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By Alameda County Environmental Health at 10:11 am, Aug 22, 2014

WORK PLAN FOR LIMITED PHASE II SUBSURFACE INVESTIGATION

AT

3037-3115 Adeline Street
Oakland, California

ERAS PROJECT NUMBER: 14063A
GLOBAL ID: RO0003142

Prepared for

Mr. John Murray
John Murray Productions
1196 32nd Street
Oakland, CA 94608

and

Reid Settlemier
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6114 LaSalle Avenue, #535
Oakland, CA 94611

August 7, 2014

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CERTIFICATION

This **Work Plan for Limited Phase II Subsurface Investigation** at 3037-3115 Adeline Street in Oakland, California, has been prepared by ERAS Environmental, Inc. (ERAS) under the professional supervision of the Registered Professional Geologist whose signature appears hereon.

This work plan was prepared in general accordance with the accepted standard of practice that exists in Northern California at the time the investigation was performed. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the conditions present. More extensive studies, including additional environmental investigations, can tend to reduce the inherent uncertainties associated with such studies.

Our firm has prepared this work plan for the Client's exclusive use for this particular project and in accordance with generally accepted professional practices within the area at the time of our investigation. No other representations, expressed or implied, and no warranty or guarantee is included or intended.

This work plan may be used only by the client and only for the purposes stated within a reasonable time from its issuance. Land use, site conditions (both on-site and off-site) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify ERAS of such intended use. Based on the intended use of report, ERAS may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release ERAS from any liability resulting from the use of this report by any unauthorized party.

Sincerely,
ERAS Environmental, Inc.

Andrew Savage
Project Geologist

Curtis Payton
California Registered Professional Geologist 5608

August 7, 2014

1.0 INTRODUCTION

The following is a work plan for the collection of soil and groundwater samples at a commercial site located at 3037-3115 Adeline Street in Oakland, California (the "Property"). The Property is an open SLIC case. Subsurface investigations previously conducted at the site have identified contamination including elevated concentrations of petroleum hydrocarbons as diesel and naphthalene, along with copper and lead in shallow soil. This work plan was requested by the Alameda County Environmental Health Care Services Agency (ACHCSA) in an e-mail dated July 16, 2014.

The Property is located on the west side of Adeline Street between 30th Street and 32nd Street in the northern portion of the City of Oakland. The location of the Property is shown on **Figure 1**. The Property consists of three assessor parcels with a total area of approximately 27,960 square feet. The Property contains a commercial building with an inside area of approximately 16,000 square feet. The layout of the Property is shown on **Figure 2**.

1.1 BACKGROUND

Phase1 and Phase 2 investigations have recently been performed on the Property.

Phase 1 Investigation

A Phase 1 Environmental Site Assessment (ESA) was conducted by Rincon Associates, Inc. (Rincon) and the results were presented in a report dated November 15, 2013. Rincon identified the following information for the Property.

- A bronze foundry operated at part of the Property (3037 and 3101 Adeline Street) from at least 1928 to 1963.

- Machine shops operated at 3101 and 3115 Adeline Street from at least 1951 until 1959.

- Six nearby historic auto stations were listed on the environmental database. Rincon indicated these sites were located hydrologically up-gradient and there is potential that contamination from these sites could have impacted groundwater beneath the subject property.

Rincon concluded foundry operations can involve the use of heavy metals including copper, lead, nickel and zinc. Machine shop operations can involve the use of cutting oil and degreasing solvents. Rincon indicated the former use of the Property represented a potential recognized environmental condition (REC).

Soil and Groundwater Investigation

A Phase 2 soil and groundwater investigation was performed by Partner Engineering and Science, Inc. (Partner). A total of 5 soil borings were drilled on the Property in the general areas of the former foundry and machine shops. The locations of the borings are shown on the Boring Locations map in **Appendix A**.

Extent of Soil Contamination

Partner reported concentrations of total petroleum hydrocarbons as diesel range organics (TPH-dro[1]) and as oil range organics (TPH-oro) in Boring PES-B2 at 3 feet and 7 feet. Concentrations of TPH-dro and TPH-oro were 1,200 milligrams per kilogram (mg/Kg) and 950 mg/Kg at 3 feet and 1,600 and 860 mg/Kg at 7 feet. Concentrations of TPH-dro were above the California Regional Water Quality Control Board Environmental Screening Level (ESL) of 110 mg/Kg (Table A, RWQCB, December 2013). The sample from 3 feet also contained total petroleum hydrocarbons as gasoline (TPH-gro) at a concentration of 46 mg/Kg. Partner does not appear to have had the laboratory run silica gel cleanup on the samples prior to analysis to remove biogenic hydrocarbon interferences.

Naphthalene was detected at 5.3 mg/Kg in the sample from Boring PES-B2 at 3 feet. This concentration was above the ESL of 1.2 mg/Kg (Table A, RWQCB, December 2013). No other concentrations of TPH-dro, TPH-oro or naphthalene were detected in soil samples.

Lead and copper were detected in soil at 3 feet in borings PES-B1 and PESB-2 which appear to be above background concentrations. However the maximum concentration of copper of 1,200 mg/Kg is below the ESL of 5,000 mg/Kg (Table A, RWQCB, December 2013). The maximum concentration of lead of 140 mg/Kg is below the ESL of 320 mg/Kg (Table A, RWQCB, December 2013).

