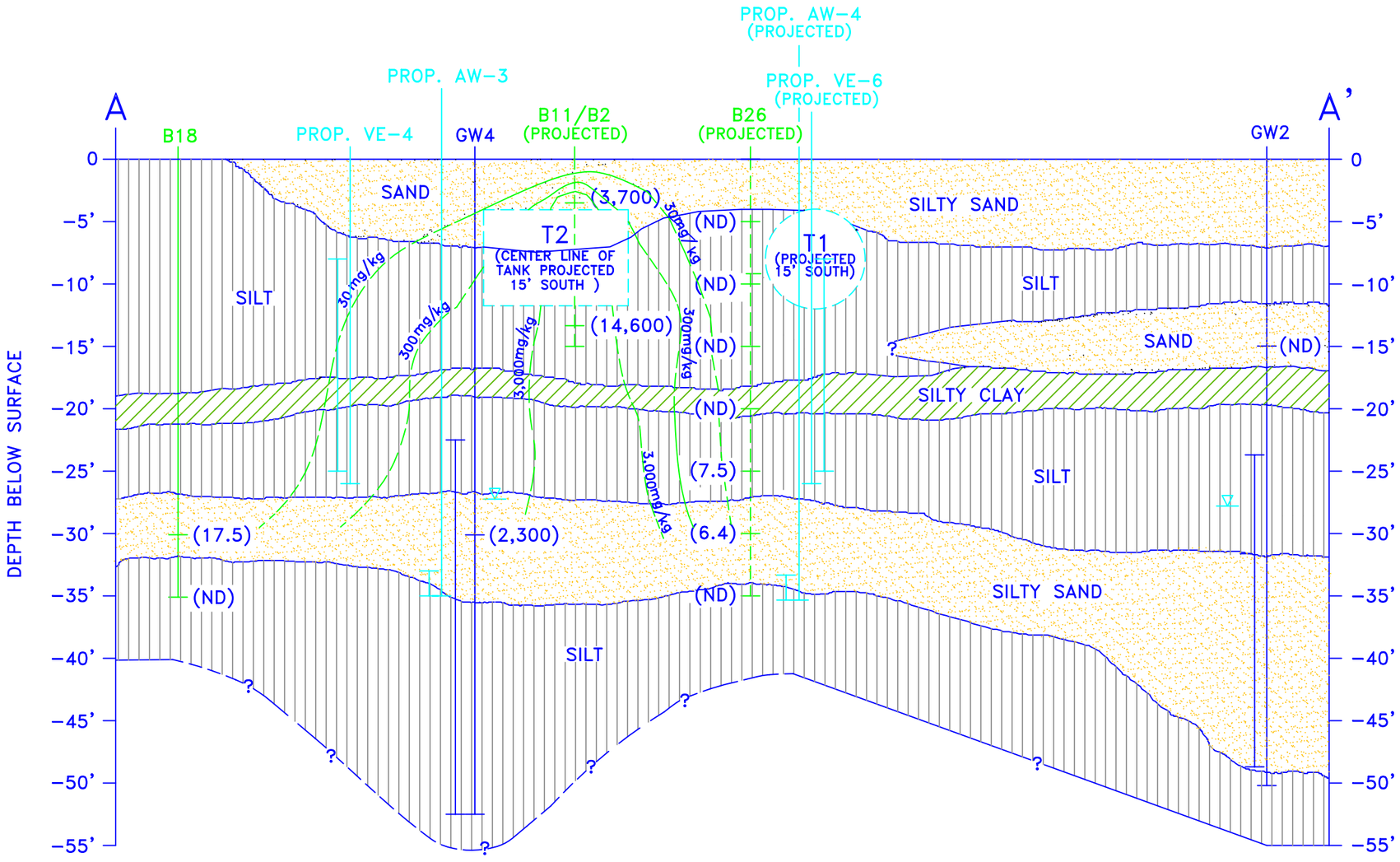

LEGEND:

- SAND AND SILTY SAND
- SILTS, CLAYEY SILTS AND SANDY SILTS
- SILTY CLAY
- GROUNDWATER ELEVATION
- 3,000 mg/kg — LINE OF EQUAL TPH(g) CONCENTRATION IN SOIL (mg/kg)
- (14,600) — MAXIMUM TPH(g) CONCENTRATIONS IN SOIL (mg/kg)
- (ND) — NON-DETECTED
- GW4 — GROUNDWATER MONITORING WELLS (GW2 AND GW4) WITH SCREENED INTERVAL SHOWN
- PROP. VE-4, VE-6 PROP.AW-3, AW-4 — PROPOSED VAPOR EXTRACTION WELLS (VE-4 AND VE-6) AND PROPOSED AIR-SPARGING WELLS (AW-3 ANG AW-4) WITH SCREENED INTERVAL SHOWN

SCALE: 1" = 10'-0"

0 1" 2"

0 10' 20'

LINDMARK ENGINEERING
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LONG BEACH, CA 90805
(562) 423-0600
FAX: (562) 423-0607

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CA

TITLE: CROSS SECTION A-A'

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
SRR	PJRA	UML	6/96	AS NOTED	94-571.1		12

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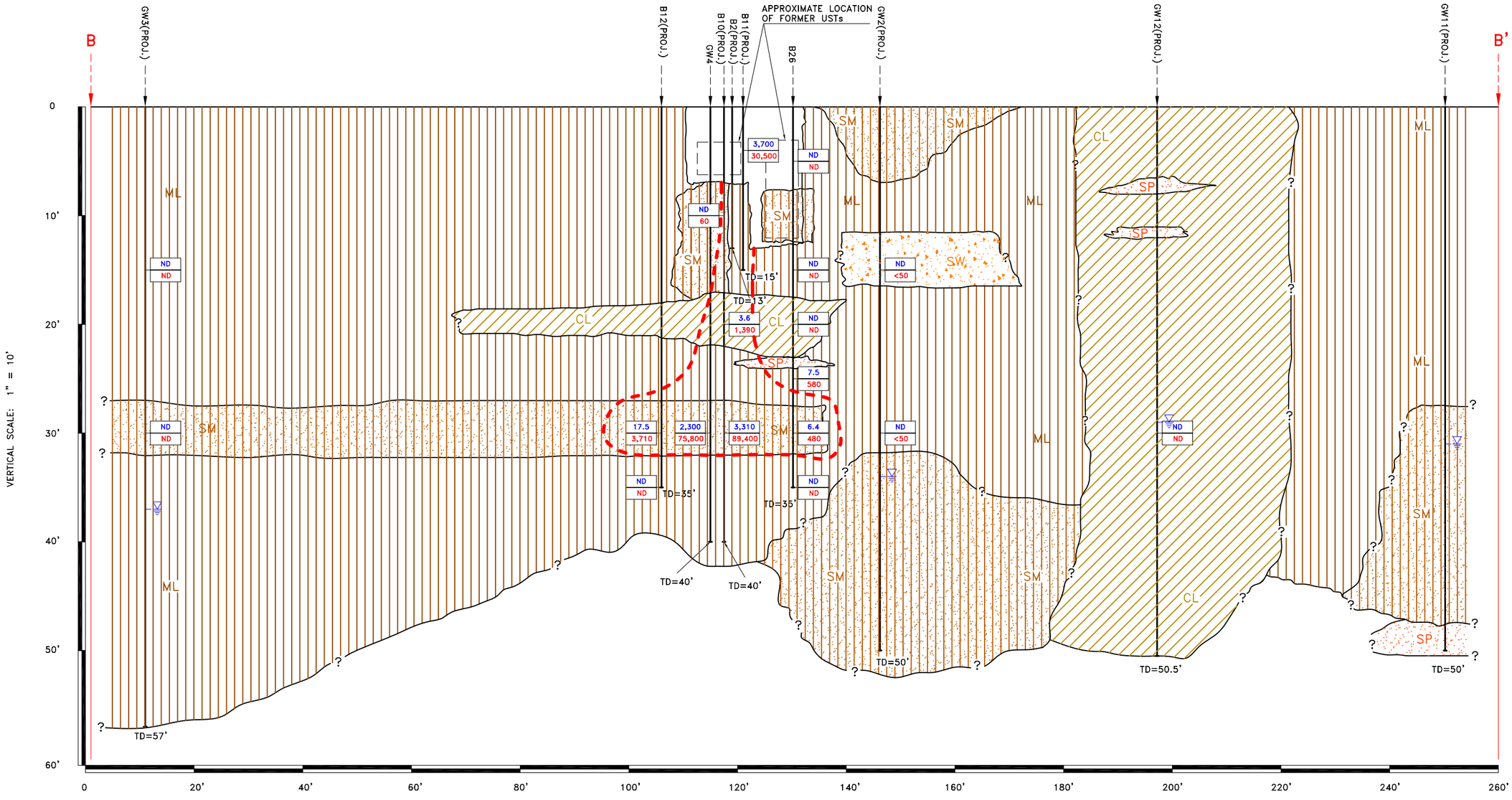


HORIZONTAL SCALE: 1" = 20'

LEGEND:

- SILT (ML)
- SILTY SAND (SM)
- CLAY (CL)
- WELL GRADED SAND (SW)
- POORLY GRADED SAND (SP)
- TPH(g) CONCENTRATION IN SOIL mg/kg
- BENZENE CONCENTRATION IN SOIL mg/kg
- APPROXIMATE EXTENT OF HYDROCARBON CONTAMINATION
- GROUNDWATER ELEVATION

LINDMARK ENGINEERING
5900 CHERRY AVENUE
LONG BEACH, CA 90805-4408
(562) 423-0600
FAX (562) 423-0607
WWW.LINDMARKENGINEERING.COM

