Phase I and Phase II Environmental Investigation
Yerba Buena Project Site
Emeryville, California

October 26, 1990
1649

Volume I of IV

Prepared for:

Catellus Development Corporation
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CONSULTING ENGINEERS AND HYDROGEOLOGISTS

Letter of Transmittal

From AMANDA SPENCER Date 11/6/90

To Dennis Byrne Project No. 1649

Subject Yerba Buena

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The report is generally the same, however some revisions were made to the sections discussing the results following some informal conversations and comments from RWQCB staff.

We will see you tomorrow at 1 pm.

Sincerely,

Amanda Spencer
(Signed)

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PHASE I AND PHASE II ENVIRONMENTAL INVESTIGATION YERBA BUENA PROJECT SITE EMERYVILLE AND OAKLAND, CALIFORNIA

EXECUTIVE SUMMARY

Introduction

The Yerba Buena Project Site is an approximately 51-acre site located in Oakland and Emeryville, California (the "Site"; Figure 1). An environmental investigation was conducted by Levine·Fricke between September 1989 and May 1990 on behalf of Catellus Development Corporation (formerly Santa Fe Pacific Realty Corporation). The layout of the Yerba Buena Project Site is presented in Figure 2. As illustrated in Figure 2, the Site has been divided into three quadrants (Areas A, B, and C) to aid in the organization of the sampling and analysis program.

Scope of Work

The Environmental Investigation was conducted in two phases. Phase I of the Investigation consisted of (1) an historical review of the Site and site usage; (2) development of a sampling and analysis work plan; (3) sampling and chemical analysis of soil samples collected at areas of potential environmental concern targeted during the historical review; (4) sampling and chemical analysis of soil in non-targeted areas to characterize the general quality of shallow soil; and (5) sampling and analysis of "grab" and monitoring well ground-water samples. Phase II of the Investigation consisted of (1) conducting a soil-gas and shallow ground-water reconnaissance survey in Area A; (2) collecting

additional soil samples for lead, zinc, polychlorinated biphenyl (PCBs), and/or volatile organic compound (VOC) analysis; and (3) conducting a shallow ground-water survey in the vicinity of Phase I monitoring well LF-9. In addition, a separate work plan was developed to specifically address soil and ground-water contamination at the Ransome Company construction yard. This work plan is included as Appendix I.

Soil and ground-water sampling results have been compared to available regulatory guidelines to aid in evaluating areas of potential environmental concern. However, local and State regulatory agencies will need to be consulted to best evaluate which areas, if any, will need further investigation and/or remediation.

Geology

Subsurface materials encountered at the Site consisted predominantly of gravelly, silty clays with occasional sandy and/or gravelly interbeds (alluvial deposits). Fill sediments greater than 2 feet thick were generally not encountered at the Site, with the exception of a 4- to 5-foot elevated soil platform in Area A and gravelly clay surface fill at the Ransome Company construction yard in Area B.

Ground-Water Flow

Ground-water elevation data collected at the Site in February and April 1990 indicated a westerly to southwesterly direction of ground-water flow. Ground-water levels measured in shallow/deeper well pairs on Area A indicated a low to moderate upward vertical gradient.

Soil Quality

With the exception of a few localized areas, concentrations of compounds detected in soils at the Site would not be expected to adversely impact human health or the environment, given the current and intended use of the Site and potential beneficial uses of ground water beneath the Site.

Lead was detected in two locations (one in Area A and one in Area C) at concentrations greater than 1,000 ppm. Additional sampling in these two areas during Phase II of the Investigation suggests that soils containing elevated lead concentrations are limited in lateral and vertical extent (i.e., to areas of less than 20 feet by 20 feet). However, additional sampling and analysis is necessary to further evaluate the volume of lead-affected soil in Area A. Lead was not detected in ground-water samples collected in the vicinity of these two locations. Elevated concentrations of zinc also were detected in soils at one of the two locations, but the affected area is also of apparently limited extent (approximately 10 feet by 10 feet).

Total petroleum hydrocarbons (TPH) as gasoline (up to 3,900 ppm) and diesel (660 ppm) were detected in soil samples collected from the Ransome Company construction yard in Area B. Benzene (up to 100 ppm), toluene (up to 240 ppm), xylenes (up to 1,000 ppm), and ethylbenzene (up to 300 ppm) were also detected in soil at the Ransome Company construction yard in Area B.

Heavy fraction TPH (in the range of oil) were detected in 39 of 101 samples collected and analyzed for this compound. Concentrations were generally below 500 ppm; however, concentrations greater than 5,000 ppm were detected in shallow soil samples (depths of 4.5 feet or less) collected from two locations at the Site in Area A. These two locations may require additional investigation and possible remediation. Samples

collected from six additional locations in Areas A, B, and C contained TPH as oil at concentrations between 1,000 and 5,000 ppm. These areas may also require additional investigation and possible remediation.

Concentrations (up to 1 ppm) of pyrene and VOCs detected in soils in Areas A and C, and herbicides detected in Areas A, B, and C were below currently available regulatory cleanup level guidelines for these compounds. PCBs were detected in near-surface soils at low concentrations (up to 7.5 ppm) at, or in the vicinity of, one Phase I sampling location in Area A and two locations in Area B. Decisions regarding remediation will be based on soil cleanup guidelines as well as possible impacts on ground water.

Asbestos, chlorinated pesticides and semi-volatile organic compounds [SVOCs] (excluding PCBs and pyrene) were not detected in soil samples collected at the Site.

Ground-Water Quality

Twenty-five monitoring well and grab ground-water samples were collected at the Site during Phase I of the Investigation and analyzed for SVOCs, 13 heavy metals, VOCs, and TPH (as gasoline and diesel/oil). Six additional monitoring well samples were collected and analyzed for VOCs during Phase II of the Investigation.

SVOCs were not detected in ground-water samples collected from the Site.

With the exception of lead detected in one sample, metal concentrations detected in ground-water samples were below laboratory detection limits, or below Maximum Contaminant Levels (MCLs) or State (DHS) Action Levels for drinking water. The lead

concentration in one grab ground-water sample was detected at the State MCL (0.050 ppm). Metal concentrations detected in ground water were also generally below ambient surface-water quality standards provided in the RWQCB Water Quality Control Plan for the San Francisco Bay Basin, and provided by the EPA to protect salt-water aquatic life. Concentrations exceeded ambient surface-water quality standards for lead in one grab ground-water sample and for copper in five ground-water samples.

Due to attenuation and the dilution expected upon discharge of ground water into the San Francisco Bay, these concentrations are not likely to adversely impact ambient surface-water quality.

One or more VOCs were detected in the samples collected from eight Phase I monitoring wells (LF-4, LF-5, LF-6, LF-8, LF-9, LF-10, LF-11, and LF-12). VOCs were not detected in samples collected from the remaining wells (LF-1, LF-2, LF-3, LF-7, and LF-16).

The compound 1,1-dichloroethane (1,1-DCA) was detected in several locations in Area B and in monitoring wells LF-6 and LF-8 at concentrations up to 0.021 ppm. These concentrations are slightly above DHS Action Levels for drinking water. Well LF-8 also contained low concentrations (0.015 ppm or less) of 1,1,1-trichloroethane (1,1,1-TCA), and 1,1-dichloroethene (1,1-DCE). The concentrations of 1,1,1-TCA and 1,1-DCE are below the current State Maximum Contaminant Levels for drinking water for these compounds.

Concentrations of 1,1-DCE, 1,1,1-TCA, and 1,1-DCA (up to 0.73 ppm) in excess of drinking water standards or action levels were detected in wells LF-4 and LF-5 located in Area A. The lateral extent of these compounds in the vicinity of these wells was characterized during Phase II of the investigation. Laterally, the plume was found to extend approximately 800 to 1,200 feet

southwest of well LF-5, and 250 to 300 feet northeast of well LF-5, in a band approximately 200 to 250 feet wide. These compounds were not detected in samples from Phase II deeper well LF-5D, but were detected in deeper well LF-4D at concentrations similar to the concentrations detected in well LF-4. Additional investigations of deeper ground-water zones may be required in the vicinity of LF-4D. A slight upward vertical ground-water gradient was measured in the location of wells LF-5D and LF-5, which would be expected to limit downward vertical migration to deeper ground-water zones of the compounds detected.

Several VOCs were detected in well LF-10, located on the upgradient (northern) boundary of Area C (notably, up to 7.6 ppm of TCE). Some of the same compounds were also detected in wells LF-12, LF-11, and LF-9, in a grab sample collected at C29 (also located along the northern boundary of Area C), and in a grab sample collected from C15, located near the center of Area C. Additional file and background review is currently being conducted to better assess and/or locate a potential off-site source for these compounds, and to better document the absence of an on-site source.

TPH as gasoline (up to 20 ppm), diesel (up to 12 ppm), and oil (up to 7.8 ppm) were detected in grab ground-water samples collected from the Ransome Company construction yard in Area B. Benzene (3.0 ppm), toluene (2.2 ppm), xylene (3.3 ppm), and ethylbenzene (0.73 ppm) were also detected in one shallow grab ground-water sample at the Ransome Company construction yard.

Perched Ground Water Near Well LF-9

Perched ground water with an oily sheen and strong fuel odor was detected during Phase I of the Investigation in shallow sediments (less than 3 feet deep) near well LF-9. A grab ground-water sample collected from this zone during Phase I was characterized

as containing TPH resembling oil and Stoddard solvent. The extent and type of hydrocarbons detected in the perched water were then more fully characterized during Phase II of the Investigation. According to Phase II fuel characterization results, the petroleum hydrocarbons consisted of a mixture of hydrocarbons resembling mineral spirits, polynuclear aromatic compounds, phenols, and fatty acids. Analytical results of a sample collected from LF-9, which was screened below the perched zone, indicated that ground water underlying the perched water has been only marginally impacted by the presence of the petroleum hydrocarbons in the perched zone (the sample contained 0.5 ppm TPH as oil). The hydrocarbons appear to be limited to the railroad track area, and extend approximately 30 feet west of well LF-9. As the eastern and northern (upgradient) extent of the petroleum hydrocarbons could not be characterized within the boundaries of the Site, it is possible that the hydrocarbons are from an upgradient, off-site source.

Conclusions and Recommendations

Based on the results of the Phase I and II Investigations, and current regulatory guidelines, soil cleanup may be required in the two areas with soil containing elevated lead and/or zinc concentrations, and near well LF-9 to remediate petroleum-impacted shallow soils and perched ground water. Further investigation of the northerly and easterly extents of petroleum-affected perched ground water in the vicinity of well LF-9 and remediation of affected soil and ground water, and further investigation of the vertical and lateral extents of lead-affected soils in Area A is recommended. It is also recommended that in other localized areas where shallow soils have been affected by PCBs, lead, and/or TPH, steps should be taken to mitigate soil erosion, such as paving or covering the

area with buildings, and/or landscaping. Such action would minimize potential concerns regarding possible impacts on fish and wildlife resulting from migration of these compounds found in near-surface soils through storm water runoff.

Additional investigation and remediation of soil in the two areas containing greater than 5,000 ppm TPH as oil in soil and six areas containing between 1,000 and 5,000 ppm of TPH as oil will likely be required. Due to the very low mobility of oil in soils, the presence of silty clays to aid in mitigating migration, and the shallow and apparently limited extent of TPH as oil in soils, soils containing less than 1,000 ppm petroleum hydrocarbons do not appear to be of environmental concern at the present time. With the exception of the Ransome Company construction yard and perched ground water at LF-9, TPH was generally not detected or detected at low concentrations (less than 1 ppm) in ground-water sampling locations throughout the Site, indicating that the presence of TPH in shallow soils has had little or no impact on shallow ground-water quality. Of note, TPH was not detected in a ground-water sample collected from monitoring well LF-5, where 14,000 ppm of TPH as oil was detected in soil at a depth of 4.5 feet. Continued monitoring of this well is recommended to detect changes in ground-water quality at this location.

Concentrations of gasoline, diesel, benzene, toluene, xylenes, and ethylbenzene were detected in soil and/or ground-water samples collected from the former Ransome Company construction yard in Area B at levels that will require further investigation and likely remediation. Specific recommendations concerning the need for further investigation and remediation of this area are included in Appendix I. With the exception of TPH concentrations detected in ground water at the Ransome site and in perched ground water at LF-9, the concentrations of TPH and metals detected in ground water do not appear to represent a

significant environmental concern. Concentrations of VOCs, metals, and TPH found in ground water beneath the Site would not be expected to adversely affect surface-water quality via ground-water discharge.

Concentrations of the VOC 1,1-DCA slightly in excess of DHS Action Levels for drinking water were detected in several locations in Area B and in monitoring wells LF-6 and LF-8. Concentrations of 1,1-DCE, 1,1,1-TCA, and 1,1-DCA in excess of DHS drinking water standards or action levels were found in wells LF-4 and LF-5 in Area A. Several VOCs, most notably TCE, 1,2-DCE, and vinyl chloride, were detected at concentrations exceeding drinking water standards or action levels in well LF-10, and in some other ground-water sampling locations in Area C.

Based on DHS statements with regard to the nearby Electro Coating site, shallow ground water in the vicinity of the Site is not used for drinking water due to the presence of salt-water intrusion. Drinking water standards may therefore be overly conservative measures of water quality in this area. However, it is possible that shallow and deeper ground water may be used in the future as a drinking water source, and that the provisions of the Safe Drinking Water Act of 1986 (Proposition 65) may apply to this Site. Further discussions with the RWQCB, DHS, and/or the Alameda County Health Services Agency are required to establish the appropriate water-quality standards for VOCs detected in ground water beneath this Site.

There appear to be at least three separate sources for the chlorinated VOCs detected in ground water in Areas A, B, and C. The concentrations of 1,1-DCA detected in Area B appear to have originated at the Ransome Company construction yard. The source of VOCs detected in ground water in Area C (notably TCE, 1,2-DCE, and vinyl chloride) appears most likely to be located off site to

the north. A possible source is the Electro Coatings facility, a State Superfund site, located approximately 450 feet northeast (and upgradient) of well LF-10. High concentrations of similar compounds have been reported in ground water at the Electro Coatings site. The area north of Area C has historically been heavily industrialized, and, as a result, a number of potential sources of the VOCs may exist in the area. Periodic monitoring of well LF-10 may be warranted to observe ground-water quality trends in this area. If no confirmatory information is obtained through further records review, additional soil and ground-water sampling in the vicinity of well LF-10 may be prudent to document the absence of an on-site source of VOCs.

The source of concentrations of VOCs (notably 1,1-DCE and 1,1,1-TCA) detected in ground water in Area A appears to be in the vicinity of the former LDS warehouse, to the northeast of LF-5 (Figure 14). Based on informal discussions with RWQCB staff, additional soil and ground-water investigation of the area to the northeast of LF-5 is recommended to further attempt to locate a source of these compounds. Additionally, monitoring of deeper ground-water zones in the vicinity of LF-4D would be required to complete the investigation of the vertical extent of VOCs in that area. Continued periodic ground-water monitoring of VOC-affected wells in Area A is recommended to monitor possible changes in concentrations of VOCs in the ground water. If VOCs are found to increase during periodic monitoring, further action may be required.

The relatively low concentrations of pyrene, VOCs, and herbicides detected in some shallow soil samples collected from the Site do not appear to present a threat to human health or the environment. However, based on informal discussions with RWQCB staff, collection and analysis of ground-water samples from

existing wells in the vicinity of the railroad tracks where herbicides were detected in soil may be warranted to document that ground-water quality has not been affected by these compounds.

1.0 INTRODUCTION

This report presents the results of the Phase I and Phase II Environmental Investigation of an approximately 51-acre property located in Emeryville and Oakland, California (the "Site"; Figure 1). This investigation was performed by Levine·Fricke on behalf of Catellus Development Corporation (Catellus), formerly Santa Fe Pacific Realty Corporation (SFPRC).

Figure 2 presents the layout of the Yerba Buena Site. As shown in the figure, the Site was divided into three quadrants, Areas A, B, and C, to aid in organizing the sampling and analysis program conducted at the Site.

2.0 PHYSICAL CHARACTERISTICS OF THE SITE

The Site consists of approximately 51 acres, including the Yerba Buena right-of-way which crosses the central portion of Site from east to west (Figure 2). It is bounded by San Pablo Avenue and Peralta Street to the east, an elevated portion of Interstate 580 to the south, Beach Street to the west, and an Atchison, Topeka & Santa Fe Railway easement to the north (Figure 1). The Site excludes the areas occupied by the Markstein Beverage Company and the Oakland Terminal Railway, as indicated on Figure 2.

The land surface in the vicinity of the Site slopes very gently to the west and southwest at approximately 55 feet per mile. The mean sea level (msl) elevation across the Site ranges from approximately 5 feet msl at the western end of the Site to approximately 40 feet msl at the eastern end.

The Site is located approximately one-half mile east of San Francisco Bay. The region around the Site is occupied by commercial and industrial businesses to the north, west, and east, and Interstate 580 and residential housing to the south.

3.0 PHASE I AND PHASE II OF THE INVESTIGATION - OBJECTIVES AND SCOPES OF WORK

3.1 Objectives

The objectives of the two phases of Environmental Investigation were to identify potential sources and releases of hazardous substances that may have affected site soil and ground-water quality, and to assess the presence and distribution of suspected compounds in on-site soil and ground water. The results of the background review obtained during Phase I of the Investigation (contained in Appendix A and summarized in Sections 4.1 and 4.2) were used as the basis for selecting sampling locations, sampling methods, depth intervals, and chemical analyses for both Phase I and Phase II of the Investigation.

3.2 Scopes of Work

Phase I of the Investigation consisted of the following:

- A review of background information concerning the Site to identify potential sources and releases of hazardous substances that may have impacted soil and/or ground-water quality at the Site.

- Development of a sampling and chemical analysis work plan (Levine·Fricke, December 10, 1989).

- Targeted sampling of soil at locations where sources or releases of hazardous substances were suspected, based upon the review of background information.

- Sampling of soil in non-targeted locations to characterize the general quality of shallow soil.

- Sampling of ground water at locations along the upgradient northern boundary of the Site, and downgradient from potential on-site chemical source areas.

- Field screening and laboratory chemical analysis of soil and ground-water samples collected for suspected compounds, including polynuclear aromatic compounds (PNAs), polychlorinated biphenyls (PCBs), metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), and herbicides.

- Data evaluation and preparation of this report.

Phase II of the Investigation focused on further evaluating the vertical and lateral extent of hazardous substances identified in soil and ground water during Phase I field investigation. The scope of work for Phase II of the Investigation included the following:

- A soil-gas and shallow ground-water reconnaissance survey in Area A.

- Collection of additional soil samples in Area A for VOC analysis.

- Installation and sampling of additional shallow monitoring wells and two deeper monitoring wells in Area A.

- Collection of additional soil samples in Areas A, B, and C to assess the extent of lead, zinc, and/or polychlorinated biphenyl (PCBs) in the shallow soil where these compounds were detected during Phase I.

- Chemical analysis of soil and ground-water samples collected through the above steps for VOCs, SVOCs, and TPH.

- Installation of a series of shallow temporary wells in the vicinity of well LF-9 to assess the thickness and lateral extent of floating petroleum product found in this well.

- Data evaluation and preparation of this report.

The activities conducted and the results obtained during each phase of the Investigation are discussed in the following sections. Analytical results of soil and ground-water samples were compared to currently available regulatory guidelines to aid in evaluating areas of potential environmental concern. These comparisons are intended only as guidelines by which areas of environmental concern may be identified. Local and State regulatory agencies should be consulted to better evaluate areas of concern, and to establish site-specific cleanup levels.

4.0 PHASE I OF THE ENVIRONMENTAL INVESTIGATION

Information concerning the recent and historical usage of the Site was obtained through a review of previous investigations of the Site (Kaldveer Associates: January 1989, February 1989, and April 1989); review of selected aerial photographs (dating from 1936, 1949, 1953, 1957, 1959, 1969, 1979, and 1988); review of available Sanborn Fire Insurance Maps (dating from 1911, 1912, 1930, 1931, 1940, 1951, 1956, and 1964); review of selected City Directories (dating from 1967, 1974, 1978, 1983, and 1986); a walk-through and drive-by inspection of the Site and immediate site vicinity (conducted during September 1989); and interviews with tenants at the Site. A detailed report of the findings of the site inspection and review of Sanborn maps is presented in Appendix A.

Levine·Fricke also reviewed information in City of Emeryville Fire Department files concerning the tenants at the Site. Other information from regulatory agencies concerning the Site and site vicinity was contained in reports prepared by Kaldveer Associates (see References). A summary of findings from the review of the above-listed sources is presented in the following section.

4.1 Recent Site Usage

Area A

An approximately 60,000-square-foot warehouse was located in the eastern portion of Area A and leased by the Clipper Exxpress Company (Clipper) from SFPRC (now Catellus). This building was demolished by SFPRC in June 1990 in preparation for future site development. Clipper had reportedly occupied the building since its construction about 20 years ago. The Clipper site also contains a 10,000-gallon capacity underground diesel fuel storage tank that reportedly had not been in service for at least a year

(personal communication, William Biggs, Operations Manager of Clipper Exxpress, September 1989). According to Mr. Biggs, the tank had passed a leak test prior to being removed from-service. Hazardous materials, including oxides, acid rinse, and chlorinated alkaline cleaner, were observed stored in 5-gallon cans and 55-gallon drums at the warehouse at the time of the inspection, along with other packaged merchandise. Reportedly, materials are stored only a short time at the warehouse before being shipped out (personal communication, William Biggs, September 1989).

The western portion of Area A consists of a vacant, unpaved yard that has been used by Santa Fe Terminal Services for storage of empty semi-truck trailers.

Area B

The southern portion of Area B, along Yerba Buena Avenue, contained an approximately 51,000-square-foot warehouse building that was most recently leased by LDS Truck Lines. This building was demolished by SFPRC in April 1990 in preparation for site development. An area directly outside the western end of the former building was noted during the September 1989 site inspection to be heavily stained with a white residue and some oil, and a concrete pad possibly overlying an underground tank(s) was observed in this area (Figure 2). A small shed, possibly a former chemical storage area, was observed adjacent to the western end of the building.

The area north of the former LDS building was used by Santa Fe Terminal Services for storage and transfer of truck freight. The northwestern portion of Area B has been occupied by the Ransome Company, a construction firm and former asphalt batch plant, for more than 50 years. The Ransome Company construction yard contained seven structures, including an office, a

machine/maintenance shop, four sheds (including an oil storage shed), a steam-cleaning shed, and a lavatory. The buildings were demolished in June 1990. The Ransome Company construction yard also contained a largely unpaved area used for storage of equipment and materials. Four underground fuel storage tanks (one 1,000-gallon capacity unleaded gasoline, one 10,000-gallon capacity regular gasoline, and two 4,000-gallon capacity diesel tanks), one waste oil tank that was partially underground, and an above-ground SS-1 tank (liquid asphalt oil) were located on this site. The underground tanks were removed in December 1989, and petroleum hydrocarbon staining of the underlying soil was observed (Figure 3). Oil stains on soil and site surfaces were observed throughout the Site, especially in the machine shop, in the vicinity of the oil storage shed, near the waste oil tank, and near the SS-1 tank. A pile of soil and asphalt debris was also located along the northern fence line.

Area C

The northeastern quarter of Area C currently contains two buildings: an approximately 79,000-square-foot warehouse, most recently leased by the Bay Area Warehouse Company; and an approximately 31,000-square-foot building on property owned and occupied by the Bashland Company, a construction company.

According to Mr. Charles Wellnitz, president of the Bay Area Warehouse Company, mostly dry goods and limited quantities of hazardous materials (including oxides and acids) have been stored in the Bay Area Warehouse building. Drums labeled as containing hazardous materials were observed in several locations inside the building; no evidence of leakage or spillage from the drums was observed. The Bay Area Warehouse Company site also contains an underground fuel storage tank, which was permitted for use by the

Alameda County Health Care Services Agency in March 1988 (Figure 3). Staining was observed on the asphalt along the eastern fence line of the Site during the site inspection.

The Bashland property contains three underground storage tanks that reportedly were formerly used to store fuel and possibly lube oil. The tanks reportedly were not in use by Bashland, and were on site at the time Bashland purchased the property in 1984 from SFPRC (personal communication with Roger Bashland, February 1990). Locations of the tanks are shown on Figure 3.

The area directly south of the Bay Area Warehouse Company and the Bashland property is currently an asphalt-paved parking area used for parking semi-truck trailers.

The western portion of Area C contains an approximately 85,000-square-foot "U"-shaped building leased by M & N Truck Lines, who used the building as a warehouse. A portion of the yard area of the M & N site has been subleased to ARC Roofing, an asphalt roofing company. In various portions of the warehouse, M & N stored reportable quantities of a variety of hazardous materials, including acids, aromatic compounds, metal compounds, ketones, and other substances. A listing of the hazardous materials inventory for the Site is included in Appendix A. An historical map of the site provided by Ms. Sarah Sharpe of M & N Truck Lines indicated the possible location of a 550-gallon capacity underground tank directly north of the southern "leg" of the warehouse (Figure 3).

Yerba Buena Right-of-Way

The eastern half of the Yerba Buena easement is a paved public roadway, Yerba Buena Avenue. The western half of the easement contains tracks for the Atchison, Topeka & Santa Fe Railroad and former Key Route electric rail system. Dumping of debris

materials, including debris fill and trash, and oily stains on the railroad tracks were noted at various locations in the western area.

4.2 Drive-by Inspection

A drive-by inspection of the Site was conducted in September 1989. The area south of the Site (beyond the elevated portion of Interstate 580 which bounds the Site to the south) was primarily residential, with some small commercial buildings. Beach Street bounds the Site to the west. Across Beach Street, a vacant lot and commercial and industrial buildings separate the Site from Interstate 580 where it loops around from the south to west of the Site. North and east of the Site, industrial manufacturing, commercial and warehouse building were observed.

The area north of Area C was noted to be primarily industrial. Several auto repair shops were observed in this area. Fifty-five-gallon drums (markings or labeling on the drums were not visible) were observed in the yards of several of the businesses, located directly adjacent to the Site, and at locations within one-quarter mile of the Site. What appeared to be two ground-water monitoring wells were observed on Holden Street (Figure 3), approximately 300 feet north of the Bay Area Warehouse Company.

An auto repair yard was also observed north of the Ransome Company construction yard (Figure 3). East of this auto repair yard is the Bessler Building, which currently houses artists' studios. Primarily commercial and small business buildings were observed along San Pablo Avenue, which bounds the Site to the east. Several gasoline stations were observed within one-half mile of the Site.

4.3 Historical Site Usage

This section discusses historical features at the Site, shown on Figure 3.

Area A

From at least 1911 to 1951, Area A was the site of railcar repair and maintenance shops associated with the Oakland Traction Company, the Key System Limited, the Key System Transit Lines, and the East Bay Transit Company. During this period, Area A contained a number of buildings that housed a variety of operations, including foundries, car repair and painting, paint and oil storage, a blacksmith shop and engine room, auto and bus repair, and a sheet metal workshop. The eastern portion of Area A was occupied in 1931 and 1940 by an auto storage and wrecking yard, a printing shop, and a hay and grain warehouse. The printing shop also was indicated on the 1951 Sanborn map.

Aerial photographs verify the existence in 1936, 1947, 1949, and 1953 of the buildings associated with the car repair shops. The eastern portion of Area A contained a yard with a parking lot and a circular course of rail track, and a small building along the eastern site boundary. In 1957, a circular-shaped area which appeared to contain disturbed soil was located in the center of the eastern portion of Area A. By 1959, all the buildings in Area A had been demolished, and demolition debris appeared scattered throughout the area. Trailer trucks were parked in the southeastern portion of Area A. The location of the circular feature noted in the 1957 photograph still appeared disturbed at the time of the 1959 photograph. In the 1969 photograph, a new building, the Clipper Exxpress warehouse, had been constructed at the Site, and the western portion of Area A was vacant. As indicated above, the building was reportedly constructed for occupancy by Clipper, and they have been the sole tenants.

By 1979, the western portion of Area A had been graded and was being used for truck trailer storage. The usage of Area A appeared essentially the same in the 1983 and 1988 photographs.

The approximate locations of historical buildings and areas where soil or pavement appeared in aerial photographs to be stained are indicated on Figure 3.

Area B

The southeastern portion of Area B served as a freight depot and passenger station for the Atchison, Topeka & Santa Fe Railroad from 1904 to the 1940s. In 1949 and 1951, the Republic Car Loading and Distributing company was a lessee of the freight terminal. The building appears to have been occupied by rail and truck freight companies throughout its history. A listing of possible occupants of the building, based on City Directories, is provided in Table 1.

The northwestern portion of Area B was used as a Western Electric Company yard in 1911, and was occupied by the Hutchison Company, an asphalt batch plant, in 1930. An electric company old pole yard was also noted in this area in 1930. The Ransome Company reportedly occupied this area from about 1938 to May 1990. Ransome's historical operations reportedly included asphalt concrete mixing, metal working, auto repair, and assembly of torch and burner equipment. An incinerator was noted in this area on the 1956 and 1964 Sanborn maps. A firm called Label Concepts, reportedly a printing company, occupied a portion of this area in 1983. Spray painting and paint thinner storage reportedly took place at the Ransome Company construction yard (Kennedy/Jenks/Chilton, November 1989).

Historical practices which reportedly occurred at the Ransome Company construction yard and which may have impacted site soil and ground-water quality include: draining oil onto the ground surface behind the oil storage shed; spraying SS-1 onto debris soil and onto the back of material delivery trucks; applying waste oil along the fence line as an herbicide; and discharging oil, grease and other materials into storm sewers at the Site (Kennedy/Jenks/Chilton, November 1989).

Activities on the northeastern and central portions of Area B have historically included rail switching and trailer truck storage.

Review of an aerial photograph taken in 1936 indicated the presence of the asphalt batch plant in the northwestern portion of Area B, and the railroad terminus in the southern portion. Rail tracks are prominent through the center of Area B. In later photographs, staining was apparent along the railroad tracks in the eastern half of Area B. By 1969, the freight terminal building was expanded to the west and east, and truck trailers were parked south of the building. Trailers were parked north and south of the building in 1973. On the Ransome Company construction yard, heavy staining can be seen south of the oil storage shed and in the central and eastern portions of the yard in the 1969, 1973, and 1979 photographs, and heavy staining was apparent along the railroad tracks directly north of the easternmost tip of the Ransome Company construction yard. In 1979, trash and staining appeared directly outside the western end of the former freight building. Most of the historical structures in the center of the Ransome Company construction yard (the asphalt batch plant) were demolished by 1988. The locations of historical structures and stained areas noted above, and others observed in the aerial photographs reviewed, are shown on Figure 3.

Area C

The Bay Area Warehouse Company building was occupied in 1911 by the Western Electric Company. At that time, the Bashland property was used as a yard area that contained a small shop building. The area south of the Bay Area Warehouse Company was the American Fuel Company yard, and was used for coal storage.

In 1930, the Bay Area Warehouse Company building was occupied by the Furniture Corporation of America, and site operations included spray painting, finishing, and paint storage. The original building was expanded and in 1951 was occupied by an oil house, a truck washing facility, an auto warehouse and service shop, a dried fruit warehouse, and beer warehouse. An incinerator was located northwest of the building at this time. In 1964, the western end of the building housed a metal shelving warehouse, and the remainder of the building was occupied by Bay Cities Warehouse. Later tenants included a vending machine manufacturer, two chemical companies, and a rubber manufacturing company. Tenants, as listed in the Haines City Directories, are presented in Table 1. According to Mr. Charles Wellnitz, the chemical and rubber manufacturing companies used the portions of the building they occupied for warehousing of materials, not for manufacturing. Bagged materials were reportedly transported to the warehouse by rail, and drummed and bulk materials were delivered by truck (personal communication, Charles Wellnitz, June 1990.)

The Bashland property was occupied in 1957 by the Santa Fe Transportation Company Bus and Truck Service Garage. The three underground tanks located on this property were used by the garage. According to a drawing of the Bashland property prepared by the Atchison, Topeka & Santa Fe Railway Company and dated April 7, 1957, the three tanks consisted of one 12,000-gallon gasoline storage tank, one 12,000-gallon diesel tank, and one

1,200-gallon lube oil tank. Santa Fe Transportation is listed as the occupant at the Bashland address in the Haines City Directories dated 1978 and 1983. Bashland, Inc., is the listed occupant in 1986.

The M & N Warehouse building was occupied in 1911 by the Griffen & Skelly Company Fruit Cannery. At that time, this area contained eight private wells and an oil tank, and was used for chemical storage. The California Packing Corporation appears to have occupied the Site from at least 1930 to the early 1950s. The building was used as a warehouse in 1956 and 1964. Notations on Sanborn Fire Insurance Maps reviewed indicated that chemicals and paints were stored at the Site during the period from 1930 to 1964. No occupant listings were found for this building in the City Directories reviewed.

The warehouses in the eastern and western portions of Area C were present in the 1936 and 1947 photographs. Aerial photographs indicated that the triangular area formed by railroad tracks between the M & N and Bay Area Warehouse buildings was used for parking in 1949. In 1953, more than 75 drums appeared to be stored east of the northernmost "leg" of the "U"-shaped M & N building. In the 1957, 1959, and 1969 photographs, the triangular area between the tracks was covered with debris and/or stored materials. The area within the "U" of the M & N building appeared heavily stained in 1979 photographs, and considerable debris or materials were disposed/stored east of each "leg" of the "U."

Stained and debris-covered areas observed in the aerial photographs are shown in Figure 3.

4.4 Identification of Areas of Potential Environmental Concern and Development of the Sampling and Analysis Plan

Based on the background review of the site history and the site inspection, a number of areas of potential environmental concern were identified at the Site which may have impacted soil or ground-water quality. These sources of potential environmental concern are listed in Table 2, and some of the more notable sources are indicated on Figure 3.

A soil and shallow ground-water sampling and analysis plan was developed to collect soil samples at targeted locations where sources of hazardous substances were suspected, based on the review of background information (Levine·Fricke, December 1989). Additional sampling in non-targeted locations was included in the plan to characterize the general quality of shallow soil in the site vicinity. Sampling of ground water in locations along the upgradient boundary of the Site and in areas downgradient of potential source areas was also incorporated.

The following sections discuss the activities conducted during soil and ground-water sampling.

4.5 Soil Sampling and Chemical Analyses

The locations, depths, and methods of soil sample collection, and the EPA Methods used for analysis of soil samples collected during Phase I of the Investigation are summarized briefly below. Detailed field procedures used in the Investigation are discussed in Appendix B.

4.5.1 SAMPLING LOCATIONS

Soil samples were collected for laboratory analysis from 103 locations at the Site, including the 13 locations where

monitoring wells were installed. Figure 4 presents the Phase I field investigation soil sampling locations at the Site.

Approximately 90 percent of the soil sampling locations were targeted for installation in the suspected or known and accessible locations of potential sources of chemical compounds, as indicated from the background review and walk-through inspection of the Site. A statistical analysis was performed to evaluate the minimum spacing of sampling locations to detect, with a reasonable degree of confidence, potential large-scale occurrence of hazardous substances at the Site in areas not targeted as source areas. A more detailed discussion of the statistical method used is contained in Appendix B. The results of this analysis indicated that a sample spacing of 150 feet would be appropriate for this purpose. Additional sampling locations were selected in accessible areas in which targeted sampling locations were spaced at greater than 150-foot intervals to achieve an approximately 150-foot spacing interval throughout the Site.

Samples were identified by the sample location, sample depth, and depth interval. For example, the sample designation of "C17(2)A" indicates that the sample was collected from location C17 at a depth of 2 feet from the "A" sampling interval.

4.5.2 SAMPLING DEPTHS

Table 3 summarizes the depth intervals of soil samples collected at the Site at each sampling location. Also included in the table are the chemical analyses performed on each sample.

Because the results of the background review indicated that the extent of fill at the Site is shallow and that the fill is generally underlain by clayey sediments with expected low permeability, vertical migration of chemical compounds introduced

at or near the site surface was anticipated to be limited. Therefore, soil sampling was focused on identifying the presence of suspected chemicals in shallow sediments to assess the impacts of potential surface sources. Where fill was observed to be present at the Site, samples were collected from the fill and at the fill-clay interface. In locations where fill was not observed to be present, samples were collected from the surface (0 to 1 foot) and slightly deeper (3 to 5 feet).

In those areas where subsurface (deeper) sources of chemicals were suspected (e.g., the former and present underground storage tank locations), deeper borings were drilled, and soil samples were collected from sediments slightly above the ground-water level. Samples of soil from slightly above the ground-water level were also collected in areas where surface sources of more mobile compounds, such as VOCs, or high concentrations of less mobile compounds, such as metals or polynuclear aromatics (PNAs), were suspected. These samples were held by the laboratory pending the results of analyses of soils collected from shallower depths. At selected locations, these borings were drilled to a final depth below the ground-water level, and grab ground-water samples were collected for chemical analysis to assess shallow ground-water quality. (It should be noted that, due to the sampling procedures for grab ground-water sampling, analysis results are qualitative.)

Samples were collected at one or more of the following intervals, as indicated on Table 3: surface (0 to 0.5 foot below grade, or below the asphalt/concrete paving and subgrade); fill at the fill/clay interface, (2 to 4 feet below grade - if fill was not

present, then a sample was collected between 3 and 5 feet below grade); and the saturated soil at the ground-water interface (6 to 13 feet below grade).

4.5.3 SAMPLING METHODS

Samples were collected using one of three methods excavation of test pits with a backhoe; hollow-stem auger drilling equipment to advance soil borings; or hand-augering. A detailed discussion of the field procedures used for sample collection is presented in Appendix B. All work was performed by or under the direction of a Levine·Fricke geologist.

4.5.4 ANALYSES METHODS

Soil samples collected during Phase I of the Investigation were transported for chemical analysis to Med-Tox Associates of Pleasant Hill, California, a State-certified laboratory. The laboratory analyses performed on samples collected from each soil sampling location are indicated in Table 3.

Soil samples collected from targeted sampling locations were submitted for the following chemical analyses for the compounds suspected at each location. These analyses included one or more of the following: VOCs using EPA Method 8240; SVOCs using EPA Methods 8270, 8080 or 8100; metals using EPA Method Series 7000; TPH using EPA Method 8015 and/or Total Oil and Grease (TOG) using EPA Method 503E; asbestos using polarized light microscopy (PLM); chlorinated herbicides using EPA Method 8150; pentachlorophenol (PCP; a wood preservative) using EPA Method 8040; and pH (for caustic compounds). Samples collected from non-targeted locations were analyzed for a broad range of chemical compounds, consisting of VOCs, SVOCs, TPH, and metals, using the analysis methods indicated above.

The work plan for the Phase I field investigation had proposed the use of two field screening techniques to provide more soil quality information at little additional cost. The techniques were thin layer chromatography (TLC) for screening of samples for

PNAs and PCBs, and the use of an organic vapor analyzer (OVA) for VOCs. However, based on preliminary field trials, the screening of soil samples for PNAs and PCBs using the TLC method did not appear to be as reliable as anticipated. Therefore, this method was not used and, in its place, additional samples were analyzed for PCB and PNAs by the analytical laboratory. For samples screened using the OVA, follow-up laboratory analysis was performed to confirm the presence of suspected compounds where the screening method had indicated positive results, and approximately 25 percent of the samples with non-detected field-screened concentrations were analyzed by the laboratory for verification and quality assurance.

4.6 Monitoring Well Installation and Ground-Water Sampling and Analyses

Activities conducted during the installation of ground-water monitoring wells, well development, and well sampling, and the corresponding EPA Methods used for analyses of ground-water samples collected during Phase I of the Investigation are summarized briefly below. Detailed field procedures used in the investigation are discussed in Appendix B.

4.6.1 MONITORING WELL INSTALLATION

A total of 13 Phase I ground-water monitoring wells were installed at the Site in locations along the property boundaries and downgradient of potential sources of hazardous substances identified during the background review to assess the quality of ground water migrating onto and off of the Site. The wells were installed in stages, with five wells installed and surveyed initially to assess the direction of ground-water flow at the Site. The originally proposed well locations were then adjusted for the remaining wells to more accurately locate wells in downgradient positions, where appropriate.

Five wells were located along the assumed upgradient (northern) property boundary (with respect to the reported ground-water flow direction identified during the background review of the Site), and the remainder of the wells were located in the downgradient direction of potential source areas on the Site.

Monitoring well locations are shown on Figure 4. Table 4 contains a summary of monitoring well construction details and ground-water elevation measurements collected at each well. Procedures used during drilling, installation, and development of the wells are discussed in Appendix B. Graphic illustration and lithologic description of sediments encountered in the well borings are shown in Figures C1 through C13 of Appendix C.

Following installation, well elevations were surveyed to the nearest 0.01 foot relative to MSL by a State-licensed surveyor.

4.6.2 MONITORING WELL DEVELOPMENT AND SAMPLING

Each of the 13 Phase I monitoring wells was developed within one to two weeks following installation. Well development and sampling procedures are presented in Appendix B. Table 5 presents a summary of water-quality parameters collected during development and sampling of the wells.

4.6.3 ANALYSES METHODS

Ground-water samples collected during Phase I of the Investigation were transported for chemical analysis to Med-Tox Associates of Pleasant Hill, California, a State-certified laboratory. The laboratory analyses performed on samples collected from each ground-water sampling location are indicated in Table 3.

Ground-water samples were analyzed by the laboratory for VOCs, SVOCs, TPH, and metals using EPA Methods 8240, 8270, 8015, and the 7000 Series, respectively. Duplicate analyses were performed on 10 percent of the ground-water samples collected during monitoring well sampling for quality assurance/quality control purposes.

5.0 SITE GEOLOGY

The geologic setting of the Site is represented by geologic data collected from 88 on-site soil borings and 19 monitoring well borings (including Phase II investigation monitoring wells) at the locations illustrated on Figure 4. Locations of geologic cross-sections are also shown in Figure 4. Geologic cross-sections A-A', B-B', and C-C' are presented in Figures 5, 6, and 7, respectively. Lithologic data collected during installation of the Phase II monitoring wells are also included on these figures. Soil boring logs containing graphic and lithologic descriptions for the deeper soil borings drilled at the Site (7 feet below grade or deeper) are contained in Appendix D.

Sediments encountered at the Site consisted predominantly of black clays, yellowish brown or olive-brown silty clays, and gravelly silty clays. Fill sediments were generally not observed at most of the sampling locations, with the exception of the western portion of Area A and at the Ransome Company construction yard in the northwestern portion of Area B. In the western portion of Area A, a soil platform consisting of sandy gravel and clayey gravel fill is elevated approximately 4 to 5 feet above grade and is used to park trailer trucks. An approximately 1- to 2-foot layer of gravel fill was encountered over the eastern portion of the Ransome Company construction yard.

