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**TRANSMITTAL**

DATE: September 3, 2008 REFERENCE NO.: 606204  
PROJECT NAME: 2301-2307 Lincoln Avenue, Alameda  
TO: Jerry Wickham  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California  
94502-6577

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3:14 pm, Oct 08, 2008  
Alameda County  
Environmental Health

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 Overnight Courier  Other

QUANTITY	DESCRIPTION
1	Site Investigation Work Plan

As Requested  For Review and Comment  
 For Your Use  \_\_\_\_\_  
 \_\_\_\_\_

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

Denis Brown  
Alan A and Beverly M. Sebanc  
C & H Development Co.

Copy to: \_\_\_\_\_  
Completed by: Peter Schaefer Signed: Peter Schaefer  
[Please Print]

Filing: Correspondence File



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

**Denis L. Brown**  
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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,

A handwritten signature in cursive script, reading "Denis L. Brown", is written over a horizontal line.

Denis L. Brown  
Project Manager



## **SITE INVESTIGATION WORK PLAN**

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

**SAP CODE           165255  
INCIDENT NO.    97767044  
AGENCY NO.      RO0002971**

**SEPTEMBER 4, 2008  
REF. NO. 060204 (1)**

This report is printed on recycled paper.

**Prepared by:  
Conestoga-Rovers  
& Associates**

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TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION.....	1
2.0 TECHNICAL RATIONALE FOR PROPOSED SCOPE OF WORK .....	2
3.0 WORK TASKS .....	3
3.1 ACCESS AGREEMENT .....	3
3.2 PERMITS.....	3
3.3 SITE SAFETY PLAN.....	3
3.4 UTILITY CLEARANCE .....	3
3.5 MONITORING WELL INSTALLATION.....	3
3.6 WELL DEVELOPMENT AND SAMPLING .....	4
3.7 GEOPROBE SOIL GAS BORINGS .....	4
3.8 GEOPROBE/HYDROPUNCH BORINGS .....	4
3.9 CHEMICAL ANALYSES.....	5
3.10 WELLHEAD AND BORING SURVEY ACTIVITIES .....	5
3.11 REPORT PREPARATION .....	5
4.0 CERTIFICATION .....	6

LIST OF FIGURES  
(Following Text)

FIGURE 1 VICINITY MAP

FIGURE 2 SITE PLAN

LIST OF APPENDICES

APPENDIX A SITE HISTORY

## 1.0 INTRODUCTION

Conestoga-Rovers & Associates, Inc. (CRA) prepared this work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell) to further delineate the lateral and vertical extent of petroleum hydrocarbons in soil and groundwater, and assess the potential for soil gas migration to indoor air.

This work plan was requested in Alameda County Health Care Services Agency (ACHCSA) correspondence dated July 1, 2008.

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 and additional background information is contained in Appendix A.

## 2.0 TECHNICAL RATIONALE FOR PROPOSED SCOPE OF WORK

ACHCSA's correspondence dated July 1, 2008 requested additional investigation to further delineate horizontal and vertical petroleum hydrocarbon and lead distribution, and soil gas assessment to determine the potential for migration of volatile constituents to indoor air. A summary of the proposed scope of work is listed below and specific tasks to complete the work are summarized under the Work Tasks sections:

- ACHCSA's correspondence requested additional delineation of total lead at the site; however the highest level of total lead detected during the Geomatrix 2007 soil investigation was a concentration of 550 mg/kg, which is below the San Francisco Bay Regional Water Quality Control Board's Environmental Screening Level (revised May 2008) for shallow soils at commercial sites where groundwater is not a source of drinking water of 750 mg/kg. Because of this, no additional lead analyses are currently proposed.
- Install groundwater monitoring wells MW-4 through MW-10 to monitor concentrations of petroleum hydrocarbons and provide additional groundwater gradient data. MW-4 will be installed in the area of the former USTs originally installed in the 1970's. MW-5 through MW-8 will be installed in likely down-gradient locations along the front of the on-site commercial building and next to the St. Vincent DePaul building. MW-9 and MW-10 will be installed in likely up-gradient locations in Lincoln Avenue and Oak Street, respectively. Soil samples will be collected from the exploratory borings to provide a lithologic log and to further delineate the extent of petroleum hydrocarbons in the soils. To address the vertical extent of impact to groundwater, a Hydropunch sample will be collected from each boring at approximately 34 fbg. The boring will be backfilled to the appropriate depth necessary for setting the monitoring wells.
- Advance four Geoprobe borings at locations B-1 through B-4 to obtain soil gas grab samples at approximately 5.5 to 6.0 fbg. The soil gas samples are to be collected at locations near the on-site commercial building and near the St. Vincent DePaul building directly to the southeast to determine the potential soil gas intrusion risk to human health on- and off-site.
- Advance two Geoprobe/Hydropunch borings (B-5 and B-6) to obtain soil and grab groundwater samples to further evaluate the lateral extent of petroleum hydrocarbon impacts.
- Conduct quarterly groundwater monitoring on all monitoring wells for at least 1 hydrologic cycle (1 year).

### **3.0 WORK TASKS**

#### **3.1 ACCESS AGREEMENT**

On behalf of Shell, CRA will obtain an access agreement, or update existing access agreements with the owners of the 2301-2307 Lincoln Avenue properties.

#### **3.2 PERMITS**

Once the access agreements have been secured, CRA will obtain the required drilling permit from Alameda County Public Works Agency-Water Resources for the boring locations, and, if required, a city encroachment permit for locations in the public-right-of-way.

#### **3.3 SITE SAFETY PLAN**

CRA will prepare a comprehensive Site-Specific Safety Plan to protect site workers. The plan will be reviewed and signed by each site worker and kept on the site during field activities.

#### **3.4 UTILITY CLEARANCE**

CRA will mark the proposed drilling locations and will clear the locations through Underground Service Alert (USA) prior to drilling. A private utility locating service will be used to verify clearance of subsurface obstructions. Additionally, the first five feet of each boring will be cleared using air-knife or water-knife equipment, to minimize potential damage to underground structures not identified through USA.

#### **3.5 MONITORING WELL INSTALLATION**

The well borings will be drilled to approximately 13 fbg. Soil samples will be collected from the borings for lithologic logging and vapor screening with a photo-ionization detector (PID). Selected samples will be submitted for chemical analysis.

Prior to over-drilling the boring for well installation, Geoprobe sampling will continue to approximately 31 fbg for soil screening and lithologic logging. Soil samples collected within the saturated zone are not recommended for laboratory analyses. A Hydropunch sampler will then be extended from 31-34 fbg for collection of a groundwater sample for



vertical assessment, as described below. Once the deeper groundwater sample is collected, the boring will be backfilled to approximately 18 fbg prior to proceeding with well installation.

The first-encountered groundwater beneath the site is approximately 9 fbg. The wells will be constructed using 4-inch diameter Schedule 40 PVC casing, thus the boring will be over-drilled using 10-inch inside diameter hollow stem augers to approximately 18 fbg. The well screen interval will be from approximately 8 to 18 fbg, but may be adjusted depending on saturation and water levels in adjacent wells (MW-1 through MW-3). The sand-pack in each 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.

### **3.6 WELL DEVELOPMENT AND SAMPLING**

Blaine Tech Services, Inc. (Blaine) of San Jose, California will develop the new groundwater monitoring wells prior to sampling. After well development, Blaine will sample all of the site groundwater monitoring wells and submit the samples to a State of California-certified laboratory for chemical analyses.

### **3.7 GEOPROBE SOIL GAS BORINGS**

CRA will supervise and observe four Geoprobe borings at locations B-1 through B-4 to obtain soil gas grab samples. After the borings are advanced to approximately 5.5 to 6 fbg, grab soil gas samples will be obtained using temporary 3-inch gas-sampling screens manufactured by Geoprobe attached to Teflon tubing. Soil gas samples will be collected from each sampling point in summa canisters according to Shell's soil gas sampling protocol. As sampling is affected by rain, it is CRA standard procedure to allow two days or more after a heavy rain event prior to collecting soil gas samples.