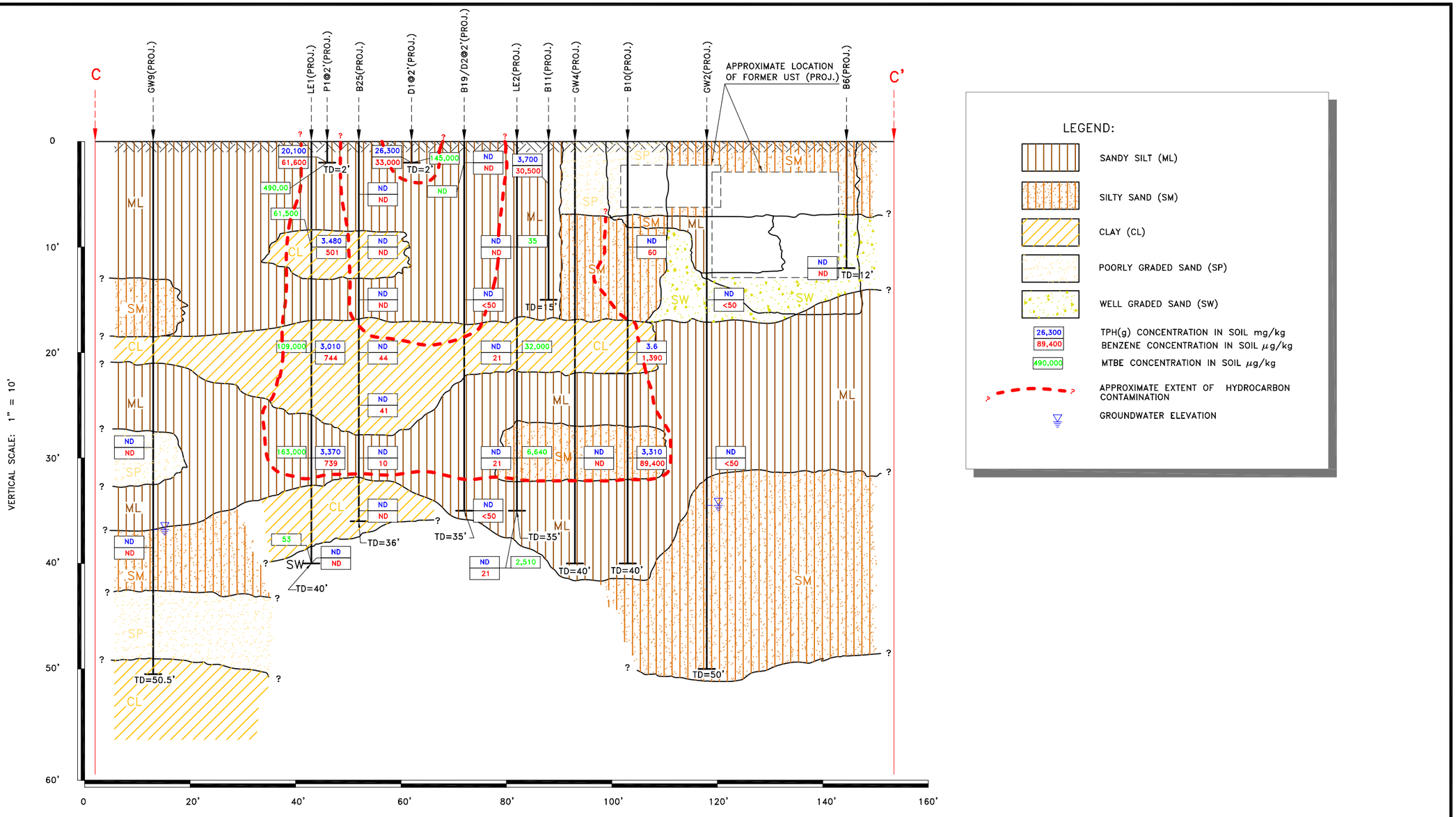
DESIGNED BY:	DRAWN BY:	CHECKED BY:
WSA	ST	WSA

PROJECT: CITY OF BEVERLY HILLS
331 NORTH FOOTHILL RD., BEVERLY HILLS, CALIFORNIA

TITLE: CROSS SECTION B – B'

DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
7/02	AS NOTED	97-707.1		13

F:\DRAWING\97\707xbb'



HORIZONTAL SCALE: 1" = 20'

LEGEND:

- SANDY SILT (ML)
- SILTY SAND (SM)
- CLAY (CL)
- POORLY GRADED SAND (SP)
- WELL GRADED SAND (SW)
- 26,300 / 89,400 — TPH(g) CONCENTRATION IN SOIL mg/kg; BENZENE CONCENTRATION IN SOIL µg/kg
- 490,000 — MTBE CONCENTRATION IN SOIL µg/kg
- APPROXIMATE EXTENT OF HYDROCARBON CONTAMINATION
- GROUNDWATER ELEVATION

LINDMARK ENGINEERING
5900 CHERRY AVENUE
LONG BEACH, CA 90805-4408
(562) 423-0600
FAX (562) 423-0607
WWW.LINDMARKENGINEERING.COM

PROJECT: CITY OF BEVERLY HILLS
331 NORTH FOOTHILL RD., BEVERLY HILLS, CALIFORNIA

TITLE: CROSS SECTION C C'

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
WSA	ST	WSA	7/02	AS NOTED	97-707.1		14

F:\DRAWING\97\707xcc'

CITY OF BEVERLY HILLS UTILITIES DIVISION WATER/WATER WASTE 342 N. FOOTHILL ROAD

CITY OF BEVERLY HILLS (WAREHOUSE AREA) 333 N. FOOTHILL ROAD

FORMER S.P.R.R. R/W

FOOTHILL ROAD

LEASABLE OFFICE SPACE BUILDING 336 N. FOOTHILL ROAD

FORMER S.P.R.R. R/W

CITY OF BEVERLY HILLS 9333 W. 3rd ST.

CITY OF BEVERLY HILLS 331 N. FOOTHILL RD.

VIRGIN RECORDS

ABANDONED BUSINESS

℄ ℄ THIRD STREET

SOUTHERN CALIFORNIA EDISON (BEVERLY SUBSTATION)

CITY OF BEVERLY HILLS 9288 THIRD ST.

MAGEN DAVID OF BEVERLY HILLS

CITY OF BEVERLY HILLS 9268 WEST THIRD ST.

FORMER S.P.R.R. R/W

U.S. POST OFFICE OF BEVERLY HILLS

ALLEY

ALLEY

ALLEY

HOTEL/APARTMENTS

N

SCALE: 1" = 80'-0"

0 1" 2"

0 80' 160'

LEGEND:

SUBJECT SITES

LINDMARK ENGINEERING
314 CHATSWORTH DRIVE
SAN FERNANDO, CALIFORNIA 91340
(818) 365-1170
FAX: (818) 365-0296

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL ROAD
9268 W. THIRD STREET

TITLE: PROJECT LOCATION PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	REV.:	FIGURE NO.:
KRP	TDM	UML	1/97	AS NOTED	94-571.1		15

F:\DRAWING\94\571PLP

APPENDIX A

Boring Logs and Well Construction Details

LOG OF BORING

LINDMARK ENGINEERING

CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CA

JOB NO.:	BORING NO.:
89-182.1	B1
LOGGED BY:	**DATE LOGGED:**
TDG	9-7-89
APPROVED BY:	**SURFACE ELEV:**
UML	

DRILL RIG: HAND AUGER
BORING DIA.: 3 inch

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
	12:35	6-inch Reinforced Concrete					
5	12:42	Brown silty clay, damp	CL			2	No odor
10	1:00	Brown clayey silt, damp	ML			15	No odor
	1:13	Brown clayey silt, damp	ML				No odor
15		Bottom of boring at 13 feet					
20							
25							
30							
35							
40							
45							
50							

LOG OF BORING

LINDMARK ENGINEERING

CITY OF BEVERLY HILLS 331 N. FOOTHILL RD., BEVERLY HILLS, CA		JOB NO.: 89-182.1	BORING NO.: B2
		LOGGED BY: TDG	DATE LOGGED: 9-7-89
DRILL RIG: HAND AUGER	BORING DIA.: 3 inch	APPROVED BY: UML	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN		GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
	1:12	6-inch Reinforced Concrete 6 inches to 4 feet - Sand with crushed rocks						
5		Dark gray silty sand, damp		SM			300	Faint hydrocarbon odor
10	1:50	Very dark gray, silty clay, damp		CL			350	Faint hydrocarbon odor
	2:30	Dark gray silty clay, hard, damp		CL			1500	Faint to moderate odor
15		Bottom of boring at 13 feet						
20								
25								
30								
35								
40								
45								
50								

LOG OF BORING

LINDMARK ENGINEERING

CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CA

JOB NO.:	BORING NO.:
89-182.1	B3
LOGGED BY:	DATE LOGGED:
TDG	9-7-89
APPROVED BY:	SURFACE ELEV:
UML	
DRILL RIG:	BORING DIA.:
HAND AUGER	3 inch

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
	2:10	6-inch Reinforced Concrete					
5	2:40	Brown silty clay, damp	CL			5	No odor
10	3:00	Brown silty clay, damp Bottom of boring at 10 feet	CL			5	No odor
15							
20							
25							
30							
35							
40							
45							
50							

LOG OF BORING

LINDMARK ENGINEERING

CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CA

JOB NO.:	BORING NO.:
89-182.1	B4
LOGGED BY:	**DATE LOGGED:**
TDG	9-7-89
DRILL RIG:	**BORING DIA.:**
HAND AUGER	3 inch
APPROVED BY:	**SURFACE ELEV:**
UML	

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
	3:05	6-inch Reinforced Concrete					
5	3:16	Brown silty clay damp	CL			0	No odor
10	3:35	Brown silty clay, damp	CL			0	No odor
						250	Very faint odor
15	4:00	Brown silty clay, damp	CL			200	Very faint odor
20							
25							
30							
35							
40							
45							
50							

LOG OF BORING

LINDMARK ENGINEERING

CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CA

JOB NO.:	BORING NO.:
89-182.1	B5
LOGGED BY: TDG	DATE LOGGED: 9-8-89
DRILL RIG: HAND AUGER	BORING DIA.: 3 inch
APPROVED BY: UML	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
	8:30	6-inch Reinforced Concrete					
5	8:52	Light brown fine sandy silt, moist	ML			10	No odor
10	9:10	Light brown sandy silt	ML			5	No odor
	9:25	Brown clayey silt, damp Bottom of boring at 12 feet	ML			5	No odor
15							
20							
25							
30							
35							
40							
45							
50							

LOG OF BORING

LINDMARK ENGINEERING

CITY OF BEVERLY HILLS
331 N. FOOTHILL RD., BEVERLY HILLS, CA

JOB NO.: 89-182.1	BORING NO.: B6		
LOGGED BY: TDG	DATE LOGGED: 9-8-89		
DRILL RIG: HAND AUGER	BORING DIA.: 3 Inch	APPROVED BY: UML	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
	8:50	6-inch Reinforced Concrete Brown sand with gravel (backfill)					
5	9:25	Dark brown silty sand, damp	SM			40	No odor
10	9:40	Brown well graded sand, damp	SW			7.0	No odor
		Hand drilling at 12 feet	SW				
		Bottom of boring at 12 feet					
15							
20							
25							
30							
35							
40							
45							
50							