Area A

A 2- to 4-foot layer of gravelly clayey sand was observed in deeper borings drilled in the western portion of Area A at a depth of approximately 15 feet below the ground surface. This gravelly clayey sand appears to be laterally continuous between wells LF-6, LF-17, LF-18, LF-19, LF-4, and possibly LF-5 (Figures 5 and 7). This sandy layer was not detected in shallow well

LF-20, located approximately 250 feet northeast of well LF-5 in Area B. Silty clays and/or gravelly silty clays were observed above and below this gravelly clayey sand layer to the bottom of the shallow well borings and deeper soil borings (depths of approximately 18 to 25 feet).

In the well boring for deeper well LF-4D (Phase II monitoring well), the gravelly silty clay underlying the sandy zone extended to a depth of 31 feet below the ground surface. At a depth of 31 feet, an approximately 6-foot thick sandy zone was encountered. This sandy zone does not appear to extend laterally to the northeast, as it was not encountered in deeper well LF-5D (Phase II monitoring well), located about 175 feet northeast of well LF-4D. However, a 3-foot thick clayey sand layer was encountered at a depth 40 feet below grade in well LF-5D.

Area B

Sediments encountered in Area B generally consisted of black clays overlying brown silty clays with a minor amount of sands and/or gravels encountered in some of the borings (B3, B4, B17, B26, B27, B31, B32, and B33). The brown silty clays were observed to a depth of 23 feet, the bottom depth of the shallow well borings drilled in Area B (LF-7 and LF-20). At the Ransome Company construction yard, the black clays were covered by approximately 1 to 1-1/2 feet of asphalt and asphalt subgrade or gravel fill.

Area C

A 2- to 5-foot layer of gravelly clayey sand was observed in borings drilled in the western portion of Area C at a depth of about 13 to 15 feet below ground surface, and appeared to be laterally continuous between wells LF-12, LF-11, and LF-10 (Figure 6). This sandy layer does not appear to extend as far

east as wells LF-9 or LF-16, as the sediments encountered in these wells consisted of predominantly silty clays and clayey silts with a minor amount of sand and gravel. Sediments encountered overlying the generally clayey sand layer in well boreholes LF-10, LF-11, and LF-12 consisted predominantly of dark brown, gravelly silty clays. Predominantly gravelly silty clays and silty clay were observed below the sandy layer to depths of approximately 20 to 22 feet.

6.0 GROUND-WATER ELEVATIONS AND FLOW DIRECTION

Water-level measurements were collected from all accessible on-site wells on February 23 and April 23, 1990 to assess the direction of shallow ground-water flow and gradients at the Site. Figures 8 and 9 present ground-water elevation maps of shallow ground water at the Site on February 23 and April 23, 1990, respectively. Table 4 presents the ground-water elevation data collected on these two dates.

Depth to ground water ranged between 1.2 feet (well LF-11) and 11.0 feet (well LF-4) below grade on February 23, 1990 and between 2.5 feet (well LF-11) and 12.2 feet (well LF-4) below grade on April 23, 1990. Ground-water elevation data indicate a generally westerly to southwesterly direction of shallow ground-water flow across the Site at the time of water-level measurement (Figures 9 and 10). On February 23, 1990, the calculated lateral ground-water flow gradient ranged between approximately 0.001 ft/ft in the eastern portion of the Site (Areas A and B) to 0.003 ft/ft in the western portion (Area C). On April 23, 1990, the calculated lateral ground-water flow gradient ranged between approximately 0.006 ft/ft in the eastern portion of the Site (Areas A and B) to 0.003 ft/ft in the western portion (Area C).

Ground-water elevation measurements collected in the two shallow/deeper well pairs installed on Area A (wells LF-4/LF-4D and LF-5/LF-5D) during Phase II of the Investigation indicate a flat to slightly upward vertical gradient in this area.

7.0 ANALYTICAL RESULTS OF PHASE I SOIL SAMPLING AND ANALYSES

Results of soil sample analyses for metals, VOCs, PCBs, TPH, and herbicides are summarized in Tables 6A through 6E, respectively. Laboratory data certificates are presented in Appendix E. Soil quality results are presented below.

7.1 Metals

Ninety-two samples collected from the 80 Phase I soil sampling locations and 13 well locations were submitted for chemical analysis for priority pollutant metals (a total of 13 metals). Table 6A summarizes the results of the analyses for these metals. Concentrations of metal compounds detected in the samples were generally low and within background concentration ranges reported in the literature for soils in the Bay Area (Table 6A; Shacklette and Boerngen, 1984), with the exception of lead at two locations and zinc at one location. Figure 10 presents a summary of the analytical results for lead and zinc for each sampling location at the Site. As illustrated in the figure, the two compounds were detected in somewhat elevated concentrations in three zinc and seven lead samples throughout the Site. High concentrations of lead and zinc (concentrations of 8,800 ppm of lead and 47,000 ppm of zinc) were detected at one location (C17). A more detailed discussion of the analytical results for metals follows.

Antimony and titanium were not detected in the soil samples submitted for chemical analysis. Silver (1 ppm) was detected in one sample, collected from location C17 at a depth of 1 foot. Mercury was detected in 13 of the 92 samples at concentrations up to 1.9 ppm. Selenium was detected in 13 samples at concentrations ranging between 1 and 4 ppm. Arsenic was detected in 76 samples at concentrations up to 34 ppm (location B9 at 1.5 feet), but generally less than 6 ppm. Beryllium was detected in 84 of the 92 samples at concentrations between 0.2 ppm and 2.1

ppm. Cadmium was detected in 51 of the 92 samples at concentrations up to 5.4 ppm (C17 at a depth of 1 foot), but generally less than 0.7 ppm.

Chromium, copper, nickel, lead, and zinc were detected in all of the soil samples submitted for analysis. Chromium, copper, and nickel concentrations ranged from 11 ppm to 77 ppm, from 7 ppm to 310 ppm, and from 12 ppm to 93 ppm, respectively. As illustrated in Table 6A, these concentrations are within ranges commonly observed in soils in the San Francisco Bay Area.

As discussed above, lead was found to be present at somewhat elevated concentrations throughout the Site. Concentrations of lead were generally between 5 ppm and 200 ppm, with the exception of four locations in Area A (290 ppm at sampling location A20 from a depth of 1 foot; 560 ppm at location A21 from a depth of 2.5 feet; 530 ppm at LF-5 from a depth of 4 feet; and 1,400 ppm at A5 from a depth of 3.5 feet), one location in Area B (330 ppm at B22 from a depth of 1.5 feet), and two locations in Area C (8,800 ppm at C17 from a depth of 1 foot and 240 ppm at C15 from a depth of 0.5 foot). Notably, lead was not detected in the 4-foot depth sample collected from location C17, indicating a limited vertical extent of elevated lead concentrations in soil at this sampling point. Background concentrations of lead in the Bay Area generally range between 30 and 700 ppm (Table 6A). It should be noted that the Site is bordered by Interstate 580 to the South. Atmospheric deposition of lead from vehicles traveling I-580 may, therefore, be responsible for some of the elevated lead concentrations at the Site.

Zinc was generally detected at concentrations well below 350 ppm, with the exception of one location in Area A (410 ppm from A20 from a depth of 1 foot) and two locations in Area C (47,000 ppm at C17 from a depth of 1 foot and 420 ppm at C15 from a depth of 0.5 foot). With the exception of the 1-foot depth sample

collected from location C17, the zinc concentrations, although slightly elevated, are within the range of zinc concentrations generally found in the Bay Area (120 to 3,500 ppm; Table 6A). Of note, the 4-foot depth sample collected from location C17 contained only 16 ppm of zinc, indicating a limited vertical extent of elevated zinc concentrations at this location.

7.2 Semi-Volatile Organic Compounds

Thirty-eight soil samples were submitted for chemical analysis for SVOCs, including analysis for PCBs and PNAs. Forty-five additional samples were analyzed for PCBs and/or PNAs. No SVOCs were detected in soil samples at the Site, with the exception of 0.39 ppm pyrene detected at one location (B7 at 1.5 feet) and PCBs at four locations at concentrations up to 5.4 ppm. Locations and depths of samples collected for SVOC analysis and analytical results are presented on Figure 12. Analytical results are summarized in Table 6B.

PCBs (Aroclor 1260) were detected at locations B25 (0.38 ppm; 1-foot depth sample), B26 (5.4 ppm; 0.5-foot depth sample), A22 (0.1 ppm; 1-foot depth sample), and C21 (0.2 ppm; 1-foot depth sample). Samples collected at the 3- to 4-foot depth interval from these locations did not contain detectable concentrations of PCBs.

7.3 Volatile Organic Compounds

Fifty-six of the 116 soil samples submitted for chemical analysis were analyzed for VOCs. Results of the VOC analyses are presented in Table 6C. Twenty-one additional samples were analyzed for benzene, toluene, xylene, and ethylbenzene (BTXE). Figure 11 summarizes the VOC analysis results. With the exception of BTXE compounds (detected at concentrations up to almost 1,700 ppm) and low concentrations (up to 0.25 ppm) of

trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), and acetone, VOC compounds were not detected in soil samples analyzed from the Site. The locations and number of samples containing one or more of these VOCs are described in more detail below.

Low concentrations of TCE (0.18 to 0.24 ppm) and 1,2-DCE (0.034 to 0.039 ppm) were detected in the deeper (9- to 13-foot depth) samples collected from two locations in Area C (C17 and C21). Trace concentrations of TCE (up to 0.009 ppm) were detected in the 10-foot depth samples collected from locations LF-9 and C24. With the exception of 0.034 ppm 1,2-DCE detected at location C24, TCE, and 1,2-DCE were not detected in the shallower samples (less than 5 feet deep) collected from these locations, nor were other VOCs detected in these shallower samples. As the deeper samples were collected from depths at or below the ground-water level, the VOCs detected in the samples are likely from the ground water. Based upon the low concentrations detected and the depth (below ground-water level), the results do not appear indicative of a possible source for VOCs in the soils. No other chlorinated VOCs were detected in soil samples collected at the Site.

Elevated concentrations of BTXE were detected in soil samples collected from the Ransome Company construction yard, located in Area B in the north-central portion of the Site. Results from analyses of soil samples collected at depths of 4 and 9 feet from location B17 indicate concentrations of total BTXE concentrations up to 36.6 ppm. Soil samples collected from location B15, located adjacent to a former fuel pump island, contained benzene (100 ppm), toluene (200 ppm), ethylbenzene (190 ppm), and xylenes (931 ppm) at a depth of 4 feet. A duplicate soil sample collected from the same depth interval contained similar concentrations of BTXE (see Table 6C). The 9-foot depth sample, located at the approximate depth of ground water, contained benzene (3.8 ppm), toluene (31 ppm), ethylbenzene (13 ppm), and xylenes (72 ppm), suggesting that shallow ground water has been

impacted by these compounds in this area. BTXE compounds (up to 224 ppm) were also detected at location 14B at a depth of 7.5 feet, but only toluene was detected (0.36 ppm) in the shallower (4-foot depth) sample. Low concentrations of acetone (less than 0.23 ppm) were also detected in shallow soils (less than 4 feet) at two locations (B33 and B30) at the Ransome Company construction yard.

Low concentrations of toluene (less than 0.55 ppm, with the exception of higher concentrations detected at the Ransome Company construction yard discussed above) were detected in 66 of the 77 samples collected and analyzed for this compound from other areas at the Site.

7.4 Total Petroleum Hydrocarbons

One-hundred-one soil samples collected from the Site were analyzed for lighter fraction TPH (e.g., gasoline) and/or heavy fraction TPH (e.g., diesel or oil). [Note: The laboratory data sheets from Med-Tox categorize heavy fraction TPH as "waste" oil. This designation is misleading; the categorization is based on the molecular weight range of hydrocarbons detected (i.e., light fraction to heavy fraction) and is not related to the source of the oil, as the modifier "waste" may infer.] Additionally, ten samples collected from the Ransome Company construction yard were analyzed for total oil and grease (TOG). Analysis results for TPH and TOG are summarized in Table 6D and presented in Figure 13.

TPH characterized as oil was detected in 39 of 101 soil samples submitted for heavy fraction TPH analysis at concentrations ranging between 30 ppm and 7,400 ppm. One sample [LF-5(4)B] collected from Area A contained 14,000 ppm of TPH characterized as oil. Most of the samples containing heavy fraction TPH had concentrations below 1,000 ppm. However, eight of the 101

samples contained concentrations above 1,000 ppm, including four samples collected from Area A [A8(4.5)B, A13(4)B, A22(1)A, and LF-5(4)B]; three samples collected from Area B [B7(1.5)A, B15(4.0)B, and B33(2)A]; and one sample from Area C [C19(4)B]. TPH concentrations in soil samples collected from depths below the depths of the listed samples generally contained lower (less than 500 ppm) to non-detected concentrations of TPH as oil.

Elevated concentrations of TOG (up to 10,000 ppm) were detected in shallow soils (between 1 and 5 feet below grade) at the Ransome Company construction yard at several locations in the western central portion of the property (locations B18, B19, B21, and B22). This portion of the property was formerly used for asphalt batching; therefore, the TOG detected may be associated with this former site usage.

Gasoline was detected in ten of 17 soil samples collected for gasoline analysis from the Ransome Company construction yard at concentrations up to 3,900 ppm. The highest gasoline concentrations were detected in soils located adjacent to the excavation area of four former underground gasoline and diesel storage tanks, and near the former fuel pump island located at the eastern portion of the Ransome Company construction yard.

With the exception of the samples collected from the Ransome Company construction yard, gasoline was not detected in samples collected from Areas A and B, and was detected at low concentrations (equal to or less than 1.0 ppm) in only two locations in Area C. Notably, samples collected in Areas A and C adjacent to existing or former fuel storage tanks did not contain detectable concentrations of TPH as gasoline or diesel. (Samples collected in the vicinity of former or existing tanks for TPH analysis were collected from the depth intervals between 3 to 5 feet and 8 to 10 feet below grade to assess possible leakage from inlet/outlet piping and tank bases.)

Diesel was only detected in two of the 110 soil samples analyzed for diesel, including one sample [B30(2)A] collected from the Ransome Company construction yard (660 ppm) and a sample [C13(3.0)B] collected from Area C (490 ppm). The sample collected from the Ransome Company construction yard that contained diesel was collected adjacent to a former underground waste oil tank. The deeper (4-foot depth) sample collected from this location did not contain TPH as diesel. Sample C13(3.0)B was collected just north of the railroad tracks, in the center of an approximately 5-foot by 10-foot area of apparently oil-stained soil.

Concentrations of kerosene (up to 220 ppm) were detected in two soil samples [B4(7.5)C and B29(3.5)B]. The 3-foot depth sample collected from location B4 did not contain detectable concentrations of kerosene, nor did the 4.5-foot depth sample collected from location B29.

Stoddard solvent (50 ppm) was detected at one soil sampling location, B7, at a depth of 1.5 feet.

7.5 Herbicides

Low concentrations of herbicides (up to 0.74 ppm) were detected in several of the soil samples collected on or near railroad track spurs (locations A12, A23, B9, B11, B12, LF-5, and LF-8; Table 6E) at depths ranging from 1.5 and 4.0 feet below grade. These compounds included dalapon, 2,4,5-trichlorophenol (2,4,5-T), 2,4-dichlorophenoxyacetic acid (2,4-D), 2,4,5-trichlorophenoxypropanionic acid (2,4,5-TP), Dicamba, and dichloropropane.

7.6 Asbestos

Eight samples collected from areas at the Site which formerly housed buildings or sheds were analyzed for asbestos. Asbestos was not detected in these samples.

7.7 Soil pH

Analysis for soil pH was performed on ten samples collected in areas of the Site where historically activities had occurred that potentially involved either caustic or acidic materials. The results of the analyses indicated pH values in the neutral range (between 6.9 and 7.5).

8.0 ANALYTICAL RESULTS OF PHASE I GROUND-WATER SAMPLING AND ANALYSES

Ground-water quality results for metals, VOCs, and TPH analyses are summarized in Tables 7A, 7B, and 7C, respectively. Laboratory data certificates are contained in Appendix F. The results of the ground-water sample analyses are summarized below.

8.1 Metals

Table 7A summarizes the results of the analysis of shallow ground-water samples for 13 Priority Pollutant metals. Beryllium, chromium, silver, titanium, and mercury were not detected in the 25 monitoring well and "grab" ground-water samples collected at the Site. With the exception of lead and copper, concentrations of metals detected in shallow ground water were below current drinking water standards or Action Levels for these compounds (Table 7A) and below ambient surface-water quality objectives listed in the RWQCB Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), or the EPA Ambient Water Quality Criteria to Protect Saltwater Aquatic Life.

One sample, a grab ground-water sample collected from location B30, contained lead at a concentration at the current State Maximum Contaminant Level (MCL) for drinking water (0.05 mg/l or ppm) and above the Basin Plan objective for surface-water quality (0.0056 ppm). Lead was not detected in any of the ground-water samples collected from the monitoring wells at the Site nor in any of the other grab ground-water samples. Since the grab ground-water samples were collected directly from an open soil boring and transported to the analytical laboratory prior to filtering and preservation, disturbance during sample collection and handling may have resulted in additional dissolution of lead

from sediments in the sampled water. Therefore, the lead detected in this sample is likely not representative of formation water at the Site. Copper was detected in five ground-water samples at concentrations exceeding the Basin Plan objectives.

Cadmium (0.004 ppm) was detected in the sample collected from well LF-3. Zinc was detected in all ground-water samples analyzed for this compound at concentrations ranging between 0.005 ppm to 0.069 ppm. Low concentrations of arsenic (up to 0.003 ppm) were detected in ten of the 26 samples; concentrations of copper (up to 0.019 ppm) were detected in five of the 26 samples; and concentrations of nickel (up to 0.05 ppm) were detected in 11 of the 26 samples. The samples containing these compounds were collected from locations in Areas A, B, and C.

8.2 Semi-Volatile Organic Compounds

No SVOCs, including chlorinated pesticides and PCBs, were detected in the 25 monitoring well and grab ground-water samples collected and analyzed during Phase I of the Investigation.

8.3 Volatile Organic Compounds

VOCs were not detected in monitoring wells LF-1, LF-2, LF-3, LF-7, or LF-16. One or more VOC were detected in samples collected from the remaining eight Phase I monitoring wells (LF-4, LF-5, LF-6, LF-8, LF-9, LF-10, LF-11, and LF-12). The distribution and concentrations of VOCs detected at the Site are summarized in Figure 14 and are discussed below, by area.

Area A

Concentrations of 1,1-DCA (up to 0.018 ppm), 1,1-DCE (up to 0.73 ppm), and 1,1,1-TCA (up to 0.27 ppm) were detected in wells LF-4 and LF-5 (Figure 14). The ground-water sample collected from

well LF-6, located approximately 900 feet west (approximately downgradient) of well LF-5, did not contain measurable concentrations of 1,1,1-TCA or 1,1-DCE, but did contain 0.018 ppm of 1,1-DCA. A grab ground-water sample collected from location A15, located approximately 180 feet downgradient of well LF-4, contained low concentrations of 1,1-DCE (0.014 ppm).

BTXE or other aromatic compounds were not detected in ground-water samples collected from this area.

Area B

The ground-water sample collected from well LF-8, located on the upgradient boundary of the Site, in the eastern portion of Area B, contained low concentrations of 1,1-DCA (0.015 ppm), 1,1-DCE (0.006 ppm), and 1,1,1-TCA (0.010 ppm). These are the same compounds as detected in wells LF-4 and LF-5; however, the concentration proportions between the three compounds in well LF-8 are not similar to those proportions observed in wells LF-4 and LF-5, suggesting a different source.

Relatively low concentrations of 1,1-DCA (up to 0.02 ppm) were also detected in several grab ground-water samples in the western portion of Area B (four locations in the western portion of the Ransome Company construction yard, and at sampling point B4, located southeast of the yard). The 1,1-DCA detected at the Ransome Company construction yard appears to originate in that area, since ground-water samples collected from upgradient locations did not contain detectable concentrations of this compound (Figure 14).

Benzene (3.0 ppm), xylene (2.2 ppm), toluene (0.73 ppm), and ethylbenzene (3.3 ppm) were detected in a grab ground-water sample collected from location B17 at the Ransome Company

construction yard. BTXE compounds were not detected in ground-water samples collected in Area B outside of the Ransome Company construction yard.

It should be noted that, due to the sample collection procedures for grab ground-water sampling, analysis results are qualitative. Although the results provide a good indication of the water quality beneath the Ransome Company construction yard, these data should be supported by results from the installation and sampling of monitoring wells at the Site.

Area C

Several VOCs were detected in the sample collected from well LF-10, located on the upgradient (northern) boundary of the Site in the central portion of Area C, at concentrations up to 7.6 ppm. These compounds included: 1,1-DCE (0.031 ppm); 1,2-DCE (3.2 ppm); PCE (0.041 ppm); 1,1,2-TCA (0.007 ppm); TCE (7.6 ppm); and vinyl chloride (1.0 ppm). Two of the compounds detected at the highest concentrations in well LF-10 (1,2-DCE [up to 3.2 ppm], and TCE [up to 7.6 ppm]) were also detected in three locations southwest (approximately downgradient) of well LF-10 (monitoring wells LF-11 and LF-12, and the grab ground-water sample collected at location C15) at concentrations up to 0.07 ppm and 0.32 ppm, respectively.

TCE (0.034 ppm) was also detected in well LF-9. Toluene (0.027 ppm) was detected in the grab ground-water sample collected from location C20. No other aromatic compounds were detected in samples from Area C.

8.4 Total Petroleum Hydrocarbons

TPH was not detected in ground-water samples collected from Area A nor in wells LF-7 and LF-8, located on the upgradient boundary (with respect to ground-water flow) of the property in Area B. TPH (up to 20 ppm) was detected at several locations at the Ransome Company construction yard and in Area C.

Low concentrations of TPH (generally less than 1 ppm) characterized as oil, gasoline, or diesel were detected at several locations in Area C. TPH as gasoline was detected in samples collected from monitoring well LF-11 (0.1 ppm) and location C20 (a grab ground-water sample; (0.2 ppm). C20 is located adjacent to the location (or former location) of an underground gasoline fuel storage tank. TPH as oil was detected in monitoring wells LF-10 (1.5 ppm) and LF-11 (0.6 ppm), both located on the upgradient (northern) boundary (with respect to ground-water flow direction) of the Site in Area C. Monitoring well LF-12, located adjacent and downgradient of the potential location of an underground oil storage tank, contained 0.5 ppm TPH as diesel.

During drilling of the wellbore for well LF-9, a perched water zone was detected at a depth of about 2 feet below grade in an approximately 1-foot thick layer of sandy fill. The perched water had an oily sheen and a strong fuel odor. A grab water sample was collected from this perched water layer and submitted for fuel characterization. The results indicated TPH resembling Stoddard solvent at a concentration of 3.6 ppm and TPH resembling oil at a concentration of 7.8 ppm. Stoddard solvent was not detected in the ground-water sample collected from well LF-9 installed in the wellbore (screened below the perched water layer); however, low concentrations (0.5 ppm) of TPH resembling oil were detected.

TPH as gasoline (up to 20 ppm) and TPH as diesel (up to 12 ppm) were detected in shallow ground water beneath the Ransome Company construction yard. The higher concentrations of the TPH were detected near the former underground fuel tanks and pipelines in the eastern portion of the yard and in location B17, located approximately 80 feet downgradient of this area. Low concentrations of TPH as oil (0.6 ppm), gasoline (0.1 ppm), and diesel (1.4 ppm) were also detected in ground water near the former waste oil tank in the southwestern portion of the Ransome Company construction yard (sample locations B27 and B30).

9.0 DISCUSSION OF PHASE I SOIL QUALITY RESULTS

Significant results from Phase I of the Environmental Investigation are discussed below and compared with available background concentrations and available regulatory limits, Applied Action Levels, or cleanup levels for soil. (It should be noted that this type of comparison does not take into account site-specific factors such as potential exposure conditions and development plans, and that a more formal risk assessment may be required to develop site-specific cleanup levels, based on a quantitative evaluation of potential human health and environmental risks presented by compounds detected at the Site.)

Results from the Phase I Environmental Investigation indicated the presence of several chemical compounds in soils at the Site. Chemical compounds that appeared relatively widespread over the Site included TPH characterized as oil, toluene, and lead. As discussed in Section 7.1, other metals were also detected in soils across the Site in the reported ranges of background concentrations. Other compounds detected with less frequency and in generally localized areas of the Site included TPH (characterized as diesel and as gasoline), benzene, xylenes, toluene, and ethylbenzene. Low concentrations of herbicides were detected in several sampling points located near railroad track spurs. Low concentrations of VOCs were detected in deeper soils in the western portion of Area C and one location in Area A. PCBs (Aroclor 1260) were detected in three locations and PNAs were detected in one location at the Site. The potential environmental significance of these results is discussed below.

9.1 Metals

To evaluate the significance of metals in soils at the Site, the metal concentrations were compared against some or all of the following: background concentrations of metal compounds in

soils, as reported in literature; Total Threshold Limit Concentrations (TTLCs) established by the Department of Health Services (DHS) to classify hazardous waste, in accordance with Title 22 of the California Administrative Code; and Applied Action Levels (AALs), calculated in accordance with the DHS California Site Mitigation Decision Tree Manual (DHS, May 1986).

Background concentrations of metals were obtained from literature values reported for western Contra Costa County, when available (Shacklette and Boerngen, 1984). These values are summarized at the bottom of Table 6A. Based on Shacklette and Boerngen, metal concentrations in soils at the Site were generally within the range of reported background concentrations, with the exceptions of lead, zinc, beryllium, and selenium.

Applied Action Levels were calculated for zinc, beryllium, and selenium. (AALs were not calculated for lead because no toxicity reference dose or observed effect level was available for this compound). Calculated AALs are presented in Appendix G.

With the exception of zinc detected in the 0.5-foot depth sample collected from location C17, zinc, beryllium, and selenium concentrations were below the respective AALs for both adults and children (Appendix G).

While TTLCs are not intended as cleanup or "action" levels, they do provide some basis for comparison. With the exception of lead and zinc, all metals concentrations detected in soil were significantly below their respective TTLCs (Table 6A). Zinc concentrations were well below the TTLC for zinc of 5,000 ppm, except in the 1-foot depth sample collected from location C17 (which contained 47,000 ppm of zinc). Lead concentrations exceeded the TTLC of 1,000 ppm in one location in Area A (A5, concentration of 1,400 ppm), and in the 1-foot depth sample collected from location C17 (8,800 ppm).

The EPA has issued an interim guidance for establishing soil lead cleanup levels at Superfund sites; the cleanup guidance levels established for total lead in soil are 500 to 1,000 ppm. These guidelines have been, or are currently being, used for cleanup levels at a number of sites in the Bay Area. Lead concentrations at the Site exceeded 500 ppm in two locations in Area A. Possible sources of lead detected in soils in Area A include disposal or spillage of lead-based paint, which may have been used in one or more of the previous operations in this area, or disposal of wastes/materials from the former metal foundries or car repair shops in Area A. The lateral and vertical extent of lead at concentrations greater than 500 ppm in soils in this area, especially in the vicinity of location A5, would need to be assessed through additional investigation. (This additional investigation was conducted during Phase II of the Investigation and is described in Section 11.0.)

The elevated lead concentrations in the soil were generally detected at depths of 2.5 to 4.5 feet in Area A, decreasing the likelihood of lead migrating off site with surface run-off from erosion. RWQCB staff has expressed some concern regarding possible impacts on surface-water quality due to potential erosion of surface soils containing elevated lead concentrations. (It should be noted that lead was not detected in ground-water samples collected from the monitoring wells; therefore, surface erosion of the lead-affected soil appears to be the primary concern with respect to water quality.)

The source for zinc and lead at location C17 appears to have originated at the surface and, as indicated by chemical analysis of the 4-foot depth sample collected from this location, does not extend vertically beyond 3 feet. The lateral extent of the lead- and zinc-affected soil in this area was further evaluated during Phase II of the Investigation, as is discussed in Sections 12.2 and 12.4.

9.2 Semi-Volatile Organic Compounds

With the exception of low concentrations of pyrene (1.0 ppm) detected in one sample, PNAs and pesticides were not detected in soil samples analyzed and do not appear to be of environmental concern.

PCBs (Aroclor 1260) were detected in samples B26(0.5)A, B25(1.5)A and A22(1)A, at concentrations of 5.4, 0.38, and 0.1 ppm, respectively. PCBs were not detected in the 3- to 4-foot depth samples from these locations, indicating a limited vertical extent of the PCBs. Ground-water samples collected from well LF-9, located approximately 150 feet downgradient of this area, did not contain detectable concentrations of PCBs.

No specific State regulatory cleanup level has been established for PCBs in soil. However, an EPA regulation for cleanup of PCB spills under the Toxic Substances Control Act (EPA, 1987) states that spills of PCBs of 500 mg/kg in residential/commercial area soil must be cleaned up to 10 mg/kg, with a minimum 10-inch cap of clean material placed on top of the excavated area. An Office of Health and Environmental Assessment (OHEA) risk assessment for PCBs in soil that was cited in the regulations (these are the most stringent cleanup requirements under the EPA regulations) indicated that 1 to 8 ppm PCBs in 0.5 acre of residential soil is associated with a 1×10^{-6} level of cancer risk. "Acceptable" risk ranges commonly referenced by regulatory agencies range between 1×10^{-4} and 1×10^{-6}. PCB concentrations observed at locations B25 and A22 were well below both of these guidelines.

Although the concentration of PCBs detected at location B26 is in the range of the OHEA 1×10^{-6} cancer risk (an acceptable risk according to regulating agencies), the lateral extent of PCBs in the vicinity of B26 was not fully characterized during Phase I of

the Investigation. This area north of the Ransome Company construction yard was observed to be stained in previous aerial photos and during the site inspection. Because PCBs were detected in the near-surface soil sample (0.5 feet) at B26, there is some potential for the PCB-affected soil to be eroded and migrate off site in surface water run-off. RWQCB staff has expressed concerns regarding potential impacts of erosion of soil containing PCBs on surface-water quality at the Site.

Additional sampling was conducted during Phase II of the Investigation to better assess the extent of PCBs in shallow soils in this area. These results are discussed in Section 12.3.

9.3 Volatile Organic Compounds

Several VOCs were detected in soil at the Site, generally at very low concentrations. Significantly, however, BTXE concentrations of up to 1,000 ppm were detected in soil at the Ransome Company construction yard.

Low concentrations of TCE (up to 0.24 ppm) and 1,2-DCE (up to 0.04 ppm) were detected in several deeper (generally depths of 8.0 feet or more) samples collected in Area C. 1,2-DCE (0.009 ppm) was detected in the 4-foot depth sample from location B2 (Area B). Acetone was detected in two locations in Area B (at the Ransome Company construction yard) at low concentrations (less than 0.23 ppm). (Acetone was not detected in ground-water samples at the Site.) The RWQCB has established 1 ppm of total VOCs as the soil cleanup goal for total VOC concentrations in soil. The TCE and 1,2-DCE in soils in Area C are in the same vicinity as elevated concentrations of these compounds in ground water; the depth these soil samples were collected is below the water table in this area.

Benzene (up to 100 ppm), toluene (up to 240 ppm), xylenes (up to 1,000 ppm), and ethylbenzene (up to 300 ppm) were detected at the Ransome Company construction yard and high concentrations of BTXE compounds were detected in ground water at one grab ground-water sampling location (B-17).

Again, the RWQCB guideline for cleanup of VOCs in soil is 1 ppm. The California State Water Resources Control Board developed a Leaking Underground Fuel Tank (LUFT) field manual to aid in determining concentrations of BTXE which could safely be left in place without threatening ground-water quality. RWQCB staff in the San Francisco Bay, North Coast, and Central Valley Regions have developed a document entitled "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks" (dated June 2, 1988; also known as the "Tri-Regional Guidelines") to clarify and expand on the LUFT manual.

The RWQCB "Tri-Regional Guidelines" also provide alternatives to several portions of the LUFT manual. Factors used in the RWQCB Tri-Regional Guidelines to determine the need for further investigation or remediation include the depth to ground water, sediment type, and evidence of impact to ground water. According to the Tri-Regional Guidelines, areas in which ground water has potentially been impacted by BTXE compounds will require further soil and ground-water investigation.

Based on the RWQCB guidelines, due to the presence of BTXE compounds in ground water and concentrations of BTXE found in soil at the Ransome Company construction yard, further soil and ground-water investigation and possible remediation will likely be required in this area.

9.4 Total Petroleum Hydrocarbons

As discussed in Section 7.4, elevated concentrations of petroleum hydrocarbons (notably TPH as oil [up to 14,000 ppm], TPH as diesel [up to 660 ppm], TPH as gasoline [up to 3,900 ppm], and TOG [up to 10,000 ppm]) were detected in soil samples at the Site.

With the exception of the TPH characterized as oil, total petroleum hydrocarbons were detected in localized areas of the Site.

The distribution and depth intervals at which the TPH as oil occurs are variable across the Site, indicating limited areas of TPH-affected soils. In most locations at the Site, TPH as oil were detected in shallow (4.0 feet deep or less) soil and above the ground-water table. Therefore, as the heavy fraction TPH compounds are not very mobile, TPH characterized as oil do not appear to present a significant threat to ground-water quality. Ground-water quality data, which indicate that TPH was not detected in most shallow ground-water samples or was detected at very low concentrations in ground-water samples collected from the Site support this conclusion (i.e., less than 1.0 ppm [with the exception of one well sample and one grab sample which each contained 1.5 ppm]).

No specific regulatory limits for cleanup of TPH (characterized as oil, gasoline, or diesel) in soil have been established by regulatory agencies, and cleanup levels are generally determined on a site-by-site basis. Factors considered in determining cleanup levels for a site include the type of petroleum hydrocarbons present; the presence of the petroleum constituents benzene, toluene, xylenes, and ethylbenzene (BTXE); the depth to ground water; the soil type; and evidence of ground-water impacts. Concentrations of 10 to 10,000 ppm of TPH as oil or

diesel, or 10 to 100 ppm as gasoline, have been used by regulatory agencies as general guidelines for cleanup of soils affected by petroleum hydrocarbons, with concentrations in the range of 100 to 1,000 ppm cited most frequently. The RWQCB Tri-Regional Guidelines require further investigation of soil or ground water in cases where TPH have been detected at concentrations greater than 100 ppm in soil samples within the first 2 feet of native soil beneath an underground storage tank.

While ground water at the Site is relatively shallow (approximately 1.8 to 11.1 feet below grade), ground-water quality does not appear to have been substantially affected by the presence of the heavy fraction TPH (characterized as oil) and TOG in soil. The heavier fraction petroleum hydrocarbons have relatively low mobility in soil, and vertical migration of these compounds at the Site appears to have been limited. In most of the areas where elevated TPH as oil were detected, the depth to ground water was observed to be greater than approximately 8 feet. Moreover, the Site is largely underlain by a layer of low permeability sediments above the ground-water table, which minimizes downward migration of compounds present in the upper soil into the ground water. With the exception of the Ransome Company construction yard, benzene, ethylbenzene, and xylenes were not detected in soil or shallow ground water at the Site, and toluene was detected at low concentrations in soil and three ground-water samples.

Concentrations of TPH as oil exceeded 5,000 ppm in one location (a soil sample collected from the wellbore for LF-5 in Area A contain 14,000 ppm TPH). Although TPH as oil were not detected in the ground-water sample collected from this well, additional investigation as to the extent of oil-affected soil in this area and remediation is likely to be required by the regulatory agencies.

Samples collected from shallow soils (4 feet deep or less) in three locations in Area A, three locations in Area B, and one location in Area C contained concentrations of TPH as oil ranging between 1,000 ppm and 5,000 ppm. With the exception of the sample collected from Area C, the depth to ground water was observed to be 8 feet or greater beneath these locations. Ground-water samples collected at or near these locations did not contain detectable concentrations of TPH. Based on these data, the oil-affected soils do not appear to be an environmental concern for ground water at the present time. However, further investigation of these areas and possible remediation or periodic ground-water monitoring to observe possible future changes in ground-water quality is likely to be required by the regulatory agencies.

TPH as oil was detected at concentrations between 100 and 1,000 ppm in nine soil samples from Area A, six samples from Area B, and two samples from Area C. Ground-water analysis results from samples collected from a number of these areas indicate that concentrations in this range have had little or no impact on ground-water quality.

Gasoline was detected in ten of 17 samples collected for gasoline analysis from the Ransome Company construction yard at concentrations up to 3,900 ppm. The highest gasoline concentrations were detected in soils located adjacent to the excavation area of four former underground gasoline and diesel storage tanks, and near the former fuel pump island located on the eastern portion of the Ransome Company construction yard. Because gasoline tends to be more mobile than oil or diesel, regulatory guidelines for gasoline in soils are generally stricter than those for oil or diesel. Concentrations of 10 to 100 ppm are generally used by regulatory agencies as cleanup guidelines for gasoline, and 100 ppm of TPH is cited in the Tri-Regional Guidelines as a level triggering further

investigation. Based these guidelines, further investigation and possible remediation likely will be required at the Ransome Company construction yard. Site-specific cleanup levels protective of ground-water quality will need to be established with the review and approval of the RWQCB.

With the exception of the samples collected from the Ransome Company construction yard, gasoline was not detected in samples collected from Areas A and B, and was detected at low concentrations (equal or less than 1.0 ppm) in only two locations in Area C. Diesel was detected in only two of the 110 samples analyzed for diesel, at concentrations less than 1,000 ppm. Gasoline and diesel detected in soils outside of the Ransome construction yard do not appear to present an environmental concern, based upon the guidelines for TPH discussed above.

Kerosene (220 ppm or less) was detected in two samples. The sample collected from location B4 at 7.5 feet below grade contained 110 ppm; however, the 3-foot depth sample collected from this location did not contain kerosene. Additionally, grab ground-water samples collected from location B4 did not contain kerosene. Samples collected from locations in the vicinity of B4 (B3, B5, and B35) did not contain measurable concentrations of kerosene. The 3-foot depth sample collected from location B29 contained 220 ppm kerosene. Samples collected below and within 50 feet of this location did not contain measurable concentrations of kerosene. Therefore, due to the apparently limited extent and relatively low concentrations of this compound, kerosene does not appear to present an environmental concern.

Stoddard solvent (50 ppm) was detected in two locations at the Site. Due to the limited extent and low concentration, this compound does not appear to present an environmental concern.

9.5 Herbicides

Low concentrations of herbicides (less than 0.74 ppm) were detected in several of the samples collected from soil or well borings located on or near railroad track spurs (at locations A12, A23, B9, B11, B12, LF-5, and LF-8). These compounds included Dalapon; 2,4,5-T; 2,4-D; 2,4,5-TP; Dicamba; and dichloropropane. Concentrations of all the compounds except 2,4,5-T were below 0.05 ppm, and concentrations of 2,4,5-T were not detected in deeper samples at two of the three locations where it had been detected at shallower depths. The background review did not indicate site usage that would have included using herbicides outside of the track area. Therefore, samples for herbicide analyses were not collected from locations outside the track area.

TTLCs currently available for some of these compounds are 10 mg/kg. As the concentrations are low and appear to be limited to shallow soils, and assuming the herbicides are limited to the railroad spur areas, the herbicides detected do not appear to present a significant environmental concern. Because the Site is underlain by a relatively low permeability clay at shallow depths well above the ground-water table, the possibility that shallow ground water has been adversely impacted by herbicides in these soils would appear to be small. However, collection and analysis of ground-water samples from locations in the vicinity of the rail tracks would be required to verify this assumption.

10.0 DISCUSSION OF PHASE I GROUND-WATER QUALITY RESULTS

Significant results from the Phase I Environmental Investigation are discussed below and compared with available background concentrations, and available regulatory limits, State Action Levels, or cleanup levels for ground water. (It should be noted that this type of comparison does not take into account site-specific factors such as potential exposure conditions and development plans, and that a more formal risk assessment may be required to develop specific cleanup levels, based on a quantitative evaluation of potential human health and environmental risks presented by compounds detected at the Site.)

With the exception of VOCs and low concentrations of TPH detected in several well and grab ground-water samples, ground-water quality beneath the Site does not appear to have been significantly affected by chemical analytes.

10.1 Metals

With the exception of lead in one sample, metals were not detected or were detected at very low concentrations, and were below current ground-water standards in shallow ground water (Table 7A). The sample (B-30W) containing lead at a concentration of 0.05 ppm (slightly above current State Action Levels for drinking water standards) was a grab ground-water sample, and therefore may not be representative of actual ground-water quality.

10.2 Semi-Volatile Organic Compounds

SVOCs, including chlorinated pesticides, PNAs, and PCBs, were not detected in ground-water samples collected at the Site.

10.3 Volatile Organic Compounds

VOCs were detected in several monitoring well and grab ground-water samples. Concentrations of 1,1,1-TCA, 1,1-DCE, and 1,1-DCA detected in wells LF-4 and LF-5 in Area A exceeded drinking water standards or Action Levels for these compounds (see Table 7B for a list of available regulatory limits or Action Levels for these compounds). Based on the concentrations of VOCs detected in ground water at these locations, additional investigation to assess the lateral and vertical extent of the VOC-impacted ground water in this area was conducted during Phase II of the Investigation. Results from the Phase II Investigation are presented in Section 12.1.

Ground water in well LF-10, located on the upgradient (northern) boundary of the Site in Area C, contained concentrations above drinking water standards or Action Levels of several VOCs (up to 7.6 ppm), notably, TCE, 1,2-DCE, and vinyl chloride. No on-site source for these compounds was identified during the background and regulatory literature review conducted at the initiation of Phase I of the Investigation, nor did soil samples collected from well LF-10 contain elevated concentrations of VOCs. Ground-water samples from LF-11 and LF-12, also located along the upgradient site boundary in Area C, also contained concentrations of 1,2-DCE and TCE at concentrations above State drinking water standards or Action Levels (up to 0.067 ppm 1,2-DCE and 0.31 ppm TCE). Similar compounds have reportedly been detected in ground water at the Electro Coatings facility, 1421 Park Avenue, located approximately 450 feet northeast and upgradient of well LF-10. This facility is currently a State Superfund site. Based on records available to date, insufficient data are available from the investigation of the Electro Coatings site to determine the

off-site extent of VOC contamination in ground water; however, it is evident that the Site has been impacted from this or another off-site source. Additional background and regulatory file review was recommended to better assess the possibility and location of specific sources for these compounds.

Relatively low concentrations of 1,1-DCA (less than or equal to 0.02 ppm) were also detected in six ground-water samples collected from Area B and monitoring well LF-6, located in Area A. These concentrations exceed the DHS Action Level of 0.005 ppm for this compound. It should be noted that five of the six ground-water samples from Area A were grab samples and, therefore, the results are qualitative.

Assuming that shallow ground water beneath the Site will not be used as a drinking water source, the relatively low concentrations of 1,1-DCA detected in Area B and well LF-6 in Area A are not expected to present a threat to human health or the environment. In addition, the concentrations of compounds in ground water would be expected to be substantially attenuated prior to discharge of the affected ground water to surface waters. Further investigation is recommended to identify possible sources for the VOCs detected in wells LF-4 and LF-5 (discussed in Section 12.1) and LF-10 (most likely associated with an off-site source).

