ENVIRONMENTAL ENGINEERING, INC.
6620 Owens Drive, Suite A • Pleasanton, CA 94588
TEL (925)734-6400 • FAX (925)734-6401
www.somaenv.com

March 3, 2010

Mr. Jerry Wickham, PG
Alameda County
Department of Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: **Fuel Leak Case#RO0002996**
Site Address: 316 38th Street, Oakland, CA

Dear Mr. Wickham:

SOMA's "Revised Workplan for Additional Soil and Groundwater Investigation" for the subject property has been uploaded to the State's GeoTracker database and Alameda County's FTP site for your review.

Thank you for your time in reviewing our report. If you have any questions or comments, please call me at (925) 734-6400.

Sincerely,

Mansour Sepehr, Ph.D., PE
Principal Hydrogeologist

Enclosure

cc: Mr. John Kortum, Esq.

Revised Workplan for Additional Soil and Groundwater Investigation

316 38th Street
Oakland, California
Case RO0002996

March 3, 2010

Project 2720

Prepared for
Mr. Earl Thompson, Jr.
Executor for the Estate of Earl Thompson, Sr.

SOMA ENVIRONMENTAL ENGINEERING, INC.
6620 Owens Drive Suite A Pleasanton CA 94588 Ph: 925.734.6400 F: 925.734-6401 www.somaenv.com

CERTIFICATION

SOMA Environmental Engineering, Inc. has prepared this report on behalf of Mr. Earl Thompson, Jr., Executor for the Estate of Earl Thompson, Sr., property owner of 316 38th Street, Oakland, California, to comply with Alameda County Environmental Health Services requirements for further soil and groundwater investigation, as specified in April 30, 2009, September 17, 2009, and December 17, 2009 correspondence.

Mansour Sepehr, PhD, PE
Principal Hydrogeologist

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

SOMA Environmental Engineering, Inc. (SOMA) has prepared this report on behalf of Mr. Earl Thompson, Jr., Executor for the Estate of Earl Thompson Sr., property owner of 316 38th Street in Oakland, California (Thompson Property). The site is located in an area of primarily commercial and residential property uses (Figure 1). The site map showing locations of underground storage tanks (USTs), boreholes and wells is shown in Figure 2. This report summarizes decommissioning results of three underground storage tanks located under the sidewalk adjacent to the Thompson Property and proposes further investigation to delineate the extent of apparent contamination observed during confirmation sampling, to comply with requirements of Alameda County Environmental Health Services (ACEHS) for further soil and groundwater investigation specified in April 30, 2009, September 17, 2009, and December 17, 2009 correspondence.

1.1 Site Vicinity

Properties in the vicinity of the Thompson Property are primarily commercial and residential. Reportedly, six USTs were previously located at or near the nearby Glovatorium site located upgradient from the subject site at 3820 Manila Avenue (Glovatorium Property). The location of the Glovatorium Property is shown on Figures 1 and 2A. Two USTs associated with the Glovatorium Property were located under the sidewalk near 316 38th Street and four USTs were located inside the Glovatorium building. Capacities of the six Glovatorium USTs have been reported as ranging from 800 gallons to 5,000 gallons. They reportedly contained Stoddard solvent (TPH-ss), fuel oil, and possibly waste oil. In June 1997, HK2 obtained City of Oakland Fire Prevention Bureau permit No. 52-97 to decommission the USTs. USTs inside the building were interconnected through a series of pipes and valves. It was reported that in about the late 1970s a significant release of TPH-ss occurred when a new piping system was installed. In August 1997, the six Glovatorium USTs were abandoned in-place by backfilling with either cement-sand slurry or pea gravel. Groundwater monitoring wells associated with the Glovatorium Property are currently monitored semi-annually. Past groundwater monitoring events have indicated the presence of volatile organic compounds (VOCs) and PHCs in groundwater beneath the Glovatorium and adjacent properties.

Following are results of the latest groundwater monitoring event at the Glovatorium Property. Detectable levels ranged as follows: TPH-ss from 57 µg/L in LFR-1 and SOMA-1 to 860,000 µg/L in SOMA-2; total petroleum hydrocarbon as gasoline (TPH-g) from 67 µg/L in LFR-1 to 1,300,000 µg/L in SOMA-2; perchloroethylene (PCE) from 1.5 µg/L in LFR-3 to 1,200 µg/L in B-10; trichloroethylene (TCE) from 6.2 µg/L in GW-2 to 1,200 µg/L in B-10; and cis-1,2-dichloroethylene (cis-1,2-DCE) from 0.7 µg/L in LFR-4 to 5,900 µg/L in SOMA-2. Vinyl chloride (VC) was below the laboratory-reporting limit throughout

the site, except for samples from LFR-2 at 32 µg/L. Figure 2 shows locations of aforementioned sampling points.

The source of contamination is believed to be either the former Glovatorium USTs, which were used to store TPH-ss and VOCs, or releases from the Glovatorium piping on the washer system and from washing floors within the Glovatorium building with TPH-ss. At this time, multi-phase extraction (MPE) pilot testing events are being conducted at the Glovatorium Property to remediate subsurface contamination and additional soil and groundwater investigation is taking place to delineate vertical and horizontal extent of contamination at the site.

Surrounding properties are primarily commercial and residential. TOSCO Marketing Company is located north and upgradient of the site, at 40th Street and Broadway, and contains a number of groundwater monitoring wells.

1.2 Site Hydrogeology

The site is located on the alluvial plain between the San Francisco Bay shoreline and the Oakland hills. Surface sediments in the site vicinity consist of Holocene alluvial deposits that are representative of an alluvial fan depositional environment. These deposits consist of brown, medium dense sand that fines upward to sandy or silty clay. The pattern of stream channel deposition results in a three-dimensional network of coarse-grained sediments interspersed with finer grained silts and clays. The individual units tend to be discontinuous lenses aligned parallel to the axis of the former stream flow direction.

Sediments encountered in soil borings in the vicinity of the site are typical of those encountered in an alluvial fan depositional environment. The sediments are predominantly fine-grained, consisting of clay, silty clay, sandy clay, gravelly clay and clayey silt. Discontinuous layers of coarse-grained sediments (clayey sand, silty sand, and clayey gravel) generally also contain relatively high percentages of silt and clay, which tend to reduce their permeability. A relatively coarse-grained layer of silty sand, clayey sand, and clayey gravel was encountered at approximately 4.5 to 14 feet below ground surface (bgs). A discontinuous layer of silty to clayey sand was encountered at depths of 17 to 21 bgs.

According to results of historical groundwater monitoring activities in the site vicinity, groundwater occurs at 13 to 20 feet bgs. Based on current and previous groundwater monitoring reports for wells in the vicinity of the site, groundwater flows from the northeast to the southwest with an approximate groundwater flow gradient of 0.019 ft/ft to 0.035 ft/ft. Slug test results indicated that hydraulic conductivity of saturated sediments ranges between 1.2×10^{-4} and 6.9×10^{-4} cm/sec, which is equivalent to 0.34 ft/day to 1.95 ft/day. Using the average groundwater flow gradient of 0.027 and aquifer porosity of 0.32, the groundwater flow velocity ranges between 10.5 and 60.1 ft/year.

Based on confirmation soil borings advanced during USTs closure, the site is underlaid with unconfined sediments as follows around three decommissioned USTs located on the sidewalk in front of the site (see decommissioning summary below): primarily sand up to approximately 8 to 12 feet bgs (possibly fill material) and inorganic clays with sand to approximately 17 feet bgs around Tank 1; inorganic clays with sand to the total depth of the borings around Tank 2; and interbedded sand, clay, silt layers with gravel up to the total depth of the borings around Tank 3. Depth to water around Tank 1 was noted at approximately 12 feet bgs, Tank 2 at approximately 7 feet bgs, and Tank 3 at 7 feet bgs.

1.3 UST Decommissioning Summary

Three USTs located under the sidewalk in front of the Thompson Property were properly closed in November 2008, thereby effectively removing the contaminant source; results were documented in SOMA's report dated January 27, 2009. All residual amounts of the hazardous substances which were stored in the UST system prior to closure have been removed, properly disposed of, and neutralized; USTs and associated piping were filled according to Oakland Fire Department (OFD) with appropriate slurry mixture.

Based on observed recharge of 0.04 gallons per minute (gpm) into Tank 1 upon purging, it was determined that a small leak possibly existed in this UST at the time of closure. No purging or leak testing was conducted at Tanks 2 and 3 due to their apparent placement above the presumed water table. To verify integrity of the decommissioned USTs, SOMA performed confirmation soil and groundwater sampling activities in accordance with OFD approval of the workplan. To verify integrity of the decommissioned USTs, on November 20-21, 2008, SOMA's field geologist oversaw advancement of confirmation soil borings around each decommissioned UST by Fisch Drilling. Locations of advanced borings are shown in Figure 2. SOMA advanced seven vertical borings to 10-27 feet bgs, depending on the depth of each UST (Tank 1 bottom at 25 feet bgs, Tank 2 bottom at 8 feet bgs, Tank 3 bottom at 15 feet bgs) utilizing direct push technology (DPT). Soil samples were collected at depths where photoionization detector (PID) readings or visual observations indicated significant soil contamination. In addition, one soil sample was collected from the vadose zone at the soil–groundwater interface. Groundwater samples were collected from each advanced boring.

TPH-g was detected in soil samples at concentrations up to 4,100 mg/kg, and TPH-g and benzene were detected in grab groundwater samples at concentrations up to 29,000 and 22 µg/L, respectively. Following are laboratory analytical results derived during the confirmation soil and groundwater sampling.

1.3.1 Extent of Soil Contamination

Elevated PID levels and hydrocarbon staining were observed in confirmation borings TB1-1, TB1-3, TB2-1, TB3-1, and TB3-2 (Figure 2). As Table 1 indicates, TPH-g was detected above California Regional Water Quality Control Board (CRWQCB) Environmental Screening Level (ESL) in TB1-3 at 14 feet bgs (1,200 mg/kg), TB2-1 at 6 and 10 feet bgs (750 and 120 mg/kg), TB2-2 at 10 feet bgs (120 mg/kg), TB3-1 at 14 feet bgs (3,800 mg/kg) and TB3-2 at 14 and 17 feet bgs (3,200 and 210 mg/kg). TPH-d was detected above ESL at TB1-1 at 18 feet bgs (110 mg/kg). TPH-ss and kerosene were observed above ESL in TB1-1 at 18 feet bgs (170 and 150 mg/kg), TB1-3 at 14 feet bgs (120 and 110 mg/kg), TB2-2 at 10 feet bgs (150 and 130 mg/kg) and in TB3-1 at 14 feet bgs (130 and 120 mg/kg).

As Table 2 indicates, all BTEX (collective term for benzene, toluene, ethylbenzene and total xylenes) and other VOCs were below laboratory-detection limits and well below ESLs at all depths. Figures 3 through 8 show chemicals of concern (COCs) in soil at different depths. Residual soil contamination appears to be present between 6 and 8 feet bgs between Tanks 1 and 2; at approximately 12 feet bgs northeast of Tank 3, between Tanks 3 and 2; and at approximately 14 feet bgs north and northeast of Tank 3.

1.3.2 Extent of Groundwater Contamination

Groundwater samples from each confirmation soil boring showed contaminants above CRWQCB ESLs for groundwater that is a current or potential source of drinking water, as well as a non-drinking-water source. ESLs for TPH-g, TPH as diesel (TPH-d), TPH-ss, and kerosene are 100 µg/L for drinking and 210 µg/L for non-drinking water. As Table 3 shows, TPH-g ranged from 890 µg/L to 29,000 µg/L, TPH-d from 230 µg/L to 330,000 µg/L, TPH-ss from 140 µg/L to 560,000 µg/L, and kerosene from 170 µg/L to 560,000 µg/L. All samples except those from TB3-2 showed contaminants above non-drinking-water ESLs. Benzene was detected above drinking-water ESL in TB3-1 (22 µg/L, ESL 1 µg/L) and total xylenes were detected above drinking and non-drinking-water ESLs in TB1-3 (1,700 µg/L, drinking-water ESL 20 µg/L). BTEX was below ESLs or laboratory-detection limits in remaining samples. Table 4 shows that VOCs were detected above drinking-water ESLs in TB1-3 (TBA at 28 µg/L, ESL 12 µg/L), TB1-4 (1,2-DCA at 3.6 µg/L, ESL 0.5 µg/L), TB2-1 and TB3-1 (naphthalene at 98 and 19 µg/L, respectively, ESL 17 µg/L). All other VOCs were below ESLs or below laboratory-detection limits. Figures 9 through 12 show PHC contamination in groundwater. Groundwater samples indicate that PCH contamination in groundwater is located in the vicinity of the decommissioned USTs.

1.4 Site Inspection Summary

As requested by ACEH in their letter dated December 17, 2009, SOMA evaluated the potential locations (current/former) of piping dispensers and/or equipment inside the building that may have been used to transport, dispense, or otherwise use the contents of the USTs formerly located beneath the sidewalk adjacent to the subject property. Accompanied by Mr. John Kortum, SOMA representative visited the site on February 26, 2010 and conducted a site inspection. No piping or equipment related to former USTs were observed at the time of inspection. According to the property occupants, some piping of unknown origin was removed from the storage area (Figure 13) sometime in 1970s, upon piping removal the dirt floor was paved with concrete. At this time, the area with former piping is inaccessible (locked) and appears to be used as storage. Several of the proposed limited access borings discussed in the later section, will be advanced adjacent to the former piping locations. Photographic documentation is summarized in Appendix A.

Also, as requested in above correspondence, SOMA evaluated sampling locations B-11 and B-12 (Figure 13), which were said to be converted to monitoring wells in the report entitled *"Subsurface Investigation Report of Two Clusters of Underground Storage Tanks at the Former Glovatorium/The Leather Cleaners Site Located at 3815 Broadway, Oakland, CA 94611."* Although SOMA was unable to locate any reports, clarifying what happened to above points, upon visual inspection of all the possible locations for above borings/wells, it was determined that these wells have been decommissioned sometime in the past. Current condition of these points is illustrated on pictures attached as Appendix A.

1.5 Data Gap Summary

Due to elevated contaminant concentrations detected in shallow soil and groundwater in close proximity to the decommissioned USTs (under the sidewalk in front of Thompson Property) and, in some instances, undefined extent of elevated concentrations, further investigation to delineate vertical and horizontal extent of contamination is warranted.

1.6 Preferential Flow Pathway and Sensitive Receptor Evaluation

In order to determine whether any preferential flow paths impacting the contaminant flow migration exist at the site, SOMA conducted an evaluation of utility lines in the general vicinity of the contaminant plume located under the sidewalk in front of the Thompson Property. A 54-inch storm drain conduit, which runs through the Glovatorium Property, maybe acting as a preferential flow path for the contaminants associated with that property, is located immediately west of the decommissioned USTs. The 54-inch storm drain is a culvertized former creek channel, part of the Rockridge branch of Glen Echo Creek. Surface topography

and groundwater flow direction suggest that natural groundwater flow pathways are likely associated with the creek's drainage system, and may direct groundwater flow toward the storm drain.

In May 1999, Levine-Fricke (LFR) conducted a utility survey, including a video survey of the 54-inch (54" x 69") storm drain between manhole 1 (MH-1) on Manila Avenue to manhole 2 (MH-2) in the center of 38th Street (Figure 2). Through a videotape survey of the storm drain, LFR observed joints in the concrete that extended up the walls and around the roof arch. Water was observed seeping into the storm drain from three joints, one located under the parking lot, west of the site. The storm drain was not followed beyond MH-2 in the center of 38th Street. The depth of the storm drain as it runs below 38th Street is between 8.5 and 14 feet bgs. An 18-inch lateral is located approximately 14-14.5 feet bgs, running from east to west along the 38th Street, a 10-inch lateral approximately 10 feet bgs and a 15-inch lateral approximately 7.5 feet bgs that run toward the site and the 54-inch storm drain. A shallow utility trench runs above the decommissioned tanks (Glovatorium USTs and USTs recently decommissioned by SOMA) toward the storm drain (Figure 2).

Depth to groundwater in confirmation soil borings and adjacent wells has been observed between 5 and 14.5 feet bgs; therefore, the storm drain and its laterals along the 38th Street may act as preferential flow pathways for contamination in the subsurface. As part of the additional investigation, SOMA proposes advancement of several soil borings along the length of the storm drain, and a survey of the lateral inlets within manhole MH-2, to determine exact depths of the lateral connections. Sampling locations and techniques are detailed in Section 3.

To evaluate the land use type in close proximity to the site, a copy of the zoning map for the area was obtained from the City of Oakland (Figure 2A). As shown, the site is zoned regional commercial with residential areas zoned mixed housing located downgradient from the site. Historical review undertaken to identify any wells in the vicinity of the site indicated that there are no domestic, industrial, irrigation or any other water supply wells within a 2,000-foot radius; the only wells located adjacent to the site are groundwater monitoring wells. Several hospitals are within a 2,000-foot radius of the site; the closest, Kaiser Foundation Hospital, is located immediately south and downgradient from the site. Several schools are within a 2,000-foot radius of the site; the closest is Snow White Preschool, located southeast (crossgradient) approximately 1,100 feet from the site at 214 W. MacArthur Blvd.