LOG OF BORING

LINDMARK ENGINEERING

BEVERLY HILLS		JOB NO.:	BORING NO.: B10
		LOGGED BY:	DATE LOGGED: 1-17-90
DRILL RIG:	BORING DIA.:	APPROVED BY:	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
		4" Concrete					
5		Gray brown sand with gravel	SP		7	30	
10		Brown silty sand	SM		9	28	
15		Brown silty sand with gravel	SM		9	33	
20		Brown silty clay with some shale, very dense	CL		49	140	
25		Brown sandy silt	ML		16	250	
30		Brown silty sand with gravel	SM		18	1500	
35		Brown sandy silt	ML	▽	17	1400	
40		Brown sandy silt	ML		38	1200	
45							
50							

LOG OF BORING

LINDMARK ENGINEERING

BEVERLY HILLS		JOB NO.: 198.1	BORING NO.: B11
		LOGGED BY: DRC	DATE LOGGED: 1-17-90
DRILL RIG:	BORING DIA.: 4"	APPROVED BY:	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
		4" Concrete					
5		Brown sandy silt with clay	ML			>2000	strong odor
10		Gray brown silt with clay	ML			>2000	strong odor
15		Sandy silt with clay	ML			>2000	strong odor
20							
25							
30							
35							
40							
45							
50							

LOG OF BORING

LINDMARK ENGINEERING

BEVERLY HILLS		JOB NO.: 198.1	BORING NO.: B12
		LOGGED BY: DRC	DATE LOGGED: 1-17-90
DRILL RIG:	BORING DIA.: 6"	APPROVED BY:	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN		GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
		4" Concrete						
5		Brown sandy silt		ML		5	0	
10		Brown sandy silt		ML		4	10	slight odor
15		Red brown sandy silt with gravel		ML			0	
20		Red brown sandy silt		ML			0	
25								
30								
35								
40								
45								
50								

LOG OF BORING

LINDMARK ENGINEERING

BEVERLY HILLS		JOB NO.: 198.1	BORING NO.: B13
		LOGGED BY: DRC	DATE LOGGED: 1-17-90
DRILL RIG:	BORING DIA.: 6"	APPROVED BY:	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
		4" Concrete					
5		Dark brown sandy silt	ML		12	0	
10		Sandy silt with some gravel	ML			0	
15		Sandy clayey silt	ML			0	
20		Very stiff silty clay with gravel	CL		49	0	
25							
30							
35							
40							
45							
50							

LOG OF BORING

LINDMARK ENGINEERING

BEVERLY HILLS		JOB NO.: 198.1	BORING NO.: B14
		LOGGED BY: DRC	DATE LOGGED: 1-17-90
DRILL RIG:	BORING DIA.: 6"	APPROVED BY:	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN		GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
		4" Concrete						
5		Brown sandy silt		ML		20	0	
10		Brown silty sand with gravel		SM			0	
15		Brown silty sand with gravel		SM			0	
20		Very firm silty clay with gravel		CL		24	0	
25								
30								
35								
40								
45								
50								

LOG OF BORING

LINDMARK ENGINEERING

PROJECT:	JOB NO.:	BORING NO.:
CITY OF BEVERLY HILLS 331 N. FOOTHILL BEVERLY HILLS, CALIFORNIA	90-228.1	B18
	LOGGED BY: RSO	DATE LOGGED 6/15-6/18/9
DRILL RIG: CME-75	BORING DIA.: 7"	APPROVED BY: UML
		SURFACE ELE

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN		GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
		4" concrete surface						
5	1:00	Dark brown clayey silt, damp, stiff		ML		11	0	no hydrocarbon odor
10	1:15	Dark yellowish-brown sandy silt, moist, stiff		ML		15	0	no hydrocarbon odor
15	1:25	Dark yellowish-brown med sandy silt, damp, very stiff		ML		19	0	no hydrocarbon odor
20	1:35	Strong brown sandy silty clay, damp, very stiff		CL		20	0	no hydrocarbon odor
25	2:15	Dark brown sandy silt, damp, very stiff		ML		29	0	no hydrocarbon odor Drilling rig broke 2:30, on 6/15/90
30	10:30	Dark brown silty sand, moist, med dense		SM		27	16	slight hydro-carbon odor
35	11:00	Dark brown clayey silt, moist, med dense		ML		11	0	no hydrocarbon odor End of boring at 35'
40								
45								
50								

LOG OF BORING

LINDMARK ENGINEERING

PROJECT:	JOB NO.:	BORING NO.:
CITY OF BEVERLY HILLS 331 N. FOOTHILL BEVERLY HILLS, CALIFORNIA	90-228.1	B19
	LOGGED BY: RSO	DATE LOGGED: 6/15/90
DRILL RIG: CME-75	BORING DIA.: 7"	APPROVED BY: UML
		SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
		4" concrete surface					
5	9:00	Dark brown clayey silt, moist, med dense	ML		16	2	no hydrocarbon odor
10	9:15	Brown clayey silt, moist, med dense	ML		24	1	no hydrocarbon odor
15	9:30	Brown clayey silt, moist, med dense	ML		18	12	no hydrocarbon odor
20	9:45	Strong brown clay, damp, very stiff with some gravel	CL		28	0	no hydrocarbon odor
25	10:00	Dark brown sandy silt, damp, very stiff	ML		19	5	no hydrocarbon odor
30	10:45	Dark brown sandy silt, damp, very stiff	ML		24	3	no hydrocarbon odor
35	10:55	Dark brown clayey silt, moist, very stiff	ML		17	1	no hydrocarbon odor End of boring at 35' no groundwater borehole PID reading 70-108
40							
45							
50							

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: B-24

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 1 of 1

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California		ELEVATION & DATUM:	
		DATE STARTED: 7-7-92	DATE FINISHED: 7-7-92
DRILLING CONTRACTOR: WESTECH	DRILLER: Scott Vandewater	COMPLETED DEPTH (feet): 18.0	WATER DEPTH (feet):
DRILLING EQUIPMENT: Mobile B-53	BORING DIAMETER: 8" OD	WELL CONSTRUCTION	
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐ ☐		TYPE AND DIAMETER OF WELL CASING:	
BACKFILL MATERIAL: Bentonite Chips	DRILLING FLUID: None	SLOT SIZE:	FILTER MATERIAL:
LOGGED BY: RSO	CHECKED BY: UML	WELL DEPTH:	PERFORATED INTERVAL:

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	USC SOIL TYPE	LITHOLOGY	WELL	PID/FID READINGS OVA PPM	REMARKS
	GRASS SURFACE								PID Calibrated on 100 ppm Isobutylene
10:00	**CLAYEY SILT**, dark brown, some rounded fine gravel and coarse sand, moist, firm	2 3 5	5		ML			6.4	No Hydrocarbon Odor
10:15	**SILTY SAND**, yellowish-brown, moist, medium dense	5 7 7	10		SM			65.2	No Hydrocarbon Odor
10:30	**SILTY SAND**, brown, medium and fine sand, trace rounded fine gravel, moist, loose	4 4 6	15		SM			24.3	No Hydrocarbon Odor
									End of Boring at 18' No Groundwater Encountered Boring grazed U.S.T. at 6'

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: B25

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 1 of 2

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California		ELEVATION & DATUM:	
		DATE STARTED: 7-10-92	DATE FINISHED: 7-10-92
DRILLING CONTRACTOR: WESTECH	DRILLER: Scott	COMPLETED DEPTH (feet): 36.0	WATER DEPTH (feet):
DRILLING EQUIPMENT: Symco	BORING DIAMETER: 6" OD	WELL CONSTRUCTION	
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐	☐	TYPE AND DIAMETER OF WELL CASING:	
BACKFILL MATERIAL: Native	DRILLING FLUID: None	SLOT SIZE:	FILTER MATERIAL:
LOGGED BY: HIP	CHECKED BY: UML	WELL DEPTH:	PERFORATED INTERVAL:

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	USC SOIL TYPE	LITHOLOGY	WELL	PID/FID READINGS OVA PPM	REMARKS
	6" THICK CONCRETE SURFACE								PID Calibrated on 50 ppm Hexane
9:45	SANDY SILT, brown, with gravel, damp, soft, sand is fine to medium grained, Gravel is subangular, approx. 3/8" in size, damp	1 1 2	5		ML			5.2	No Hydrocarbon Odor
10:15	CLAY, dark brown, damp, hard	4 4 6	10		CL			5.1	No Hydrocarbon Odor
10:45	SANDY SILT, brown, with trace clay, damp, stiff, sand is medium to coarse grained, brown, damp	5 5 5	15		ML			51.2	No Hydrocarbon Odor
11:40	SANDY CLAY, brown, damp, very stiff, sand is brown and medium grained, damp	6 7 8	20		CL			40.1	No Hydrocarbon Odor
1:15	SANDY CLAY, brown to dark brown, with trace silt, damp, stiff, sand is medium to coarse grained, light brown, damp	4 5 8	25		CL			79.7	No Hydrocarbon Odor
2:00	SANDY SILT, olive-brown, damp, dense, sand is coarse grained		30		ML			198	Faint Hydrocarbon Odor

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: B25

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 2 of 2

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
2:30	**CLAY**, Brown, moist, hard	6 8 11	35		CL			32.3	No Hydrocarbon Odor End of Boring at 36' No Groundwater Encountered

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: B-26

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 1 of 2

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California		ELEVATION & DATUM:	
		DATE STARTED: 7-9-92	DATE FINISHED: 7-9-92
DRILLING CONTRACTOR: WESTECH	DRILLER: Scott Vandewater	COMPLETED DEPTH (feet): 35.0	WATER DEPTH (feet):
DRILLING EQUIPMENT: Mobile B-53	BORING DIAMETER: 8" OD	WELL CONSTRUCTION	
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐		TYPE AND DIAMETER OF WELL CASING:	
BACKFILL MATERIAL: Bentonite Chips	DRILLING FLUID: None	SLOT SIZE:	FILTER MATERIAL:
LOGGED BY: RSO	CHECKED BY: UML	WELL DEPTH:	PERFORATED INTERVAL:

