FOR CONTRACT NO.: 04-4A3414

INFORMATION HANDOUT

MATERIALS INFORMATION

COPY OF REVISED OVERHEAD SIGN FOUNDATION REPLACEMENT RECOMMENDATIONS MEMORANDUM.

COPY OF UNDERGROUND CLASSIFICATION OF CIDH PILE EXCAVATIONS BY CAL-OSHA MINING AND TUNNELING UNIT.

EXCERPTS FROM SITE INVESTIGATION REPORT, ROUTES 13, 24, AND 580, ALAMEDA AND CONTRA COSTA COUNTIES, CALIFORNIA.

ROUTE: 04-Ala-13-4.4/8.6

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. ALBERT ZEPEDA
District Branch Chief
Office of Alameda Design I

Date: May 26, 2010

Attention: P. Snyder

File: 04-ALA-13, PM 4.5/8.6
04-4A3411
Overhead Sign

From: DAVID NESBITT
Transportation Engineer
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

MAHMOOD MOMENZADEH
Chief, Branch C
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject: Revised Overhead Sign Foundation Replacement Recommendations

Per your request, we have reviewed the plans for the Overhead Sign Replacement project along Route 13 in Alameda County. The original request dated March 29, 2010 included four overhead sign relocation sites. This was later reduced to three sites, as the overhead sign on Route 24 was deleted from the project in an e-mail dated April 7, 2010.

The expected subsurface soil conditions and the foundation evaluation for the three remaining overhead sign relocations sites are discussed in detail below:

Location No. 1 (04-ALA-13 PM 4.97): The as-built Log of Test Borings for the Leona Heights Park POC located at PM 4.85 indicate that the groundwater elevation was measured at elevation of 283 ft on August 15, 1962. The as-built LOTBs indicate a medium dense to dense sandy silt material near the proposed site. According to the information provided by Paul Snyder (CT), the overhead sign will be supported by a Cast in Drilled Hole (CIDH) pile with a diameter of 5 feet and length of 25 feet. Based on our evaluation, the foundation soil meets or exceeds the required internal friction of 30 degree and a unit weight of 120 pcf.

Location No. 2 (04-ALA-13 PM 8.6): The as-built Log of Test Borings for the Moraga Avenue Undercrossing located at PM 8.28 indicate that the groundwater elevation was measured at elevation of 595.4 ft on April 4, 1961. The as-built LOTBs indicate a medium stiff-to-stiff sandy silt material near the proposed site. According to the

information provided by Paul Snyder (CT), a CIDH pile with a diameter of 5 feet and length of 23 feet will support this sign. Based on our evaluation, the foundation soil meets or exceeds the required internal friction of 30 degrees and a unit weight of 120 pcf.

Location No. 3 (04-ALA-13 PM 4.56): The as-built Log of Test Borings for the Mountain Blvd UC located at PM 4.32 indicates that the groundwater was not encountered on July 26, 1961. The as-built LOTBs indicate very stiff clay with gravel material near the proposed site. According to the information provided by Paul Snyder (CT), two CIDH piles with a diameter of 4.5 feet and length of 23 feet will support this sign. Based on our evaluation, the foundation soil meets or exceeds the required internal friction of 30 degrees and a unit weight of 120 pcf

Construction Considerations:

- Since groundwater levels change overtime, we anticipate groundwater to be encountered during the drilling of the CIDH piles. Please include a copy of the Wet Method CIDH standard special provision for this project.

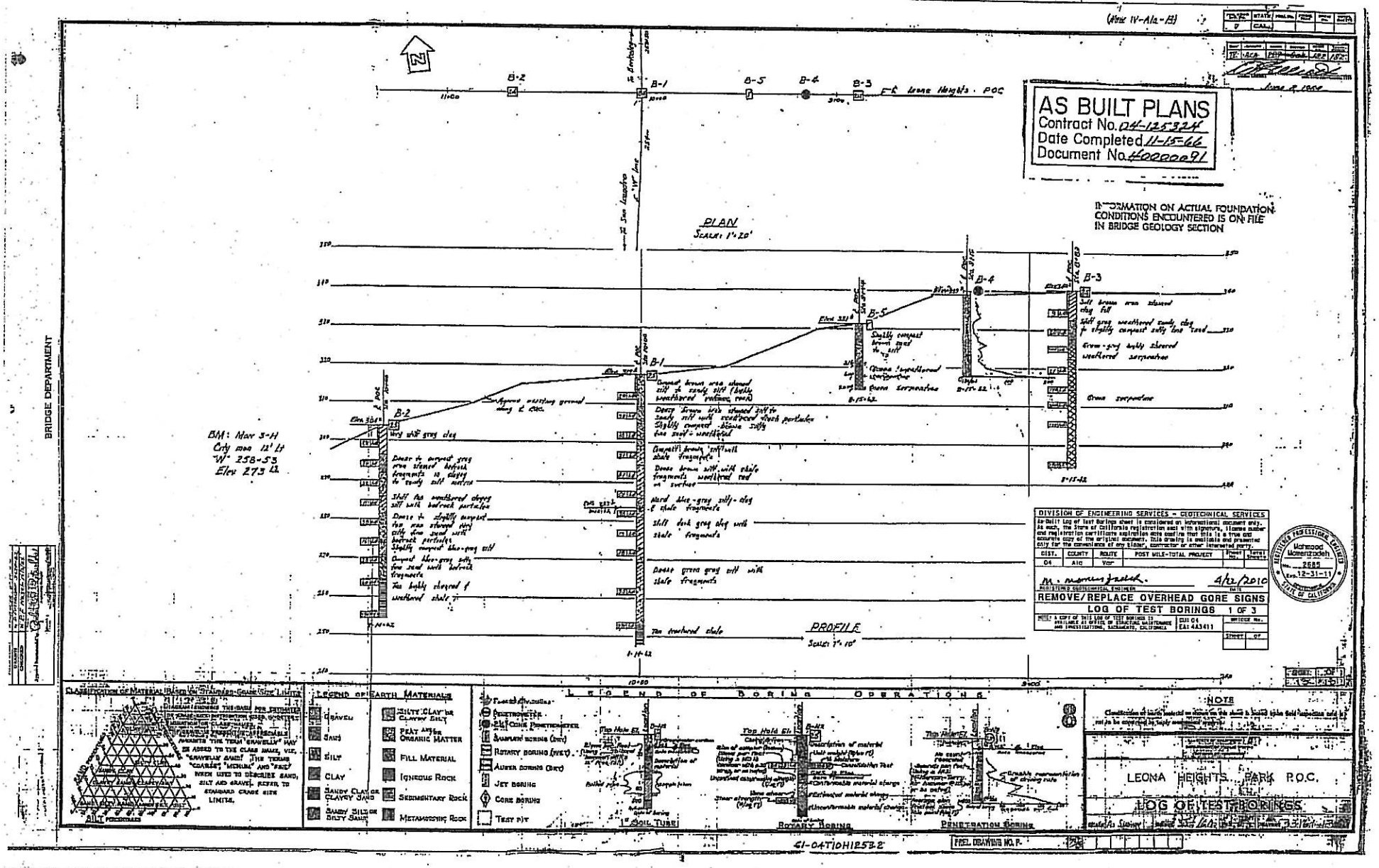
- Temporary casing will be needed to prevent caving potential due to the presence of granular soil.

