EAST BAY ASIAN LOCAL DEVELOPMENT CORPORATION
BUILDING HEALTHY AND VIBRANT NEIGHBORHOODS SINCE 1975

April 17, 2015

Karel Detterman, P.G.
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502
karel.detterman@acgov.org

RE: Work Plan, Additional Subsurface Investigation, Properties at 760 22nd Street and 2201 Brush Street, Oakland, California 94612

Dear Alameda County Environmental Health:

Please find attached for your review the following document:

- Work Plan, Additional Subsurface Investigation, Properties at 760 22nd Street and 2201 Brush Street, Oakland, California 94612 (ACEH Document No. RO#3153_WP_R_040815)

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

Please call me at (510) 287-5353 ext. 336 if you have any questions.

Sincerely,

Carlos Castellanos
Director, Real Estate Development Department

WORK PLAN
ADDITIONAL SUBSURFACE INVESTIGATION

PROPERTIES AT
760 22ND STREET AND 2201 BRUSH STREET
OAKLAND, CALIFORNIA 94612

Prepared for:

Mr. Everett Cleveland
Senior Project Manager
East Bay Asian Local Development Corporation
1825 San Pablo Avenue, Suite 200
Oakland, California 94612

Prepared by:

Essel Environmental Consulting
564 Market Street
San Francisco, California 94104
(415) 938-7002

April 8, 2015

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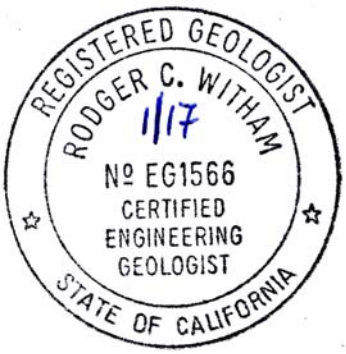

Rodger C. Witham, P.G., C.E.G.
Project Manager

Nik Lahiri
Principal

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1.0 INTRODUCTION

The East Bay Asian Local Development Corporation (EBALDC) has requested that Essel Environmental Consulting (Essel) prepare a work plan proposing additional subsurface environmental investigation on two adjacent properties located at 760 22nd Street and 2201 Brush Street in Oakland, California. This request follows a March 2, 2015 letter from Alameda County Environmental Health (ACEH) requesting that EBALDC submit a data gap investigation work plan to further assess the extent of petroleum hydrocarbons in soil and ground water beneath the properties. This subsurface petroleum hydrocarbon impact is related to former diesel and gasoline underground storage tanks (USTs) that were located on and adjacent to the 760 22nd Street property. The ACEH closed this UST case (associated with another address) in December 1997 based on a continued commercial use of the property. The EBALDC plans to redevelop the properties for residential use.

1.1 Site Location and Description

The two properties are located at the addresses of 760 22nd Street and 2201 Brush Street in Oakland, California and are located a short distance to the southwest of the intersection of West Grand Avenue, San Pablo Avenue, and Interstate Highway 980. The adjacent and abutting properties are located on the west side of Brush Street between West Grand Avenue on the north and 22nd Street on the south. Plate 1 shows the locations of the properties and the features of the regional and local vicinities and Plate 2 shows the two properties.

At present, the northernmost property at 760 22nd Street is occupied by a wood frame/metal siding shed and the remaining portion of the property is paved with concrete. This property is used to park trucks. The adjacent and abutting property at 2201 Brush Street is unpaved and also used to park trucks.

East Bay Asian Local Development Corporation plans to redevelop the 760 22nd Street/2201 Brush Street properties with a multistory residential structure containing 59 residential living units. Preliminary architectural plans show that the building will cover the entire property. Parking will include a podium garage with parking at ground level and below ground level. Two 3-high puzzle lifts will be constructed near the center of the property for below ground parking

(total of 45 parking spaces). Below grade parking will involve excavation of soil beneath this central portion of the property to an approximate depth of 12 feet below the ground surface.

1.2 Previous Work

Previous environmental work has included underground storage tank (UST) removal, Phase I Environmental Site Assessments (ESAs), and subsurface investigations related to the UST removal. These activities took place between 1986 and 2012.

1.2.1 Underground Storage Tank Removal

Four USTs, associated with a Bekins Van & Storage (Bekins) warehouse located at 2227 San Pablo Avenue, were removed from the 760 22nd Street location and vicinity in 1986 (PES Environmental, Inc. [PES], 1997). Two of the tanks included a 7,000-gallon diesel UST that was located on the 760 22nd Street property and a 2,000-gallon gasoline UST that was located beneath the adjacent sidewalk. After tank removal, soil samples were collected beneath both ends of the diesel and gasoline USTs at depths of 12 to 13 feet below the ground surface. The samples beneath the diesel UST were analyzed for total petroleum hydrocarbons as diesel (TPHd) and the sample beneath the gasoline tank was analyzed for total petroleum hydrocarbons as gasoline (TPHg).

The results of laboratory analyses showed concentrations of 80 and 220 to 250 milligrams per kilogram (or parts per million [ppm]) TPHd were detected in the soil samples collected beneath the southern and northern ends, respectively, of the 7,000-gallon diesel UST located on the 760 22nd Street property. Concentrations of 1.8 and 70 ppm TPHg were detected in the soil samples collected beneath the respective southern and northern ends of the gasoline UST located on the sidewalk adjacent to the 760 22nd Street property. In 1997, PES presented the tank removal information to the Alameda County Health Care Services Agency who reviewed the information and issued a closure letter for the Bekins site on December 8, 1997. Plate 3 shows the locations of the former gasoline and diesel USTs and Table 1 presents the results of the laboratory analyses of the soil samples.

1.2.2 Phase I Environmental Site Assessments

<u>2005 and 2007</u>

PES Environmental, Inc. (PES, 2005a, 2007) performed Phase I ESAs of the subject properties in 2005 and 2007. In the reports of the assessments, PES describes the presence and removal of USTs and closure of the UST contamination case at the 760 22nd Street property (described above). PES did not identify any off-site properties that were of environmental concern to the subject properties in either assessment. In 2005, PES concluded that the UST case and oil staining observed in an oil changing pit at the 760 22nd Street property represented recognized environmental conditions (RECs) in connection with that property and, in 2007 concluded that these two issues and the presence of diesel- and motor-oil petroleum hydrocarbons in ground water also constituted RECs at the property.

2011

PES (2011a) performed another Phase I ESA of the two properties in 2011. PES reported that, historically, the two properties were a mix of undeveloped land and of commercial and residential use as follows.

- **760 22nd Street.** This property was occupied by residences from at least 1902 to the late 1940s and since then has been used for truck storage and repair. Repair operations appear to have ceased at sometime before 2005.

- **2201 Brush Street.** A single family residence was present on this property from at least 1902 until sometime before 1925; the property contained apartments and a store (occupied by printer, sheet metal, cabinet maker, and delivery service companies) from the 1920s until the 1980s; and from the 1980s to the present time the property has been an unpaved lot used to park buses and trucks.

PES, again, found no off-site properties that were of environmental concern to the subject properties. PES concluded that the former USTs at and adjacent to the 760 22nd Street property, the former truck repair operations on that property, and the concentrations of diesel and motor oil petroleum hydrocarbons in soil and ground water beneath that property at levels greater than residential cleanup goals were RECs associated with the property.