Extent of Groundwater Contamination

No concentrations of TPH-dro or TPH-oro were detected in groundwater samples from Borings PES-B1 and PES-B2. Volatile organic compounds (VOCs) were not detected in the groundwater sample collected from PES-B1. Naphthalene was not detected in the groundwater sample from PES-B2. No groundwater samples were collected from borings PES-B3, PES-B4, or PES-B5.

Results of the laboratory analyses are tabulated in the Tables 1 through 7 that are included in **Appendix A**.

[1] TPH-gro, TPH-dro, and TPH-oro are methods that compare analytical results to standards for gasoline, diesel and motor oil, respectively. Therefore analytical results are estimates of quantities based on what would be expected for the range of hydrocarbon results for the standard. Gasoline range organics (gro) are those hydrocarbon compounds that are in the range of C6 to C10, diesel range organics (dro) are those hydrocarbon compounds that are in the range of C10 to C23, and oil range organics (oro) are those hydrocarbon compounds that are in the range of C18 to C36. There can be overlap in reporting methods as well as identification of compounds that fall within the standard that may not necessarily be derived from gasoline, diesel, or oil.

2.0 REGIONAL GEOLOGY/HYDROLOGY

The Property is in the southern part of the City of Oakland in the San Francisco Bay area. The San Francisco Bay area occupies a broad alluvial valley that slopes gently northward and is flanked by alluvial fans deposited at the foot of the Diablo Range to the east and the Santa Cruz Mountains to the west. Surface topography in the immediate vicinity of the Property is gently sloping down to the west towards Oakland Outer Harbor.

The Property is at an elevation of approximately 20 feet above Mean Sea Level according to the United States Geological Survey (USGS) Oakland East Quadrangle California 7.5 Minute Series topographic map.

Materials underlying the site are unconsolidated deposits of near shore and beach sediments, deposited in Oakland Bay at higher sea level stands. At shallow depths beneath these sediments are chert, greywacke, serpentine and shale bedrock that are a part of the Cretaceous to Jurassic-aged Franciscan Formation. Bedrock is exposed to the east-northeast on the upland surfaces.

The subject site is located on the San Francisco Bay Plain in the northernmost part of the Santa Clara Valley Groundwater Basin, (DWR, 1967), the surface of which slopes gently down toward west.

The regional groundwater flow follows the topography, moving from areas of higher elevation to areas of lower elevation. The regional groundwater flow direction in the area of the Property is estimated to be toward the west-southwest toward the Oakland Outer Harbor.

Based on the borings drilled on the Property, the subsurface sediments consist of mostly medium stiff to stiff clay to the depths explored of approximately 20 feet. Coarser sediments were observed in Boring PES-B1 at approximately 10-15 feet. Groundwater was reported in the borings at depths of approximately 17.5 to 19.5 feet.

3.0 SITE CONCEPTUAL MODEL

3.1 HYDROGEOLOGIC SETTING

Shallow groundwater is located at roughly 17.5-19.5 feet bgs. No groundwater monitoring has been conducted on the Property but based on local topography groundwater is estimated to flow toward the southwest.

The shallow water-bearing zone appears to be located in thin silty/sandy units interbedded with clay. Groundwater is generally under water-table conditions, but may be locally confined by clay in the upper portion of the water-bearing zone. The base of the shallow water bearing zone has not been determined.

3.2 EXTENT OF CONTAMINATION

3.2.1 Results in Soil

High concentrations of diesel range hydrocarbons were detected at 3 and 7 feet in Boring PES-B2 located near the southwest corner of the building. The lateral extent of contamination is defined on three sides of this boring although none of those borings are closer than approximately 30 feet. The vertical extent of contamination has not been determined.

Naphthalene was detected at an elevated concentration at 3 feet but was not detected in the deeper sample at 7 feet.

3.2.2 Results in Groundwater

No contamination has been detected in groundwater samples collected from two of the borings (PES-B1 & PES-B2) drilled at the site.

4.0 WORK PLAN

4.1 SCOPE OF PROPOSED INVESTIGATION

ERAS proposes a scope of work for this investigation as follows.

- Obtain a permit for drilling from the Alameda County Public Works Department (ACPWD).
- Clear the boring locations for the presence of utilities by notifying Underground Service Alert and employing a private underground locating/clearance service.
- Advance three borings using a direct push sample rig to approximately 20 feet in the vicinity of Boring PES-B2. These borings will be continuously logged by a field geologist.
- Groundwater samples will be collected from each boring. If contamination is observed in the vadose zone a soil sample will be collected in addition. Evidence of contamination will consist of discoloration, odor, or elevated detections on the organic vapor meter (OVM).
- Analyze the soil and groundwater samples for the presence of TPH-gro, TPH-dro, TPH-oro, VOCs, polychlorinated biphenyls (PCB), semi-volatile organic compounds (SVOCs) and LUFT 5 metals (cadmium, chromium, nickel, lead, zinc).
- Prepare a report detailing the field procedures and results of the investigation.

4.2 FIELD WORK COORDINATION

ERAS will procure a drilling permit from the ACPWD prior to drilling activities.

The boring locations will be painted and Underground Service Alert notified at least 48 hours in advance to give owners of underground utilities an opportunity to mark their lines. Prior to drilling, each boring location will be cleared using a private underground utility locator.