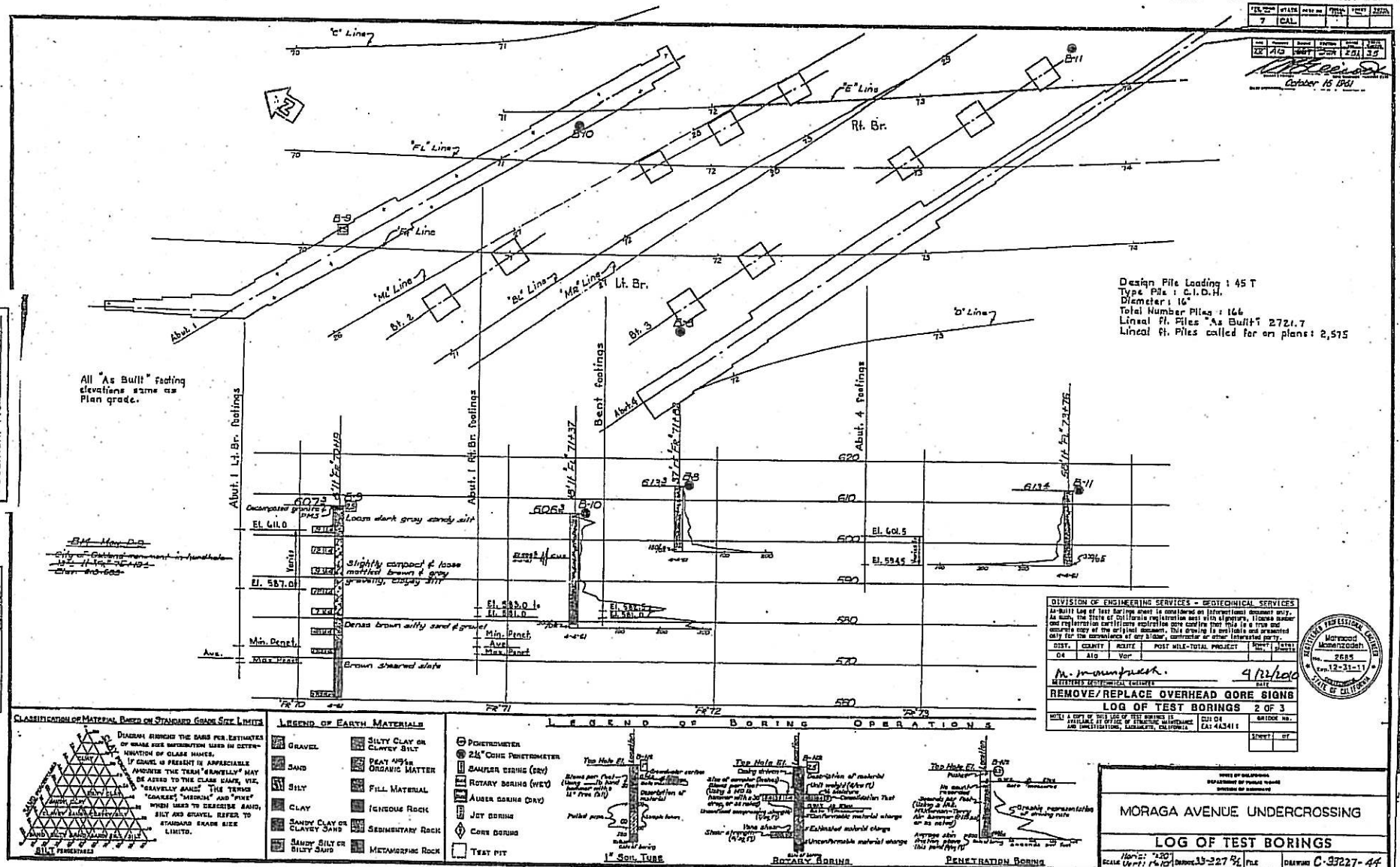
If you have any questions, please contact David Nesbitt at (510) 622-0104 or Mahmood Momenzadeh at (510) 286-5732.

Attachment:

c: MMomenzadeh, TJPokrywka, KHolden, BKearney, MWillian, Structures RE Pending File, Daily File, Route File

DNesbitt/mm


AS BUILT PLANS
Contract No. 04-125324
Date Completed 11-15-66
Document No. 400000091
INFORMATION ON ACTUAL FOUNDATION CONDITIONS ENCOUNTERED IS ON FILE IN BRIDGE GEOLOGY SECTION
PLAN
SCALE: 1"=20'
PROFILE
SCALE: 1"=10'
B-1
B-2
B-3
B-4
B-5
F.R. Leona Heights - POC
BM: Mon 3-H
City mon 12' Lt
"W" 258-53
Elev 273.42
DIVISION OF ENGINEERING SERVICES - GEOTECHNICAL SERVICES
REMOVE/REPLACE OVERHEAD GORE SIGNS
LOG OF TEST BORINGS 1 OF 3
LEONA HEIGHTS PARK P.O.C.
LOG OF TEST BORINGS
LEGEND OF EARTH MATERIALS
LEGEND OF BORING OPERATIONS
NOTE
BRIDGE DEPARTMENT



DIVISION OF ENGINEERING SERVICES - GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	SHEET	TOTAL SHEETS
04	Alg	Var			

M. Mamjuck — 9/22/2010
REGISTERED GEOTECHNICAL ENGINEER — DATE

Mansood Mamnzadeh
No. 2685
Exp. 12-31-11
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

REMOVE/REPLACE OVERHEAD GORE SIGNS

LOG OF TEST BORINGS 2 OF 3

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

CU	EA	BRIDGE NO.
04	443411	

SHEET OF

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

DIAGRAM SHOWING THE BARS PER. ESTIMATES OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES. IF GRAVEL IS PRESENT IN APPRECIABLE AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ. "GRAVELLY SAND." THE TERMS "COARSE," "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE SAND, SILT AND GRAVEL REFER TO STANDARD GRADE SIZE LIMITS.

LEGEND OF EARTH MATERIALS

- GRAVEL
- SAND
- SILT
- CLAY
- SANDY CLAY OR CLAYEY SAND
- SANDY SILT OR SILTY SAND
- SILTY CLAY OR CLAYEY SILT
- PEAT AND OTHER ORGANIC MATTER
- FILL MATERIAL
- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

LEGEND OF BORING OPERATIONS

- PENETROMETER
- 2½" CONE PENETROMETER
- SAMPLER BORING (DRY)
- ROTARY BORING (WET)
- AUGER BORING (DRY)
- JET BORING
- CORE BORING
- TEST PIT

MORAGA AVENUE UNDERCROSSING

LOG OF TEST BORINGS

Horiz: "=20'
Scale Vert: 1"=10'

DRAWING 33-227 Sh

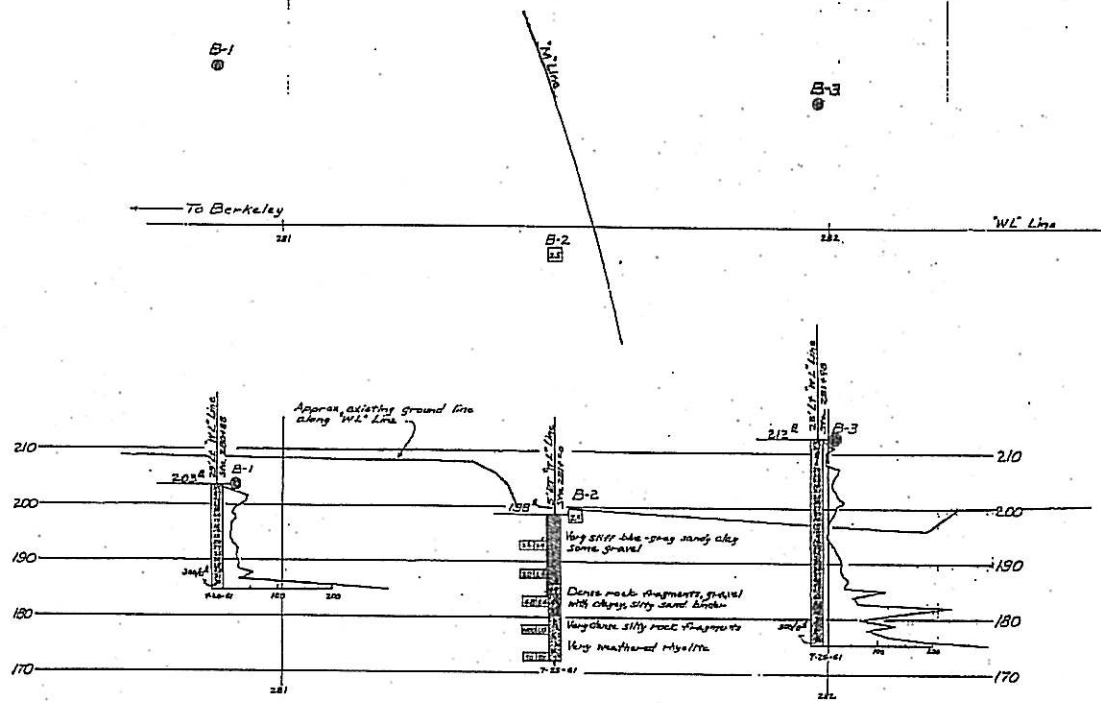
FILE

DRAWING C-33227-44

PHEL DRAWING NO. 33227-44

PR-33227-6

129



B.M.
Point on concrete foundation
20' L "WL" Line sta. 221+90
Elev. 208.61

GROUND WATER ENCOUNTERED DURING THIS INVESTIGATION BY BRIDGE DEPT. GEOLOGY SECTION
DATE 7-24-61

AS BUILT PLANS
Contract No. 04-122021
Date Completed
Document No. 1680254

DIVISION OF ENGINEERING SERVICES - GEOTECHNICAL SERVICES

As-built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal, signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Ala	Var			

Registered Professional Engineer — Mahmood Momenzadeh
No. 2685
Date 12-31-11
STATE OF CALIFORNIA

M. Momenzadeh 4/22/2010
REGISTERED GEOTECHNICAL ENGINEER DATE

REMOVE/REPLACE OVERHEAD GORE SIGNS
LOG OF TEST BORINGS 3 OF 3

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

BRIDGE NO.	
CU	04
EA	143411
Sheet	of

BRIDGE DEPARTMENT

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRAIN SIZE LIMITS

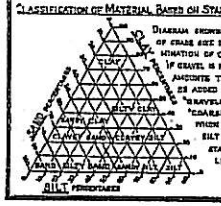


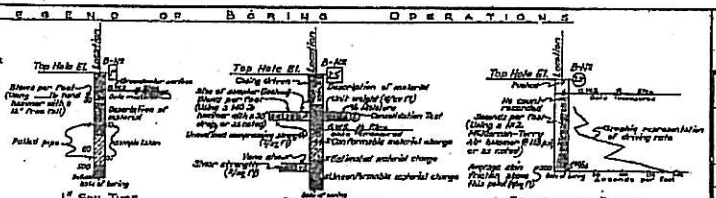
DIAGRAM SHOWING THE BASIS FOR ESTIMATES OF GRADE SIZE DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES. IF GRAVEL IS PRESENT IN APPREciable AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ. "GRAVELLY SAND." THE TERMS "COARSE," "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE SAND, SILT AND GRAVEL REFER TO STANDARD GRADE SIZE LIMITS.

