

FOR CONTRACT NO.: 04-264H64

INFORMATION HANDOUT

MATERIALS INFORMATION

SITE INVESTIGATION REPORT
(Volume I of III: State Route 101 Sonoma County, California)

CONTRACT 04-263904 ELECTRICAL PLAN AS-BUILT
(Sheets E-1 TO E-7)

ROUTE: 04-Son-12,101-R15.5/R16.0, 2.0/22.4

Site Investigation Report – Volume I of III

State Route 101

Sonoma County, California



PREPARED FOR:

CALIFORNIA DEPARTMENT OF TRANSPORTATION

DISTRICT 4

OFFICE OF ENVIRONMENTAL ENGINEERING, HAZARDOUS WASTE BRANCH

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CONTRACT NO.: 43A0078

TASK ORDER NO.: 04-263900-CH



Shaw Environmental, Inc.

SITE INVESTIGATION REPORT

SOIL, GROUNDWATER, AND ASBESTOS INVESTIGATION STATE ROUTE 101 PROJECT SANTA ROSA, SONOMA COUNTY, CALIFORNIA

March 4, 2004

Prepared for:

California Department of Transportation
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**Task Order No.: 04-263900-CH
Contract No.: 43A0078
EA Nos.: 263900 & 245400**

Project No.: 845467.01010000

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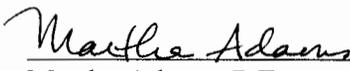
Project No.: 845467.01010000

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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.



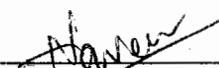
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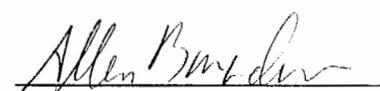
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Executive Summary

Shaw Environmental, Inc. (Shaw) conducted a soil, groundwater, and asbestos containing material (ACM) investigation along and in the vicinity of State Route (SR) 101 between the SR 12 Interchange and Bicentennial Way Interchange in Santa Rosa, Sonoma County, California (Figure 1). This investigation was conducted at the request and authorization of Mr. Naveen Aachi of the California Department of Transportation (Caltrans) Task Order No. 04-263900-CH, Contract No. 43A0078.

In order to reduce congestion and increase traffic circulation, Caltrans proposes freeway improvements within the subject site. Part I is a freeway widening project that widens SR 101 from four to six lanes for high occupancy vehicle (HOV) use from the Steele Lane Undercrossing to south of the Bicentennial Way Overcrossing (OC) in the city of Santa Rosa, Sonoma County. Part II is a freeway widening project that widens SR 101 from four to six lanes for HOV use from SR 12 to Steele Lane Undercrossing and also the widening of the SR 12 eastbound and westbound connecting ramps to southbound SR 101 in the city of Santa Rosa, Sonoma County.

Work for this investigation was performed within Caltrans right-of-way (ROW) along SR 101 and at the 4th Street viaduct, and outside Caltrans ROW in areas proposed to be acquired by Caltrans. The investigation was conducted for soil characterization along SR 101, soil and groundwater characterization for parcels along College Avenue and SR 101, and inspection of bridge structures for ACMs. This investigation involved three separate tasks to meet the projects objectives.

The first objective was to screen soil that will be excavated from the site during the proposed construction activities along SR 101 (Parts I and II) by evaluating the presence and concentration of aurally deposited lead (ADL) in shallow soil. A total of 117 shallow borings were advanced for ADL sampling along SR 101 (Parts I and II). The shallow borings were advanced to depths of approximately 1.2 meters (4 feet) below ground surface to allow characterization of ADL distribution in shallow subsurface soils. A total of 426 ADL soil samples were collected and submitted for analysis.

The second objective was to evaluate properties that may require acquisition by Caltrans for the proposed improvements by performing soil and groundwater sampling to evaluate the presence or absence of petroleum hydrocarbons, fuel oxygenates, polychlorinated biphenyl's, volatile organic compounds (VOCs), semi-VOCs (SVOCs), and heavy metals in soil and groundwater.

A total of 25 deep borings were advanced for soil and groundwater sampling. Caltrans selected five properties located outside of State ROW for investigation. In addition, the Steele Lane OC, College Avenue OC, and the 4th Street Viaduct were included in the subsurface investigation. A total of 46 soil samples were collected and submitted for analyses during this subsurface investigation. Groundwater grab samples were collected from 23 boring locations.

The third objective was to inspect bridge structures and screen material for suspected ACMs. Forty-four bulk samples were collected from suspected ACMs from seven bridge structures identified by Caltrans to be affected by the proposed construction activities.

The results from this investigation will be used to determine the applicability of the California Environmental Protection Agency (EPA), Department of Toxic Substances Control (DTSC) variance for re-use of lead contaminated soil along SR 101, soil handling and disposal procedures, evaluate soil and groundwater conditions at parcels along College Avenue and SR 101, and assess worker health and safety issues.

ADL Investigation

Lead was reported in 424 of the 426 samples collected at concentrations ranging between 1.35 and 5,030 milligrams per kilogram (mg/kg). Eighty-one samples were further analyzed for soluble lead by the waste extraction test (WET). Soluble lead concentrations ranged between 0.424 and 287 milligrams per liter (mg/l).

Lead concentrations were compared to the total threshold limit concentration (TTLC) of 1,000 mg/kg and the soluble threshold limit concentration (STLC) of 5.0 mg/l to evaluate whether the soil would be considered a hazardous waste, should it become a waste. Soil with total lead concentrations in excess of the TTLC (1,000 mg/kg) and/or soluble lead by the WET in excess of the STLC (5 mg/l) would be considered a California hazardous waste, should the soil become a waste. Thirteen soil samples exceeded the TTLC of 1,000 mg/kg and 56 soil samples exceeded the STLC of 5 mg/l within the project limits. Soil at 46 boring locations would be considered a California hazardous waste, should the soil become a waste, based on the total and soluble lead results.

Soil with soluble lead by the toxicity characteristic leaching procedure (TCLP) in excess of the STLC (5 mg/l) would be considered a Resource Conservation Recovery Act (RCRA) hazardous waste, should the soil become a waste. Surface soil at four boring locations (HA-036, BP-083, BP-103, and BP-111) would be considered a RCRA hazardous waste, should the soil become a waste, based on the TCLP soluble lead results.

Soil at specific sample points may be classified as a hazardous waste, however, the data from all intervals were combined into one data set for analysis. The statistical analysis for the total lead data was conducted to estimate the 90 percent Upper Confidence Level (UCL) for the mean of the total lead data. The results of the statistical evaluation are summarized below.