### **3.8 GEOPROBE/HYDROPUNCH BORINGS**

CRA will supervise and observe two Geoprobe borings (B-5 and B-6) at the approximate locations shown on Figure 2. Each Geoprobe location will be cleared to five feet by air- or water-knife, as previously discussed. A direct push sample will then be advanced from 5-9 fbg for collection of two soil samples retained for chemical analysis (5.5-6.0 fbg

and 8.5-9.0 fbg). The remaining soil will be used for lithologic logging and field screening with a photo ionization detector (PID). Soil samples for chemical analyses will be sealed with Teflon tape and tight fitting plastic end caps, labeled, logged onto a chain-of-custody record, and placed into a cooler with ice for transport to a State of California certified laboratory for analysis. Hydropunch groundwater samples will then be obtained from each boring (approximately 9-13 fbg). The actual groundwater interval sampled will be determined in the field based on current groundwater levels in nearby wells (MW-1 through MW-3). Groundwater samples will be contained in appropriate sample containers supplied by the laboratory. Upon their collection, each groundwater sample will be labeled, entered onto a chain-of-custody record, and placed into a cooler with ice for transport to a State of California certified laboratory for analysis. A standard two week turn-around time will be requested for laboratory results.

### **3.9 CHEMICAL ANALYSES**

Based on the results of previous samples, the groundwater and soil samples will be analyzed for TPHg, benzene, toluene, ethylbenzene, and xylenes (BTEX), by EPA Method 8260B. The soil gas samples will be analyzed by Modified EPA Methods TO-15 for BTEX, MTBE, and TO-3 for TPHg, and leak test compounds isobutene, butane, and propane.

### **3.10 WELLHEAD AND BORING SURVEY ACTIVITIES**

Following monitoring well installation, a licensed surveyor will survey wellhead elevations relative to mean sea level and the wells' and the borings' latitude and longitude.

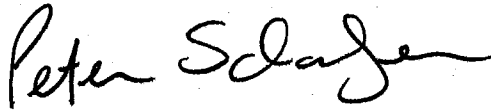
### **3.11 REPORT PREPARATION**

Following the receipt of analytical results from the laboratory, CRA will prepare a written report which will include a description of the field procedures, a presentation of the analytical results, tabulated data, figures showing sample locations, the complete analytical laboratory reports, a boring log with well construction details, findings and conclusions, and recommendations.

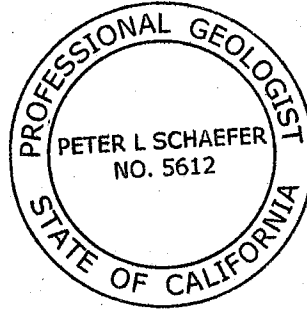
#### 4.0 CERTIFICATION

The scope of work described in this work plan will be performed under the supervision of a California Professional Geologist or Engineer.