1.2.3 Subsurface Investigations

PES (2005b) performed a subsurface soil and ground-water quality investigation at the 760 22nd Street property in September 2005. Borings B-1 through B-6 were advanced to depths of 12 to 16 feet below grade at locations near the former USTs and fuel dispenser, inside an oil-changing building, and at the southern and northern ends of the property. Soil samples from four borings, collected between 5 and 12 feet below the ground surface, were analyzed for TPHg, TPHd, TPH as motor oil (TPHmo), benzene, toluene, ethylbenzene, total xylenes (BTEX), and methyl tertiary butyl ether (MTBE). Grab ground-water samples collected from borings B-1, B-2, B-5, and B-6 were also analyzed for the above analytes. Concentrations of 190 ppm TPHg and 230 ppm TPHd were detected in soil at 8 feet below the ground surface in boring B-4, located near the dispenser island. Concentrations of TPHg and TPHd were less than 25 ppm or were not detected in the other soil samples. No BTEX or MTBE was detected in the soil samples. In ground water, TPHd was detected in the four borings at concentrations of 170 to 3,200 micrograms per liter (µg/L or parts per billion [ppb]) and TPHmo was found at concentrations of 190 to 490 ppb in three of the four borings. No BTEX or MTBE was detected in ground-water samples, except for a trace 0.61-ppb MTBE in boring B-1.

PES (2011b) performed additional subsurface soil investigation in October 2011 to delineate the extent of the petroleum hydrocarbons found during the 2005 investigation. Six additional borings SB1 through SB6 were advanced to depths of 10 to 11 feet below grade at locations from 10 to 15 feet west of the borings advanced in 2005. PES collected soil samples from the borings at various depths from 2 to 10 feet below the ground surface and submitted the samples for laboratory analyses for TPHg, TPHd, and BETX. No TPHg or BTEX was found in any soil sample and low levels of TPHd (1.2 to 12 ppm) were detected in 10 of the 17 soil samples analyzed. Plate 2 shows the locations of borings advanced by PES during the two subsurface investigations. Table

1 presents the results of laboratory analyses of the soil samples and Table 2 presents the results of laboratory analyses of the ground-water samples.

1.2.4 Geophysical Surveys

PES (2011b, 2012) conducted two geophysical surveys of the 760 22nd Street property in October 2011 and April 2012 to evaluate the presence of subsurface features related to the former fuel facilities. The results of these surveys detected various underground utility pipes, but did not find indications of additional USTs. A shallow triangular-shaped metallic anomaly, shown on Plate 2, was identified approximately 10 feet west of the former dispenser island.

2.0 CONCEPTUAL SITE MODEL

Essel reviewed geologic and ground-water data from several sources, including data presented by PES, to formulate a conceptual site model. This conceptual site model pertains to the property at 760 22nd Street and the abutting property at 2201 Brush Street.

2.1 Physiographic Setting

The City of Oakland and the two properties are located near the center of a topographic feature known as the East Bay Plain, which is an elongate northwest to southeast trending alluvial plain that bounds the eastern side of San Francisco Bay. The 760 22nd Street property is at an approximate elevation of 18 feet above mean sea level (USGS Oakland West, California 7½-minute quadrangle topographic map). Surface topography in the local area and at 760 22nd Street slopes gently downward toward the northwest.

2.2 Geologic Setting

The East Bay Plain in the site vicinity comprises a series of alluvial fans and dune sands that were deposited on a westward sloping bedrock surface. The bedrock that underlies the alluvial plain is presumed to consist of rocks of the Jurassic to Cretaceous-age Franciscan complex. Unconsolidated sediments that overlie the Franciscan complex rocks are Pleistocene to Holocene in age and, from oldest to youngest, may include the Santa Clara, Alameda, and Temescal Formations. Semi-consolidated sediments of the early Pleistocene-age Santa Clara Formation consist of units of conglomerate, sandstone, siltstone, and claystone. The Alameda formation, of Pleistocene to Holocene age, comprises several members that include the Yerba Buena mud (black, organic-rich clay); a sequence of alluvial fan deposits (sand, gravel, silt) referred to as the San Antonio/Merritt/Posey member, and the Young Bay mud (black, organic-rich clay). The Temescal Formation is early Holocene in age and is an alluvial deposit consisting of silt and clay. The total thickness of these Pleistocene to Holocene sediments in the general area is reported to range from 300 to 700 feet (see California Regional Water Quality Control Board, San Francisco Bay Region, 1999).

The 760 22nd Street property is located near the surface contact between two geologic units as mapped by Graymer (2000). Sediments that are exposed at the site and areas to the south are the Merritt sand, which consists of a fine-grained, very well sorted, well-drained eolian (wind-blown) deposit. Graymer describes the sediments underlying West Grand Avenue and areas to the north as Holocene-age alluvial fan and fluvial deposits, which comprise gravelly sand or sandy gravel that generally grades upward to sandy or silty clay. These deposits are included in the Temescal

Formation described by the California Regional Water Quality Control Board, San Francisco Bay Region (1999).

PES (2005b) describes the sediments encountered in borings drilled at the 760 22nd Street property in 2005 as consisting of black to dark greenish gray clay from the ground surface to depths of 8 to 10 feet below the ground surface, dark greenish gray to brown sand generally from 8 to 12 feet below grade, and dark greenish-gray to brown clay from 12 to 16 feet below the ground surface. In borings drilled in 2011, PES (2011b) describes encountering silt from the ground surface to approximately 4 feet below grade and sandy clay and clayey sand from 4 to 10 feet below the ground surface. Plates 3 and 4 are generalized geologic cross sections of the sediments encountered in borings at the site, as described by PES. The locations of the cross sections are shown on Plate 2.

2.3 Hydrologic Setting

The closest surface water is Lake Merritt, which is located approximately 3,900 feet east-southeast of the 760 22nd Street property. The Oakland Inner Harbor is located 6,700 feet south of the property.

The two properties overlie the East Bay Plain Subbasin of the Santa Clara Valley Groundwater Basin. The subbasin is contained within the northwest-to-southeast-trending alluvial plain that extends from Union City in the south to San Pablo Bay in the north. The subbasin is bounded on the east by the Hayward Fault and the Franciscan complex basement rocks and extends westward beneath San Francisco Bay. The California Regional Water Quality Control Board, San Francisco Bay Region (1999) further subdivides the East Bay Plain Subbasin into sub-areas based on geologic, geomorphic, and geographic factors. The site and vicinity are in the Oakland sub-area. Water-bearing units that underlie the site and vicinity are not distinguished as aquifers or zones; however, shallower ground-water zones occur within the Holocene-age alluvial fan and dune sand deposits and deeper ground-water zones occur within the Pleistocene age sand and gravel units of the Santa Clara Formation.