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	USC SOIL TYPE	LITHOLOGY	WELL	PID/FID READINGS OVA PPM	REMARKS
	9" THICK CONCRETE SURFACE								PID Calibrated on 100 ppm Isobutylene
8:20	CLAYEY SILT, dark brown	2 3 3	5		ML			7.1	No Hydrocarbon Odor
8:30	SILTY SAND, yellowish-brown, subangular, medium and fine sand, moist, medium dense	4 5 7	10		SM			13.0	No Hydrocarbon Odor
8:45	CLAYEY SILT, brown, trace angular medium sand, damp, firm	4 8 8	15		ML			7.6	No Hydrocarbon Odor
9:00	SILTY CLAY, dark brown, some angular sand, moist, stiff	5 8 10	20		CL			2.0	No Hydrocarbon Odor
					SP				
9:15	SILT, dark brown, with 1' layer of coarse sand, angular, moist, very stiff	12 8 8	25		ML			OR 255	Strong Hydrocarbon Odor (Span Reduced .5%)
9:30	SILTY SAND, brown, coarse and medium sand, angular, moist, medium dense	5 8 11	30		SM			OR 227	Strong Hydrocarbon Odor (Span Reduced .5%)

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: **B-26**

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 2 of 2

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
9:45	SILT, dark brown, moist, firm	2 3 5	35		ML			25.2	No Hydrocarbon Odor End of Boring at 35' No Groundwater Encountered

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: B-27

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 1 of 2

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California		ELEVATION & DATUM:	
		DATE STARTED: 7-13-92	DATE FINISHED: 7-13-92
DRILLING CONTRACTOR: WESTECH	DRILLER: Scott	COMPLETED DEPTH (feet): 36.0	WATER DEPTH (feet): 30.0
DRILLING EQUIPMENT: Simco 2400	BORING DIAMETER: 6" OD	WELL CONSTRUCTION	
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐		TYPE AND DIAMETER OF WELL CASING:	
BACKFILL MATERIAL: Native & Bentonite	DRILLING FLUID: None	SLOT SIZE:	FILTER MATERIAL:
LOGGED BY: PRJ	CHECKED BY: UML	WELL DEPTH:	PERFORATED INTERVAL:

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
									PID Calibrated on 50 ppm Hexane
10:16	**SANDY SILT**, brown, fine to medium grained sand, slightly plastic silt, damp, stiff	3 5 8	5		ML			0	No Hydrocarbon Odor
11:18	**SANDY SILT**, brown, fine grained sand, slightly plastic silt, damp, stiff	6 6 6	10		ML			2.0	No Hydrocarbon Odor
11:46	**CLAYEY SILT**, brown, gravel at 15.5', moist, medium stiff	2 3 5	15		ML			3.0	No Hydrocarbon Odor
1:00	**CLAYEY SILT**, brown, plastic, moist, very stiff	5 8 10	20		ML			2.0	No Hydrocarbon Odor
1:40	**CLAYEY SILT**, brown, plastic, wet, stiff	4 5 10	25		ML			10.0	No Hydrocarbon Odor
2:05	**CLAYEY SILT**, brown, plastic, saturated, stiff	6 5 6	30		ML		▼	26.0	No Hydrocarbon Odor

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: B-27

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 2 of 2

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
2:25	**CLAYEY SILT**, brown, wet, stiff	5 6 8	35		ML			15.0	No Hydrocarbon Odor End of Boring at 36' Groundwater Encountered at 30'

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: B28

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 1 of 2

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California		ELEVATION & DATUM:	
		DATE STARTED: 7-9-92	DATE FINISHED: 7-9-92
DRILLING CONTRACTOR: WESTECH	DRILLER: Craig Winegarner	COMPLETED DEPTH (feet): 36.0	WATER DEPTH (feet): 31.0
DRILLING EQUIPMENT: Mobile B-61	BORING DIAMETER: 8" OD	WELL CONSTRUCTION	
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐		TYPE AND DIAMETER OF WELL CASING:	
BACKFILL MATERIAL: Native	DRILLING FLUID: None	SLOT SIZE:	FILTER MATERIAL:
LOGGED BY: HIP	CHECKED BY: UML	WELL DEPTH:	PERFORATED INTERVAL:

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	USC SOIL TYPE	LITHOLOGY	WELL	PID/FID READINGS OVA PPM	REMARKS
	LAWN SURFACE								PID Calibrated on 50 ppm Hexane
4:45	CLAY, light brown, damp, stiff	3 5 5	5		CL			6.4	No Hydrocarbon Odor
4:50	CLAYEY SILT, brown, damp, stiff	4 6 7	10		ML			6.3	No Hydrocarbon Odor
4:55	GRAVELLY SILT, brown, with trace brown sand, gravel is black and subangular, damp, stiff	4 5 8	15		ML			5.3	No Hydrocarbon Odor (Sample Not Retained)
4:55		5 7 8							
5:00		4							
5:10	CLAY, brown, with trace sand, moist, stiff, sand is very fine	7 9 5 5 6	20		CL			7.8	No Hydrocarbon Odor
5:15	SILTY SAND, dark olive, damp, medium dense, sand is medium to coarse grained	7 13 18	25		SM			138.5	Strong Hydrocarbon Odor
5:20	SILTY SAND, dark olive, wet, medium dense, sand is medium to coarse grained	5 12 15	30		SM		▼	404	Strong Hydrocarbon Odor

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: B28

PROJECT NO: 92-384.1

SOIL BORING ☑ MONITORING WELL ☐

SHEET NO.: 2 of 2

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
5:15	**SILTY SAND**, dark olive, wet, medium dense, sand is medium to coarse grained	7 10 14	35		SM				End of Boring at 36' Groundwater Encountered at 31'

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BORING / WELL CONSTRUCTION LOG

PROJECT NUMBER _____ BORING/WELL NUMBER LE1
PROJECT NAME _____ DATE DRILLED _____
LOCATION _____ CASING TYPE/DIAMETER _____
DRILLING METHOD _____ SLOT SIZE _____ SCREEN INTERVAL _____
SAMPLING METHOD _____ GRAVEL PACK TYPE _____
BORING DIAMETER _____ DRILLING CONTRACTOR _____
BORING DPTH _____ WELL DPTH _____ DPTH TO WATER DURING DRILLING (BGS) _____
LOGGED BY _____ CHECKED BY _____ DPTH TO WATER AFTER INSTALLATION (BGS) _____
REMARKS _____

TIME	BLOW COUNTS	SAMPLE ID.	SAMPLE DEPTH	DEPTH (BGS)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	PID (ppm)	WELL DIAGRAM
				0			**CONCRETE**, approximately 2-inches thick		
				5			**SILTY CLAY**, dark greenish gray (Gley1 10Y 3/1), low plasticity, medium stiff, damp		
				10			**CLAYEY SILTY**, greenish black (Gley1 10Y 2.5/1), low plasticity, stiff, damp		
				15			**SILTY CLAY**, dark greenish gray (Gley1 10Y 4/1), medium plasticity, stiff, damp		
							CLAYEY SILT, dark greenish gray (Gley1 10Y 4/1), low plasticity, medium stiff, minor fine grained sand, damp		
				20			**CLAYEY SILT**, same as above		
				25			**CLAYEY SILT**, dark yellowish brown (10YR 4/4), mottled green/blue, low plasticity, stiff, damp		
				30			**SANDY SILT**, olive brown (2.5Y 4/3), low plasticity, fine to medium grained sand, stiff, damp		
				35			**CLAYEY SILT**, dark yellowish brown (10YR 3/6),		

Continued Next Page

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BORING / WELL CONSTRUCTION LOG

PROJECT NUMBER _____ BORING/WELL NUMBER LE1

PROJECT NAME _____ DATE DRILLED _____

Continued from Previous Page

TIME	BLOW COUNTS	SAMPLE ID.	SAMPLE DEPTH	DEPTH (BGS)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	PID (ppm)	WELL DIAGRAM
							medium plasticity, stiff, very damp		
							CLAYEY SILT, same as above		
				40			**GRAVELLY SAND,** dark yellowish brown (10YR 3/4), medium to coarse grained sand, dense, moist		

WELL 97707.GPJ WELL.GDT 5/9/00

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BORING / WELL CONSTRUCTION LOG

PROJECT NUMBER _____ BORING/WELL NUMBER LE2
PROJECT NAME _____ DATE DRILLED _____
LOCATION _____ CASING TYPE/DIAMETER _____
DRILLING METHOD _____ SLOT SIZE _____ SCREEN INTERVAL _____
SAMPLING METHOD _____ GRAVEL PACK TYPE _____
BORING DIAMETER _____ DRILLING CONTRACTOR _____
BORING DPTH _____ WELL DPTH _____ DPTH TO WATER DURING DRILLING (BGS) _____
LOGGED BY _____ CHECKED BY _____ DPTH TO WATER AFTER INSTALLATION (BGS) _____
REMARKS _____

TIME	BLOW COUNTS	SAMPLE ID.	SAMPLE DEPTH	DEPTH (BGS)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	PID (ppm)	WELL DIAGRAM
				0			CONCRETE, approximately 2-inches thick		
				5			**SILTY CLAY,** dark brown (10YR 3/3), minor fine grained sand, low plasticity, medium stiff, damp		
				10			**CLAYEY SILT,** dark yellowish brown (10YR 4/4), low plasticity, stiff, damp		
				15			**CLAYEY SILT,** dark yellowish brown (10YR 3/4), low plasticity, stiff, damp		
				20			**CLAYEY SILT,** dark yellowish brown (10YR 3/4), medium plasticity, stiff, damp		
				25			**CLAYEY SILT,** same as above		
				30			**SILTY SAND,** dark brown (10YR 3/3), fine to coarse grained sand, minor gravel, dense, damp		
				35			**CLAYEY SILT,** dark brown (10YR 3.3), minor fine		

Continued Next Page

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BORING / WELL CONSTRUCTION LOG

PROJECT NUMBER _____ BORING/WELL NUMBER LE2

PROJECT NAME _____ DATE DRILLED _____

Continued from Previous Page

TIME	BLOW COUNTS	SAMPLE ID.	SAMPLE DEPTH	DEPTH (BGS)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	PID (ppm)	WELL DIAGRAM
							grained sand, low plasticity, stiff, damp		