Area	Total Lead Mean (mg/kg)	Total Lead 90% UCL (mg/kg)	Predicted WET Lead Concentration (mg/l)	Predicted DIWET Lead Concentration (mg/l)	Predicted TCLP Lead Concentration (mg/l)
SR 101	114.16	148.47	7.10	0.995	0.27

Based on the statistical analyses performed, the excavated soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities would be classified as a California hazardous waste based on the soluble lead data. The soil could be reused under condition 2 of the DTSC variance. Condition 2 of the DTSC variance states soil can be reused 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 deionization waste extraction test (DIWET) analysis is greater than 0.5 mg/l but less than 50 mg/l, and the total lead concentration is less than 1,411 mg/kg. This condition applies only if the soil is not a RCRA waste.

Based on the statistical analysis, the entire ADL soil data was segregated into Part I and Part II data sets, respectively. In addition, soil sample results from the 0.3 meters (1 foot) sample interval from borings HA-036, BP-083, BP-103, and BP-111 were removed from the sample populations since their respective TCLP values were greater than 5 mg/l. The soil sample results from the 0.3 meters (1 foot) sample interval from boring BP-122 was also removed from the sample populations since this sample location had the highest reported concentrations of total lead (5,030 mg/kg) and soluble WET lead (287 mg/l). The associated TCLP was 4.77 mg/l. The statistical analysis assumes that the soil in the vicinity of borings HA-036, BP-083, BP-103, BP-111, and BP-122 will be excavated separately and handled as one waste stream. The results of the statistical evaluation for the areas designated Part's I and II are summarized below.

Area	Total Lead Mean (mg/kg)	Total Lead 90% UCL (mg/kg)	Predicted WET Lead Concentration (mg/l)	Predicted DIWET Lead Concentration (mg/l)	Predicted TCLP Lead Concentration (mg/l)
Part I	63.04	99.08	3.08	0.57	-
Part II	82.64	105.04	4.93	0.58	0.09

Based on the statistical analyses performed, the excavated soil from Part I would not be classified as a California hazardous waste, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities. Based on the statistical analyses performed, the excavated soil from Part II, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities would not be classified as a California hazardous waste. As the soil from Parts I and II respectively would not be considered a hazardous waste, special handling and disposal procedures are not required, except as needed to protect worker health and safety.

Soil in the vicinity of borings HA-036, BP-083, BP-103, BP-111, and BP-122 should be excavated separately and stockpiled to evaluate disposal options. If the construction work is staged in a manner that segregates the excavated soil in the vicinity of borings HA-036, BP-083, BP-103, BP-111, and BP-122, waste soil from these areas may be considered a hazardous waste. Special handling and disposal procedures may be required, and special procedures may need to be implemented to protect worker health and safety.

Under the direction of Caltrans, the data set was further segregated into specific layers for characterization. Based on the statistical analyses, the soil classified as a California hazardous waste could be reused under Condition 2 of the DTSC Variance. The areas where the soil can be considered a California hazardous waste are listed below:

- The soil collected from the upper 0.3 meter (1 foot) of the shoulder area in Part I, if it were to become a waste, would be considered California hazardous waste.
- The soil from the upper 0.3 meter (1 foot) of the shoulder areas in Part II, if it were to become a waste, would be considered a California hazardous waste.
- The soil collected from the upper 0.3 meter (1 foot) of the College Avenue on-ramp and off-ramp to and from southbound SR 101 would be considered a California hazardous waste. At the location of the Steele Lane on-ramp, northbound SR 101, the top 0.3 meter (1 foot) would be considered a California hazardous waste. All the excavated soil from northbound SR 101 on-ramp and off-ramp to and from College Avenue would be considered a California hazardous waste.

Deep Boring Soil and Groundwater Investigation

Soil results were compared to EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soil (EPA, 2002). PRGs have not been established for total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd), motor oil (TPHmo), and oil and grease (O&G). As a result, analytical results were compared to environmental screening levels (ESLs) for residential land

use, established by the California Regional Water Quality Control Board, San Francisco Bay Region.

Groundwater analytical results were compared to California Department of Health Services Drinking Water Maximum Contaminant Levels (MCLs) and EPA Region 9 PRGs for tap water, where established. A summary of each site is outlined below:

Luther Burbank Elementary School Site

A summary of the deep boring soil investigation includes the following:

- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the respective ESL.
- A low concentration of acetone, a VOC, was reported at a concentration less than the residential PRG.
- The VOC 2-butanone was reported in one sample; however, there is no established PRG for 2-butanone.
- A low concentration of bis(2-ethylhexyl)phthalate, a SVOC, was reported at a concentration less than the residential PRG.
- Low concentrations of metals were reported at concentrations below their respective PRGs.
- Arsenic was reported at concentrations that exceeded the residential PRG cancer endpoint of 0.39 mg/kg but did not exceed the non-cancer endpoint of 22 mg/kg.
- After considering background concentrations in a local area, EPA Region 9 has at times used the non-cancer residential PRG of 22 mg/kg to evaluate sites recognizing that this value tends to be above background levels, yet still falls within the range of soil concentrations (0.39 to 39 mg/kg) that equates to EPA's "acceptable" cancer risk range of 10E-6 to 10E-4 (EPA, 2002).
- One total lead concentration exceeded the residential PRG.
- Chromium was reported at concentrations exceeding 10 times the STLC value.
- Lead was reported at concentrations exceeding 10 times the STLC value.
- Soluble lead was reported at concentrations that exceeded the STLC value. Soil at specific boring locations at this site (borings B-2, B-3, and B-5) may be considered a California hazardous waste based on the soluble lead concentrations reported in individual soil samples collected at these three boring locations.

A summary of the groundwater investigation includes the following:

- A low concentration of barium was reported at a concentration less than the ESL.

Shell Site

A summary of the deep boring soil investigation includes the following:

- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the ESL or residential PRG.
- A low concentration of acetone, a VOC, was reported at a concentration less than the residential PRG.
- Low concentrations of metals were reported at concentrations below their respective PRGs.
- Chromium was reported at concentrations exceeding 10 times the STLC value.
- Lead was reported at concentrations exceeding 10 times the STLC value.

A summary of the groundwater investigation includes the following:

- TPHg was reported in one groundwater sample at a concentration that exceeded the ESL.
- Low concentrations of copper were reported at concentrations above the ESL.
- A low concentration of zinc was reported at a concentration above the ESL.
- Based on the analytical results, a degradation of groundwater quality has occurred at this site.

Midas Site

A summary of the deep boring soil investigation includes the following:

- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the respective ESL.
- Low concentrations of VOCs were reported at concentrations less than the residential PRG.
- Low concentrations of metals were reported at concentrations below their respective PRGs.
- Chromium was reported at concentrations exceeding 10 times the STLC value.
- Lead was reported at concentrations exceeding 10 times the STLC value.

A summary of the groundwater investigation includes the following:

- A low concentration of copper was reported at a concentration above the ESL.
- Based on the analytical results, a degradation of groundwater quality has occurred at this site.