10.4 Total Petroleum Hydrocarbons

With the exception of samples collected from the Ransome Company construction yard and well LF-9, TPH in ground water was generally detected at concentration less than 1 ppm (1.5 ppm of TPH as oil was detected in LF-10, located along the upgradient site boundary.) While no specific regulatory guidelines are

available for allowable petroleum hydrocarbons in ground water, these low concentrations would not be expected to threaten human health or the environment.

The finding of low or non-detected concentrations of TPH in ground water indicates that, in general, concentrations of TPH as oil detected in soil have had little or no impact on ground-water quality. Of note, TPH were not detected in a ground-water sample collected from well LF-5, where 14,000 ppm oil had been detected in soil at a depth of 4.5 feet. Continued monitoring of this well would be prudent to detect significant changes in ground-water quality.

Concentrations of TPH as gasoline and diesel up to 20 ppm were detected in shallow grab ground-water samples collected from the Ransome Company construction yard. Based upon the RWQCB precedents discussed above, additional investigation of the extent of the TPH-affected ground water and possible remediation will likely be required in this area.

Concentrations of TPH characterized as oil and Stoddard solvent up to 7.8 ppm were detected in perched ground water collected from the wellbore for well LF-9. TPH as oil was detected at 0.5 ppm in the ground-water sample collected from the well (screened below the perched zone). Well LF-9 is located within 15 feet of underground fuel tanks at the Bashland property. The extent and possible source location for the oil were not fully assessed during Phase I of the Investigation, but they were addressed during the Phase II investigation (see Section 11.6).

11.0 PHASE II OF THE ENVIRONMENTAL INVESTIGATION

Phase II of the Environmental Investigation was conducted at the Site to further assess the lateral and vertical extent of areas of potential environmental concern identified during Phase I of the Environmental Investigation. As discussed above, these areas included:

- VOC-affected ground water in the vicinity of wells LF-4 and LF-5 in Area A
- lead-affected soil in Area A
- PCB-affected soil in the vicinity of location B26
- lead- and zinc-affected soil observed at location C17 in Area C
- petroleum hydrocarbon-affected perched ground water in the vicinity of well LF-9 in Area C.

Additional areas of concern consisted of VOC-affected ground water in the vicinity of well LF-10, and TPH- and BTXE-affected soil and ground water at the Ransome Company construction yard. Because LF-10 is located on the upgradient boundary of the Site in Area C, further review of available local, State, and Federal agency files concerning releases of hazardous materials near the Site was conducted during Phase II of the Environmental Investigation to identify a possible upgradient source of VOCs that could be impacting the Site. The extent of BTXE- and TPH-affected soil and ground water at the Ransome Company construction yard in Area B was not further evaluated during Phase II of the Investigation, since the Ransome Company itself was coordinating further investigation of this property.

11.1 Soil-Gas and Shallow Ground-Water Reconnaissance Survey

Soil-gas and/or shallow ground-water samples were collected from 19 locations in the vicinity of monitoring wells LF-4 and LF-5 to further assess the extent of VOC-affected ground water and to aid in locating a possible source for the VOCs found in these wells during Phase I of the Investigation. Reconnaissance soil-gas and shallow ground-water sampling locations are shown in Figures 16 and 17.

Soil-gas and ground-water samples were collected and analyzed in a mobile laboratory by Weston, Inc., under the supervision of a Levine·Fricke hydrogeologist. The samples were analyzed for VOCs, including 1,1,1-TCA, 1,1-DCA, and 1,1-DCE. Specific procedures that were followed during the soil-gas and shallow ground-water reconnaissance survey are discussed in Appendix B.

11.2 Installation of Six Monitoring Wells

Four shallow (20 to 22 feet deep) monitoring wells and two deeper (39 and 44 feet deep) monitoring wells were installed in the vicinity of wells LF-4 and LF-5 to better assess and monitor the lateral and vertical extent of the VOC-affected ground water found in wells LF-4 and LF-5 during Phase I of the Investigation.

Monitoring well locations are shown on Figure 18. The results of the soil-gas and shallow ground-water reconnaissance survey were used to select locations for the monitoring wells. Three of the shallow wells (LF-17, LF-18, and LF-19) were located southwest (downgradient) of well LF-4; one shallow well (LF-20) was located upgradient of wells LF-4 and LF-5. Deeper wells LF-4D and LF-5D were located within 10 feet of wells LF-4 and LF-5, respectively, to assess the quality of intermediate-depth ground water and to determine vertical hydraulic gradients at the Site.

The two deeper wells were double-cased to depths of 20 feet (LF-4) and 25 feet (LF-5) below grade to prevent possible downward migration of VOCs during well installation activities. These wells were screened at depth intervals of 29 to 39 feet, and 34 to 44 feet, respectively. Well construction data are summarized in Table 2.

Well (top of casing) elevations of the newly installed wells were surveyed to the nearest 0.01 foot relative to MSL by a State-licensed surveyor.

Details of well construction and well installation procedures are presented in Appendix B. Graphic illustration and lithologic description of sediments encountered in the Phase II well borings are shown in Figures C14 through C19 of Appendix C.

11.3 Development and Sampling of Newly Installed Monitoring Wells

The newly installed monitoring wells were developed and sampled as described in Section 4.6.2. Procedures followed during development and sampling are discussed in Appendix B. Water-quality parameters (pH, temperature, specific conductance and water clarity) measured during well development are presented in Table 5.

11.4 Additional Soil Sampling Conducted in Four Areas of the Site

Soil samples were collected at 25 additional locations for laboratory analysis in four areas of the Site. Soil samples were collected at six locations in the vicinity of wells LF-4 and LF-5, from depths of approximately 2, 5, and 8 feet below grade. Two samples from each borehole were submitted for chemical analysis for VOCs (EPA Method 8010); the remaining samples were held by the analytical laboratory pending results of the submitted samples. VOC concentrations in the soil samples were

monitored in the field using an OVA. Results of the field OVA monitoring were used to aid in selecting soil samples to be submitted for chemical analysis.

Soil sampling locations for VOCs were selected based on the results of the soil-gas survey performed in this area. Sampling locations and chemical analysis results are summarized in Figure 17.

Samples were collected for lead analysis from 11 locations in Area A from depths between 1 and 4 feet below grade to further assess the extent and distribution of lead in shallow soils in this area. Table 10 and Figure 19 summarize the lead analysis results of the additional samples collected in Area A.

Six samples were collected from three locations within 10 feet of Phase I sampling location B26 to assess the lateral and vertical extent of PCBs in this area. Sampling locations and chemical analysis results are summarized on Figure 20. Twelve samples were collected from six locations in the vicinity of Phase I sampling location C17 to assess the lateral and vertical extent of lead and zinc in shallow soils near location C17. Sampling locations and chemical analysis results for lead and zinc are summarized in Figure 21.

Soil sampling procedures are described in Appendix B.

11.5 Chemical Analyses of Ground-Water and Soil Samples

The ground-water samples collected from the six newly installed monitoring wells and the additional soil samples collected from four areas of the Site were transported for chemical analysis to Med-Tox Laboratory of Pleasant Hill, California, a State-certified laboratory.

The ground-water samples collected from the six newly installed monitoring wells were analyzed for VOCs using EPA Method 8010. One duplicate and one field blank sample was also analyzed by this method for quality assurance/quality control purposes.

The soil samples collected in the vicinity of wells LF-4 and LF-5 were analyzed for chlorinated VOCs using EPA Method 8010. Soil samples collected in Area A and in the vicinity of A5 were analyzed for total lead using EPA Method 7420. Soil samples collected in the vicinity of C17 were analyzed for total zinc and lead using EPA Methods 7420 and 7950, respectively. The soil samples collected in the vicinity of B26 were analyzed for PCBs using EPA Method 8080.

11.6 Shallow Ground-Water Survey in the Vicinity of Monitoring Well LF-9

A shallow ground-water survey was performed in the vicinity of monitoring well LF-9 to better assess the extent and thickness of floating product found at this location. During this survey, eight shallow boreholes were installed in the vicinity of LF-9 to depths of approximately 6 to 10 feet using hollow-stem auger drilling equipment. Two-inch diameter factory-slotted PVC casing was placed in each hole to keep the borehole from collapsing. The area was then secured so that the boreholes could remain open to allow floating product (if present) and ground water to enter the boreholes. Product thickness measurements were collected two weeks after installation of the boreholes and again four weeks following installation. Samples were collected from five of the eight boreholes from within the PVC casing and submitted to Friedman and Bruya, Inc., of Seattle, Washington, for fuel characterization.

12.0 PRESENTATION AND DISCUSSION OF THE RESULTS OF PHASE II OF THE ENVIRONMENTAL INVESTIGATION

The following discussion provides the results of Phase II of the Environmental Investigation, a discussion of these results, and a comparison of the significant results with regulatory limits or guidelines, when applicable.

12.1 Volatile Organic Compounds (Area A)

Soil-gas results are summarized in Figure 16; field data laboratory sheets generated during the soil-gas survey are contained in Appendix H.

Soil-gas sampling in the vicinity of wells LF-4 and LF-5 indicated slightly elevated (up to 26.12 ug/l) concentrations of VOCs in soil vapor in several locations near well LF-5. Soil-gas samples collected downgradient (southwest) of well LF-5 did not contain measurable concentrations of VOCs. Of some note, the soil-gas sample collected adjacent to well LF-4 did not contain measurable concentrations of VOCs, although a shallow ground-water sample from well LF-4 contained several hundred parts per billion of VOCs. This indicates poor correlation between soil-gas and underlying ground-water VOC concentrations and suggests that soil-gas sampling to track the lateral extent of the VOC-affected ground water was of limited value at the Site. However, locations containing measurable concentrations in soil gas could indicate the presence of VOCs in soils, and aid in identifying potential source areas for the VOCs detected in the shallow ground water.

Soil samples were collected from six locations identified during the soil-gas survey to contain slightly elevated concentrations of VOCs in soil gas near well LF-5. Soil sampling results are summarized in Table 8 and presented on Figure 17. Results of the

sampling and analysis (Figure 17) did not indicate significant concentrations of VOCs in the soil samples. Trace concentrations (less than 0.008 ppm) of 1,1-DCA and 1,1-DCE were detected in two locations (SS-23 and SS-25) approximately 150 feet northeast of well LF-5 at depths of 6 to 7 feet below grade. 1,1,1-TCA (0.002 ppm) was detected in the 2.5-foot depth sample collected from location SS-20, but was not detected in the 5.5-foot depth sample. Soil samples collected from the remaining three locations did not contain measurable concentrations of VOCs.

Results of the shallow ground-water reconnaissance survey, combined with the results of grab ground-water sampling in Area A during Phase I of the Environmental Investigation (Figure 18), indicated that the lateral extent of the VOC-affected ground water in the vicinity of wells LF-4 and LF-5 appeared to be limited to Area A. The locations of the shallow wells (LF-17, LF-18, LF-19, and LF-20) installed during Phase II of the Environmental Investigation were chosen based upon these results. Results of ground-water sampling and analysis of the Phase II wells suggested a limited downgradient lateral extent of VOC-affected ground water.

VOCs were not detected in upgradient shallow well LF-20 or deeper well LF-5D. Trace concentrations (0.009 ppm or less) of 1,1-DCA, 1,1-DCE, and 1,1,1-TCA were detected in wells LF-17, and a trace concentration of 1,1-DCE (0.003 ppm) was detected in LF-18. Concentrations of 1,1-DCA (0.007 ppm), 1,1-DCE (0.430 ppm), and 1,1,1-TCA (0.087 ppm) detected in well LF-4D were similar to concentrations of these compounds detected in well LF-4 during Phase I of the Investigation. Concentrations of 1,1-DCA (0.006 ppm), 1,1-DCE (0.150 ppm), and 1,1,1-TCA (0.034 ppm) in well LF-19 were lower than those detected in wells LF-4, LF-4D, and LF-5; however, the relative proportions of the compounds detected in well LF-19 are very similar to the relative proportions of the compounds detected in the other three wells, suggesting that this

area is part of the same plume. VOC concentrations exceeded State drinking water standards or Action Levels for one or more compounds in samples collected from LF-4D, LF-17, LF-19, and GW-3 (a grab sample).

The pattern and distribution of VOCs detected in ground water in Area A indicate that a band approximately 200 feet wide of VOC-affected ground water crosses beneath the central and western portions of Area A. The similarity in the relative proportions of the compounds detected suggests that VOC-affected ground water is continuous between wells LF-5 and LF-19.

These compounds were not detected in an off-site well located approximately 475 feet west (downgradient) of well LF-19, suggesting that VOC-affected ground water extends laterally somewhere between 800 and 1,200 feet downgradient of well LF-5.

Results indicated that the Phase II investigation of VOC-affected ground water was successful in characterizing the lateral extent of VOCs in ground water in this area. The vertical extent of VOC-affected ground water appears to be limited to shallow (less than 25 feet deep) ground water in the vicinity of wells LF-5/LF-5D. However, analytical results from ground water collected from well LF-4D indicate that deeper ground water may have been impacted by VOCs. Measured ground-water elevations in LF-4 and LF-4D were nearly equal, indicating no effective vertical ground-water gradient at this location. A slight upward ground-water gradient was measured at the locations of wells LF-5 and LF-5D (approximately 0.12 ft/ft), which would tend to limit downward migration to deeper ground-water zones of VOCs.

12.2 Lead (Area A)

Results of Phase II soil sampling and analysis for total lead are presented on Figure 19 and summarized in Table 10. With the

exception of the 4-foot depth sample collected from location SS-2 (Figure 19), lead concentrations in soil samples collected from the 11 Phase II sampling locations in Area A (SS-1 through SS-11) were equal to or less than 200 ppm. The 4-foot depth sample collected from location SS-2, located approximately 15 feet south of Phase I sampling location A5, contained 1,300 ppm of lead. (As discussed in Section 7.1, the 4-foot depth sample collected from location A5 contained 1,400 ppm lead). The 1-foot depth sample from this location (SS-2) contained only 7 ppm lead. Less than 50 ppm lead was detected in the samples collected from location SS-1, located 5 feet north of Phase I location A5.

The results of the sampling and analysis for lead suggest that a localized area of soil containing lead concentrations greater than 1,000 ppm is present at depths of 3 to 4 feet near location A5. However, additional sampling and analysis is necessary to further evaluate the volume of affected soil. As discussed in Section 9.1, current EPA guidelines for cleanup of lead-impacted soils generally range from 500 and 1,000 ppm; these guidelines have been or are currently being used for cleanup levels at a number of sites in the Bay Area. Based on these guidelines, soils in the vicinity of location A5 may require remediation. It should be noted that, at the present time, this area is capped by asphalt, which reduces the potential for erosion of the lead-affected soils in this area.

12.3 Polychlorinated Biphenyls (Area B)

Soil samples were collected for PCB analysis from three locations radially surrounding Phase I sampling location B26, located north of the Ransome Company construction yard. Concentrations of PCBs detected in near-surface samples (less than 1 foot deep) ranged between 0.92 and 7.5 ppm. PCBs were not detected in the 3-foot depth sample from location B26. The samples were collected from

within an area of slight visible oily staining to assess concentrations of PCBs in shallow soils within this stained area. Phase I location B25 was located outside this area. The shallow sample (1-foot depth) collected from B25 contained less than 0.3 ppm PCBs.

Results of sampling and analysis for PCBs conducted during Phase II of the Investigation indicated a limited extent of low concentrations of PCBs in shallow soils at depths less than 3 feet in the vicinity of location B26. Concentrations were below the OHEA 1 x 10^{-6} cancer risk value associated with PCB soil concentrations of 1 to 8 ppm. Assuming that the PCB results of the four samples collected from the stained area are representative of the shallow soils in this stained area, the PCBs in the soil do not appear to present a significant threat to human health. As discussed in Section 9.2, RWQCB staff has expressed concerns regarding the potential for erosion of PCB-containing soil into surface waters. To address this concern, it is recommended that the site development plan include measures to minimize surface soil erosion in this area by means such as paving the area or covering it with a building, landscaping, or a layer of low-permeability soil.

12.4 Lead and Zinc (Area C)

Nine samples collected from six locations in the vicinity of location C17 were analyzed for lead and zinc. Results of these analyses are summarized on Figure 21. With the exception of the surface sample (depth of 1 foot) collected from location SS-14, lead and zinc concentrations were less than 85 ppm and 185 ppm, respectively.

The surface sample collected from SS-14 contained 400 ppm of lead and 990 ppm of zinc; however, the 3.5-foot depth sample did not contain detectable concentrations of zinc and contained only 7

ppm lead. These concentrations are below the respective TTLCs for lead and zinc. The lead concentration is below the EPA interim cleanup level for lead of 500 to 1,000 ppm. Samples collected from locations within 10 feet of location C17 (SS-12 and SS-13) contained less than 50 ppm of lead and less than 75 ppm of zinc, indicating a limited extent of soil affected by high concentrations of lead and zinc. As the concentrations detected at Phase I location C17 exceeded TTLCs (see Section 9.1), limited soil remediation would likely be required at this location.

As discussed in Section 9.1, RWQCB staff has expressed concern regarding potential impact of erosion of lead-affected surface soils on surface-water quality. Site development plans should therefore include measures to minimize the potential for erosion of surface soils containing elevated concentrations of lead. This could be accomplished using methods such as covering affected areas with pavement, buildings, landscaping, or low-permeability soils.

12.5 Petroleum Hydrocarbons Near Well LF-9 (Area C)

Results of the shallow ground-water survey near well LF-9 are summarized on Figure 22. During the installation of the boreholes and PVC casing, the lithology of the sediments encountered was recorded. Sediments encountered consisted primarily of yellow-brown sandy, gravelly clay. An approximately 1-foot thick layer of well-sorted sand fill was observed in borings BB2, BB3, BB4, and BB7 at a depth of 2 to 3 feet below grade. This layer of fill appeared saturated with perched water which had a strong petroleum and/or creosote-like odor and an oily sheen.

Product thickness measurements were conducted 14 days and 31 days after installation of the boreholes. Ground water had equilibrated at a depth of about 2 feet below grade at each of

the locations. Floating product was not detected in any of the boreholes during either measuring event; however, a slight oily sheen was observed on the ground-water surface in locations BB6 and BB7.

Perched ground-water samples were collected from locations BB1, BB3, BB6, BB7, and BB8 for fuel characterization. No petroleum hydrocarbons were detected in the shallow ground water collected from location BB8. Fuel characterization results indicated a variable mix of petroleum hydrocarbons detected in the remaining samples. Results of the fuel characterization for samples collected from BB3, BB6, and BB7 indicated the presence of hydrocarbons similar to diesel and mineral spirits in the shallow ground-water samples. Also detected in the samples, according to the laboratory sheets of Friedman and Bruya, were a "broad mixture of compounds, including PNAs, phenols, fatty acids, or other biogenic compounds." Results of the sample collected from BB1 indicated 3 ppm of TPH in the hydrocarbon range of diesel, but was not identified as diesel. This sample was not further characterized but it is assumed to contain similar hydrocarbons as detected in adjacent samples.

As can be seen in Figure 22, the lateral extent of the petroleum hydrocarbon-affected area appears to be limited to the railroad track area, and appears to extend along the railroad tracks less than 40 feet west of well LF-9. The eastern extent of the petroleum hydrocarbons was not adequately defined during this investigation. Concentrations of TPH in the perched ground water generally ranged between 1 and 4 ppm.

Well LF-9 is located approximately 10 feet north of three underground fuel storage tanks at the Bashland property. As petroleum hydrocarbons were not detected in soils or ground water collected from borings located within 10 feet southwest (downgradient) of the tanks, it does not appear that the

petroleum hydrocarbons detected in the vicinity of well LF-9 are emanating from the underground tanks. The tanks reportedly were used to store diesel, gasoline, and possibly, lube oil. These compounds were not identified in the soil or ground-water samples collected near well LF-9.

The source of the petroleum hydrocarbons in the shallow soils and perched ground water in the vicinity of well LF-9 is not clearly defined; however, as this area is at the end of a railway spur, it is possible that the source might be spillage or disposal of freight materials onto the rail tracks. As the northern/eastern extent of affected ground water was not adequately characterized, it is also possible that the hydrocarbons may be coming from an off-site source. Additional investigation of this possibility may be warranted. Limited soil and perched ground-water cleanup also may be required in this area.

12.6 Volatile Organic Compounds Detected in Well LF-10 (Area C)

Further review of available files concerning hazardous releases and handling and storage practices of hazardous materials, and a telephone interview with Mr. Charles Wellnitz of Bay Area Warehouse Company, were conducted to aid in identifying a possible source for the VOCs detected in well LF-10.

The record review and interview did not indicate a likely source, based on current or past site usage, for the VOCs detected in well LF-10. The warehouse has been occupied by tenants who have used the warehouse to store hazardous materials (Table 2) and likely transported some of those materials by rail. The possibility exists that spillage of materials may have occurred along the railroad tracks during shipment and unloading. However, according to the telephone interview with Mr. Wellnitz on June 27, 1990, only dry goods, mostly talcum powder and cement, have been shipped to or from the warehouse (Bay Area

Warehouse) using rail transport. Liquid materials have generally been transported to the warehouse via truck and are offloaded to doors located along the southern and western sides of the building.

A State Superfund site, Electro Coatings, was identified approximately 450 feet northeast (upgradient) of well LF-10 at 1421 Park Street in Emeryville. According to DHS files, TCE (up to 520 ppm), PCE (up to 42 ppm), and 1,1,1-TCA (concentrations not identified in files) have been identified in the shallow ground water beneath the Electro Coatings site. The files did not indicate the extent of VOC-affected ground water at the Electro Coatings site, nor whether ground-water investigations or cleanup are currently being conducted.

During the drive-by inspection of the Site conducted in September 1989, several businesses in the area north and northwest of well LF-10 were observed to house 55-gallon drums and/or to conduct operations which potentially could use solvents (e.g., auto repair shops, manufacturing companies). Monitoring wells were observed at a site located approximately 200 feet upgradient (northeast) of well LF-10. Emeryville Fire Department, RWQCB, and DHS files did not contain information concerning the presence or use of these wells. Alameda County Health Services Agency files could not be obtained for review within the time frame of Phase II of the Investigation to check if there had been any recently reported releases of hazardous materials in this area. No other potential sources were identified in Kaldveer's review of related chemical release or contamination cases. However, Sanborn Fire Insurance maps indicate that the area north of the Site has historically been heavily industrialized; therefore, numerous potential sources of VOCs may have existed in this area.

13.0 QUALITY ASSURANCE

Quality assurance (QA) procedures for the Phase I and Phase II soil and ground-water sampling included both laboratory and field procedures. Laboratory QA procedures included analyzing method blanks, surrogates, and duplicate matrix spikes. Field QA procedures included collecting field blank samples during each day of sampling, and collecting a quantity of duplicate samples amounting to 10 percent of the total number of ground-water samples. Both laboratory and field QA measures indicated acceptable quality for the analytical data. Quality assurance data (i.e., analytical results of field blanks and duplicates) are summarized in Table 7 and contained in Appendix F.

Field blanks were collected prior to sampling wells LF-10, LF-5, LF-4, LF-1 (Phase I), and LF-5D (Phase II). Field blanks were analyzed for TPH and VOCs (using EPA Methods 8015 and 624, respectively). No TPH or VOCs were detected in the field blanks submitted for analysis. Duplicate samples were collected from wells LF-6 (Phase I) and LF-20 (Phase II). Results of field duplicate samples indicated good reproducibility of results.

An internal review of the QA data and an audit performed by Med-Tox Associates indicated that all quality control criteria were met for the laboratory data generated during Phase I and Phase II of the Investigation. A letter certifying this audit is included in Appendix E.

14.0 CONCLUSIONS AND RECOMMENDATIONS

14.1 Conclusions

Soil and ground-water sampling conducted during Phase I of the Environmental Investigation indicated that the Site generally has not been significantly environmentally impacted by previous usage. However, some areas of potential environmental concern were identified and additional investigation was recommended. These included:

- ground water affected by VOCs in the vicinity of wells LF-4 and LF-5 in Area A
- slightly elevated concentrations of lead in shallow soils in Area A
- slightly elevated concentrations of PCBs in shallow soils at location B26 in Area B
- lead- and zinc-affected shallow soil observed at location C17 in Area C
- petroleum hydrocarbons observed in soil and perched water in the vicinity of well LF-9 in Area C
- VOCs detected in ground water from well LF-10 and other wells located along the upgradient northern boundary of the Site in Area C
- petroleum hydrocarbons and BTXE compounds detected in soil and ground water at the Ransome Company construction yard in Area B and additional areas of soil staining.

The objective of Phase II of the Environmental Investigation was to better assess the lateral and vertical extent of these potential areas of environmental concern.

As discussed in Sections 7.3 and 7.4, concentrations of BTXE and TPH were detected in soils and ground water at the Ransome Company construction yard above the investigation and cleanup guidelines generally applied by regulatory agencies. The presence of these compounds in the subsurface appears to be associated with possible leakage from the former underground storage tanks. Additional investigation and possible remediation of soils and ground water should be conducted at the Ransome Company construction yard. Specific recommendations concerning further investigation and remediation of this area are presented in Appendix I. This work has reportedly been initiated by the Ransome Company itself and therefore was not conducted by Levine·Fricke during Phase II of the Investigation.

Additional review of background and regulatory files was conducted during Phase II of the Investigation to better assess possible sources of VOCs detected in well LF-10 and in other wells along the upgradient boundary of Area C. Soil-gas, soil, and ground-water sampling, and chemical analyses were also conducted during Phase II of the Environmental Investigation and successfully characterized the remaining areas of concern. Phase II sampling and analyses results indicated the following:

- The lateral extent of VOCs in shallow ground water in the vicinity of wells LF-4 and LF-5 in Area A appears to be limited to a band approximately 200 feet wide (north-south) and about 800 to 1,200 feet long (east-west). Additional sampling of wells LF-4D and LF-5D and possible additional investigations are needed to verify results and further assess the vertical extent of the VOCs.

- A source for the VOCs in Area A could not be identified based on results of the soil-gas survey or soil sampling.

- Concentrations of lead greater than the EPA interim cleanup guideline for protection of human health of 500 to 1,000 ppm in Area A appear to be limited to a small area (approximately 20 feet by 20 feet) including and south of Phase I sampling location A5. However, additional investigation is necessary to further evaluate the volume of affected soil.

- PCB concentrations detected in soils in the vicinity of soil boring B26 ranged from 0.3 to 7.3 ppm, within the range of concentrations identified by the EPA as corresponding to a potential cancer risk of 1×10^{-6} or less, which is generally considered by regulating agencies to represent an acceptable risk level to protect human health. The affected soils are limited vertically to a depth of 3 feet.

- Elevated concentrations of lead (greater than 500 ppm) and zinc (greater than 1,000 ppm) in soils near soil boring C17 appear to be limited to an approximately 10-foot by 10-foot area and a depth of less than 3 feet.

- Petroleum hydrocarbons in shallow soils and perched ground water in the vicinity of well LF-9 likely are limited to the rail line area. Based on sampling results from LF-9, the petroleum-affected soil and ground water appear to have limited impact on shallow ground water below the perched water zone. No specific on-site source was identified, although prior shipping and handling of materials along the rail line may have introduced petroleum into the subsurface. Alternatively, there may be an off-site source. Additional investigation would be necessary to

further evaluate the northern and eastern boundaries of the affected area and check for a possible off-site source.

- No sources of VOCs detected in well LF-10 could be confirmed through additional records review or the tenant interview. Electro Coating, located approximately 450 feet northeast of well LF-10, appears to be the most likely source of the compounds based on the information available, but insufficient data regarding ground-water contamination associated with the Electro Coatings site have been available to date to verify this assumption. Because the Bay Area Warehouse Company building, located adjacent to LF-10, has been used for storage of hazardous materials, it is possible, although not likely, that materials were spilled on the railroad tracks and that an on-site source of the VOCs may exist.

14.2 Recommendations

14.2.1 SOIL REMEDIATION

Based on these results and regulatory guidelines discussed in Section 9.0, soil cleanup may be required at three locations on the Site. These locations are:

- in the vicinity of location A5 in Area A to remediate lead detected in shallow soils in this area

- in the vicinity of location C17 in Area C to remediate the lead and/or zinc detected in shallow soils in this area

- near well LF-9 to remediate elevated concentrations of petroleum hydrocarbons detected in soil and perched ground water in this area.

In addition, in order to address RWQCB concerns regarding potential impacts on surface-water quality due to erosion of surface soils, measures to mitigate soil erosion such as covering of areas affected by elevated concentrations of metals (lead and zinc), TPH, and PCBs with buildings, paving, low permeability soils, or landscaping are recommended to be included in the development plan for the Site.

14.2.2 ADDITIONAL INVESTIGATION/MONITORING

Additional investigation may be required to further define the northerly and easterly extents of petroleum hydrocarbons in ground water on the Site in the vicinity of well LF-9. Additional investigation is also necessary to further evaluate the volume of lead-affected soils in the vicinity of A-5.

As discussed above, soil in several apparently isolated areas was observed during Phase I of the Investigation to contain heavy fraction petroleum hydrocarbons (characterized as oil) at concentrations above 1,000 ppm. While ground water beneath the Site does not appear to have been significantly impacted by petroleum-affected soils (with the exception of the Ransome Company construction yard), further investigation and possible remediation of these soils (or periodic ground-water quality monitoring) will likely be required by regulatory agencies. Due to the very low mobility of oil in soils, the presence of silty clays to aid in mitigating vertical migration, and the shallow and apparently limited extent of TPH as oil in soils, and the fact that TPH concentrations in ground water in these areas were low (1 ppm or less) or not detected, soil containing less than 1,000 ppm TPH as oil does not appear to threaten the environment or human health.

Periodic ground-water monitoring of well LF-10 in Area C and VOC-affected wells in Area A is recommended to monitor possible changes in distribution or concentrations of the VOCs in these locations. Additionally, if no confirmatory information as to the possible source(s) of VOCs detected in well LF-10 and vicinity is obtained through further records search, additional soil and ground-water investigation in the area of well LF-10 may be prudent to evaluate the presence of potential off-site sources.

As discussed above, VOC concentrations detected in shallow ground water in Area A were above drinking water standards in several locations. The lateral extent of the affected ground water in Area A appears to be relatively limited, and to be contained on site. Elevated concentrations of VOCs detected in the intermediate-depth well LF-4D (screened from approximately 30 to 40 feet below grade) suggest that some vertical migration of VOCs has occurred at this location. Resampling of wells LF-4/LF-4D and LF-5/LF-5D should be performed to verify the results of the initial sampling and analysis. Additional monitoring of deeper ground-water zones in the vicinity of wells LF-4/LF-4D is necessary to further evaluate the vertical extent of VOCs in this area. Specific requirements for ground-water monitoring and/or remediation in this area should be discussed with the RWQCB following completion of this additional evaluation, and the appropriate water-quality standards to be applied at the Site should be established. At a minimum, periodic ground-water monitoring will be required to observe possible changes in the concentrations and/or distribution of VOCs in the shallow and intermediate ground-water zones. Finally, additional investigation of soil and ground water should be conducted in the area northwest of LF-5 as a further attempt to identify a potential source for the VOCs in this area.

The low concentrations of pyrene and VOCs detected in shallow soil in Areas A and C and herbicides detected in Areas A, B, and C do not appear to present a threat to human health or the environment. However, collection and analysis of ground-water samples from locations in the vicinity of the railroad tracks where herbicides were detected in soil may be warranted to document that ground-water quality has not been affected by these compounds.

Finally, underground storage tanks in each area of the Site should be properly closed prior to development of the area.

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TABLE 1A

HISTORICAL SITE FEATURES

AREA A

a. oil warehouse

b. iron and brass foundry

c. storage

d. waste room/scrap bins

e. sandblasting

f. store room

g. machine shop, auto and bus repair

h. blacksmith shop

i. water tank

j. lumber shed

k. iron storage, iron shop, bins, lumber shed

l. storage

m. 9,000-gallon oil tank (possibly underground)

n. engine room

o. lumber shed, storage shed

p. sheet metal workshop

q. planing mill, car repairing

r. car repairing

s. transfer table runway

t. car painting, paint, varnishing and oil storage room; car washing and reparing

u. auto wrecking yard

v. auto storage

w. electric printing

TABLE 1A

HISTORICAL SITE FEATURES

AREA B

Building 1 - office

Building 2 - machine maintenance shop

Building 3 - oil storage

Building 4 - storage shed

Building 5 - storage shed

Building 6 - butane and propane cyclinder filling

Building 7 - steam cleaning shed

Building 8 - lavatory

a. open steel rock bunker

b. concrete oil tank - underground

c. steel asphalt banks

d. cement storage

e. boiler house, 3 asphalt mixers

f. sand dryer

g. asphalt kettles, mixer

h. asphalt tank (7,722-gallon)

i. butane control

j. underground tanks

k. underground tanks

l. incinerator

m. electric company old pole yard

n. freight depot

o. passenger station

p. SS-1 tank

q. waste oil tank

TABLE 1A

HISTORICAL SITE FEATURES

AREA C

a. oil tank (possibly underground)

b. well/pump

c. water tank

d. machine shop

e. label room, chemical storage

f. box printing

g. chemical storage

h. 55-gallon drum storage

i. junk/debris/materials storage or disposal

j. junk/debris/materials storage or disposal

k. junk/debris/materials storage or disposal

l. paint storage

m. pump and air compressor

n. truck washing

o. incinerator

p. oil house

q. auto warehouse and service shop

r. Western Electric Co. warehouse

s. American Fuel Co. Yard - coal storage

TABLE 1

CITY DIRECTORY LISTINGS OF OCCUPANTS
YERBA BUENA SITE

==========

LDS Truck Lines - 1268 Yerba Buena Avenue (formerly 40th Street)

1974 - Republic Carloading, Republic Freight (1)
1978 - Coast Carloading (1)
Springmeier Shipping (1)
Westransco Freight (1)
1983 - Clipper Carloading (1)
Westransco Freight (1)
Apollo Transport Satellite Systems
1986 - Clipper Carloading (1)
Westransco Freight (1)
A & B Transportation
Coast Truck Rental (1270 Yerba Buena Avenue)

Bay Area Warehouse - 4001 Hollis Street

1967 - Vendo Stoner Co. (manuf. vending machines)
Bay Cities Warehouse
1974 - Bay Cities Warehouse
Eureka Vacuum Cleaner
Pennsylvania Independant Chemical
1978 - Bay Area Warehouse
Lipscomb Chemical
1983 - Bay Area Warehouse
Lipscomp Chemical
Park Rubber Co.
1986 - Bay Area Warehouse
Lipscomb Chemical
TCR Industries

Bashland Company - 4015 Hollis Street

1967 - Santa Fe Garage
1978 - Santa Fe Transportation
1983 - Santa Fe Transportation
1986 - Bashland, Inc.

TABLE 1

CITY DIRECTORY LISTINGS OF OCCUPANTS
YERBA BUENA SITE

==========

Ransome Company - 4030 Hollis Street

1967 - Ransome Co.
1974 - Ransome Co.
1978 - Ransome Co.
1983 - Ransome Co.
Label Concepts
1986 - Ransome Co.

M & N Truck Lines - 1549 40th Street

No listings on 40th Street or Beach Street

==========

Notes:

(1) Tentative occupant only - no address was provided in the City Directory for this listing

TABLE 2

POTENTIAL SOURCES OF CHEMICAL SUBSTANCES

POTENTIAL SOURCE	SUSPECTED CHEMICAL SUBSTANCES
Area A	
Underground tank at Clipper Exxpress	Diesel fuel
Oil warehouse	Petroleum hydrocarbons
Machine shop	Metals, solvents, petroleum hydrocarbons
Blacksmith shop	Metals, petroleum hydrocarbons
Underground oil tank	Petroleum hydrocarbons
Engine room	PCBs, petroluem hydrocarbons
Car repairing and painting	PCBs, solvents, metals
Auto and bus repair	Petroluem hydrocarbons, solvents, metals
Auto wrecking yard	Metals, petroleum hydrocarbons, lead
Electric printing	Metals, solvents, PCBs
Demolition of historical buildings	Asbestos
Area B - Ransome Site	
Asphalt batch plants	PNAs
Concrete oil tank	Petroleum hydrocarbons
Electric Company pole yard	PNAs
Underground fuel and waste oil tanks	Petroleum hydrocarbons, BTXE
Auto repair	Petroleum hydrocarbons, solvents, metals
Metalworking	Metals, petroleum hydrocarbons, solvents
Printing shop	Metals, solvents
Demolition of insulated above-ground asphalt tanks	Asbestos
Machine shop/vehicle repair	Solvents, petroleum hydrocarbons, metals
Oil storage	Petroleum Hydrocarbons
Spraying of SS-1, waste oil	Petroleum hydrocarbons, PNAs
Discharge to drains and storm sewers	Solvents, petroleum hydrocarbons, metals
Spray painting, storage of paints and thinners	Solvents, metals
Incinerator	Metals, PNAs
Area B - LDS Site	
Possible former underground tank	Petroleum hydrocarbons
Possible chemical storage area	Petroleum hydrocarbons, PCBs, solvents, BNAs

TABLE 2

POTENTIAL SOURCES OF CHEMICAL SUBSTANCES

POTENTIAL SOURCE	SUSPECTED CHEMICAL SUBSTANCES
Area C - Bay Area Warehouse Site	
Spray painting, paint storage	Solvents, metals
Oil house	Petroleum hydrocarbons
Auto service shop	Petroleum hydrocarbons, metals, solvents
Incinerator	Metals, PNAs
Underground diesel tank	Petroleum hydrocarbons
Vending machine manufacture	Metals, petroleum hydrocarbons, solvents, BNAs
Chemical companies	Metals, VOCs, BNAs
Rubber company	Petroleum hydrocarbons, VOCs, BNAs
Area C - Bashland Site	
Underground storage tanks	Petroleum hydrocarbons
Area C - M & N Site	
Fruit canning	Caustics
Oil tank	Petroleum Hydrocarbons
Paint house	Metals, solvents
Box printing	Metals, solvents, PCBs
55-gallon drum storage	Metals, solvents, petroleum hydrocarbons
Chemical storage	Metals, solvents, corrosive compounds
Asphalt roofing	PNAs
Possible underground tank	Petroleum hydrocarbons
Area C - Truck Trailer Yard	
Coal storage	PNAs
Area C - Track Areas	
Trash and debris dumping	Metals, petroleum hydrocarbons, solvents, semi-volatile organics

TABLE 2

POTENTIAL SOURCES OF CHEMICAL SUBSTANCES

POTENTIAL SOURCE	SUSPECTED CHEMICAL SUBSTANCES
Yerba Buena Right-of-Way	
Oily stains on tracks	Petroleum hydrocarbons, metals
Possible application of herbicides on tracks	Petroleum hydrocarbons, lead, mercury, chlorinated herbicides
Trash and debris dumping	Metals, petroleum hydrocarbons, solvents, BNAs

Explanations of Abbreviations:
PNA = Polynuclear Aromatic Hydrocarbons
PCB = Polychlorinated Biphenyls
BTXE = Benzene, Toluene, Xylenes, Ethylbenzene
BNA = Base-Neutral and Acid Extractable Compounds
VOC = Volatile Organic Compounds

TABLE 3A

SUMMARY OF SOIL SAMPLES AND CHEMICAL ANALYSES
AREA A
YERBA BUENA PROJECT SITE, EMERYVILLE, CALIFORNIA

		ORGANIC COMPOUNDS						PETROLEUM HYDROCARBONS			INORGANIC COMPOUNDS			
Sample Location	Sample Depth	VOCs (8240)	BNAs (8270)	PCBs (8080)	PNAs (8100)	Herbicides (8150)	BTXE (8020)	TPH gas (8015)	TPH diesel/ waste oil (8015)	Total Extract-ables (SM 503E)	CAM-13 Metals	Lead	Asbestos	pH
A1	14.0						1	1	1			1		
	17.5						1	1	1			1		
A5	2.0	1	1						1		1			
	3.5	1	1						1		1			
A6	1.5			1					1		1		1	
	25.0	1									1			
A7	5.5								1		1			
A8	2.0			1					1		1			
	4.5			1					1		1			
A9	1.5										1			
	4.5			1					1		1			
A10	4.5										1			
A11	4.0	1	1						1		1		1	
A12	4.0			1					1		1			
	3.5			1	1	1			1		1			
A13	1.0										1			
	4.0			1					1		1			
A14	5.5								1		1			
	19.5	1												
A15	3.0		1								1			
	4.5	1	1						1		1			
	9.5	1	1						1					
A16	1.0												1	
	4.0				1				1		1		1	
A17	1.0										1		1	
	4.0			1							1		1	
A18	4.0	1	1					1			1			
A19	1.0			1										
	3.0			1	1				1		1			1
A20	1.0										1			
	2.5								1		1			1
A21	2.5								1		1			
A22	1.0			1					1		1			
	4.0			1					1		1			
A23	3.0	1	1			1			1		1			
A24	3.5						1	1	1					
	17.0						1	1	1			1		

*Collect sample at this depth and hold for possible future analysis.

NOTES TO TABLE 3A:

Abbreviations: VOC = Volatile Organic Compounds
BNA = Base/Neutral Acid Extractables
PCB = Polychlorinated Biphenyls
PNA = Polynuclear Aromatic Hydrocarbons
BTXE = Benzene, Toluene, Xylenes, Ethylbenzene
TPH = Total Petroleum Hydrocarbons

TABLE 3B

SUMMARY OF SOIL SAMPLES AND CHEMICAL ANALYSES
(AREA B)
YERBA BUENA PROJECT SITE, EMERYVILLE, CALIFORNIA

		ORGANIC COMPOUNDS							PETROLEUM HYDROCARBONS			INORGANIC COMPOUNDS			
Sample Location	Sample Depth	VOCs (8240)	BNAs (8270)	PCBs (8080)	PNAs (8100)	PCP (8040)	Herbicides (8150)	BTXE (8020)	TPH gas (8015)	TPH diesel/ waste oil (8015)	Total Extract-ables (SM 503E)	CAM-13 Metals	Lead	Asbestos	pH
B1	4.0		1							1		1			
B2	4.0	1	1							1		1			
B3	1.5				1					1					
B4	3.0	1							1	1					
	7.5	1							1	1					
B5	5.0	1	1							1					
B6	4.0		1							1		1			
B7	1.5		1							1		1			
B8	3.5	1	1							1		1			
B9	1.5		1				1			1		1			
	4.5						1								
B10	4.5	1	1							1		1			
B11	1.5				1		1			1		1			
	4.5						1								
B12	3.5	1	1				1			1		1			
B13	9.5								1	1					
B14A	4.0							1	1	1					
	9.0							1	1	1					
B14B	4.0							1	1	1					
	7.5							1	1	1					
B15	4.0	1	1					1	1	1					
	9.0							1	1	1					
B16	3.5				1				1		1	1			
	9.5				1			1	1		1	1			
B17	4.0	1							1	1	1				
	9.0							1	1	1					
B18	4.0										1				
B19	1.0				1						1	1			
	5.0			1	1						1	1			
B20	4.0				1						1				
B21	1.0				1						1	1			
	4.0				1						1				
	7.5				1						1				
B22	1.5		1	1					1	1			1		
B24	4.0									1					
	8.5				1					1					
B25	1.0			1								1			
	3.5									1		1			
B26	0.5			1											
	3.5			1	1					1		1			
B27	3.5	1		1					1	1		1			

TABLE 3B

SUMMARY OF SOIL SAMPLES AND CHEMICAL ANALYSES
(AREA B)
YERBA BUENA PROJECT SITE, EMERYVILLE, CALIFORNIA

		ORGANIC COMPOUNDS							PETROLEUM HYDROCARBONS			INORGANIC COMPOUNDS			
Sample Location	Sample Depth	VOCs (8240)	BNAs (8270)	PCBs (8080)	PNAs (8100)	PCP (8040)	Herbicides (8150)	BTXE (8020)	TPH gas (8015)	TPH diesel/ waste oil (8015)	Total Extract-ables (SM 503E)	CAM-13 Metals	Lead	Asbestos	pH
B29	3.0	1							1	1		1			
	4.5	1							1	1		1			
B30	2.0	1								1					
	4.0	1		1					1	1		1			
B31	2.0	1								1		1			
	5.5	1								1					
B32	1.5			1					1	1					
	10.0								1	1					
B33	2.0	1							1	1					
	10.0	1							1	1					
B34	3.5	1	1	1						1		1			
B35	1.5											1			
	4.0	1	1							1		1			

*Collect sample at this depth and hold for possible future analysis.