4.3 BORING LOCATIONS AND SAMPLING

The locations of the borings are shown on **Figure 2**. The Standard Operating Procedures for direct-push sampling is included in **Appendix B**.

Three borings will be advanced using a direct push sample rig to about 20 feet in the outside parking lot. These borings will be continuously logged.

A groundwater sample will be collected from each boring. If evidence of contamination is discovered in the vadose zone a soil sample will be collected for analysis from the highest impacted area. Evidence to warrant the selection of the soil sample shall include discoloration of soil, odor, or elevated reading on the photoionization detector (PID).

The groundwater samples will be kept refrigerated pending transport under chain-of-custody

procedures to a California certified environmental analytical laboratory.

The soil and groundwater samples will be analyzed for the presence of TPH-gro, TPH-dro, TPH-oro, VOCs, polychlorinated biphenyls (PCB), semi-volatile organic compounds (SVOCs) and LUFT 5 metals (cadmium, chromium, nickel, lead, zinc).

4.4 FIELD AND REPORT SCHEDULE

The field work will be scheduled as soon as possible following approval of this work plan by the ACEHD. A report will be submitted within 30 working days of the completion of field activities.

5.0 REFERENCES

Alameda County Environmental Health Department, New Spills, Leaks, Investigations, and Cleanup Case No. RO0003142, Adeline Foundry, 3037-3115 Adeline Street, Oakland, CA 94608, July 9, 2014.

California Department of Water Resources, Evaluation of Ground Water Resources South Bay, Appendix A: Geology, Bulletin 118-1, August 1967.

California Regional Water Quality Control Board, Water Quality Control Plan, San Francisco Bay Basin Region (2), December 1986.

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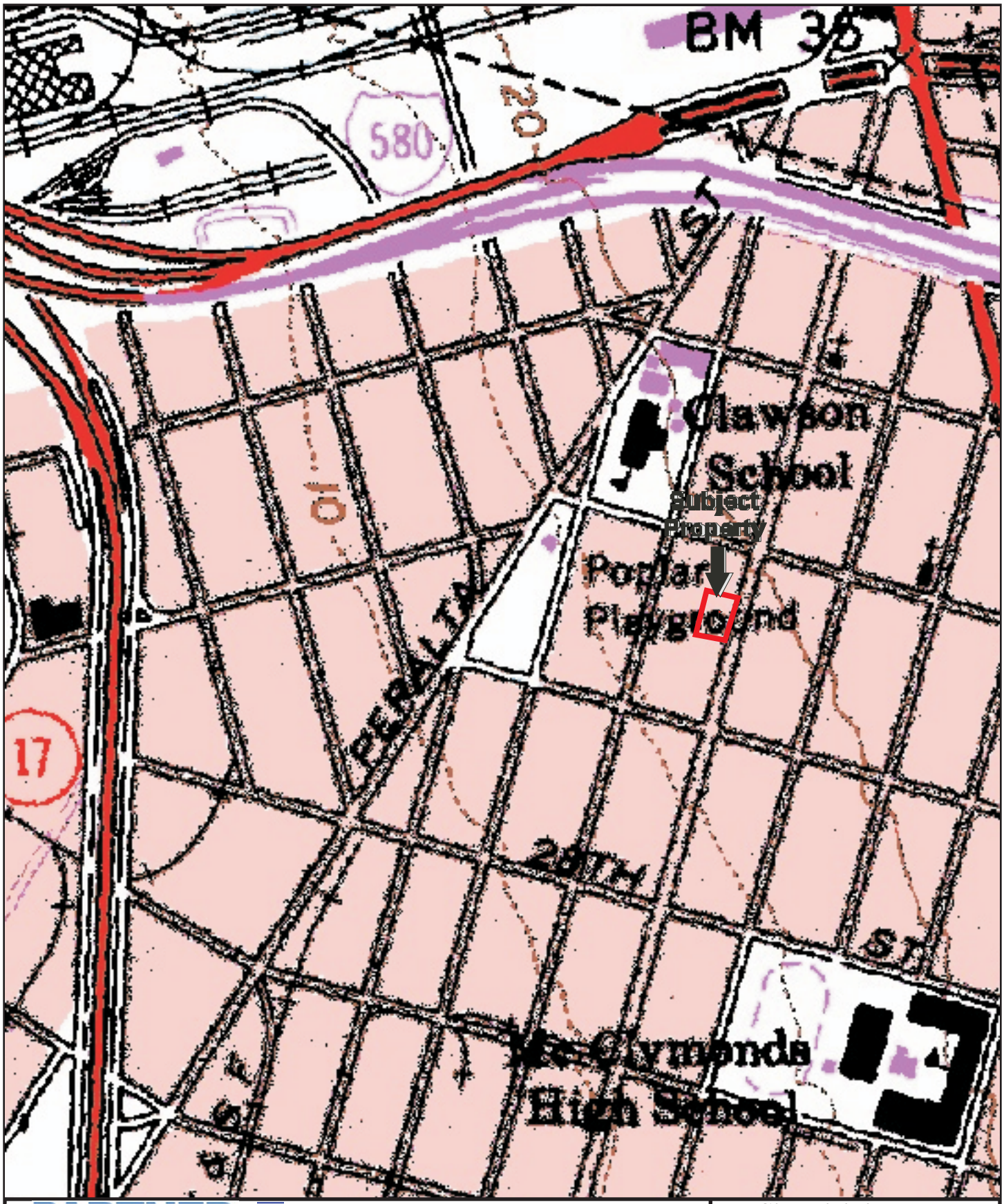
Goldman, Harold B., Geology of San Francisco Bay prepared for San Francisco Bay Conservation and Development Commission, February 1967.