LEGEND OF EARTH MATERIALS

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

LEGEND OF BORING OPERATIONS

- Penetrometer
- 2½" Core Penetrometer
- Sampler Boring (DRY)
- Rotary Boring (WET)
- Auger Boring (DRY)
- Jet Boring
- Core Boring
- Test Pit



NOTE

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

MOUNTAIN BLVD UC

LOG OF TEST BORINGS

SCALE	1"=10'	BRIDGE	33-348	FILE	DRAWING C-33348-9

REL. DRAWING NO. P-33348-14

PIC-33348-4

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT
2211 Park Towne Circle, Suite 2
Sacramento, California 95825

Telephone (916) 574-2540
FAX (916) 574-2542

August 10, 2010

Department of Transportation
111 Grand Avenue, 11th Floor
Oakland, CA 94623

Attention: Paul Snyder (via e-mail)

Subject: Underground Classification #'s.: C024-001-11T thru C026-001-11T

Route 13 Signage Replacement

Mr. Snyder:

The information provided to this office relative to the above project has been reviewed. On the basis of this analysis, Underground Classification of "Potentially Gassy with Special Conditions" has been assigned to the shafts identified on your submittal. Please retain the original Classification for your records and deliver a true and correct copy of the Classification to the shaft contractor(s) for posting at the job site.

When the contractor who will be performing the work is selected, please advise them to notify this office to determine if a mandated Prejob Conference with the Division is required prior to commencing any activity associated with drilling of the shafts.

Should you have another bore under construction that is not required to have an Underground Classification (i.e.: less than 30 inches in diameter), please contact the Mining and Tunneling Unit prior to any employee entry of such a space.

If you have any questions on this subject, please contact this office at your earliest convenience.

Sincerely,

Douglas Patterson for John R. Leahy
Senior Engineer

cc: Rich Brockman
File

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C024-001-11T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 111 Grand Avenue, 11th Floor, Oakland, CA 94623

(MAILING ADDRESS)

at ROUTE 13 CARSON STREET OFFRAMP SIGNAGE

(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***

(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 60-inch diameter by 25 feet deep shaft, located on the east shoulder of northbound Route 13, approximately 100 feet south of the Carson Street off ramp, Oakland, Alameda County.

This classification shall be conspicuously posted at the place of employment.

Date August 10, 2010

D Patterson

(SENIOR ENGINEER)

D. Patterson for J. Leahy

03 77089

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C025-001-11T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 111 Grand Avenue, 11th Floor, Oakland, CA 94623

(MAILING ADDRESS)

at ROUTE 13 MORAGA AVENUE OFFRAMP SIGNAGE

(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***

(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The 60-inch diameter by 23 feet deep shaft, located on the west shoulder of southbound Route 13, approximately 50 feet north of the Moraga Avenue off ramp, Oakland, Alameda County.

This classification shall be conspicuously posted at the place of employment.

Date August 10, 2010

D. Patterson

(SENIOR ENGINEER)

D. Patterson for J. Leahy

03 77089

State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

Underground Classification

C026-001-11T

DEPARTMENT OF TRANSPORTATION

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of 111 Grand Avenue, 11th Floor, Oakland, CA 94623

(MAILING ADDRESS)

at ROUTE 13 MOUNTAIN BOULEVARD OFFRAMP SIGNAGE

(LOCATION)

has been classified as *** POTENTIALLY GASSY with Special Conditions***

(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

SPECIAL CONDITIONS

1. A Certified Gas Tester shall perform pre-entry and continuous monitoring of the underground environment to measure Oxygen and detect explosive, flammable, and toxic gasses whenever an employee is working in the underground environment.
2. Mechanical ventilation shall provide for continuous exhaust of fumes and air at any time an employee is working in the underground environment. The primary ventilation fans must be located outside of the underground environment and shall be reversible by a single switch near the fan location.
3. The Division shall be notified immediately if any **Flammable Gas** or **Petroleum Vapor** exceeds 5% of the Lower Explosive Limit.
4. All utilities that may be in conflict with the project shall be identified and physically located (potholed) prior to the start of project operations.

The two 54-inch diameter by 23 feet deep shaft, located on the east and west shoulders of southbound Route 13, approximately 25 feet north of the Mountain Boulevard off ramp, Oakland, Alameda County.

This classification shall be conspicuously posted at the place of employment.

Date August 10, 2010

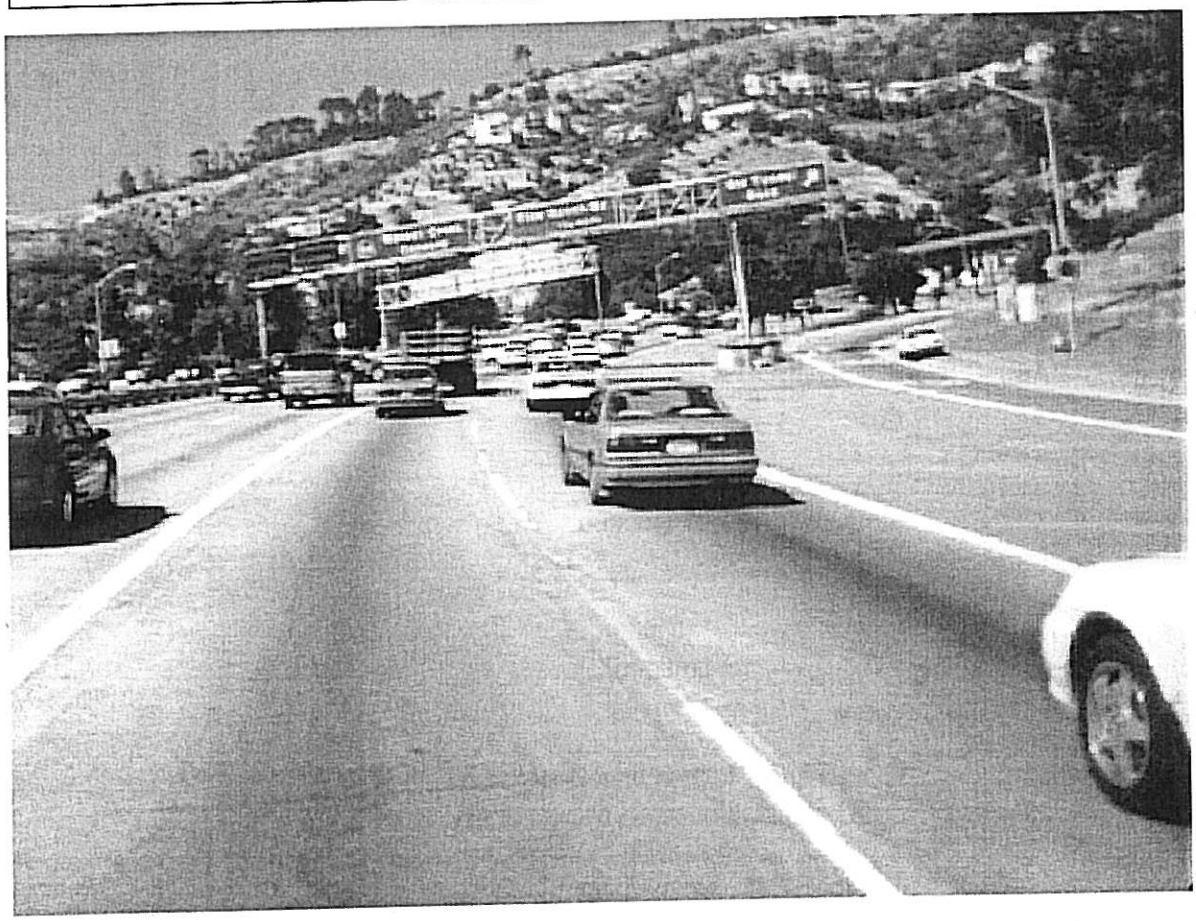
D. Patterson

(SENIOR ENGINEER)

D. Patterson for J. Leahy

03 77089

Site Investigation Report
Routes 13, 24, and 580
Alameda and Contra Costa Counties, California



Caltrans

PREPARED FOR:

CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 4
OFFICE OF ENVIRONMENTAL ENGINEERING, HAZARDOUS WASTE BRANCH
111 W. GRAND AVE
OAKLAND, CALIFORNIA

Shaw Shaw Environmental, Inc.

PREPARED BY:

SHAW ENVIRONMENTAL, INC.
1326 NORTH MARKET BOULEVARD
SACRAMENTO, CALIFORNIA
CONTRACT 43A0078
TASK ORDER NO. 04-270701-CC

Shaw™ Shaw Environmental, Inc.