1.7 Evaluation of Existing Groundwater Monitoring Well Network

In order to avoid duplication of effort and determine whether additional well installation is necessary, SOMA evaluated the existing groundwater monitoring well network associated with the adjacent Glovatorium Property. Three existing groundwater monitoring wells are associated with the Glovatorium (GW-5,

GW-6A, and LFR-4) which were installed in close proximity to the USTs decommissioned by Glovatorium (Figure 2). Historical wells and borings GW-5A, GW-6, GW-7 and GW-8 were decommissioned between July 1999 and July 2000.

Well GW-5 is screened from 8 to 13 feet bgs, GW-6A from 5 to 15 feet bgs, and LFR-4 from 9 to 19 feet bgs. The wells are located 10 to 40 downgradient and crossgradient from the decommissioned USTs. GW-5 and GW-6A, located adjacent to the 54-inch storm drain conduit, have not been monitored since 2000, at that time all contaminants were below laboratory-detection limits. Contamination observed in LFR-4 (the closest well located downgradient of decommissioned tanks) is a few orders of magnitude lower than that observed during the UST decommissioning (most recent soil and groundwater investigation). During the Second Semi-Annual Monitoring Event conducted at the Glovatorium site (September 2009 Groundwater Monitoring Report), TPH-g was detected in LFR-4 at 480 µg/L and TPH-ss at 270 µg/L; highest TPH-g and TPH-ss concentrations, observed during the UST decommissioning, were detected at 29,000 µg/L, and 560,000 µg/L, respectively.

Groundwater has been encountered in confirmation soil borings and adjacent wells from 5 feet bgs to 14.5 feet bgs. Since the closest downgradient well LFR-4 is screened from 9 to 19 feet bgs, this well may not be ideal for contaminant plume monitoring around the decommissioned USTs. Though not ideal, wells GW-5 and GW-6A may be appropriate for preferential flow path monitoring, adjacent to the 54-inch storm drain. Historical boring logs are attached in Appendix B.

Therefore, as part of the proposed soil and groundwater investigation, SOMA proposes collecting groundwater samples from wells LFR-4, GW-5, and GW-6A and advancing a soil boring in close proximity to LFR-4 to determine whether this well is suitable for monitoring contaminant plume migration. Results will be evaluated in conjunction with data derived from the proposed investigation prior to making a final determination regarding additional well installation.

2. SCOPE OF WORK

Based on results of the most recent site investigation, conducted in 2008, and ACEHS approval, SOMA proposes installation of DP borings to delineate horizontal extent of contaminant plume upgradient and downgradient of decommissioned USTs.

Task 1: Permit acquisition, Health and Safety Plan preparation, and subsurface utility clearance

Task 2: Advancement of DP borings

Task 3: Report preparation

Following are brief descriptions of these tasks.

3. FIELD ACTIVITIES

3.1 Pre-Investigation Activities

Upon approval of this workplan, and prior to initiating field activities, drilling permits will be obtained from ACEHS.

SOMA will prepare a site-specific Health and Safety Plan (HASP). The HASP will be prepared according to the Occupational Safety and Health Administration (OSHA), "Hazardous Waste Operation and Emergency Response" guidelines (29 CFR 1910.120) and the California Occupational Safety and Health Administration (Cal/OSHA) "Hazardous Waste Operation and Emergency Response" guidelines (CCR Title 8, section 5192). The HASP is designed to address safety provisions during field activities and protect the field crew from physical and chemical hazards resulting from drilling and sampling. The HASP establishes personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans. The HASP will be reviewed and signed by field staff and contractors prior to beginning field operations.

SOMA will contact Underground Service Alert (USA) to ensure that drilling areas are clear of underground utilities. Following USA clearance, SOMA will retain a private utility locator to survey proposed drilling areas and locate any additional subsurface conduits.

SOMA will also survey the 54-inch storm drain, by opening manhole MH-2 and surveying the depth to the storm lateral inlets.

3.2 Evaluation of Existing Groundwater Monitoring Well Network

Three existing groundwater monitoring wells are associated with the adjacent Glovatorium Property in the vicinity of the subject site (GW-5, GW-6A, and LFR-4). Nearby wells and borings, GW-5A, GW-6, GW-7 and GW-8 were decommissioned between July 1999 and July 2000. Except for LFR-4 as noted earlier, the existing wells appear to be screened across the appropriate interval (5 to 15 feet bgs, discussed below). GW-5 is screened from 8 to 13 feet bgs, GW-6A is screened from 5 to 15 feet bgs, and LFR-4 is screened from 9 to 19 feet bgs. The wells are located 10 to 40 feet downgradient and crossgradient of the decommissioned USTs. Contamination has been observed in LFR-4 (the closest well) with TPH-g observed at 480 µg/L and TPH-ss observed at 270 µg/L during the Second Semi-Annual Monitoring Event at the Glovatorium site (September 2009 Groundwater Monitoring Report). GW-5 and GW-6A have not been monitored since 2000, at which time all contaminants were below

laboratory-detection limits. As part of the proposed soil and groundwater investigation, SOMA proposes collecting groundwater samples from wells LFR-4, GW-5, and GW-6A.

3.3 Direct Push Borings, Collection of Soil and Groundwater Samples

3.3.1 Limited Access Direct Push Borings

Due to access limitations inside the Thompson building (Appendix A), proposed limited access Geoprobe borings will be advanced using Ram-Set hand portable equipment that utilizes DP technology (DPT). Proposed borings LDP-1 through LDP-3 are positioned inside the building upgradient of the former USTs to allow for baseline condition assessment. SOMA proposes utilizing Ram-Set, a portable hydraulically powered direct push soil probe unit designed for extremely tight space conditions. The unit requires only 5 feet of vertical clearance and has a footprint of only 2 square feet; the depth limitation of this rig in normally consolidated soil ranges between 25 and 80 feet bgs. Upon site inspection on February 26, 2010, several locations were found suitable for limited access borehole advancement, the proposed locations are shown on Figure 13, photographic documentation is cataloged in Appendix A.

Three borings (LDP-1 through LDP-3) are proposed upgradient of decommissioned USTs and adjacent to the area of former piping and existing floor drain (Figure 13). If for any reason Ram-Set cannot be utilized, with concurrence from ACEHS, where feasible a depth-limited hand-augered borehole will be advanced instead, to collect soil and groundwater samples.

Each DP boring will be advanced to approximately 25 feet bgs. SOMA will utilize a PID and field observations of odor and staining to determine ultimate soil and groundwater sampling depth and final depth of each boring, if no staining is observed at minimum soil samples will be collected at soil/groundwater interface and if varying lithologies are encountered. One groundwater sample will be collected from each encountered groundwater bearing zone. Samples will be collected according to the applicable protocol and analyzed as described in sections below. Proposed boring locations are illustrated in Figure 13.

3.3.2 Direct Push Borings

Proposed Geoprobe borings around former USTs will be advanced using DPT. As many as eight borings (DP-1 through DP-8) are proposed adjacent to and downgradient from decommissioned USTs. Final quantity of borings will be determined in the field based on access limitations or subsurface conditions. The purpose of this subsurface assessment is twofold: 1) determine the lateral extent of elevated contaminant levels reported in soil and groundwater samples; and 2) determine the necessity for permanent groundwater monitoring well installation in proximity to and downgradient from decommissioned USTs.

Subsurface soil and groundwater samples will be collected from each boring. Since confirmation borings were advanced only 1 to 2 feet beneath each tank (some borings were as shallow as 10 feet bgs) the vertical plume extent is not fully defined at this time. Therefore, each boring will be advanced to at least 30 feet bgs, since the deepest tank was installed to total depth of 25 feet bgs (Tank 1). SOMA will utilize a PID and field observations of odor and staining to determine ultimate depth of each boring. Borings advanced adjacent to decommissioned USTs will aid in determining the vertical extent of contamination; borings positioned downgradient from the source will aid in determining horizontal extent of contamination.

In order to determine whether contaminant migration via preferential pathways is occurring, proposed borings DP-2 and DP-3 are located adjacent to the storm drain, crossgradient from the site, and DP-7 is located adjacent to the storm drain, downgradient from the site. SOMA proposes utilizing a hand auger to clear these borings beyond 9 feet bgs, to avoid damaging the storm drain. Boring DP-7 will be advanced in close proximity to LFR-4 to allow for evaluation of existing screening interval in relation to contaminant transport and geology of saturated sediments.

Existing groundwater monitoring wells GW-5, GW-6A, and LFR-4 will be also sampled prior to making a final determination regarding additional well installation, in order to evaluate possible contaminant migration via preferential pathways along the storm drain and monitor groundwater flow patterns and plume migration in the vicinity of decommissioned tanks. All collected samples will be analyzed for constituents outlined in Section 3.4.

3.3.3 Soil Sampling

DPT is an efficient method of collecting continuous soil cores while preventing cross-contamination. DPT involves hydraulically hammering a set of steel rods into the subsurface with the lead section consisting of a polyethylene-lined sampler. After pushing the drilling rods to the desired depth, the soil-filled liner will be retrieved. SOMA's field geologist will log continuous soil cores from each boring location, characterizing the content of each soil-filled tube using the Unified Soil Classification System.

Encountered subsurface lithologies from all advanced borings will be recorded on geologic borehole logs. At each interval of depth-discrete soil sampling, the DP drilling rig will obtain a 4-foot soil core sample. The contents of each sediment-filled tube will be screened using PID. Vapors from the soil core sample(s) will be screened for volatile compounds and will be documented on geologic borehole logs. SOMA proposes that soil samples be collected at depths where PID readings or visual observations indicate the presence of significant soil contamination. In addition, one soil sample will be collected from the vadose

zone at the soil-groundwater interface. Absent detectable contaminants of concern in soil during field screening, a minimum of two soil samples will be collected from each soil boring. SOMA's field geologist will select and cut sections of the soil-filled tubes into 6-inch-long sections and cap ends of each sample with a Teflon liner and polyethylene end caps. Samples will be labeled and immediately placed into a chilled ice chest for transportation to a California state-certified environmental laboratory for analysis.

3.3.4 Groundwater Sampling

To collect groundwater samples at field-identified depth intervals, a hydropunch groundwater profiler will be used. It is designed for discrete groundwater sampling without cross-contaminating water-bearing zones (WBZs) at different depth intervals. The dual-walled sampler involves hydraulically driving or hammering a cased set of rods into the ground with the lead rod section consisting of a hollow acetate-lined sampler. After pushing the cased rods to the desired depth, the drilling rods are withdrawn from within the 1.25-inch-diameter outer casing to insert the screened sampler. The field crew will use a Watera sampler to collect groundwater samples from all advanced boreholes (regular and limited access), the low-flow sampling technique will be utilized to minimize the turbidity of groundwater samples and to allow for collection of groundwater samples that are more representative of the subsurface conditions.

3.3.5 Boring Decommissioning

Following soil and groundwater sampling, borings will be abandoned and sealed with a bentonite grout mixture and completed at the surface with materials to match the existing grade.

Soil and waste water generated during boring activities will be temporarily stored on-site in separate DOT-rated 55-gallon steel drums pending characterization, profiling and transport to an approved disposal/recycling facility.

3.3.6 Laboratory Analyses

Collected grab groundwater samples and soil samples will be submitted to a California state-certified environmental laboratory under appropriate chain-of-custody protocol for analysis of the following:

- TPH-g, TPH-d, and TPH-ss, EPA Method 8015, using silica gel cleanup method
- Kerosene, EPA Method 8015
- BTEX, EPA Method 8260

- VOCs such as PCE, TCE, VC, and naphthalene, and gasoline oxygenates such as methyl tertiary-butyl ether (MtBE) and tertiary-butyl alcohol (TBA), EPA Method 8260
- Total lead, EPA Method 6010

3.3.7 Data Review

Soil and groundwater data collected during the DP investigation will be utilized to determine whether all data gaps have been closed. Furthermore, investigation results will be made available to the regulatory agency for final determination regarding possible future well installation.

4. REPORT PREPARATION

SOMA will prepare a full report of the additional site investigation, including the following:

- Description of field activities; tabulation of soil and groundwater sample analytical data; maps illustrating boring locations; and description of lateral and vertical extent of impacted soil and groundwater utilizing all available up-to-date data.
- Conclusions regarding lateral and vertical extent of impact at the assessment area of concern, based on data and information derived from field work and laboratory analysis.
- Proposed further actions. If it appears that additional monitoring wells are necessary, a workplan detailing proposed well locations and installation procedures will be prepared for review.
- Prescreening evaluation of possible remedial technologies for addressing soil and groundwater contamination at the site.

Tables

Table 1: Soil Analytical Results (TPH and BTEX)
November 20 and 21, 2008
316 38th Street, Oakland

Borehole	Depth[1] (feet bgs)	TPH-g (mg/kg)	TPH-d (mg/kg)	TPH-ss (mg/kg)	Kerosene (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)
TB1-1	10	3.1	3.3	4.5	6	<0.023	<0.023	<0.023	<0.047
TB1-1	12	850	260	340	340	<2.4	<2.4	<2.4	<4.9
TB1-1	18	0.91	110	170	150	<0.005	<0.005	<0.005	<0.0099
TB1-1	27	<0.23	<0.99	<0.99	<0.99	<0.005	<0.005	<0.005	<0.01
TB1-3	10	7.3	12	21	22	NA	NA	NA	NA
TB1-3	12	300	35	58	53	<0.97	<0.97	<0.97	<1.9
TB1-3	14	1,600	66	120	110	<0.022	<0.022	<0.022	<0.043
TB1-3	27	<0.23	1.0	<0.99	2.8	<0.005	<0.005	<0.005	<0.01
TB1-4	24	<0.24	<1.0	1.8	3.7	<0.0047	<0.0047	<0.0047	<0.0095
TB1-4	27	2.0	<1.0	2.2	4.0	<0.005	<0.005	<0.005	<0.01
TB2-1	6	750	18	39	35	<0.005	<0.005	<0.005	<0.0099
TB2-1	10	120	1.8	1.7	3.6	<0.0049	<0.0049	<0.0049	<0.0099
TB2-2	6	250	15	28	27	<0.96	<0.96	<0.96	<1.9
TB2-2	8	3,900	630	950	950	<2.5	<2.5	<2.5	<4.9
TB2-2	10	140	79	150	130	<0.012	<0.012	<0.012	<0.024
TB3-1	6	<0.25	2.5	1.1	1.4	<0.005	<0.005	<0.005	<0.01
TB3-1	8	220	4.4	4	7.4	<1.9	<1.9	<1.9	<3.9
TB3-1	14	3,800	81	130	120	<0.024	<0.024	0.036	<0.048
TB3-1	17	<0.24	<1.0	1.4	3.3	<0.005	<0.005	<0.005	<0.01
TB3-2	6	<0.25	31	2.5	5	<0.005	<0.005	<0.005	<0.0099
TB3-2	12	2,100	12	15	17	<4.9	<4.9	<4.9	<9.7
TB3-2	14	3,200	5.5	5.5	7.9	<0.0049	<0.0049	<0.0049	<0.0099
TB3-2	14	4,100	NA	NA	NA	<0.0048	<0.0048	<0.0048	<0.0096
TB3-2	17	210	3.7	5.6	7.0	<0.0049	<0.0049	0.024	0.022
ESL - Shallow Soil <3m bgs		**83**	**83**	**83**	**83**	**0.044**	**2.9**	**2.3**	**2.3**
ESL - Deep Soil >3m bgs		**83**	**83**	**83**	**83**	**0.044**	**2.9**	**3.3**	**2.3**

Notes:

TPH-g: Total Petroleum Hydrocarbons as Gasoline (C5-C12)

TPH-d: Total Petroleum Hydrocarbons as Diesel (C9-C19)

TPH-ss: Total Petroleum Hydrocarbons as Stoddard Solvents (C9-C13)

TPH by EPA Method 8015, BTEX by EPA Method 8260B/CA_LUFTMS

ESL: California Regional Water Control Board Environmental Screening levels, Interim Final November 2007, Revised May 2008, Tables A and C

Table 2: Soil Analytical Results (VOC compounds)