WELL 97707.GPJ WELL.GDT 5/9/00

LOG OF BORING

LINDMARK ENGINEERING

PROJECT: CITY OF BEVERLY HILLS, 331 N. FOOTHILL, BEVERLY HILLS, CALIFORNIA		JOB NO.: 90-228.1	BORING NO.: GW1
		LOGGED BY: RSO	DATE LOGGED: 6/7/90
DRILL RIG: CME-75	BORING DIA.: 7"	APPROVED BY: UML	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN		GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
		2" asphalt surface						
5	9:30	Dark brown clayey silt, damp		ML			0	no hydrocarbon odor
10		Dark brown silty clay, moist		CL			0	no hydrocarbon odor
15	9:45	Brown clayey silt, moist		ML			6	no hydrocarbon odor
20	9:55	Dark brown clayey silt, moist		ML		5	0	no hydrocarbon odor
25	10:00	Dark brown clayey silt, moist		ML			0	no hydrocarbon odor groundwater at 29'
30	10:10	Dark brown silty sand, wet, some pebbles & coarse sand		SM	▼	15	1	no hydrocarbon odor
35	10:30	Dark brown clayey silt, moist		ML		11	0	no hydrocarbon odor
40								
45	10:45	Dark brown clayey silt		ML				no hydrocarbon odor
50								End of boring at 45'

LOG OF BORING

LINDMARK ENGINEERING

PROJECT: CITY OF BEVERLY HILLS, 331 N. FOOTHILL, BEVERLY HILLS, CALIFORNIA		JOB NO.: 90-228.1	BORING NO.: GW2
		LOGGED BY: RSO	DATE LOGGED: 5/22/90
DRILL RIG: CME 75	BORING DIA.: 7" DIA. O.D.	APPROVED BY: UML	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN	GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
	5:00	4" concrete surface					
5		Dark brown silty sand, moist, med dense	SM				no hydrocarbon odor
10		Dark brown silt, moist, med dense	ML				no hydrocarbon odor
15	5:20	Yellowish-brown med sand, moist, med dense	SW		10	2	no hydrocarbon odor
20							
25							
30	5:40	Dark yellowish-brown sandy silt, moist, loose	ML		9	15	no hydrocarbon odor
35				▼			Groundwater at 34'
40		Dark yellowish-brown silty sand, wet, loose	SM				no hydrocarbon odor
45							
50		Brown silty sand, wet, loose	SM				no hydrocarbon odor End of boring at 50'

LOG OF BORING

LINDMARK ENGINEERING

PROJECT: CITY OF BEVERLY HILLS, 331 N. FOOTHILL, BEVERLY HILLS, CALIFORNIA		JOB NO.: 90-228.1	BORING NO.: GW3
		LOGGED BY: RSO	DATE LOGGED: 5/22/90
DRILL RIG: CME 75	BORING DIA.: 7" DIA. O.D.	APPROVED BY: UML	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN		GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
0	9:30	bare ground surface in maintenance yard						no hydrocarbon odor
15	9:45	Dark brown clayey silt, moist, loose		ML		7	0	no hydrocarbon odor
30	10:15	Dark brown silty coarse sand, moist, loose		SM		5	0	no hydrocarbon odor
35		Dark brown clayey silt, moist, med dense		ML				no hydrocarbon odor groundwater at 37'
40		Dark brown clayey silt, wet, loose		ML				no hydrocarbonj odor
50	10:40	Brown sandy silt, wet, loose		ML				no hydrocarbon odor
		Brn clayey silt, wet, stiff		ML				" End of boring @ 57'

LOG OF BORING

LINDMARK ENGINEERING

PROJECT:	JOB NO.:	BORING NO.:
CITY OF BEVERLY HILLS 331 N. FOOTHILL BEVERLY HILLS, CALIFORNIA	90-228.1	GW4
	LOGGED BY: RSO	DATE LOGGED: 5/22/90
DRILL RIG: CME 75 / BORING DIA.: 9" DIA. O.D.	APPROVED BY: UML	SURFACE ELEV:

BORING DEPTH (FT.)	TIME	DESCRIPTION	LITHOLOGIC COLUMN		GROUNDWATER LEVEL	PENETRATION (BL./FT.)	PID READING (PPM)	REMARKS
0	12:30	4" concrete surface						
5		Gray brown sand with gravel		SP				
10		Brown silty sand		SM				
15		Brown silty sand with gravel		SM				
20		Brown silty clay with some shale, very dense		CL				
25		Brown sandy silt		ML				
30	2:00	Olive-gray & brown silty sand, moist, loose		SM		7	1600	strong hydro-carbon odor
35		Brown sandy silt		ML	▼			Groundwater at 36'
40		Brown sandy silt		ML				End of boring at 40'
45								
50								

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: GW9

PROJECT NO: 92-384.1

SOIL BORING ☐ MONITORING WELL ☑

SHEET NO.: 1 of 2

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California		ELEVATION & DATUM:	
		DATE STARTED: 7-7-92	DATE FINISHED: 7-7-92
DRILLING CONTRACTOR: WESTECH	DRILLER: Scott Vandewater	COMPLETED DEPTH (feet): 50.5	WATER DEPTH (feet): 37.0
DRILLING EQUIPMENT: Mobile B-53	BORING DIAMETER: 8" OD	WELL CONSTRUCTION	
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐		TYPE AND DIAMETER OF WELL CASING: 2" Dia. Sch. 40 PVC	
BACKFILL MATERIAL: Sand/Bentonite Seal	DRILLING FLUID: None	SLOT SIZE: 0.020"	FILTER MATERIAL: Monterey Sand #3
LOGGED BY: RSO	CHECKED BY: UML	WELL DEPTH: 50'	PERFORATED INTERVAL: 15' to 50'

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	USC SOIL TYPE	LITHOLOGY	WELL	PID/FID READINGS OVA PPM	REMARKS
	GRASS SURFACE								PID Calibrated on 100 ppm Isobutylene
12:00	CLAYEY SILT, dark brown, trace medium sand, damp, stiff	3 5 8	5		ML			3.3	No Hydrocarbon Odor
12:50	SANDY SILT, yellowish-brown, trace coarse sand, rounded, moist, stiff	4 5 10	10		ML			5.0	No Hydrocarbon Odor
1:00	SILTY SAND, dark yellowish-brown, trace clay, moist, loose	3 4 6	15		SM			2.7	No Hydrocarbon Odor
1:20	SILTY CLAY, dark brown, some angular medium sand, moist, stiff	3 4 10	20		CL			5.1	No Hydrocarbon Odor
1:30	CLAYEY SILT, dark brown, trace subangular fine gravel, moist, stiff	4 6 10	25		ML			6.0	No Hydrocarbon Odor
1:40	SAND, brown, angular medium and fine sand, with layers of silt, moist, medium dense	3 4 9	30		SP			492	No Hydrocarbon Odor

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: GW9

PROJECT NO: 92-384.1

SOIL BORING ☐ MONITORING WELL ☑

SHEET NO.: 2 of 2

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
2:10	**CLAYEY SILT**, dark brown, moist, stiff	4 6 8	35		ML			12	No Hydrocarbon Odor
2:20	**SILTY SAND**, brown, trace subrounded shaly gravel, wet		40		SP			-	No Hydrocarbon Odor
2:40	**SAND**, dark yellowish-brown, angular coarse sand, wet		45		SP			-	No Hydrocarbon Odor
2:50	**CLAY**, dark brown, trace rounded fine sand, moist, very stiff		50		CL			-	No Hydrocarbon Odor End of Boring at 50.5' Groundwater at 37'

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: GW10

PROJECT NO: 92-384.1

SOIL BORING ☐ MONITORING WELL ☑

SHEET NO.: 1 of 2

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California		ELEVATION & DATUM:	
		DATE STARTED: 7-9-92	DATE FINISHED: 7-9-92
DRILLING CONTRACTOR: WESTECH	DRILLER: Scott Vandewater	COMPLETED DEPTH (feet): 50.0	WATER DEPTH (feet): 33.0
DRILLING EQUIPMENT: Mobile B-53	BORING DIAMETER: 8" OD	WELL CONSTRUCTION	
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐		TYPE AND DIAMETER OF WELL CASING: 2" Dia. Sch. 40 PVC	
BACKFILL MATERIAL: Sand/Bentonite Seal	DRILLING FLUID: None	SLOT SIZE: 0.020"	FILTER MATERIAL: Monterey Sand #3
LOGGED BY: RSO	CHECKED BY: UML	WELL DEPTH: 50'	PERFORATED INTERVAL: 20' to 50'

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	USC SOIL TYPE	LITHOLOGY	WELL	PID/FID READINGS OVA PPM	REMARKS
	GRASS SURFACE (Tree Lawn Area)								PID Calibrated on 100 ppm Isobutylene
1:00	**CLAYEY SILT**, very dark brown, moist, firm	2 3 5	5		ML			8.5	No Hydrocarbon Odor
1:10	**SILT**, yellow-brown, trace rounded and subangular medium sand, moist, stiff	3 4 8	10		ML			4.0	No Hydrocarbon Odor
1:20	**SILT**, brown, some angular medium sand, moist, stiff	3 4 6	15		ML			5.8	No Hydrocarbon Odor
1:35	**SILT**, brown, moist, firm	2 3 5	20		ML			6.9	No Hydrocarbon Odor
1:50	**CLAYEY SILT**, brown, some angular medium sand and subangular fine gravel, moist, very stiff	5 11 12	25		ML			8.0	No Hydrocarbon Odor
2:05	**SILT**, brown, some medium rounded sand, moist, stiff	5 5 5	30		ML			11.4	No Hydrocarbon Odor

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: GW10

PROJECT NO: 92-384.1

SOIL BORING ☐ MONITORING WELL ☑

SHEET NO.: 2 of 2

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
2:20	**CLAY**, brown and gray, with layers of sandy silt, wet	--	35		CL				No Hydrocarbon Odor
2:30	**SANDY SILT**, brown, wet	--	40		ML				No Hydrocarbon Odor
2:45	SAND, brown, fine and medium sand, subangular, saturated	--	45		SP				No Hydrocarbon Odor
3:00	SAND, brown, fine and medium sand, subangular, saturated	--	50		SP				No Hydrocarbon Odor End of Boring at 50' Groundwater Encountered at 33'