Mission Car Wash Site

A summary of the deep boring soil investigation includes the following:

- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the respective ESL.
- Low concentrations of VOCs were reported at concentrations less than the residential PRG.
- The SVOCs benzo(a)anthracene, benzo(a)pyrene, and benzo(k)fluoranthene were reported at concentrations that exceeded their respective PRGs.
- Low concentrations of SVOCs were reported at concentrations less than the respective residential PRG.
- Low concentrations of metals were reported at concentrations below their respective PRGs.
- Arsenic was reported at concentrations that exceeded the residential PRG cancer endpoint of 0.39 mg/kg but did not exceed the non-cancer endpoint of 22 mg/kg.
- After considering background concentrations in a local area, EPA Region 9 has at times used the non-cancer residential PRG of 22 mg/kg to evaluate sites recognizing that this value tends to be above background levels, yet still falls within the range of soil concentrations (0.39 to 39 mg/kg) that equates to EPA's "acceptable" cancer risk range of 10E-6 to 10E-4 (EPA, 2002).
- Chromium was reported at concentrations exceeding 10 times the STLC value.

A summary of the groundwater investigation includes the following:

- TPHg was reported in one groundwater sample at a concentration that exceeded the ESL.
- The reported concentration of lead exceeded the ESL.
- A low concentration of copper was reported at a concentration above the ESL.
- Based on the analytical results, a degradation of groundwater quality has occurred at this site.

Steele Lane OC

A summary of the deep boring soil investigation includes the following:

- TPHmo was reported in a sample that exceeded the ESL.
- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the ESL or residential PRG.
- Low concentrations of VOCs were reported at concentrations less than the residential PRG.
- Low concentrations of metals were reported at concentrations below their respective PRGs.
- Arsenic was reported at a concentration that exceeded the residential PRG cancer endpoint of 0.39 mg/kg and the non-cancer endpoint of 22 mg/kg.
- Chromium was reported at concentrations exceeding 10 times the STLC value.
- Lead was reported at concentrations exceeding 10 times the STLC value.
- Soluble lead was reported at a concentration that exceeded the STLC value. Soil in the vicinity of boring S-2-1 at this site may be considered a California hazardous waste based on the soluble lead concentrations reported in the surface soil sample.

A summary of the groundwater investigation includes the following:

- TPHg and TPHd were reported in groundwater samples at concentrations that exceeded the ESLs
- Based on the analytical results, a degradation of groundwater quality has occurred at this site.

4th Street Viaduct

A summary of the deep boring soil investigation includes the following:

- TPHmo was reported in a sample that exceeded the ESL.
- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the ESL or residential PRG.
- Low concentrations of VOCs were reported at concentrations less than the residential PRG.
- Low concentrations of metals were reported at concentrations below their respective PRGs.

- Arsenic was reported at a concentration that exceeded the residential PRG cancer endpoint of 0.39 mg/kg and the non-cancer endpoint of 22 mg/kg.
- Chromium was reported at concentrations exceeding 10 times the STLC value.
- Lead was reported at concentrations exceeding 10 times the STLC value.
- Soluble lead was reported at a concentration that exceeded the STLC value. Soil in the vicinity of boring S-2-1 at this site may be considered a California hazardous waste based on the soluble lead concentrations reported in the surface soil sample.

A summary of the groundwater investigation includes the following:

- A low concentration of copper was reported at a concentration above the ESL.
- The VOC PCE was detected in the groundwater sample at a concentration, which did not exceed the ESL.
- Based on the analytical results, a degradation of groundwater quality has occurred at this site.

College Avenue OC

A summary of the deep boring soil investigation includes the following:

- TPHmo was reported in a sample that exceeded the ESL.
- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the ESL or residential PRG.
- Low concentrations of VOCs were reported at concentrations less than the residential PRG.
- Low concentrations of metals were reported at concentrations below their respective PRGs.
- Arsenic was reported at a concentration that exceeded the residential PRG cancer endpoint of 0.39 mg/kg and the non-cancer endpoint of 22 mg/kg.
- Chromium was reported at concentrations exceeding 10 times the STLC value.
- Lead was reported at concentrations exceeding 10 times the STLC value.
- Soluble lead was reported at a concentration that exceeded the STLC value. Soil in the vicinity of boring S-2-1 at this site may be considered a California hazardous waste based on the soluble lead concentrations reported in the surface soil sample.

A summary of the groundwater investigation includes the following:

- Lead was reported in one groundwater sample at a concentration equal to the Action Level and exceeded the ESL.
- Low concentrations of copper were reported at concentrations above the ESL at five sites.
- Based on the analytical results, a degradation of groundwater quality has occurred at this site.

Chevron Site

A summary of the deep boring soil investigation includes the following:

- TPHmo was reported in a sample that exceeded the ESL.
- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the ESL or residential PRG.
- Low concentrations of VOCs were reported at concentrations less than the residential PRG.
- Low concentrations of metals were reported at concentrations below their respective PRGs.
- Arsenic was reported at a concentration that exceeded the residential PRG cancer endpoint of 0.39 mg/kg and the non-cancer endpoint of 22 mg/kg.
- Chromium was reported at concentrations exceeding 10 times the STLC value.
- Lead was reported at concentrations exceeding 10 times the STLC value.
- Soluble lead was reported at a concentration that exceeded the STLC value. Soil in the vicinity of boring S-2-1 at this site may be considered a California hazardous waste based on the soluble lead concentrations reported in the surface soil sample.

A summary of the groundwater investigation includes the following:

- MTBE was reported at concentrations less than the ESL.
- Based on the analytical results, a degradation of groundwater quality has occurred at this site.

Asbestos Survey

Seven bridge structures were included in the asbestos survey. Forty-four bulk samples were collected and analyzed for ACM. Fibrous asbestos material was reported in only one bulk

sample. This sample was collected from joint material obtained from the Olive Street bridge structure and was reported to have 10 percent chrysotile asbestos fibers.

Fibrous joint material encountered in the Olive Street bridge structure should be considered to be Presumed Asbestos Containing Material (PACM) and suitable asbestos precautions should be implemented for worker health and safety and for debris disposal. Fibrous joint material that may be encountered in the retrofit of the bridges inspected should be considered to be PACM and suitable asbestos containment and precautions should be implemented when this material is handled.

Other than the fibrous joint material, the bridge structures do not contain any detectable ACM. Therefore, worker health and safety or disposal procedures related to asbestos are not necessary for the majority of the work that will be conducted.

1.0 Introduction

This report presents the results of the soil, groundwater, and asbestos containing material (ACM) investigation conducted along and in the vicinity of State Route (SR) 101, between the SR 12 Interchange and Bicentennial Way Interchange in Santa Rosa, Sonoma County, California (Figure 1). This investigation was conducted at the request and authorization of Mr. Naveen Aachi of the California Department of Transportation (Caltrans) Task Order No. 04-263900-CH, Contract No. 43A0078.

Work for this investigation was performed within Caltrans right-of-way (ROW) along SR 101, and outside Caltrans ROW in areas that may require acquisition by Caltrans for the proposed construction activities.