November 20 and 21, 2008

316 38th Street, Oakland

Borehole	Depth[1] (feet bgs)	PCE (mg/kg)	TCE (mg/kg)	Vinyl Chloride (mg/kg)	TBA (mg/kg)	MtBE (mg/kg)	1,2-DCA (mg/kg)	Cis-1,2 DCE (mg/kg)	Napthalene (mg/kg)
TB1-1	12	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
TB1-1	18	<0.005	<0.005	<0.005	<0.0095	<0.0049	<0.005	<0.005	<0.0099
TB1-1	27	<0.005	<0.005	<0.005	<0.0094	<0.0047	<0.005	<0.005	<0.01
TB1-3	12	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
TB1-3	14	<0.022	<0.022	<0.022	<1.9	<0.97	<0.97	<0.022	<0.043
TB1-3	27	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.01
TB1-4	24	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
TB1-4	27	<0.005	<0.005	<0.005	<0.0095	<0.0047	<0.0047	<0.005	<0.01
TB2-1	6	<0.005	<0.005	<0.005	<1.9	<0.96	<0.96	<0.005	<0.0099
TB2-1	10	<0.0049	<0.0049	<0.0049	<1.9	<0.94	<0.94	<0.0049	<0.0099
TB2-2	6	<0.0049	<0.0049	<0.0049	NA	NA	NA	NA	NA
TB2-2	10	<0.012	<0.012	<0.012	<2.0	<0.98	<0.98	<0.012	<0.024
TB3-1	6	<0.0049	<0.0049	<0.0049	NA	NA	NA	NA	NA
TB3-1	14	<0.024	<0.024	<0.024	<5.0	<2.5	<2.5	<0.024	0.480
TB3-1	17	<0.005	<0.005	<0.005	<0.0096	<0.0048	<0.0048	<0.005	<0.01
TB3-2	6	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
TB3-2	14	<0.0049	<0.0049	<0.0049	<1.9	<0.96	<0.96	<0.0049	<0.0099
TB3-2	14	NA	NA	NA	<9.6	<4.8	<4.8	<0.0049	<0.0099
TB3-2	17	<0.0049	<0.0049	<0.0049	<1.9	<0.93	<0.93	<0.0049	0.018
ESL - Shallow Soil <3m bgs		**0.37**	**0.46**	**0.022**	**0.075**	**0.023**	**0.0045**	**0.19**	**1.3**
ESL - Deep Soil >3m bgs		**0.70**	**0.46**	**0.085**	**0.075**	**0.023**	**0.0045**	**0.19**	**3.4**

Notes:

NA: Not Analyzed

TBA, MtBE, 1,2-DCA by Method 8260B/CA_LUFTMS

PCE, TCE, Vinyl Chloride, Cis-DCE, and Napthalene by EPA Method 8260B

Environmental Screening levels or Laboratory Detection levels

ESL: California Regional Water Control Board Environmental Screening levels, Interim Final November 2007, Revised May 2008, Tables A and C

Table 3: Groundwater Analytical Results (TPH and BTEX)

November 20 and 21, 2008

316 38th Street, Oakland

Borehole	TPH-g (ug/L)	TPH-d (ug/L)	TPH-ss (ug/L)	Kerosene (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
TB1-1	2,600	7,400	2,700	7,500	<0.5	<0.50	<0.50	<1.0
TB1-3	29,000	8,700	7,900	12,000	0.54	<0.50	<0.50	1,700
TB1-4	1,400	290	520	600	0.75	10	6.50	59
TB2-1	28,000	52,000	110,000	97,000	<5.0	<5.0	9.10	<10
TB2-2	12,000	330,000	560,000	560,000	<5.0	<5.0	<5.0	<10
TB3-1	1,100	700	490	730	22	<0.50	2.10	5.8
TB3-2	890	230	140	170	<0.50	<0.50	0.55	<1.0
ESL - Groundwater is a Current/Potential Source of Drinking Water	**100**	**100**	**100**	**100**	**1**	**40**	**30**	**20**

Notes:

TPH-g: Total Petroleum Hydrocarbons as Gasoline (C5-C12)

TPH-d: Total Petroleum Hydrocarbons as Diesel (C9-C19)

TPH-ss: Total Petroleum Hydrocarbons as Stoddard Solvents (C9-C13)

TPH by EPA Method 8015, BTEX by EPA Method 8260B/CA_LUFTMS

ESL: California Regional Water Control Board Environmental Screening levels, Interim Final November 2007, Revised May 2008, Tables F-1a

Table 4: Groundwater Analytical Results (VOC compounds)

November 20 and 21, 2008

316 38th Street, Oakland

Borehole	PCE (ug/L)	TCE (ug/L)	Vinyl Chloride (ug/L)	TBA (ug/L)	MtBE (ug/L)	1,2-DCA (ug/L)	Cis-1,2 DCE (ug/L)	Napthalene (ug/L)
TB1-1	<0.50	<0.50	<0.50	9.3	<0.50	<0.50	<0.50	<1.0
TB1-3	<0.50	<0.50	<0.50	28	<0.50	<0.50	<0.50	<1.0
TB1-4	1.8	1.1	<0.50	7.3	<0.50	3.6	0.69	<1.0
TB2-1	<0.50	<0.50	<0.50	<50	<5.0	<5.0	0.81	98
TB2-2	<0.50	<0.50	<0.50	<50	<5.0	<5.0	<0.50	1.5
TB3-1	<0.50	<0.50	<0.50	<5.0	1.30	<0.50	1.0	19
TB3-2	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<1.0
ESL - Groundwater is a Current/Potential Source of Drinking Water	**5**	**5**	**0.5**	**12**	**5**	**0.5**	**6**	**17**

Notes:

TBA, MtBE, 1,2-DCA by Method 8260B/CA_LUFTMS

PCE, TCE, Vinyl Chloride, Cis-DCE, and Napthalene by EPA Method 8260B

Semi-volatie organic compounds analyized by EPA Method 8270 were below Laboratory Detection levels

ESL: California Regional Water Control Board Environmental Screening levels, Interim Final November 2007, Revised May 2008, Tables F-1a

Figures

N

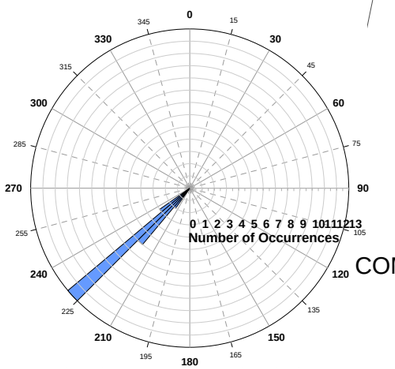
approximate scale in feet

0 250 500

Figure 1: Site vicinity map.

SOMA ENVIRONMENTAL ENGINEERING, INC.

N



Rose Diagram of Approximate Groundwater Flow Direction

COMMERCIAL AREA

COMMERCIAL AREA

PARKING AREA

PARKING AREA

MW-8

MW-9

MW-11

MH-1

MH-3

Sanitary Sewer Manhole

GW-1

GW-8

LFR-1

10" Diameter Cast Iron Sanitary Sewer

THE GLOVATORIUM

SB-11

E-16

E-25

MPE-1

E-15

SB-7

MH-5

B-8

SB-8

SB-9

E-17

E-18

B-2

B-10

B-9

SB-16

B-1

MPE-3

SOMA-2

SOMA-3

SB-10

MPE-2

THE GLOVATORIUM

B-7

E-20

SB-12

SB-13

SB-15

E-19

SOMA-4

B-4

SB-6

B-6

MPE-4

MPE-5

B-13

GW-2

54" Diameter Storm Drain

SB-5

B-5

B-3

SB-14

E-21

SB-2

E-22

SB-4

SB-3

E-26

SB-1

LFR-2

SOMA-1

GW-4

E-23

E-24

RESIDENCES

MANILA AVENUE

RESIDENCE

PARKING

RESIDENCE

SITE

DRIVE

DRIVE

RESIDENCE

Inlet

GW-3

316 38th St Decommissioned Tanks

Glovatorium Decommissioned Tanks

B-12

10" Storm Conduit (10' bgs)

MH-4

GW-5A

B-11

GW-5

GW-7

LFR-4

Pac Bell and EBMUD 2' deep 2' wide

Lamphole

LFR-3

38TH ST

GW-6A

GW-6

15" Storm Conduit (7.5' bgs)

18" Storm Conduit (14-14.5' bgs)

MH-2

8'-14' deep

(54' x 69")

Residential Area

BROADWAY

RED CROSS BUILDING

MPE Wells May 2009

Confirmation Soil Borings

Soil Borings MAY 2009

SOMA Monitoring Well

TOSCO Monitoring Well

Geosolv Monitoring Well

LFR Monitoring Wells

54" Diameter Storm Conduit

Storm Conduit Manhole

10" Diameter Cast Iron Sanitary Sewer w/ Floor Drains

Sanitary Sewer Manhole

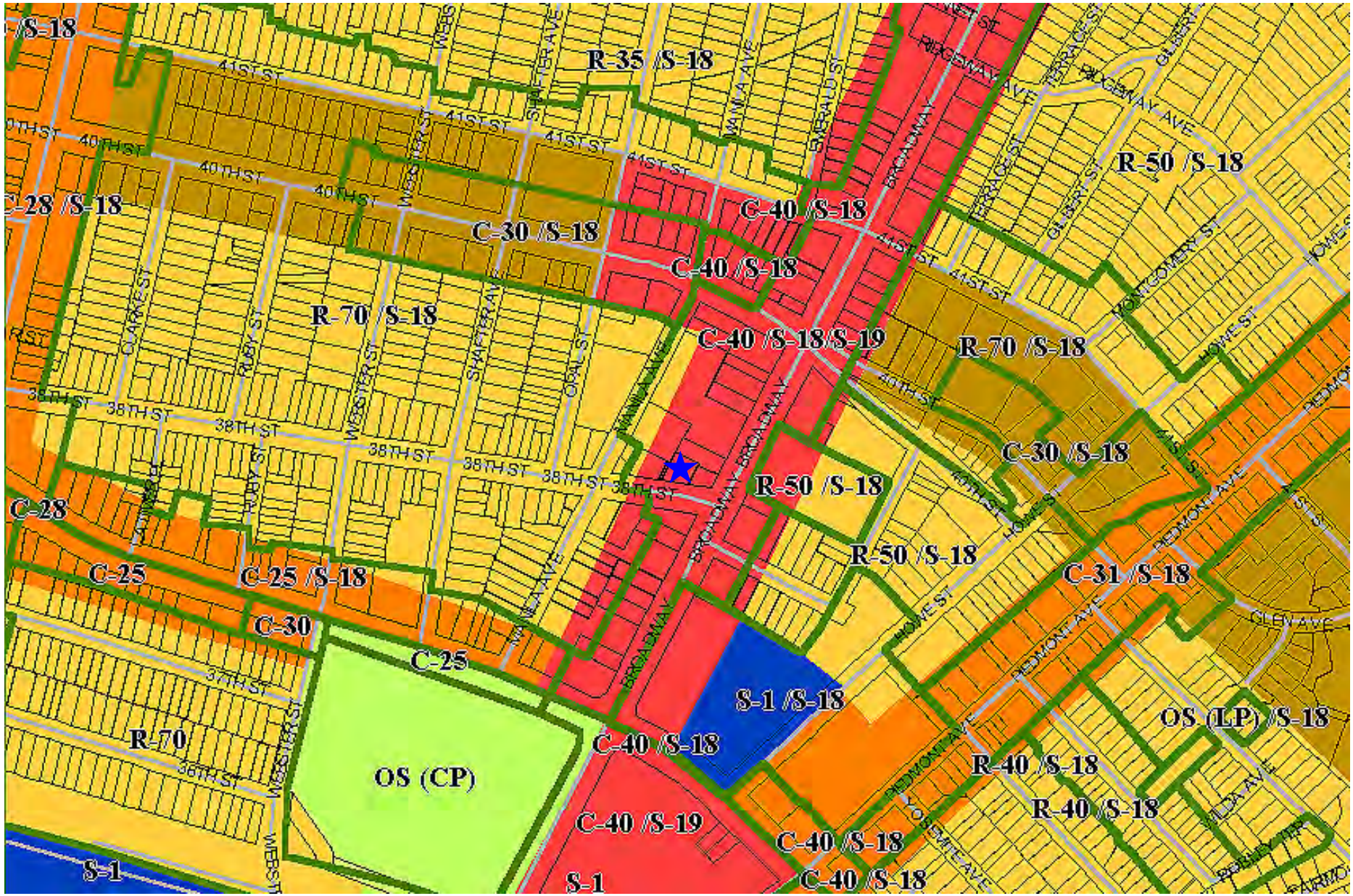
Not Completed to Depth
GW-5A/GW-7 Decommissioned 7/99
GW-6/GW-8 Decomissioned 7/00
B-11/B-12 Presumably Decommissioned

approximate scale in feet

0 40 80

Figure 2: Site Vicinity Map Showing Locations of USTs, and Advanced Sampling Boreholes and Wells

SOMA ENVIRONMENTAL ENGINEERING, INC.



PARK/OPEN SPACE
NEIGHBORHOOD CENTER
REGIONAL COMMERCIAL
MIXED HOUSING TYPE
INSTITUTIONAL
URBAN RESIDENTIAL

GENERAL PLAN DESIGNATIONS

C-25 - OFFICE COMMERCIAL
C-28 - COMMERCIAL SHOPPING DIST.
C-30 - DISTRICT THOROUGHFARE
C-40 - COMMUNITY THOROUGHFARE
R-35 - SPECIAL ONE FAMILY RESIDENTIAL
R-40 - GARDEN APT. RESIDENTIAL
R-70 - HIGH DENSITY RESIDENTIAL
S-1 - MEDICAL CENTER
S-18 - MEDIATED RESIDENTIAL

ZONING DESIGNATIONS

approximate scale in feet
0 500

Figure 2A: Generalized zoning map of areas in the vicinity of 316 38th Street, Oakland, CA