SITE INVESTIGATION REPORT
AERIALLY DEPOSITED LEAD INVESTIGATION
ROUTES 13, 24, AND 580
ALAMEDA AND CONTRA COSTA COUNTIES, CALIFORNIA

January 16, 2004

Prepared for:

California Department of Transportation
North Region Hazardous Waste Office
District 4
111 Grand Avenue, 14th Floor
Oakland, California 94623

Prepared by:

Shaw Environmental, Inc.
1326 North Market Boulevard
Sacramento, California 95834-1912

Task Order No.: 04-270701-CC
Caltrans Contract No.: 43A0078

Project No.: 846072.01010000

SITE INVESTIGATION REPORT
AERIALLY DEPOSITED LEAD INVESTIGATION
ROUTES 13, 24, AND 580
ALAMEDA AND CONTRA COSTA COUNTIES, CALIFORNIA

January 12, 2004

Prepared for:

California Department of Transportation
North Region Hazardous Waste Office
District 4
111 Grand Avenue, 14th Floor
Oakland, California 94623

Prepared by:

Shaw Environmental, Inc.
1326 North Market Boulevard
Sacramento, California 95834-1912

Task Order No.: 04-270701-CC
Contract No.: 43A0078

Project No.: 846072.01010000

Table of Contents

List of Tables

List of Figures

List of Appendices

Report Limitations

This report has been prepared in accordance with generally accepted practices using standards of care and diligence normally practiced by recognized consulting firms performing services of a similar nature. This report presents our professional judgment based upon data and findings identified in this report and the interpretation of such data based on our experience and background, and no warranty, either expressed or implied, is made. The conclusions presented are based on the current regulatory climate and may require revision if future regulatory changes occur.

The findings identified in this report are predicated on the results of the limited sampling and laboratory testing performed. This report does not address impacts related to sources other than those specified herein.

The contents of this report reflect the views of Shaw Environmental, Inc., who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

SHAW ENVIRONMENTAL, INC.

Martha Adams

Martha Adams, P.E.
Project Manager

CALIFORNIA DEPARTMENT OF TRANSPORTATION
OFFICE OF ENVIRONMENTAL ENGINEERING - HAZARDOUS WASTE BRANCH

Reviewed by:	**Recommended by:**	**Approved by:**
Naveen Aachi Task Order Manager	Christopher R. Wilson, P.E. Senior Environmental Engineer	Allen Baradar, P.E., REA District Office Chief

Project Team

Contact	Affiliation	Responsibility
Christopher R. Wilson, P.E. (510) 286-5647	Department – District 4 Office of Environmental Engineering, Hazardous Waste Branch 111 Grand Avenue, 14th Floor Oakland, California 94623	Contract Manager
Naveen Aachi (510) 286-4914		Task Order Manager
Martha Adams, P.E. (916) 565-4183	Shaw Environmental, Inc. 1326 North Market Blvd Sacramento, California 95834	Project Manager
Benjamin Chevlen (916) 565-4353		Site Supervisor

Executive Summary

Shaw Environmental, Inc. conducted a soil investigation within the medians of State Routes (SR) 13, SR 24, and SR 580 in Alameda County, and SR 24 in Contra Costa County, California (Figure 1). The investigation was conducted to evaluate the presence and concentration of aerially deposited lead prior to anticipated construction activities by the California State Department of Transportation (Caltrans).

This investigation was conducted within the unpaved median areas and included the collection of soil samples to provide data for systematic evaluation of subsurface conditions within the Caltrans right-of-way.

Lead was reported in soil samples collected from the site. Total lead concentrations ranged from 6.84 to 7,740 milligrams per kilogram (mg/kg) in soil samples analyzed. The source for the lead is not known, however, it is thought to be related to accumulation of dust and debris containing lead from leaded gasoline emissions.

Lead concentrations were compared to Total Threshold Limit Concentration (TTLC) of 1,000 mg/kg, and Soluble Threshold Limit Concentration (STLC) of 5 milligrams per liter (mg/l) values to evaluate whether the soil would be considered a California-hazardous waste, should it become a waste. Fourteen soil samples analyzed during this investigation exceeded the TTLC value of 1,000 mg/kg for total lead. A total of 19 soil samples were reported to contain total lead in excess of 750 mg/kg, a level requiring waste disposal in a Class 1 facility. Forty-eight soil samples were reported to contain soluble lead at concentrations in excess of the STLC of 5 mg/l by the Waste Extraction Test (WET) analysis. Soil samples reported to contain soluble lead exceeding the STLC would be considered a California hazardous waste, should the soil become a waste.

Additionally, soil samples reported to contain total lead in excess of 1,000 mg/kg were further analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) to determine if the soil would be considered a hazardous waste under Resource Conservation and Recovery Act (RCRA). Eight of the 14 samples analyzed by the TCLP method exceeded 5.0 mg/l. If lead concentrations in TCLP extract exceed 5 mg/l, the soil is a RCRA hazardous waste per Title 40 Code of Federal Regulations Section 261 (40 CFR 261) and Title 22 California Code of Regulations Section 66261.24(a). RCRA hazardous waste must be treated to meet 40 CR 268 treatment standards prior to disposal.

Although soil at specific sample points may be classified as a California hazardous or RCRA waste, the mean concentration values for total lead data were less than 750 mg/kg within each section of median when surface samples of greater than 1,000 mg/kg of total lead are removed from the data set. This suggests that the soil, if treated as a whole, and sampled on a composite basis, may not require Class I disposal if boring locations with higher concentrations of total lead are segregated for special handling. The excavated soil would likely require soluble lead analysis by the WET, as the mean was greater than 50 mg/kg. If WET analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations greater than the STLC, as the predicted soluble lead concentrations are greater than 5 mg/l.

The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), has granted Caltrans a variance for soil considered hazardous due to the presence of elevated lead concentrations. The variance allows Caltrans to reuse lead-contaminated soil within Caltrans right-of-way in the roadway corridor boundaries under certain conditions.

Based on the statistical analysis conducted, the waste soil, if treated as a whole, and sampled on a composite basis from stockpiles generated during construction activities, may be considered a California hazardous waste, as the predicted STLC concentration is greater than 5.0 mg/l. Soil generated from construction along SR 580, with the exception of the surface soil near borings 5, 8, and 9, would likely be able to be reused under condition 1 of the DTSC variance. Soil generated from construction along SR 13, with the exception of surface soil near boring 8 and on SR 24 from depths of greater than 0.15 meters, would likely be able to be reused under condition 2 of the DTSC variance. Special handling and disposal procedures may be required to protect worker health and safety.

1.0 Introduction

This report has been prepared by Shaw Environmental, Inc. (Shaw) to present results of the soil investigation that was conducted along State Routes (SRs) 13, 24, and 580 in Alameda and Contra Costa Counties, California (Figure 1). This investigation was conducted at the request and authorization of Mr. Naveen Aachi of the California Department of Transportation (Caltrans) and in general accordance with Caltrans Contract 43A0078, Task Order Number 04-270701-CC.

1.1 Project Description

Shaw conducted a soil investigation in Alameda County within the medians of SR 13 between Kilo Posts (KP) 10.3 and 15.4, SR 24 between KP 7.1 and 9.6, and on SR 580 between KP 49.2 and 54.1 in Alameda County, and in Contra Costa County on SR 24 between KP 0.6 and 1.3, California (Figure 1). The investigation was conducted to evaluate the presence and concentration of aerially deposited lead (ADL) prior to anticipated construction activities by Caltrans.

Caltrans proposes to replace metal beam barriers with concrete median barriers (Type 60) in Alameda County on SR 13 between KP 10.3 and 15.4, on SR 24 between KP 7.1 and 9.6, and on SR 580 between KP 49.2 and 54.1, and in Contra Costa County on SR 24 between KP 0.6 and 1.3.

The site investigation included the advancement of 34 shallow soil borings using hand auger sampling equipment. Three soil samples per boring location were collected and retained for analysis from intervals at depths of 0.0 to 0.15 meters (0.0 to 0.5 feet), 0.15 to 0.30 meters (0.5 to 1.0 feet), and 0.30 to 0.60 meters (1.0 to 2.0 feet) below ground surface (bgs). A total of 95 soil samples were collected and submitted under chain-of-custody procedures for analysis by a California-certified analytical laboratory.

1.2 Project Objective

The objective of this soil investigation is to evaluate the presence and concentration of ADL in shallow soil within the project limits. The investigation provided data for systematic evaluation of subsurface conditions along the project limits. This investigation was conducted in areas of the anticipated construction activities proposed by Caltrans.

The analytical data obtained from this investigation will be used to assess worker health and safety issues, estimate removal and/or disposal costs, and determine the applicability of the Department of Toxic Substance Control (DTSC) variance for re-use of lead contaminated soil.

2.0 Scope of Work

The scope of work for the investigation was presented in Shaw's workplan dated September 4, 2003, which was approved for implementation by Caltrans (Shaw, 2003a). The following scope of work was conducted:

1. Planning and Permitting
2. Field Investigation
3. Laboratory Analyses
4. Site Investigation Report Preparation

2.1 Planning and Permitting

Planning and permitting included a pre-work site visit, and preparation of a work plan and health and safety plan.