NOTES:

Abbreviations: VOC = Volatile Organic Compounds
BNA = Base/Neutral Acid Extractables
PCB = Polychlorinated Biphenyls
PNA = Polynuclear Aromatic Hydrocarbons
PCP = Pentachlorophenol
BTXE = Benzene, Toluene, Xylenes, Ethylbenzene
TPH = Total Petroleum Hydrocarbons

TABLE 3C

SUMMARY OF SOIL SAMPLES AND CHEMICAL ANALYSES
AREA C (EXCLUDING THE YERBA BUENA RIGHT-OF-WAY)
YERBA BUENA PROJECT SITE, EMERYVILLE, CALIFORNIA

		ORGANIC COMPOUNDS							PETROLEUM HYDROCARBONS			INORGANIC COMPOUNDS			
Sample Location	Sample Depth	VOCs (8240)	BNAs (8270)	PCBs (8080)	PNAs (8100)	PCP (8040)	Herbicides (8150)	BTXE (8020)	TPH gas (8015)	TPH diesel/ waste oil (8015)	Total Extract-ables (SM 503E)	CAM-13 Metals	Lead	Asbestos	pH
C1	1.0											1			
	4.0				1							1			
C2	1.0				1							1			
	4.0											1			
C4	4.0				1					1		1			
C5	4.0	1	1							1		1			
C6	1.0			1								1			
	3.0			1						1		1			
C8	4.0	1	1							1		1			
C9	3.5							1	1	1			1		
	9.0							1	1	1			1		
C10	4.0							1	1	1			1		
	9.5							1	1	1			1		
C11	4.0								1	1					
C12	3.5	1	1							1		1			
C13	3.0									1		1			
C14	4.0									1		1			
C15	0.5											1		1	
	4.0		1	1						1		1		1	
	9.5	1													
C17	1.0	1	1							1		1			1
	4.0	1	1							1		1			1
	9.0	1	1							1		1			1
C18	2.0											1			
	3.5	1	1							1		1			1
C19	4.0	1	1					1	1	1					
C20	3.0							1	1	1			1		
C21	1.0			1								1			
	4.0	1	1									1			1
	8.0	1	1									1			1
	13.0	1	1									1			1
C23	10.0	1	1							1		1			1
C24	3.5	1	1												
	10.0	1	1									1			
C25	4.5	1	1							1		1			
C26	3.0	1	1							1		1			
C28	4.0							1	1	1					

*Collect sample at this depth and hold for possible future analysis.

NOTES TO TABLE 3C

Abbreviations: VOC = Volatile Organic Compounds
BNA = Base/Neutral Acid Extractables
PCB = Polychlorinated Biphenyls
PNA = Polynuclear Aromatic Hydrocarbons
PCP = Pentachlorophenol
BTXE = Benzene, Toluene, Xylenes, Ethylbenzene
TPH = Total Petroleum Hydrocarbons

TABLE 3D

SUMMARY OF PROPOSED SOIL SAMPLES AND CHEMICAL ANALYSES
MONITORING WELL LOCATIONS
YERBA BUENA PROJECT SITE, EMERYVILLE, CALIFORNIA

		ORGANIC COMPOUNDS							PETROLEUM HYDROCARBONS			INORGANIC COMPOUNDS			
Sample Location	Sample Depth	VOCs (8240)	BNAs (8270)	PCBs (8080)	PNAs (8100)	PCP (8040)	Herbicides (8150)	BTXE (8020)	TPH gas (8015)	TPH diesel/ waste oil (8015)	Total Extract-ables (SM 503E)	CAM-13 Metals	Lead	Asbestos	pH
LF-1	1.5	1	1						1*	1		1			
LF-2	3.5	1	1						1*	1		1			
LF-4	4.0	1	1						1	1		1			
LF-5	4.0	1	1				1			1		1			
LF-6	4.5	1	1						1	1					
LF-7	7.5							1	1	1					
LF-8	3.0	1	1				1								
LF-8	10.0	1							1	1					
LF-10	4.5	1	1									1			
LF-11	1.5		1									1			
	4.0	1	1									1			
LF-12	4.5	1	1						1	1		1			

*Collect sample at this depth and hold for possible future analysis.

NOTES:

Abbreviations: VOC = Volatile Organic Compounds
BNA = Base/Neutral Acid Extractables
PCB = Polychlorinated Biphenyls
PNA = Polynuclear Aromatic Hydrocarbons
PCP = Pentachlorophenol
BTXE = Benzene, Toluene, Xylenes, Ethylbenzene
TPH = Total Petroleum Hydrocarbons

TABLE 3E

SUMMARY OF GROUND-WATER SAMPLES AND CHEMICAL ANALYSES
MONITORING WELL LOCATIONS, AREAS A, B, AND C
YERBA BUENA PROJECT SITE, EMERYVILLE, CALIFORNIA

	ORGANIC COMPOUNDS							PETROLEUM HYDROCARBONS			INORGANIC COMPOUNDS			
Sample Location	VOCs (8240)	BNAs (8270)	PCBs (8080)	PNAs (8100)	PCP (8040)	Herbicides (8150)	BTXE (8020)	TPH gas (8015)	TPH diesel/ waste oi (8015)	Total Extract-ables (SM 503E)	CAM-13 Metals	Lead	Asbestos	pH
LF-1	1	1						1	1		1			
LF-2	1	1						1	1		1			
LF-3	1	1						1	1		1			
LF-4	1	1						1	1		1			
LF-5	1	1						1	1		1			
LF-6	1	1						1	1		1			
LF-7	1	1						1	1		1			
LF-8	1	1						1	1		1			
LF-9	1	1						1	1		1			
LF-10	1	1						1	1		1			
LF-11	1	1						1	1		1			
LF-12	1	1						1	1		1			
LF-16	1	1						1	1		1			

*Collect sample at this depth and hold for possible future analysis.

NOTES:

Abbreviations: VOC = Volatile Organic Compounds
BNA = Base/Neutral Acid Extractables
PCB = Polychlorinated Biphenyls
PNA = Polynuclear Aromatic Hydrocarbons
PCP = Pentachlorophenol
BTXE = Benzene, Toluene, Xylenes, Ethylbenzene
TPH = Total Petroleum Hydrocarbons

TABLE 3F

SUMMARY OF GRAB GROUND-WATER SAMPLES AND CHEMICAL ANALYSES
SOIL BORINGS, AREAS A, B, AND C
YERBA BUENA PROJECT SITE, EMERYVILLE, CALIFORNIA

	ORGANIC COMPOUNDS							PETROLEUM HYDROCARBONS			INORGANIC COMPOUNDS			
Sample Location	VOCs (8240)	BNAs (8270)	PCBs (8080)	PNAs (8100)	PCP (8040)	Herbicides (8150)	BTXE (8020)	TPH gas (8015)	TPH diesel/ waste oi (8015)	Total Extract-ables (SM 503E)	CAM-13 Metals	Lead	Asbestos	pH
A6	1										1			
A15	1	1							1					
A24	1	1					1	1	1		1			
B3									1					
B4	1							1	1					
C10							1	1				1		
C15	1										1			
C18								1	1		1			1
C20							1	1				1		1
C26	1	1												
C28							1	1						
C29	1							1	1					
LF9G	1	1						1	1					

*Collect sample at this depth and hold for possible future analysis.

NOTES:

Abbreviations: VOC = Volatile Organic Compounds
BNA = Base/Neutral Acid Extractables
PCB = Polychlorinated Biphenyls
PNA = Polynuclear Aromatic Hydrocarbons
PCP = Pentachlorophenol
BTXE = Benzene, Toluene, Xylenes, Ethylbenzene
TPH = Total Petroleum Hydrocarbons

TABLE 4

WELL CONSTRUCTION AND
GROUND-WATER ELEVATION DATA
YERBA BUENA, EMERYVILLE, CALIFORNIA
(all elevations in feet above mean sea level)

WELL NO.	WELL ELEV.	WELL DEPTH (feet)	SCREENED INTERVAL (feet)	GROUND-WATER ELEVATION 23-Feb-90	GROUND-WATER ELEVATION 23-Apr-90
LF-1	29.74	21	11-21	20.85	20.17
LF-2	30.36	22	11.5-21.5	26.10	25.84
LF-3	25.29	25	14.5-24.5	15.19	13.79
LF-4	26.09	20	9.5-19.5	14.98	13.89
LF-4D	26.20	39	29-39	NI	13.82
LF-5	27.01	25	10-25	16.15	14.69
LF-5D	27.09	44	34-44	NI	16.48
LF-6	18.12	19.5	9.5-19.5	10.57	9.46
LF-7	37.94	22	8-18	30.73	29.72
LF-8	29.70	18	7.5-17.5	23.65	--
LF-9	14.59	15.5	5.5-15.5	11.77	11.49
LF-10	14.09	22.5	7.5-22.5	10.00	--
LF-11	10.06	20.5	10.5-20.5	8.18	7.56
LF-12	8.18	16	5.5-15.5	2.54	1.55
LF-13	9.19	20	5-20	5.09	2.99
LF-14	14.56	18	5.5-15.5	8.26	7.16
LF-16	17.56	20	5-20	11.58	--
LF-17	25.60	20.5	10-20	NI	11.89
LF-18	28.48	20.5	10-20	NI	12.85
LF-19	20.88	20.5	10-20	NI	9.70
LF-20	33.24	20.5	7-22	NI	22.06

Notes:

NI - Well not installed at time of water level measurement
-- - Well not accessible at time of water level measurement

TABLE 5

WATER-QUALITY PARAMETERS MEASURED DURING SAMPLING
FEBRUARY and APRIL 1990

Well No.	Date Sampled	Volume Extracted (gallons)	pH (s.u.)	Specific Conductance (micromhos per cm)	Temperature (Deg C)	Water Clarity
LF-1	5-Feb-90	80	6.55	669	20.5	clear
LF-2	6-Feb-90	104	7.08	1087	21.3	clear
LF-3	6-Feb-90	77	6.82	1060	18.7	turbid
LF-4	7-Feb-90	60	6.79	760	19.9	moderately turbid
LF-5	6-Feb-90	78	6.88	889	21.0	slightly turbid
LF-6	7-Feb-90	80	6.86	582	17.9	moderately turbid
LF-7	8-Feb-90	61	6.85	867	18.6	moderately turbid
LF-8	7-Feb-90	80	6.69	568	18.4	moderately turbid
LF-9	8-Feb-90	90	7.26	800	18.5	turbid
LF-10	8-Feb-90	130	6.65	1275	18.7	turbid
LF-11	9-Feb-90	130	6.96	941	17.7	turbid
LF-12	23-Feb-90	80	6.89	1793	19.2	clear
LF-4D	25-Apr-90	220	6.67	1057	18.0	slightly turbid
LF-5D	26-Apr-90	124	7.13	718	21.9	slightly turbid
LF-16	23-Feb-90	35	6.81	699	19.9	slightly turbid
LF-17	25-Apr-90	50	6.72	834	17.7	slightly turbid
LF-18	25-Apr-90	26	6.87	1056	19	slightly turbid
LF-19	25-Apr-90	66	6.60	1025	19.7	clear
LF-20	26-Apr-90	98	6.34	827	18.4	turbid

TABLE 6A

METAL COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Sb	As	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Tl	Zn
A1	A1(14)C	22-Jan-90	14.0	NA	NA	NA	NA	NA	NA	6	NA	NA	NA	NA	NA	NA
A1	A1(17.5)C	22-Jan-90	17.5	NA	NA	NA	NA	NA	NA	5	NA	NA	NA	NA	NA	NA
A5	A5(2)A	24-Jan-90	2.0	ND	6.9	0.5	0.6	42	51	100	ND	40	ND	ND	ND	110
A5	A5(3.5)B	24-Jan-90	3.5	ND	3.6	0.4	2.8	58	49	1400	1.9	27	2	ND	ND	200
A6	A6(1.5)B	23-Jan-90	1.5	ND	3.7	0.5	0.3	27	27	72	0.4	27	3	ND	ND	99
A6	A6(25)C	24-Jan-90	25.0	ND	6	0.3	0.2	42	17	5	ND	50	ND	ND	ND	39
A7	A7(5.5)B	24-Jan-90	5.5	ND	4.8	0.4	ND	28	16	6	ND	36	2	ND	ND	36
A8	A8(2)A	24-Jan-90	2.0	ND	4.4	0.7	0.2	47	20	7	ND	44	ND	ND	ND	47
A8	A8(4.5)B	24-Jan-90	4.5	ND	3.2	0.4	0.3	30	35	58	0.4	31	2	ND	ND	92
A9	A9(1.5)A	24-Jan-90	1.5	ND	5.1	0.4	ND	26	17	24	0.2	35	3	ND	ND	55
A9	A9(4.5)B	24-Jan-90	4.5	ND	5.7	0.5	ND	30	25	29	0.4	32	4	ND	ND	56
A10	A10(4.5)B	25-Jan-90	4.5	ND	3.4	0.5	0.7	41	56	24	ND	42	ND	ND	ND	240
A11	A11(4)B	05-Feb-90	4.0	ND	1.8	0.5	0.3	44	32	10	ND	40	ND	ND	ND	67
A12	A12(1)A	05-Feb-90	1.0	ND	8.3	ND	0.7	52	130	200	ND	39	ND	ND	ND	190
A12	A12(3.5)B	05-Feb-90	3.5	ND	9.6	0.4	ND	43	30	16	ND	31	ND	ND	ND	51
A13	A13(1)A	05-Feb-90	1.0	ND	8	0.5	0.2	33	27	51	ND	31	ND	ND	ND	74
A13	A13(4)B	05-Feb-90	4.0	ND	1.6	0.6	0.2	44	23	7	ND	36	ND	ND	ND	71
A14	A14(5.5)B	25-Jan-90	5.5	ND	5.3	0.5	1.6	34	150	140	ND	32	ND	ND	ND	110
A15	A15(3)A	25-Jan-90	3.0	ND	15	0.5	0.3	38	110	92	ND	39	ND	ND	ND	95
A15	A15(4.5)B	25-Jan-90	4.5	ND	5.2	0.4	0.7	32	41	64	ND	47	ND	ND	ND	160
A16	A16(4)B	05-Feb-90	4.0	ND	0.9	0.5	0.2	41	25	11	ND	36	ND	ND	ND	49
A17	A17(1)A	05-Feb-90	1.0	ND	2.8	0.4	0.5	34	47	100	0.2	39	ND	ND	ND	110
A17	A17(4)B	05-Feb-90	4.0	ND	1.7	0.7	0.3	39	20	6	ND	46	ND	ND	ND	69
A18	A18(4)B	05-Feb-90	4.0	ND	2.7	0.5	0.4	45	91	19	ND	49	ND	ND	ND	59

TABLE 6A

METAL COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID.	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Sb	As	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Tl	Zn
A19	A19(3)B	05-Feb-90	3.0	ND	0.9	0.6	ND	42	29	18	ND	37	1	ND	ND	55
A20	A20(1)A	05-Feb-90	1.0	ND	3.4	0.2	1.5	51	640	290	0.5	36	ND	ND	ND	410
A20	A20(2.5)B	05-Feb-90	2.5	ND	0.9	0.4	ND	41	21	11	ND	34	ND	ND	ND	50
A21	A21(2.5)B	05-Feb-90	2.5	ND	0.9	0.3	0.4	37	340	560	ND	31	1	ND	ND	320
A22	A22(1)A	05-Feb-90	1.0	ND	1.1	ND	0.4	31	120	130	1.9	33	ND	ND	ND	120
A22	A22(4)B	05-Feb-90	4.0	ND	ND	0.3	ND	35	40	39	ND	31	ND	ND	ND	48
A23	A23(3)B	25-Jan-90	3.0	ND	12	0.9	0.2	28	12	10	ND	22	ND	ND	ND	23
A24	A24(17)C	23-Jan-90	17.0	NA	NA	NA	NA	NA	NA	4	NA	NA	NA	NA	NA	NA
B1	B1(4)B	29-Jan-90	4.0	ND	3.7	0.4	0.3	45	19	7	ND	50	ND	ND	ND	46
B2	B2(4)B	29-Jan-90	4.0	ND	2.3	0.4	ND	29	17	4	ND	20	ND	ND	ND	26
B6	B6(4)B	26-Jan-90	4.0	ND	26	0.4	0.7	54	38	59	ND	68	ND	ND	ND	230
B7	B7(1.5)A	26-Jan-90	1.5	ND	7.1	0.2	0.2	34	24	19	0.3	38	ND	ND	ND	86
B8	B8(3.5)B	30-Jan-90	3.5	ND	1.8	0.4	ND	42	25	5	ND	32	ND	ND	ND	36
B9	B9(1.5)A	26-Jan-90	1.5	ND	34	0.3	ND	24	23	9	ND	30	ND	ND	ND	53
B10	B10(4.5)B	30-Jan-90	4.5	ND	2.2	0.7	0.4	40	25	9	ND	41	ND	ND	ND	64
B11	B11(1.5)A	26-Jan-90	1.5	ND	8.9	0.4	0.2	61	30	30	ND	64	ND	ND	ND	61
B12	B12(3.5)A	29-Jan-90	3.5	ND	15	0.4	0.3	38	20	7	ND	42	ND	ND	ND	55
B16	B16(3.5)A	29-Jan-90	3.5	ND	23	ND	ND	14	14	15	ND	16	ND	ND	ND	39
B16	B16(9.5)C	29-Jan-90	9.5	ND	6.1	0.6	0.3	43	17	5	ND	43	ND	ND	ND	43
B19	B19(1)A	01-Feb-90	1.0	ND	1.6	0.3	ND	20	26	13	ND	30	2	ND	ND	52
B19	B19(5)B	01-Feb-90	5.0	ND	0.9	0.5	0.2	42	22	5	ND	37	ND	ND	ND	40
B21	B21(1)A	01-Feb-90	1.0	ND	2.4	ND	0.6	24	38	110	ND	27	1	ND	ND	320

TABLE 6A

METAL COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Sb	As	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Tl	Zn
B22	B22(1.5)	02-Feb-90	1.5	NA	NA	NA	NA	NA	NA	330	NA	NA	NA	NA	NA	NA
B25	B25(1)A	29-Jan-90	1.0	ND	31	0.5	0.4	77	60	44	ND	93	ND	ND	ND	110
B25	B25(3.5)B	29-Jan-90	3.5	ND	2.6	0.6	ND	31	17	5	ND	26	ND	ND	ND	29
B26	B26(3.5)B	29-Jan-90	3.5	ND	2.4	0.3	ND	42	16	4	ND	26	ND	ND	ND	30
B27	B27(3.5)B	23-Feb-90	3.5	ND	1.4	0.5	ND	31	14	4	ND	24	ND	ND	ND	24
B29	B29(3)A	22-Feb-90	3.0	ND	5	0.3	0.2	32	27	31	ND	35	ND	ND	ND	61
B29	B29(4.5)B	22-Feb-90	4.5	ND	4	0.3	ND	35	15	5	ND	31	ND	ND	ND	30
B30	B30(4)B	22-Feb-90	4.0	ND	ND	0.2	ND	30	14	5	ND	26	ND	ND	ND	29
B31	B31(2)A	22-Feb-90	2.0	ND	2	0.3	0.5	38	38	21	0.2	38	ND	ND	ND	180
B34	B34(3.5)B	30-Jan-90	3.5	ND	3.5	0.6	0.4	44	35	22	ND	45	ND	ND	ND	74
B35	B35(1.5)A	29-Jan-90	1.5	ND	3.1	ND	ND	11	17	14	ND	13	ND	ND	ND	34
B35	B35(4)B	29-Jan-90	4.0	ND	2.8	0.5	0.3	37	23	8	ND	38	ND	ND	ND	45
C1	C1(3.5)B	31-Jan-90	3.5	ND	2.0	0.3	ND	30	12	5	ND	15	ND	ND	ND	24
C2	C2(1)A	30-Jan-90	1.0	ND	25	2.1	0.2	36	30	56	0.2	31	ND	ND	ND	89
C2	C2(4)B	30-Jan-90	4.0	ND	3	0.5	ND	36	13	6	0.2	24	ND	ND	ND	28
C3	C3(4)B	31-Jan-90	4.0	ND	3.8	0.4	ND	34	15	6	ND	24	ND	ND	ND	30
C4	C4(4)B	30-Jan-90	4.0	ND	1.6	0.4	ND	30	9	4	ND	18	ND	ND	ND	18
C5	C5(4)B	30-Jan-90	4.0	ND	1.6	0.4	ND	39	16	4	ND	21	ND	ND	ND	30
C6	C6(1)A	15-Feb-90	1.0	ND	ND	0.3	0.2	39	21	14	ND	33	ND	ND	ND	42
C6	C6(3)B	15-Feb-90	3.0	ND	ND	0.4	ND	43	11	4	ND	32	ND	ND	ND	25
C7	C7(4)B	31-Jan-90	4.0	ND	2.1	0.6	ND	42	15	5	ND	25	ND	ND	ND	32
C8	C8(4)B	06-Feb-90	4.0	ND	1.3	0.4	0.3	33	29	27	ND	38	ND	ND	ND	68

TABLE 6A

METAL COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Sb	As	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Tl	Zn
C9	C9(3.5)B	08-Feb-90	3.5	NA	NA	NA	NA	NA	NA	5.0	NA	NA	NA	NA	NA	NA
C9	C9(9)C	08-Feb-90	9.0	NA	NA	NA	NA	NA	NA	3.0	NA	NA	NA	NA	NA	NA
C10	C10(4)B	08-Feb-90	4.0	NA	NA	NA	NA	NA	NA	5.0	NA	NA	NA	NA	NA	NA
C10	C10(9.5)C	08-Feb-90	9.5	NA	NA	NA	NA	NA	NA	4.0	NA	NA	NA	NA	NA	NA
C12	C12(3.5)B	31-Jan-90	3.5	ND	6.8	0.4	0.3	45	27	9	ND	33	ND	ND	ND	58
C13	C13(3)B	15-Feb-90	3.0	ND	2	0.3	ND	41	16	5	ND	30	ND	ND	ND	29
C14	C14(4)B	05-Feb-90	4.0	ND	ND	ND	ND	33	29	27	ND	38	ND	ND	ND	27
C15	C15(.5)A	31-Jan-90	0.5	ND	22	0.4	0.9	39	72	240	0.2	42	ND	ND	ND	420
C15	C15(4)B	31-Jan-90	4.0	ND	ND	0.5	ND	33	29	5	ND	29	ND	ND	ND	38
C16	C16(4)B	31-Jan-90	4.0	ND	5.6	0.6	0.2	36	24	7	ND	32	ND	ND	ND	44
C17	C17(1)A	08-Feb-90	1.0	ND	14	0.4	5.4	46	310	8800	0.5	33	ND	1	ND	47000
C17	C17(4)B	08-Feb-90	4.0	ND	ND	ND	ND	28	7.0	3.0	ND	14	1	ND	ND	16
C17	C17(9)C	08-Feb-90	9.0	ND	3.4	0.3	0.5	22	20	3	ND	35	2	ND	ND	50
C18	C18(2)A	07-Feb-90	2.0	ND	1.4	0.3	ND	21	64	9.0	ND	35	ND	ND	ND	84
C18	C18(3.5)B	07-Feb-90	3.5	ND	1	0.3	ND	18	8.0	3.0	ND	16	ND	ND	ND	15
C20	C20(3)	07-Feb-90	3.0	NA	NA	NA	NA	NA	NA	10	NA	NA	NA	NA	NA	NA
C21	C21(1)A	08-Feb-90	1.0	ND	7	0.2	1	35	120	190	0.6	58	ND	ND	ND	300
C21	C21(4)B	08-Feb-90	4.0	ND	1.7	0.3	ND	19	30	8	ND	31	ND	ND	ND	48
C21	C21(8)C	08-Feb-90	8.0	ND	1.2	0.3	ND	17	12	6	ND	35	ND	ND	ND	18
C21	C21(13)	08-Feb-90	13.0	ND	2.4	0.3	0.3	20	22	3	ND	25	ND	ND	ND	37
C23	C23(10)C	07-Feb-90	10.0	ND	0.7	0.5	ND	27	21	4.0	ND	29	ND	ND	ND	43
C24	C24(10)C	23-Feb-90	10.0	ND	1.6	0.4	ND	28	13	3.0	ND	21	ND	ND	ND	30
C25	C25(4.5)B	30-Jan-90	4.5	ND	1.4	0.3	ND	38	10	4	ND	15	ND	ND	ND	22
C26	C26(3)B	23-Feb-90	3.0	ND	ND	0.4	ND	24	11	4	ND	21	ND	ND	ND	33

TABLE 6A

METAL COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Sb	As	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Tl	Zn
C27	C27(10)C	07-Feb-90	10.0	ND	0.8	0.4	ND	23	11	4.0	ND	12	ND	ND	ND	16
LF1	LF1(1.5)B	23-Jan-90	1.5	ND	4.5	0.4	0.3	25	18	6	ND	29	4	ND	ND	39
LF2	LF2(3.5)B	22-Jan-90	3.5	ND	2.2	0.2	ND	21	20	3	ND	14	ND	ND	ND	34
LF4	LF4(4)B	25-Jan-90	4.0	ND	3.8	0.6	0.2	42	31	4	ND	44	ND	ND	ND	57
LF5	LF5(4)B	24-Jan-90	4.0	ND	12	0.3	1	25	160	530	ND	29	ND	ND	ND	270
LF10	LF10(4.5)B	31-Jan-90	4.5	ND	3.8	0.5	ND	31	17	6	ND	37	ND	ND	ND	38
LF11	LF11(1.5)A	31-Jan-90	1.5	ND	2.2	0.6	0.2	35	30	6	ND	32	ND	ND	ND	50
LF11	LF11(4)B	01-Feb-90	4.0	ND	2.3	0.2	ND	36	8	4	ND	16	ND	ND	ND	20
LF12	LF12(4.5)B	12-Feb-90	4.5	ND	2	ND	ND	61	36	18	ND	43	ND	ND	ND	80
	Background															
	*observed range	low		<1	6.5	<1	0.01	150	30	30	0.082	30	<0.1	NL	NL	120
		high		10	65.0	<1	0.7	1,500	700	700	5.1	700	0.5	NL	NL	3,500
		TTLC		500	500	75	100	2,500	2,500	1,000	20	2,000	100	500	700	5,000
		STLC		15	5.0	0.75	1.0	560	25	5.0	0.2	20	1.0	5.0	7.0	250
	Detection Limit			5.0	0.5	0.2	0.2	1.0	1.0	1.0	0.2	1.0	1.0	0.3	1.0	2.0
	Method Reference			7040	7060	7090	7130	7190	7210	7420	7471	7520	7740	7760	7840	7950

NOTES:

NL - not listed
NA - not analyzed
ND - not detected
*Shacklette, H.T., and J.G. Boerngen, 1984. Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States. U.S. Geological Survey Professional Paper 1270.
TTLC - Total Threshold Limit Concentration
STLC - Soluble Threshold Limit Concentration

Key to Abbreviations:

Sb = Antimony
As = Arsenic
Be = Beryllium
Cd = Cadmium
Cr = Chromium
Cu = Copper
Pb = Lead
Hg = Mercury
Ni = Nickel
Se = Selenium
Ag = Silver
Tl = Thallium
Zn = Zinc

TABLE 6B

SEMI-VOLATILE ORGANIC CHEMICALS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Notes	PYRENE	PCB AROCLOR 1260
A5	A5(2)A	24-Jan-90	2.0		ND	NA
A5	A5(3.5)B	24-Jan-90	3.5		ND	NA
A6	A6(1.5)B	23-Jan-90	1.5		NA	ND
A8	A8(2)A	24-Jan-90	2.0		NA	ND
A8	A8(4.5)B	24-Jan-90	4.5		NA	ND
A9	A9(4.5)B	24-Jan-90	4.5		NA	ND
A11	A11(4)B	05-Feb-90	4.0		ND	NA
A12	A12(1)A	05-Feb-90	1.0		NA	ND
A12	A12(3.5)B	05-Feb-90	3.5		ND	ND
A13	A13(4)B	05-Feb-90	4.0		NA	ND
A15	A15(3)A	25-Jan-90	3.0		ND	NA
A15	A15(4.5)B	25-Jan-90	4.5		ND	NA
A15	A15(9.5)	25-Jan-90	9.5		ND	NA
A16	A16(4)B	05-Feb-90	4.0		ND	NA
A17	A17(4)B	05-Feb-90	4.0		NA	ND
A18	A18(4)B	05-Feb-90	4.0		ND	NA
A19	A19(1)A	05-Feb-90	1.0		NA	ND
A19	A19(3)B	05-Feb-90	3.0		ND	ND
A22	A22(1)A	05-Feb-90	1.0		NA	0.1
A22	A22(4)B	05-Feb-90	4.0		NA	ND
A23	A23(3)B	25-Jan-90	3.0		ND	NA
B1	B1(4)B	29-Jan-90	4.0		ND	NA
B2	B2(4)B	29-Jan-90	4.0		ND	NA

TABLE 6B

SEMI-VOLATILE ORGANIC CHEMICALS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Notes	PYRENE	PCB AROCLOR 1260
B3	B3(1.5)A	26-Jan-90	1.5		ND	NA
B5	B5(5)B	26-Jan-90	5.0		ND	NA
B6	B6(4)B	26-Jan-90	4.0		ND	NA
B7	B7(1.5)A	26-Jan-90	1.5		0.39	NA
B8	B8(3.5)B	30-Jan-90	3.5		ND	NA
B9	B9(1.5)A	26-Jan-90	1.5		ND	NA
B10	B10(4.5)B	30-Jan-90	4.5		ND	NA
B11	B11(1.5)A	29-Jan-90	1.5		ND	NA
B12	B12(3.5)A	29-Jan-90	3.5		ND	NA
B15	B15(4)B	02-Feb-90	4.0		ND	++ND
B16	B16(3.5)A	29-Jan-90	3.5		ND	NA
B16	B16(9.5)C	29-Jan-90	9.5		ND	NA
B19	B19(1)A	01-Feb-90	1.0		ND	NA
B19	B19(5)B	01-Feb-90	5.0		ND	ND
B20	B20(4)B	01-Feb-90	4.0		ND	NA
B21	B21(1)A	01-Feb-90	1.0		ND	NA
B21	B21(4)B	01-Feb-90	4.0		ND	NA
B21	B21(7.5)C	01-Feb-90	7.5		ND	NA
B22	B22(1.5)	02-Feb-90	1.5		ND	++ND
B24	B24(8.5)C	22-Feb-90	8.5		ND	NA
B25	B25(1)A	29-Jan-90	1.0		NA	0.38

TABLE 6B

SEMI-VOLATILE ORGANIC CHEMICALS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Notes	PYRENE	PCB AROCLOR 1260
B26	B26(.5)A	29-Jan-90	0.5		NA	5.4
B26	B26(3.5)B	29-Jan-90	3.5		ND	ND
B27	B27(3.5)B	22-Feb-90	3.5		NA	ND
B30	B30(4)B	21-Feb-90	4.0		NA	ND
B32	B32(1.5)A	21-Feb-90	1.5		NA	ND
B34	B34(3.5)B	30-Jan-90	3.5		ND	ND
B35	B35(4)B	29-Jan-90	4.0		ND	NA
C1	C1(3.5)B	31-Jan-90	3.5		ND	NA
C2	C2(4)B	30-Jan-90	4.0		ND	NA
C3	C3(4)B	31-Jan-90	4.0		ND	NA
C4	C4(4)B	30-Jan-90	4.0		ND	NA
C5	C5(4)B	30-Jan-90	4.0		ND	NA
C6	C6(1)A	15-Feb-90	1.0		NA	ND
C6	C6(3)B	15-Feb-90	3.0		NA	ND
C7	C7(4)B	31-Jan-90	4.0		NA	ND
C8	C8(4)B	06-Feb-90	4.0		ND	NA
C12	C12(3.5)B	31-Jan-90	3.5		ND	+ND
C15	C15(.5)A	31-Jan-90	0.5		ND	NA
C15	C15(4)B	31-Jan-90	4.0		ND	+ND
C16	C16(4)B	31-Jan-90	4.0		NA	ND

TABLE 6B

SEMI-VOLATILE ORGANIC CHEMICALS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Notes	PYRENE	PCB AROCLOR 1260
C17	C17(1)A	08-Feb-90	1.0		ND	NA
C17	C17(4)B	08-Feb-90	4.0		ND	NA
C17	C17(9)C	08-Feb-90	9.0		ND	NA
C18	C18(3.5)B	07-Feb-90	3.5		ND	NA
C19	C19(4)B	08-Feb-90	4.0		ND	NA
C21	C21(1)A	08-Feb-90	1.0		NA	0.2
C21	C21(4)B	08-Feb-90	4.0		ND	NA
C21	C21(8)C	08-Feb-90	8.0		ND	NA
C21	C21(13)	08-Feb-90	13.0		ND	NA
C23	C23(10)C	07-Feb-90	10.0		ND	NA
C24	C24(3.5)B	22-Feb-90	3.5		ND	NA
C24	C24(10)C	22-Feb-90	10.0		ND	NA
C25	C25(4.5)B	30-Jan-90	4.5		ND	NA
C26	C26(3)B	22-Feb-90	3.0		ND	NA
C27	C27(3)B	07-Feb-90	3.0		ND	NA
C27	C27(10)C	07-Feb-90	10.0		ND	NA
LF1	LF1(1.5)B	23-Jan-90	1.5		ND	NA
LF2	LF2(3.5)B	22-Jan-90	3.5		ND	NA
LF4	LF4(4)B	25-Jan-90	4.0		ND	NA
LF5	LF5(4)B	24-Jan-90	4.0		**ND	NA
LF6	LF6(4.5)B	29-Jan-90	4.5		ND	NA
LF8	LF8(3)B	26-Jan-90	3.0		ND	NA
LF10	LF10(4.5)B	31-Jan-90	4.5		ND	NA

TABLE 6B

SEMI-VOLATILE ORGANIC CHEMICALS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	Notes	PYRENE	PCB AROCLOR 1260
LF11	LF11(1.5)A	31-Jan-90	1.5		ND	NA
LF11	LF11(4)B	01-Feb-90	4.0		ND	NA
LF12	LF12(4.5)B	12-Feb-90	4.5		ND	ND
Detection Limit					0.33	0.05

NOTES:

NA - not analyzed
ND - not detected

* Detection Limit 1.7 ppm
** Detection Limit 3.3 ppm
\+ Estimated Detection Limit 1.6 ppm
++ Estimated Detection Limit 8 ppm
@ Detection Limit .66 ppm

(1) Also detected: 2.8 ppm Acenaphthene; 2.0 ppm Anthracene, 0.85 ppm Be 0.85 ppm Benzo(a)pyrene; 0.78 ppm Benzo(b)fluoranthene; 0.75 ppm Benz 1.1 ppm Chrysene; 3.7 ppm Fluoranthene; 2.8 ppm Fluorene; 8.3 ppm Phe

(2) Sample was diluted 100x due to significant diesel content. Detection limits were adjusted accordingly; 33 ppm for Pyrene, 2-Meth naphthalene, and Naphthalene

TABLE 6C

VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	NOTES	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	ACE	B	T	E	X	1,1-DCA	1,1-DCE	TCE	1,2-DCE
A1	(1)	A1(14)C	22-Jan-90	14.0	ND	ND	0.019	ND	ND	NA	NA	NA	NA
A1	(1)	A1(17.5)C	22-Jan-90	17.5	ND	ND	ND	ND	ND	NA	NA	NA	NA
A5		A5(2)A	24-Jan-90	2.0	ND	*ND	*ND	*ND	**ND	ND	ND	ND	ND
A5		A5(3.5)B	24-Jan-90	3.5	ND	*ND	0.007	*ND	**ND	ND	ND	ND	ND
A6		A6(25)C	24-Jan-90	25.0	ND	*ND	*ND	*ND	*ND	ND	ND	ND	ND
A11		A11(4)B	05-Feb-90	4.0	ND	*ND	0.2	*ND	**ND	ND	ND	ND	ND
A14		A14(19.5)C	25-Jan-90	19.5	ND	*ND	*ND	*ND	**ND	ND	ND	ND	ND
A15		A15(4.5)B	25-Jan-90	4.5	ND	*ND	0.034	*ND	**ND	ND	ND	ND	ND
A15		A15(9.5)	25-Jan-90	9.5	ND	*ND	0.016	*ND	**ND	ND	ND	ND	ND
A18		A18(4)B	05-Feb-90	4.0	ND	*ND	0.21	*ND	**ND	ND	ND	ND	ND
A23		A23(3)B	25-Jan-90	3.0	ND	*ND	0.054	*ND	**ND	ND	ND	ND	ND
A24	(1)	A24(17)C	23-Jan-90	17.0	ND	ND	0.015	ND	ND	NA	NA	NA	NA
A24	(1)	A24(3.5)B	23-Jan-90	3.5	ND	ND	0.03	ND	ND	NA	NA	NA	NA
B2		B2(4)B	29-Jan-90	4.0	ND	*ND	0.01	*ND	**ND	0.006	0.009	ND	ND
B4		B4(3)B	26-Jan-90	3.0	ND	*ND	0.29	*ND	**ND	ND	ND	ND	ND
B4		B4(7.5)C	26-Jan-90	7.5	ND	*ND	0.024	0.019	**ND	ND	ND	ND	ND
B5		B5(5)B	26-Jan-90	5.0	ND	*ND	*ND	*ND	**ND	ND	ND	ND	ND
B8		B8(3.5)B	30-Jan-90	3.5	ND	*ND	0.062	*ND	**ND	ND	ND	ND	ND
B10		B10(4.5)B	30-Jan-90	4.5	ND	*ND	0.028	*ND	**ND	ND	ND	ND	ND
B12		B12(3.5)A	29-Jan-90	3.5	ND	*ND	0.032	*ND	**ND	ND	ND	ND	ND
B14A	(1)	B14A(4)B	02-Feb-90	4.0	ND	*ND	0.25	*ND	***ND	NA	NA	NA	NA
B14A	(1)	B14A(9)C	02-Feb-90	9.0	ND	++ND	0.025	++ND	+++ND	NA	NA	NA	NA
B14B	(1)	B14B(4)B	01-Feb-90	4.0	ND	ND	0.36	ND	ND	NA	NA	NA	NA

TABLE 6C

VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	NOTES	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	ACE	B	T	E	X	1,1-DCA	1,1-DCE	TCE	1,2-DCE
B148	(1)	B148(7.5)C	01-Feb-90	7.5	ND	0.83	2.5	3.1	16	NA	NA	NA	NA
B15	(1)	B15(4)B	02-Feb-90	4.0	ND	100	200	190	910	NA	NA	NA	NA
B15	(1)	B15(4)B	02-Feb-90	4.0	ND	91	240	300	1000	NA	NA	NA	NA
B15	(1)	B15(9)C	02-Feb-90	9.0	ND	3.8	31	13	72	NA	NA	NA	NA
B16	(1)	B16(9.5)C	29-Jan-90	9.5	ND	ND	0.19	ND	ND	NA	NA	NA	NA
B17	(1)	B17(9)C	02-Feb-90	9.0	ND	2	8.7	4.9	21	NA	NA	NA	NA
B27		B27(3.5)B	22-Feb-90	3.5	ND	*ND	0.02	*ND	*ND	ND	ND	ND	ND
B29		B29(3)A	21-Feb-90	3.0	ND	*ND	ND	*ND	*ND	ND	ND	ND	ND
B29		B29(4.5)B	21-Feb-90	4.5	ND	*ND	0.026	*ND	*ND	ND	ND	ND	ND
B30		B30(2)A	21-Feb-90	2.0	ND	*ND	0.2	*ND	*ND	ND	ND	ND	ND
B30		B30(4)B	21-Feb-90	4.0	0.15	*ND	0.036	*ND	*ND	ND	ND	ND	ND
B31		B31(2)A	21-Feb-90	2.0	ND	*ND	0.053	*ND	*ND	ND	ND	ND	ND
B31		B31(5.5)B	21-Feb-90	5.5	ND	*ND	0.025	*ND	*ND	ND	ND	ND	ND
B33		B33(2)A	21-Feb-90	2.0	0.22	*ND	0.29	*ND	0.071	ND	ND	ND	ND
B33		B33(10)C	21-Feb-90	10.0	ND	*ND	0.055	*ND	*ND	ND	ND	ND	ND
B34		B34(3.5)B	30-Jan-90	3.5	ND	*ND	0.081	*ND	**ND	ND	ND	ND	ND
B35		B35(4)B	29-Jan-90	4.0	ND	*ND	0.018	*ND	**ND	ND	ND	ND	ND
C1		C1(3.5)B	31-Jan-90	3.5	ND	*ND	*ND	*ND	**ND	ND	ND	ND	ND
C5		C5(4)B	30-Jan-90	4.0	ND	*ND	0.013	*ND	**ND	ND	ND	ND	ND
C8		C8(4)B	06-Feb-90	4.0	ND	*ND	0.54	*ND	**ND	ND	ND	ND	ND
C9	(1)	C9(3.5)B	08-Feb-90	3.5	ND	ND	ND	ND	ND	NA	NA	NA	NA
C9	(1)	C9(9)C	08-Feb-90	9.0	ND	ND	ND	ND	ND	NA	NA	NA	NA
C10	(1)	C10(4)B	08-Feb-90	4.0	ND	ND	0.045	ND	ND	NA	NA	NA	NA
C10	(1)	C10(9.5)C	08-Feb-90	9.5	ND	ND	ND	ND	ND	NA	NA	NA	NA

TABLE 6C

VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	NOTES	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	ACE	B	T	E	X	1,1-DCA	1,1-DCE	TCE	1,2-DCE
C12		C12(3.5)B	31-Jan-90	3.5	ND	*ND	0.012	*ND	**ND	ND	ND	ND	ND
C15		C15(9.5)C	31-Jan-90	9.5	ND	*ND	0.15	*ND	**ND	ND	ND	ND	ND
C17		C17(1)A	08-Feb-90	1.0	ND	*ND	0.18	*ND	**ND	ND	ND	ND	ND
C17		C17(4)B	08-Feb-90	4.0	ND	*ND	0.006	*ND	**ND	ND	ND	ND	0.034
C17		C17(9)C	08-Feb-90	9.0	ND	*ND	0.033	*ND	**ND	ND	ND	0.24	0.039
C18		C18(3.5)B	07-Feb-90	3.5	ND	*ND	0.085	*ND	**ND	ND	ND	ND	ND
C19		C19(4)B	08-Feb-90	4.0	ND	*ND	0.052	*ND	**ND	ND	ND	ND	ND
C19	(1)	C19(4)B	08-Feb-90	4.0	ND	ND	0.078	ND	ND	NA	NA	NA	NA
C20		C20(3)B	07-Feb-90	3.0	ND	ND	0.027	ND	ND	ND	NA	NA	NA
C21		C21(4)B	08-Feb-90	4.0	ND	*ND	0.078	*ND	**ND	ND	ND	ND	ND
C21		C21(8)C	08-Feb-90	8.0	ND	*ND	0.073	*ND	**ND	ND	ND	ND	0.022
C21		C21(13)	08-Feb-90	13.0	ND	*ND	0.12	*ND	*ND	ND	ND	0.18	0.034
C23		C23(10)C	07-Feb-90	10.0	ND	*ND	0.006	*ND	**ND	ND	ND	ND	ND
C24		C24(10)C	22-Feb-90	10.0	ND	*ND	0.07	*ND	*ND	ND	ND	0.009	ND
C24		C24(3.5)B	22-Feb-90	3.5	ND	*ND	0.25	*ND	*ND	ND	ND	ND	ND
C25		C25(4.5)B	30-Jan-90	4.5	ND	*ND	0.005	*ND	**ND	ND	ND	ND	ND
C26		C26(3)B	22-Feb-90	3.0	ND	*ND	0.083	*ND	*ND	ND	ND	ND	ND
C27		C27(10)C	07-Feb-90	10.0	ND	*ND	0.014	*ND	**ND	ND	ND	ND	ND
C27		C27(3)B	07-Feb-90	3.0	ND	*ND	0.015	*ND	**ND	ND	ND	ND	ND
C28	(1)	C28(4)B	12-Feb-90	4.0	ND	ND	0.55	ND	ND	NA	NA	NA	NA
LF1		LF1(1.5)B	23-Jan-90	1.5	ND	*ND	0.058	*ND	**ND	ND	ND	ND	ND
LF2		LF2(3.5)B	22-Jan-90	3.5	ND	*ND	0.008	*ND	**ND	ND	ND	ND	ND
LF4		LF4(4)B	25-Jan-90	4.0	ND	*ND	0.011	*ND	**ND	ND	ND	ND	ND

TABLE 6C

VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	NOTES	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	ACE	B	T	E	X	1,1-DCA	1,1-DCE	TCE	1,2-DCE
LF5		LF5(4)B	24-Jan-90	4.0	ND	+ND	0.11	+ND	@ND	ND	ND	ND	ND
LF6		LF6(4.5)B	29-Jan-90	4.5	ND	*ND	*ND	*ND	**ND	ND	ND	ND	ND
LF7	(1)	LF7(7.5)	26-Jan-90	7.5	ND	0.006	0.057	ND	0.003	NA	NA	NA	NA
LF8		LF8(3)B	26-Jan-90	3.0	ND	*ND	0.093	*ND	**ND	ND	ND	ND	ND
LF9		LF9(10)C	30-Jan-90	10	ND	*ND	*ND	*ND	**ND	ND	ND	0.007	ND
LF10		LF10(4.5)B	31-Jan-90	4.5	ND	*ND	0.035	*ND	**ND	ND	ND	ND	ND
LF11		LF11(4)B	01-Feb-90	4.0	ND	*ND	0.014	*ND	**ND	ND	ND	ND	ND
LF12		LF12(4.5)B	12-Feb-90	4.5	ND	*ND	0.068	*ND	*ND	ND	ND	ND	ND
Detection Limit					0.1	0.001	0.001	0.001	0.003	0.005	0.005	0.005	0.005

NOTES:
All samples analyzed by Med-Tox Associates of Pleasant Hilll, California, using EPA Method 8240 unless noted otherwise.