SOMA ENVIRONMENTAL ENGINEERING, INC. SAN RAMON CA (925) 244 6600

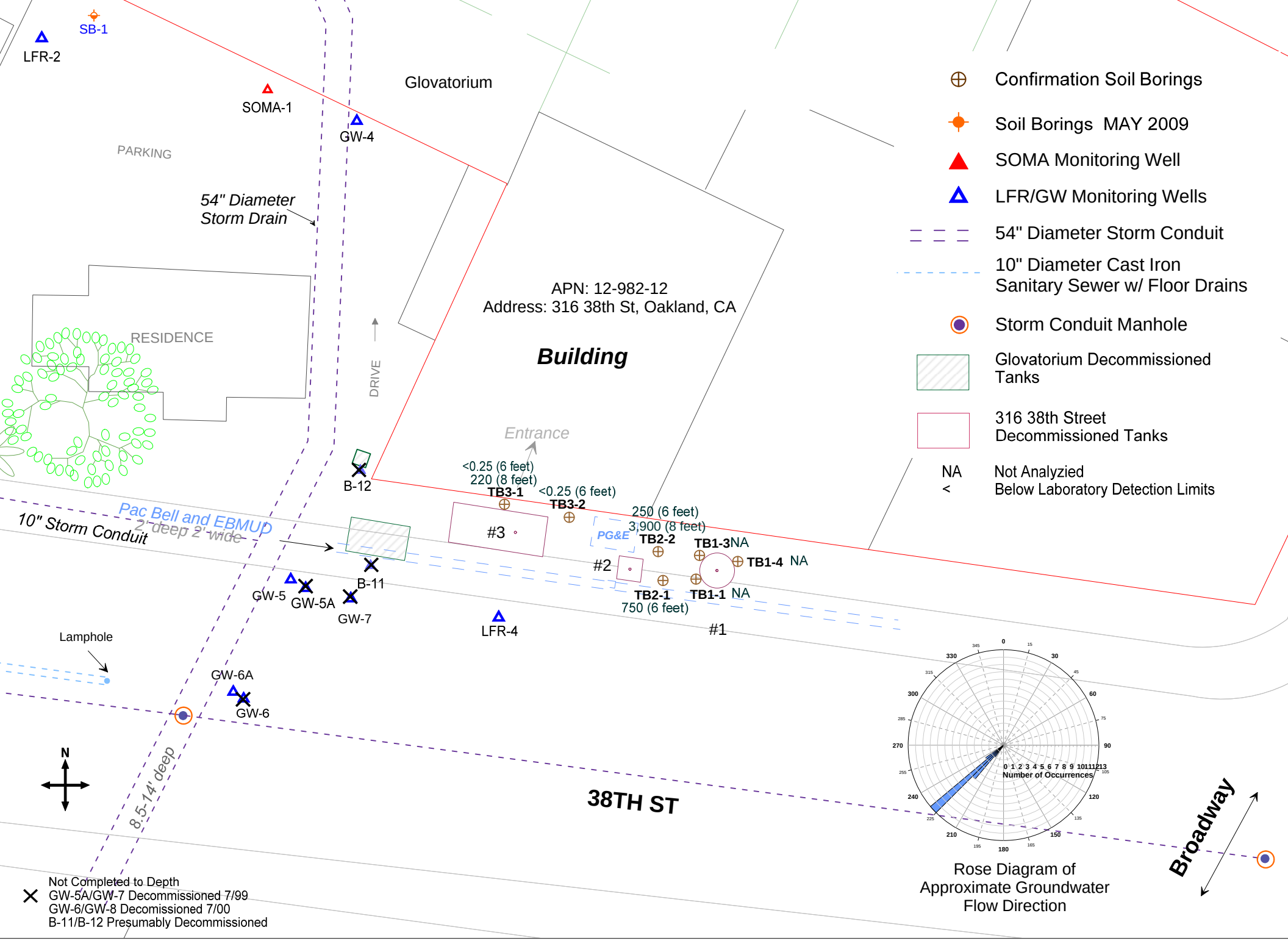


Figure 3: Map of TPH-g Concentration (mg/kg) in Soil at 6 to 8 feet bgs

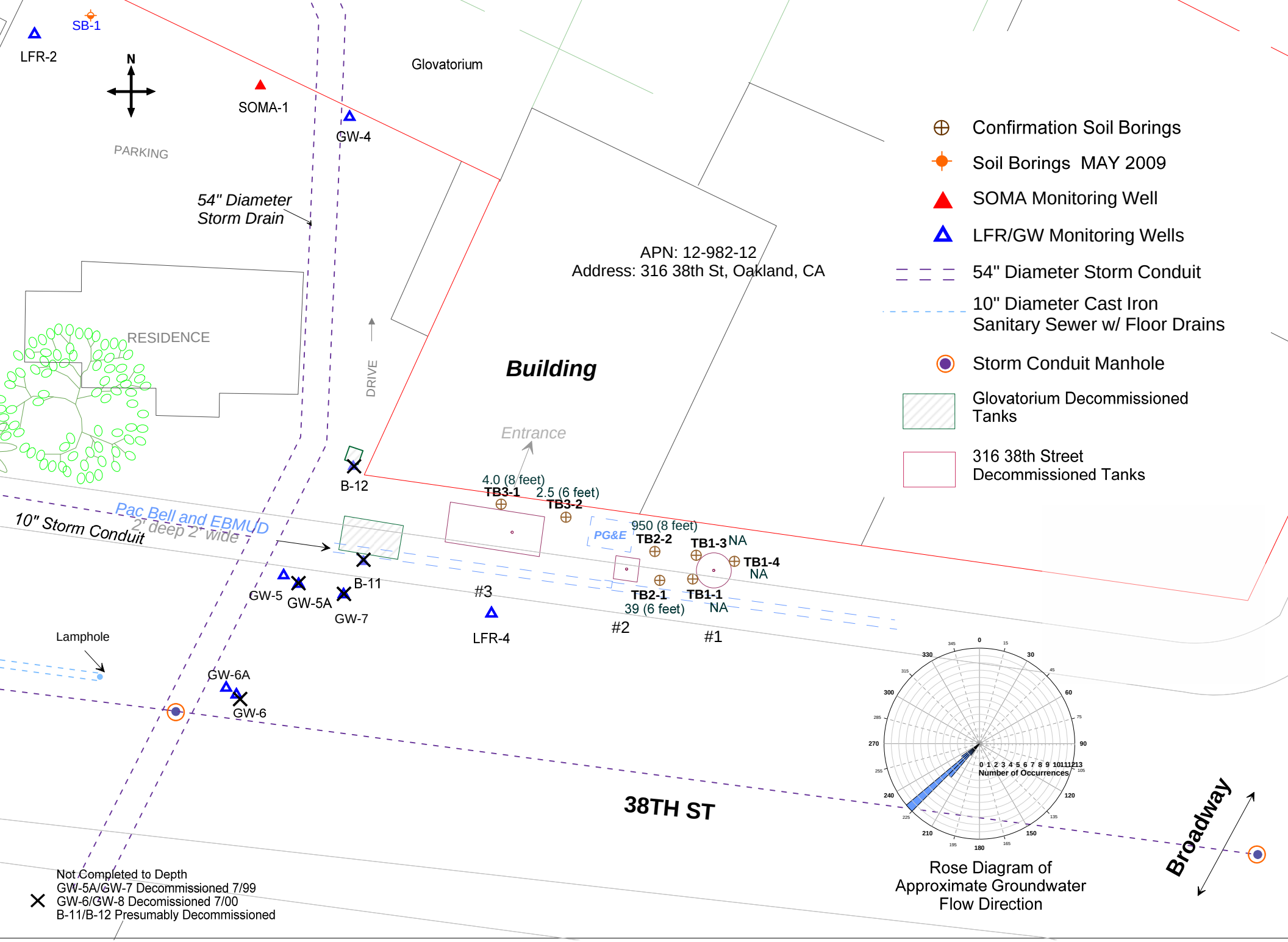


Figure 4: Map of TPH-ss Concentration (mg/kg) in Soil at 6 to 8 feet bgs

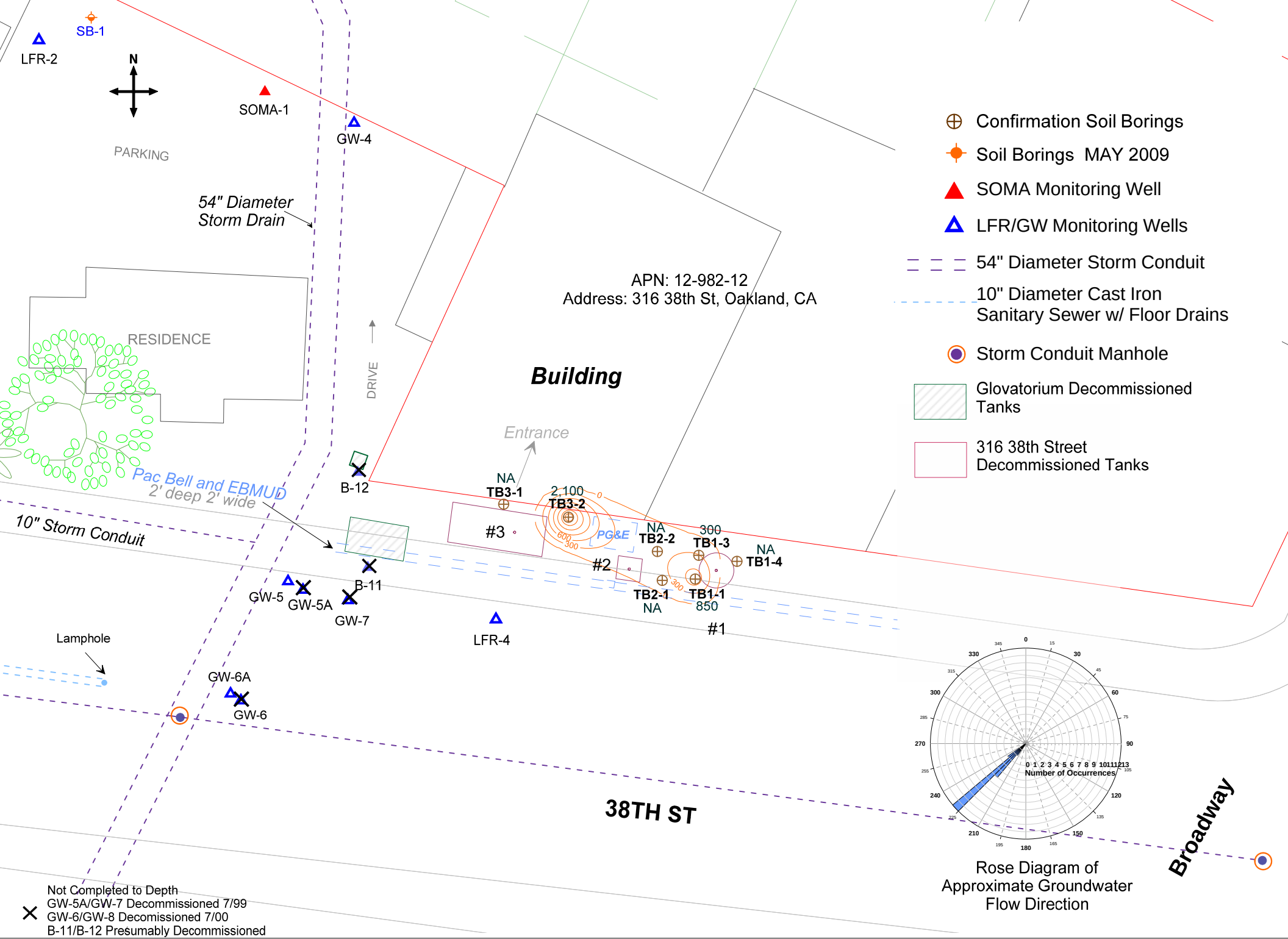


Figure 5: Contour of TPH-g Concentration (mg/kg) in Soil at 12 feet bgs

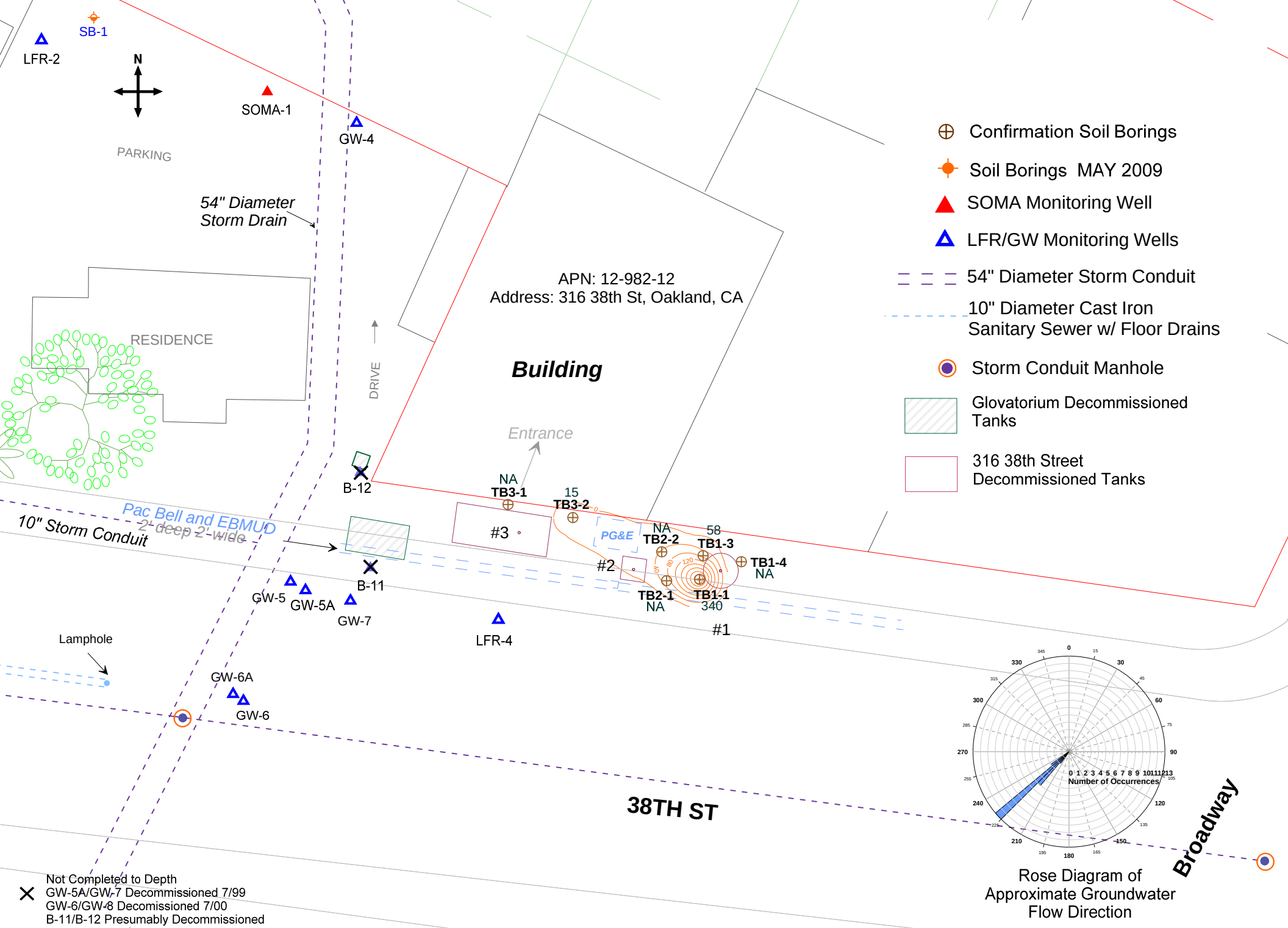


Figure 6: Contour of TPH-ss Concentration (mg/kg) in Soil at 12 feet bgs

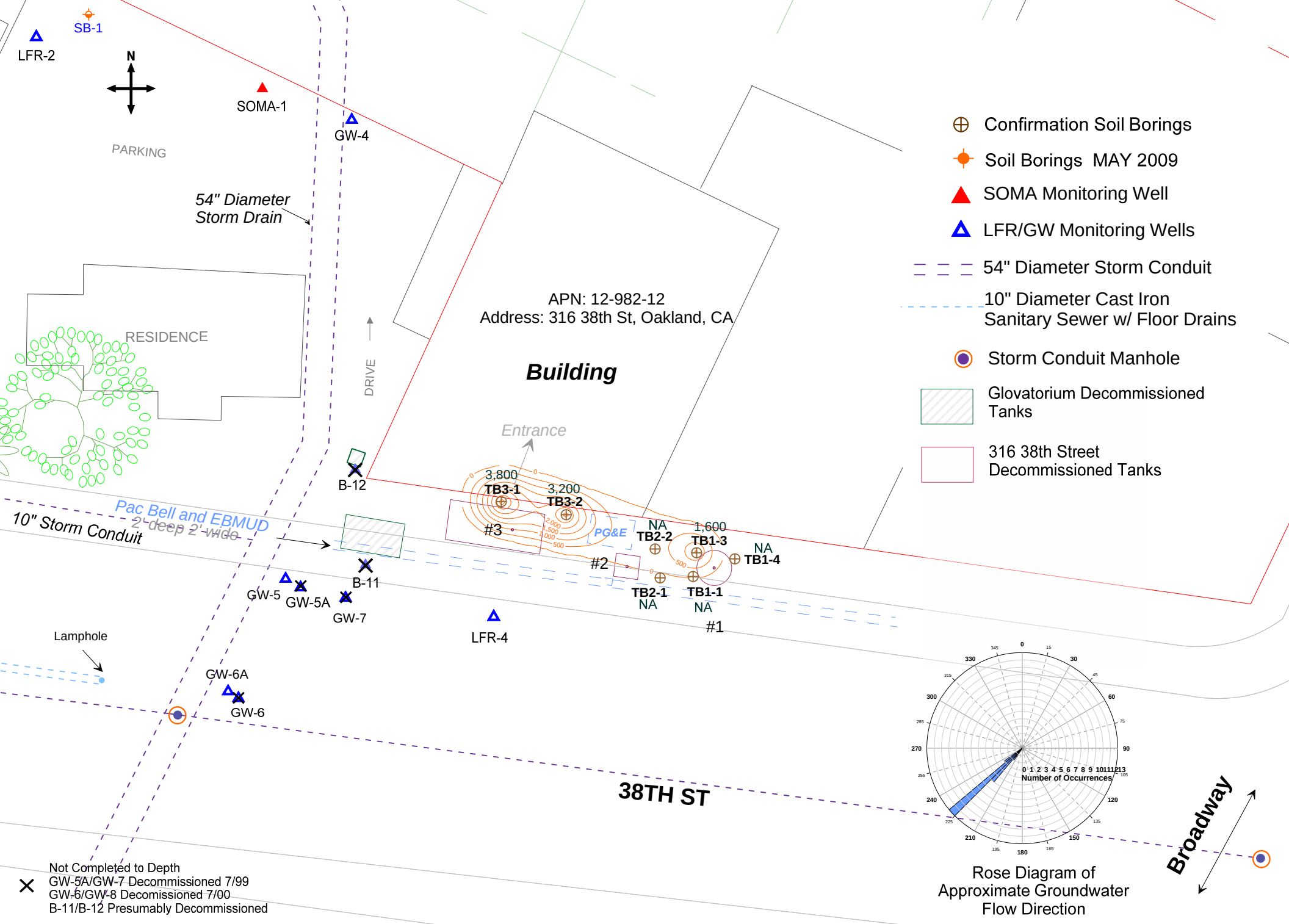


Figure 7: Contour of TPH-g Concentration (mg/kg) in Soil at 14 feet bgs