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: GW11

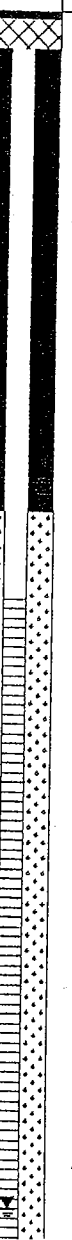
PROJECT NO: 92-384.1

SOIL BORING ☐ MONITORING WELL ☑

SHEET NO.: 1 of 2

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California	ELEVATION & DATUM:
	DATE STARTED: 7-8-92 / DATE FINISHED: 7-8-92
DRILLING CONTRACTOR: WESTECH / DRILLER: Mobile B-53	COMPLETED DEPTH (feet): 50.0 / WATER DEPTH (feet): 31.0
DRILLING EQUIPMENT: Mobile B-53 / BORING DIAMETER: 8" OD	WELL CONSTRUCTION
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐	TYPE AND DIAMETER OF WELL CASING: 2" Dia. Sch. 40 PVC
BACKFILL MATERIAL: Sand/Bentonite Seal / DRILLING FLUID: None	SLOT SIZE: 0.020" / FILTER MATERIAL: Monterey Sand #3
LOGGED BY: RSO / CHECKED BY: UML	WELL DEPTH: 50' / PERFORATED INTERVAL: 20' to 50'

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	USC SOIL TYPE	PID/FID READINGS OVA PPM	REMARKS
	GRASS SURFACE					PID Calibrated on 100 ppm Isobutylene
10:20	CLAYEY SILT, dark brown, damp, firm	2 3 4	5	ML	10.1	No Hydrocarbon Odor
10:30	CLAYEY SILT, dark brown, damp, firm	3 4 6	10	ML	4.4	No Hydrocarbon Odor
10:45	CLAYEY SILT, brown, damp, firm	3 4 5	15	ML	3.1	No Hydrocarbon Odor
10:50	CLAYEY SILT, brown, trace angular, medium sand, damp, firm	3 4 6	20	ML	5.5	No Hydrocarbon Odor
11:00	CLAYEY SILT, dark brown, damp, firm	3 5 6	25	ML	8.5	No Hydrocarbon Odor
11:15	SILTY SAND, brown, some angular medium sand, and trace angular fine gravel	4 7 8	30	SM	4.2	No Hydrocarbon Odor



LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: GW11

PROJECT NO: 92-384.1

SOIL BORING ☐ MONITORING WELL ☑

SHEET NO.: 2 of 2

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
			35		SM				
12:00	**SILTY SAND**, brown, some angular medium sand, trace angular fine gravel, wet	5 7 10	40		SM			-	No Hydrocarbon Odor
			45		SM				
12:20	**SAND**, brown, angular coarse medium sand, trace angular fine gravel, wet		50		SP			-	No Hydrocarbon Odor End of Boring at 50' Groundwater Encountered at 31' Well is Located at 9298 W. Third St. Beverly Hills, CA

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

WELL/BORING NO.: GW12

PROJECT NO: 92-384.1

SOIL BORING ☐ MONITORING WELL ☑

SHEET NO.: 1 of 2

PROJECT LOCATION: 331 N. Foothill Rd., Beverly Hills, California		ELEVATION & DATUM:	
		DATE STARTED: 7-9-92	DATE FINISHED: 7-9-92
DRILLING CONTRACTOR: WESTEX	DRILLER: Craig Winegarner	COMPLETED DEPTH (feet): 50.5	WATER DEPTH (feet): 29.0
DRILLING EQUIPMENT: Mobile B-61	BORING DIAMETER: 8" OD	WELL CONSTRUCTION	
SAMPLING METHOD: California Modified ☑ Hand Soil Auger ☐		TYPE AND DIAMETER OF WELL CASING: 4" Dia. Sch. 40 PVC	
BACKFILL MATERIAL:	DRILLING FLUID: None	SLOT SIZE: 0.020"	FILTER MATERIAL: Monterey Sand #3
LOGGED BY: HIP	CHECKED BY: UML	WELL DEPTH: 50'	PERFORATED INTERVAL: 20' to 49.5'

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	USC SOIL TYPE	LITHOLOGY	WELL	PID/FID READINGS OVA PPM	REMARKS
	GRASS SURFACE								PID Calibrated on 50 ppm Hexane
9:30	SANDY CLAY, dark brown, damp to moist, very stiff	5 7 7	5		CL			3.2	No Hydrocarbon Odor
	SAND, brown, coarse grained, damp				SP				
9:40	SANDY CLAY, dark brown, damp, stiff	3 4 4	10		CL			2.8	No Hydrocarbon Odor
	SHALE, dark brown to black, rocky				GP				
9:45	GRAVELLY CLAY, brown, damp, very stiff, gravel is shale, dark brown, flakey	5 7 8	15		CL			4.7	No Hydrocarbon Odor
9:50	CLAY, brown, trace sand, damp, very stiff	4 7 15	20		CL			4.3	No Hydrocarbon Odor
10:05	SANDY CLAY, brown, with trace shale bits, moist, hard, sand is coarse grained, brownish, moist	9 10 13	25		CL			3.5	No Hydrocarbon Odor
10:10	SANDY CLAY, brown, saturated, stiff, sand is coarse grained, brown, saturated	4 6 6	30		CL				No Hydrocarbon Odor

LINDMARK ENGINEERING, INC.

PROJECT NAME: CITY OF BEVERLY HILLS

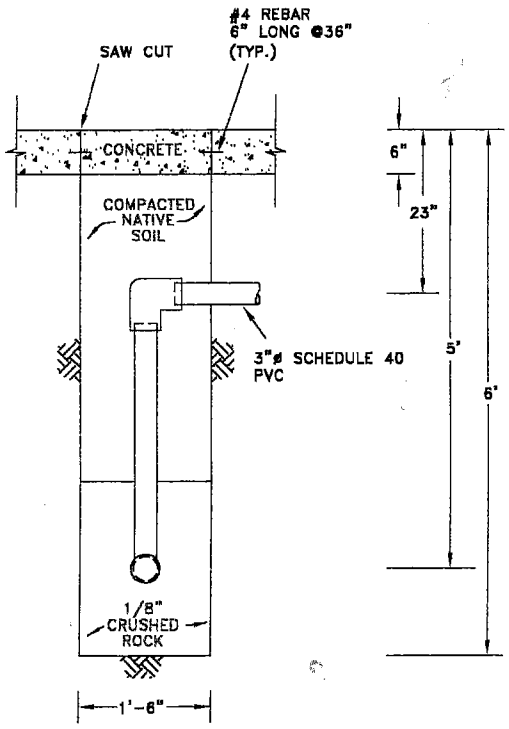
WELL/BORING NO.: GW12

PROJECT NO: 92-384.1

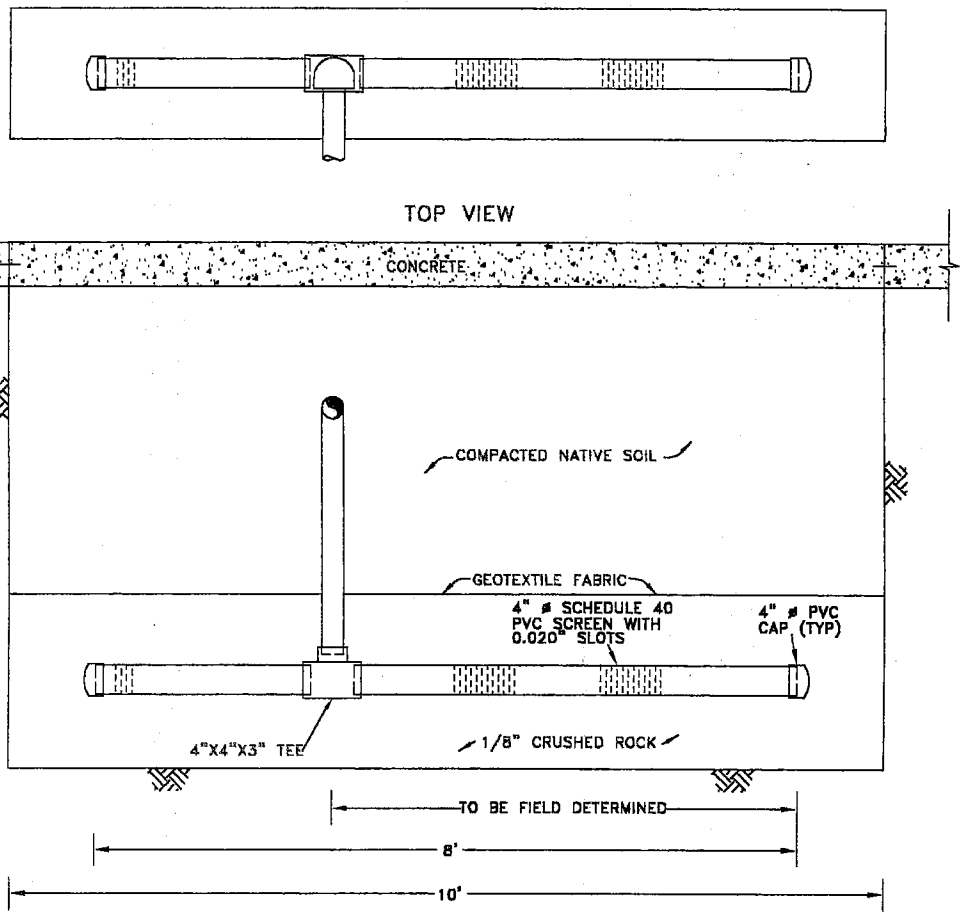
SOIL BORING ☐ MONITORING WELL ☑

SHEET NO.: 2 of 2

TIME	DESCRIPTION	BLOW-COUNTS	DEPTH (FEET)	GRAPHIC LOGS: SAMPLE	GRAPHIC LOGS: USC SOIL TYPE	GRAPHIC LOGS: LITHOLOGY	GRAPHIC LOGS: WELL	PID/FID READINGS OVA PPM	REMARKS
	CLAY, brown, with trace sand, saturated		35		CL				No Hydrocarbon Odor
10:20	**CLAY**, brown, with trace sand, saturated, very stiff, sand is fine to coarse grained		40		CL				No Hydrocarbon Odor
	CLAY, brown, with trace sand, saturated		45		CL				No Hydrocarbon Odor
10:35	**SILTY CLAY**, brown, with trace gravel, saturated, gravel is yellow, rounded and about 3/8" in diameter		50		CL				No Hydrocarbon Odor End of Boring at 50.5' Groundwater Encountered at 29'



END VIEW



SIDE VIEW

SCALE: 3/4" = 12"

0 1" 2"
0 1' 2'