Key to Abbreviations:

A = ACETONE
T = TOLUENE
B = BENZENE
E = ETHYLBENZENE
X = Total XYLENES
1,1-DCA = 1,1-DICHLOROETHANE
1,1-DCE = 1,1-DICHLOROETHENE
TCE = TRICHLOROETHENE
1,2-DCE = 1,2-DICHLOROTHENE
NA = not analyzed
ND = not detected

* Detection Limit 0.005 ppm
** Detection Limit 0.01 ppm
*** Detection Limit 0.02 ppm
\+ Detection Limit 0.03 ppm
++ Detection Limit 0.0005 ppm
+++ Detection Limit 0.002 ppm
@ Detection Limit 0.05 ppm
1 Sample analyzed using EPA Method 8020

TABLE 6D

PETROLEUM HYDROCARBONS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	GASOLINE	DIESEL	WASTE OIL	KEROSENE	STODDARD SOLVENT	TOTAL OIL AND GREASE
A1	A1(14)C	22-Jan-90	14.0	ND	ND	ND	ND	ND	NA
A1	A1(17.5)C	22-Jan-90	17.5	ND	ND	ND	ND	ND	NA
A5	A5(2)A	24-Jan-90	2.0	NA	ND	30	NA	NA	NA
A5	A5(3.5)B	24-Jan-90	3.5	NA	ND	460	NA	NA	NA
A6	A6(1.5)B	23-Jan-90	1.5	NA	ND	130	NA	NA	NA
A7	A7(5.5)B	24-Jan-90	5.5	NA	ND	ND	NA	NA	NA
A8	A8(2)A	24-Jan-90	2.0	NA	ND	40	NA	NA	NA
A8	A8(4.5)B	24-Jan-90	4.5	NA	ND	7400	NA	NA	NA
A9	A9(4.5)B	24-Jan-90	4.5	NA	ND	340	NA	NA	NA
A11	A11(4)B	05-Feb-90	4.0	NA	ND	ND	NA	NA	NA
A12	A12(1)A	05-Feb-90	1.0	NA	ND	770	NA	NA	NA
A12	A12(3.5)B	05-Feb-90	3.5	NA	ND	450	NA	NA	NA
A13	A13(4)B	05-Feb-90	4.0	NA	ND	2100	NA	NA	NA
A14	A14(5.5)B	25-Jan-90	5.5	NA	ND	100	NA	NA	NA
A15	A15(4.5)B	25-Jan-90	4.5	NA	ND	270	NA	NA	NA
A15	A15(9.5)	25-Jan-90	9.5	NA	ND	ND	NA	NA	NA
A16	A16(4)B	05-Feb-90	4.0	NA	ND	30	1	NA	NA
A18	A18(4)B	05-Feb-90	4.0	ND	NA	NA	ND	ND	NA
A19	A19(3)B	05-Feb-90	3.0	NA	ND	60	NA	NA	NA
A20	A20(2.5)B	05-Feb-90	2.5	NA	ND	30	NA	NA	NA
A21	A21(2.5)B	05-Feb-90	2.5	NA	ND	590	NA	NA	NA

TABLE 6D

PETROLEUM HYDROCARBONS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	GASOLINE	DIESEL	WASTE OIL	KEROSENE	STODDARD SOLVENT	TOTAL OIL AND GREASE
A22	A22(1)A	05-Feb-90	1.0	NA	ND	1300	NA	NA	NA
A22	A22(4)B	05-Feb-90	4.0	NA	ND	800	NA	NA	NA
A23	A23(3)B	25-Jan-90	3.0	NA	ND	ND	NA	NA	NA
A24	A24(17)C	23-Jan-90	17.0	ND	ND	ND	ND	ND	NA
A24	A24(3.5)B	23-Jan-90	3.5	ND	ND	ND	ND	ND	NA
B1	B1(4)B	29-Jan-90	4.0	NA	ND	ND	NA	NA	NA
B2	B2(4)B	29-Jan-90	4.0	NA	ND	180	NA	NA	NA
B3	B3(1.5)A	26-Jan-90	1.5	NA	ND	ND	NA	NA	NA
B4	B4(3)B	26-Jan-90	3.0	ND	ND	220	ND	ND	NA
B4	B4(7.5)C	26-Jan-90	7.5	**ND	ND	60	110	ND	NA
B5	B5(5)B	26-Jan-90	5.0	NA	ND	ND	NA	NA	NA
B6	B6(4)B	26-Jan-90	4.0	NA	ND	410	NA	NA	NA
B7	B7(1.5)A	26-Jan-90	1.5	NA	++ND	1200	NA	50	NA
B7	B7(4)B	26-Jan-90	4.0	NA	ND	ND	ND	ND	NA
B8	B8(3.5)B	30-Jan-90	3.5	NA	ND	ND	NA	NA	NA
B9	B9(1.5)A	26-Jan-90	1.5	NA	ND	ND	NA	NA	NA
B10	B10(4.5)B	30-Jan-90	4.5	NA	ND	20	NA	NA	NA
B11	B11(1.5)A	26-Jan-90	1.5	NA	++ND	490	NA	NA	NA
B12	B12(3.5)A	29-Jan-90	3.5	NA	ND	ND	NA	NA	NA
B13	B13(9.5)C	29-Jan-90	9.5	*ND	ND	ND	ND	ND	NA
B14A	B14A(4)B	02-Feb-90	4.0	3.0	ND	20	ND	ND	NA

TABLE 6D

PETROLEUM HYDROCARBONS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	GASOLINE	DIESEL	WASTE OIL	KEROSENE	STODDARD SOLVENT	TOTAL OIL AND GREASE
B14A	B14A(9)C	02-Feb-90	9.0	ND	ND	ND	ND	ND	NA
B14B	B14B(4)B	01-Feb-90	4.0	+++ND	ND	ND	ND	ND	NA
B14B	B14B(7.5)C	01-Feb-90	7.5	110	ND	ND	ND	ND	NA
B15	B15(4)B	02-Feb-90	4.0	3900	ND	2500	ND	ND	NA
B15	B15(9)C	02-Feb-90	9.0	570	ND	ND	ND	ND	NA
B16	B16(3.5)A	29-Jan-90	3.5	*0.8	NA	NA	ND	ND	1200
B16	B16(9.5)C	29-Jan-90	9.5	ND	NA	NA	ND	ND	ND
B17	B17(4)	02-Feb-90	4.0	NA	NA		NA	NA	290
B17	B17(9)C	02-Feb-90	9.0	210	ND	ND	ND	ND	NA
B18	B18(4)B	01-Feb-90	4.0	NA	NA	NA	NA	NA	290
B19	B19(1)A	01-Feb-90	1.0	NA	NA	NA	NA	NA	4400
B19	B19(5)B	01-Feb-90	5.0	NA	NA	NA	NA	NA	320
B20	B20(4)B	01-Feb-90	4.0	NA	NA	NA	NA	NA	14
B21	B21(1)A	01-Feb-90	1.0	NA	NA	NA	NA	NA	10000
B21	B21(4)B	01-Feb-90	4.0	NA	NA	NA	NA	NA	1700
B21	B21(7.5)C	01-Feb-90	7.5	NA	NA	NA	NA	NA	11
B22	B22(1.5)	02-Feb-90	1.5	NA	ND	***100	NA	NA	NA
B24	B24(4)B	22-Feb-90	4.0	NA	ND	ND	NA	NA	NA
B24	B24(8.5)C	22-Feb-90	8.5	NA	ND	ND	NA	NA	NA
B25	B25(3.5)B	29-Jan-90	3.5	NA	ND	ND	NA	NA	NA
B26	B26(3.5)B	29-Jan-90	3.5	NA	ND	ND	NA	NA	NA
B27	B27(3.5)B	22-Feb-90	3.5	ND	ND	ND	ND	ND	NA
B29	B29(3)A	02-Mar-90	3.0	130	ND	360	220	ND	NA
B29	B29(4.5)B	02-Mar-90	4.5	ND	ND	ND	ND	ND	NA

TABLE 6D

PETROLEUM HYDROCARBONS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	GASOLINE	DIESEL	WASTE OIL	KEROSENE	STODDARD SOLVENT	TOTAL OIL AND GREASE
B30	B30(2)A	02-Mar-90	2.0	NA	660	ND	NA	NA	NA
B30	B30(4)B	02-Mar-90	4.0	ND	ND	ND	ND	ND	NA
B31	B31(2)A	02-Mar-90	2.0	NA	ND	ND	NA	NA	NA
B31	B31(5.5)B	02-Mar-90	5.5	NA	ND	ND	NA	NA	NA
B32	B32(1.5)A	02-Mar-90	1.5	36	ND	330	ND	ND	NA
B32	B32(10)C	02-Mar-90	10.0	0.4	ND	ND	ND	ND	NA
B33	B33(2)A	02-Mar-90	2.0	0.9	ND	4600	ND	ND	NA
B33	B33(10)C	02-Mar-90	10.0	0.4	ND	30	ND	ND	NA
B34	B34(3.5)B	30-Jan-90	3.5	NA	ND	ND	NA	NA	NA
B35	B35(4)B	29-Jan-90	4.0	NA	ND	ND	NA	NA	NA
C3	C3(4)B	31-Jan-90	4.0	NA	ND	ND	NA	NA	NA
C4	C4(4)B	30-Jan-90	4.0	NA	ND	ND	NA	NA	NA
C5	C5(4)B	30-Jan-90	4.0	NA	ND	ND	NA	NA	NA
C6	C6(3)B	15-Feb-90	3.0	NA	ND	ND	NA	NA	NA
C7	C7(4)B	31-Jan-90	4.0	NA	ND	ND	NA	NA	NA
C8	C8(4)B	06-Feb-90	4.0	NA	ND	60	NA	NA	NA
C9	C9(3.5)B	08-Feb-90	3.5	ND	ND	ND	ND	ND	NA
C9	C9(9)C	08-Feb-90	9.0	ND	ND	ND	ND	ND	NA
C10	C10(4)B	08-Feb-90	4.0	ND	ND	ND	ND	ND	NA
C10	C10(9.5)C	08-Feb-90	9.5	ND	ND	ND	ND	ND	NA
C11	C11(4)B	08-Feb-90	4.0	ND	ND	ND	ND	ND	NA
C12	C12(3.5)B	31-Jan-90	3.5	NA	ND	ND	NA	NA	NA

TABLE 6D

PETROLEUM HYDROCARBONS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	GASOLINE	DIESEL	WASTE OIL	KEROSENE	STODDARD SOLVENT	TOTAL OIL AND GREASE
C13	C13(3)B	15-Feb-90	3.0	NA	490	ND	NA	NA	NA
C14	C14(4)B	05-Feb-90	4.0	NA	ND	50	NA	NA	NA
C15	C15(4)B	31-Jan-90	4.0	NA	ND	ND	NA	NA	NA
C16	C16(4)B	31-Jan-90	4.0	NA	ND	ND	NA	NA	NA
C17	C17(1)A	08-Feb-90	1.0	NA	ND	60	NA	NA	NA
C17	C17(4)B	08-Feb-90	4.0	NA	ND	ND	NA	NA	NA
C17	C17(9)C	08-Feb-90	9.0	NA	ND	ND	NA	NA	NA
C18	C18(3.5)B	07-Feb-90	3.5	NA	ND	ND	NA	NA	NA
C19	C19(4)B	08-Feb-90	4.0	0.2	ND	2600	ND	ND	NA
C20	C20(3)	07-Feb-90	3.0	NA	ND	ND	NA	NA	NA
C23	C23(10)C	07-Feb-90	10.0	NA	ND	ND	NA	NA	NA
C25	C25(4.5)B	30-Jan-90	4.5	NA	ND	ND	NA	NA	NA
C26	C26(3)B	22-Feb-90	3.0	NA	ND	ND	NA	NA	NA
C27	C27(10)C	07-Feb-90	10.0	ND	ND	ND	ND	ND	NA
C28	C28(4)B	12-Feb-90	4.0	@@1.0	ND	670	ND	ND	NA
LF1	LF1(1.5)B	23-Jan-90	1.5	NA	ND	30	NA	NA	NA
LF2	LF2(3.5)B	22-Jan-90	3.5	NA	ND	ND	NA	NA	NA
LF4	LF4(4)B	25-Jan-90	4.0	ND	ND	ND	ND	ND	NA
LF5	LF5(4)B	24-Jan-90	4.0	NA	ND	14000	NA	NA	NA
LF6	LF6(4.5)B	29-Jan-90	4.5	ND	ND	ND	ND	ND	NA

TABLE 6D

PETROLEUM HYDROCARBONS DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	GASOLINE	DIESEL	WASTE OIL	KEROSENE	STODDARD SOLVENT	TOTAL OIL AND GREASE
LF7	LF7(7.5)	26-Jan-90	7.5	ND	ND	ND	ND	ND	NA
LF9	LF9(10)C	30-Jan-90	10.0	ND	ND	ND	ND	ND	NA
LF12	LF12(4.5)B	12-Feb-90	4.5	0.8	ND	620	ND	ND	NA
Detection Limit				0.2	10	20	10	20	10

NOTES:

NA - not analyzed
ND - not detected

* Sample appears to contain lighter hydrocarbons than those found in gasoline. Results based on gasoline calibration.
** Detection Limit elevated to 100 ppm due to presence of hydrocarbons heavier than those typically contained in gasoline.
*** Sample appears to be a different "cut" of hydrocarbon than the SAE 30W motor oil. Concentration was based on motor oil calibration.
\+ Detection Limit 40 ppm
++ Detection Limit 20 ppm
+++ Detection Limit 0.001 ppm
@ Detection Limit 10 ppm
@@ Gasoline result is due primarily to presence of toluene
@@@ Sample contains what appears to be a broader range of hydrocarbons than normally found in diesel fuel. The reported concentration is based on diesel calibration.

TABLE 6E

HERBICIDES DETECTED IN SOIL SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA

(concentrations in ppm)

SAMPLE LOCATION ID	SAMPLE ID	DATE SAMPLED	SAMPLE DEPTH (feet)	DALA-PON	2,4,5 -TP	2,4-D	DCBA	DCP	2,4,5 -T
A12	A12(3.5)B	05-Feb-90	3.5	ND	ND	ND	ND	ND	ND
A23	A23(3)B	25-Jan-90	3.0	ND	ND	ND	0.054	ND	ND
B9	B9(1.5)A	26-Jan-90	1.5	ND	ND	ND	ND	ND	0.24
B9	B9(4.5)B	26-Jan-90	4.5	ND	ND	ND	ND	ND	ND
B11	B11(1.5)A	29-Jan-90	1.5	ND	ND	ND	ND	ND	0.51
B11	B11(4.5)B	29-Jan-90	4.5	ND	ND	ND	ND	ND	ND
B12	B12(3.5)A	29-Jan-90	3.5	ND	ND	0.017	ND	ND	ND
C1	C1(3.5)B	31-Jan-90	3.5	ND	ND	ND	0.008	ND	ND
C3	C3(4)B	31-Jan-90	4.0	ND	ND	ND	0.015	0.05	ND
LF5	LF5(4)B	24-Jan-90	4.0	0.07	0.034	ND	ND	ND	ND
LF8	LF8(3)B	26-Jan-90	3.0	ND	ND	ND	ND	ND	0.74
Detection Limit				0.005	0.005	0.005	0.005	0.005	0.005

NOTES:

NA - not analyzed
ND - not detected

Key to Abbreviations:

DCBA = Dicamba
DCP = dichloropropane
2,4,5-TP = 2,4,5-trichlorophenoxypropanionic acid
2,4-D = 2,4-dichlorophenoxyacetic acid
2,4,5-T = 2,4,5-trichlorophenol

TABLE 7A

METAL COMPOUNDS DETECTED IN GROUND-WATER SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA
(concentrations in ppm)

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	Sb	As	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Tl	Zn
A6	A6C	24-Jan-90	ND	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.026
A24	A24C	23-Jan-90	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.003	ND	ND	0.026
B27	B27W	22-Feb-90	ND	ND	ND	ND	ND	0.006	ND	ND	0.05	*ND	ND	ND	0.04
B29	B29W	22-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	0.03	ND	ND	ND	0.008
B30	B30W	22-Feb-90	ND	0.001	ND	ND	ND	0.019	0.05	ND	0.05	ND	ND	ND	0.069
B31	B31W	22-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND	ND	ND	0.01
C10	C10W	08-Feb-90	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
C15	C15W	31-Jan-90	ND	0.002	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	0.009
C18	C18W	07-Feb-90	ND	0.001	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	0.017
C20	C20W	07-Feb-90	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA
LF1	LF1-7503	05-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.015
LF2	LF2-7503	06-Feb-90	ND	0.002	ND	ND	ND	0.007	ND	ND	ND	ND	ND	ND	0.026
LF3	LF3-7503	06-Feb-90	ND	ND	ND	0.004	ND	0.006	ND	ND	ND	ND	ND	ND	0.024
LF4	LF4-7501	07-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND	0.051

TABLE 7A

METAL COMPOUNDS DETECTED IN GROUND-WATER SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA
(concentrations in ppm)

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	Sb	As	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Tl	Zn
LF5	LF5-7503	06-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.018
LF6	LF6-7501	07-Feb-90	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.016
LF7	LF7-7501	08-Feb-90	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.019
LF8	LF8-7501	07-Feb-90	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.018
LF9	LF9-7501	08-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.016
LF10	LF10-7501	08-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	0.021
LF11	LF11-7501	09-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	0.007
LF12	LF12W	23-Feb-90	ND	0.003	ND	ND	ND	0.011	ND	ND	0.02	ND	ND	ND	0.005
LF16	LF16W	23-Feb-90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.005
Detection Limit			0.5	0.001	0.003	0.003	0.02	0.005	0.01	0.0003	0.01	0.003	0.01	0.02	0.003
Method Reference			7040	7060	7090	7130	7190	7210	7420	7471	7520	7740	7760	7840	7950
MCL			NA	0.05	NA	0.01	0.05 (4)	1.30	0.05	0.002	NA	0.01	0.05	NA	5.0 (6)
Ocean Plan (1)			---	0.008	---	0.003	0.002 (4)	0.005	0.008	0.14 (5)	0.020	---	---	---	0.020
Basin Plan (2)			---	0.036	---	0.0093	0.050 (4)	---	0.0056	0.025 (5)	---	---	0.45 (5)	---	---
EPA Criteria (3)			---	0.036	---	0.0093	0.002 (4)	---	0.0056	0.025 (5)	0.0083	0.071	---	---	0.086

TABLE 7A

METAL COMPOUNDS DETECTED IN GROUND-WATER SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA
(concentrations in ppm)

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	Sb	As	Be	Cd	Cr	Cu	Pb	Hg	Ni	Se	Ag	Tl	Zn

NOTES:

* Detection Limit 0.03 ppm

NA - not analyzed
ND - not detected

MCL = California DHS Maximum Contaminant Level for Drinking Water (California Department of Health Services)

(1) = California Ocean Plan Limiting Concentrations - 6 month median concentration
(2) = RWQCB Water Quality Control Plan, Water Quality Objectives San Francisco Bay Basin - 4 day average concentration
(3) = EPA Natural Water Quality Criteria to Protect Salt Water Aquatic Life - 4 day average concentration
(4) = Cr VI
(5) = Unit in part per billion
(6) = Secondary Standard (taste and odor)

Key to Abbreviations:

Sb = Antimony
As = Arsenic
Be = Beryllium
Cd = Cadmium
Cr = Chromium
Cu = Copper
Pb - Lead
Hg = Mercury
Ni = Nickel
Se = Selenium
Ag = Silver
Tl = Thallium
Zn = Zinc

TABLE 7B

VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUND-WATER SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA
(concentrations in ppm)

SAMPLE LOCATION	SAMPLE ID	NOTES	DATE SAMPLED	B	T	E	X	1,1-DCE	1,1-DCA	1,2-DCE	TCE	1,1,1-TCA	PCE	1,1,2-TCA	VNCL
LF1	LF1-7503		05-Feb-90	*ND	*ND	*ND	**ND	ND	ND	ND	ND	ND	ND	ND	ND
LF2	LF2-7503		06-Feb-90	*ND	*ND	*ND	**ND	ND	ND	ND	ND	ND	ND	ND	ND
LF3	LF3-7503		06-Feb-90	*ND	*ND	*ND	**ND	ND	ND	ND	ND	ND	ND	ND	ND
LF4	LF4-7501		07-Feb-90	*ND	*ND	*ND	**ND	0.49	0.008	ND	ND	0.082	ND	ND	ND
LF5	LF5-7503		06-Feb-90	*ND	*ND	*ND	**ND	0.73	0.014	ND	ND	0.27	ND	ND	ND
LF6	LF6-7501		07-Feb-90	*ND	*ND	*ND	**ND	ND	0.018	ND	ND	ND	ND	ND	ND
LF6	LF6D-7501		07-Feb-90	*ND	*ND	*ND	**ND	ND	0.018	ND	ND	ND	ND	ND	ND
LF7	LF7-7501		08-Feb-90	*ND	*ND	*ND	**ND	ND	ND	ND	ND	ND	ND	ND	ND
LF8	LF8-7501		07-Feb-90	*ND	*ND	*ND	**ND	0.006	0.015	ND	ND	0.01	ND	ND	ND
LF9	LF9-7501		08-Feb-90	*ND	*ND	*ND	**ND	ND	ND	ND	0.034	ND	ND	ND	ND
LF9	LF9G		30-Jan-90	*ND	*ND	*ND	**ND	ND	ND	ND	ND	ND	ND	ND	ND
LF10	LF10-7501		08-Feb-90	*ND	*ND	*ND	**ND	0.031	ND	3.2	7.6	ND	0.041	0.007	1.0
LF11	LF11-7501		09-Feb-90	*ND	*ND	*ND	**ND	ND	ND	0.051	0.31	ND	ND	ND	ND
LF12	LF12W		23-Feb-90	*ND	*ND	*ND	**ND	ND	ND	0.067	0.008	ND	ND	ND	ND
LF16	LF16W		23-Feb-90	*ND	*ND	*ND	**ND	ND	ND	ND	ND	ND	ND	ND	ND
Field Blanks															
LF1-7503			05-Feb-90	*ND	*ND	*ND	**ND	ND	ND	ND	ND	ND	ND	ND	ND
Detection Limit				0.0005	0.0005	0.0005	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01
MCL (1)				0.001	2.0	0.68	1.75	0.006	---	---	0.005	0.2	0.002	0.032	0.0005
State Action Level (2) (3)				---	0.1	---	---	---	0.005	0.006	---	---	0.005	---	---

NOTES TO TABLE 7B:

All samples analyzed by Med-Tox Associates of Pleasant Hill, California, using EPA Method 8240 unless noted otherwise.

* Detection Limit .005 ppm
** Detection Limit .01 ppm
*** Detection Limit .0002 ppm

TABLE 7C

PETROLEUM HYDROCARBONS DETECTED IN GROUND-WATER SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA
(concentrations in ppm)

SAMPLE LOCATION	SAMPLE ID	DATE SAMPLED	GASOLINE	DIESEL	WASTE OIL	STODDARD SOLVENT
A15	A15C	25-Jan-90	NA	ND	ND	NA
A24	A24C	23-Jan-90	ND	ND	ND	NA
B3	B3C	26-Jan-90	NA	ND	ND	NA
B4	B4C	26-Jan-90	0.2	ND	ND	NA
B14	B14AW	02-Feb-90	+ND	12	**ND	NA
B15	B15W	02-Feb-90	NA	NA	NA	NA
B17	B17W	02-Feb-90	20	***ND	2	NA
B27	B27W	22-Feb-90	ND	ND	0.6	NA
B29	B29W	02-Mar-90	ND	ND	ND	NA
B30	B30W	02-Mar-90	0.1	1.4	ND	NA
B31	B31W	02-Mar-90	ND	ND	ND	NA
C7	C7W	31-Jan-90	ND	ND	0.5	NA
C10	C10W	08-Feb-90	ND	NA	NA	NA
C16	C16W	31-Jan-90	ND	ND	0.7	NA
C18	C18W	07-Feb-90	ND	++ND	NA	NA
C20	C20W	07-Feb-90	0.2	NA	NA	NA
C28	C28W	12-Feb-90	ND	ND	ND	NA
C29	C29W	15-Feb-90	ND	ND	ND	NA
LF1	LF1-7503	05-Feb-90	ND	ND	ND	NA
LF2	LF2-7503	06-Feb-90	ND	ND	ND	NA
LF3	LF3-7503	06-Feb-90	ND	ND	ND	NA
LF4	LF4-7501	07-Feb-90	ND	ND	ND	NA

TABLE 7B

VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUND-WATER SAMPLES
PHASE I INVESTIGATION
YERBA BUENA SITE, EMERYVILLE, CALIFORNIA
(concentrations in ppm)

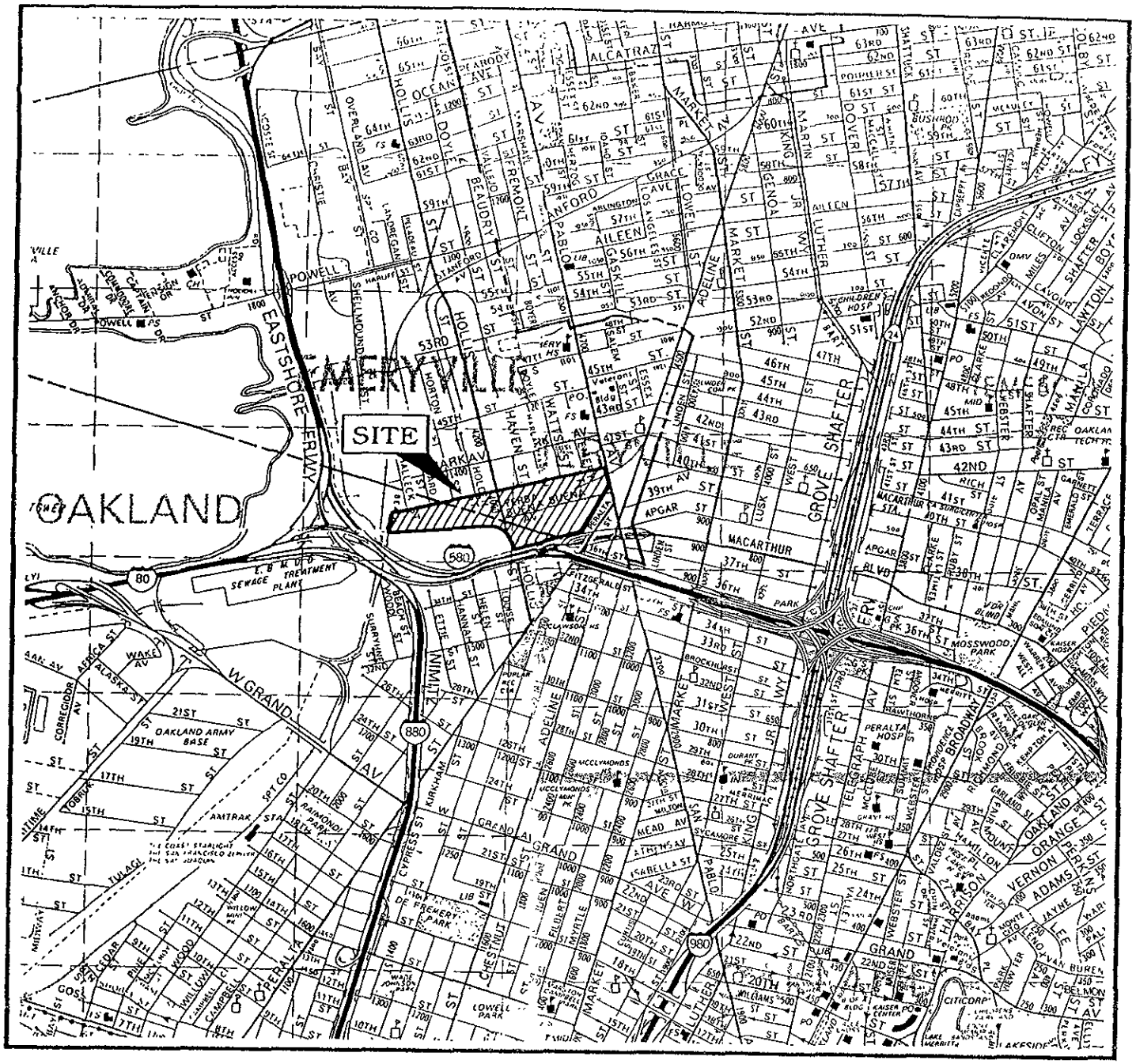
SAMPLE LOCATION	SAMPLE ID	NOTES	DATE SAMPLED	B	T	E	X	1,1-DCE	1,1-DCA	1,2-DCE	TCE	1,1,1-TCA	PCE	1,1,2 TCA	VNCL

NA = not analyzed
ND = not detected

(1) MCL = Maximum Contaminant Level for drinking water (California Department of Health Services)
(2) California Department of Health Services Action Level for drinking water
(3) State or federal surface water quality criteria for chronic or short-term exposure not available for VOCs

Key to Abbreviations:

T = TOLUENE
B = BENZENE
E = ETHYLBENZENE
X = Total XYLENES
1,1-DCE = 1,1-DICHLOROETHENE
1,1-DCA = 1,1-DICHLOROETHANE
1,2-DCE = 1,2-DICHLOROETHENE
TCE = TRICHLOROETHENE
1,1,1-TCA = 1,1,1-TRICHLOROETHANE
PCE = TETRACHLOROETHENE
1,1,2-TCA = 1,1,2-TRICHLOROETHANE
VNCL = VINYL CHLORIDE



MAP SOURCE.
Alameda & Contra Costa Counties,
Thomas Bros. map, 1990 Edition

Figure 1 : SITE LOCATION MAP

Project No. 1649

08AUG90jc

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A
(West)

A'
(East)

ELEVATION
(feet, msl)

30
25
20
15
10
5
0
-5
-10
-15

LF-6

Sandy Gravelly Silt

Silty Clay

Silt

Silty Clay

Clayey Gravelly Sand

Silty Sand

Sandy Silty Clayey Gravel

LF-17
(projected 30 feet
south)

Gravelly Silty Clay

Gravelly Clayey Sand

LF-4
LF-4D
(projected 40 feet
north)

Ground Surface

Gravelly Silt

Silty Clay

Sandy Clayey Silt

Silty Clay

Silty Gravelly Sand

Sandy Silt

Clayey Sand

A6

Gravel Fill

Clay

Silt

Sandy Silt

LF-1

Clay

Silt

Clay

Silty Clay

Gravelly Sand

Silt

Clayey Gravelly Sand

Silt

EXPLANATION

Clay

Silt

Sand

Gravel

Screened interval of
monitoring well

Depth to water
in well

Note Water levels measured on Apnl 23, 1990

5
Scale in feet
0
0 100

Figure 5 :

GEOLOGIC CROSS SECTION A-A'
YERBA BUENA SITE

Project No 1649

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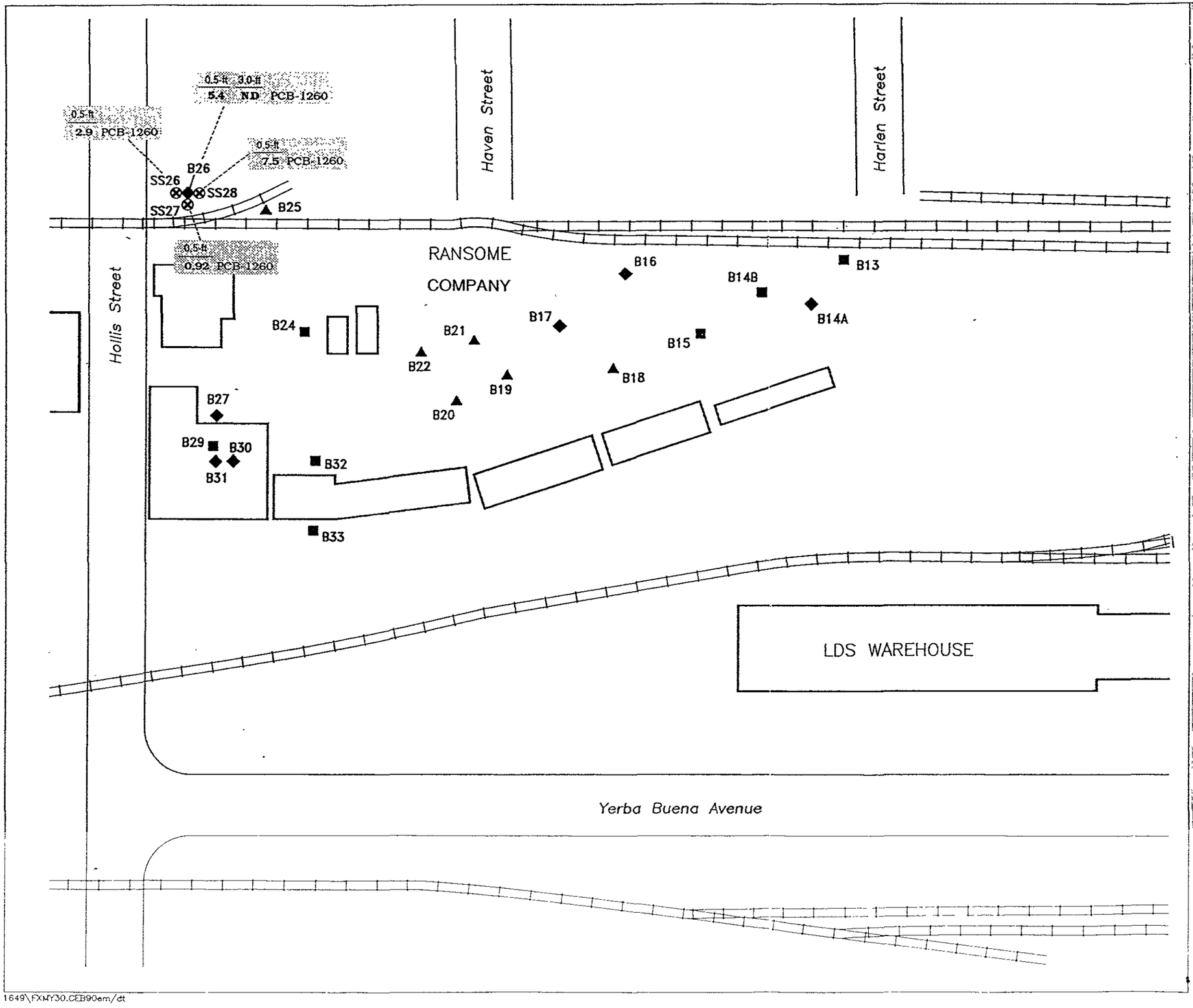
6/7 AS/BD



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N

EXPLANATION

- ▲ Phase I shallow soil sampling location (less than 5 feet)
- ■ Phase I deeper soil sampling location (6 to 13 feet)
- ◆ Phase I deeper soil sampling location (6 to 13 feet) and grab ground-water sample location
- ⊗ Phase II soil sampling location for PCB analysis

0.5-ft
5.4 PCB-1260

- Depth of sample
- Chemical Compound
- Concentration in mg/kg

NOTE: B26 results were collected during the Phase I investigation.

0 40 80 FEET

Figure 20 :

PCB DETECTED IN
SOIL SAMPLES (mg/kg) IN AREA B,
PHASE II INVESTIGATION

Project No 1649

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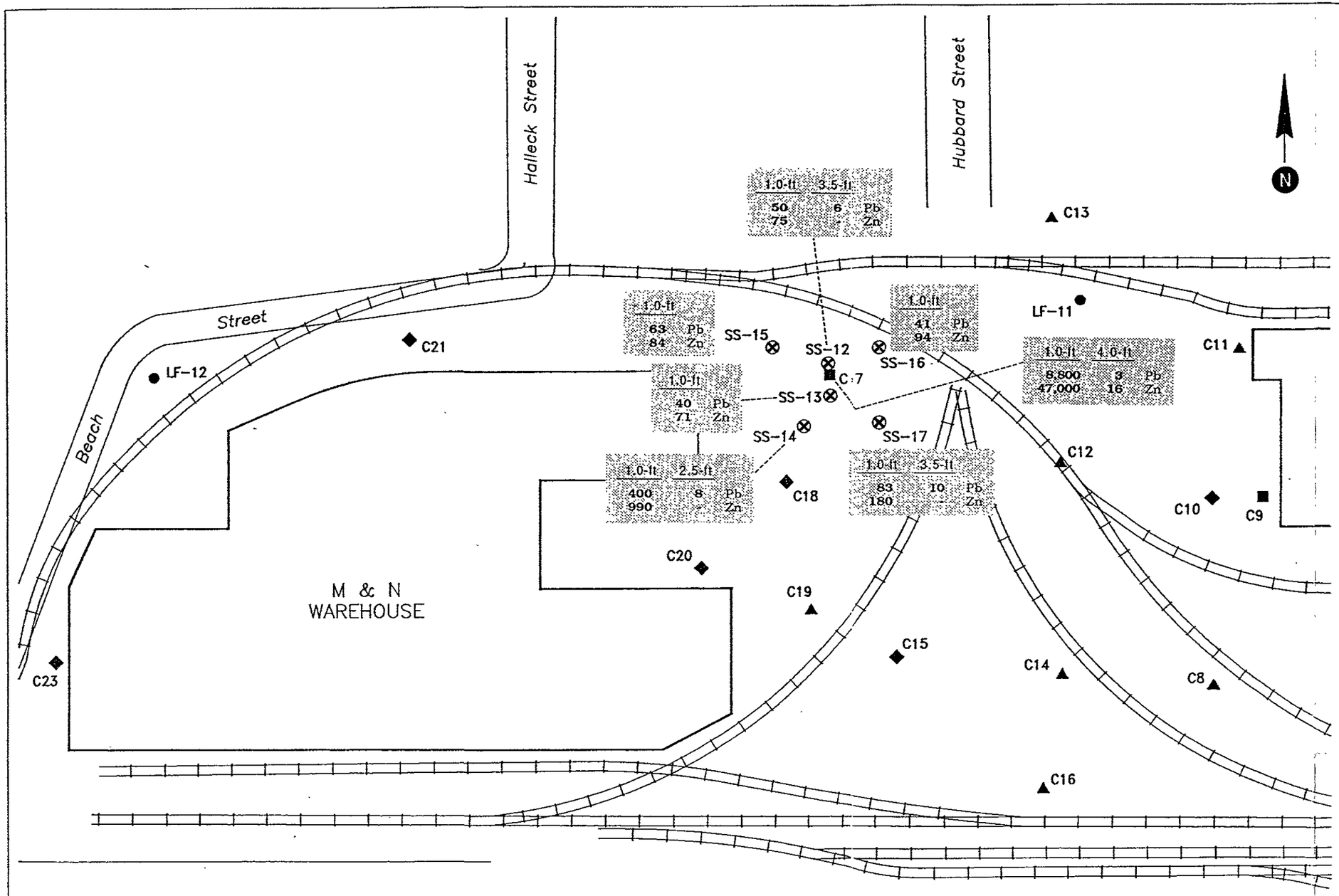
ALS12JUL90cdr



EXPLANATION

- ▲ Phase I shallow soil sampling location (less than 5 feet)
- ■ Phase I deeper soil sampling location (6 to 13 feet)
- ◆ Phase I deeper soil sampling location (6 to 13 feet) and grab ground-water sample location
- ⊗ Phase II soil sampling location for lead and zinc analysis

1.0-ft — Depth of sample
63 Pb — Chemical compound
84 Zn — Concentration in ppm

KEY TO ABBREVIATIONS

Pb Lead
Zn Zinc

NOTE: C17 results are from the Phase I investigation.

