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TRANSMITTAL

DATE: November 23, 2009

REFERENCE NO.: 060204

PROJECT NAME: 2301-2307 Lincoln Avenue, Alameda

TO: Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

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QUANTITY	DESCRIPTION
1	Revised Subsurface Investigation Work Plan

- ☐ As Requested
- ☐ For Your Use
- ☒ For Review and Comment
- ☐
- ☐

COMMENTS:
If you have any questions regarding the contents of this document, please call Peter Schaefer at (510) 420-3319.

Copy to: Denis Brown, Shell Oil Products US, 20945 S. Wilmington Avenue, Carson, CA 90810
Alan A. and Beverly M. Sebanc, Trustees, 2805 Ralston Avenue, Hillsborough, CA 94010
Jake Torrens, AMEC Geomatrix, Inc., 2101 Webster Street, 12th Floor, Oakland, CA 94612

Completed by: Peter Schaefer Signed: Peter Schaefer

Filing: **Correspondence File**

Denis L. Brown
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HSE - Environmental Services
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Carson, CA 90810-1039
Tel (707) 865 0251
Fax (707) 865 2542
Email denis.l.brown@shell.com

Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: 2301-2307 Lincoln Avenue
Alameda, California
SAP No. 165255
Incident No. 97767044
Agency No. RO0002971

Dear Mr. Wickham,

The attached document is provided for your review and comment. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

As always, please feel free to contact me directly at (707) 865-0251 with any questions or concerns.

Sincerely,

Denis L. Brown
Project Manager

REVISED SUBSURFACE INVESTIGATION WORK PLAN

FORMER SHELL SERVICE STATION
2301-2307 LINCOLN AVENUE
ALAMEDA, CALIFORNIA

SAP CODE 165255
INCIDENT NO. 97767044
AGENCY NO. RO0002971

Prepared by:
Conestoga-Rovers & Associates

5900 Hollis Street, Suite A
Emeryville, California
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NOVEMBER 23, 2009
REF. NO. 060204 (7)
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TABLE OF CONTENTS

LIST OF FIGURES
(Following Text)

1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) prepared this revised work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell). The purpose of this revision, which supersedes CRA's August 27, 2009 *Subsurface Investigation Work Plan,* is to supplement our initial proposals for soil vapor and shallow groundwater investigations and to propose site-specific alternative soil vapor screening levels.

The site is a former Shell service station located at the northeastern corner of Lincoln Avenue and Oak Street in Alameda, California (Figure 1). The area surrounding the site is mixed commercial and residential. The current site layout (Figure 2) includes a parking lot and commercial building housing a convenience store, a cleaners (not a dry cleaner), and a laundromat. The former service station layout included a station building, two dispenser islands, and seven fuel underground storage tanks (USTs). According to the Alameda Fire Department, the seven USTs were removed from the site in June 1982. A summary of previous work performed at the site was included in CRA's August 27, 2009 *Subsurface Investigation Work Plan* and is not repeated herein.

2.0 REVISED WORK TASKS

The initial work plan proposed installing two additional soil vapor probes (SVP-5A and SVP-6), reinstalling soil vapor probe SVP-4, installing one sub-slab vapor probe, and drilling one off-site soil and hydropunch boring (B-6).

This revised work plan proposes installing a monitoring well (MW-9) adjacent to soil boring B-8, drilling a soil and grab groundwater sampling boring (B-6) at the southeast corner of the former 76 service station, located across Oak Street from the subject site, installing a soil vapor probe (SVP-5A) at a depth of 3 feet below grade (fbg) adjacent to SVP-5, and installing nested soil vapor probes at depths of 3 and 6 fbg at proposed probe locations SVP-4 and SVP-6 through SVP-8 (Figure 2). CRA no longer proposes the sub-slab probe.

The proposed scope of work will performed under the supervision of a professional geologist or engineer.

2.1 MONITORING WELL

2.1.1 PERMIT

CRA will obtain a drilling permit from the Alameda County Public Works Agency (ACPWA).

2.1.2 HEALTH AND SAFETY PLAN (HASP)

CRA will prepare a HASP to protect site workers. The plan will be kept on site during field activities and will be reviewed and signed by each site worker.

2.1.3 UTILITY CLEARANCE

CRA will mark the proposed drilling location, and the location will be cleared through Underground Service Alert (USA) and a private line locator service prior to drilling.

2.1.4 SUBSURFACE INVESTIGATION

Monitoring well MW-9 will be installed adjacent to the location of soil boring B-8 to provide additional information on groundwater gradient and the extent of petroleum hydrocarbons in soils and shallow groundwater (Figure 2).