Helley, E.J., La Joie, K.R., Spangle, W.E., and Blair, M.L., Flatland Deposits of the San Francisco Bay Region, California - their geology and engineering properties and their importance to comprehensive planning, U.S. Geological Survey Professional Paper 943, 1974.

Partner Engineering and Science Inc, Limited Phase II Subsurface Investigation, 3037, 3101, & 3115 Adeline Street, Oakland, California 94608, May 24, 2013.

FIGURES

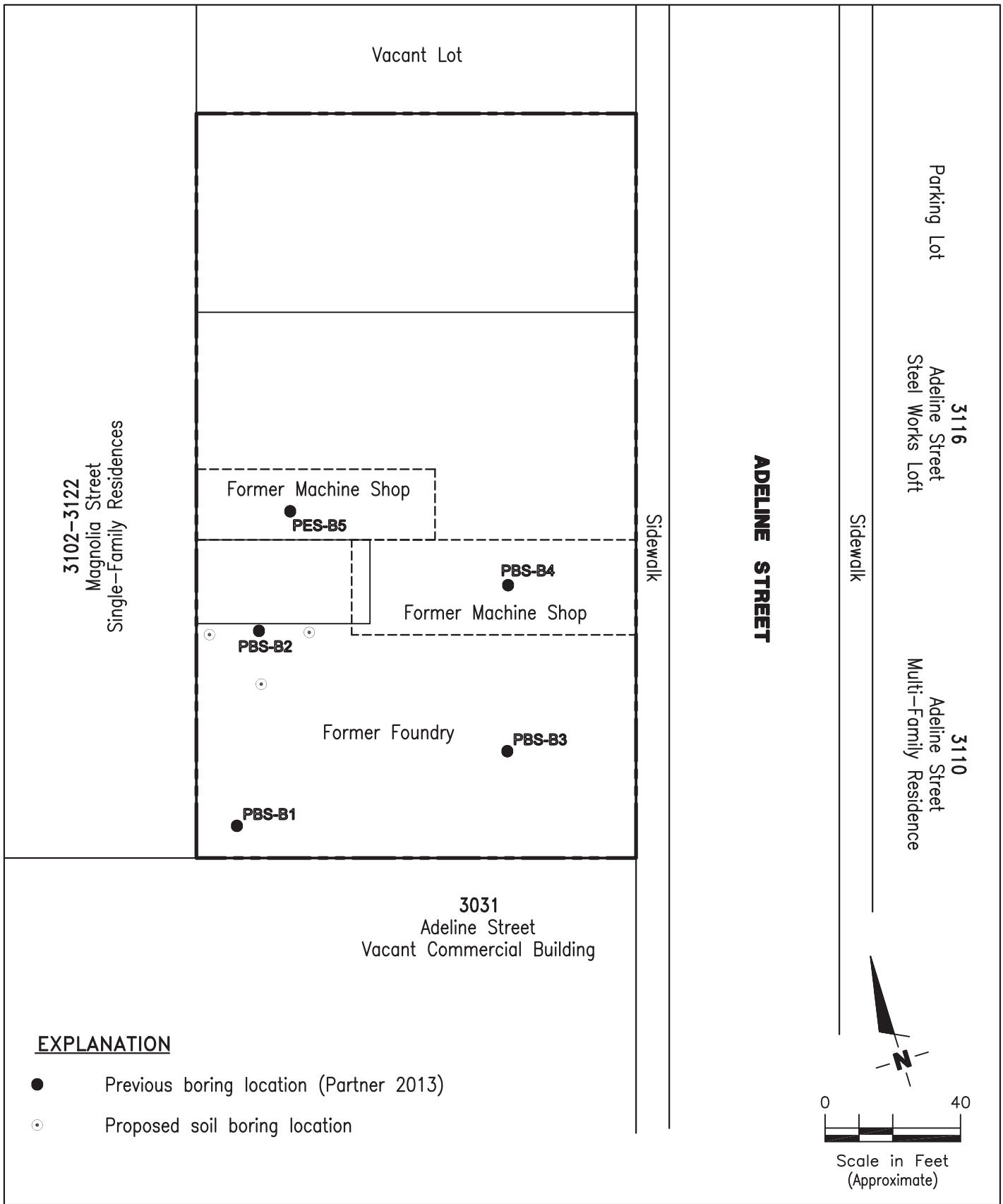


USGS Oakland West Quadrangle
Version: 1980

Site Vicinity Map

Figure	
1	

3037, 3101 & 3115 Adeline Street
Oakland, California 94608



PROPOSED BORING LOCATION MAP

DATE
08/14
REVIEWED BY
AS

3037, 3101 & 3115 Adeline Street
Oakland, California

JOB NUMBER
14063A
FIGURE
2

ERAS Environmental Inc.