0 40 80 120 160 FEET

Figure 21 :
LEAD AND ZINC DETECTED IN SHALLOW SOIL SAMPLES IN AREA C NEAR PHASE I SAMPLING LOCATION C-17, PHASE II INVESTIGATION

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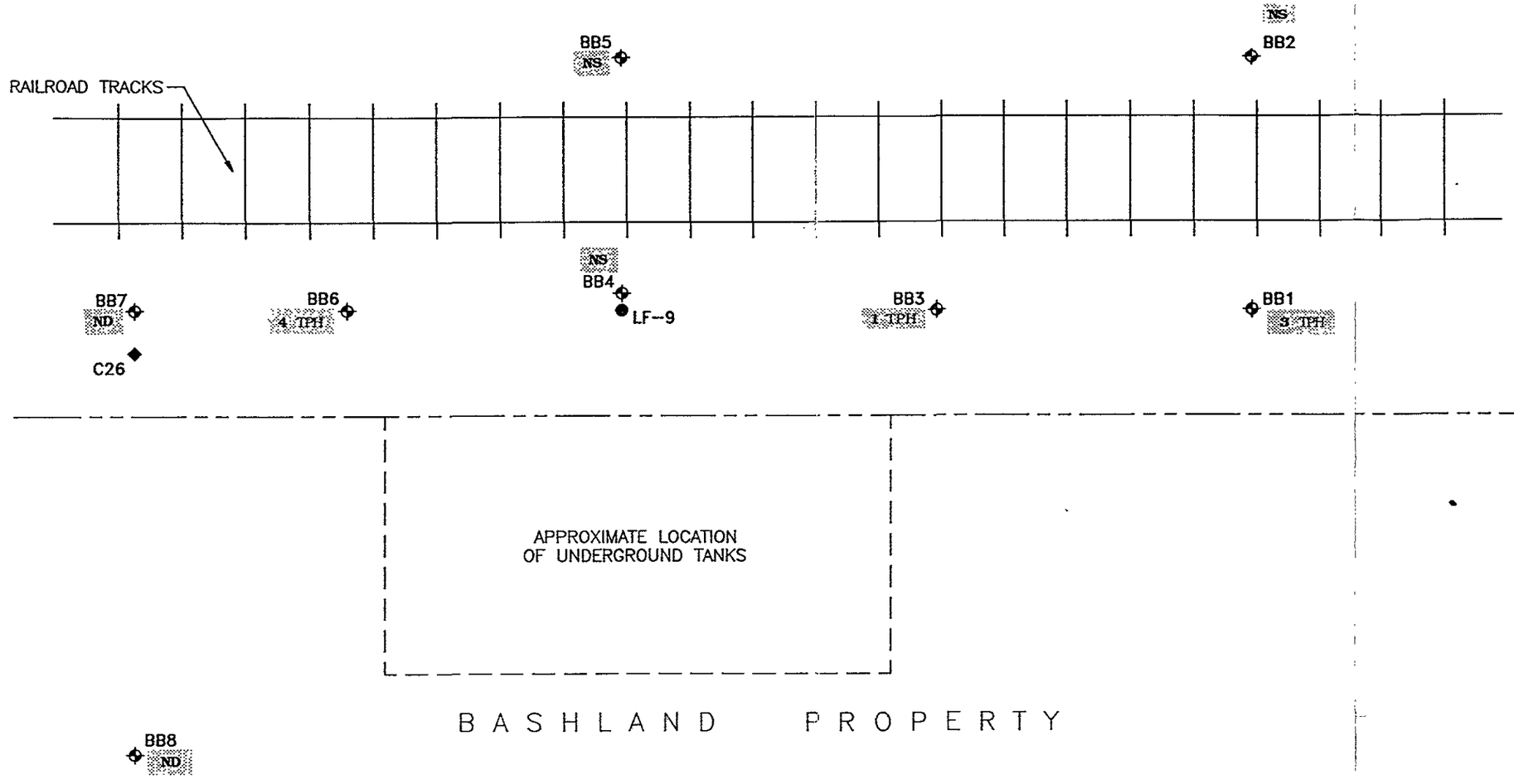

EXPLANATION

- Phase II borehole location
- Monitoring well location
- Phase I soil sampling and grab ground-water sampling location
- Property boundary

4 TPH — Chemical compound; Concentration (ppm)

NS Not sampled

ND Not detected

Note TPH (Total Petroleum Hydrocarbons) were characterized by Friedman & Bruya of Seattle, Washington, to be a mixture of hydrocarbons resembling mineral spirits, polynuclear aromatics, phenols and fatty acids

Figure 22 :

TOTAL PETROLEUM HYDROCARBONS DETECTED IN PERCHED GROUND-WATER (ppm) NEAR LF-9 IN AREA C PHASE II INVESTIGATION

Project No 1649

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1649\BJL05.CEB90DAT

ALS11JUL90BDrjc

C
(South)

C'
(North)

ELEVATION
(feet, msl)

30
25
20
15
10
5
0
-5
-10
-15

LF-19
Gravel Fill
Silty Clay
Silty Clay
Gravelly Sandy Clay
Gravelly Silty Clay

LF-18
Gravel Fill
Gravelly Silty Clay
Silty Clay
Gravelly Silty Clay

LF-4
LF-4D
Gravelly Silt
Silty Clay
Sandy Clayey Silt
Silty Clay
Silty Gravelly Sand
Sandy Silt
Gravelly Sandy Silty Clay
Clayey Sand
Silty Sand
Silty Sandy Gravel
Clayey Sand
Silty Clay

LF-5
LF-5D
Clay
Gravelly Silt
Silty Clay
Gravelly Sandy Clay
Silty Clay
Clayey Sand
Silty Clay
Clayey Sand
Silty Clay

Ground Surface

LF-20
Gravelly Silty Clay
Silty Clay
Silty Clay
Gravelly Silty Clay

LF-8
Gravelly Sand
Silty Clay
Silt
Interbedded sand, gravel, clay and silt
Clay
Sandy Clay

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Screened interval of monitoring well
- ▽ Depth to water in well

Note Water levels measured on April 23, 1990

5
0
Scale in feet
0
100

Figure 7 :

GEOLOGIC CROSS SECTION C-C'
YERBA BUENA SITE

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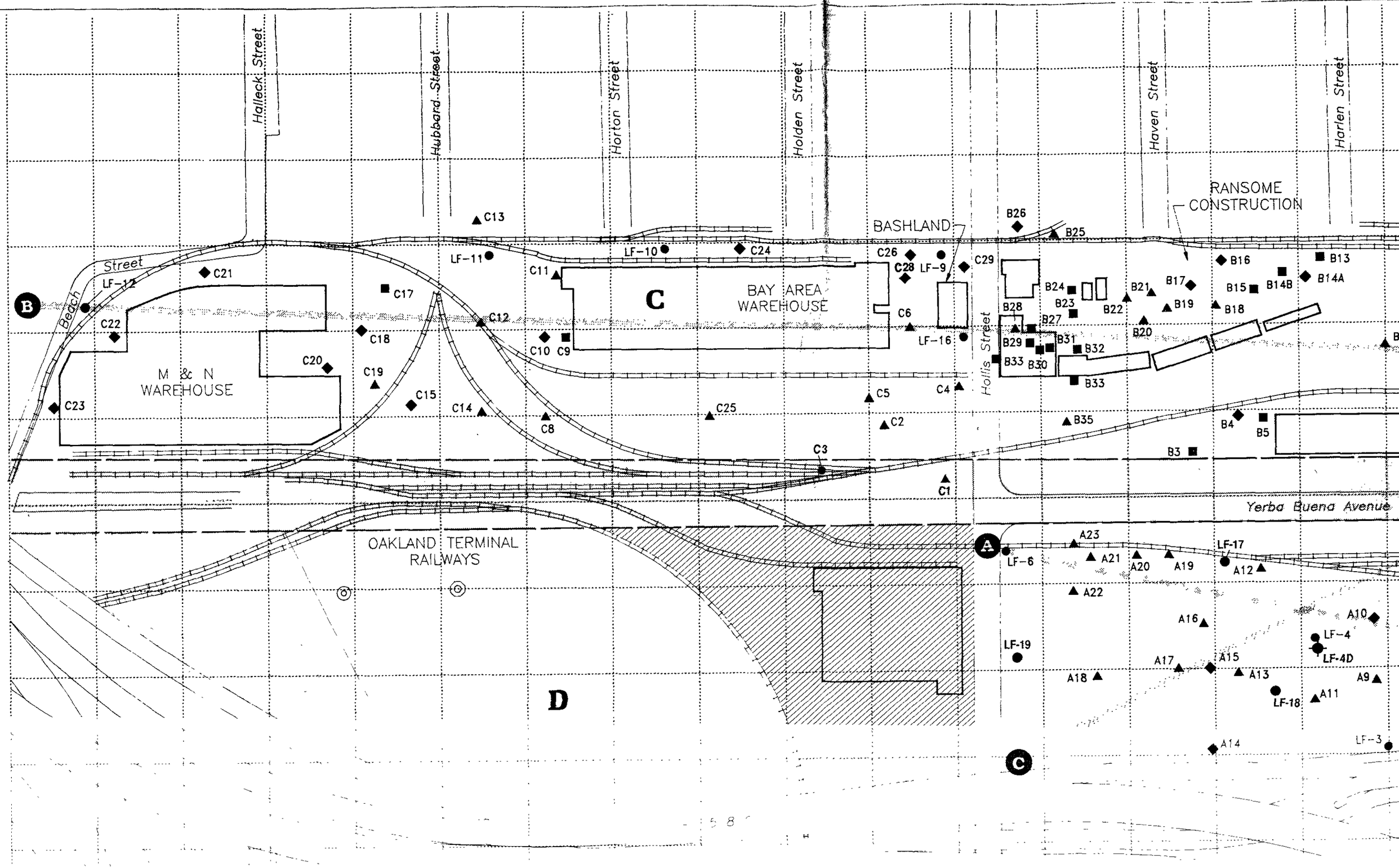
6/7 AS/BD



649\B1MY22 ALS90em,'dt 1 150

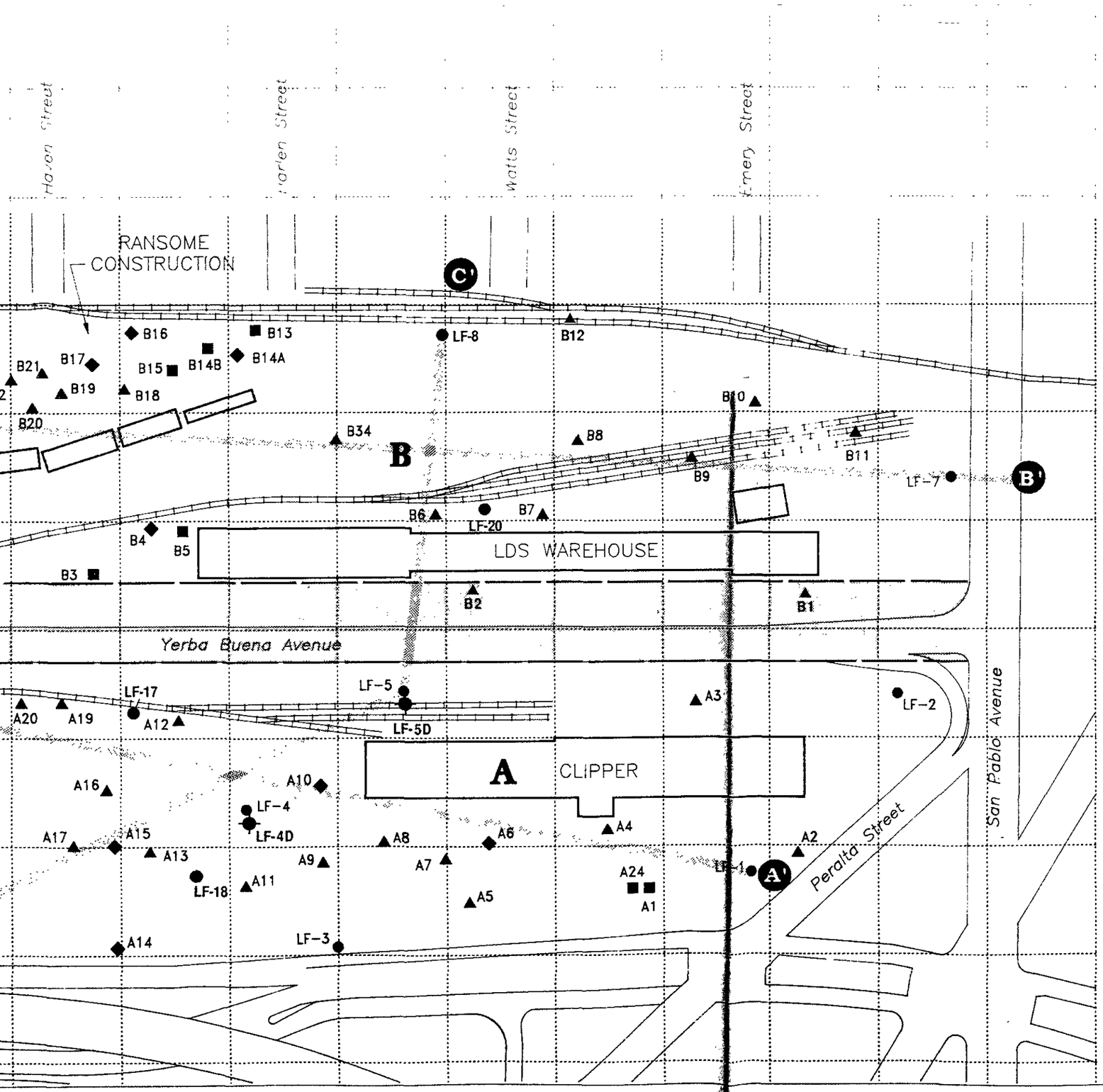


Figure 4 :

SITE PLAN SHOWING PHASE I SOIL AND GROUND-WATER SAMPLING LOCATIONS AND LOCATIONS OF GEOLOGIC CROSS-SECTIONS

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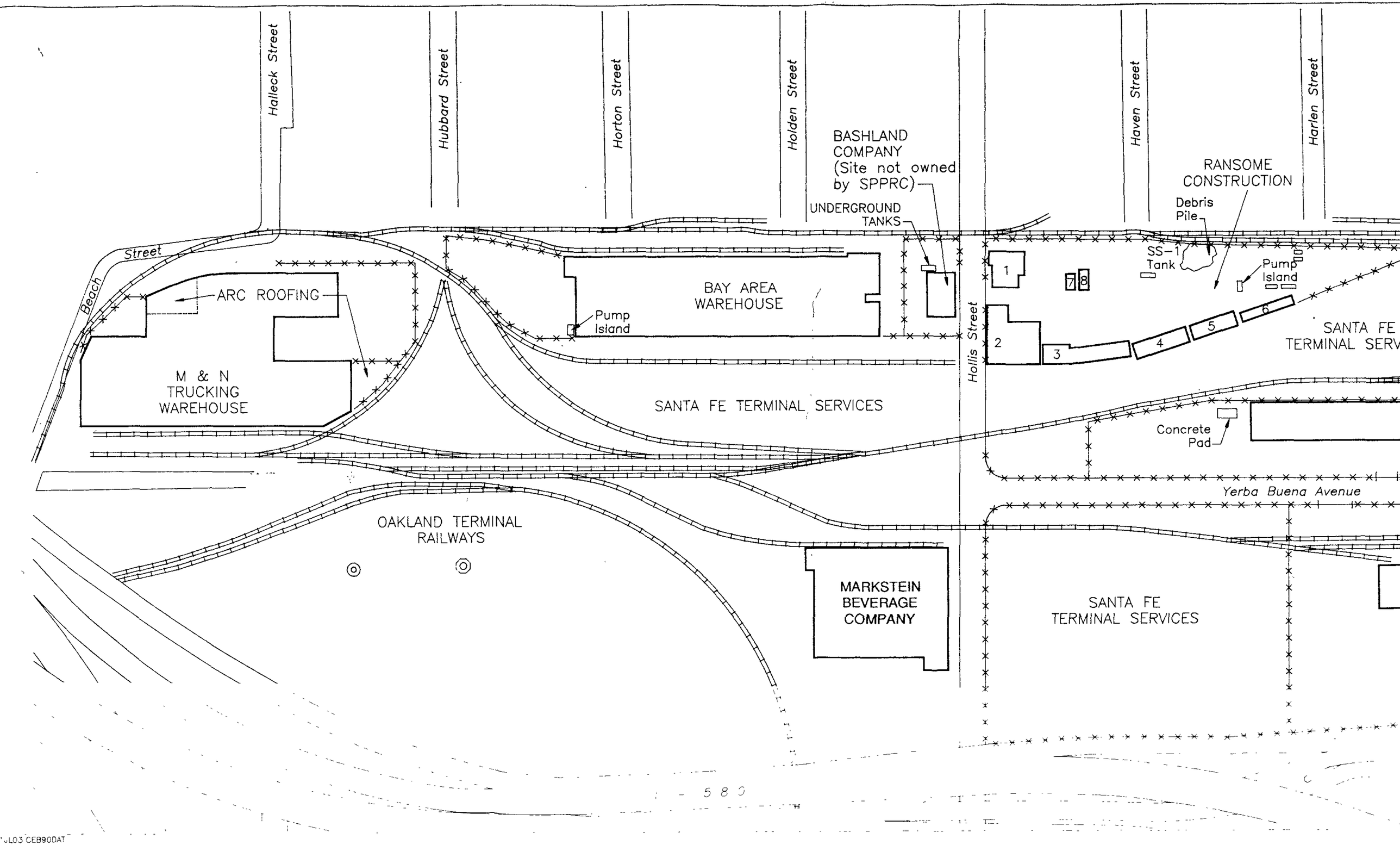
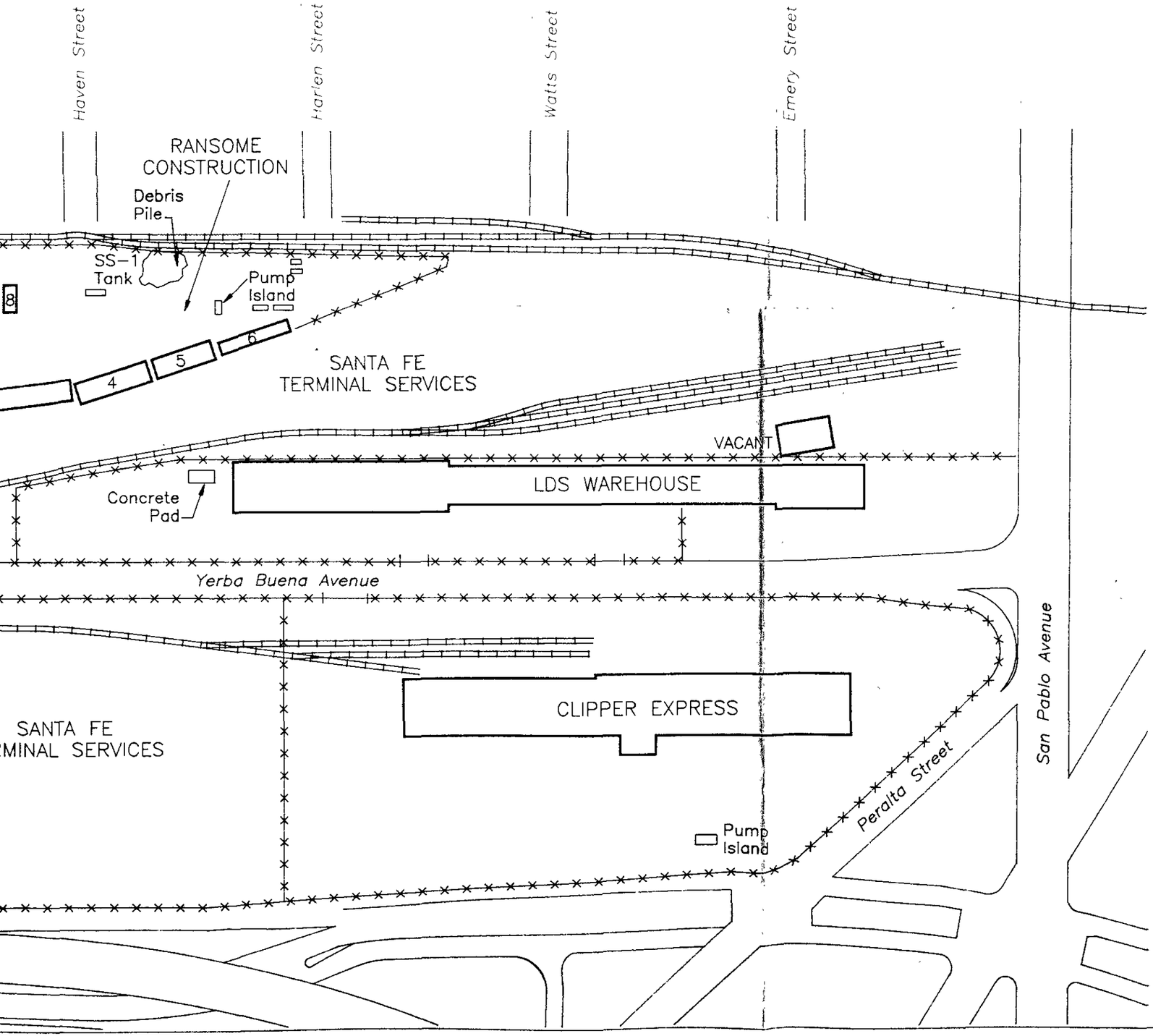
ALS09AUG90AJC



JL03 CEB90DAT



EXPLANATION

FENCE LINE

NOTE: OAKLAND TERMINAL RAILWAY AND MARKSTEIN BEVERAGE COMPANY PROPERTIES NOT INCLUDED IN THIS INVESTIGATION

0 150 300 FEET

Figure 2 :

SITE PLAN SHOWING CURRENT OR MOST RECENT TENANTS

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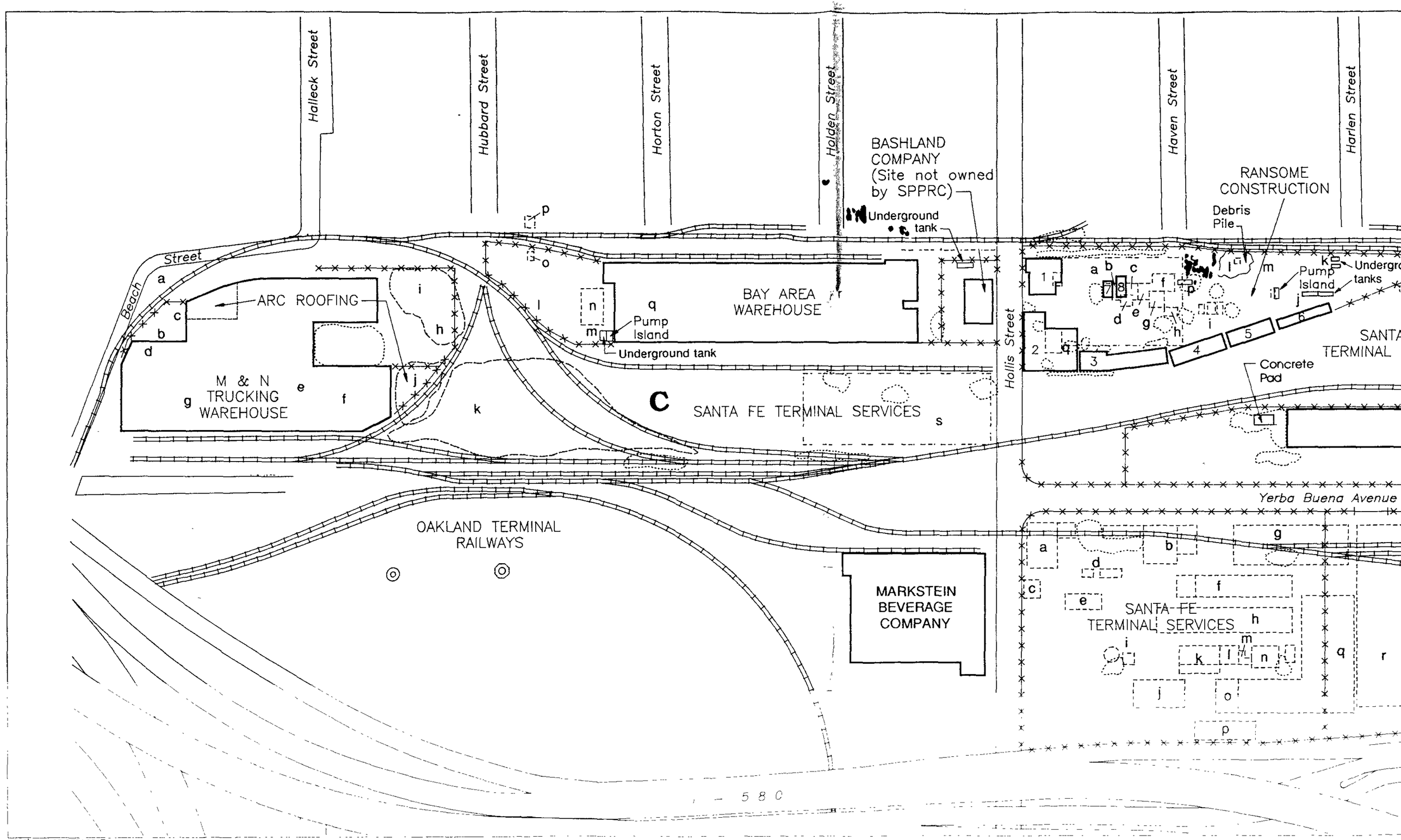

1649\B1OL03 CEB90DAT

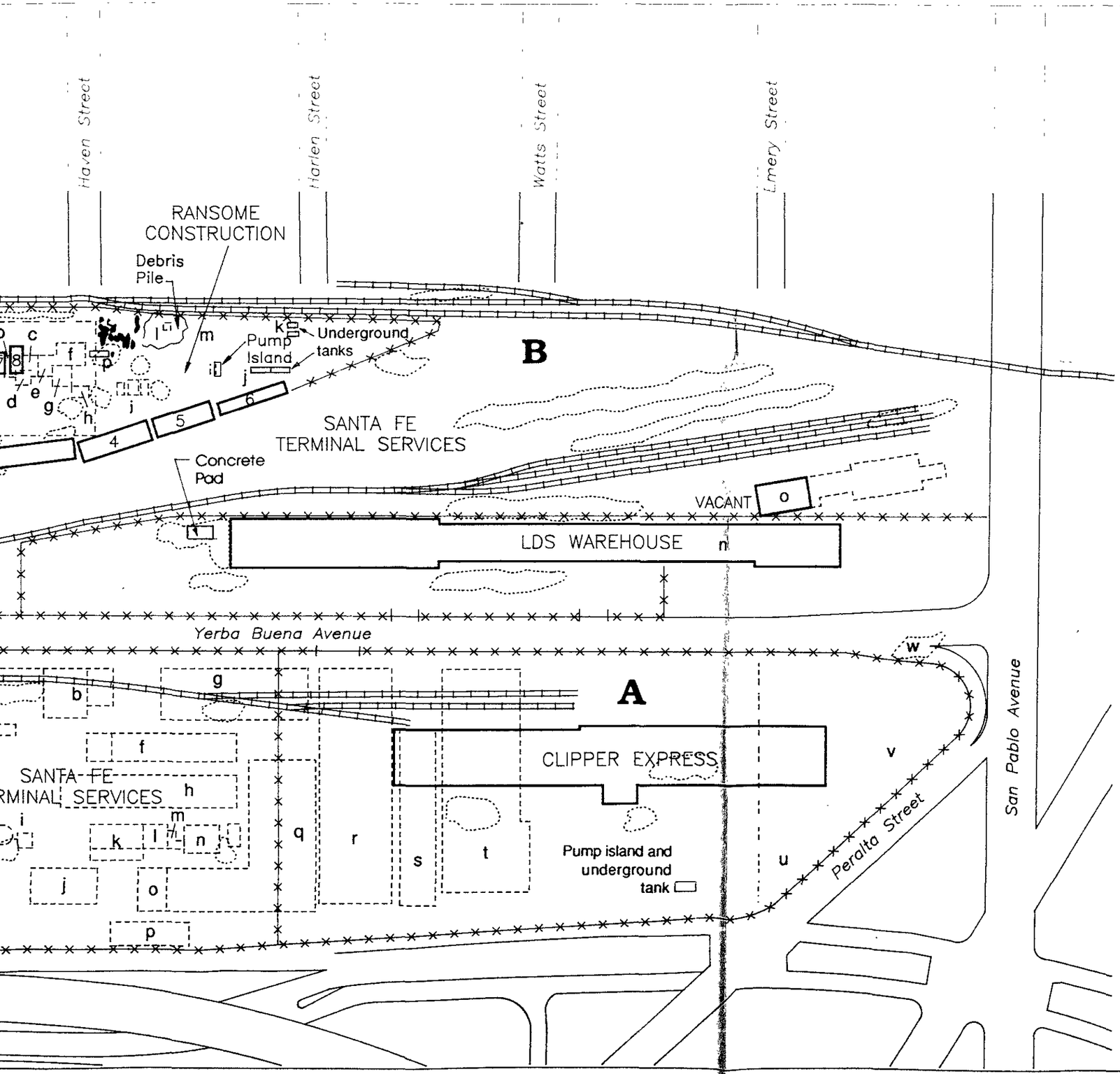

Figure 3 :

SITE PLAN SHOWING HISTORICAL USAGE AND AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

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1990\F3JN13.JCS90

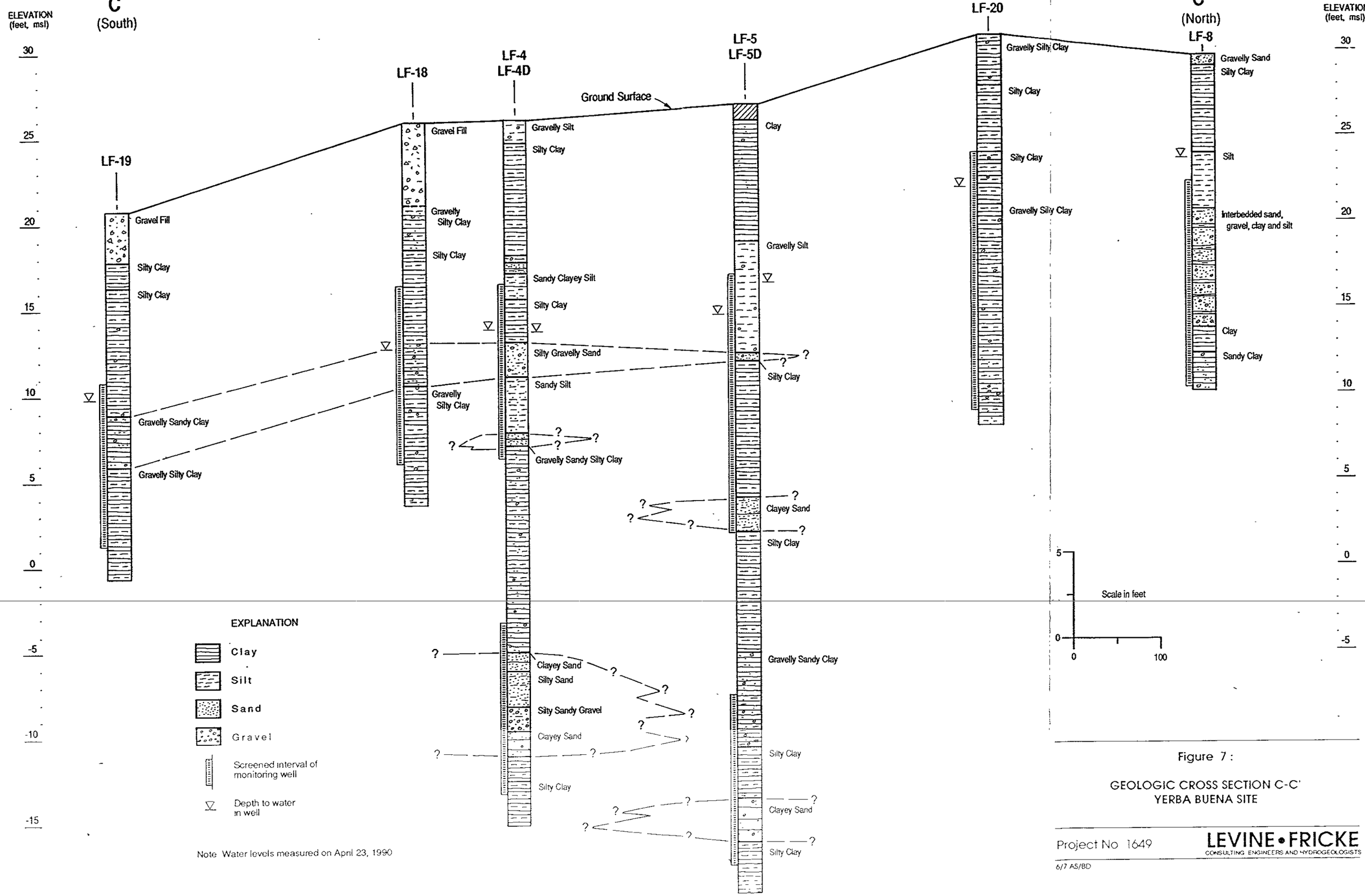

Figure 7 :

GEOLOGIC CROSS SECTION C-C'
YERBA BUENA SITE

Project No 1649

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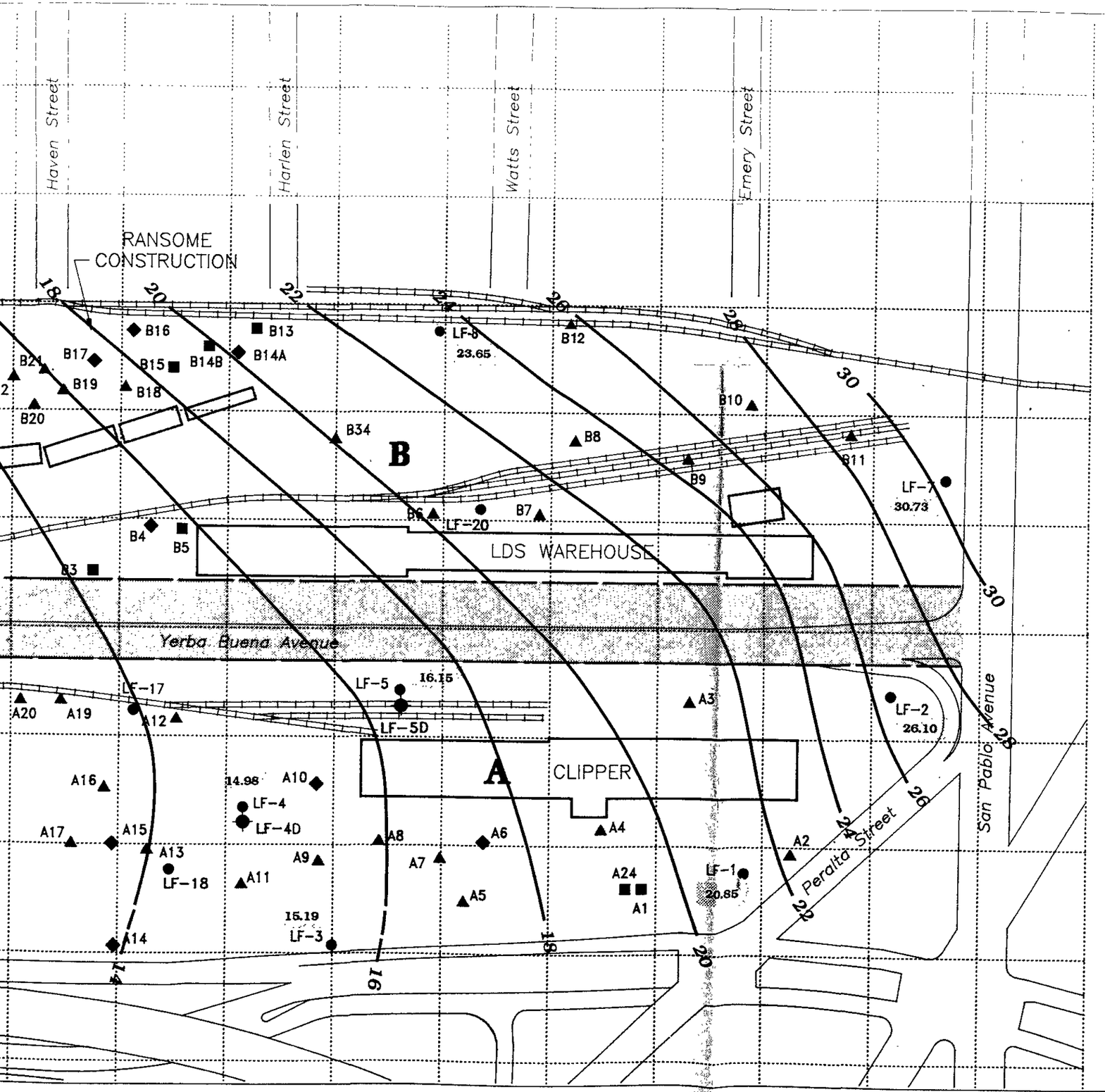
6/7 AS/BD

Halleck Street
Hubbard Street
Horton Street
Holden Street
Haven Street
Harlen Street
Beach Street
Hollis Street
RANSOME CONSTRUCTION
BASELAND
BAY AREA WAREHOUSE
M & N WAREHOUSE
OAKLAND TERMINAL RAILWAYS
Yerba Buena Avenue
I - 580
C
D
LF-10
LF-11
LF-12
LF-13
LF-14
LF-16
LF-17
LF-18
LF-19
LF-4
LF-4D
LF-3
LF-6
LF-9
10.00
8.18
2.54
5.09
8.26
11.77
11.58
10.57
14.98
15.19
1649\B1MY22.ALS90am/dt 1:150



N

EXPLANATION

- SHALLOW MONITORING WELL (<25 FT)
- DEEP MONITORING WELL (35-45 FEET)
- PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION
- NON-ACCESSIBLE AREA
- YERBA BUENA RIGHT-OF-WAY
- OAKLAND TERMINAL RAILWAYS (NOT INCLUDED IN THIS INVESTIGATION)
- 25.84 GROUND-WATER ELEVATION
- 6 WATER TABLE CONTOURS
- NM NOT MEASURED

NOTE: WELLS LF-17 THROUGH LF-20, LF-4D AND LF-5D NOT INSTALLED AT TIME ON FEBRUARY 23, 1990 WATER LEVEL MEASUREMENT.