A CRA geologist will supervise the drilling and describe encountered soils using the Unified Soil Classification System (USCS) and Munsell Soil Color Charts. After clearing the boring to 5 fbg with an air- or water-knife, the boring will be continuously sampled to approximately 18 fbg for soil description and petroleum vapor screening using a photo-ionization detector (PID). CRA will prepare a boring log for the boring, and PID measurements will be recorded on the boring log.

Selected soil samples will be retained for chemical analyses in 6-inch stainless steel or brass tubes, covered on both ends with Teflon sheets and plastic end caps, labeled, entered onto a chain-of-custody (COC), and placed into a cooler with ice for transport to a State of California-certified laboratory.

2.1.5 MONITORING WELL INSTALLATION

Well boring MW-9 will be completed to approximately 18 fbg. The first-encountered groundwater beneath the site is approximately 9 fbg. The well will be constructed using 4-inch diameter Schedule 40 PVC casing. The well screen interval will be from approximately 8 to 18 fbg, but may be adjusted depending on soil saturation and water levels in adjacent wells (MW-1 and MW-2). The sand-pack in the well will be placed from the bottom of the well screen up to 2 feet above the top of the well screen, followed by a 2-foot thick bentonite seal and cement grout to grade. Actual well construction details will be based on field conditions encountered during drilling. The well will be secured with a locking cap under a traffic-rated well box.

2.1.6 WELL DEVELOPMENT AND SAMPLING

Blaine Tech Services, Inc. (Blaine) of San Jose, California will develop the new groundwater monitoring well prior to sampling. After well development, Blaine will include the new well as part of the site groundwater monitoring program and submit the samples to a State of California-certified laboratory for chemical analyses. The new well will be sampled quarterly for the first year and then semiannually during the second and fourth quarters.

2.1.7 CHEMICAL ANALYSES

Selected soil samples and groundwater samples from well MW-9 will be analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260B. Groundwater samples from the existing wells will be analyzed per the existing protocol.

2.1.8 WELLHEAD SURVEY ACTIVITIES

A licensed surveyor will survey wellhead elevation relative to mean sea level and the well's latitude and longitude.

2.2 OFF-SITE SOIL BORING

2.2.1 PERMIT AND ACCESS AGREEMENT

CRA will obtain a drilling permit from the ACPWA and an access agreement from the property owner of the former 76 service station property.

2.2.2 HASP

CRA will prepare a HASP to protect site workers. The plan will be kept on site during field activities and will be reviewed and signed by each site worker.

2.2.3 UTILITY CLEARANCE

CRA will mark the proposed drilling location, and the location will be cleared through USA and a private line locator service prior to drilling.

2.2.4 SUBSURFACE INVESTIGATION

To further investigate the extent of hydrocarbon impact to shallow groundwater, one boring (B-6) will be drilled using a Geoprobe® rig at the southeast corner of the former 76 service station, located across Oak Street from the subject site (Figure 2).

A CRA geologist will supervise the drilling and describe encountered soils using the USCS and Munsell Soil Color Charts. After clearing the boring to 5 fbg with an air- or water-knife, the boring will be continuously sampled to approximately 13 fbg for soil description and petroleum vapor screening using a PID. CRA will prepare a boring log for the boring, and PID measurements will be recorded on the boring log.

Soil samples from approximately 5 and 8 fbg will be retained for chemical analyses in 6-inch sections of plastic Geoprobe® tubing, covered on both ends with Teflon sheets and plastic end caps, labeled, entered onto a COC, and placed into a cooler with ice for transport to a State of California-certified laboratory.

CRA will collect a grab groundwater sample at first-encountered groundwater (estimated at 9 to 13 fbg) using a Hydropunch® and a Teflon® bailer. Samples will be transferred into vials containing hydrochloric acid preservative with no headspace. The

samples will be labeled, entered onto a COC, and placed into a cooler with ice for transport to a State of California-certified laboratory.

2.2.5 CHEMICAL ANALYSES

Soil samples and grab groundwater samples from the boring will be analyzed for TPHg and BTEX by EPA Method 8260B.

2.3 SOIL VAPOR PROBES

2.3.1 PERMIT

CRA will obtain a drilling permit from the ACPWA.

2.3.2 HASP

CRA will prepare a HASP to protect site workers. The plan will be kept on site during field activities and will be reviewed and signed by each site worker.

2.3.3 UTILITY CLEARANCE

CRA will mark the proposed probe locations, and the locations will be cleared through USA and a private line locator service prior to drilling.