ERAS 08-03-2014 Proposed boring location map.dwg

APPENDIX A

Previous Investigation Maps and Tables

Table 1: Summary of Investigation Scope

Borehole Identification	Location	Terminal Depth (feet bgs)	Matrix Sampled	Sampling Depths* (feet bgs)	Target Contaminants
PES-B1	Southwestern Portion of Parking Lot / Former Foundry	20**	Soil	3, 7, 13, 19	Metals
			Groundwater	***17.5***	TPH-cc, VOCs
PES-B2	Northern Portion of Parking Lot / Former Foundry	19**	Soil	***3***, 7[1,2], 12[1,2], 18[1,2]	TPH-cc, VOCs, Metals
			Groundwater	18.8[1]	TPH-cc, VOCs
PES-B3	Southern Portion of Parking Lot / Former Foundry	20**	Soil	***3***, 8, 13, 17	TPH-cc, VOCs, Metals
			Groundwater	18.4	NA
PES-B4	Northwestern Portion of Parking Lot / Former Foundry Machine Shop	20**	Soil	3, 7, ***11***, 13	TPH-cc, VOCs, Metals
			Groundwater	19.5	NA
PES-B5	Southwestern Interior of Subject Property Warehouse/ Former Machine Shop	18.2***	Soil	3, ***7***, 11, 15	TPH-cc, VOCs, Metals

Notes:

*Depths in **bold** analyzed for carbon chain total petroleum hydrocarbons (TPH-cc) in accordance with Environmental Protection Agency (EPA) Method 8015M. Depths in *italics* analyzed for volatile organic compounds (VOCs) in accordance with EPA Method 8260B. Underlined depths analyzed for California Administrative Manual (CAM) 17 Metals in accordance with EPA Method 6010B/7471A. [1]Sample analyzed for total petroleum hydrocarbons - diesel-range organics/oil-range organics (TPH-DRO/ORO) in accordance with EPA Method 8015M, napthalene in accordance with EPA Method 8260B. [2]Sample analyzed for lead and copper in accordance with EPA Method 6010.

**Boring Terminated at the terminal depth after groundwater was encountered

***Refusal encountered at the terminal depth

bgs = below ground surface

NA = not analyzed

Table 2: Soil Sample TPH-cc Laboratory Results

EPA Method	TPH-cc via 8015M		
Units	(mg/kg)		
Sample Identification	**TPH-g**	**TPH-d**	**TPH-o**
PES-B2-3	46	1200	*950*
PES-B2-7	NA	1600	*860*
PES-B2-12	NA	< 10	< 10
PES-B2-18	NA	< 10	< 10
PES-B3-3	< 10	< 10	< 10
PES-B4-11	< 10	< 10	< 10
PES-B5-7	< 10	< 10	< 10
Residential ESLs	100	100	500
Industrial ESLs	420	500	2,500

Notes:

TPH-cc = carbon chain total petroleum hydrocarbons

EPA = Environmental Protection Agency

TPH-g = total petroleum hydrocarbons as gasoline

TPH-d = total petroleum hydrocarbons as diesel

TPH-o = total petroleum hydrocarbons as oil

mg/kg = milligrams per kilogram

< = not detected above indicated laboratory Method Detection Limit (MDL)

ESLs = Environmental Screening Levels (EPA Region 9 - 2013)

Italicized values exceed residential ESLs

Underlined values exceed both residential and industrial ESLs

NA = not applicable

Table 3: Soil Sample VOCs Laboratory Results

EPA Method	VOCs via 8260B				
Units	(µg/kg)				
Sample Identification	n-Butylbenzene	sec-Butylbenzene	Napthalene	n-Propylbenzene	Other VOCs
PES-B2-3	19	5.4	5300	7.6	ND
PES-B2-7	NA	NA	ND	NA	NA
PES-B2-12	NA	NA	ND	NA	NA
PES-B2-18	NA	NA	ND	NA	NA
PES-B3-3	ND	ND	ND	ND	ND
PES-B4-11	ND	ND	ND	ND	ND
PES-B5-7	ND	ND	ND	ND	ND
Residential Soil ESL	540	540	1,700	540	--
Industrial Soil ESL	1,200	1,200	4,800	1,200	--

Notes:

VOCs = volatile organic compounds

EPA = Environmental Protection Agency

µg/kg = micrograms per kilogram

ND = not detected above laboratory Method Detection Limit (MDL)

ESLs = Environmental Screening Levels

NA = not applicable

Underlined values exceed both residential and industrial ESLs

Table 4: Soil Sample CAM 17 Metals Laboratory Results (mg/kg)