0 150 300 FEET

Figure 8 :

GROUND-WATER ELEVATION CONTOURS FEBRUARY 23, 1990

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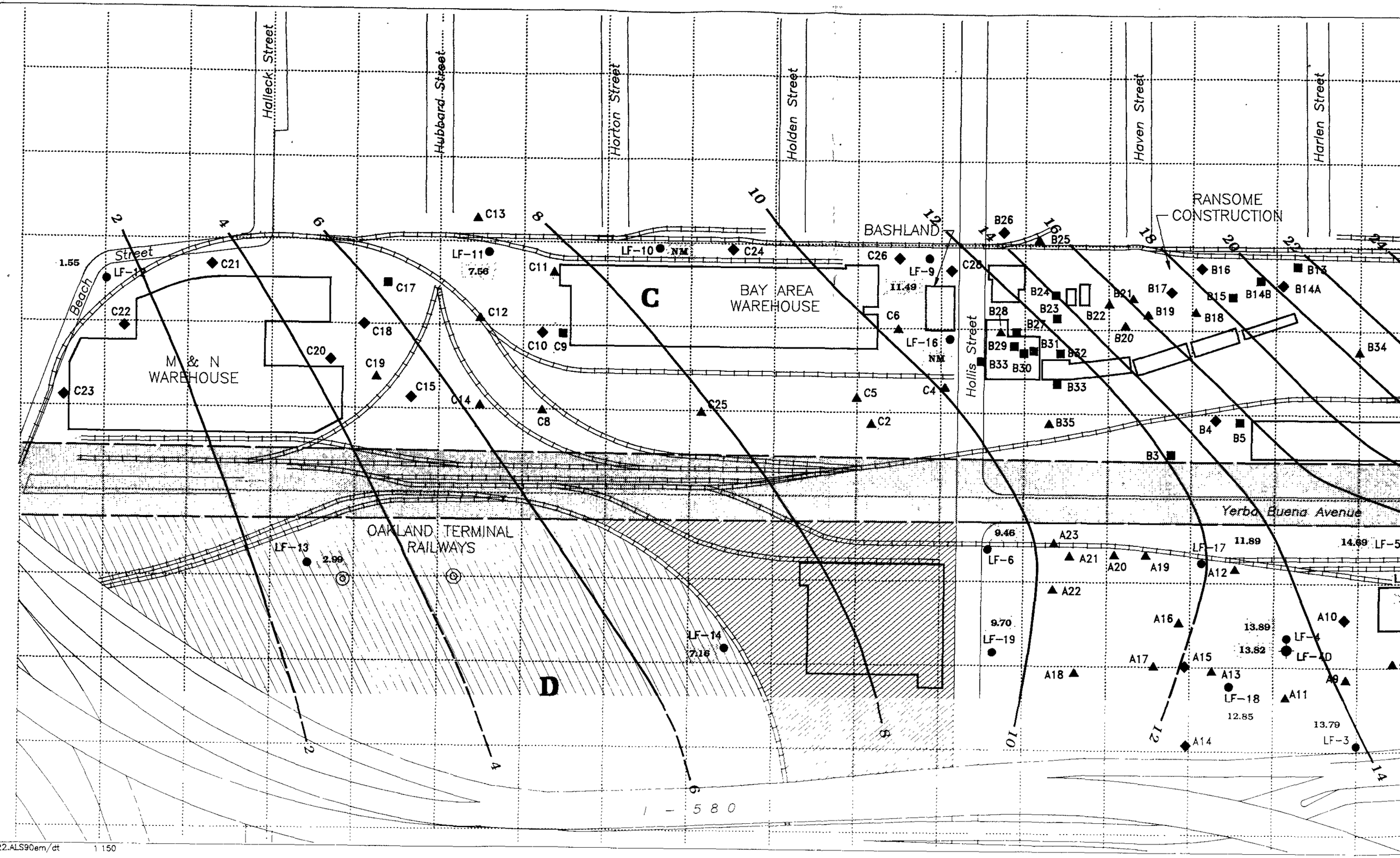
AS/BD



22.ALS90em/dt 1 150

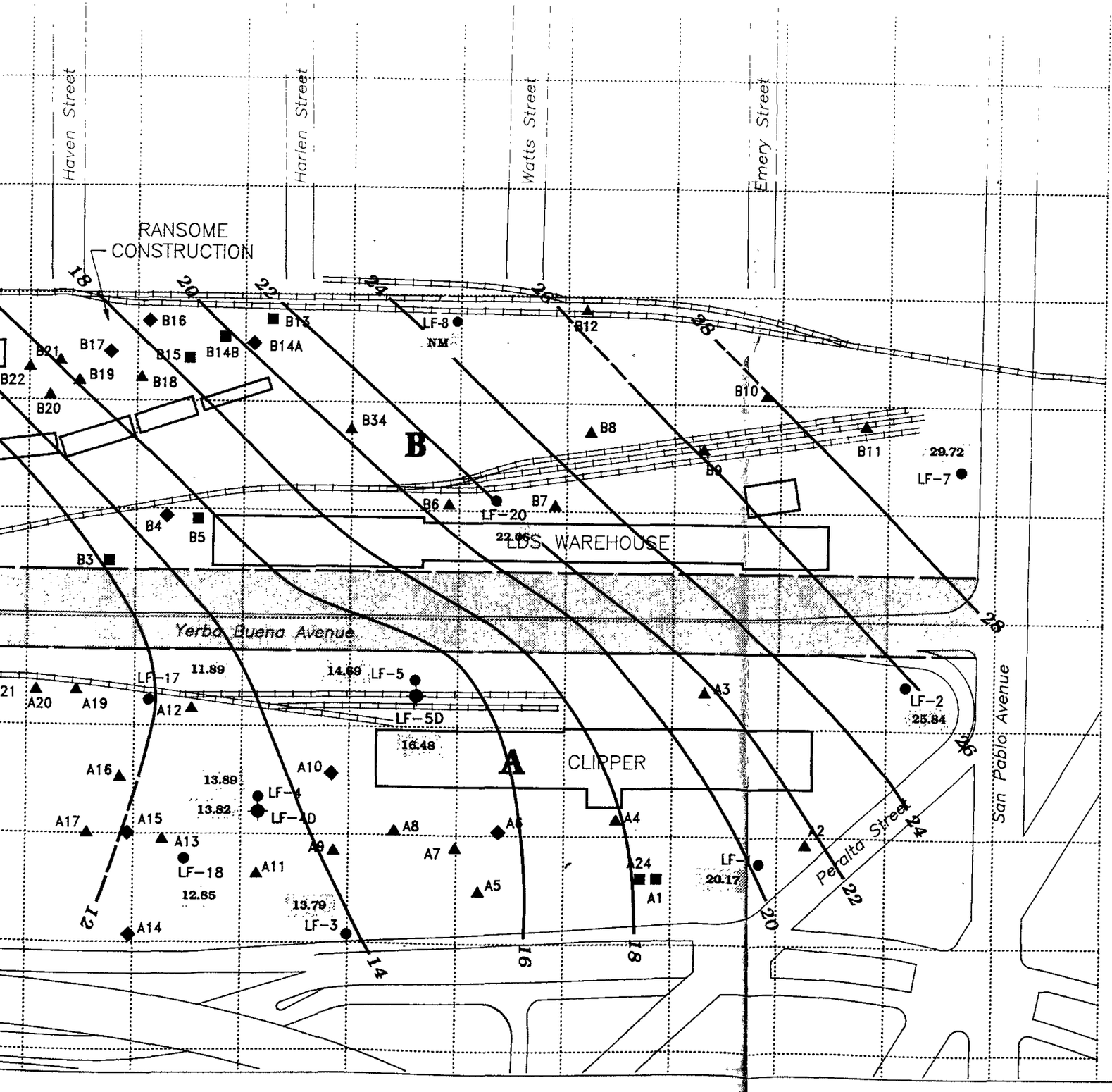


Figure 9 :

GROUND-WATER ELEVATION CONTOURS APRIL 23, 1990

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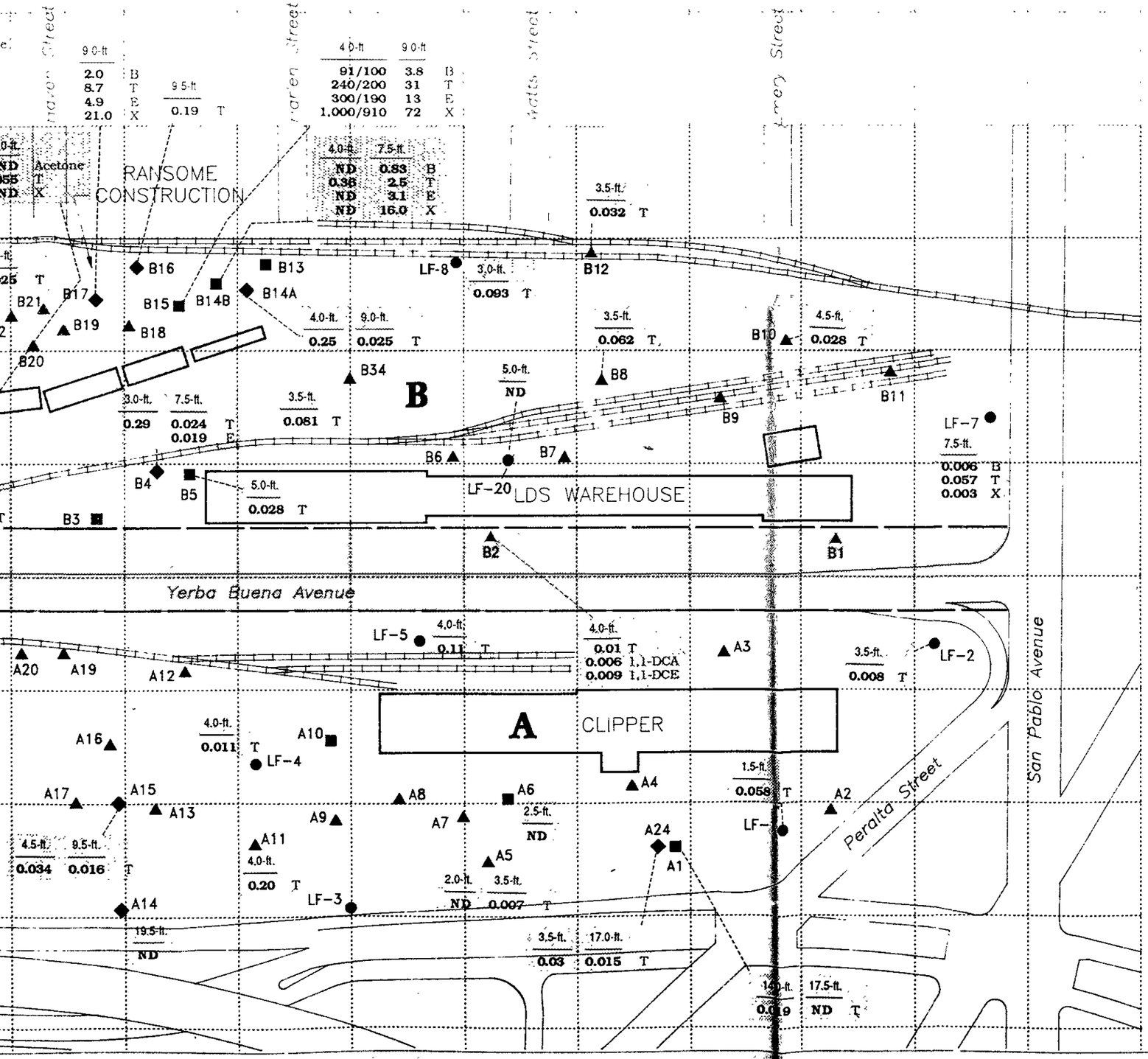
AS/BD



EXPLANATION

- MONITORING WELL LOCATION
- PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION
- NON-ACCESSIBLE AREA
- YERBA BUENA RIGHT-OF-WAY
- OAKLAND TERMINAL RAILWAYS (NOT INCLUDED IN THIS INVESTIGATION)

9.0-ft — DEPTH OF SAMPLE

91/100	B	BENZENE
240/200	T	TOLUENE
300/190	E	ETHYLBENZENE
1,000/910	X	XYLENES

- CHEMICAL COMPOUND
- DUPLICATE ANALYSIS
- CONCENTRATION DETECTED IN SOIL SAMPLES (PPM)

ND NOT DETECTED

KEY TO ABBREVIATIONS

1,1-DCA 1,1-DICHLOROETHANE
1,2-DCE 1,2-DICHLOROETHENE
TCE TRICHLOROETHENE

Figure 11 :

VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES (ppm) PHASE I INVESTIGATION

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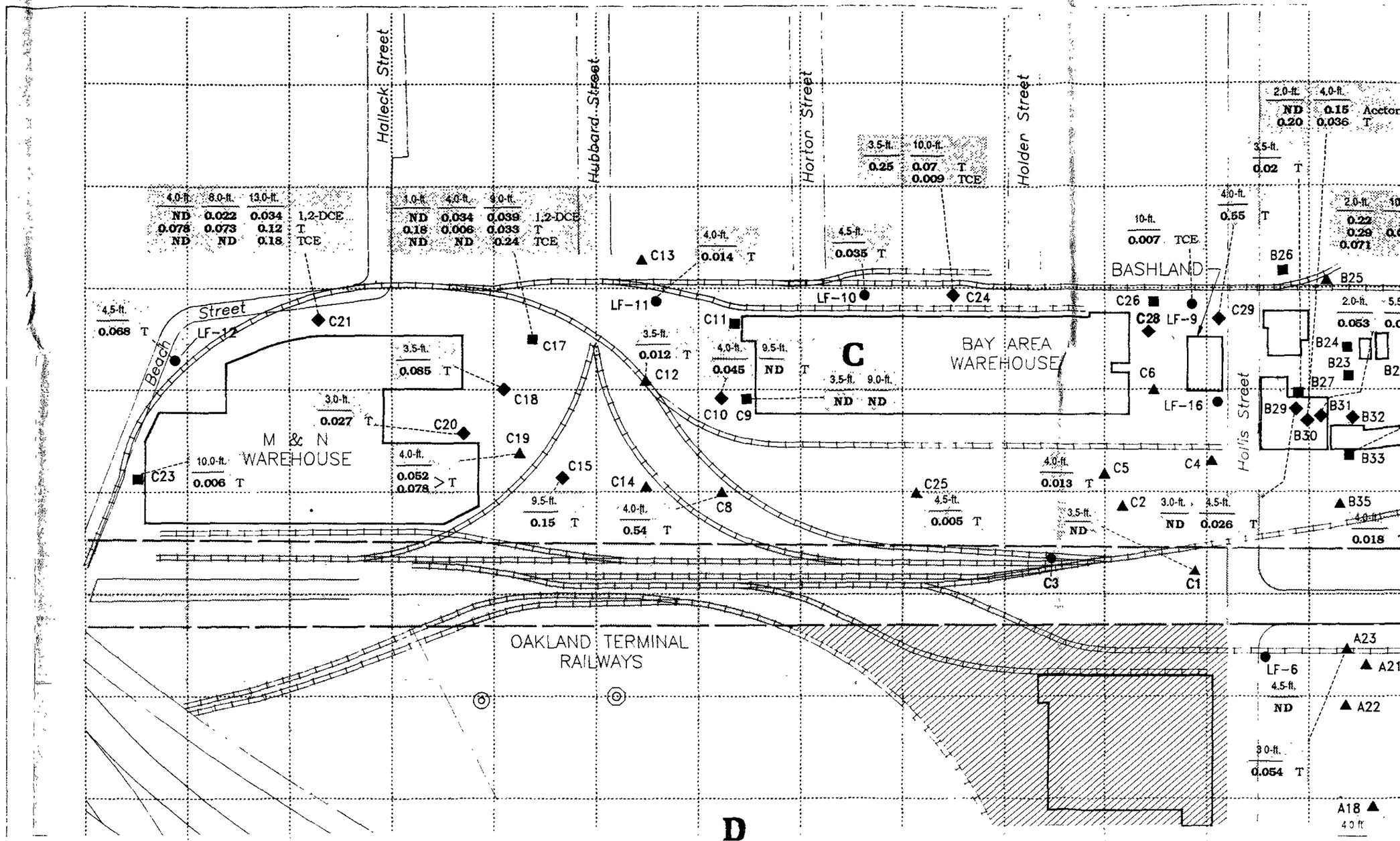
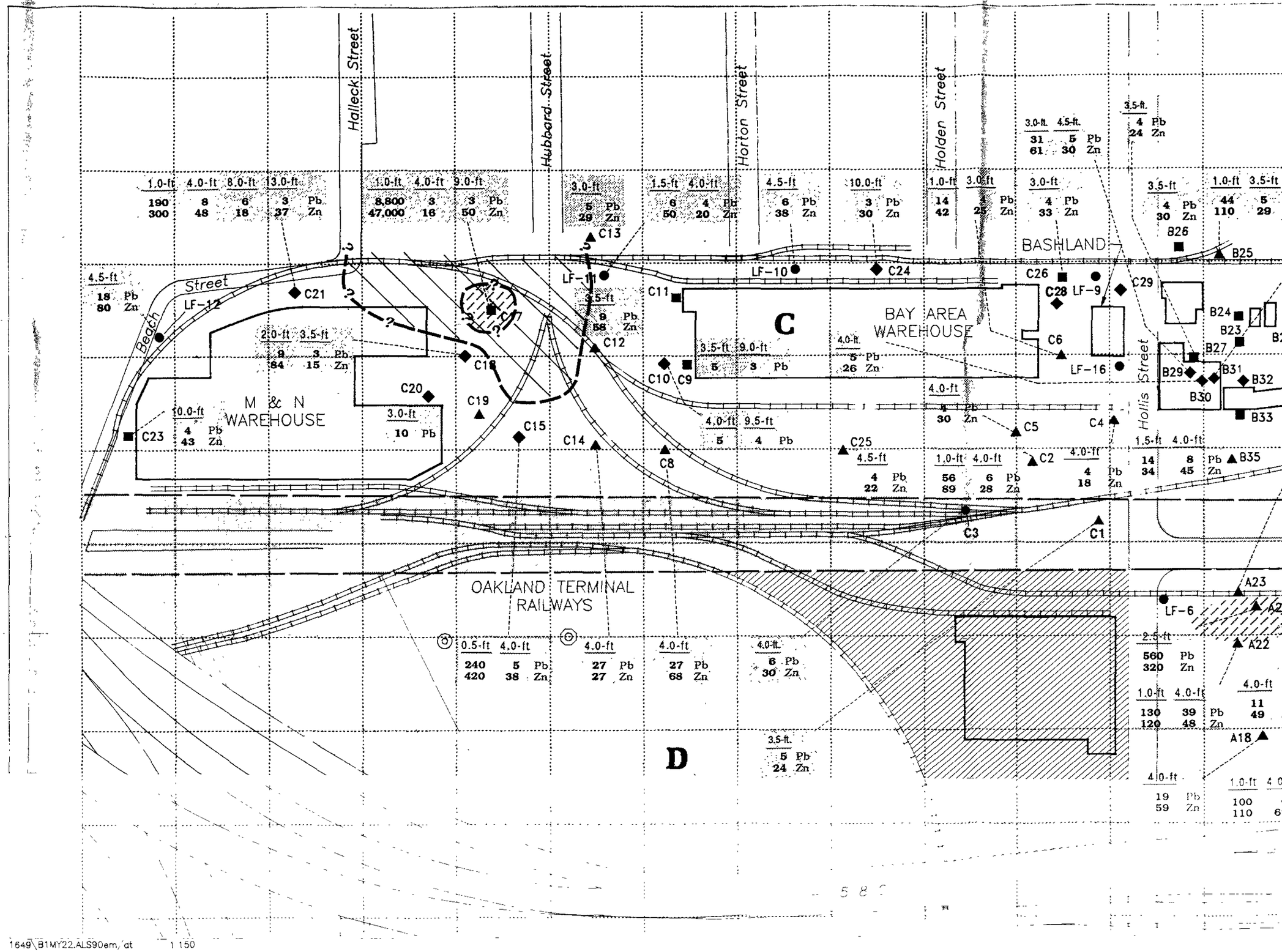
ALS12/JUL90bd/jc


Halleck Street
Hubbard Street
Horton Street
Holder Street
Hollis Street
Beach Street
BASHLAND
BAY AREA WAREHOUSE
M & N WAREHOUSE
OAKLAND TERMINAL RAILWAYS
C
D
LF-10
LF-11
LF-12
LF-9
LF-16
LF-6
C1
C2
C3
C4
C5
C6
C8
C9
C10
C11
C12
C13
C14
C15
C17
C18
C19
C20
C21
C23
C24
C25
C26
C28
C29
B23
B24
B25
B26
B27
B29
B30
B31
B32
B33
B35
A18
A21
A22
A23
4.0-ft. ND 0.078 | 8.0-ft. 0.022 0.073 ND | 13.0-ft. 0.034 0.12 0.18 1,2-DCE T TCE
1.0-ft. ND 0.18 ND | 4.0-ft. 0.034 0.006 ND | 9.0-ft. 0.039 0.033 0.24 1,2-DCE T TCE
3.5-ft. 0.25 | 10.0-ft. 0.07 0.009 T TCE
2.0-ft. ND 0.20 | 4.0-ft. 0.15 0.036 Acetor T
3.5-ft. 0.02 T
4.0-ft. 0.55 T
10-ft. 0.007 TCE
2.0-ft. 0.22 0.29 0.071
4.0-ft. 0.014 T
4.5-ft. 0.035 T
3.5-ft. 0.012 T
4.0-ft. 0.045 | 9.5-ft. ND T
3.5-ft. ND | 9.0-ft. ND
4.5-ft. 0.068 T
3.5-ft. 0.085 T
3.0-ft. 0.027 T
10.0-ft. 0.006 T
4.0-ft. 0.052 0.078 > T
9.5-ft. 0.15 T
4.0-ft. 0.54 T
4.0-ft. 0.013 T
4.5-ft. 0.005 T
3.5-ft. ND
3.0-ft. ND | 4.5-ft. 0.026 T
2.0-ft. 0.053
4.0-ft. 0.018
4.5-ft. ND
3.0-ft. 0.054 T
4.0-ft. 0.21 T



1649\B1MY22.ALS90em,'dt 1 150

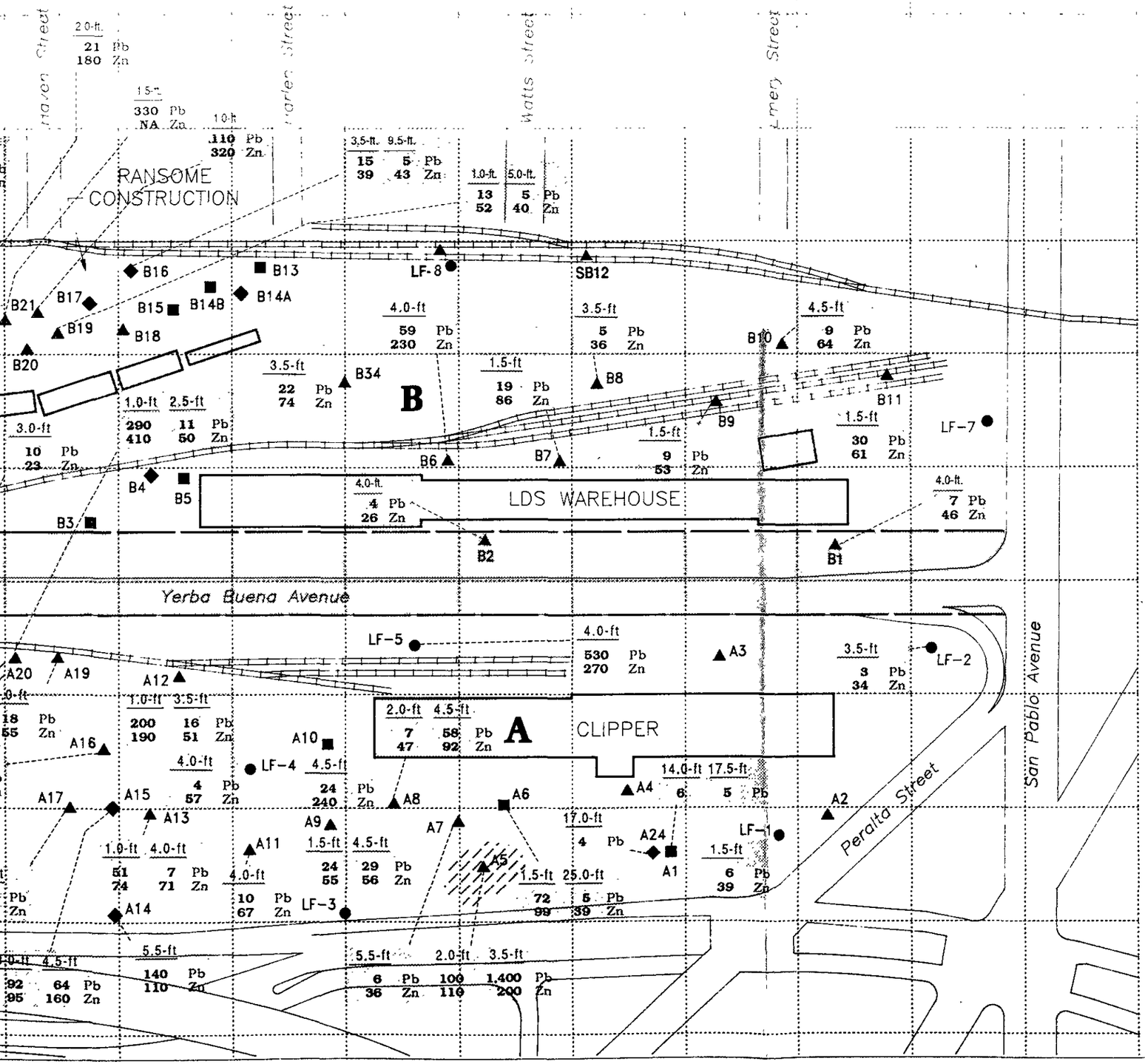


Figure 10 :

ZINC AND LEAD CONCENTRATIONS DETECTED IN SOIL SAMPLES (ppm) PHASE I INVESTIGATION

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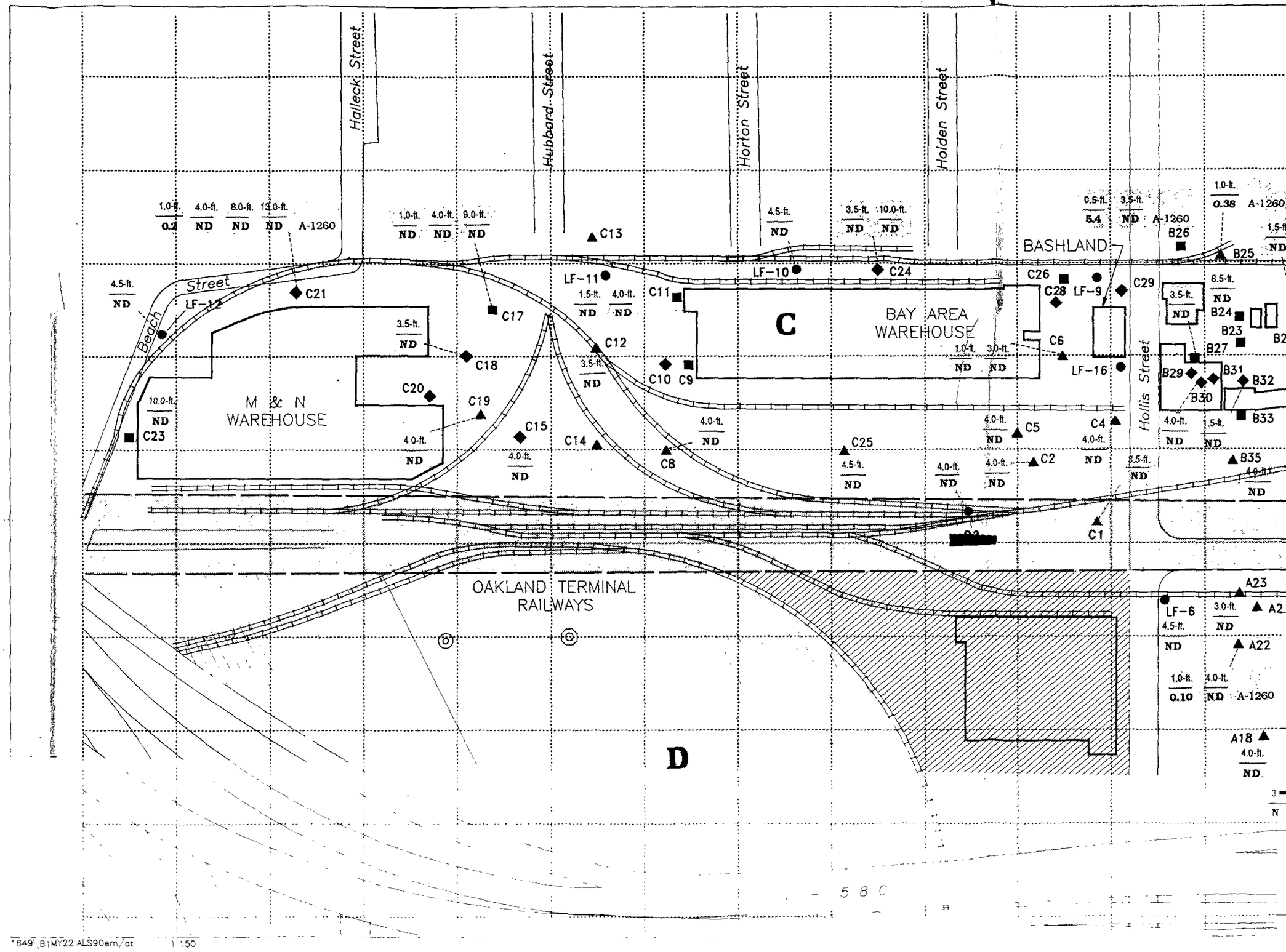
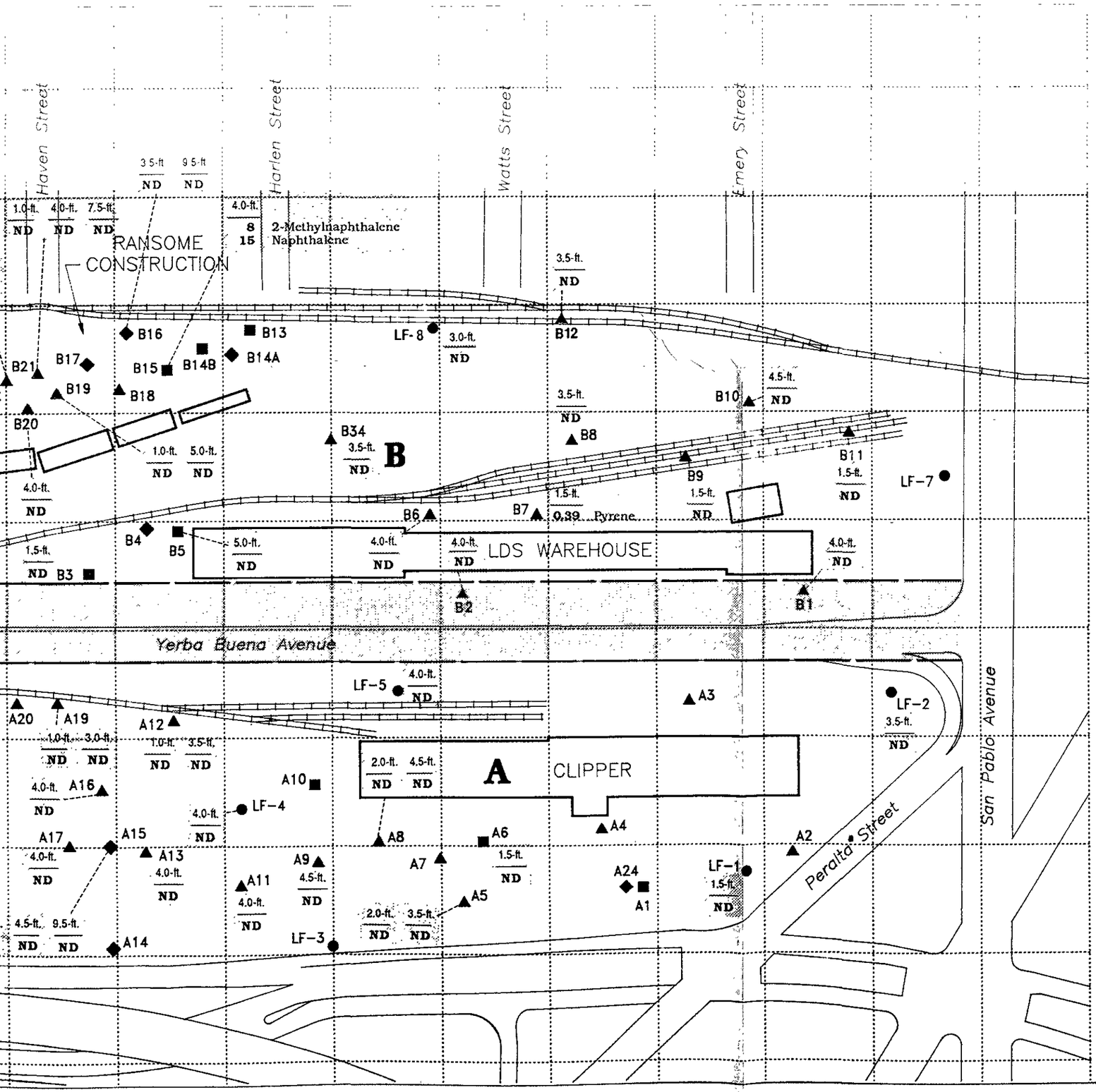

Halleck Street
Hubbard Street
Horton Street
Holden Street
Hollis Street
Beach Street
BASHLAND
BAY AREA WAREHOUSE
M & N WAREHOUSE
OAKLAND TERMINAL RAILWAYS
C
D
LF-11
LF-10
LF-12
LF-9
LF-16
LF-6
C13
C21
C17
C18
C20
C19
C15
C14
C8
C12
C11
C10
C9
C24
C25
C26
C28
C29
C6
C5
C4
C2
C1
B26
B25
B24
B23
B27
B29
B31
B32
B30
B33
B35
A23
A22
A18
A2
1.0-ft. 0.2 | 4.0-ft. ND | 8.0-ft. ND | 13.0-ft. ND A-1260
1.0-ft. ND | 4.0-ft. ND | 9.0-ft. ND
4.5-ft. ND
3.5-ft. ND | 10.0-ft. ND
0.5-ft. 5.4 | 3.5-ft. ND A-1260
1.0-ft. 0.38 A-1260
4.5-ft. ND
1.5-ft. ND
1.5-ft. ND | 4.0-ft. ND
3.5-ft. ND
8.5-ft. ND
3.5-ft. ND
1.0-ft. ND | 3.0-ft. ND
10.0-ft. ND
C23
4.0-ft. ND
4.0-ft. ND
4.0-ft. ND
4.5-ft. ND
4.0-ft. ND
4.0-ft. ND
3.5-ft. ND
4.0-ft. ND
1.5-ft. ND
4.0-ft. ND
LF-6 4.5-ft. ND
3.0-ft. ND
1.0-ft. 0.10
4.0-ft. ND A-1260
4.0-ft. ND
580
649 B1MY22 ALS90em/at 1:50



N

EXPLANATION

- MONITORING WELL LOCATION
- PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION
- NON-ACCESSIBLE AREA
- YERBA BUENA RIGHT-OF-WAY
- OAKLAND TERMINAL RAILWAYS (NOT INCLUDED IN THIS INVESTIGATION)

4.0-ft. — DEPTH OF SAMPLE

8 2-Methylnaphthalene
15 Naphthalene
— CHEMICAL COMPOUND
— CONCENTRATION DETECTED IN SOIL SAMPLES (PPM)

ND NOT DETECTED

0 150 300 FEET

Figure 12 :

SEMI-VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES (ppm) PHASE I INVESTIGATION

Project No.1649

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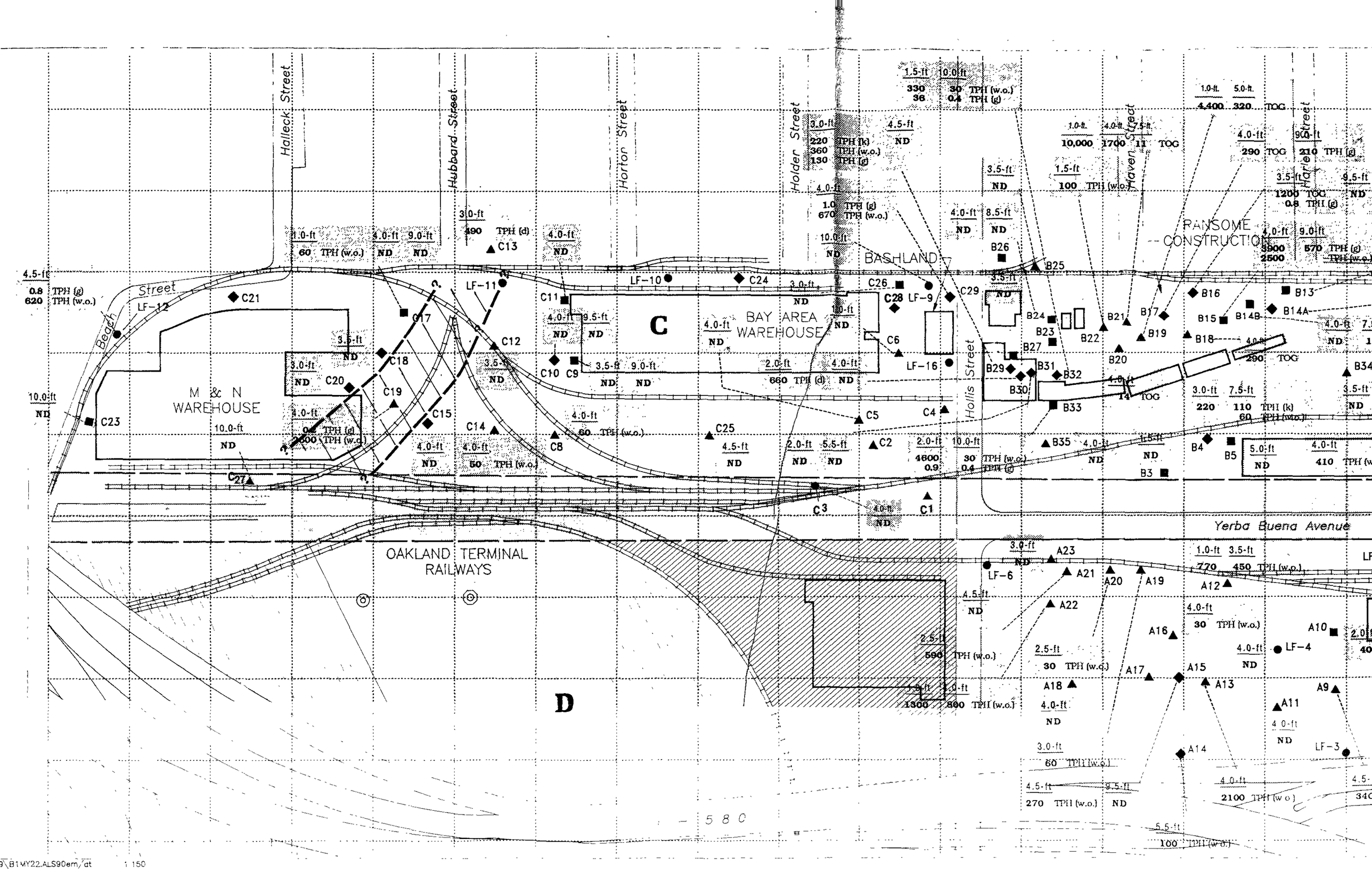
ALS12JUL90bd/jc



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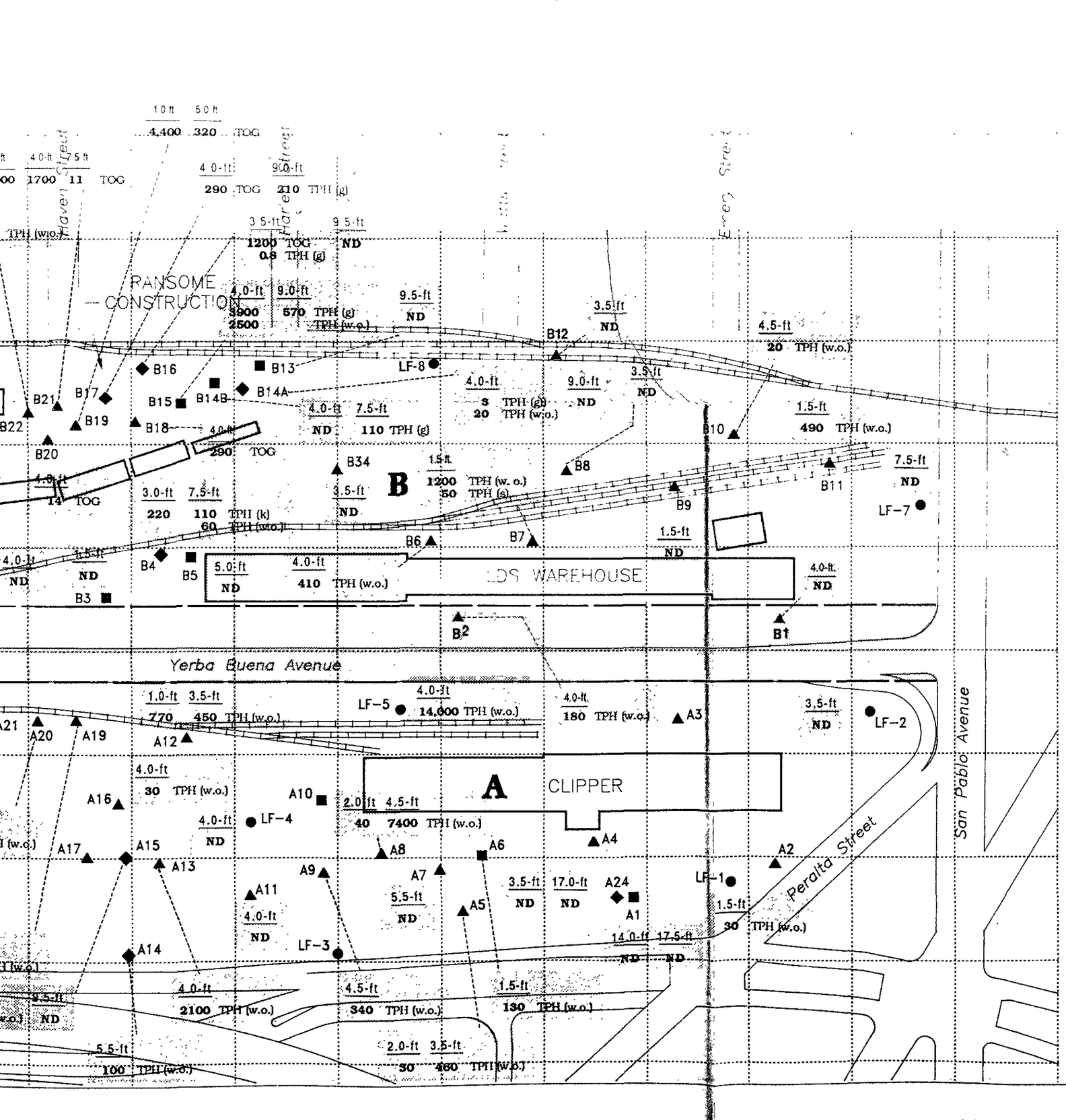

Figure 13 :