2.3.4 PROBE INSTALLATION

CRA proposes to reinstall one soil vapor probe (SVP-4) and install four additional soil vapor probes (SVP-5A and SVP-6 through SVP-8) into the subsurface beneath the site (Figure 2). Probe SVP-5A will be installed with a screen at 3 fbg and probes SVP-4 and SVP-6 through SVP-8 will be installed with nested screens at 3 and 6 fbg in order to assess vertical attenuation of soil vapors.

Assuming the absence of subsurface obstructions, CRA will advance the soil borings to 5 fbg using an air-knife rig in the approximate locations shown on Figure 2. As discussed above, SVP-5A will be advanced to 2 fbg. After the borings are advanced,

fixed vapor-sampling points will be installed in each boring using ¼-inch diameter Teflon tubing at 5 fbg. Each point will use a ¾-inch screen interval attached to the Teflon tubing. To ensure the tubing does not curl or kink during installation, CRA will first straighten out each length of tubing prior to installation, and then use a small-diameter PVC guide pipe to hold the tubing in place within the boring while packing the annulus with sand. A clean, fine-grained silica sand filter pack will be installed approximately 3 inches below and above the screened interval, and the guide pipe will be lifted as the sand pack is installed to ensure the pack stabilizes the tubing within each boring. The annulus will then be sealed with a bentonite slurry set atop a 2-inch base of bentonite pellets up to the next probe interval at 2 fbg and another probe will be installed in a similar manner. The probe will completed from 18 inches below ground to the surface using bentonite slurry, set atop a 2-inch base of bentonite pellets. Each nested soil vapor probe will be completed at the surface using a traffic-rated well box at grade.

2.3.5 SOIL VAPOR PROBE SAMPLING

At least 2 weeks following probe installation, CRA will collect soil vapor samples from soil vapor probes SVP-4, SVP-5, SVP-5A, and SVP-6 through SVP-8. Sampling is affected by rain. CRA's standard procedure is to allow 2 days or more following a heavy rain event prior to collecting soil vapor samples.

CRA will sample soil vapor probes SVP-4, SVP-5, SVP-5A, and SVP-6 through SVP-8 using a vacuum pump and Tedlar bags. Prior to sampling, CRA will purge at least three tubing volumes of air from the probes using a vacuum pump. Then CRA will attach a sealed "lung sampler" containing a 1-liter Tedlar bag to the probe and attach the vacuum pump to the box. The vacuum pump will lower the pressure in the "lung sampler" and draw air from the probe into the Tedlar bag. To avoid breakage, CRA will fill the bags no more than two-thirds full. Each sample will be labeled, entered onto a COC, and placed into a protective box at room temperature for transport to a State of California State-certified laboratory for analysis within 72 hours.

2.3.6 SOIL VAPOR PROBE LEAK TESTING

To check the system for leaks, CRA will cover the soil gas probe surface casing and sampling manifold with a containment unit (or shroud). Prior to soil gas probe purging, CRA will introduce helium into the containment unit to obtain a minimum 50 percent helium content level. CRA will confirm the helium content within the containment unit

using a helium meter and will record the helium meter readings in our field notes. Helium will continue to be introduced to the containment unit during soil gas probe purging and sampling.

All samples will be analyzed in a laboratory for helium. In the event that the soil vapor samples contain a helium content of greater than 10 percent of the source concentration (i.e., 10 percent of the helium content measured within the containment unit), the soil gas sample will be considered invalid.

2.3.7 CHEMICAL ANALYSES

Vapor samples will be analyzed for BTEX by Modified EPA Method 8260B and for helium by ASTM D 1946 (M).

2.4 REPORT PREPARATION

Following receipt of analytical reports from the laboratory, CRA will prepare a written report, which will include field procedures, tabulated analytical data, boring logs, and analytical laboratory reports.

3.0 SCHEDULE

CRA will implement well, soil boring, and soil vapor probe upon ACEH's approval of this work plan, receipt of a drilling permit from ACPWA, and receipt of a fully executed access agreement with the owner of the former 76 service station property.