Element	PES-B1-3	PES-B2-3	PES-B2-7	PES-B2-12	PES-B2-18	PES-B3-3	PES-B4-3	PES-B5-3	Background Concentrations*	Residential ESL	Commercial/ Industrial ESL
Antimony (Sb)	< 3.0	< 3.0	NA	NA	NA	< 3.0	< 3.0	< 3.0	0.21 - 0.99	20	40
Arsenic (As)	< 5.0	< 5.0	NA	NA	NA	< 5.0	< 5.0	< 5.0	11**	.39	40
Barium (Ba)	180	160	NA	NA	NA	160	68	170	299 - 719	750	1500
Beryllium (Be)	< 1.0	< 1.0	NA	NA	NA	< 1.0	< 1.0	< 1.0	0.76 - 1.8	4	8
Cadmium (Cd)	< 2.0	2.8	NA	NA	NA	< 2.0	< 2.0	< 2.0	0.05 - 0.67	12	12
Chromium (Cr)	20	20	NA	NA	NA	21	16	23	0 - 345	8	8
Cobalt (Co)	9.1	8.9	NA	NA	NA	7.7	7.5	9.0	5.7 - 24.1	.33	1.6
Copper (Cu)	**160**	**1200**	15	11	17	17	11	18	9.4 - 48	230	230
Lead (Pb)	**43**	**140**	< 3.0	8.3	< 3.0	< 3.0	< 3.0	**44**	10.1 - 37.7	80	320
Mercury (Hg)	< 0.10	< 0.10	NA	NA	NA	< 0.10	< 0.10	< 0.10	0.05 - 0.47	40	40
Molybdenum (Mo)	< 5.0	< 5.0	NA	NA	NA	< 5.0	< 5.0	< 5.0	0 - 2.8	150	150
Nickel (Ni)	24	26	NA	NA	NA	33	17	25	0 - 137	10	10
Selenium (Se)	< 5.0	< 5.0	NA	NA	NA	< 5.0	< 5.0	< 5.0	0 - 0.142	20	40
Silver (Ag)	< 2.0	< 2.0	NA	NA	NA	< 2.0	< 2.0	< 2.0	0 - 2.23	.78	10
Thallium (Tl)	< 2.0	< 2.0	NA	NA	NA	< 2.0	< 2.0	< 2.0	0.37 - 0.75	200	200
Vanadium (V)	28	30	NA	NA	NA	26	17	31	59 - 165	600	600
Zinc (Zn)	140	**530**	NA	NA	NA	25	14	29	117 - 181	6.7	10

Notes:

*From Kearney Foundation of Soil Science March 1996 report *Background Concentrations of Trace and Major Elements in California Soils.* Background concentrations of metals are considered to be within one standard deviation from the mean metal concentrations determined by the study. Concentrations indicated in milligrams per kilogram (mg/kg).

**From a thesis submitted to the Faculty of San Francisco State University and the San Francisco Bay RWQCB December 2011 report *Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region* .

CAM = California Administrative Manual
mg/kg = milligrams per kilogram
< = not detected above indicated laboratory Method Detection Limit (MDL)
NA = Not Applicable

Table 5: Groundwater Sample TPH-cc Laboratory Results

EPA Method	TPH-cc via 8015C		
Units	(mg/L)		
Sample Identification	TPH-g	TPH-d	TPH-o
PES-B1-GW	< 0.50	< 0.50	< 0.50
PES-B2-GW	NA	< 0.50	< 0.50
Groundwater ESL	0.5	0.64	0.64

Notes:

TPH-cc = carbon chain total petroleum hydrocarbons

EPA = Environmental Protection Agency

TPH-g = total petroleum hydrocarbons as gasoline

TPH-d = total petroleum hydrocarbons as diesel

TPH-o = total petroleum hydrocarbons as oil

mg/L = milligrams per liter

< = not detected above indicated laboratory Method Detection Limit (MDL)

NA = Not Applicable

Table 6: Groundwater Sample VOCs Laboratory Results

EPA Method	VOCs via 8260B						
Units	(µg/L)						
Sample Identification	Benzene	Toluene	Ethyl-benzene	Xylenes	Napthalene	Trichloro-ethene	Other VOCs
PES-B1-GW	ND	ND	ND	ND	NA	ND	ND
PES-B2-GW	NA	NA	NA	NA	ND	NA	NA
Groundwater ESL	27	130	43	100	63	130	NA

Notes:

VOCs = volatile organic compounds

EPA = Environmental Protection Agency

µg/L = micrograms per liter

< = not detected above indicated laboratory Method Detection Limit (MDL)

ND = not detected above laboratory PQLs

ESLs = Environmental Screening Levels (EPA Region 9 - 2013)

NA = not applicable

Table 7: Comparison of Metal Laboratory Results and STLC/TTLC (mg/kg)

Metal Exceeding Background*	PES-B2-3	10xSTLC	TTLC
Copper (Cu)	**1200**	250	2,500
Lead (Pb)	**140**	50	1,000
Zinc (Zn)	530	2,500	5,000

Notes:

*From Kearney Foundation of Soil Science March 1996 report *Background Concentrations of Trace and Major Elements in California Soils.*