1.1 Project Description

In order to reduce congestion and increase traffic circulation, Caltrans proposes freeway improvements within the subject site. Five properties outside of Caltrans ROW may require acquisition by Caltrans for the proposed construction projects. The five sites selected by Caltrans for investigation are located at the Steele Lane Overcrossing (OC), College Avenue OC, and the 4th Street Viaduct.

Part I is a freeway widening project that widens SR 101 from four to six lanes for high occupancy vehicle (HOV) use from the Steele Lane Undercrossing (UC) to south of the Bicentennial Way OC in the city of Santa Rosa, Sonoma County (Kilo Post [KP] 34.8/35.7, Post Mile [PM] 21.6/22.2). This project will also involve widening of the northbound on-ramp of the Steele Lane Interchange, widening of the local street (Steele Lane) within the limits of the interchange, replacement of the Steele Lane UC structure, and construction of one soundwall.

Part II is a freeway widening project that widens SR 101 from four to six lanes for HOV use from SR 12 to Steele Lane UC and also the widening of the SR 12 eastbound and westbound connecting ramps to southbound SR 101 in the city of Santa Rosa, Sonoma County (KP 31.4/34.8, PM 19.5/21.6). This project will also involve the widening of both the northbound and southbound College Avenue off-ramps near the intersection with College Avenue. The southbound Steele Lane on-ramp will also be realigned to accommodate SR 101 widening, and increase the ramp capacity. The northbound Steele Lane on-ramp and off-ramp will also be widened. Part II also involves replacement of the Santa Rosa Creek Bridge, SR 101 Bridge at the College Avenue UC, the construction of an additional left turn lane onto northbound SR 101 on eastbound Steele Lane, and the SR 101 Bridge at the Steele Lane UC.

1.2 Project Objectives

The results from this investigation will be used to determine the applicability of the California Environmental Protection Agency (EPA), Department of Toxic Substances Control (DTSC) variance for re-use of lead contaminated soil along SR 101, soil handling and disposal procedures, and assess worker health and safety issues. This investigation involved three separate tasks to meet the projects objectives, which are outlined below:

1. The first objective was to screen soil that will be excavated from the site during the proposed construction activities along SR 101 (Parts I and II) by evaluating the presence and concentration of aerially deposited lead (ADL) in shallow soil.
2. The second objective was to evaluate eight properties that may require acquisition by Caltrans for the proposed improvements by performing soil and groundwater sampling to evaluate the presence or absence of petroleum hydrocarbons, fuel oxygenates, polychlorinated biphenyl's (PCBs), volatile organic compounds (VOCs), semi-VOCs (SVOCs), and heavy metals in soil and groundwater.
3. The third objective was to inspect bridge structures and screen material for suspected ACMs.

2.0 Scope of Work

The scope of work for the investigation was presented in Shaw Environmental, Inc.'s (Shaw's) workplan dated July 11, 2003, which was approved, for implementation by Caltrans (Shaw, 2003a). The following scope of work was conducted:

1. Permitting and Mobilization
2. Field Investigation
3. Laboratory Analyses
4. Investigation-Derived Waste Disposal
5. Site Investigation Report Preparation

2.1 Planning and Permitting

Planning and permitting included a pre-work site visit, preparation of a workplan and health and safety plan (HSP), and acquisition of required permits.

A pre-work site visit was conducted at the site on July 8, 2003, and was attended by Mr. David Foley, Mr. Ben Chevlen, and Mr. Mike Wademan of Shaw and Mr. Naveen Aachi and Mr. Abdullah Akram of Caltrans. Locations for soil borings were observed and marked, and the scope of work and objectives were discussed.

A site-specific HSP (Shaw, 2003b) was prepared for the site in general accordance with 29 CFR 1910.120 and Title 8, California Code of Regulations, Section 5192. The HSP included safety procedures for work to be performed at the site, chemical hazard information, identification of site safety officers, and preferred medical emergency locations.

A drilling permit was obtained from the Sonoma County Public Works Agency for the soil borings. Caltrans obtained "Permits to Enter" for work performed on parcels outside the Caltrans ROW. Copies of the Sonoma County drilling permit and the Caltrans "Permits to Enter" are presented in Appendix A.

2.2 Field Investigation

The field investigation was conducted on July 14 through 17, July 23, July 29 and 30, August 11 through 13, and September 2 and 3, 2003. Precision Sampling, Inc. (Precision), of San Rafael, California provided the direct-push drilling and sampling services. The fieldwork included using direct push (Geoprobe®) sampling equipment for the advancement of 117 shallow borings for ADL sampling along SR 101 (Parts I and II), and 25 deep borings for soil and

groundwater sampling at selected sites. Certain boring locations along SR 101 (Parts I and II) were advanced using hand-auger sampling equipment due to accessibility constraints. Boring locations were selected by Caltrans in accordance with Caltrans' Task Order No. 04-263900-CH.

All drilling and sampling equipment was washed prior to use. In addition, to minimize cross-contamination between borings, all appropriate downhole drilling and sampling equipment was washed between borings. Wash water generated during the field investigation was contained in a United Nations approved 208-liter (55-gallon) drum for disposal. Excess soil cuttings generated during the direct-push boring activities was contained in a United Nations approved 208-liter (55-gallon) drum for disposal.

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 horizontal and vertical datums used for this investigation was the California Coordinate System of 1983 (CCS83), Zone 2, and the North American Vertical Datum of 1988 (NAVD88), respectively. The standard unit of measurement for both of these datums was the meter. The boring positions are presented in GIS database format in Tables 1 and 2. The locations of the borings are shown in Figures 2 through 11.

2.2.1 ADL Soil Sample Collection

A total of 117 shallow borings were advanced for ADL sampling along SR 101 (Parts I and II). The shallow borings were advanced to depths of approximately 1.2 meters (4 feet) below ground surface (BGS) to allow characterization of ADL distribution in shallow subsurface soils along SR 101. Certain boring locations along SR 101 (Parts I and II) were advanced using hand-auger sampling equipment due to accessibility constraints. ADL soil samples retained for analyses were collected from depths of approximately 0.3, 0.6, 0.9, and 1.2 meters (1, 2, 3, and 4 feet) BGS. A total of 426 ADL soil samples were collected during this site investigation.

Soil samples were collected using a Geoprobe® rig equipped with an approximate 5-centimeter (2-inch) diameter, 1.2-meter (4 foot) long sampler lined with an acetate sleeve. Soil samples were retained, by cutting an approximately 0.15-meter (6-inch) section of the acetate sleeve for each sample depth interval. The acetate sleeve was immediately capped and labeled. Some boring locations along SR 101 (Parts I and II) were advanced using hand-auger sampling equipment due to accessibility constraints. ADL soil samples collected using hand-auger

sampling equipment were placed directly into resealable plastic baggies. Drilling and sampling procedures are included in Appendix B.