PES (2005b) reported depth to first ground water in borings drilled at the 760 22nd Street property to be 12 to 13 feet below the ground surface. Green Star Environmental (2011) reported that depth to ground water at the Oakland Bus Terminal, located approximately 600 feet southeast and upgradient of the 760 22nd Street property, has ranged from 12 to 22 feet below the ground surface, with the direction of ground-water flow varying from west-southwest to northwest. Broadbent & Associates, Inc. (2014) reports depth to ground water at an ARCO gasoline service station located approximately 900 feet west-northwest and downgradient from the site to range from 9 to 12 feet below the ground surface, with a direction of ground-water flow approximately toward the northwest. Based on information from these nearby properties, the direction of ground-water flow beneath the 760 22nd Street/2201 Brush Street properties is inferred to be between west and northwest.

2.4 Distribution of Contaminants

Soil and ground-water samples collected during previous subsurface investigations at the 760 22nd Street property were variously analyzed for TPHg, TPHd, and TPHmo; BTEX; and MTBE. Based on laboratory analytical results, contaminants of concern appear to be only the gasoline and diesel range hydrocarbons (TPHg and TPHd) in soil and diesel and motor oil range

hydrocarbons (TPHd and TPHmo) in ground water. No BTEX was found in any soil or ground-water sample, no MTBE was detected in any soil sample, and MTBE was detected at a trace (less than 1 part per billion) concentration in one ground-water sample. Following are discussions of the distribution of the petroleum compounds in the subsurface beneath the 760 22nd Street property.

2.4.1 Soil

TPH as Gasoline

In soil, TPHg was found in samples collected at either end of the former gasoline UST that was located beneath the sidewalk next to the 760 22nd Street property and in two borings advanced near the former fuel dispenser located at the eastern edge of the property. Concentrations detected at 12 feet below grade beneath the former gasoline UST were 1.8 and 70 ppm. Concentrations detected at depths of 8 to 12 feet below grade in the two borings (B-4 and SB3) advanced near the fuel dispenser ranged from 1.6 to 190 ppm. The most stringent environmental screening level (ESL) for TPHg established by the San Francisco Bay Regional Water Quality Control Board (2013a) is 100 ppm. Soil collected at a depth of 8 feet below the ground surface in boring B-4 was the only sample containing TPHg at a concentration greater than the ESL. Data from adjacent borings B-4 and SB1 constrain the vertical extent of the TPHg to an interval between 4 and 10 feet below the ground surface. The lateral extent of relatively elevated levels of TPHg is likely restricted to an area within a radius of 10 feet from the dispenser. Table 1 presents the laboratory analytical results of soil samples and Plates 3 and 4 show the distribution of TPHg in soil along Cross Sections A-A' and B-B'.

TPH as Diesel

Concentrations of TPHd were found in a greater number of soil samples; however, most concentrations were significantly less than the most stringent ESL for TPHd, which is also 100 ppm. Concentrations of 250 and 220 ppm TPHd were found in 1986 at the northern end of the on-site 7,000-gallon diesel UST at respective depths of 12 and 13 feet below the ground surface. A concentration of 80 ppm TPHd was detected at 12 feet below grade beneath the southern end of the former UST. A concentration of 230 ppm TPHd, associated with the elevated TPHg, was also detected in the soil sample collected at the 8-foot depth in boring B-4, which was advanced next to the former fuel dispenser. This concentration dropped to 23 ppm at the 12-foot depth in boring B-4.

At the northern end of the former diesel UST, TPHd-impacted soil appears to be vertically restricted to a depth of 12 feet (the bottom of the former UST) and greater. The maximum depth of elevated impact is not known, but is likely within the zone of ground-water fluctuation (smear zone), which may be up to approximately 4 feet (Green Star Environmental, 2011). The lateral extent is also inferred to be relatively localized (within 10 to 15 feet of the former UST) as soil analyzed from nearby borings B-2 and SB6 contained TPHd at a maximum concentration of 12 ppm. At the location of the fuel dispenser, the vertical and lateral extent of TPHd is likely approximately the same as for TPHg; that is, constrained within a vertical interval between 4 and 10 feet below the ground surface and within a lateral distance of a 10-foot radius of the dispenser. Plates 3 and 4 present the distribution of TPHd in soil along Cross Sections A-A' and B-B'.

2.4.2 Ground Water

PES (2005b) collected ground-water samples from borings B-1, B-2, B-5, and B-6 during the 2005 subsurface investigation. The concentrations of TPHd detected in the four water samples and of TPHmo in three of the four water samples were greater than the applicable ground-water ESL of 100 ppb. The highest concentration of TPHd (3,200 ppb) was detected in the water sample from boring B-2, advanced at a location within or near the former on-site 7,000-gallon diesel UST. Plate 5 presents a contour map of TPHd in the shallow ground water and shows that concentrations greater than the ESL likely are present beneath the entire 760 22nd Street property, may extend southward to the abutting 2201 Brush Street property, and may extend a short distance to the west beneath the adjacent commercial and residential properties.

3.0 PROPOSED WORK

The results of previous subsurface investigations have essentially defined the extent of petroleum hydrocarbons in the unsaturated soil, except possibly in the vicinity of the northern end of the former 7,000-gallon diesel UST. The extent of petroleum hydrocarbons in ground water has not been fully delineated and soil vapor has not been investigated. Essel, therefore, proposes to advance seven soil borings at the site for soil and ground-water sampling and analysis and advance two borings at the site for soil-vapor sampling and analysis. Data from these locations will be used to complement and compare against the historical subsurface information. Following are descriptions of the work tasks.

3.1 Permit, Utility Clearance, and Health and Safety

Essel will submit an application to drill the borings to the Alameda County Public Works Agency (ACPWA) and will notify the ACPWA a minimum of 5 working days before the start of on-site activities. Essel will mark the proposed boring locations and notify Underground Services Alert of Northern California and Nevada a minimum of 48 hours before the date of planned drilling. Essel will also subcontract with a private utility locator to clear boring locations with respect to potential on-site underground utilities.

Essel will prepare a site-specific Health and Safety Plan (Plan) before conducting fieldwork and this Plan will be available at the site during field activities. Essel and subcontractor personnel will be apprised of potential on-site hazards during a field orientation meeting that will be conducted before field work begins.

3.2 Borings

Nine borings are proposed to be advanced around the perimeter of the two properties, as described below and depicted on Plate 5.

- One boring will be advanced at the northern end of the former 7,000-gallon diesel UST where the relatively elevated concentrations of diesel petroleum hydrocarbons were detected at 12 to 13 feet below the ground surface during the 1986 UST removal. This boring will be advanced to a maximum depth of approximately 20 feet below the ground surface to delineate the vertical depth of petroleum hydrocarbons in soil. Two soil and one ground-water sample will be collected from this boring for laboratory analysis. The ground water will be checked for the presence of free-phase petroleum product.