mg/kg = milligrams per kilogram

STLC = Soluble Threshold Limit Concentration

TTLC = Total Threshold Limit Concentration

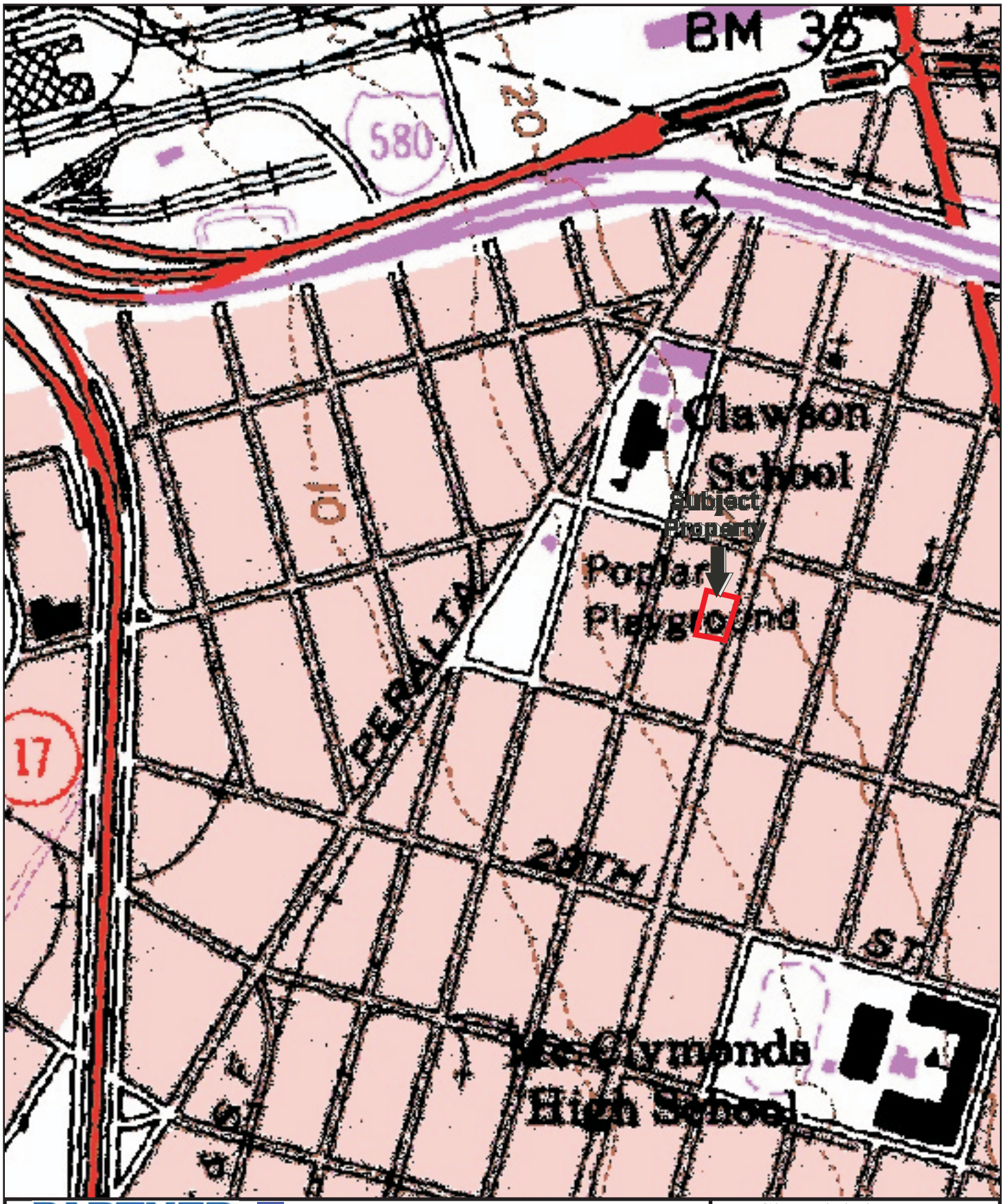
Table 8: Comparison of Metal Laboratory Results and STLCs (mg/L)

Element	PES-B2-3	STLC
Copper (Cu)	**81**	25
Lead (Pb)	**9.8**	5

Notes:

mg/L = milligrams per liter

STLC = Soluble Threshold Limit Concentration



PARTNER
Engineering and Science, Inc.
2154 Torrance Boulevard, Suite 200
Torrance, California 90501