The ADL soil samples were labeled, packaged, and stored on ice in insulated chests for transport under chain-of-custody manifest to a California Department of Health Services Environmental Laboratory Accreditation Program (DHS-ELAP) laboratory. The borings were backfilled with neat cement grout.

2.2.2 Deep Boring Soil and Groundwater Sample Collection

The site locations selected by Caltrans for soil and groundwater sampling are listed below:

- Luther Burbank Elementary School Site 203 A Street, Santa Rosa
- Shell Station Site (Shell Site) 266 College Avenue, Santa Rosa
- Midas Auto Service Site (Midas Site) 131 College Avenue, Santa Rosa
- Mission Car Wash Site 257 College Avenue, Santa Rosa
- Steele Lane OC SR 101 ROW
- 4th Street Viaduct SR 101 ROW
- College Avenue OC SR 101 ROW
- Chevron Site 136 College Avenue, Santa Rosa

A total of 25 deep borings were advanced for soil and groundwater sampling. The boreholes were advanced to depths ranging from 4.8 to 8.4 meters (16 to 28 feet) BGS to allow for sufficient groundwater flow for groundwater grab sample collection. At the 4th Street Viaduct site, the sampling device could not penetrate further than 0.6 meters (2 feet) BGS due to subsurface obstructions at two boring locations. As a result, groundwater grab samples could not be collected at two locations (B-18-S-1 and B-19-S-1). At the Chevron site, soil samples could not be recovered from boring B-23 due to subsurface conditions, however, a groundwater grab sample was collected from this boring.

Soil samples were collected using a Geoprobe[®] rig equipped with an approximate 5-centimeter (2-inch) diameter, 1.2-meter (4 foot) long sampler lined with an acetate sleeve. Soil samples were collected at the surface and groundwater interface (capillary fringe). Soil samples were retained by cutting an approximately 0.15-meter (6-inch) section of the acetate sleeve for each selected sample depth interval. The acetate sleeve was immediately capped and labeled. A total of 46 soil samples were collected from the five parcels during this investigation.

Groundwater grab samples were collected from 23 borings advanced on the five subject parcels. Groundwater was encountered approximately 1.5 and 5.8 meters (5 to 19 feet) BGS. To facilitate groundwater sampling a temporary well casing was inserted into each boring. The casing consisted of approximately 2.5-centimeter (1-inch) diameter, Schedule 40, flush-threaded, 0.05-centimeter (0.020-inch), machine-slotted polyvinyl chloride well screen joined to blank casing. Groundwater grab samples were collected using dedicated disposable polyethylene bailers. Groundwater grab samples were transferred from the bailers to laboratory-supplied containers appropriate for the analytical methods selected. A total of 23 groundwater samples were collected during this investigation.

A Shaw staff geologist, under the supervision of a California Registered Geologist, logged the borings in general accordance with the Unified Soil Classification System. Soil samples were field screened using a photo-ionization detector (PID). Drilling and sampling procedures are included in Appendix B. Boring logs are included in Appendix C.

The soil and groundwater grab samples were labeled, packaged, and stored on ice in an insulated chest for transport under chain-of-custody manifest to a California Department of Health Services Environmental Laboratory Accreditation Program (DHS-ELAP) laboratory. Soil and groundwater sampling procedures are presented in Appendix B.

Following groundwater sample collection, the borings were backfilled with bentonite cement grout mixture from the bottom of the borehole to ground surface. Drill cuttings were placed into a 208-liter (55-gallon) United Nations-approved drum.

2.2.3 Asbestos Survey

The expansion of the roadways proposed by Caltrans will require some destruction of the existing structures. The investigation included a visual inspection to locate and document the existence and quantities of suspected ACMs. Mr. Rudolph Von Burg, a certified asbestos inspector, performed the asbestos survey of the bridge structures located within the project area that will be impacted by the proposed improvements of SR 101. The bridges included in the asbestos survey are listed below.

- Steele Lane UC (Bridge No. 20-0221)
- College Avenue OC (Bridge No. 20-0145)
- 9th Street UC (Bridge No. 20-0134)
- Santa Rosa Creek (Bridge No. 20-0034)
- Sonoma Avenue POC, Pedestrian Bridge (Bridge No. 20-0219)
- Olive Street UC (Bridge No. 20-0205OR)
- Santa Rosa OH, Railroad Bridge (Bridge No. 20-0204R)

The field survey included a visual inspection to locate and document the existence of suspected ACMs in the existing bridge structures. Access to the structural components of the bridges was limited by high-speed traffic, steep slopes and fencing. Samples were collected by using a cold chisel and sledge hammer at opportunistic and accessible points along the bridge structure. Five to eight samples were obtained from each structure. The chisel was dry decontaminated between samples by using a clean paper towel. The samples were immediately placed into plastic bags that could be hermetically sealed, labeled and delivered to the analytical laboratory. Forty-four bulk samples were collected from suspected ACMs. Photographs of the OCs and structural elements typically sampled can be found in Appendix E. Sampling procedures are included in Appendix B.

2.3 Laboratory Analysis

2.3.1 Soil and Groundwater

The soil and groundwater samples collected for analysis were submitted to Sparger Technology, Inc. (Sparger), of Sacramento, California, a DHS-ELAP 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 laboratories for analysis. The chain-of-custody forms and laboratory analytical reports are included in Appendix D. The analyses were conducted on a standard turn-around basis in general accordance with EPA specified holding times. The analyses were performed on selected samples in general accordance with the following methods.

Matrix	Analysis	EPA Method
Soil/ADL	Lead only for Parts I and II	6010
Soil	pH (10 percent of all soil samples)	9045
Soil/Water	CAM 17 Metals (Groundwater samples were filtered at the laboratory in general accordance with Standard Method 302A prior to metal analyses)	6010
Soil/Water	Total Petroleum Hydrocarbons as Gasoline (TPHg)	8015M
Soil/Water	Total Petroleum Hydrocarbons as Diesel (TPHd)	8015M
Soil/Water	Total Petroleum Hydrocarbons as Motor Oil (TPHmo)	8015M
Soil/Water	Oil and Grease (O&G)	1664
Soil/Water	PCBs	8082
Soil/Water	Benzene, toluene, ethylbenzene, xylenes (BTEX)	8260B
Soil/Water	Fuel Oxygenate Compounds	8260B
Soil/Water	VOCs	8260B
Soil/Water	SVOCs	8270C

A total of 426 ADL 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) and less than 1,000 mg/kg were further analyzed for soluble lead using the waste extraction test (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). A total of 81 soil samples were analyzed for soluble lead by the WET.

ADL samples with soluble lead concentrations greater than or equal to 5.0 mg/l (STLC) were further analyzed for soluble lead by the WET using a deionized water extraction (DI WET). A total of 56 soil samples exceeded the STLC of 5.0 mg/l and were analyzed for soluble lead by the DI WET.