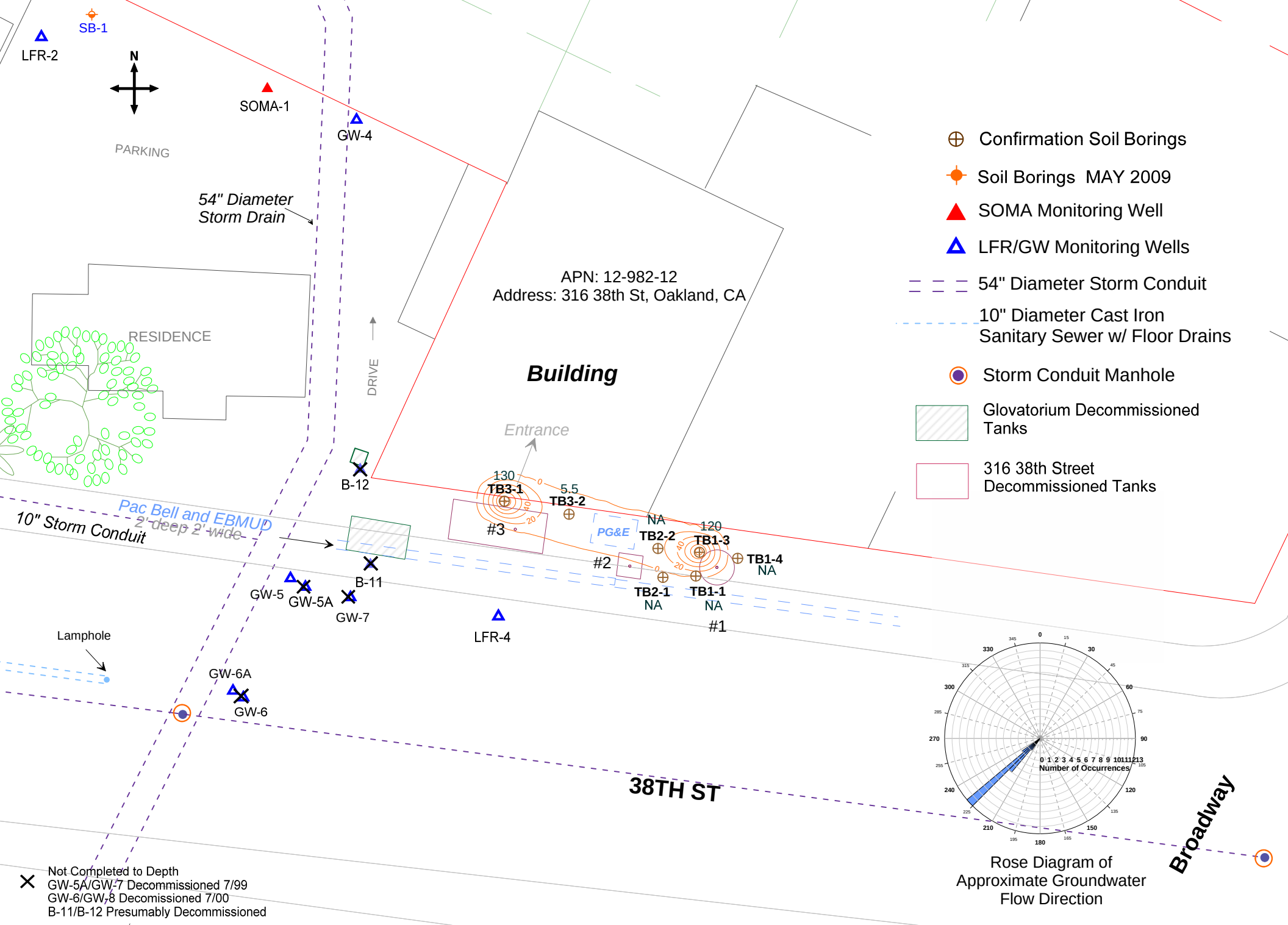


Figure 8: Contour of TPH-ss Concentration (mg/kg) in Soil at 14 feet bgs

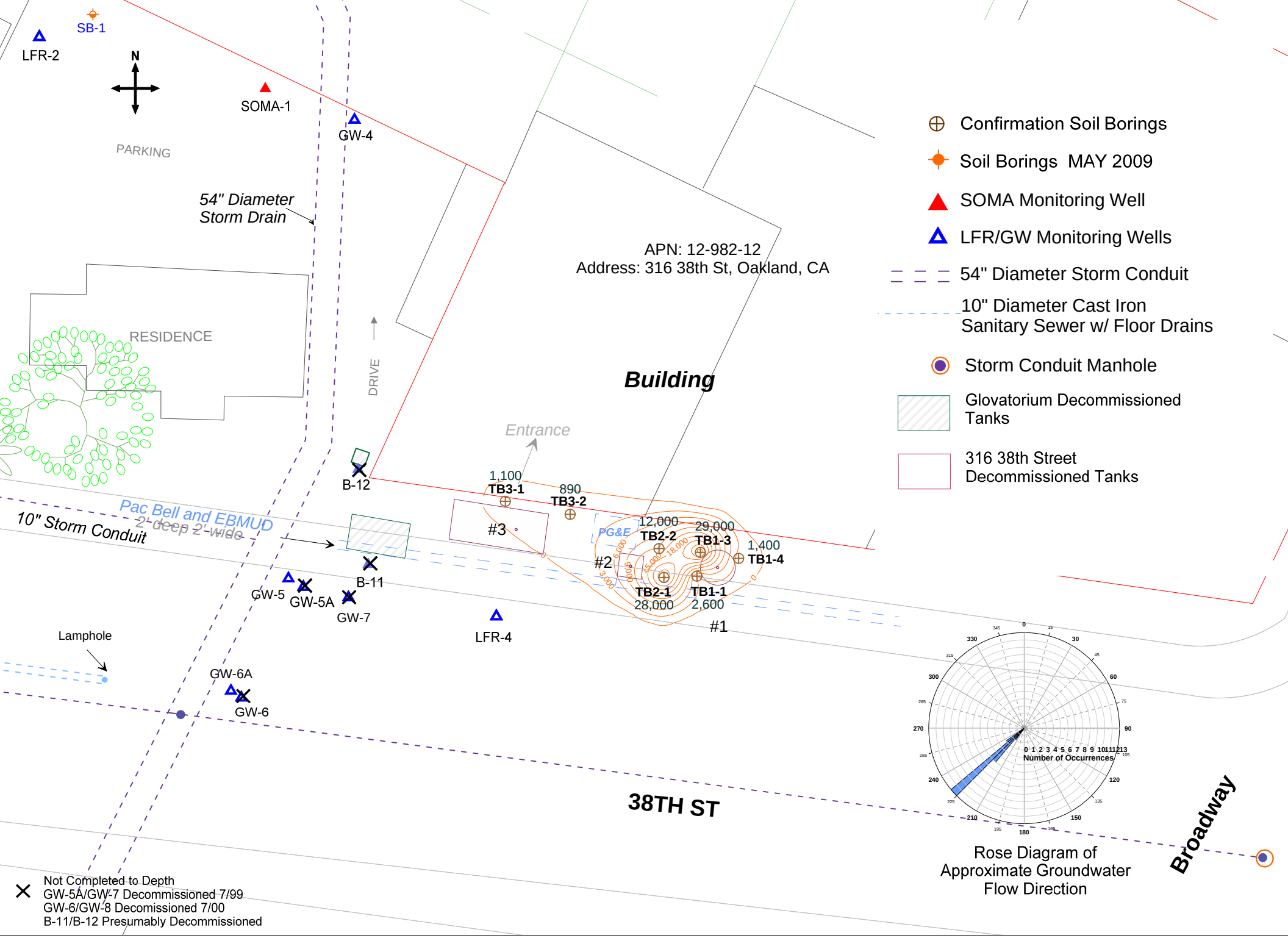


Figure 9: Contour of TPH-g Concentration (µg/L) in Groundwater

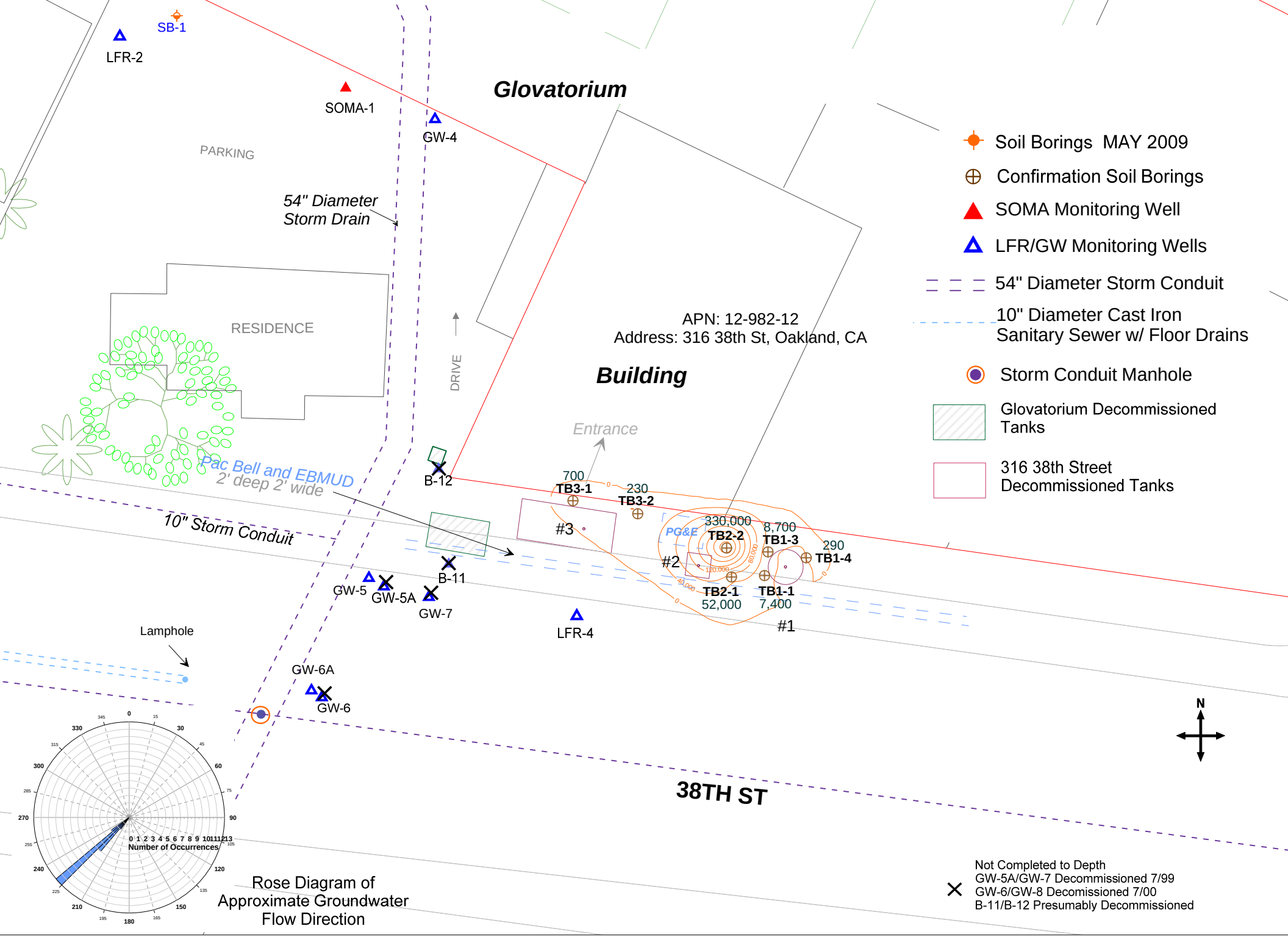


Figure 10 Contour of TPH-d Concentration (µg/L) in Groundwater

SOMA ENVIRONMENTAL ENGINEERING, INC.

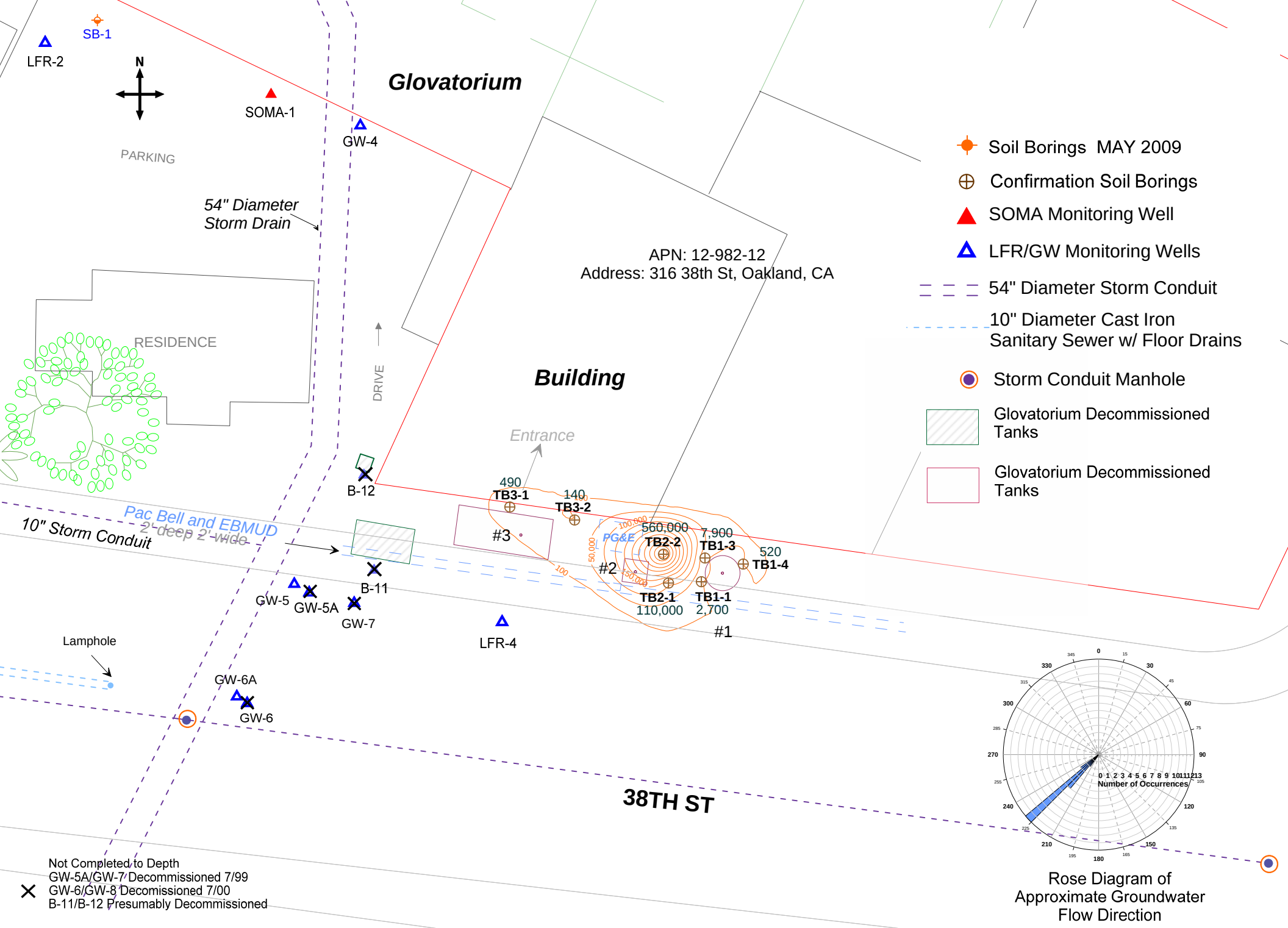


Figure 11: Contour of TPH-ss Concentration (ug/L) in Groundwater

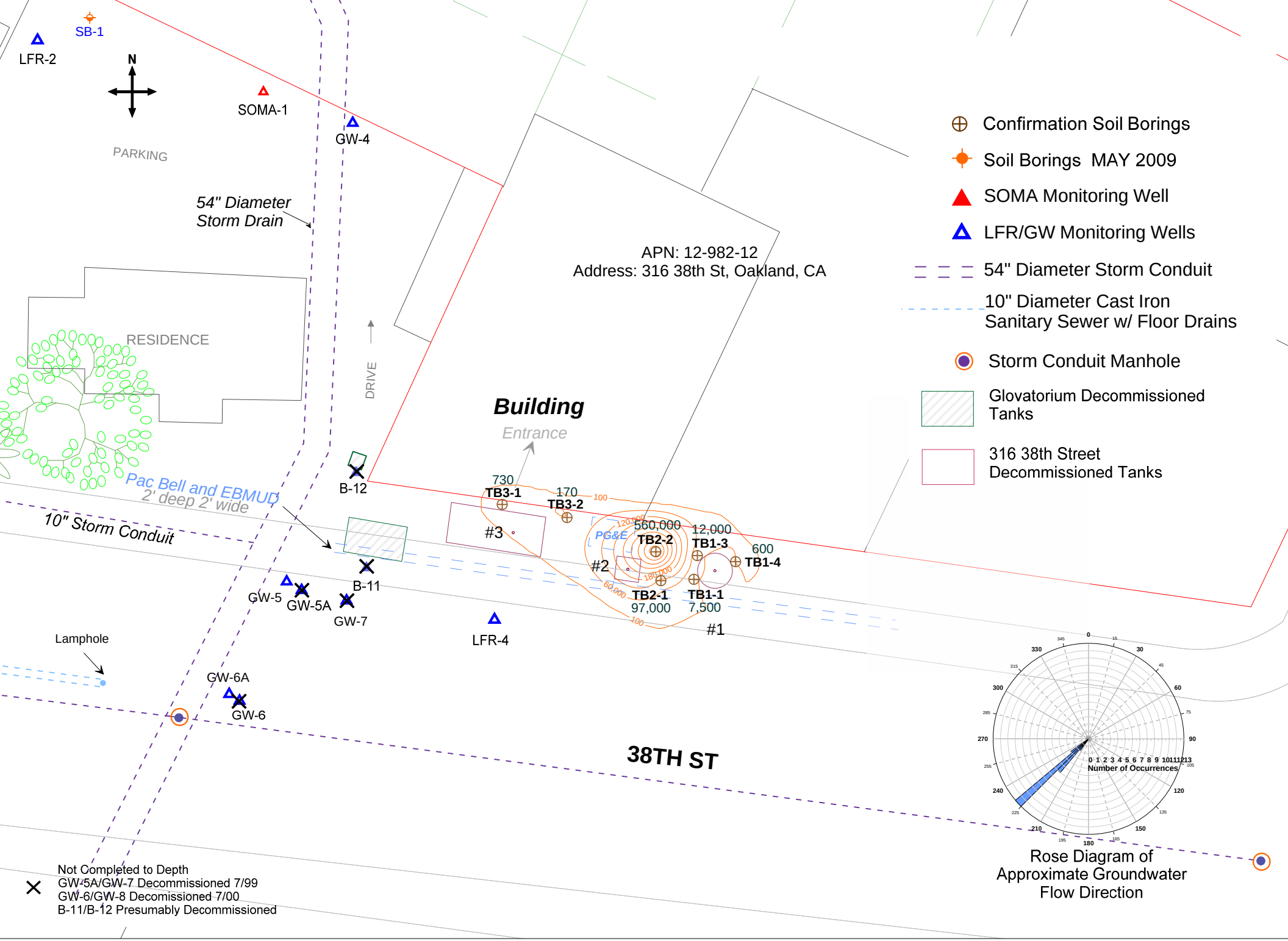


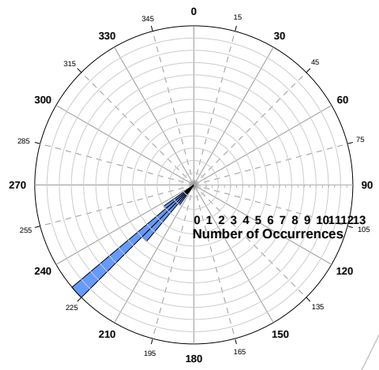
Figure 12: Contour of Kerosene Concentration (µg/L) in Groundwater