- One boring will be advanced at a location less than 10 feet to the north of the former northern end of the 7,000-gallon diesel UST to assess the extent of soil and ground-water impact to the north of the former UST. This boring will be advanced a few feet below the ground-water surface and up to three soil and one ground-water sample will be collected for laboratory analysis. The ground water will be checked for the presence of free-phase petroleum product.
- One boring will be advanced adjacent to previous borings B-4 and SB1 to a depth sufficient to collect a ground-water sample and check the ground water for the presence of free-phase petroleum product. Up to three soil samples will also be collected for laboratory analysis to compare petroleum hydrocarbon concentrations to levels detected at this location in 2005.
- One boring will be advanced into the ground water at a location on the 2201 Brush Street property primarily to assess impact to ground water at the southeastern corner of the project area. One soil and one ground-water sample will be collected from this boring for laboratory analyses.
- Three borings will be advanced into the ground water at locations along the western side of the 760 22nd Street property primarily to assess the downgradient extent of petroleum hydrocarbons in the ground water. One soil and one ground-water sample will be collected from each boring for laboratory analysis.
- Two borings will be advanced to a minimum depth of 5 feet below the ground surface for the purpose of collecting soil vapor at the locations of the two primary sources and highest detected petroleum-hydrocarbon concentrations in soil. One boring will be located next to the northern end of the former 7,000-gallon diesel UST and one boring will be located next to the former dispenser island.

Borings will be advanced using a direct-push drill rig equipped with a 2½-inch-outside-diameter, hollow steel rod. Continuous soil cores will be collected from the borings in clear plastic sleeves that will be contained inside the steel rod. Each sleeve will be removed from the core barrel after each sampling interval and replaced with a clean plastic sleeve for the next lower sampling interval. Soil cores retrieved from the borings will be screened in the field for evidence of contaminants. A photoionization detector will be used to check for volatile organic vapor concentrations. Field screening will also include visual observation of the soil for discoloration and noting any odors. Soil encountered during drilling will be described and classified using the Unified Soil Classification System (USCS).

Drilling equipment will be decontaminated between boring locations. After drilling and sampling (described below), each borehole will be backfilled with neat cement slurry from the total depth of the boring to the ground surface. A representative of the ACPWA will witness backfilling of the boreholes per requirements of the drilling permit.

3.3 Sampling Soil and Ground Water

Soil samples selected for laboratory analysis will be retained in the plastic sleeves. A 6-inch-long section of the plastic sleeve will be cut at the selected sample depth and the ends of each sleeve will be covered with Teflon sheets, sealed with plastic caps, and wrapped with duct tape. Each sample will then be labeled with a unique identifying number and placed on ice in a cooler pending delivery to the laboratory.

Ground-water samples will be collected from the borings through ¾-inch-diameter polyvinyl chloride (PVC) casings that will be placed in each borehole. After placement, each temporary well will be checked for free-phase petroleum product by carefully lowering a small-diameter bailer part way through the air-water interface and retrieving the bailer for visual observation. The temporary wells will then be purged a minimum three casing volumes before sampling. Water samples will be collected using ¼-inch-diameter polyethylene tubing, which will be inserted into the PVC casings and attached to a peristaltic pump. The water samples will be placed into laboratory-supplied containers that will be of appropriate size and contain the appropriate preservative for the laboratory analyses requested. Sample containers will be filled completely to eliminate air bubbles, sealed with the container caps, labeled with a unique identifying number, and placed on ice in a closed cooler.

Essel will complete Chain-of-Custody forms for both soil and ground-water samples. These forms will accompany the samples to the laboratory.

3.4 Sampling Soil Vapor

Soil-vapor samples will be collected using procedures that are generally consistent with the April 2012 soil-gas advisory document developed by the California Department of Toxic Substances Control and the San Francisco Bay and Los Angeles Regional Water Quality Control Boards. Vapor probes will be constructed in each of the two proposed boreholes by inserting a stainless-steel probe tip into ¼-inch-diameter Teflon tubing, placing the probe tip at a specified depth, and backfilling the borehole with clean sand and bentonite to the ground surface. The probe tip will be suspended approximately 3 inches off of the bottom of each borehole and a minimum 6 inches of sand will be placed below and above the tip. Approximately 6 inches of dry bentonite flakes will be place on top of the sand and hydrated bentonite will be placed from the top of the bentonite flakes to the ground surface. Each soil vapor probe will be allowed to equilibrate at least 2 hours before sampling.

Soil vapor samples will be collected in 1-liter stainless steel Summa canisters that will be certified clean by the supplying laboratory. The canisters are evacuated to a negative pressure (vacuum) of approximately 30 inches of mercury. The purging and sampling apparatus will include a two-way in-line valve, a vacuum gauge, flow controller, a 2-micron moisture filter, and the Summa canister equipped with an open and close valve. Swagelok fittings will be used at the connection points in the manifold assembly.

Before sampling, Essel will perform a shut-in test to check the integrity of the sampling equipment fittings. This test will be performed for a 5-minute period and will be successful if the vacuum gauge on the sampling assembly shows no change. If vacuum on the manifold assembly begins to drop, all fittings will be checked and tightened, a vacuum will again be placed on the manifold assembly, and the shut-in test will be restarted. Following the shut-in test, Essel will purge the probes a minimum of three volumes of tubing, sand void space, and dry bentonite void space.

Soil-vapor samples will be collected at a controlled rate between 100 and 200 milliliters per minute. During sampling, a volatile tracer (such as isopropyl alcohol) will be applied to the sampling equipment either by placing strips of cloth wetted with the tracer near sampling equipment fittings or by placing a shroud over the sampling train and placing a tracer inside the shroud. The tracer will be used to evaluate possible leakage of ambient air into the sampling assembly. Sampling will continue until the vacuum gauge indicates that the negative pressure in the canister is at 5 inches of mercury. At the completion of sampling, the valve on the sampling Summa canister

will be closed, the manifold assembly disconnected, and the Summa canister will be capped, labeled, and placed in a closed container out of the direct sunlight. The date, time, starting and ending vacuums on the Summa canister, and the serial numbers of the Summa canisters will be noted and recorded on the sample Chain-of-Custody form. The Chain-of-Custody form will accompany the samples to the laboratory.

3.5 Laboratory Testing

Soil, ground water, and soil-vapor samples will be analyzed by state of California certified testing laboratories. Soil and ground-water samples will be submitted for analysis for TPHg, TPHd, and TPHmo using U.S. Environmental Protection Agency (EPA) Method 8015Bm/8015B and for chlorinated and aromatic volatile organic compounds (VOCs) using EPA Method 8260B. Depending on target analyte concentrations, laboratory-reporting limits for soil will be 1.0 and 5.0 milligrams per kilogram (mg/kg) for the TPHg, TPHd, and TPHmo analyses and 0.0050 mg/kg for the VOC analysis. For ground-water samples, laboratory-reporting limits will be 50 and 250 micrograms per liter (ug/L) for the TPH analyses and 0.5 ug/L for most of the VOCs.

Soil vapor samples will be analyzed for aromatic and chlorinated VOCs using EPA Method TO-15. Typical laboratory reporting limits for the various analytes included in the TO-15 analysis are anticipated to range from 3.7 to 53 micrograms per cubic meter. The TO-15 analysis is anticipated to include the tracer gas used for the leak testing.

3.6 Technical Report

A technical report will be prepared for the project. The report will present the results of field and laboratory work, interpretations of the data collected, and conclusions and recommendations. The report will be signed and stamped by a geologist registered in the state of California.

4.0 REFERENCES CITED

Broadbent & Associates, Inc., 2014, *First quarter 2014 monitoring report, Atlantic Richfield Company station #2169, 889 West Grand Avenue, Oakland, Alameda County, California*. Project No. 06-88-621, April 29.