ADL samples with total lead concentrations greater than the Total Threshold Limit Concentration (TTLC) of 1,000 mg/kg were further analyzed for soluble lead by the Toxicity Characteristic Leaching Procedure (TCLP). A total of 13 soil samples exceeded the TTLC of 1,000 mg/kg and were analyzed for soluble lead by the TCLP.

Subsurface soil samples reported to contain total heavy metal concentrations in excess of ten-times their STLC were further analyzed for soluble metal concentrations. Soluble metal analyses were conducted for barium, chromium, lead, and silver on selected soil samples. Thirty-four soluble metals analyses and one TCLP analysis were performed.

A total of 45 soil samples, chosen at random by Caltrans, were tested for pH.

Certified analytical reports and chain-of-custody forms are included in Appendix D.

2.3.2 Asbestos

Samples for analyses of suspected ACM were submitted to EMSL Analytical, Inc., (EMSL) of Milpitas, California. EMSL is certified by the Department of Commerce's National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NAVLAP).

A total of 44 bulk samples of suspected ACM from the bridge structures were analyzed using Polarized Light Microscopy (PLM) in accordance with EPA-600/R-93/116.

Certified analytical reports and chain-of-custody forms are included in Appendix D.

2.4 Investigation-Derived Waste Disposal

Soil cuttings from the drilling and equipment rinsate were placed in separate United Nations (UN) approved 208-liter (55-gallon) drums for temporary storage on Caltrans property. Each drum was labeled with its contents, origin of contents, contact name, and date generated.

3.0 Site Investigation Results

3.1 Site Geology

The site is mapped as being underlain by alluvium (Wright, 1988). Lithologies encountered during drilling consisted primarily of clay interbedded with thin lenses of gravels, sands, and silts. Water-saturated sediments were encountered at depths ranging from 1.5 to 5.8 meters (5 to 19 feet) BGS. The depths to first groundwater varied with boring and site location.

3.2 ADL Soil Analytical Results

Lead was reported in 424 of the 426 samples collected at concentrations ranging between 1.35 and 5,030 mg/kg. Eighty-one samples were further analyzed for soluble lead by the WET. Soluble lead concentrations ranged between 0.424 and 287 mg/l. Soil samples with soluble lead concentrations greater than the STLC of 5.0 µg/l were further analyzed by the DI WET. Fifty-six soil samples were further analyzed for soluble lead by DI WET, and concentrations ranged between 0.276 and 37.5 mg/l. Thirteen samples were submitted for analysis by the TCLP. Soluble lead concentrations by TCLP ranged between 0.243 and 14.3 mg/l. Tests for pH values were conducted on 45 soil samples. Reported pH values were between 4.9 and 9.8 standard units. ADL soil sample analytical results are summarized on Table 1.

Lead concentrations were compared to TTLC (1,000 mg/kg) and STLC (5.0 mg/l) values to evaluate whether the soil would be considered a hazardous waste, should it become a waste. Soil with total lead concentrations in excess of the TTLC (1,000 mg/kg) and/or soluble lead by the WET in excess of the STLC (5 mg/l) would be considered a California hazardous waste, should the soil become a waste.

Thirteen soil samples exceeded the TTLC of 1,000 mg/kg and 56 soil samples exceeded the STLC of 5 mg/l within the project limits. Soil at 46 boring locations would be considered a California hazardous waste, should the soil become a waste, based on the total and soluble lead results.

Soil with soluble lead by the TCLP in excess of the STLC (5 mg/l) would be considered a Resource Conservation Recovery Act (RCRA) hazardous waste, should the soil become a waste. Four surface soil samples exceeded the STLC by TCLP within the project limits. Surface soil at four boring locations (HA-036, BP-083, BP-103, and BP-111) would be considered a RCRA hazardous waste, should the soil become a waste, based on the TCLP soluble lead results.

3.3 Deep Boring Soil Analytical Results

A total of 25 deep borings were advanced at properties located outside of Caltrans ROW along SR 101 to evaluate subsurface soil conditions at each respective site prior to acquisition. The sites selected by Caltrans for investigation are located at the Steele Lane OC, College Avenue OC, and the 4th Street Viaduct. Soil samples were collected at the surface and groundwater interface (capillary fringe) from each boring. A total of 46 soil samples were collected during this investigation. The soil samples were analyzed for TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, fuel oxygenate compounds, VOCs, and SVOCs and metals. A summary of soil analytical results are presented on Tables 4 through 6.

3.3.1 Luther Burbank Elementary School Site

Ten soil samples were collected from five borings and submitted for analyses. TPHg, TPHd, BTEX, PCBs, and fuel oxygenates were not reported at concentrations above their respective analytical method reporting limits. TPHmo were reported in four surface soil samples at concentrations ranging from 16 to 140 mg/kg. No soil sample collected from the five borings at depths of 3 to 6 meters (10 to 20 feet) BGS reported detectable concentrations of TPHmo. Six samples were reported to contain O&G at concentrations ranging from 60 to 1,140 mg/kg. With the exception of boring B-3, concentrations of O&G decreased with depth.

The VOCs acetone and 2-butanone were reported in one sample at concentrations of 66 and 9.5 micrograms per kilogram ($\mu\text{g}/\text{kg}$), respectively. No other VOCs were detected. Bis2-ethylhexylphthalanate, a SVOC, was reported in one soil sample at a concentration of 1,130 $\mu\text{g}/\text{kg}$. No other SVOCs were detected. Arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, vanadium and zinc were reported in soil samples collected from the site. The concentrations and metals reported in the soil samples collected from the Burbank School site are listed below.

Arsenic	<8.0 to 10 mg/kg	Lead	4.7 to 510 mg/kg
Barium	94 to 231 mg/kg	Mercury	0.043 to 0.22 mg/kg
Cadmium	<0.50 to 0.6 mg/kg	Nickel	25 to 74 mg/kg
Chromium	50 to 82 mg/kg	Vanadium	32 to 51 mg/kg
Cobalt	14 to 22 mg/kg	Zinc	40 to 169 mg/kg
Copper	22 to 39 mg/kg		

Chromium and lead were reported at concentrations exceeding 10 times their respective STLC values. Five soil samples were analyzed for soluble chromium by the TCLP. TCLP results were below the analytical reporting limit of 0.05 mg/l. Four soil samples were analyzed for soluble lead by the WET. The soluble lead concentrations range from 2.75 to 20.7 mg/l. The sample with a soluble lead (WET) concentration of 20.7 mg/l (B-5-S-1) was further analyzed for soluble lead by the TCLP. The soluble lead concentration by TCLP was 1.32 mg/l.