GLOVATORIUM
Old USTs

SB-1
LFR-2
SOMA-1
GW-4
PARKING
Residential Property
54" Diameter Storm Drain
4' deep
RESIDENCE
DRIVE
Building
Storage
Covered Yard (Plants)
Floor Drain
Open Storage
walkways
DP-3
LDP-3
LDP-1
Entrance
LDP-2
Storage Area (Former Piping)
Stored Boat
B-12
DP-2
TB3-1
TB3-2
Tank #3
PG&E
TB2-2
TB1-3
TB1-4
DP-1
TB2-1
TB1-1
Tank #2
Tank #1
Pac Bell and EBMUD 2' deep 2' wide
10" Storm Conduit
B-11
GW-5
GW-5A
GW-7
DP-4
LFR-4
DP-5
DP-6
Sanitary Sewer
Lamphole
8.5-14' deep
GW-6A
GW-6
MH-2
38TH ST
DP-7
DP-8
alternate placement
Residential Property
Kaiser Permanente

APN: 12-982-12
Address: 316 38th St, Oakland, CA
Earl Thompson Property (Building Structure)

PROPOSED DP BORINGS
PROPOSED LIMITED ACCESS INDOOR BORINGS
Soil Borings MAY 2009
Confirmation Soil Borings
SOMA Monitoring Well
LFR/GW Monitoring Wells
54" Diameter Storm Conduit
10" Diameter Cast Iron Sanitary Sewer w/ Floor Drains
Storm Conduit Manhole
Glovatorium Decommissioned Tanks
316 38th Street Decommissioned Tanks



Rose Diagram of Approximate Groundwater Flow Direction

N

Not Completed to Depth
GW-5A/GW-7 Decommissioned 7/99
GW-6/GW-8 Decomissioned 7/00
B-11/B-12 Presumably Decommissioned

approximate scale in feet
0 20 40

Figure 13: Site Map Showing the Locations of USTs, the Advanced Sampling Boreholes, and Proposed DP Boreholes

SOMA ENVIRONMENTAL ENGINEERING, INC.

Appendix A
Photographic Documentation

Plate 1: View of the former Glovatorium UST, adjacent to southwest corner of the site, with visible drilling location (possible location of B-12)

Plate 2: View of the former Glovatorium UST, adjacent to southwest corner of the site, with visible drilling location and decommissioned well location (possible locations of B-12)

Plate 3: View east, along the sidewalk adjacent to the site, two decommissioned well boxes visible (possible locations of B-12 and B-11)

Plate 4: View of the former Glovatorium UST in the sidewalk area adjacent to the site, with visible decommissioned well location in front of it (possible B-11 location)

Plate 5: Proposed location for LDP-1 inside the site building

Plate 6: Proposed location for LDP-2

Plate 7: Proposed location for LDP-3

Appendix B
Historical Boring Logs

ENVIRONMENTAL ENGINEERING, INC.	GEOLOGIC LOG OF BOREHOLE: TB1-1	PAGE 1 OF 2

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/21/2008

CASING ELEVATION: N/A

DEPTH TO GW: 12 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED (SPLIT SPOON / CORE)	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
				HAND AUGER TO 10 ft. BGS.				
41.1	10		CL	LEAN CLAY w/sand: Dark greenish-brown; stiff; moist; LEK; fine to coarse-grained sand; slight Petroelum Hydrocarbon (PHC) odor.				
122.3			GP	POORLY GRADED GRAVEL w/sand: Greenish-gray; medium stiff; wet; fine to coarse-grained sand; fine- to medium-grained gravel; PHC odor.		▽		
82.3			CL	Sandy Lean Clay with Gravel: Greenish-gray; medium-stiff; moist; fine- to coarse-grained sand; fine- to medium-grained gravel; PHC odor.				
78.3	15		SP	POORLY GRADED SAND: Grayish-green; medium dense; very moist to wet; fine- to medium-grained sand; PHC odor.				
300			ML	SILT: Grayish-green; medium stiff; moist; PHC odor.	TB1-1 @ 18 ft			
35.7	20		SW	WELL GRADED SAND: Grayish-green; soft; moist to wet; fine-grained sand; PHC odor.				
135			ML	SILT: Grayish-green; soft; moist to very moist; PHC odor.				
106.2			CL	LEAN CLAY: Tan; stiff; moist; LEK; slight PHC odor.				
	25							

COMMENTS:

ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: TB1-1

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/21/2008

CASING ELEVATION: N/A

DEPTH TO GW: 12 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON	SAMPLED: CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
15.2 31.4			CL	LEAN CLAY: Tan; stiff; moist; LEK; slight PHC odor.		TB1-1 @ 27 ft			

30

35

40

45

50

COMMENTS:

SOMA ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: TB1-3

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/20/2008

CASING ELEVATION: N/A

DEPTH TO GW: 12 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON / CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
				HAND AUGER TO 10 FT. BGS				
54.4	10		CL	LEAN CLAY w/sand: Dark greenish-brown; stiff; moist; LEK; fine- to coarse-grained sand; slight Petroleum Hydrocarbon (PHC) odor.				
45.6			GP	POORLY GRADED GRAVEL w/sand: Greenish-gray; medium stiff; wet; fine to coarse-grained sand; fine- to coarse-grained gravel; PHC odor.		▽		
342	15				TB1-3 @ 14 ft			
294			SP	POORLY GRADED SAND: Grayish-green; medium dense; very moist to wet; fine- to medium-grained sand; slight PHC odor.				
278			ML	SILT: Grayish-green; medium stiff; moist; slight PHC odor.				
272	20			Becomes wet from 20-22 ft.				
5.5								
4.7			CL	LEAN CLAY: Tan; very stiff; moist; LEK; very slight PHC odor.				
	25							

COMMENTS:

ENVIRONMENTAL ENGINEERING, INC.	GEOLOGIC LOG OF BOREHOLE: TB1-3	PAGE 2 OF 2

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/20/2008

CASING ELEVATION: N/A

DEPTH TO GW: 12 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON	SAMPLED: CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
1.5	1.5		CL	LEAN CLAY: Tan; very stiff; moist; LEK; very slight PHC odor.		TB1-3 @ 27 ft			
	30								
	35								
	40								
	45								
	50								

COMMENTS:

ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: TB1-4

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/21/2008

CASING ELEVATION: N/A

DEPTH TO GW: 12 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON / CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
				HAND AUGER TO 10 FT BGS				
10.4	10		CL	LEAN CLAY w/sand: Dark brown; soft; very moist; no Petroleum Hydrocarbon (PHC) odor. Saturated at 12 ft.		▽		
48	15			No Recovery				
	20			No Recovery				
4.7	25		CL	LEAN CLAY: Tan; stiff; moist; LEK; no PHC odor.				

COMMENTS:

ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: TB1-4

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/21/2008

CASING ELEVATION: N/A

DEPTH TO GW: 12 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON	SAMPLED: CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
6.7			CL	LEAN CLAY: Tan; stiff; moist; LEK; no PHC odor.					
7.1						TB1-4 @ 27 ft			
	30								
	35								
	40								
	45								
	50								

COMMENTS:

SOMA ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: TB2-1

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/20/2008

CASING ELEVATION: N/A

DEPTH TO GW: 7 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON / CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
				HAND AUGER TO 5 FT BGS				
124.4	5		CL	LEAN CLAY w/sand: Black with green mottling; soft; moist; LEK-MEK; fine- to coarse-grained sand; slight Petroleum Hydrocarbon (PHC) odor.	TB2-1 @ 6 ft	▽		
22				Wet from 7-7.5 ft.				
27.8				Becomes very stiff at 8'				
	10				TB2-1 @ 10 ft			
	15							
	20							
	25							

COMMENTS: TD @ 10 ft. bgs.

ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: TB2-2

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/20/2008

CASING ELEVATION: N/A

DEPTH TO GW: 7 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED (SPLIT SPOON / CORE)	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
				HAND AUGER TO 5 FT BGS				
31.8	5		CL	LEAN CLAY w/sand: Greenish-brown with black mottling; medium stiff; moist; LEK-MEK; fine- to coarse-grained sand; slight Petroleum Hydrocarbon (PHC) odor.				
21.3			CL	LEAN CLAY w/sand: Black; soft; moist to wet; LEK-MEK; fine- to coarse-grained sand; slight PHC odor.		▽		
21.3	10				TB2-2 @ 10 ft			
	15							
	20							
	25							

COMMENTS: TD @ 10 ft. bgs.

ENVIRONMENTAL ENGINEERING, INC.	GEOLOGIC LOG OF BOREHOLE: TB3-1	PAGE 1 OF 1

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/21/2008

CASING ELEVATION: N/A

DEPTH TO GW: 8 ft. bgs.

T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON / CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
				HAND AUGER TO 5 FT BGS				
1.9	5		SP	SAND (Fill): Brown; loose; dry; MEK; fine- to medium-grained sand; no Petroleum Hydrocarbon (PHC) odor.				
0.3			CL	LEAN CLAY w/sand: Dark greenish-gray; soft; moist to wet; LEK-MEK; fine- to medium-grained sand; no PHC odor.		▽		
3.5	10							
39.5				PHC odor increases at 13 ft. bgs.	TB3-1 @ 14 ft			
244.9								
7.5	15		CL-ML	SILTY CLAY: Greenish-gray; medium stiff; moist; LEK; PHC odor.				
3.9					TB3-1 @ 17 ft			
	20							
	25							

COMMENTS:

SOMA ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: TB3-2

PROJECT: 2722

SITE LOCATION: 316 38th St., Oakland

DRILLER: Fisch Drilling

DRILLING METHOD: Direct Push (DP)

BORING DIAMETER: 2.25"

LOGGED BY: E. Hightower

DATE DRILLED: 11/21/2008

CASING ELEVATION: N/A

DEPTH TO GW: 5 ft. bgs.

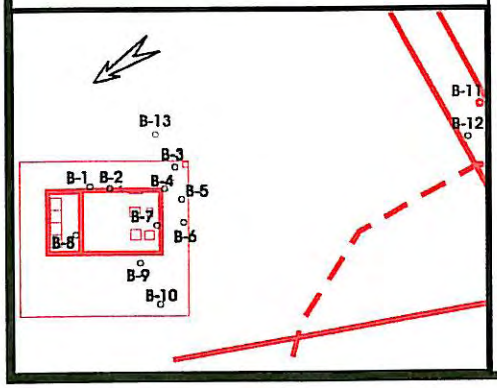
T.O.C. TO SCREEN: N/A

SCREEN LENGTH: N/A

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON / CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
				HAND AUGER TO 5 FT BGS				
4.3	5		SP	SAND (Fill): Brown; loose; saturated; fine- to medium-grained sand; no Petroleum Hydrocarbon (PHC) odor.		▽		
23.3	10							
16.8			CL	LEAN CLAY w/sand: Dark greenish-gray; soft; very moist; LEK-MEK; fine- to medium-grained sand; slight PHC odor.				
270			CL-ML	SILTY CLAY: Greenish-gray; medium stiff; moist; LEK; PHC odor.	TB3-2 @ 14 ft			
7.1	15							
34.2					TB3-2 @ 17 ft			
	20							
	25							

COMMENTS:

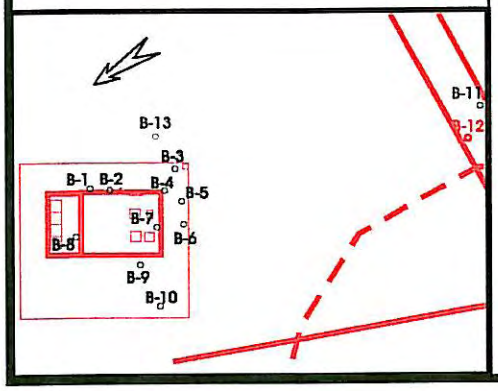


DRILLING LOG

BORING NO. B11

PROJECT NAME:	Depper	PROJECT NO.	
ADDRESS:	3815 Broadway, Oakland, California		
FIELD GEOLOGIST:	Frank Goldman	DATE:	08/22/97
DRILLING COMPANY:	Precision	SAMPLER:	
DRILLING METHOD:		TOTAL DEPTH:	22'
BORING DIAMETER:	2.5"		

DEPTH	SAMPLE RECOVERY	BLOW COUNT	PID [ppm]	BORING CONSTR.	LITHOLOGIC LOG	USCS SYMBOLS	LITHOLOGIC DESCRIPTION Description, Grain Size, Sorting, Color, Moisture, Mechanical Properties
						SW	Sand, reddish brown, medium to coarse, very dense, dry to slightly moist; no odor.
						SP	Sand, medium grained, orange, dense, slightly moist; no odor.
						CL	Gravelly clay, brown, stiff, moist; mottled; no odor.
10							
						CL	Silty clay, grayish green, firm to stiff, moist; no odor.
15						ML	Sandy silt, green, firm, moist; no odor.
						SP	Silty sand, green, moderate dense, fine to medium, wet; no odor.
20						ML	Sandy silt, light brown, stiff, slightly moist to moist.
							End of boring at 22 feet. Groundwater encountered at 21'. Boring converted into a well.
25							
30							
35							
40							