LINDMARK ENGINEERING 314 CHATSWORTH DRIVE SAN FERNANDO, CALIFORNIA 91340 (818) 365-1170 FAX: (818) 365-0296			PROJECT: CITY OF BEVERLY HILLS 331 N. FOOTHILL ROAD			
			TITLE: HORIZONTAL WELL DETAILS			
DESIGNED BY: EBL	DRAWN BY: JKF	CHECKED BY: UML	DATE: 1/97	SCALE: AS NOTED	JOB NO. 94-571.1	FIGURE NO.: 9

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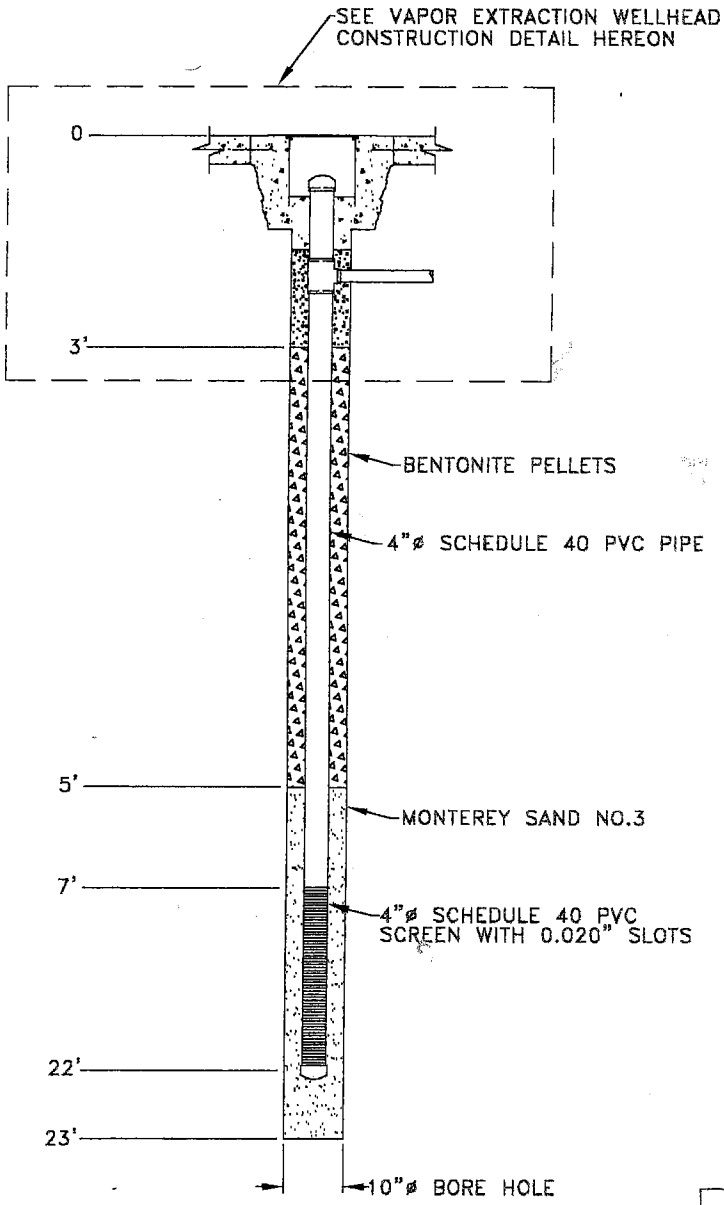
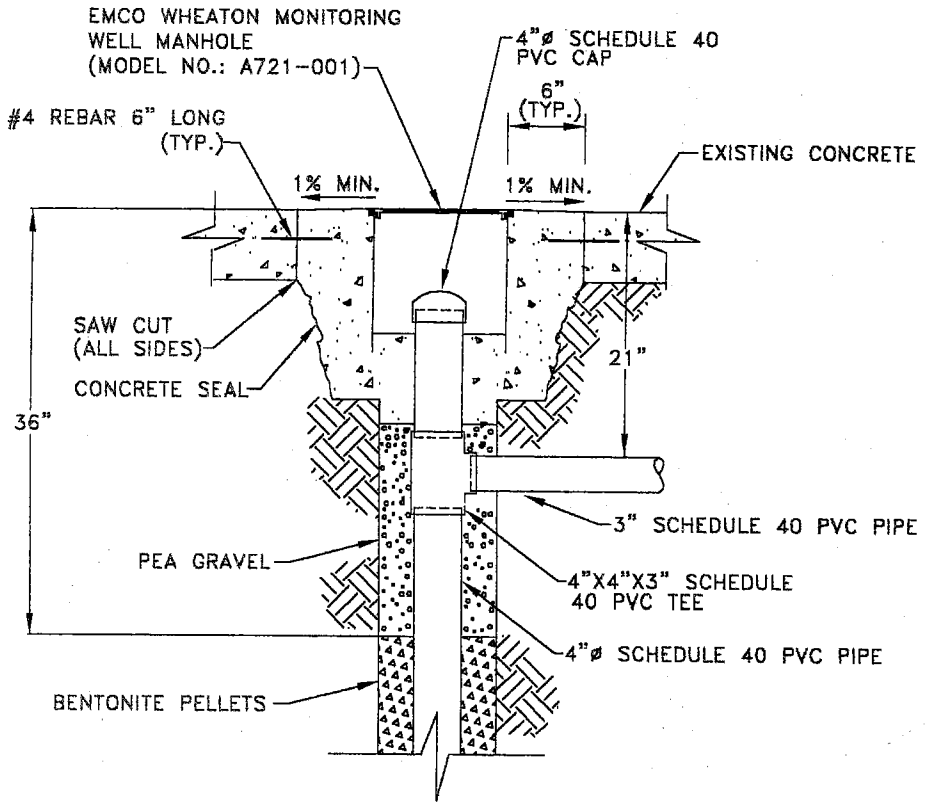


VAPOR EXTRACTION
WELL DETAIL
NOT TO SCALE



VAPOR EXTRACTION
WELLHEAD CONSTRUCTION DETAIL
NOT TO SCALE

LINDMARK ENGINEERING
314 CHATSWORTH DRIVE
SAN FERNANDO, CALIFORNIA 91340
(818) 365-1170
FAX: (818) 365-0296

PROJECT: CITY OF BEVERLY HILLS
331 N. FOOTHILL ROAD

TITLE: VAPOR EXTRACTION WELL DETAIL
(VE4 AND VE6)

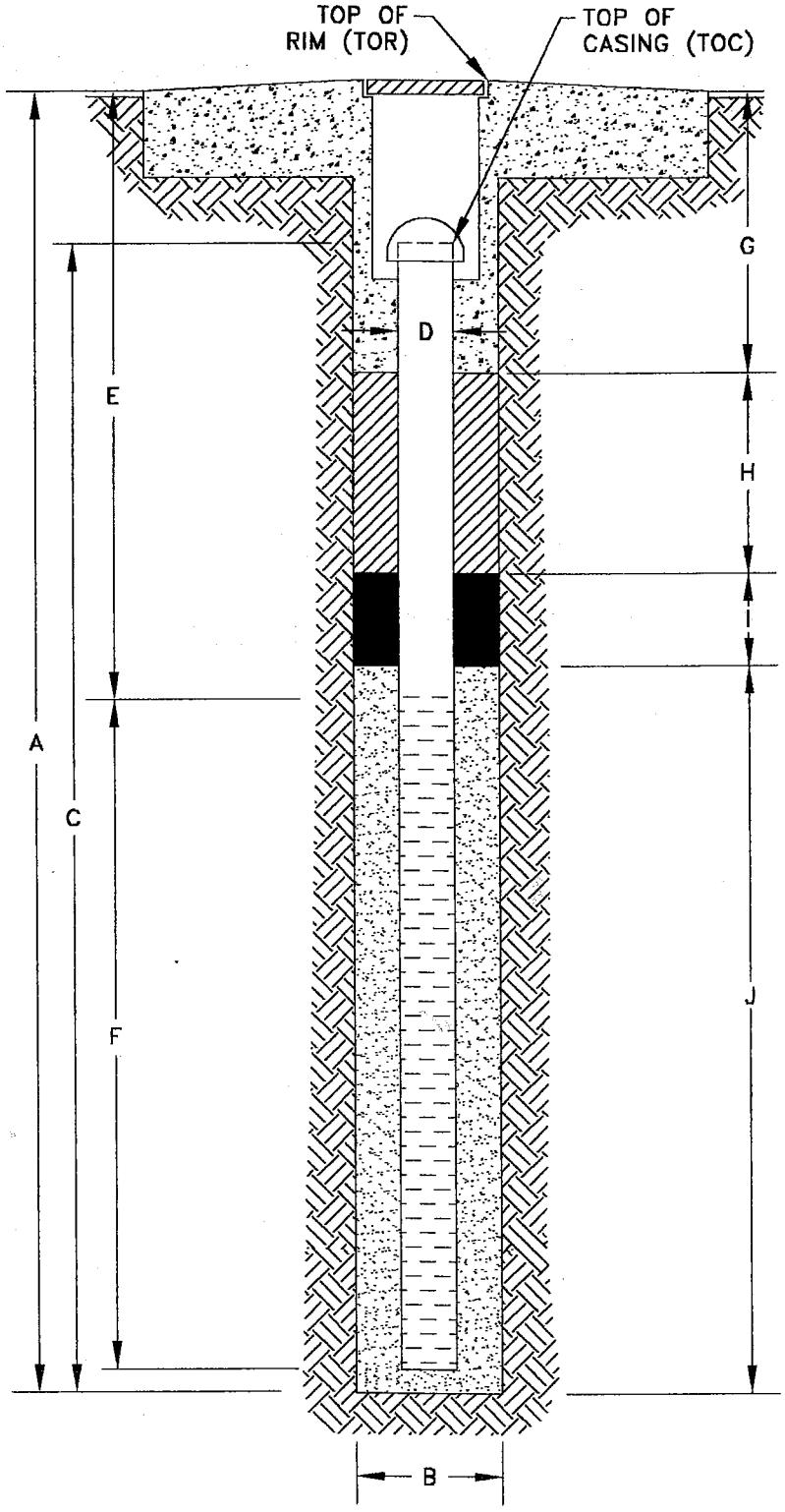
DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	SCALE:	JOB NO.	FIGURE NO.:
RB	JKF	EBL	1/97	N.T.S.	94-571.1	3

F:\DRAWING\94\571VEWC

LINDMARK ENGINEERING, INC.
314 CHATSWORTH DRIVE
SAN FERNANDO, CALIFORNIA 91340
(818) 365-1170
FAX: (818) 365-0296

AIR SPARGING WELL CONSTRUCTION DETAIL

PROJECT NAME: CITY OF BEVERLY HILLS
PROJECT NO.: 97-707.1
PROJECT LOCATION: 331 NORTH FOOTHILL ROAD, BEVERLY HILLS, CA
WELL NO.: AW5
ELEVATION TOC: TBD
ELEVATION TOR: TBD
DATUM: TBD



BORING

DEPTH (A) 35 FT.
DIAMETER (B) 10 IN.
METHOD HSA

WELL

CASING:

LENGTH (C) 35 FT.
DIAMETER (D) 1 IN.
MATERIAL SCHEDULE 40 PVC

PERFORATIONS:

DEPTH TO TOP (E) 33 FT.
LENGTH (F) 2 FT.
INTERVAL 33 TO 35 FT.
TYPE SCHEDULE 40 PVC
SIZE 0.010 IN.