Mr. Benjamin Chevlen and Mr. John Wharff of Shaw and Mr. Naveen Aachi of Caltrans conducted a pre-work site meeting and field reconnaissance on August 20, 2003. Items discussed and reviewed during the meeting included the scope of work, the site visit checklist, and the project schedule. The boring locations were then marked for Underground Service Alert (USA), and notification was submitted at least 48 hours prior to initiation of the field investigation.

A site-specific health and safety plan (Shaw 2003b) was prepared in general accordance with 29 CFR 1910.120. The health and safety plan included safety procedures for work to be performed at the site, chemical hazard information, site safety officers, and preferred medical emergency locations (Shaw, 2003b).

A boring permit was not required for this project. A Caltrans encroachment permit was not required since the task order constitutes Shaw's encroachment permit for the investigation. Caltrans provided the appropriate traffic control measures including shoulder closure and an attenuator truck, when needed, between the hours of 9:00 A.M. and 3:00 P.M.

All work was conducted within Caltrans right-of-way, between the hours of 9:00 A.M. and 3:00 P.M., in the unpaved portion of the median shoulder areas, where the shoulder was wide enough to allow for safe stopping of the sampling vehicle.

3.0 Field Investigation

The field investigation was conducted on September 24 and 25, 2003. The site investigation included the advancement of 34 shallow soil borings using hand-auger sampling equipment along the medians of SR 13, 24 and 580 (Figures 2-15). Where possible, the soil borings were advanced to a maximum depth of approximately 0.6 meters (2 feet) bgs. The soil boring locations were selected according to Caltrans' Task Order No. 04-270701-CC. Where possible, the borings were located next to the median barriers to be replaced. Depending on boring location conditions, three soil samples per boring were collected and retained for chemical analysis. The soil samples were collected from the following intervals.

- Surface to 0.15 meters (0.5 feet) BGS
- 0.15 to 0.3 meters (0.5 to 1.0 feet) BGS
- 0.3 to 0.6 meters (1.0 to 2.0 feet) BGS

Soil samples were labeled with the boring number, and the sample collection depth. For example, "SR-24-1-0.6" represents the first boring collected on SR 24 at a depth of 0.3 to 0.6 meters (1.0 to 2.0 feet) BGS. A total of 95 soil samples were collected during this investigation. The soil samples were collected in Ziploc® plastic bags. Following sample collection, the borings were backfilled with the remaining soil cuttings.

The ADL soil samples were labeled, packaged and stored on ice in an insulated chest for transport under chain-of-custody manifest to a California-certified analytical laboratory. Drilling and sampling procedures are presented in Appendix A.

All drilling and sampling equipment was washed prior to drilling. In addition, to minimize cross-contamination between borings, all appropriate sampling equipment was washed between borings. Wastewater generated during the field investigation was poured onto the ground, avoiding storm drains or conduits to surface water bodies, and allowed to soak into the soil. Solutions were poured onto the ground in such a way as to avoid runoff.

The horizontal and vertical locations of the borings were established using a Trimble GPS Pathfinder™ Pro XRS global positioning system (GPS). The GPS utilized a GPS receiver and MSK radio beacon differential receiver. The GPS is reported to have sub-meter accuracy for horizontal location of the borings. The vertical accuracy is reported to be two to five times that of the horizontal precision. The GPS data was downloaded in the office and Trimble software

was utilized to provide differential corrections to the coordinates. The coordinates were referenced to US State Plane 1983 and California Zone 3.

3.1 Laboratory Analyses

The soil samples collected and retained for analysis were submitted to Sparger Technology, Inc. (Sparger), of Sacramento, California, a California-certified analytical laboratory (ELAP #1614). Chain-of-custody procedures, including the use of chain-of-custody forms, were used to document sample handling and transport from the time of collection to delivery to the laboratory for analysis. The chain-of-custody forms and laboratory analytical reports are included in Appendix B.

A total of 95 soil samples were submitted for laboratory analysis. The analyses were conducted on a 5-day turn-around basis in general accordance with Environmental Protection Agency (EPA) specified holding times. The analyses were performed on selected samples in general accordance with the following methods.

Matrix	Analyses
Soil	ICAP EPA 6010: lead only (all soil samples)
Soil	Waste Extraction Test (WET) 22CCR 667000 Extraction and 6010 Analysis
Soil	Deionized Waste Extraction Test (DIWET) 22CCR 667000 Extraction and 6010 Analysis
Soil	Toxicity Characteristic Leaching Procedure (TCLP) EPA 1311
Soil	pH EPA 9045

Soil samples were analyzed for total lead in general accordance with EPA Method 6010. Soil samples reported to contain total lead concentrations in excess of 50 milligrams per kilogram (mg/kg) were further analyzed for soluble lead using the WET. The total lead concentration of 50 mg/kg was selected because it is 10 times the Soluble Threshold Limit Concentration (STLC) of 5.0 milligrams per liter (mg/l).

Samples with soluble lead concentrations greater than or equal to 5.0 mg/l were further analyzed for soluble lead by the WET using a DIWET. Soil samples exceeding 1,000 mg/kg of total lead were further analyzed using the TCLP.

A total of eight soil samples, chosen at random, were tested for pH.

4.0 Site Investigation Results

4.1 Lead Investigation Results

Soil sample analytical results are summarized on Table 1. The samples were segregated based on the highway that the sample was collected from. For SR 24, the samples were further segregated by depth (0 to 0.15 meters and 0.15 to 0.6 meters) due to high lead concentrations. Tests for pH were conducted on eight randomly selected soil samples. Reported pH values were between 6.6 and 8.6 standard units (Table 1).

4.1.1 SR 13

Total lead was reported in all 32 samples collected at concentrations ranging between 6.84 and 3,160 mg/kg. Nineteen soil samples were analyzed for soluble lead by the WET method with resulting concentrations ranging between 0.49 and 34.0 mg/l. Ten soil samples were analyzed by the DIWET method with concentrations ranging between 0.43 and 15.3 mg/l. One soil sample was submitted for analysis by the TCLP method with a reported concentration of 50.1 mg/l.

4.1.2 SR 24

4.1.2.1 0 to 0.15 Meters

Total lead was reported in all 14 soil samples collected at concentrations ranging between 44.5 and 7,740 mg/kg. Twelve soil samples were analyzed for soluble lead by the WET method with resulting concentrations ranging between 1.15 and 56.9 mg/l. Ten samples were analyzed by the DIWET method with concentrations ranging between 0.57 and 20.7 mg/l. Seven soil samples were submitted for analysis by the TCLP method with concentrations ranging between 1.63 and 83.9 mg/l.

4.1.2.2 0.15 to 0.6 Meters

Total lead was reported in all 22 soil samples collected at concentrations ranging between 8.09 and 1400 mg/kg. Twenty one soil samples were analyzed for soluble lead by the WET method with resulting concentrations ranging between 0.57 and 32.3 mg/l. Twelve samples were analyzed by the DIWET method with concentrations ranging between 0.43 and 5.7 mg/l. Three soil samples were submitted for analysis by the TCLP method with concentrations of 1.18, 19.1, and 47.6 mg/l.

4.1.3 SR 580

Total lead was reported in all 27 soil samples collected at concentrations ranging between 8.24 and 1,820 mg/kg. Twenty-four samples were analyzed for soluble lead by the WET method with resulting concentrations ranging between 1.68 and 41.6 mg/l. Sixteen samples were

analyzed by the DIWET method with concentrations ranging between 0.15 and 1.03 mg/l. Three samples were submitted for analysis by the TCLP method with concentrations ranging between 0.34 and 0.72 mg/l.

5.0 Data Evaluation

5.1 Lead Concentrations and Distribution

Soil samples collected from the site were reported to contain lead (Table 1). The source for the lead is not known. However, studies along the transportation corridors have attributed elevated lead concentrations within soil to accumulation of dust and debris-containing lead from leaded gasoline emissions (Coltrin, et al., 1993).

The soil samples containing the highest lead concentrations were collected from the surface to 0.15-meter depth interval. A summary of the distribution of the lead concentrations is presented below. The summary table is restricted to those samples reported to contain greater than or equal to 50 mg/kg lead, a level selected because it is 10 times the STLC.