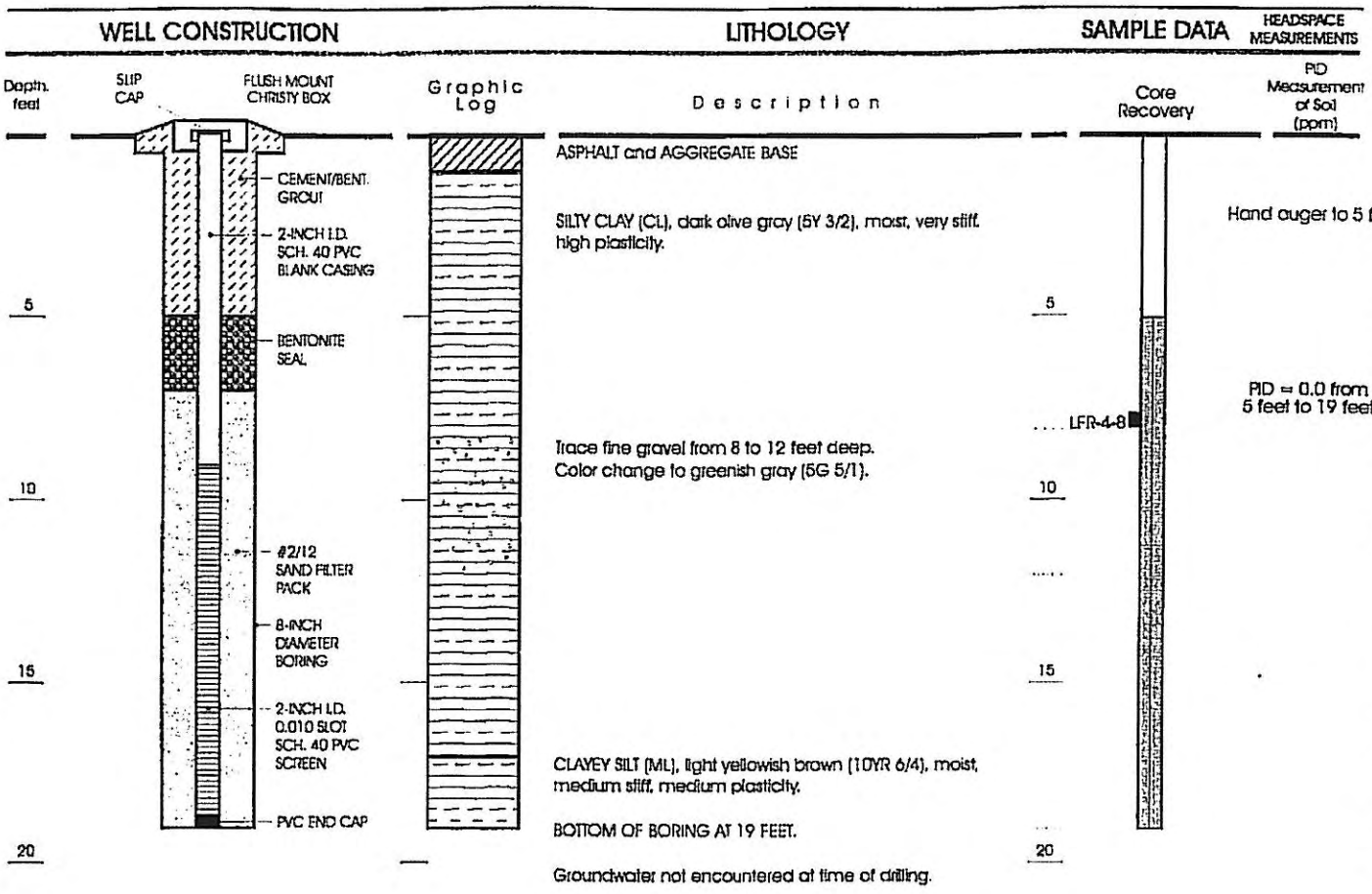


DRILLING LOG

BORING NO. B12

PROJECT NAME:	Depper	PROJECT NO.	
ADDRESS:	3815 Broadway, Oakland, California		
FIELD GEOLOGIST:	Frank Goldman	DATE:	08/22/97
DRILLING COMPANY:	Precision	SAMPLER:	
DRILLING METHOD:		TOTAL DEPTH:	20'
BORING DIAMETER:	2.5"		

DEPTH	SAMPLE RECOVERY	BLOW COUNT	PID [ppm]	BORING CONSTR.	LITHOLOGIC LOG	USCS SYMBOLS	LITHOLOGIC DESCRIPTION Description, Grain Size, Sorting, Color, Moisture, Mechanical Properties
						SW	Gravel, coarse, medium dense, gray, slightly moist; no odor. No core recovery to 4 feet. Used 1" macrocore sampler.
						CL	Silty clay, reddish brown, firm to stiff, moist; no odor.
10						CL	No odor.
							No odor.
15						SW	Sand, medium to coarse grained, dark gray, dense, wet; strong diesel odor.
							No odor.
20							End of boring at 20 feet. Groundwater encountered at 15'. Boring converted into a well.
25							
30							
35							
40							



Well Permit No.	W00-446
Date Well Drilled:	July 28, 2000
Drilling Company:	Gregg Drilling
Driller:	Trevor
Drill Rig:	Mari M5-T (Rhino) Hollow Stem Auger
Sampling Method:	Hydraulic, continous core
LFR Geologist:	Dan Foster

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Interval sampled using continuous core barrel
- Soil sample collected for analysis

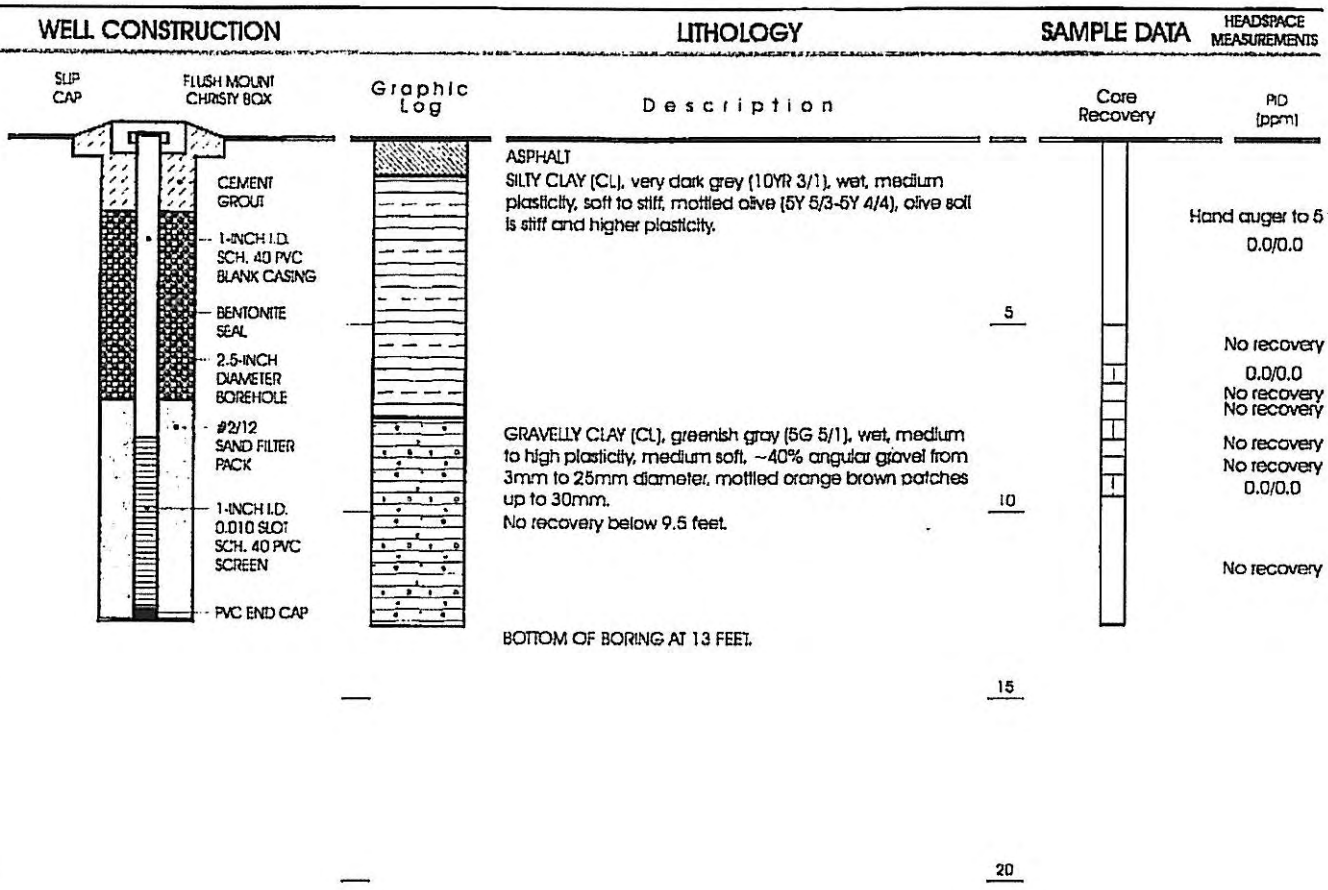
Approved by:

CONSTRUCTION AND LITHOLOGY FOR LFR-4

LFR LEVINE•FRICKE

FORMER GLOVATORIUM

6896L114.CDR 091100



Well Permit No.	99WR341
Date Well Drilled:	July 15, 1999
Drilling Company:	Precision
Driller:	Ken Perez
Drilling Method:	Direct push
Sampling Method:	Hydraulic, continous core
LFR Geologist:	Jim Burke

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Interval sampled using continuous core barrel

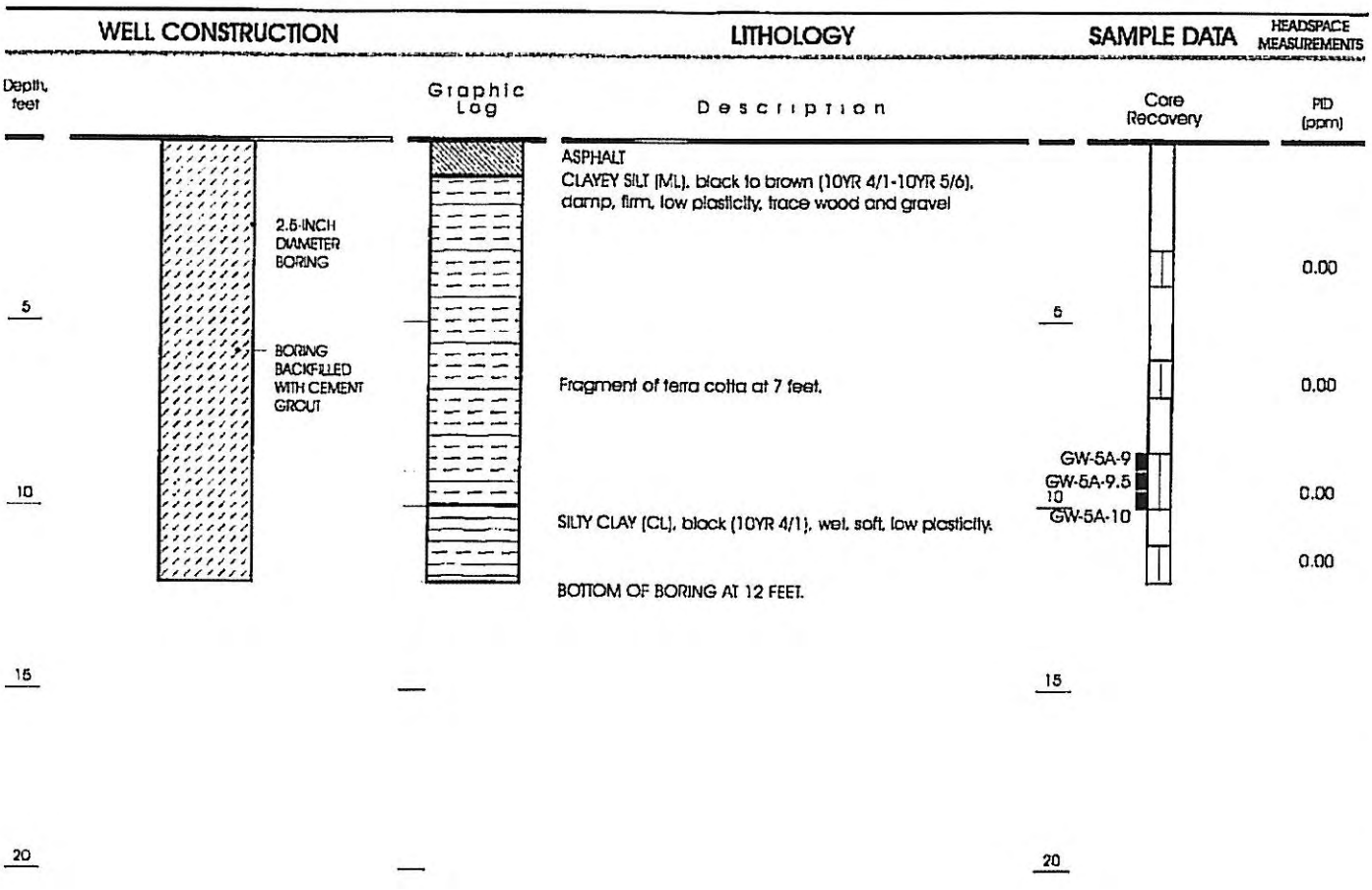
Approved by: Taylor Bennett R.G. #6595

CONSTRUCTION AND LITHOLOGY FOR GW-5

LFR LEVINE•FRICKE

FORMER GLOVATORIUM

6895L104.CDR 030600



Well Permit No. 99WR341
Date Well Drilled: July 16, 1999
Drilling Company: Precision
Driller: Ken Perez
Drilling Method: Direct push
Sampling Method: Hydraulic, continous core
LFR Geologist: Chris Voci

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Interval sampled using continuous core barrel
- Soil sample collected for analysis

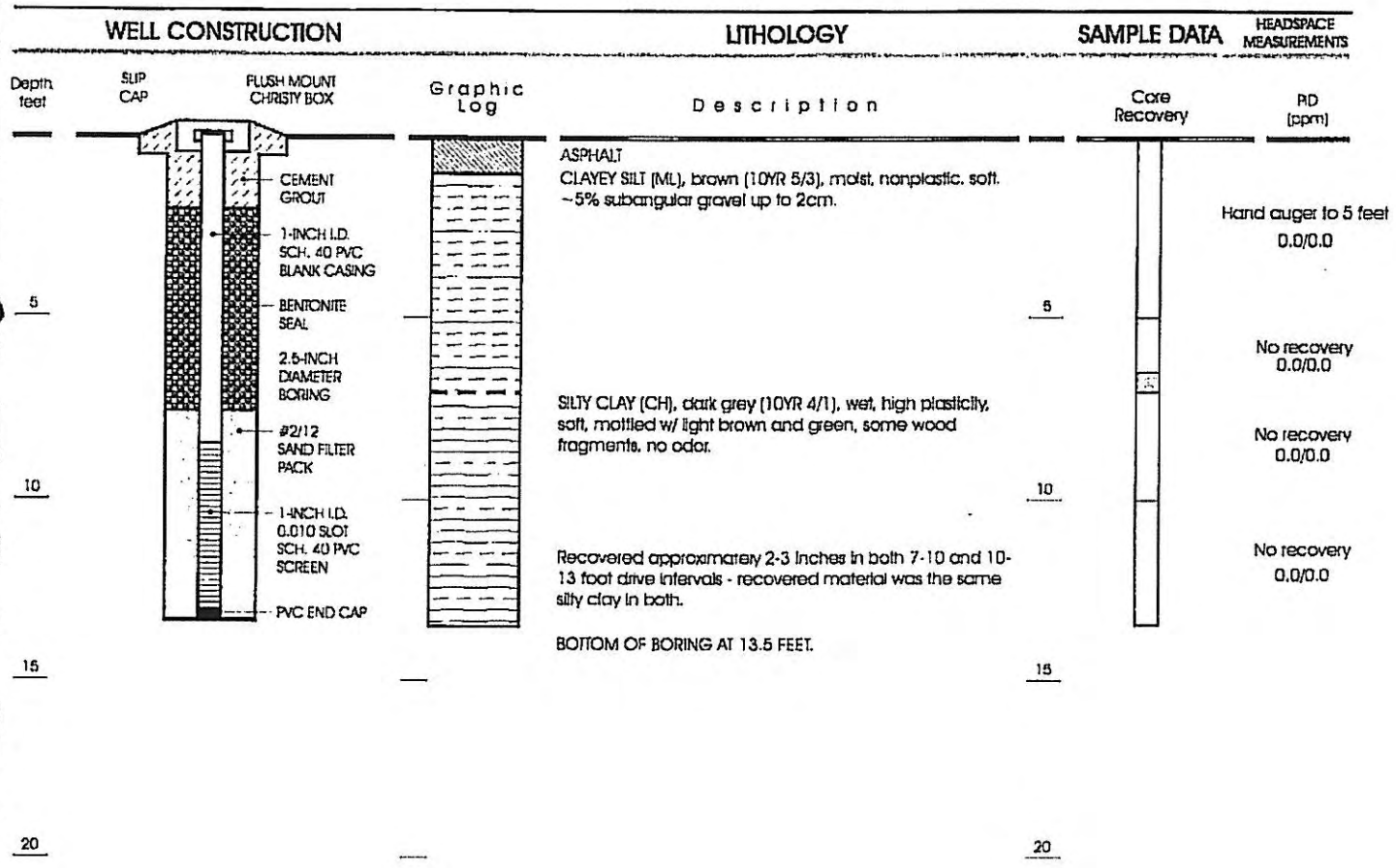
Approved by: Taylor Bennett R.G.#6595

CONSTRUCTION AND LITHOLOGY FOR GW-5A

LFR LEVINE•FRICKE

FORMER GLOVATORIUM

6895L105.CDR 030600



Well Permit No.	99WR341
Date Well Drilled:	July 15, 1999
Drilling Company:	Precision
Driller:	Ken Perez
Drilling Method:	Direct push
Sampling Method:	Hydraulic, continous core
LFR Geologist:	Jim Burke