All of Which is Respectfully Submitted,  
CONESTOGA-ROVERS & ASSOCIATES



Peter Schaefer, CEG, CHG  
Project Manager



Ana Friel, PG  
Professional Geologist

APPENDIX A

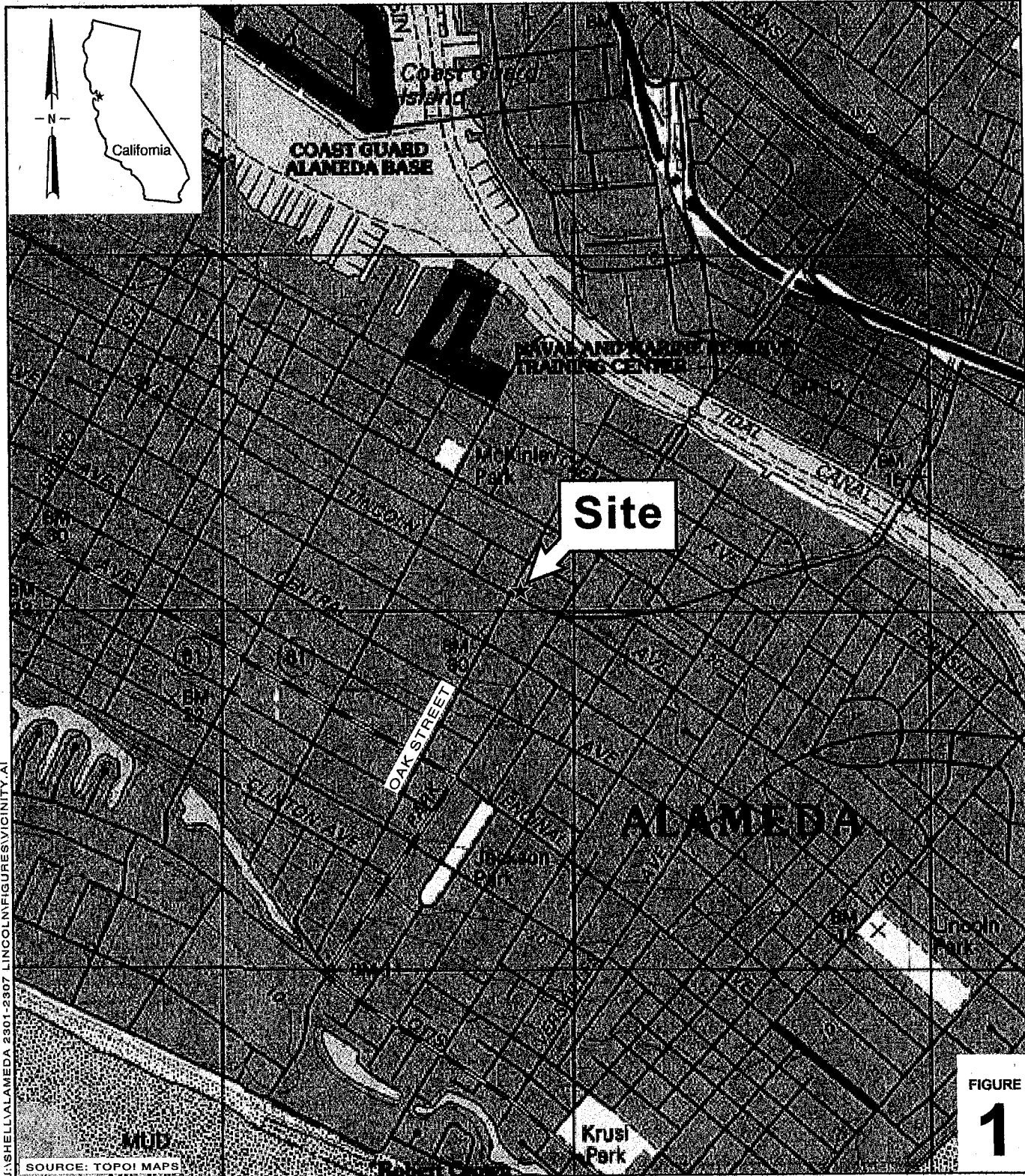
SITE HISTORY

## SITE HISTORY

**1999 Phase II Site Investigation:** Basics Environmental (Basics) drilled six borings (SB-1 through SB-6, Figure 2) in the western portion of the site. Single soil samples were collected from all of the borings at 5 or 7.5 feet below grade (fbg) and grab groundwater samples were obtained from five of the borings (all except SB-5). Benzene and methyl tertiary-butyl ether (MTBE) were not detected in any of the samples. Analyses of the soil sample from boring SB-3 at 7.5 fbg showed concentrations of 40 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg) and 0.012 mg/kg ethylbenzene. Analyses of the grab groundwater sample from SB-3 showed concentrations of up to 4,500 micrograms per liter ( $\mu\text{g}/\text{l}$ ) TPHg, 4.4  $\mu\text{g}/\text{l}$  toluene, 2.7  $\mu\text{g}/\text{l}$  ethylbenzene, 4.0  $\mu\text{g}/\text{l}$  xylenes, 10  $\mu\text{g}/\text{l}$  n-butylbenzene, 14  $\mu\text{g}/\text{l}$  sec-butylbenzene, 45  $\mu\text{g}/\text{l}$  isopropyl benzene, 60  $\mu\text{g}/\text{l}$  n-propylbenzene, and 26  $\mu\text{g}/\text{l}$  vinyl acetate. These results were presented in Basics' August 12, 1999 *Limited Phase II Environmental Site Investigation* report.