		Distribution of Samples from Total Sample Population with Greater Than 50 mg/kg Lead		Distribution of Samples from Interval with Greater Than 50 mg/kg Lead		Distribution of Samples from All Samples with Greater Than 50 mg/kg Lead	
Sample Area	Sample Interval	Number	Percentage	Number	Percentage	Number	Percentage
SR 13	0.0 to 0.15 m	12 of 32	37.50	12 of 12	100.00	12 of 19	63.16
SR 13	0.15 to 0.3 m	6 of 32	18.75	6 of 12	50.00	6 of 19	31.58
SR 13	0.3 to 0.6 m	1 of 32	3.13	1 of 8	12.50	1 of 19	5.26

		Distribution of Samples from Total Sample Population with Greater Than 50 mg/kg Lead		Distribution of Samples from Interval with Greater Than 50 mg/kg Lead		Distribution of Samples from All Samples with Greater Than 50 mg/kg Lead	
Sample Area	Sample Interval	Number	Percentage	Number	Percentage	Number	Percentage
SR 24	0.0 to 0.15 m	13 of 36	36.11	13 of 14	92.86	13 of 33	39.39
SR 24	0.15 to 0.3 m	12 of 36	33.33	12 of 13	92.31	12 of 33	36.36
SR 24	0.3 to 0.6 m	8 of 36	22.22	8 of 9	88.89	8 of 33	24.24

		Distribution of Samples from Total Sample Population with Greater Than 50 mg/kg Lead		Distribution of Samples from Interval with Greater Than 50 mg/kg Lead		Distribution of Samples from All Samples with Greater Than 50 mg/kg Lead	
Sample Area	Sample Interval	Number	Percentage	Number	Percentage	Number	Percentage
SR 580	0.0 to 0.15 m	9 of 27	33.33	9 of 9	100.00	9 of 24	37.50
SR 580	0.15 to 0.3 m	9 of 27	33.33	9 of 9	100.00	9 of 24	37.50
SR 580	0.3 to 0.6 m	6 of 27	22.22	6 of 9	66.66	6 of 24	25.00

As shown above, the number of samples containing elevated lead concentrations decreased with depth. This is typical of accumulations of ADL, as reported by Coltrin and others (1993), where lead concentrations were observed to decrease with depth. An exception to this was in areas where accumulation of urban dust and debris continued following cessation of leaded gasoline use resulting in lower lead concentrations at shallower depths (Coltrin, et al., 1993). This may explain the results at some locations where elevated concentrations of lead were present in the deeper soil samples.

Lead concentrations were compared to total threshold limit concentrations (TTLC) (1,000 mg/kg) and STLC (5.0 mg/l) values to evaluate whether the soil would be considered a California hazardous waste, should it become a waste. Generally, TTLC and STLC values for lead are used to judge whether a waste is a California hazardous waste based on the total or soluble concentration of lead within the waste. The TCLP values are used to judge whether a waste is a Resource Conservation and Recovery Act (RCRA) hazardous waste (also known as a Federal hazardous waste) based on the soluble concentration of lead within the waste.

Fourteen soil samples were reported to contain total lead at a concentration in excess of the TTLC of 1,000 mg/kg. Soil samples reported to contain total lead exceeding the TTLC would be considered a California hazardous waste, should the soil become a waste. Additionally, soil samples reported to contain total lead in excess of 1,000 mg/kg were further analyzed using the TCLP to determine if the soil would be considered a hazardous waste under RCRA. Eight of the 14 samples analyzed by the TCLP method exceeded 5.0 mg/l. If lead concentrations in TCLP extract exceed 5 mg/l, the soil is a RCRA hazardous waste per Title 40 Code of Federal Regulations Section 261 (40 CFR 261) and Title 22 California Code of Regulations Section 66261.24(a). RCRA hazardous waste must be treated to meet 40 CR 268 treatment standards prior to disposal.

Forty-eight soil samples collected had soluble lead at concentrations in excess of the STLC of 5.0 mg/l by WET analysis. Soil samples reported to contain soluble lead exceeding the STLC would be considered a California hazardous waste, should the soil become a waste. Soil samples reported to contain soluble lead by the WET method exceeding the STLC were further analyzed by the WET method with deionized water extraction to evaluate applicability of the DTSC variance.

Soil samples at 19 boring locations exceeded total lead concentrations of 750 mg/kg and would require disposal at a Class I landfill should the soil at these locations become a waste.

The California Environmental Protection Agency, DTSC, granted Caltrans a variance for soil considered hazardous due to the presence of elevated lead concentrations (DTSC, 2000). The variance allows Caltrans to reuse lead-contaminated soil within Caltrans right-of-way in the roadway corridor boundaries under certain conditions if the soil is considered a non-RCRA waste. Assembly Bill 414 allows Caltrans to reuse soil with total lead concentrations of up to 1,496 mg/kg. However, within the jurisdiction of the Regional Water Quality Control Board, San Francisco Bay Region, Caltrans is restricted to total lead concentrations of less than 750 mg/kg, in accordance with HSC 25157.8. Therefore, in accordance with the variance and HSC 25157.8, the following conditions apply to Caltrans' re-use and management of soil impacted by ADL as fill material for construction and maintenance operations (DTSC, 2000):

1. As fill beneath at least one foot of clean (non-hazardous) soil and a minimum five feet above the maximum water table elevation if the soluble lead concentration reported by the DIWET analysis is less than 0.5 mg/l and the total lead concentration is less than 750 mg/kg. This condition applies only if the soil is not a RCRA waste.

2. As fill beneath a pavement structure designated to protect the soil from water infiltration and five feet above the water table if the soluble lead concentration reported by DIWET analysis is greater than 0.5 mg/l but less than 50 mg/l, and the total lead concentration is less than 750 mg/kg. This condition applies only if the soil is not a RCRA waste.

3. Lead-contaminated soil with a pH below 5 shall only be used as fill beneath the paved portion of the roadway. This condition applies only if the soil is not a RCRA waste.

5.2 Lead Data Statistical Analysis

To further evaluate the applicability of the DTSC variance (DTSC, 2000), Shaw conducted a statistical evaluation of lead analytical data for this project at the request of Caltrans. The statistical evaluation was conducted in general accordance with the procedures discussed in EPA Technology Support Center Issue (EPA, December 1997). A statistical evaluation was conducted to further evaluate the concentration of lead within soil at the site. The statistical evaluation addressed the following items:

- Calculation of mean;
- Determination of the distribution of the sample data; and
- Calculation of the 80% Confidence Intervals (CI) which provides the corresponding 90% Upper Confidence Level (UCL), interpreted as a 0.90 probability that the true mean for a given sample is no higher than the calculated UCL.

A value of one-half the detection limit was used for non-detect values. Soil data was segregated by SR, and in the case of SR 24, was further segregated by depth. The surface samples SR-13-08, SR-580-5, SR-580-8, and SR-580-9 were not included in the statistical populations due to high lead concentrations. Soil in these vicinities should be excavated and stockpiled separately to evaluate if the soil would be considered a RCRA or California hazardous waste.

Evaluation of the soil data for the SR 13 sample population resulted in an arithmetic mean (average) concentration of total lead of 146.50 mg/kg (Appendix C). Evaluation of the soil data for SR 24 for the 0 to 0.5 feet sample population and the 0.5 to 2 feet sample population resulted in average concentrations of total lead of 2,640.90 and 297.19 mg/kg, respectively. The average concentration of total lead in the SR 580 sample population was 284.33 mg/kg.

A histogram of the total lead results for each data set was constructed to evaluate the distribution of the total lead concentrations within the data sets. The data was found to be heavily skewed to lower concentrations (Appendix C). Therefore, statistical analysis was conducted using non-parametric techniques, which do not require that the data be drawn from a specific distribution (Gilbert, 1987).

The statistical analysis for the total lead data was conducted using the Bootstrap method (Efron, 1982) to estimate the 90% UCL for the mean of the total lead data. Bootstrap methods are non-parametric techniques to infer the distribution of a statistic derived from a data set. Bootstrap methods construct a "distribution" for a statistic (in this case the mean) by re-sampling with replacement from the data set. A large number (B) of data subsets of size n (where n is the size of the data subset) are selected. The statistic is computed for each of the B data subsets of size n. This gives a sample of values of the statistic, rather than one value. Confidence limits for the population parameter that is estimated by the Bootstrapped statistic are then constructed using percentiles of the sampled distribution of the statistic.

There are several variations on the nonparametric Bootstrap. Efron's empirical quantile method (Efron, 1982) applied to the mean was used to estimate the 90% UCL for the mean for the data sets. The calculated 90% UCLs for the total lead are presented below:

Location	Depth (ft)	90 Percent UCL
SR 13	0-2	197.19
SR 24	0-0.5	3406.9
SR 24	0.5-2	403.61
SR 580	0-2	356.26

Pearson (product moment) correlation coefficients (Pearson values) were obtained from regression analysis for regression lines fit to the data (Appendix C). Prior to calculation of the correlation coefficients, the total/soluble lead bivariate data were visually inspected for outliers. A scatter plot was generated for the total/soluble lead data set. As discussed in Gilbert (1987), data points outside the main "data cloud" were considered outliers, as they may not be from the same bivariate distribution as the remaining data points.

The correlation coefficient for the total/WET lead data for the various data sets ranged between 0.79 and 0.95, above or marginally below the minimum acceptable correlation coefficient value of 0.8, per Caltrans contract 43A0078. The correlation coefficient for the data indicates that acceptable correlation between total and WET soluble data does exist.

Expected soluble (WET) lead concentrations were obtained from regression analysis (model fit to the data) developed from the total and soluble lead data. The coefficient for the dependant variables (slope of regression line) used in the regression analyses and the total lead versus soluble lead concentration plots are presented in Appendix C. A summary of the statistical data is outlined below.