EXPLANATION

Clay

Silt

Sand

Gravel

Interval sampled using continuous core barrel

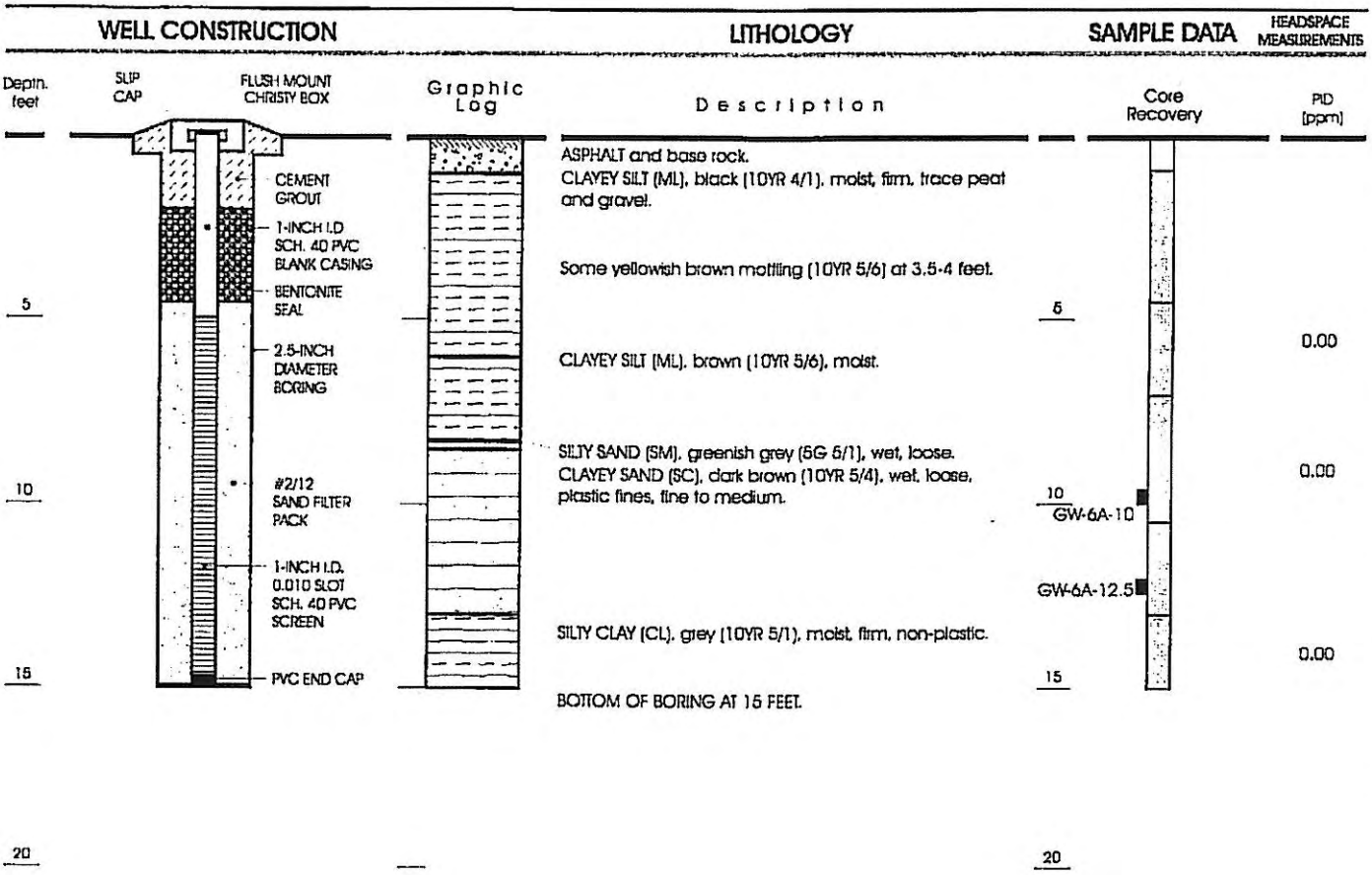
Approved by: Taylor Barnett R.G. #6595

CONSTRUCTION AND LITHOLOGY FOR GW-6

LFR LEVINE • FRICKE

FORMER GLOVATORIUM

6895L106.CDR 030600



Well Permit No.	99WR341
Date Well Drilled:	July 16, 1999
Drilling Company:	Precision
Driller:	Ken Perez
Drilling Method:	Direct push
Sampling Method:	Hydraulic, continous core
LFR Geologist:	Chris Vocl

EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Interval sampled using continuous core barrel

Soil sample collected for analysis

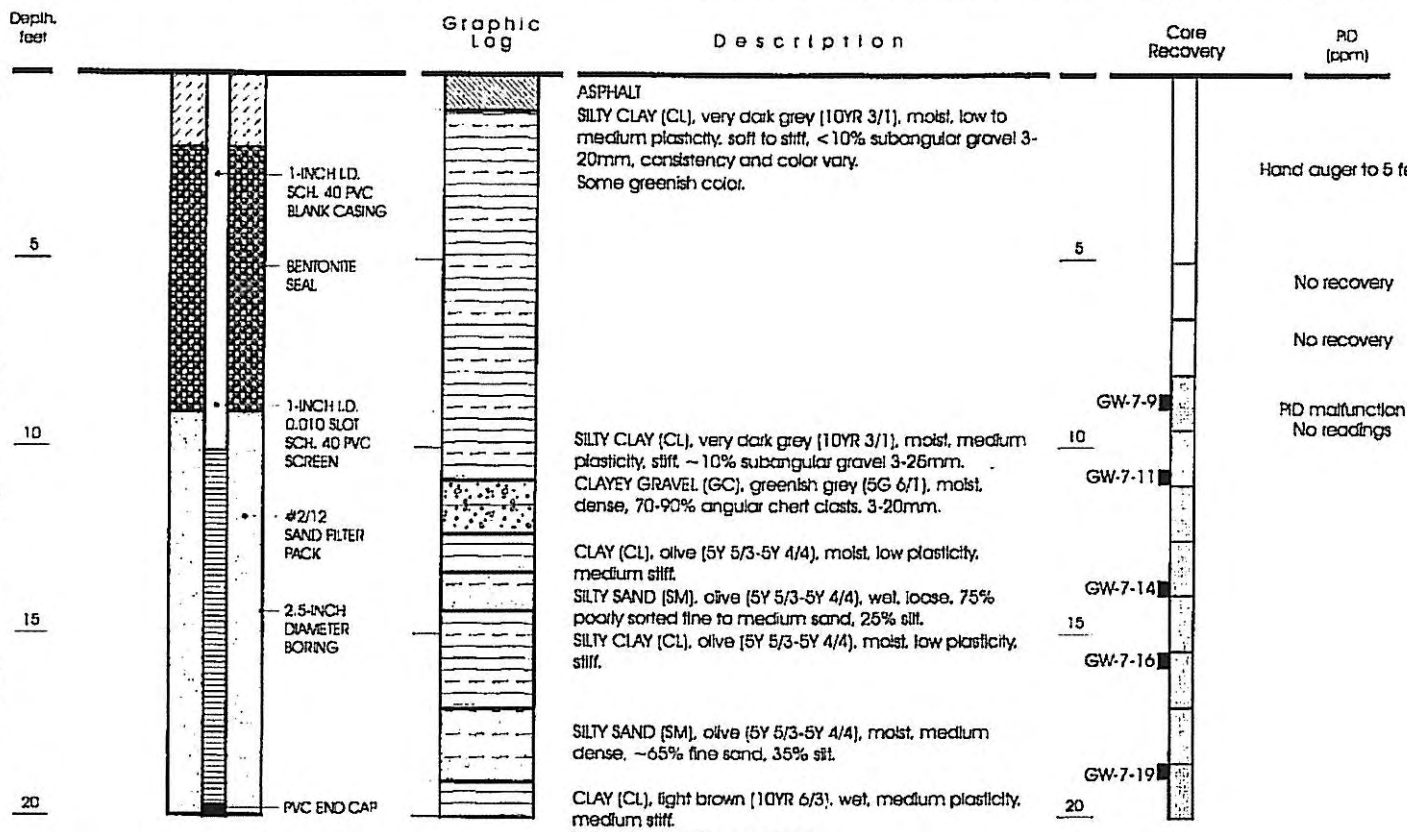
Approved by: Taylor Bennett R.G. #6595

CONSTRUCTION AND LITHOLOGY FOR GW-6A

LFR LEVINE•FRICKE

FORMER GLOVATORIUM

6895L107.CDR 030600



Well Permit No.	99WR341
Date Well Drilled:	July 15, 1999
Drilling Company:	Precision
Driller:	Ken Perez
Drilling Method:	Direct push
Sampling Method:	Hydraulic, continous core
LFR Geologist:	Jim Burke

EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Interval sampled using continuous core barrel

Soil sample collected for analysis

Approved by: Taylor Bennett R.G. #6595

CONSTRUCTION AND LITHOLOGY FOR GW-7

LFR LEVINE•FRICKE

FORMER GLOVATORIUM

6895L108.CDR 030600

Table 1
Construction Data for Temporary Sampling Points and Monitoring Wells
Former Glovatorium
3815 Broadway, Oakland, California

Location	Date Installed	Ground Surface Elevation (ft msl)	Top of Casing Elevation (ft msl)	Total Depth (ft bgs)	Screened Interval Depth (ft bgs)	Screened Interval Elevation (ft msl)	Notes
Temporary sampling points installed by GeoSolv, LLC:							
B-2	19-Aug-97	82.20	82.09	21	5 to 21	77.2 to 61.2	
B-3	19-Aug-97	82.60	82.57	18	5 to 18	77.6 to 64.6	(1)
B-7	20-Aug-97	77.33	76.96	17.5	5 to 17.5	72.3 to 59.8	
B-8	20-Aug-97	82.06	81.82	24	9 to 24	73.1 to 58.1	
B-9	21-Aug-97	77.57	77.37	19.5	4.5 to 19.5	73.1 to 58.1	
B-10	21-Aug-97	81.65	81.50	19	4 to 19	77.7 to 62.7	
B-13	22-Aug-97	85.12	84.58	20	5 to 20	80.1 to 65.1	
Temporary sampling points installed by LFR:							
GW-1	16-Jul-99	80.24	79.94	8	3 to 8	77.2 to 72.2	
GW-2	16-Jul-99	79.44	79.14	20	10 to 20	69.4 to 59.4	
GW-3	15-Jul-99	78.48	77.92	20	10 to 20	68.5 to 58.5	
GW-4	16-Jul-99	82.55	82.37	12	7 to 12	75.6 to 70.6	
GW-5	15-Jul-99	81.31	81.01	13	8 to 13	73.3 to 68.3	
GW-6	15-Jul-99	81.91	81.65	13.5	7.5 to 13.5	74.4 to 68.4	(2)
GW-6A	16-Jul-99	81.93	81.61	15	5 to 15	76.9 to 66.9	
GW-7	15-Jul-99	81.3	NS	20	10 to 20	71.3 to 61.3	(2)
GW-8	16-Jul-99	80.28	80.10	20	10 to 20	70.3 to 60.3	(2)
Groundwater Monitoring Wells Installed by Tosco:							
MW-8	unknown	NS	87.44	unknown	unknown	unknown	
MW-9	unknown	NS	86.56	unknown	unknown	unknown	
MW-11	unknown	NS	84.13	unknown	unknown	unknown	
Groundwater Monitoring Wells Installed by LFR:							
LFR-1	28-Jul-00	NS	79.97	19	9 to 19		
LFR-2	27-Jul-00	NS	81.89	19	9 to 19		
LFR-3	27-Jul-00	NS	77.96	22	12 to 22		
LFR-4	28-Jul-00	NS	81.65	19	9 to 19		

Notes:
(1) Top of casing surveyed on south side on January 21, 2000, because the casing was broken.
(2) GW-7 was abandoned on July 15, 1999, in accordance with LFR's work plan dated May 6, 1999, and GW-6 and GW-8 were abandoned on July 26, 2000, in accordance with LFR's work plan dated June 14, 2000.

ft msl = feet above mean sea level
ft bgs = feet below ground surface
NS = Not surveyed.

Appendix C
Field and Laboratory Procedures

Direct Push (GEOPROBE) Drilling

Utility Locating

Prior to drilling, boring locations are marked with white paint or other discernible marking and cleared for underground utilities through Underground Service Alert (USA). In addition, the first five feet of each borehole are air-knifed, or carefully advanced with a hand auger if shallow soil samples are necessary, to help evaluate the borehole location for underground structures or utilities.

Borehole Advancement

Pre-cleaned push rods (typically one to two inches in diameter) are advanced using a hydraulic push type rig for the purpose of collecting samples and evaluating subsurface conditions. The drill rod serves as a soil sampler, and an acetate liner is inserted into the annulus of the drill rod prior to advancement. Once the sample is collected, the rods and sampler are retracted and the sample tubes are removed from the sampler head. The sampler head is then cleaned, filled with clean sample tubes, inserted into the borehole and advanced to the next sampling point where the sample collection process is repeated.

Soil Sample Collection

The undisturbed soil samples intended for laboratory analysis are cut away from the acetate sample liner using a hacksaw, or equivalent tool, in sections approximately 6 inches in length. The 6 inch samples are lined at each end with Teflon® sheets and capped with plastic caps. Labels documenting job number, borehole identification, collection date, and depth are affixed to each sample. The samples are then placed into an ice-filled cooler for delivery under chain-of-custody to a laboratory certified by the State of California to perform the specified tests. The remaining collected soil that has not been selected for laboratory analysis is logged using the United Soil Classification System (USCS) under the direction of a State Registered Professional Geologist, and is field screened for organic vapors using a photo ionization detector (PI D), or an equivalent tool. Soil cuttings generated are stored in Department of Transportation (DOT) approved 55-gallon steel drums, or an equivalent storage container.

Grab Groundwater Sample Collection

Once the desired groundwater sampling depth has been reached, a Hydropunch tip is affixed to the head of the sampling rods. The Hydropunch tip is advanced between approximately 6 inches to one foot within the desired groundwater sampling zone (effort is made to emplace the Hydropunch screen across the center of the water table), and retracted to expose the Hydropunch screen. Grab groundwater samples are collected by lowering a pre-cleaned, single-sample polypropylene, disposable bailer down the annulus of the sampler rod. The groundwater sample is discharged from the bailer to the sample container through a bottom emptying flow control valve to minimize volatilization.

Alternatively, groundwater samples are collected by lowering a disposable bailer through the sampler rod or into the borehole.

Collected water samples are discharged directly into laboratory provided, pre-cleaned, vials or containers and sealed with Teflon-lined septum, screw-on lids. Labels documenting sample number, well identification, collection date, and type of preservative (if applicable. i.e. HCI for TPPH, BTEX, and fuel oxygenates) are affixed to each sample. The samples are then placed into an ice-filled cooler for delivery under chain-of-custody to a laboratory certified by the State of California to perform the specified tests.

Borehole Completion

Upon completion of drilling and sampling, the rods are retracted. Neat cement grout, mixed at a ratio of 6 gallons of water per 94 pounds of Portland cement, is introduced, *via* a tremmie pipe, and pumped to displace standing water in the borehole. Displaced groundwater is collected at the surface into DOT approved 55-gallon steel drums, or an equivalent storage container. In areas where the borehole penetrates asphalt or concrete, the borehole is capped with an equivalent thickness of asphalt or concrete patch to match finished grade.

Organic Vapor Procedures

Soil samples are collected for analysis in the field for ionizable organic compounds using a PID with a 10.2 eV lamp. The test procedure *involves* measuring approximately 30 grams from an undisturbed soil sample, placing this subsample in a Ziploc--type bag or in a clean glass jar, and sealing the jar with aluminum foil secured under a ring-type threaded lid. The container is warmed for approximately 20 minutes (in the sun); then the head-space within the container is tested for total organic *vapor,* measured in parts per million as benzene (ppm; volume/volume). The instrument is calibrated prior to drilling. The results of the field-testing are noted on the boring logs. PID readings are useful for indicating relative levels of contamination, but cannot be used to evaluate petroleum hydrocarbon levels with the confidence of laboratory analyses.

Equipment Decontamination

Equipment that could potentially contact subsurface media and compromise the integrity of the samples is carefully decontaminated prior to drilling and sampling. Drill augers and other large pieces of equipment are decontaminated using high pressure hot water spray. Samplers, groundwater pumps, liners and other equipment are decontaminated in an Alconox scrub solution and double rinsed in clean tap water rinse followed by a final distilled water rinse.

The rinsate and other wastewater are contained in 55-gallon DOT-approved drums, labeled (to identify the contents, generation date and project) and stored on-site pending waste profiling and disposal.

Soil Cuttings and Rinsate/Purge Water

Soil cuttings and rinsate/purge water generated during drilling and sampling are stored onsite in DOT-approved 55-gallon steel drums pending characterization. A label is affixed to the drums indicating the contents of the drum, suspected contaminants, date of generation,

and the boring number from which the waste is generated. The drums are removed from the site by a licensed waste disposal contractor under manifest to an appropriate facility for treatment/recycling.