SURFACE SEAL:

INTERVAL (G) 0 TO 1 FT.
MATERIAL CONCRETE

SEAL:

INTERVAL (H) 1 TO 31 FT.
MATERIAL BENTONITE CHIPS
INTERVAL (I) 31 TO 32 FT.
MATERIAL BENTONITE PELLETS

PACK:

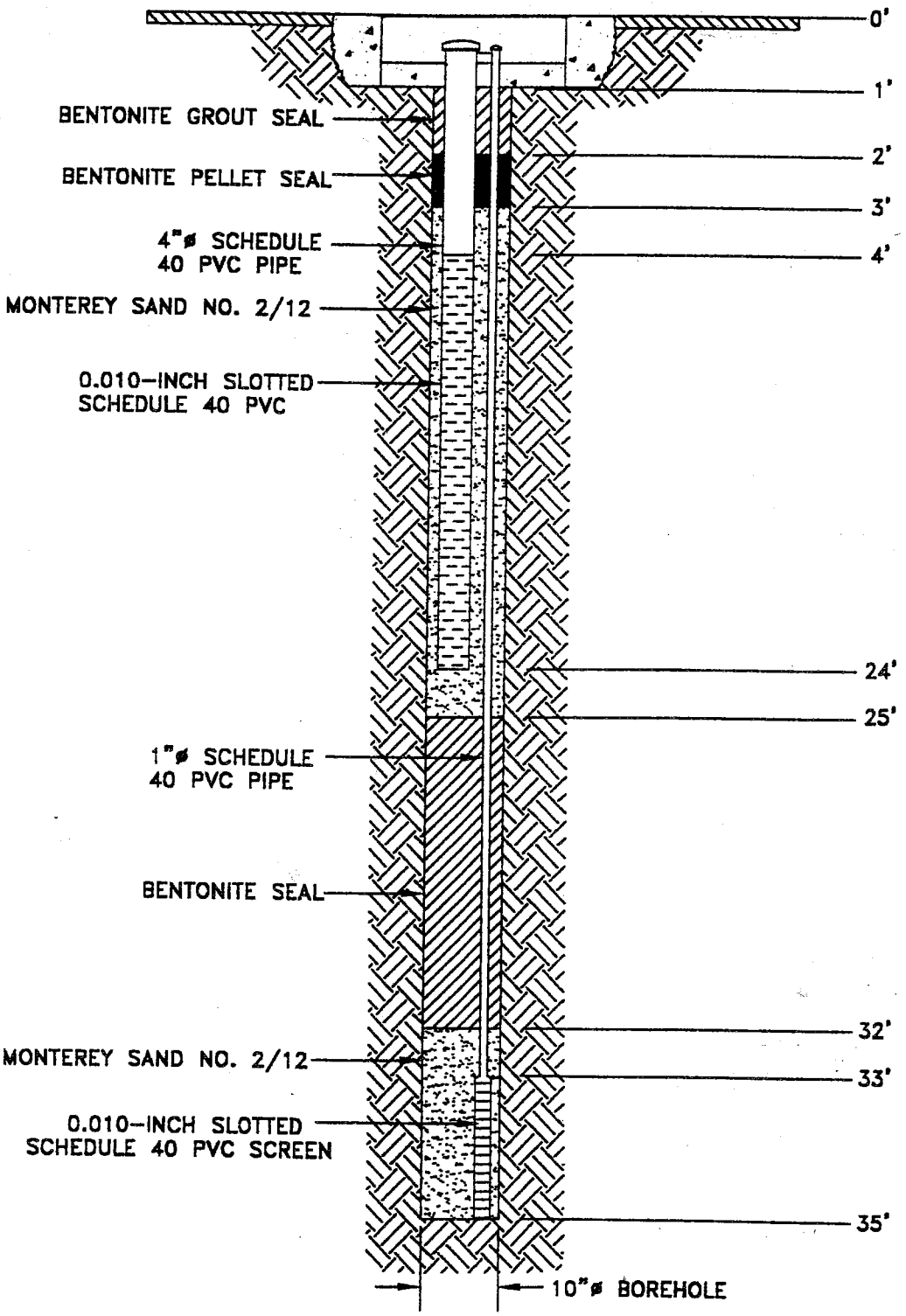
INTERVAL (J) 32 TO 35 FT.
MATERIAL #2/12 SAND

F:\DRAWING\97\707WELL

LINDMARK ENGINEERING
314 CHATSWORTH DRIVE
SAN FERNANDO, CALIFORNIA 91340
(818) 365-1170
FAX: (818) 365-0296

VAPOR EXTRACTION/ AIR SPARGING WELL CONSTRUCTION DETAIL

PROJECT NAME: CITY OF BEVERLY HILLS
PROJECT NO.: 97-707.1
PROJECT LOCATION: 331 NORTH FOOTHILL ROAD, BEVERLY HILLS, CA
WELL NO.: VE7/AW5
ELEVATION TOC: NA
ELEVATION TOR: NA
DATUM: NA



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Lindmark Engineering
5900 Cherry Avenue
Long Beach, CA 90805
(562) 423-0600

BORING / WELL CONSTRUCTION LOG

PROJECT NUMBER	97-707.1	**BORING/WELL NUMBER**	VE8/AW6
PROJECT NAME	City of Beverly Hills Maintenance Yard	**DATE DRILLED**	11/01/00
LOCATION	331 North Foothill Road	**CASING TYPE/DIAMETER**	2-inch (VE)/1-inch (AW) sched 40 PVC
DRILLING METHOD	Hollow Stem Auger	**SLOT SIZE**	0.02/0.01-inch **SCREEN INTERVAL** 15 to 30/43 to 45
SAMPLING METHOD	Calif. Mod. Split Spoon	**GRAVEL PACK TYPE**	#3 Monterey sand
BORING DIAMETER	10-Inch	**DRILLING CONTRACTOR**	THF Drilling
BORING DPTH	46 **WELL DPTH** 45	**DEPTH TO WATER DURING DRILLING (FT BGS)**	34.5
LOGGED BY	D. Young **CHECKED BY** S. Ridenour	**DEPTH TO WATER AFTER INSTALLATION (FT BGS)**	
REMARKS	Hand-augered upper 5 feet. PID calibrated to 50 ppm hexane.		

TIME	BLOW COUNTS	SAMPLE ID.	DEPTH (BGS)	U.S.C.S.	LITHOLOGIC DESCRIPTION	PID (ppm)
					CONCRETE; Approx 1-foot thick	
10:10	13 20 16	VE8-5	5	ML	**SILT**; Approx 85% silt, 15% clay, trace of sand; med stiff; low plasticity; very dark grayish brown (10YR 3/2); moist, no odor.	ND
10:20	4 7 9	VE8-10	10	ML	**SANDY SILT WITH GRAVEL**; Approx 50% silt, 35% fine-coarse sand, 15% fine gravel; soft-loose, low plast, dark yellowish brown (10YR 4/4); moist, no odor.	ND
10:29	5 9 15	VE8-15	15	SW-SM	**WELL-GRADED SAND WITH SILT AND GRAVEL**; Approx 75% fine-coarse sand, 15% fine gravel, 10% silt; loose; color AA; moist; no odor.	ND
10:44	5 10 12	VE8-20	20	ML	**SILT**; Approx 70% silt, 30% clay; med stiff; low plasticity; dark yellowish brown (10YR 3/6); moist; no odor.	ND
11:05	10 14 17	VE8-25	25	ML	**SILT WITH SAND**; Approx 85% silt, 15% med-coarse sand; med stiff; low plasticity; dark yellowish brown (10YR 4/4); moist; no odor.	38.6
11:20	13	VE8-30	30	ML	**SILT**; Approx 90% silt, 10% fine sand; med stiff; low	

Continued Next Page

WELL DIAGRAM: BENTONITE CHIPS; BENTONITE PELLETS; NO. 3 SAND

WELL 97707.GPJ WELL.GDT 7/9/02

Lindmark Engineering
5900 Cherry Avenue
Long Beach, CA 90805
(562) 423-0600

BORING / WELL CONSTRUCTION LOG

PROJECT NUMBER 97-707.1 **BORING/WELL NUMBER** VE8/AW6

PROJECT NAME City of Beverly Hills Maintenance Yard **DATE DRILLED** 11/01/00

Continued from Previous Page

TIME	BLOW COUNTS	SAMPLE ID.	SAMPLE DEPTH	DEPTH (BGS)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	PID (ppm)	WELL DIAGRAM
	19 20						plasticity; dark brown (10YR 3/3); moist; no odor.	ND	
11:34	5 15 20	VE8-35		35	ML		**SILT**; Approx 60% silt, 40% clay; soft; low-med plasticity; dark brown (10YR 3/3); damp; no odor.	ND	BENTONITE CHIPS
11:47	20 30 43	VE8-40		40	GM		**SILTY GRAVEL**; Approx 70% fine-coarse gravel, 20% silt, 10% sand; dense; very dark grayish brown (10YR 3/2); wet; no odor.	ND	
11:51	18 30 40	VE8-42			GM		**SILTY GRAVEL**; As above; wet; no odor.	ND	BENTONITE PELLETS
12:00	20 36 37	VE8-45		45	SM		**SILTY SAND**; Approx 75% med sand, 25% silt; dense; dark brown (10YR 3/3); wet; no odor.	ND	NO. 3 SAND

WELL 97707.GPJ WELL.GDT 7/9/02