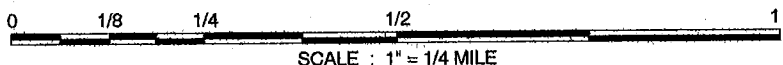
**2000 Site Assessment:** Toxichem Management Systems, Inc. (Toxichem) conducted a site assessment which included a review of Basics' investigation, aerial photographs, Sanborn maps, and agency files. The site assessment is presented in Toxichem's May 1, 2000 *Site Assessment Report*.

**2007 Site Investigation:** Geomatrix installed three groundwater monitoring wells (MW-1 through MW-3, Figure 2) in the western former UST (USTs originally installed in the 1920's) area and drilled 11 exploratory borings (EB-1 through EB-6 and EB-8 through EB-11, Figure 2) in the area of the eastern former USTs (USTs originally installed in the 1970's) and fuel dispensers. No toluene, fuel oxygenates, or lead scavengers were detected in any of the soil samples. No petroleum hydrocarbons were detected in samples collected from 1.5 to 6.5 fbg. Soil samples collected from 8.5 to 14.0 fbg showed concentrations of up to 1,600 mg/kg TPHg, 0.99 mg/kg benzene, 100 mg/kg ethylbenzene, 1.1 mg/kg xylenes, and 21  $\mu\text{g}/\text{kg}$  lead. Sample EB-10-2.0 contained a concentration of 550 mg/kg lead. Grab groundwater samples collected from the wells and exploratory borings EB-1 and EB-4 contained concentrations of up to 7,000  $\mu\text{g}/\text{l}$  TPHg, 980  $\mu\text{g}/\text{l}$  benzene, 490  $\mu\text{g}/\text{l}$  ethylbenzene, 11  $\mu\text{g}/\text{l}$  toluene, and 19  $\mu\text{g}/\text{l}$  xylenes. Groundwater was gauged at 8.37 to 9.26 fbg and flow direction was calculated to be to the east-northeast. These results were presented in Geomatrix's December 2007 *Subsurface Investigation Summary Report*.