Area	Soil Interval (m)	Total Lead Mean (mg/kg)	Total Lead 90% UCL (mg/kg)	Predicted WET Lead Concentration (mg/l)	Predicted DIWET Lead Concentration (mg/l)
SR 13	0.0 to 0.6	146.50	197.19	8.46	1.14
SR 24	0.0 to 0.15	2640.90	3406.90	22.90	8.30
SR 24	0.15 to 0.6	297.19	403.61	7.03	1.43
SR 580	0.0 to 0.6	284.33	356.26	12.57	0.31

5.2.1 *Summary*

Although soil at specific points may be classified as a California hazardous or RCRA waste, the mean concentration values for total lead data were less than 750 mg/kg within each section of median when surface samples of greater than 1,000 mg/kg of total lead and soil from the top 0.15 meters of SR 24 are removed from the data set. This suggests that the soil, if treated as a whole, and sampled on a composite basis may not require Class 1 disposal if surface soil near boring locations reported to have higher concentrations of total lead are segregated for special handling.

The excavated soil would likely require soluble lead analysis by the WET, as the mean total lead was greater than 50 mg/kg. If WET analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations greater than the STLC, as predicted soluble lead concentrations are greater than 5 mg/l.

Soil generated from construction along SR 13, with the exception of surface soil near boring 8, and from depths of greater than 0.15 meters for SR 24 would likely be able to be reused under condition 2 of the DTSC variance. Soil generated from construction along SR 580, with the exception of surface soil near borings 5, 8, and 9 would likely be able to be reused under condition 1 of the DTSC variance.

6.0 Conclusions and Recommendations

Based on the laboratory results, current regulatory guidelines and the judgment of Shaw, the following conclusions and recommendations are offered:

- Lead was reported in soil samples collected within the project limits. The source for the lead is not known. However, studies along the transportation corridors have attributed elevated lead concentrations within soil to accumulation of dust and debris-containing lead from leaded gasoline emissions (Coltrin, et al., 1993).
- Lead concentrations were compared to the TTLC value to evaluate whether the soil would be considered a hazardous waste should it become a waste. Fourteen soil samples were reported to contain total lead concentrations that exceed the TTLC value of 1,000 mg/kg for lead. Eight TCLP results were above 5.0 mg/l, a level requiring disposal at a RCRA hazardous waste site.
- Forty-eight soil samples contained soluble lead at concentrations in excess of the STLC of 5.0 mg/l by WET analysis.
- The statistical evaluation resulted in the following data:

Area	Soil Interval (meters)	Total Lead Mean (mg/kg)	Total Lead 90% UCL (mg/kg)	Predicted WET Lead Concentration (mg/l)	Predicted DIWET Lead Concentration (mg/l)
SR 13	0.0 to 0.6	146.50	197.19	8.46	1.14
SR 24	0.0 to 0.15	2640.90	3406.9	22.90	8.30
SR 24	0.15 to 0.6	297.19	403.61	7.03	1.43
SR 580	0.0 to 0.6	284.33	356.26	12.57	0.31

- The mean concentrations for total lead data were less than 750 mg/kg in SR 13, SR 24 from 0.15 to 0.6 meters, and SR 580, when surface samples with total lead concentrations exceeding the TTLC value are removed from the statistical evaluation. This suggests that soil, if segregated based on analytical results during construction and sampled on a composite basis from the stockpiles generated, may not require Class I disposal.
- The mean concentrations for total lead data were greater than 750 mg/kg in soil from the top 0.15 meters of SR 24 and may require Class 1 disposal.
- The excavated soil from SR 13, SR 24, and SR 580 will likely require soluble lead analysis by the WET method as the means and 90% UCLs for total lead are greater than 50 mg/kg, a level that triggers WET analysis when considering soil disposal options.

- If management of the soil within the variance is required based on soluble lead concentrations, the statistical data indicated that the soil generated during construction activities on SR-13, and from SR-24 at depths below 0.15 meters, could be reused under condition 2 of the DTSC variance. Soil generated during construction activities on SR-580 could likely be reused under condition 1 of the DTSC variance.

7.0 References

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Gilbert, R. O., *Statistical Methods for Environmental Pollution Monitoring*: Van Nostrand Reinhold, New York, New York, 1987.

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TABLE 1

MAINLINE LEAD ANALYTICAL DATA AND GPS COORDINATES
Caltrans - RTE 13, 24, 580
Alameda and Contra Costa Counties, California
Task Order No. 04-270701-CC

Boring	Sample Designation (site - boring - depth)	Latitude	Longitude	MSL (feet)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
1	SR-24-01-.15	-	-	-	0.15	0.5	**6,180**	**27.9**	9.2	40.7	
	SR-24-01-.3				0.3	1.0	**203**	**7.19**	0.71		
	SR-24-01-.6				0.6	2.0	**121**	0.570			8.3
2	SR-24-02-.15	37.86601762	-122.2060678	907.247	0.15	0.5	**751**	**26.2**	1.26		7.3
	SR-24-02-.3				0.3	1.0	**172**	4.62			
	SR-24-02-.6				0.6	2.0	**181**	4.87			
3	SR-24-03-.15	37.86494174	-122.2075532	950.849	0.15	0.5	**4,640**	**29.9**	14.2	41.0	
	SR-24-03-.3				0.3	1.0	**284**	**6.49**	0.43		
	SR-24-03-.6				0.6	2.0	**230**	**5.87**	0.66		
4	SR-24-04-.15	37.85407711	-122.2196904	718.638	0.15	0.5	**1,530**	**15.0**	3.4	20.5	
	SR-24-04-.3				0.3	1.0	**325**	**10.9**	1.07		
	SR-24-04-.6				0.6	2.0	**67.5**	2.95			
5	SR-24-05-.15	37.85275203	-122.2211092	658.526	0.15	0.5	**6,110**	**56.9**	20.7	83.9	
	SR-24-05-.3				0.3	1.0	**1,400**	**12.5**	5.7	19.1	
	SR-24-05-.6				0.6	2.0	8.09				
6	SR-24-06-.15	37.85117893	-122.2217707	627.454	0.15	0.5	**232**	**9.67**	0.57		
	SR-24-06-.3				0.3	1.0	**75.5**	1.80			
7	SR-24-07-.15	37.8497206	-122.2227272	590.067	0.15	0.5	**7,740**	**47.1**	18.8	57.5	
	SR-24-07-.3				0.3	1.0	**872**	**32.3**	3.16		
	SR-24-07-.6				0.6	2.0	**247**	**9.94**	1.55		
8	SR-24-10-.3	37.84903963	-122.2286463	550.923	0.3	1.0	**5,310**	**39.2**	10.9	47.6	
9	SR-24-11-.15	-	-	-	0.15	0.5	**53.9**	1.15			
	SR-24-11-.3				0.3	1.0	**69.0**	1.29			
	SR-24-11-.6				0.6	2.0	**93.5**	2.64			6.6
10	SR-24-12-.15	-	-	-	0.15	0.5	**2,540**	**13.1**	5.9	3.88	
	SR-24-12-.3				0.3	1.0	**230**	**9.76**	0.86		
	SR-24-12-.6				0.6	2.0	**184**	**6.06**	0.61		
11	SR-24-13-.15	-	-	-	0.15	0.5	**174**	**5.46**	0.60		
	SR-24-13-.3				0.3	1.0	48.1				
12	SR-24-14-.15	37.84969893	-122.2361506	418.163	0.15	0.5	**1,490**	**8.00**	3.6	1.63	
	SR-24-14-.3				0.3	1.0	**1,020**	**6.48**	2.4	1.18	
	SR-24-14-.6				0.6	2.0	**532**	**20.3**	2.18		
13	SR-24-15-.15	-	-	-	0.15	0.5	**177**	4.05			
	SR-24-15-.3				0.3	1.0	**92.1**	1.57			
14	SR-24-16-.15	-	-	-	0.15	0.5	44.5				
	SR-24-16-.3				0.3	1.0	**83.3**	2.69			
15	SR-13-01-.15	37.8109003	-122.1968469	656.124	0.15	0.5	**507**	**12.3**	1.04		
	SR-13-01-.3				0.3	1.0	14.9				
	SR-13-01-.6				0.6	2.0	25.1				
16	SR-13-02-.15	-	-	-	0.15	0.5	**449**	**21.9**	2.52		
	SR-13-02-.3				0.3	1.0	31.7				
	SR-13-02-.6				0.6	2.0	**56.2**	0.720			
17	SR-13-03-.15	37.81483922	-122.2006561	578.123	0.15	0.5	**189**	**11.8**	0.43		
	SR-13-03-.3				0.3	1.0	**226**	0.490			
	SR-13-03-.6				0.6	2.0	12.0				
18	SR-13-04-.15	37.81701907	-122.2023001	553.406	0.15	0.5	**94.8**	1.77			8.4
	SR-13-04-.3				0.3	1.0	**178**	4.75			
	SR-13-04-.6				0.6	2.0	35.7				
19	SR-13-05-.15	37.81914578	-122.2040355	527.645	0.15	0.5	**174**	**6.05**	0.50		
	SR-13-05-.3				0.3	1.0	**146**	4.88			
20	SR-13-06-.15	37.82123211	-122.2057521	496.337	0.15	0.5	**684**	**34.0**	5.07		
	SR-13-06-.3				0.3	1.0	23.3				
21	SR-13-07-.15	37.82337275	-122.2074741	550.497	0.15	0.5	**322**	**15.7**	1.62		
	SR-13-07-.3				0.3	1.0	**296**	**10.5**	0.85		
22	SR-13-08-.15	37.82562529	-122.2093218	587.474	0.15	0.5	**3,160**	**29.7**	15.3	50.1	
	SR-13-08-.3				0.3	1.0	14.5				8.6
	SR-13-08-.6				0.6	2.0	8.66				
23	SR-13-09-.15	37.82744725	-122.2108073	625.909	0.15	0.5	**63.3**	1.78			
	SR-13-09-.3				0.3	1.0	10.5				
	SR-13-09-.6				0.6	2.0	10.8				
24	SR-13-10-.15	37.82950788	-122.2126902	631.098	0.15	0.5	**85.7**	2.32			
	SR-13-10-.3				0.3	1.0	**63.4**	1.87			
	SR-13-10-.6				0.6	2.0	20.4				
25	SR-13-11-.15	-	-	-	0.15	0.5	**131**	3.63			
	SR-13-11-.3				0.3	1.0	**350**	**29.7**	5.20		
26	SR-13-12-.15	-	-	-	0.15	0.5	**292**	**7.29**	0.55		
	SR-13-12-.3				0.3	1.0	6.84				7.8
	SR-13-12-.6				0.6	2.0	19.7				