4.0 PROPOSAL OF ALTERNATIVE SOIL VAPOR SCREENING LEVELS

CRA proposes alternative site-specific soil vapor screening levels based on San Francisco Bay Regional Water Quality Control Board's (RWQCB's) *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, Interim Final November 2007 (Revised May 2008). The RWQCB document provides Tier 1 environmental screening levels (ESLs) and states that alternative screening levels may be appropriate for some sites. Alternative screening levels may be calculated by replacing targeted components of the Tier 1 ESLs as appropriate to reflect site conditions or alternative risk assumptions (Section 3.1 of the ESL document referenced above). The following equation is used to

derive appropriate alternative screening levels using the Tier 1 residential indoor air ESL as a starting point.

$$ESL_{res} \times \frac{TR_{com}}{TR_{res}} \times \frac{Exposure_{res}}{Exposure_{com}} \times 1/\alpha_{soil\ vapor\ to\ commercial\ indoor\ air} = SG_{alt}$$

where:

- ESL_{res} = ESL for indoor air in a residential setting (Table E).
- TR_{com} = Target risk for commercial/industrial settings of one cancer per 100,000 workers (RWQCB used a default target risk of 10^{-6} in calculating Tier 1 soil gas ESLs, however a 10^{-5} target risk is used by RWQCB in calculating commercial and construction worker soil ESLs [Section 6.2]) = 10^{-5}.
- TR_{res} = Target risk for residential settings of one cancer per 1,000,000 residents (default value per the ESL document and the United States Environmental Protection Agency [USEPA][1]) = 10^{-6}.
- $Exposure_{com}$ = Commercial worker exposure, assumes 250 days per year x 10 hours/day x 25 years = 62,500 exposure hours (per ESL document, Section 6.2 with the exception of 10 hours/day, which is chosen as a conservative site-specific estimate for exposure of workers).
- $Exposure_{res}$ = Residential exposure, assumes 350 days per year x 24 hours/day x 30 years = 252,000 exposure hours (per ESL document, Section 6.1.1).
- $\alpha_{soil\ vapor\ to\ commercial\ indoor\ air}$ = Attenuation factor = 0.0005 (per ESL document, Section 7.2 and Table E-1).
- SG_{alt} = Alternative site-specific soil gas screening level for vapor intrusion to indoor air.

Constituent of Concern	*RWQCB Residential Indoor Air ESL: Table E ($\mu g/m^3$)*	*Proposed Alternative Site-Specific Soil Vapor Screening Level ($\mu g/m^3$)*
Benzene	8.4E-02	6.8E+03
Ethylbenzene	9.8E-01	7.9E+04
Toluene	6.3E+01	5.1E+06
Xylenes	2.1E+01	1.7E+06
TPHg/TPHd	1.0E+01	8.1E+05

All of Which is Respectfully Submitted,

1 Default value per ESL document footnotes to Tables E-1 through E-4, and per USEPA, *Users Guide for Evaluating Subsurface Vapor Intrusion into Buildings*, revised February 2004, page 56.