California Regional Water Quality Control Board, San Francisco Bay Region, 1999, *East Bay Plain Basin groundwater beneficial use evaluation report, Alameda and Contra Costa Counties, CA.* June.

_____, 2013, *Environmental screening levels, lookup tables – detail.* http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml. Interim final, December.

Graymer, R. W., 2000, *Geologic map and map database of the Oakland metropolitan area, Alameda, Contra Costa, and San Francisco Counties, California*. U. S. Geological Survey Miscellaneous Field Studies Map MF-2342, scale 1:50,000.

Green Star Environmental, 2011, *Revised site conceptual model, Greyhound Lines terminal, 2103 San Pablo Avenue, Oakland, California 94608.* Project No. 11-1379, December 21.

PES Environmental, Inc., 1997, *Request for closure, Beacon Storage Company 2227 San Pablo Avenue, Oakland, California 94612*. Project No. 631.0101.001, November 26.

_____, 2005a, *Phase I Environmental Site Assessment, 777 W. Grand Avenue, 760 22nd Street, 756 21st Street, and 2116 and 2201 Brush Street, Oakland, California*. August 18.

_____, 2005b, *Soil and groundwater investigation results, 760 22nd Street, Oakland, California*. September 16.

_____, 2007, *Phase I Environmental Site Assessment, 760 22nd Street, 756 21st Street, and 2116 and 2201 Brush Street, Oakland, California*. May 25.

_____, 2011a, *Phase I Environmental Site Assessment, 760 22nd Street, 756 21st Street, and 2116 and 2201 Brush Street, Oakland, California*. August 30.

_____, 2011b, *Results of geophysical survey and additional subsurface investigation, 760 22nd Street site, Oakland, California*. Project No. 1284.001.02.004, November 9.

_____, 2012, *Results of supplemental geophysical survey, 760 22nd Street site, Oakland, California*. Project No. 1284.001.02.005, June 6.

TABLE 1
Concentrations of Petroleum Hydrocarbons in Soil Samples
Properties at 760 22nd Street and 2201 Brush Street, Oakland, California

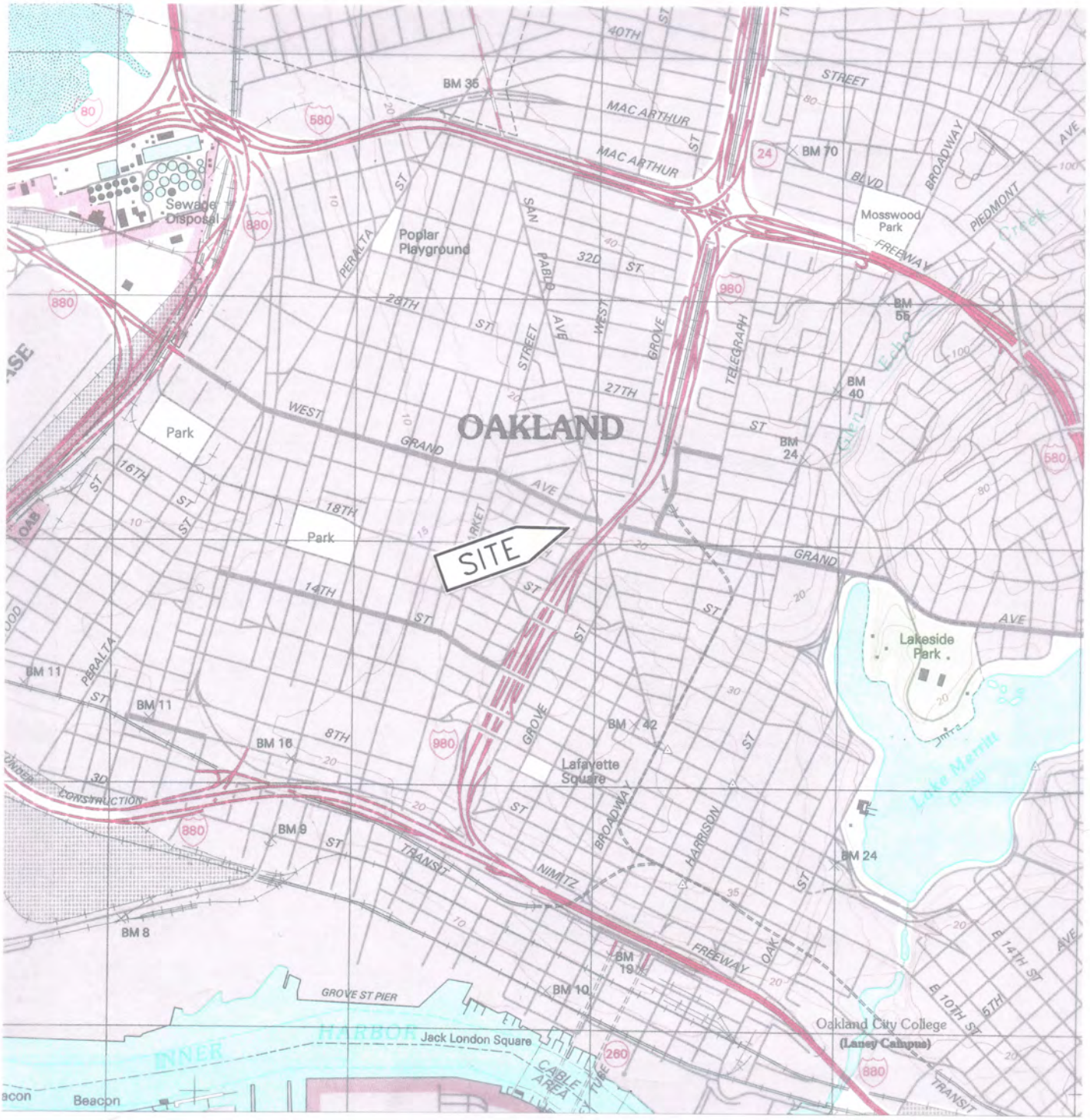
Location	Date Sampled	Sample Designation	Sample Depth (feet)	Total Petroleum Hydrocarbons			Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				Gasoline	Diesel	Waste Oil					
Underground Storage Tank Removal - 760 22nd Street and Adjacent Sidewalk											
2K Gasoline UST-north end	Oct-86	S-1	12	70	--	--	--	--	--	--	--
2K Gasoline UST-south end	Oct-86	S-3	12	1.8	--	--	--	--	--	--	--
7K Diesel UST-north end	Oct-86	S-5	12	--	250	--	--	--	--	--	--
7K Diesel UST-north end	Oct-86	S-8	13	--	220	--	--	--	--	--	--
7K Diesel UST-south end	Oct-86	S-2	12	--	80	--	--	--	--	--	--
				Gasoline	**Diesel**	**Motor Oil**					
2005 Subsurface Investigation (PES Environmental, Inc.)											
B-2	9/8/05	B-2-7.5	7 1/2	<1.0	<1.0	<10	<0.005	<0.005	<0.005	<0.005	<0.005
	9/8/05	B-2-12	12	<1.0	1.5	<10	<0.005	<0.005	<0.005	<0.005	<0.005
B-3	9/8/05	B-3-5.0	5	<1.0	<1.0	<10	<0.005	<0.005	<0.005	<0.005	<0.005
	9/8/05	B-3-11.5	11 1/2	1.6	23	<10	<0.005	<0.005	<0.005	<0.005	<0.005
B-4	9/8/05	B-4-8.0	8	190	230	<10	<0.025	<0.025	<0.025	<0.025	<0.025
	9/8/05	B-4-12	12	6.6	23	<10	<0.005	<0.005	<0.005	<0.005	<0.005
B-5	9/8/05	B-5-5.0	5	<1.0	<1.0	<10	<0.005	<0.005	<0.005	<0.005	<0.005
	9/8/05	B-5-11.5	11 1/2	<1.0	<1.0	<10	<0.005	<0.005	<0.005	<0.005	<0.005
							--	--	--	--	--
2011 Subsurface Investigation (PES Environmental, Inc.)											
SB1	10/20/11	SB1-4.0	4	<1.0	<1.0	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB1-10.0	10	<1.0	<1.0	--	<0.0050	<0.0050	<0.0050	<0.0050	--
SB2	10/20/11	SB2-2.0	2	<1.0	1.7	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB2-4.0	4	<1.0	4.3	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB2-8.0	8	<1.0	<1.0	--	<0.0050	<0.0050	<0.0050	<0.0050	--
SB3	10/20/11	SB3-2.0	2	<1.0	3.1	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB3-4.0	4	<1.0	<1.0	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB3-8.0	8	<1.0	<1.0	--	<0.0050	<0.0050	<0.0050	<0.0050	--
SB4	10/20/11	SB4-2.0	2	<1.0	2.1	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB4-4.0	4	<1.0	1.2	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB4-8.0	8	<1.0	5.0	--	<0.0050	<0.0050	<0.0050	<0.0050	--
SB5	10/20/11	SB5-2.0	2	<1.0	1.9	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB5-4.0	4	<1.0	<1.0	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB5-8.0	8	<1.0	<1.0	--	<0.0050	<0.0050	<0.0050	<0.0050	--
SB6	10/20/11	SB6-2.0	2	<1.0	12	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB6-4.0	4	<1.0	2.2	--	<0.0050	<0.0050	<0.0050	<0.0050	--
	10/20/11	SB6-8.0	8	<1.0	9.3	--	<0.0050	<0.0050	<0.0050	<0.0050	--
SFBRWQCB Environmental Screening Level (Residential)											
Soil less than 3 meters (10 feet) in depth				**100**	**100**	**100**	**0.044**	**2.9**	**3.3**	**2.3**	**0.023**
Soil greater than 3 meters (10 feet) in depth				**500**	**110**	**500**	**0.044**	**2.9**	**3.3**	**2.3**	**0.023**