Project Number: 13-99891.2

N

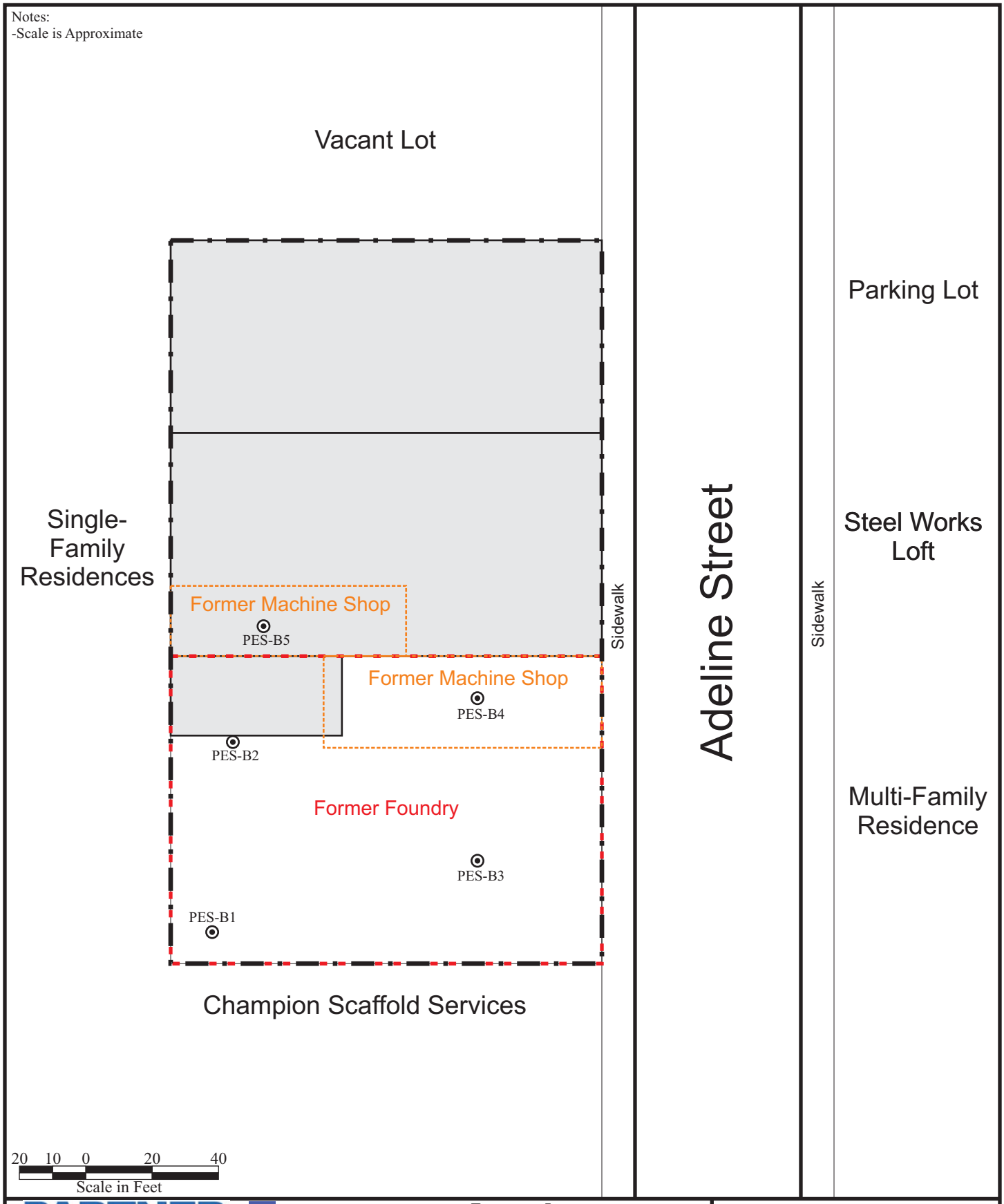
USGS Oakland West Quadrangle
Version: 1980

Site Vicinity Map

Figure	Prepared By	Date
1	E. French	May 2013

3037, 3101 & 3115 Adeline Street
Oakland, California 94608

Notes:
-Scale is Approximate



PARTNER
Engineering and Science, Inc.
2154 Torrance Boulevard, Suite 200
Torrance, California 90501

Project Number: 13-99891.2

Legend

Subject Site

Boring Location

Boring Locations

Figure	Prepared By	Date
2	T. Men	May 2013

3037, 3101 & 3115 Adeline St.
Oakland, California 94608

APPENDIX B

Standard Operating Procedures

STANDARD OPERATING PROCEDURE – DIRECT PUSH BORINGS

SOIL CORING AND SAMPLING PROCEDURES

Prior to drilling, all boreholes will be hand dug to a depth of 4-5 feet below ground surface (bgs) to check for underground utilities.

Soil and groundwater samples are collected for lithologic and chemical analyses using a direct driven soil coring system. A hydraulic hammer drives sampling rods into the ground to collect continuous soil cores. As the rods are advanced, soil is driven into an approximately 2.5-inch-diamter sample barrel that is attached to the end of the rods. Soil samples are collected in sleeves inside the sample barrel as the rods are advanced. After being driven 4 to 5 feet into the ground, the rods are removed from the borehole. The sleeve containing the soil core is removed from the sample barrel, and can then be preserved for chemical analyses, or used for lithologic description. This process is repeated until the desired depth or instrument refusal is reached.

A soil core interval selected for analyses is cut from the sleeve using a pre-cleaned hacksaw. The ends of the tube are covered with aluminum foil or Teflon liner and sealed with plastic caps. The soil-filled liner is labeled with the bore number, sample depth, site location, date, and time. The samples are placed in bags and stored in a cooler containing ice. Soil from the core adjacent to the interval selected for analyses is placed in a plastic zip-top bag. The soil is allowed to volatilize for a period of time, depending on the ambient temperature. The soil is scanned with a flame-ionization detector (FID) or photo-ionization detector (PID).

All sample barrels, rods, and tools (e.g. hacksaw) are cleaned with Alconox or equivalent detergent and de-ionized water. All rinsate from the cleaning is contained in 55-gallon drums at the project site.

GROUNDWATER SAMPLING FROM DIRECT PUSH BORINGS

After the targeted water-bearing zone has been penetrated, the soil-sample barrel is removed from the borehole. Small-diameter well casing with 0.010-inch slotted well screen may be installed in the borehole to facilitate the collection of groundwater samples. Threaded sections of PVC are lowered into the borehole. Groundwater samples may then be collected with a bailer, peristaltic pump, submersible or other appropriate pump until adequate sample volume is obtained. Perstaltic pumps are not used in applications requiring a lift of greater than 1 foot of net head.

Groundwater samples are preserved, stored in an ice-filled cooler, and are delivered, under chain-of-custody, to a laboratory certified by the California Department of Health Services (DHS) for hazardous materials analysis.

BOREHOLE GROUTING FOR DIRECT PUSH BORINGS

Upon completion of soil and water sampling, boreholes will be abandoned with neat cement grout to the surface. If the borehole was advanced into groundwater, the grout is pumped through a grouting tube positioned at the bottom of the borehole.