3.3.2 Shell Site

Six soil samples were collected from three borings and submitted for analyses. TPHd, PCBs, and SVOCs were not reported at concentrations exceeding the analytical method reporting limits. TPHg and benzene were reported in one sample collected at the capillary fringe in boring 9 at concentrations of 2.02 and 0.025 mg/kg, respectively. TPHmo were reported in three surface soil samples at concentrations ranging from 11 to 51 mg/kg. TPHmo was not reported in samples collected at 3 meters (10 feet) BGS. Three samples were reported to contain O&G at concentrations ranging from 60 to 260 mg/kg. Methyl tert-butyl ether (MTBE) was reported in all three borings in the soil samples collected at the capillary fringe at concentrations ranging from 1.0 to 11 µg/kg. Acetone, a VOC, was reported in one soil sample at a concentration of 19 µg/kg. No other VOCs were detected. Barium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, vanadium, and zinc were reported in some soil samples from the site. The concentrations of metals reported in the soil samples collected from the Shell site are listed below.

Barium	147 to 235 mg/kg	Mercury	0.038 to 0.20 mg/kg
Chromium	69 to 103 mg/kg	Molybdenum	<5.0 to 170 mg/kg
Cobalt	17 to 28 mg/kg	Nickel	39 to 187 mg/kg
Copper	38 to 98 mg/kg	Vanadium	39 to 44 mg/kg
Lead	7.2 to 66 mg/kg	Zinc	66 to 111 mg/kg

Chromium and lead were reported at concentrations exceeding 10 times their respective STLC values. Two soil samples were analyzed for soluble lead by the WET and the soluble lead concentrations were 2.16 and 1.69 mg/l. Three samples were analyzed for soluble chromium by the TCLP. TCLP results for chromium were below the analytical method reporting limit of 0.05 mg/l.

3.3.3 Midas Site

Six soil samples were collected from three borings and submitted for analysis. TPHd, BTEX, PCBs, fuel oxygenates, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits. TPHg were reported in one surface soil sample at a concentration of 2.4 mg/kg. TPHmo were reported in one soil sample at a concentration of 27 mg/kg. Four samples were reported to contain O&G at concentrations ranging from 60 to 240 mg/kg. Acetone, a VOC, was reported in one surface soil sample at a concentration of 15 µg/kg. A VOC, 4-isopropyltoluene, was reported in all three surface soil samples at concentrations ranging from 2.1 to 26 mg/kg. No other VOCs were detected.

The metals and concentrations reported in the soil samples collected from the Midas site are listed below.

Barium	151 to 204 mg/kg	Mercury	<0.010 to 0.06 mg/kg
Chromium	71 to 114 mg/kg	Nickel	126 to 183 mg/kg
Cobalt	18 to 25 mg/kg	Vanadium	41 to 56 mg/kg
Copper	25 to 41 mg/kg	Zinc	58 to 106 mg/kg
Lead	5.7 to 63 mg/kg		

Chromium and lead were reported at concentrations exceeding 10 times their respective STLC values. One soil sample was analyzed for soluble lead by the WET. The soluble lead concentration was 1.98 mg/l. Three samples were analyzed for soluble chromium by the TCLP. TCLP results for chromium were below the analytical method reporting limit of 0.05 mg/l.

3.3.4 Mission Car Wash Site

Six soil samples were collected from three borings and submitted for analyses. TPHd, O&G, PCBs, and fuel oxygenates were not reported at concentrations exceeding their respective analytical method reporting limits. TPHg were reported in the two samples collected in boring 14 at concentrations of 3.8 and 6.9 mg/kg. Benzene was also reported in these two soil samples at concentrations of 0.019 and 0.062 mg/kg. Total xylenes were reported in the surface soil sample in boring 14 at a concentration of 0.022 mg/kg. TPHmo were reported in two surface soil samples at concentrations of 13 and 24 mg/kg. VOCs were reported in the soil samples collected from borings 14 and 15 and the compounds and concentrations are summarized below:

Acetone	<2.0 to 86 µg/kg	1,3,5-Trimethylbenzene	<2.0 to 13 µg/kg
Benzene	<2.0 to 35 µg/kg	n-Butylbenzene	<2.0 to 7.6 µg/kg
Ethylbenzene	<2.0 to 2.2 µg/kg	sec-Butylbenzene	<2.0 to 7.0 µg/kg
Naphthalene	<2.0 to 2.8 µg/kg	tert-Butylbenzene	<2.0 to 36 µg/kg
Isopropylbenzene	<2.0 to 37 µg/kg	Total xylenes	<2.0 to 32.4 µg/kg
n-Propylbenzene	<2.0 to 33 µg/kg		

SVOCs were reported in the surface soil sample collected from boring 15 at the Mission Car Wash site, and the compounds and concentrations are listed below:

Anthracene	352 µg/kg	Chrysene	875 µg/kg
Benzo (a) anthracene	853 µg/kg	Fluoranthene	1,610 µg/kg
Benzo (a) pyrene	640 µg/kg	Phenanthrene	936 µg/kg
Benzo (b) fluoranthene	458 µg/kg	Pyrene	1,340 µg/kg
Benzo (k) fluoranthene	493 µg/kg		

The following metals and concentrations reported in the soil samples collected from the Mission Car Wash site are listed below:

Arsenic	<8.0 to 11 mg/kg	Lead	6.5 to 38 mg/kg
Barium	134 to 261 mg/kg	Mercury	0.04 to 0.19 mg/kg
Chromium	60 to 114 mg/kg	Nickel	24 to 122 mg/kg
Cobalt	15 to 26 mg/kg	Vanadium	42 to 57 mg/kg
Copper	30 to 50 mg/kg	Zinc	64 to 88 mg/kg

Three soil samples were analyzed for soluble chromium by the TCLP. TCLP results for chromium were below the analytical method reporting limit of 0.05 mg/l.

3.3.5 Steele Lane OC

Eight soil samples were collected from four borings and submitted for analyses. TPHd, PCBs, fuel oxygenates, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits. TPHg and toluene were reported in one sample collected at the capillary fringe in boring 16 at concentrations of 7.5 and 0.009 mg/kg, respectively. TPHmo were reported in the two soil samples collected in boring S-2 at concentrations of 110 and 170 mg/kg. O&G were reported in four soil samples at concentrations ranging from 140 to 3,740 mg/kg.

The following VOCs and the reported concentrations in soil samples collected from the Steele Lane OC site are summarized below:

Acetone	<2.0 to 14 µg/kg	n-Propylbenzene	<2.0 to 25 µg/kg
Ethylbenzene	<2.0 to 9.2 µg/kg	1,3,5-Trimethylbenzene	<2.0 to 27 µg/kg
4-Isopropyltoluene	<2.0 to 2.0 µg/kg	1,2,4-Trimethylbenzene	<2.0 to 61 µg/kg
Isopropylbenzene	<2.0 to 6.0 µg/kg	Total xylenes	<2.0 to 11 µg/kg

The metals and reported concentrations in the soil samples collected from the Steele Lane OC site are listed below:

Arsenic	<8.0 to 36 mg/kg	Lead	7.1 to 92 mg/kg
Barium	111 to 233 mg/kg	Mercury	0.028 to 0.14 mg/kg
Chromium	51 to 133 mg/kg	Nickel	84 to 129 mg/kg
Cobalt	11 to 28 mg/kg	Vanadium	28 to 68 mg/kg
Copper	22 to 45 mg/kg	Zinc	36 to 86 mg/kg

Four soil samples were analyzed for soluble chromium by the TCLP. TCLP results for chromium were below the analytical method reporting limit of 0.05 mg/l. One soil sample was analyzed for soluble lead by the WET. The soluble lead concentration was 24.3 mg/l.