Results are in milligrams per kilogram = parts per million.
Detectable concentrations are shaded gray. Detectable concentrations that are greater than the applicable and most stringent soil screening levels are shaded yellow.
-- = not analyzed
< = less than
ND = not detected at the laboratory reporting limit. Reporting limit not available.
MTBE = methyl tertiary butyl ether
SFBRWQCB = San Francisco Bay Regional Water Quality Control Board
Environmental screening levels for residential land use taken from SFBRWQCB Environmental Screening Levels, December 2013.

TABLE 2
Concentrations of Petroleum Hydrocarbons in Ground-Water Samples
Property at 760 22nd Street, Oakland, California

Location	Date Sampled	Sample Designation	Sample Depth (feet)	Total Petroleum Hydrocarbons			Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
				Gasoline	Diesel	Motor Oil					
2005 Subsurface Investigation (PES Environmental, Inc.)											
B-1	9/8/05	B-1	12 to 13	<50	360	190	<0.50	<0.50	<0.50	<0.50	0.61
B-2	9/8/05	B-2	12 to 13	<50	3,200	<100	<0.50	<0.50	<0.50	<0.50	<0.50
B-5	9/8/05	B-5	12 to 13	<50	530	490	<0.50	<0.50	<0.50	<0.50	<0.50
B-6	9/8/05	B-6	12 to 13	<50	170	230	<0.50	<0.50	<0.50	<0.50	<0.50
		Maximum Contaminant Level		--	--	--	1.0	150	300	1,750	13/5.0#
		SFBRWQCB Environmental Screening Level		100	100	100					

Results are in micrograms per liter = parts per billion.
Detectable concentrations are shaded gray.
Detectable concentrations that are greater than the applicable drinking water standard are shaded yellow.
-- = not available
< = less than
# Primary Maximum Contaminant Level/Secondary Maximum Contaminant Level
MTBE = methyl tertiary butyl ether
Maximum Contaminant Levels for drinking water taken from California Department of Public Health website, updated June 1, 2014
SFBRWQCB = San Francisco Bay Regional Water Quality Control Board
Environmental screening levels for drinking water taken from SFBRWQCB Environmental Screening Levels, December 2013.



Scale: 0 2000 feet 4000 feet

Source: USGS 7 1/2–Minute Quadrangle, Oakland West, California 1993

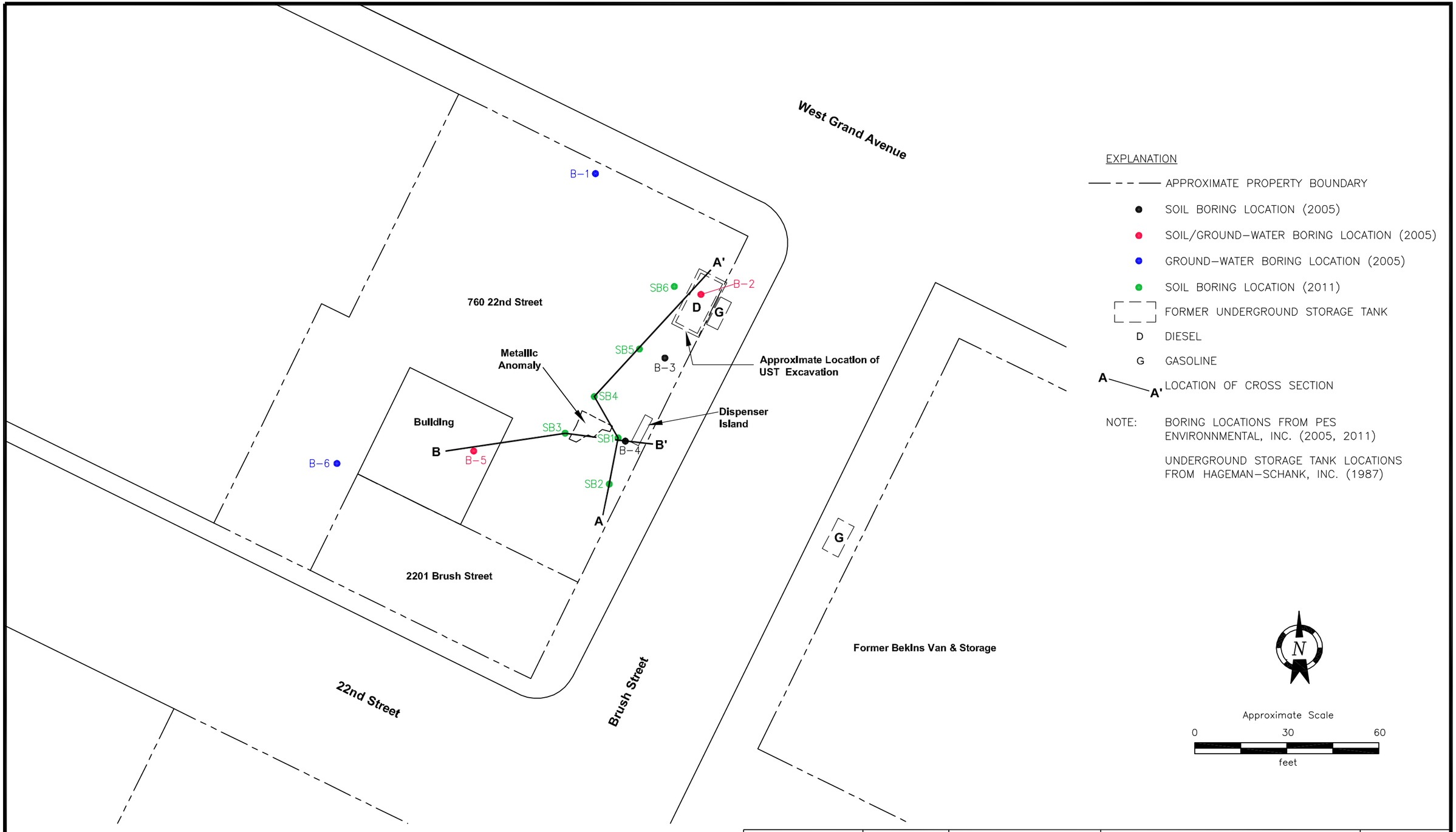
PROJECT NO.	DRAWN BY	REPORT DATE
14064	EC	April 2015