Peter Schaefer, CEG, CHG

Aubrey K. Cool, PG

FIGURES

12/01/08

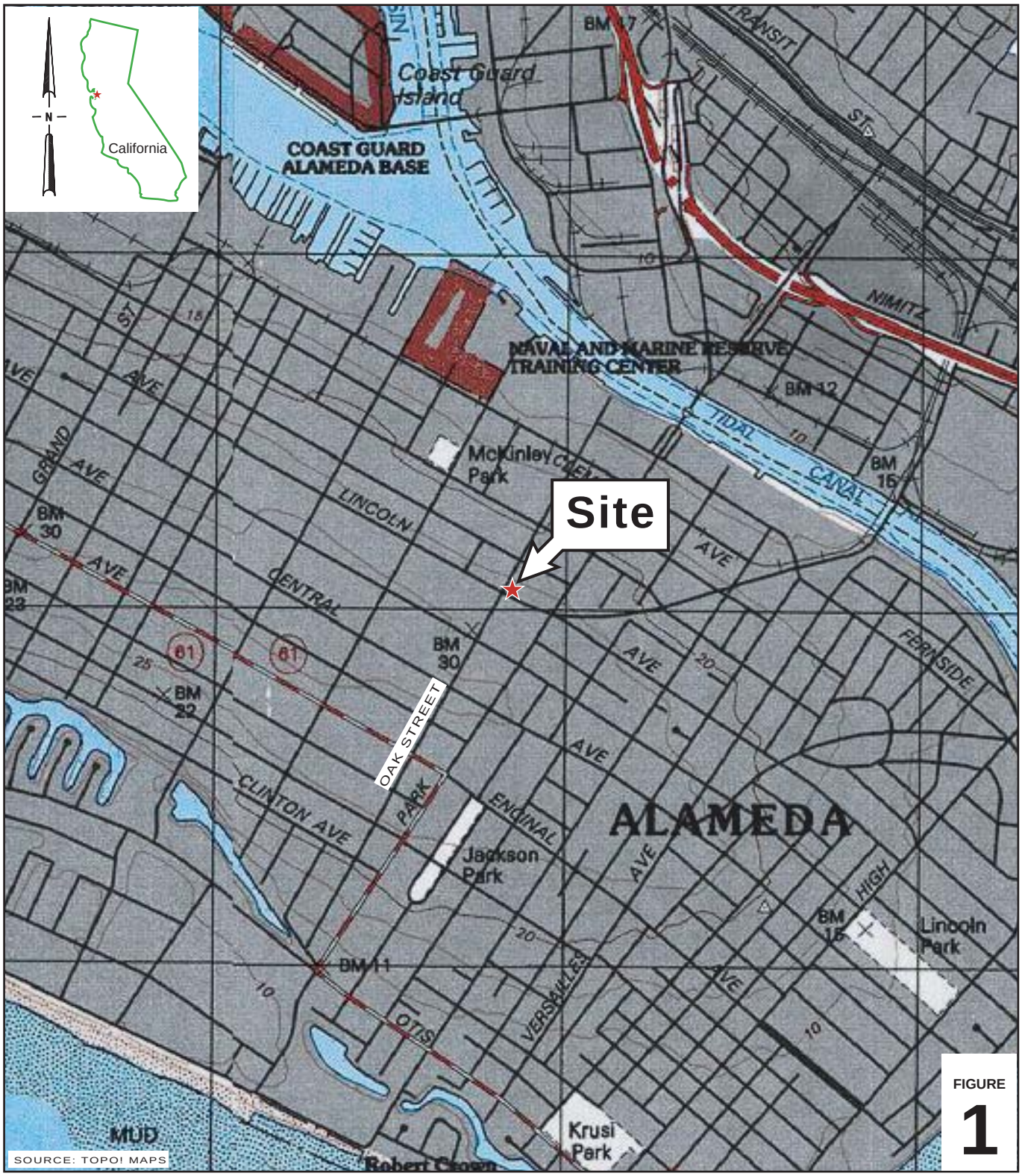

FIGURE
1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

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Former Shell Service Station

2301-2307 Lincoln Avenue

Alameda, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

10/05/09

Site Plan

EXPLANATION

- B-6 — Proposed soil boring location
- MW-9 — Proposed monitoring well location
- SVP-4 — Proposed soil vapor probe location
- SVP-1 — Soil vapor probe location (CRA, 2/09)
- B-5 — Geoprobe boring location (CRA, 2/09)
- MW-1 — Monitoring well location
- EB-1 — Soil boring location (Geomatrix, 8/07)
- SB-1 — Soil boring location (Basics Environmental, 7/99)
- Electrical & Telecommunications line (E)
- Telecommunications & Cable TV line (T)
- Gas line (G)
- Storm drain line (STM)
- Sanitary sewer line (SAN)
- Water line (W)

Sources:
1. Sanborn Fire Insurance Map, 1950
2. Majors Civil Engineering, 1982

OAK STREET

LINCOLN AVENUE

Former 76 Station

Former Shell Station
2301-2307 Lincoln Avenue

Former Gasoline & Oil USTs (installed in 1920s)

Former Building (circa 1950)[1]

Former Tire Recapping Facility (circa 1950)[1]

7-11 Store Building

Former Building (circa 1950)[1]

Former Oil Sump (circa 1982)[2]

Former Station Building (circa 1982)[2]

Former Dispensers (circa 1982)[2]

Laundorland Building

Commercial Building

Former USTs (installed in 1970s)

Alameda County Police Dept.

Alameda Free Library

Sidewalk, Planter, Parking, Overhang, Agronomic Property Line

SB-1, SB-2, SB-3, SB-4, SB-5, SB-6

MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9

SVP-1, SVP-2, SVP-3, SVP-4 (re-install), SVP-5, SVP-5A, SVP-6, SVP-7, SVP-8

B-5, B-6, B-7, B-8

EB-1, EB-2, EB-3, EB-4, EB-5, EB-6, EB-8, EB-9, EB-10, EB-11

N

0 15 30 60

Scale (ft)

Basemap modified from data from Virgil Chavez Land Surveying and drawing provided by Geomatrix

FIGURE

2

Former Shell Service Station

2301-2307 Lincoln Avenue

Alameda, California

CONESTOGA-ROVERS & ASSOCIATES

I:\Shell\6-chars\0602--\060204-Alameda 2301-2307 Lincoln Ave\060204 FIGURES\060204 SITE PLAN.DWG