J:\SHELL\ALAMEDA 2301-2307 LINCOLN\FIGURES\VICINITY.A1

MUD  
SOURCE: TOPOI MAPS

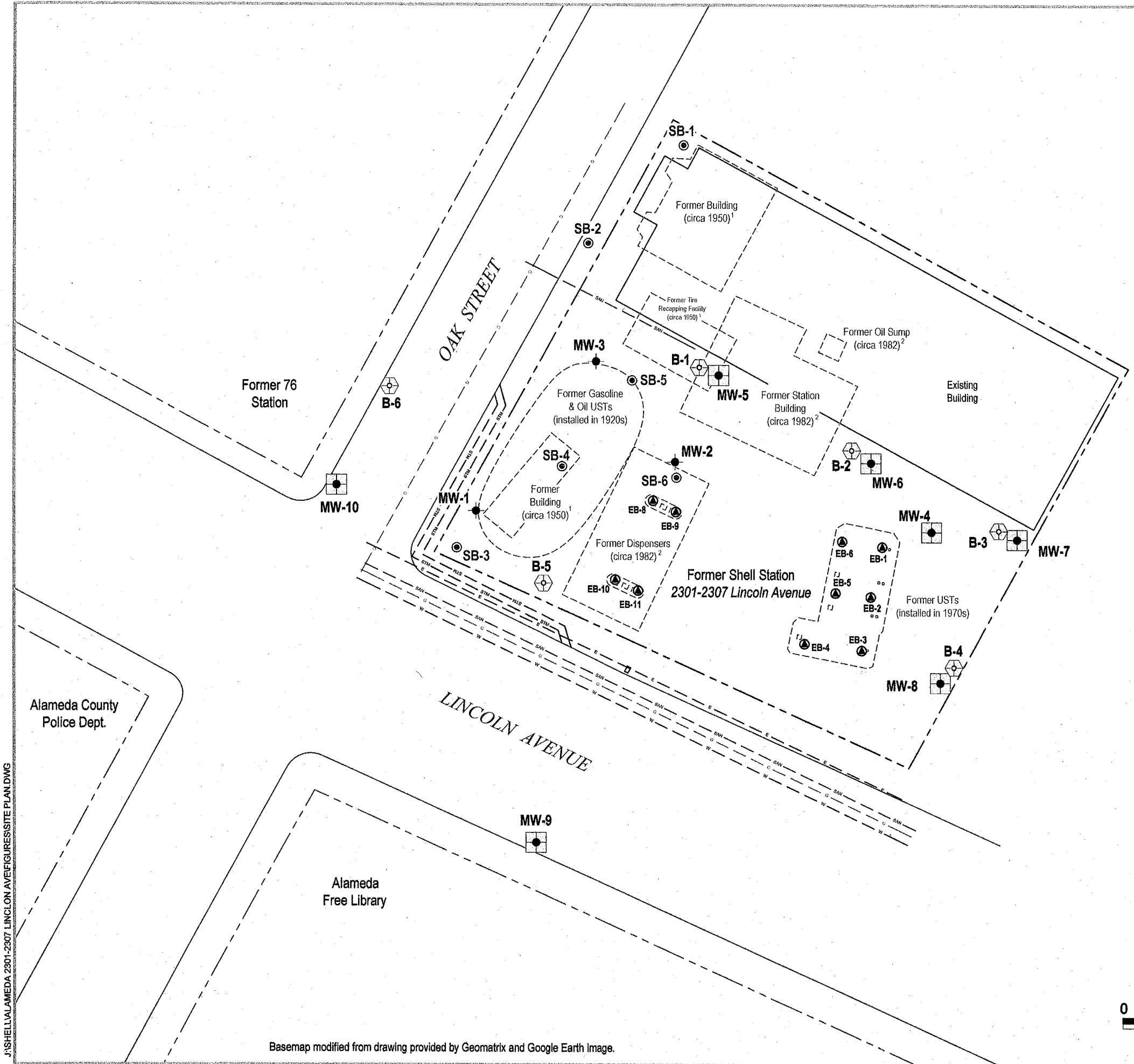


**Former Shell Service Station**  
 2301-2307 Lincoln Avenue  
 Alameda, California



**CONESTOGA-ROVERS  
 & ASSOCIATES**

**Vicinity Map**



**EXPLANATION**

- MW-4 Proposed monitoring well location
- B-1 Proposed geoprobe boring location
- 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)
- 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

J:\SHELL\ALAMEDA 2301-2307 LINCOLN AVE\FIGURES\SITE PLAN.DWG

Basemap modified from drawing provided by Geomatrix and Google Earth Image.

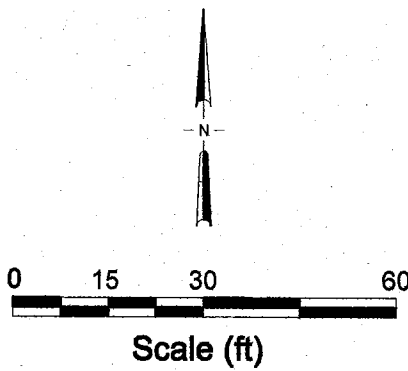


FIGURE 2

**Former Shell Service Station**  
 2301-2307 Lincoln Avenue  
 Alameda, California