Essel Environmental Consulting
564 Market Street
San Francisco, California 94104
(415) 938–7002

Site Vicinity

760 22nd Street and
2201 Brush Street
Oakland, California

PLATE 1



PROJECT NO.	DRAWN BY	REPORT DATE		PLATE
14064	EC	April 2015	Site Plan 760 22nd Street and 2201 Brush Street Oakland, California	2

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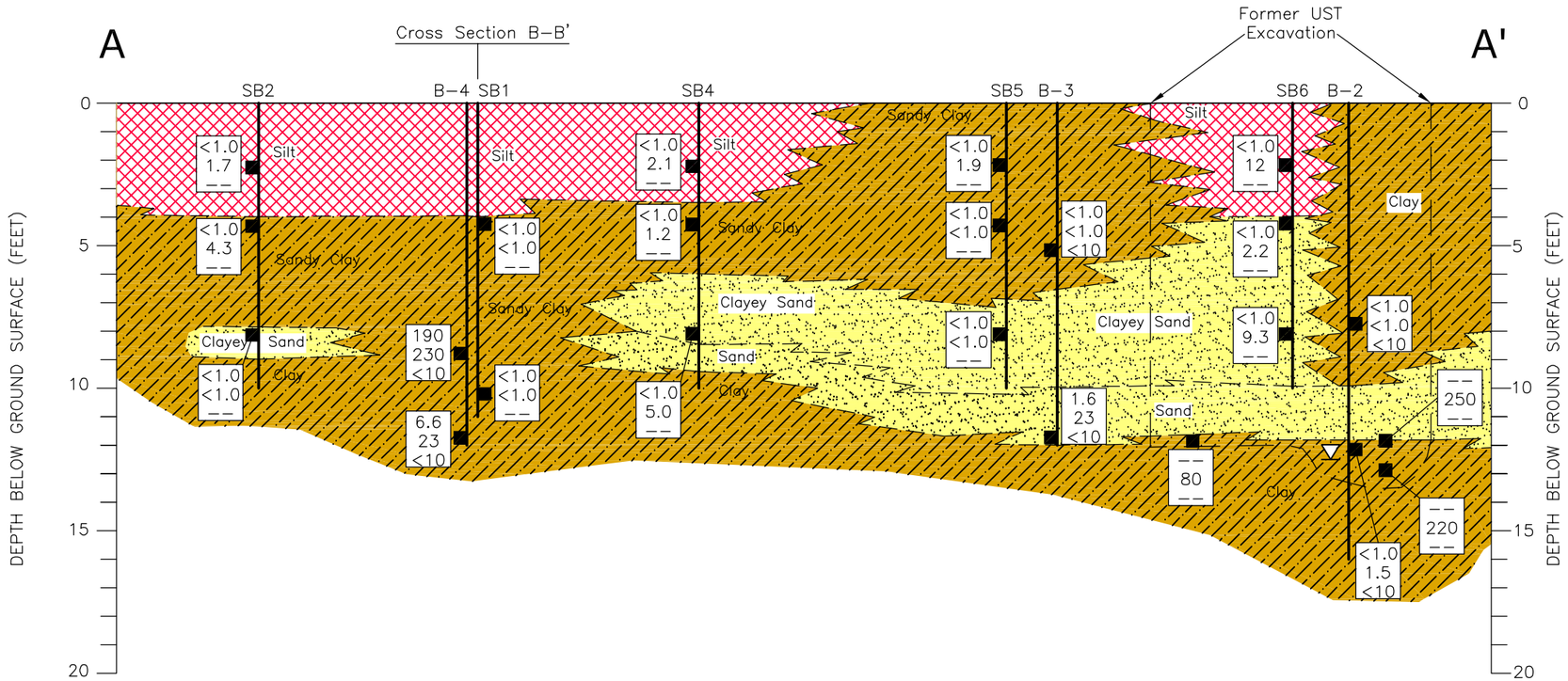

EXPLANATION

- ■ SAMPLE LOCATION
- 190 / 250 / <10 — TOTAL PETROLEUM HYDROCARBONS AS GASOLINE / DIESEL / MOTOR OIL
- –– NOT ANALYZED
- < LESS THAN
- ▽ WATER LEVEL