TOTAL PETROLEUM HYDROCARBONS DETECTED IN SOIL SAMPLES (ppm) PHASE I INVESTIGATION

Project No. 1649

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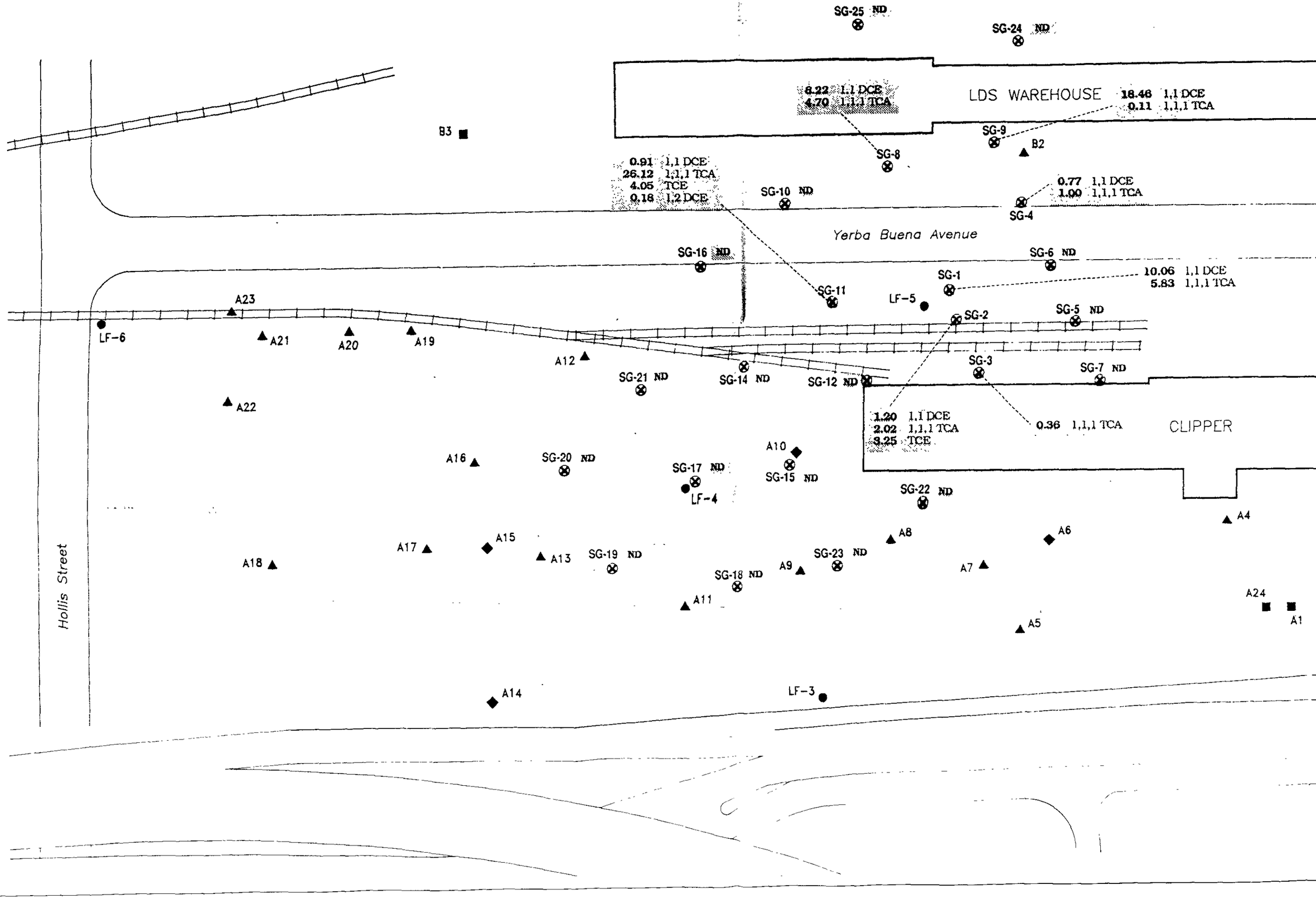
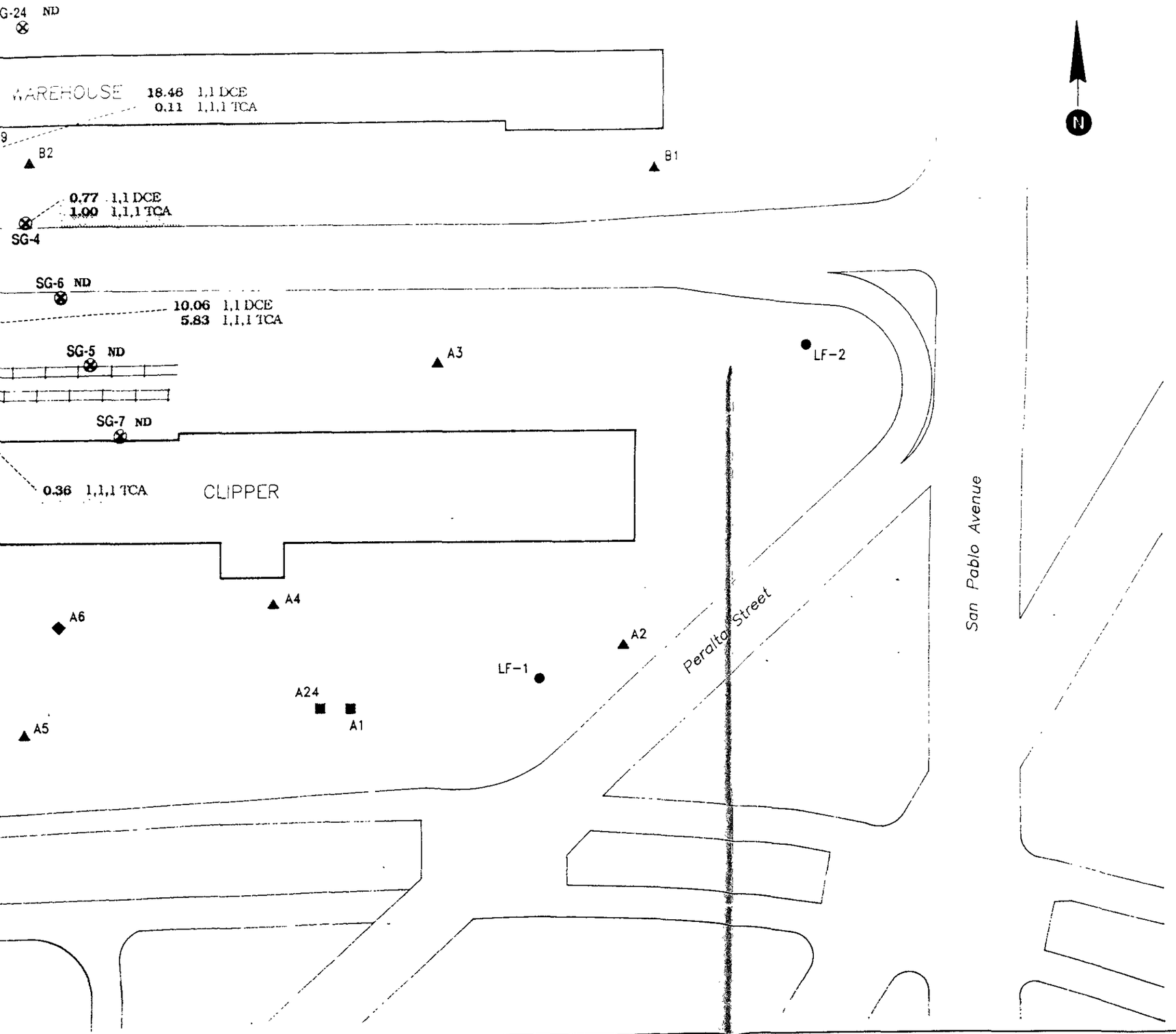

SG-25 ND
SG-24 ND
LDS WAREHOUSE
6.22 1,1 DCE
4.70 1,1,1 TCA
18.46 1,1 DCE
0.11 1,1,1 TCA
SG-9
B2
SG-8
B3
0.91 1,1 DCE
26.12 1,1,1 TCA
4.05 TCE
0.18 1,2 DCE
SG-10 ND
0.77 1,1 DCE
1.00 1,1,1 TCA
SG-4
Yerba Buena Avenue
SG-16 ND
SG-6 ND
SG-1
10.06 1,1 DCE
5.83 1,1,1 TCA
SG-11
LF-5
SG-2
SG-5 ND
A23
LF-6
A21
A20
A19
A12
SG-21 ND
SG-14 ND
SG-12 ND
SG-3
SG-7 ND
A22
1.20 1,1 DCE
2.02 1,1,1 TCA
3.25 TCE
0.36 1,1,1 TCA
CLIPPER
A10
A16
SG-20 ND
SG-17 ND
SG-15 ND
LF-4
SG-22 ND
A4
A8
A6
A15
A17
A13
SG-19 ND
SG-23 ND
A18
A9
A7
SG-18 ND
A11
A24
A1
A5
Hollis Street
A14
LF-3



EXPLANATION

- MONITORING WELL LOCATION
- PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION
- SOIL-GAS SAMPLING LOCATION FOR VOLATILE ORGANIC COMPOUND ANALYSIS

6.22	1,1-DCE	1,1-DICHLOROETHENE
0.18	1,2-DCE	1,2-DICHLOROETHENE
26.12	1,1,1-TCA	1,1,1-TRICHLOROETHENE
4.05	TCE	TRICHLOROETHENE

- CHEMICAL COMPOUND
- CONCENTRATION DETECTED IN SOIL SAMPLES (ug/l)

ND NOT DETECTED

NOTE: ALL SAMPLES WERE ANALYZED BY WESTON, INC. OF CALIFORNIA AND/OR TESTED FOR 1,1-DCE, 1,2-DCE, 1,1,1-TCA, TCE, 1,1-DCA AND 1,2-DCA.

0 40 80 120 160 FEET

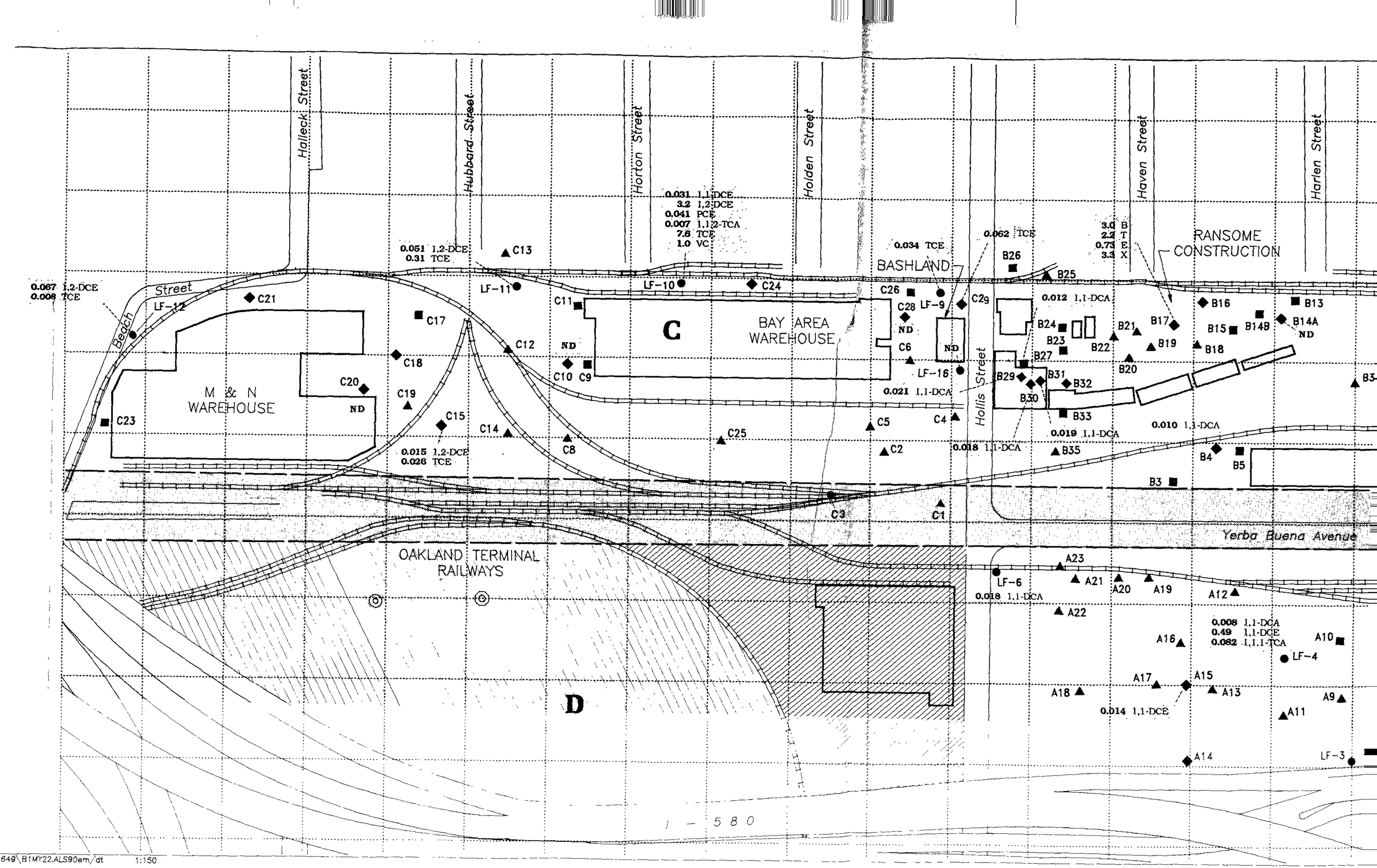
Figure 16:

SOIL-GAS SAMPLING RESULTS, AREA A (ug/l)
PHASE II INVESTIGATION

Project No. 1649

LEVINE • FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

6/7 AS/BD



649\B1MY22.ALS90em/dt 1:150

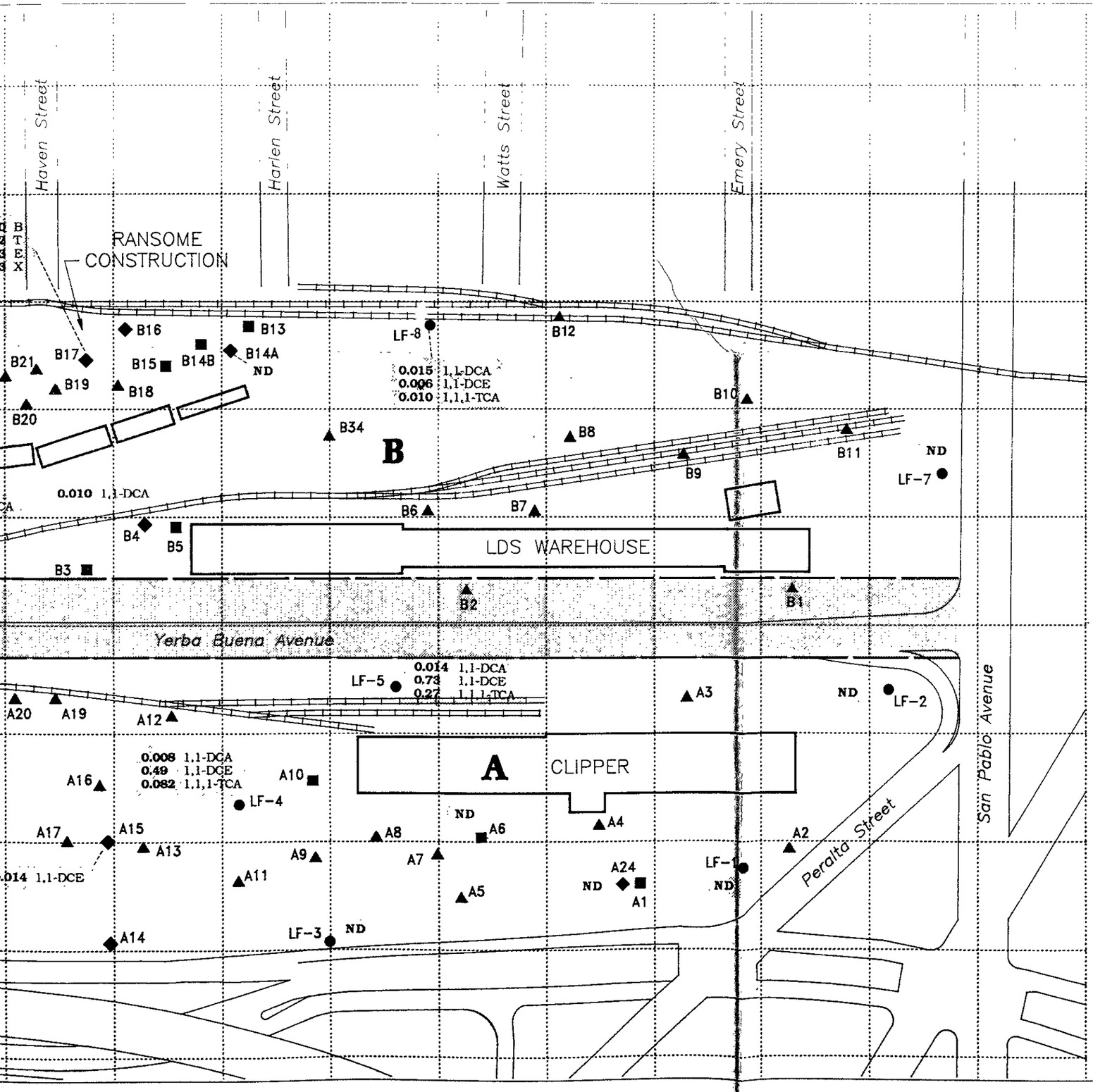


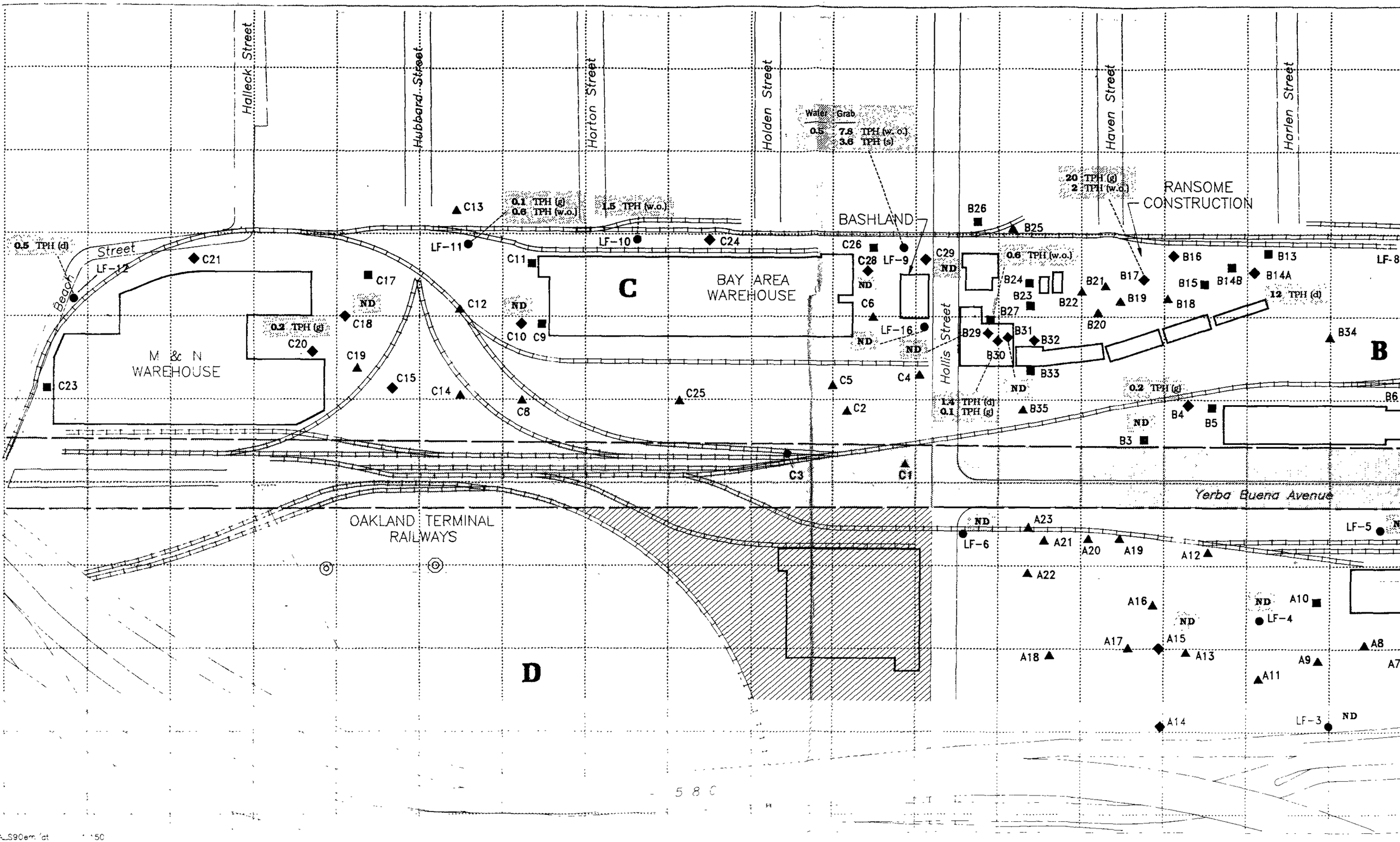
Figure 14 :

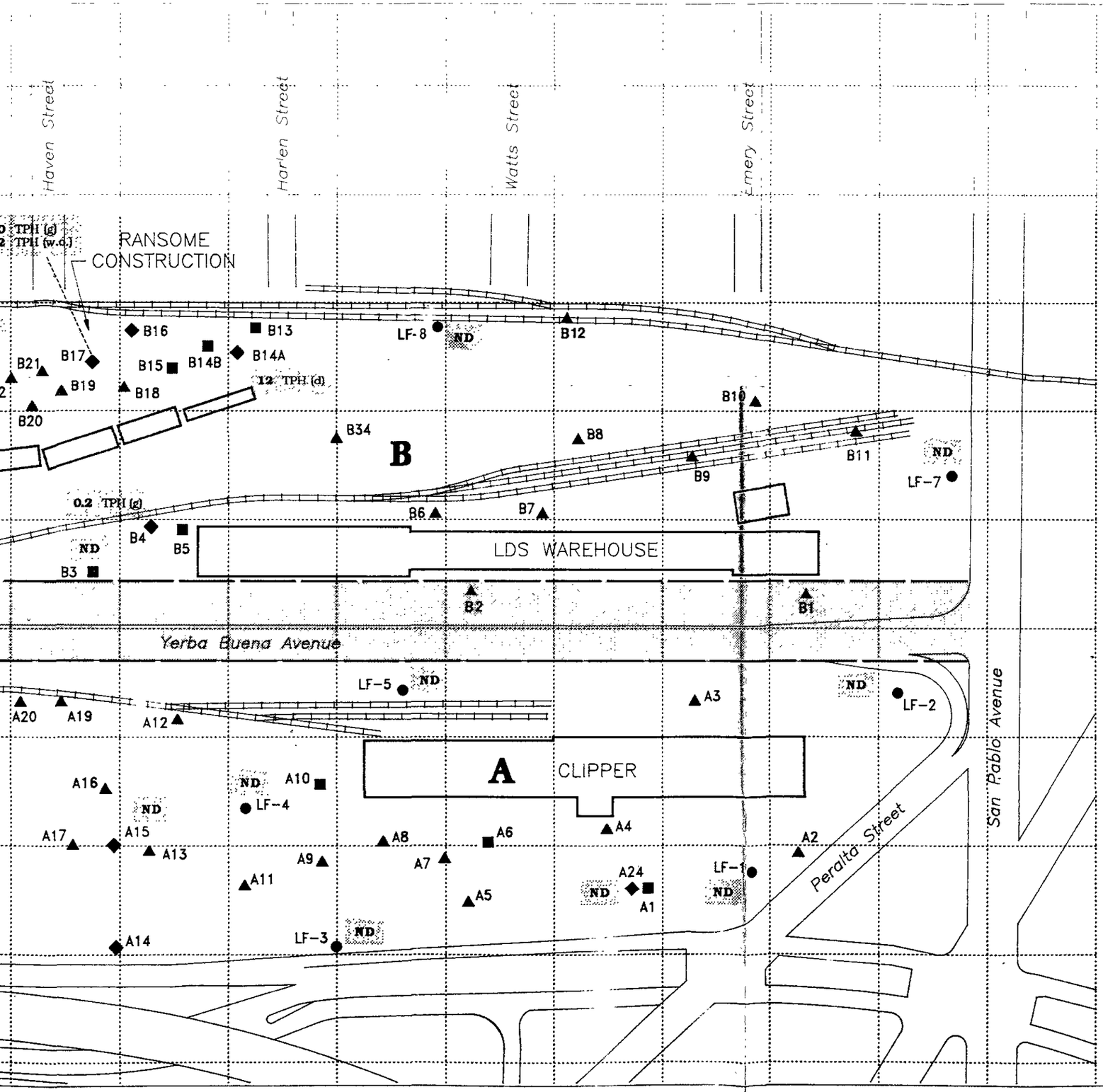
VOLATILE ORGANIC COMPOUNDS DETECTED IN SHALLOW GROUND-WATER SAMPLES (ppm) PHASE I INVESTIGATION

Project No. 1649

LEVINE • FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

ALS12JUL90dd/jc


Halleck Street
Hubbard Street
Horton Street
Holden Street
Haven Street
Harlen Street
Water Grab
0.5 7.8 TPH (w.o.)
3.6 TPH (s)
20 TPH (g)
2 TPH (w.o.)
RANSOME CONSTRUCTION
BASHLAND
0.1 TPH (g)
0.6 TPH (w.o.)
1.5 TPH (w.o.)
0.5 TPH (d)
Beach Street
LF-12
LF-11
LF-10
LF-9
LF-16
LF-8
LF-6
LF-5
LF-4
LF-3
C
BAY AREA WAREHOUSE
M & N WAREHOUSE
OAKLAND TERMINAL RAILWAYS
D
B
0.6 TPH (w.o.)
12 TPH (d)
0.2 TPH (g)
1.4 TPH (d)
0.1 TPH (g)
Yerba Buena Avenue
ND
C1
C2
C3
C4
C5
C6
C8
C9
C10
C11
C12
C13
C14
C15
C17
C18
C19
C20
C21
C23
C24
C25
C26
C28
C29
B3
B4
B5
B6
B10
B12
B13
B14A
B14B
B15
B16
B17
B18
B19
B20
B21
B22
B23
B24
B25
B26
B27
B29
B30
B31
B32
B33
B34
B35
A7
A8
A9
A10
A11
A12
A13
A14
A15
A16
A17
A18
A19
A20
A21
A22
A23



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EXPLANATION

- MONITORING WELL LOCATION
- PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION
- NON-ACCESSIBLE AREA
- YERBA BUENA RIGHT-OF-WAY
- OAKLAND TERMINAL RAILWAYS (NOT INCLUDED IN THIS INVESTIGATION)

1.4 TPH (d) TPH AS DIESEL (d)
0.1 TPH (g) TPH AS GAS (g)
10 TPH (w.o) TPH AS WASTE OIL (w.o.)
3.6 TPH (s) TPH AS STODDARD SOLVENT (s)

- CHEMICAL COMPOUND
- CONCENTRATION DETECTED IN SOIL SAMPLES (PPM)

ND NOT DETECTED

NOTE: TPH - TOTAL PETROLEUM HYDROCARBONS

0 150 300 FEET

Figure 15 :

TOTAL PETROLEUM HYDROCARBONS DETECTED IN SHALLOW GROUND-WATER SAMPLES (ppm) PHASE I INVESTIGATION

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LDS WAREHOUSE

B3

2.5-ft 6.0-ft
ND 0.003 1,1-DCA
ND 0.007 1,1-DCE
SS-23

SS-24

B2

3.0-ft 6.5-ft
ND 0.003 1,1-DCA
2.5-ft 5.5-ft ND 0.001 1,1,1-TCA
ND ND SS-25

Yerba Buena Avenue

SS-22
3.0-ft 8.0-ft
ND ND

SS-21
5.0-ft 8.0-ft
ND ND

LF-5

SS-20

A23

LF-6

A21

A20

A19

A12

A22

2.0-ft 5.0-ft
0.002 ND 1,1,1-TCA

CLIPPER

SS-11

A16

SS-8

A10

LF-4

A4

A8

A6

A15

A17

A13

A18

A9

A7

SS-5

A11

SS-3

A24

SS-7

SS-1

A1

A5

SS-10

SS-6

SS-4

SS-9

SS-2

A14

LF-3

Hollis Street

649\F1ABMR27.ALS90DA: 1:80

AREHOUSE

B2

3.0-ft 6.5-ft

ND 0.003 1,1-DCA

SS-25 ND 0.001 1,1,1-TCA

B1

SS-21

5.0-ft 8.0-ft

ND ND

A3

LF-2

CLIPPER

A4

A6

SS-5

A2

LF-1

Peralta Street

San Pablo Avenue

SS-3

A24

SS-1

A1

SS-4

SS-2

N

EXPLANATION

- ● MONITORING WELL LOCATION
- ▲ PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)
- ■ PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)
- ◆ PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION
- ⊗ PHASE II SOIL **SAMPLING LOCATION FOR** VOLATILE ORGANIC COMPOUND ANALYSIS

6.0-ft. — DEPTH OF SAMPLE

0.003 1,1-DCA — 1,1-DICHLOROETHANE

0.007 1,1-DCE — 1,1-DICHLOROETHENE

0.001 1,1,1-TCA — 1,1,1-TRICHLOROETHANE

CHEMICAL COMPOUND

CONCENTRATION DETECTED IN SOIL SAMPLES (mg/kg)

ND NOT DETECTED

0 40 80 120 160 FEET

Figure 17 :

VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL SAMPLES (mg/kg) IN AREA A, PHASE II INVESTIGATION

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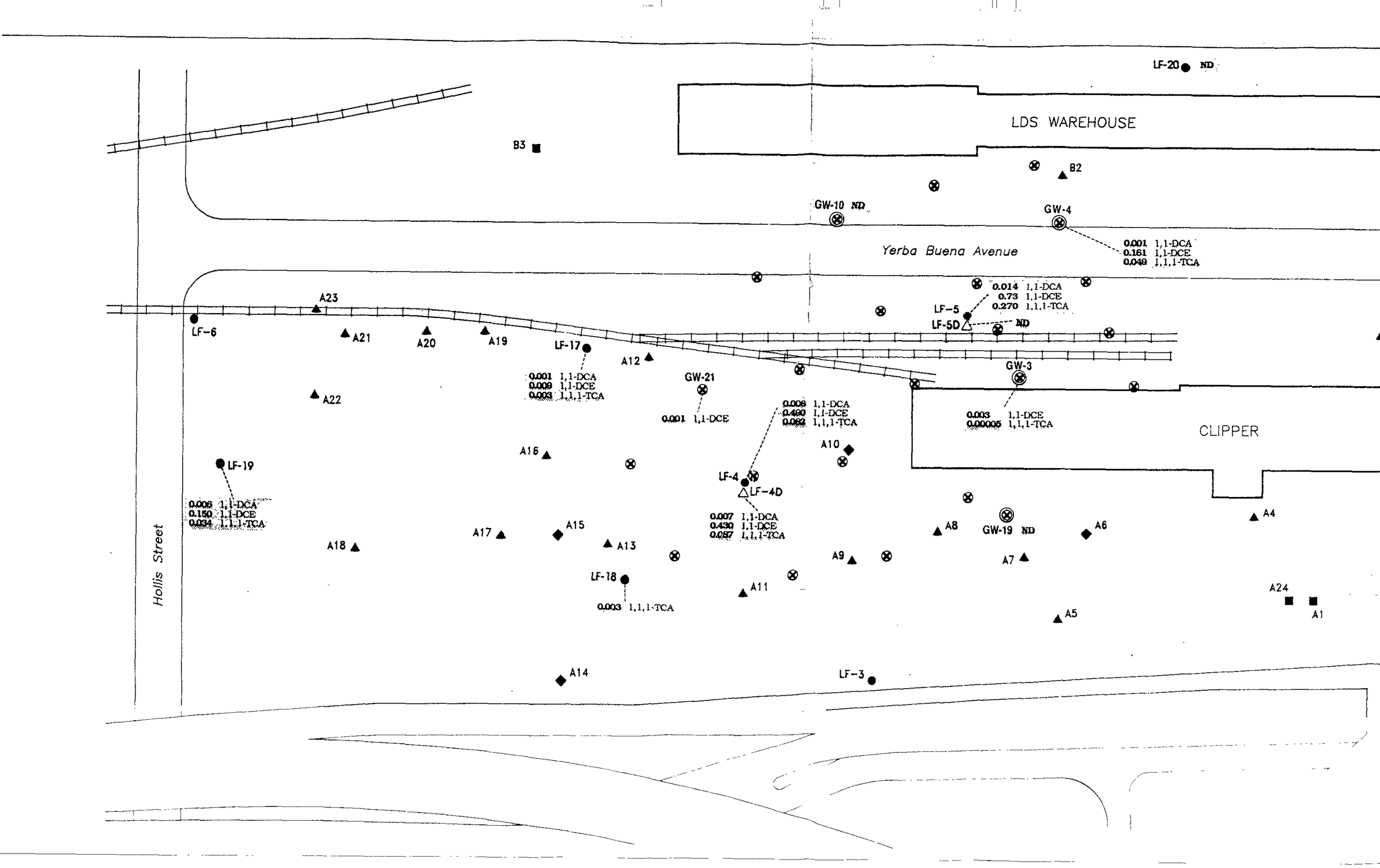
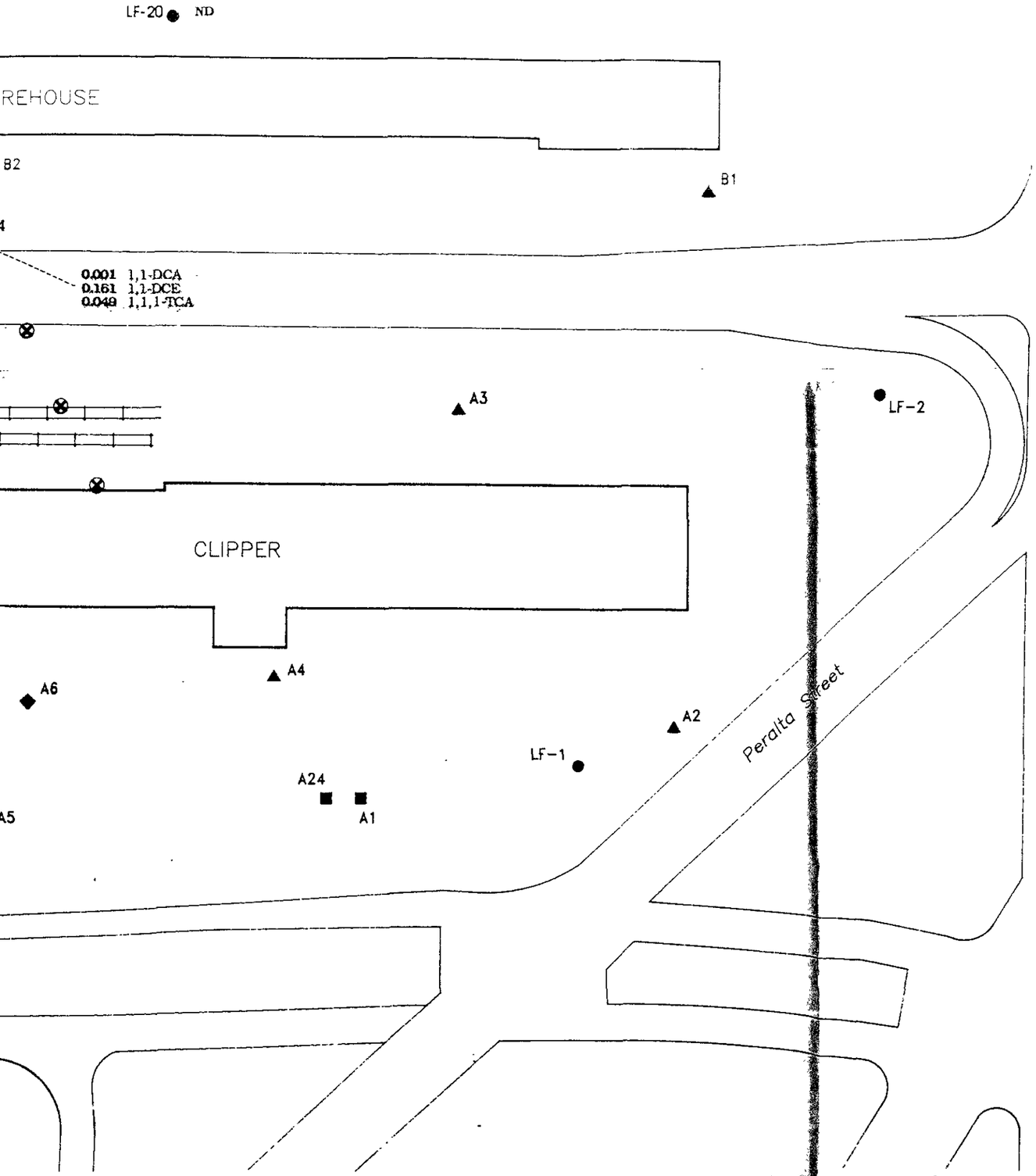

LF-20 ND
LDS WAREHOUSE
B3
B2
GW-10 ND
GW-4
0.001 1,1-DCA
0.161 1,1-DCE
0.049 1,1,1-TCA
Yerba Buena Avenue
0.014 1,1-DCA
0.73 1,1-DCE
0.270 1,1,1-TCA
LF-5
LF-5D
ND
A23
LF-6
A21
A20
A19
LF-17
A12
0.001 1,1-DCA
0.009 1,1-DCE
0.003 1,1,1-TCA
GW-21
GW-3
A22
0.001 1,1-DCE
0.008 1,1-DCA
0.490 1,1-DCE
0.062 1,1,1-TCA
0.003 1,1-DCE
0.00005 1,1,1-TCA
CLIPPER
A10
A16
LF-19
0.006 1,1-DCA
0.150 1,1-DCE
0.034 1,1,1-TCA
LF-4
LF-4D
0.007 1,1-DCA
0.430 1,1-DCE
0.057 1,1,1-TCA
A4
A8
GW-19 ND
A6
A17
A15
A18
A13
A9
A7
LF-18
A11
0.003 1,1,1-TCA
A24
A1
A5
Hollis Street
A14
LF-3



EXPLANATION

- ● SHALLOW (LESS THAN 25 FEET) MONITORING WELL LOCATION
- △ DEEPER (35 TO 45 FEET) MONITORING WELL LOCATION
- ▲ PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)
- ■ PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)
- ◆ PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION
- ⊗ SOIL-GAS SAMPLING LOCATION
- ⊗ SHALLOW GROUNDWATER RECONNAISSANCE SAMPLING LOCATION

0.006 1,1-DCA 1,1-DICHLOROETHANE
0.720 1,1-DCE 1,1-DICHLOROETHENE
0.025 1,1,1-TCA 1,1,1-TRICHLOROETHENE

- CHEMICAL COMPOUND
- CONCENTRATION DETECTED IN GROUND-WATER SAMPLES (PPM)

ND NOT DETECTED

NOTE.
1. MONITORING WELL SAMPLES WERE SUBMITTED TO MED-TOX ASSOCIATES FOR VOLATILE ORGANIC
2. COMPOUNDS ANALYSIS USING EPA METHOD 8010. RESULTS INDICATED FOR WELLS LF-4 AND LF-5 ARE FROM THE PHASE I INVESTIGATION.

0 40 80 120 160 FEET

Figure 18 :

VOLATILE ORGANIC COMPOUNDS DETECTED IN SHALLOW GROUND-WATER SAMPLES (ppm) IN AREA A, PHASE II INVESTIGATION

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LDS WAREHOUSE

B3

SS-24

B2

SS-23

SS-25

Yerba Buena Avenue

SS-22

SS-21

LF-5

SS-20

A23

LF-6

A21

A20

A19

A12

A22

CLIPPER

SS-11

1-ft
94

A16

SS-8

0.5-ft 1.5-ft
200 30

LF-4

A10

A4

A8

A6

1.0-ft
15

SS-5

A17

A15

A13

A18

A9

A7

1.0-ft 3.5-ft
9 50

A11

2.0-ft 3.5-ft
100 1400

SS-7

SS-1

SS-3

A24

A1

A5

1.0-ft 3.5-ft
7 15

1.0-ft
200

SS-10

2-ft
29

1.5-ft
90

SS-9

SS-6

SS-2

SS-4

1.0-ft 3.5-ft
52 42

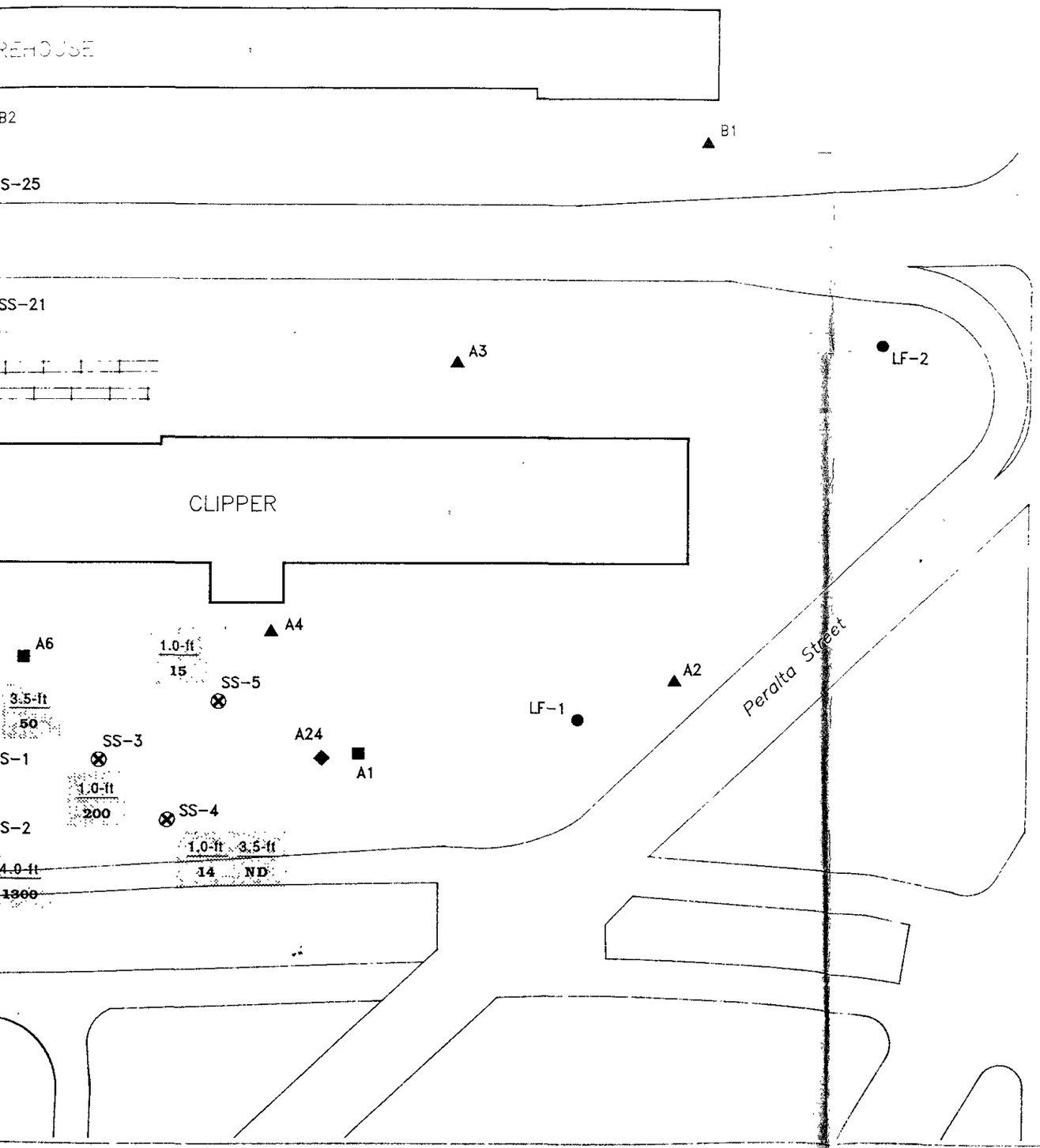
1.0-ft 3.5-ft
14 ND

LF-3

1.0-ft 4.0-ft
7 1300

A14

Hollis Street



EXPLANATION

- MONITORING WELL LOCATION
- PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)
- PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION
- SOIL SAMPLING LOCATION FOR LEAD ANALYSIS

6.0-ft 6.0-ft — DEPTH OF SAMPLE
52 42 — CONCENTRATION DETECTED IN SOIL SAMPLES (mg/kg)

ND NOT DETECTED

NOTE: SAMPLE RESULTS PRESENTED FOR LOCATION A-5 WERE COLLECTED DURING PHASE I OF THE INVESTIGATION.

0 40 80 120 160 FEET

Figure 19 :

LEAD DETECTED IN SHALLOW SOIL SAMPLES (mg/kg) IN AREA A, PHASE II INVESTIGATION

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