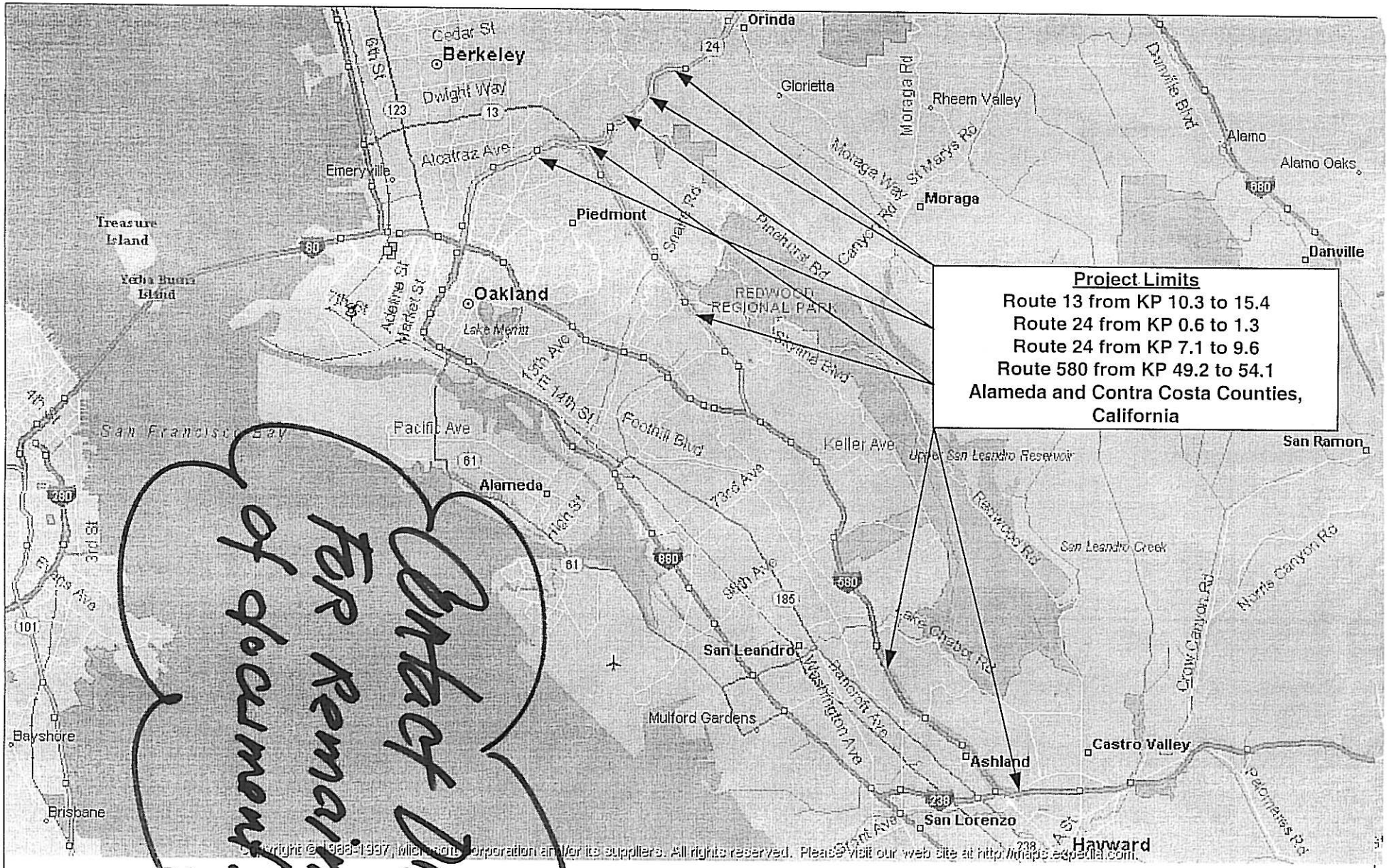
TABLE 1

MAINLINE LEAD ANALYTICAL DATA AND GPS COORDINATES
Caltrans - RTE 13, 24, 580
Alameda and Contra Costa Counties, California
Task Order No. 04-270701-CC

Boring	Sample Designation (site - boring - depth)	Latitude	Longitude	MSL (feet)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
27	SR-580-01-.15	-	-	-	0.15	0.5	**307**	**13.3**	0.30		
	SR-580-01-.3				0.3	1.0	**370**	**11.3**	0.19		
	SR-580-01-.6				0.6	2.0	**62.6**	1.87			
28	SR-580-02-.15	37.71430481	-122.1299424	74.538	0.15	0.5	**58.6**	2.94			
	SR-580-02-.3				0.3	1.0	**54.0**	2.47			
	SR-580-02-.6				0.6	2.0	24.8				
29	SR-580-03-.15	-	-	-	0.15	0.5	**438**	**19.2**	0.34		
	SR-580-03-.3				0.3	1.0	**254**	**7.75**	0.18		
	SR-580-03-.6				0.6	2.0	8.24				
30	SR-580-04-.15	-	-	-	0.15	0.5	**91.2**	1.68			7.2
	SR-580-04-.3				0.3	1.0	**72.6**	1.69			
	SR-580-04-.6				0.6	2.0	**70.6**	1.74			
31	SR-580-05-.15	-	-	-	0.15	0.5	**1,330**	**11.4**	1.0	0.720	
	SR-580-05-.3				0.3	1.0	**759**	**41.6**	0.91		
	SR-580-05-.6				0.6	2.0	**833**	**32.2**	1.03		
32	SR-580-06-.15	-	-	-	0.15	0.5	**697**	**21.1**	0.59		
	SR-580-06-.3				0.3	1.0	**349**	**8.46**	0.17		
	SR-580-06-.6				0.6	2.0	**121**	3.95			
32	SR-580-07-.15	37.70043627	-122.1078766	130.104	0.15	0.5	**371**	**11.9**	0.31		
	SR-580-07-.3				0.3	1.0	**314**	**13.4**	0.72		7.6
	SR-580-07-.6				0.6	2.0	45.3				
33	SR-580-08-.15	37.69849868	-122.1059343	131.613	0.15	0.5	**1,820**	**12.7**	0.8	0.680	
	SR-580-08-.3				0.3	1.0	**238**	**8.35**	0.18		
	SR-580-08-.6				0.6	2.0	**56.0**	2.13			
34	SR-580-09-.15	37.69645573	-122.1041064	142.877	0.15	0.5	**1,280**	**6.00**	0.3	0.340	
	SR-580-09-.3				0.3	1.0	**885**	**19.5**	0.28		
	SR-580-09-.6				0.6	2.0	**344**	**9.44**	0.15		
TTLC							1,000				
STLC								5.0			
Reporting Limits							1	0.050	0.010	0.050	0.10

Notes:

1. Analyses conducted in general accordance with EPA Method 6010 for lead and EPA Method 9045 for soil pH.
2. Sample depths reported in approximate meters (m) / feet (ft) below ground surface.
3. TTLC = total threshold limit concentration. STLC = soluble threshold limit concentration. WET = waste extraction test. DI WET = WET with deionized water extraction solution. TCLP = toxicity characteristic leaching procedure.
4. WET conducted in general accordance with California Title 22 procedures.
5. Total lead results reported in milligrams per kilogram. WET, DI WET, and TCLP results reported in milligrams per liter. pH results reported in standard units.
6. Soil samples labeled as follows: route no.-boring no.-depth. Ex.: SR580-01-0.15 ,state route 580, boring 01, 0.15-meter depth.
7. For total results, bold results exceed 10 times the STLC.
8. For WET results, bold results exceed the STLC.
9. ND = not detected above reporting limit.
10. Latitude and longitude converted to decimal format.



Reference:
Microsoft Expedia, Streets 98

Not to Scale

Figure 1

Site Location Map
Routes 13, 24, 580.
Alameda and Contra Costa Counties, CA

Shaw™ Shaw Environmental, Inc.