NOTE: SEE PLATE 3 FOR LOCATION OF CROSS SECTION

Approximate Scale

0 10 20

feet

VERTICAL EXAGGERATION = 2X

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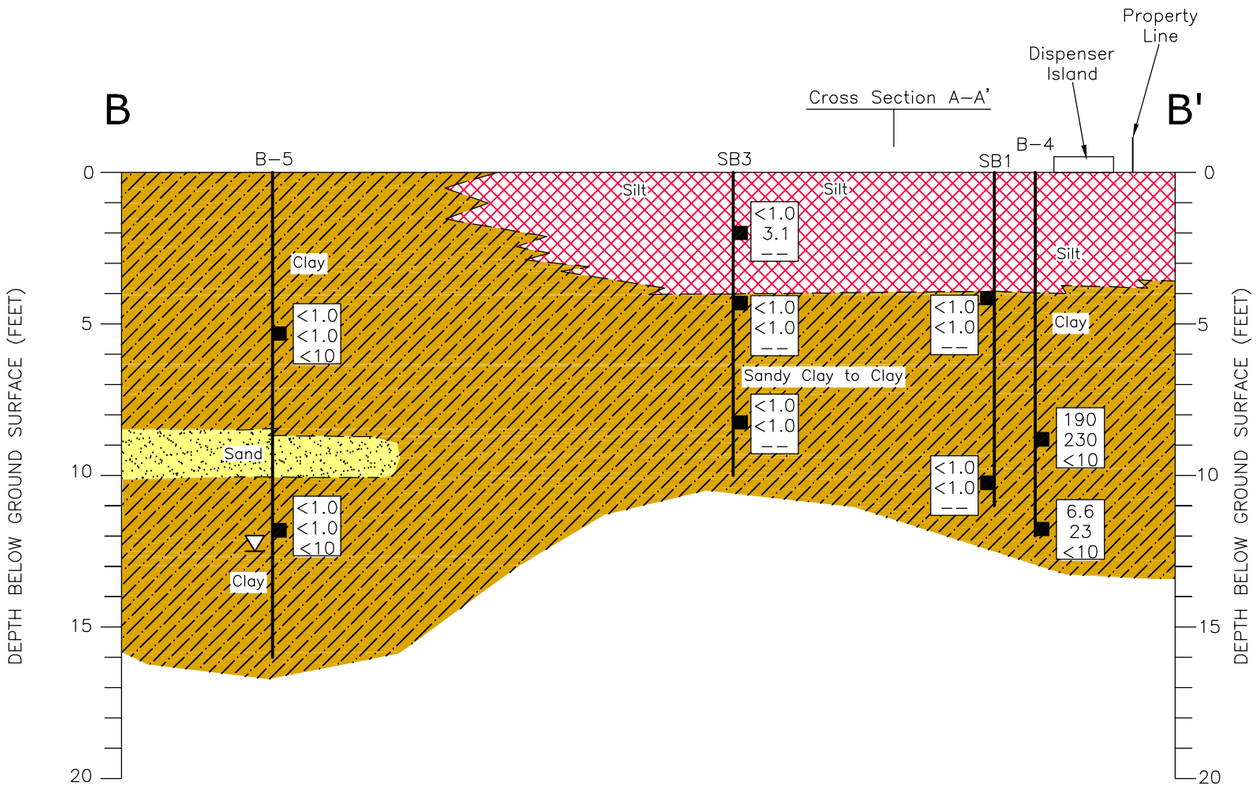
Cross Section A - A'

760 22nd Street and
2201 Brush Street
Oakland, California

PLATE 3



EXPLANATION

- ■ SAMPLE LOCATION
- 190 / 230 / <10 — TOTAL PETROLEUM HYDROCARBONS AS GASOLINE / TOTAL PETROLEUM HYDROCARBONS AS DIESEL / TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
- –– NOT ANALYZED
- < LESS THAN
- ▽ WATER LEVEL

NOTE: SEE PLATE 3 FOR LOCATION OF CROSS SECTION

Approximate Scale

0 10 20

feet

VERTICAL EXAGGERATION = 2X

PROJECT NO.	DRAWN BY	REPORT DATE		PLATE
14064	EC	April 2015	Cross Section B - B'	4

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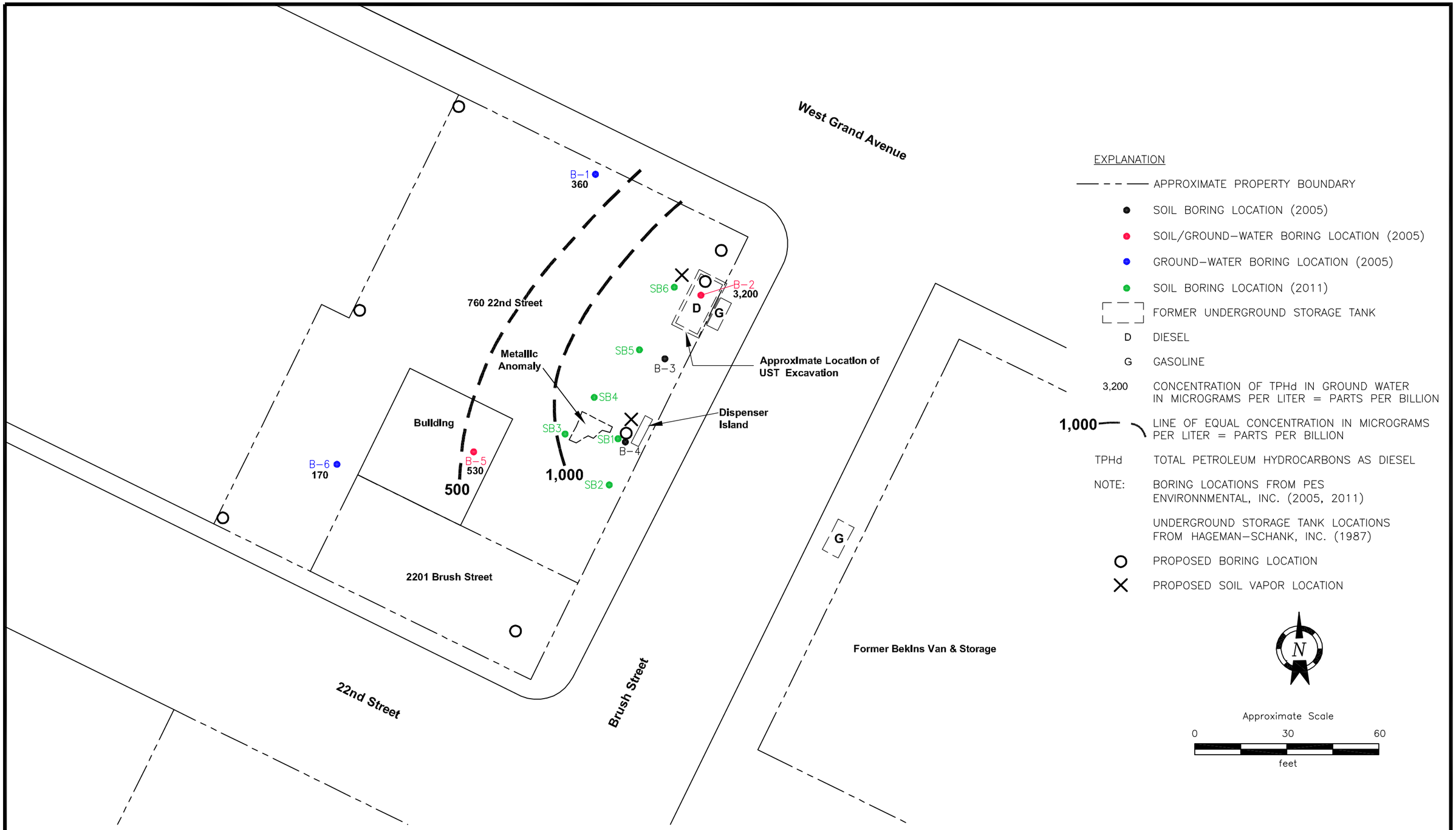
760 22nd Street and
2201 Brush Street
Oakland, California



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14064	EC	April 2015

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Proposed Boring and Soil Vapor Locations
760 22nd Street and
2201 Brush Street
Oakland, California

PLATE 5