3.3.6 4th Street Viaduct

Four samples were collected from three borings and submitted for analyses. TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, fuel oxygenates, VOCs, and SVOCs were not reported in the soil samples at concentrations exceeding their respective analytical method reporting limits.

The metals and reported concentrations in the soil samples collected from the 4th Street Viaduct site are listed below:

Arsenic	<8.0 to 8.2 mg/kg	Lead	5.2 to 24 mg/kg
Barium	50 to 208 mg/kg	Mercury	0.057 to 0.11 mg/kg
Beryllium	<0.30 to 0.57 mg/kg	Nickel	<4.0 to 96 mg/kg
Chromium	6.2 to 102 mg/kg	Vanadium	9.4 to 55 mg/kg
Cobalt	<5.0 to 25 mg/kg	Zinc	28 to 103 mg/kg
Copper	9.8 to 39 mg/kg		

One soil sample was analyzed for soluble chromium by the TCLP. The TCLP result for chromium was below the analytical method reporting limit of 0.05 mg/l.

3.3.7 College Avenue OC

Four samples were collected from two borings and submitted for analyses. TPHg, BTEX, TPHd, PCBs, fuel oxygenates, VOCs, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits in any of the samples. TPHmo were reported in two soil samples at concentrations of 25 and 33 mg/kg. O&G were reported in the two surface soil samples at concentrations of 140 and 160 mg/kg. The metals and concentrations reported in the soil samples collected from the College Avenue OC site are listed below:

Arsenic	<8.0 to 15 mg/kg	Mercury	0.057 to 0.16 mg/kg
Barium	149 to 1,090 mg/kg	Nickel	74 to 141 mg/kg
Chromium	89 to 100 mg/kg	Silver	<1.0 to 51 mg/kg
Cobalt	12 to 21 mg/kg	Vanadium	<5.0 to 53 mg/kg
Copper	35 to 41 mg/kg	Zinc	<1.5 to 129 mg/kg
Lead	7.4 to 112 mg/kg		

Two soil samples were analyzed for soluble chromium by the TCLP and soluble lead by the WET. TCLP results for chromium were below the analytical method reporting limit of 0.05 mg/l. The soluble lead concentrations were 2.63 and 4.88 mg/l. Two soil samples were analyzed for soluble barium and soluble silver by the WET. The WET concentration for barium

was 64.2 mg/l. The WET concentration for silver was below the analytical reporting limit of 0.05 mg/l.

3.3.8 Chevron Site

Two soil samples were collected from one boring and submitted for analyses. TPHg, BTEX, TPHd, O&G, PCBs, fuel oxygenates, VOCs, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits in either of the samples. TPHmo were reported in the surface soil sample at a concentration of 12.9 mg/kg. The following metals and concentrations reported in the soil samples collected from the Chevron site are listed below:

Arsenic	<8.0 and 8.9 mg/kg	Lead	7.9 and 24 mg/kg
Barium	183 and 594 mg/kg	Mercury	0.055 and 0.12 mg/kg
Cadmium	<0.50 and 0.55 mg/kg	Nickel	<4.0 and 139 mg/kg
Chromium	21 and 89 mg/kg	Vanadium	31 and 49 mg/kg
Cobalt	9.2 and 20 mg/kg	Zinc	71 and 1,170 mg/kg
Copper	31 and 49 mg/kg		

One soil sample was analyzed for soluble chromium by the TCLP. The TCLP result for chromium was below the analytical method reporting limit of 0.05 mg/l.

3.4 Groundwater Analytical Results

Groundwater grab samples were collected from parcels that may be acquired by Caltrans as part of the proposed construction activities. Groundwater grab samples were analyzed for TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, fuel oxygenates, VOCs, SVOCs, and metals. Groundwater grab sample analytical results are summarized on Tables 7 through 9.

3.4.1 Luther Burbank Elementary School Site

Five groundwater samples were collected and submitted for analyses. TPHg, BTEX, TPHd, TPHmo, PCBs, fuel oxygenates, VOCs, and SVOCs were not reported in samples at concentrations exceeding their respective analytical method reporting limits. Barium was the only metal detected in groundwater. Barium was reported in all five groundwater samples at concentrations ranging from 0.10 and 0.17 mg/l.

3.4.2 Shell Site

Three groundwater samples were collected and submitted for analyses. BTEX, TPHmo, O&G, PCBs, VOCs, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits. One groundwater sample (boring B-9) reported a non-typical TPH pattern in the gasoline range at a concentration of 2,700 micrograms per liter ($\mu\text{g}/\text{l}$) and a non-typical TPH pattern in the diesel range at a concentration of 250 $\mu\text{g}/\text{l}$. MTBE was reported in all three groundwater samples at concentrations ranging from 45.0 to 430 $\mu\text{g}/\text{l}$. Tertiary butanol (TBA) was reported in one groundwater sample (boring B-9) at a concentration of 750 $\mu\text{g}/\text{l}$. Barium, copper and zinc were reported in all three groundwater samples at concentrations up to 0.34, 0.06 and 0.09 mg/l, respectively.

3.4.3 Midas Site

Three groundwater samples were collected and submitted for analyses. TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, VOCs, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits. MTBE was reported in two samples at concentrations of 2.4 and 14 $\mu\text{g}/\text{l}$. Barium and zinc were reported in all three groundwater samples at concentrations of up to 0.33 and 0.062 mg/l, respectively. Copper was reported in one groundwater sample at a concentration of 0.024 mg/l.

3.4.4 Mission Car Wash Site

Three groundwater samples were collected and submitted for analyses. TPHd, TPHmo, O&G, PCBs, and SVOCs were not reported in any of the samples at concentrations exceeding their respective analytical method reporting limits. TPHg were reported in all three groundwater samples at concentrations ranging from 110 to 660 $\mu\text{g}/\text{l}$. The laboratory reported a non-typical TPH pattern in the gasoline range for two of the samples. Ethylbenzene and total xylenes were reported in one sample (boring B-13) at concentrations of 0.66 and 1.9 $\mu\text{g}/\text{l}$, respectively. MTBE was reported in one sample (boring B-15) at a concentration of 5.5 $\mu\text{g}/\text{l}$. Low concentrations of VOCs, n-butylbenzene, isopropylbenzene, n-propylbenzene, and naphthalene were reported at concentrations of 3.6, 3.3, 11, and 2.8 $\mu\text{g}/\text{l}$, respectively. Barium and zinc were reported in all three groundwater samples at concentrations up to 0.47 and 0.04 mg/l, respectively. Copper was reported in one sample at a concentration of 0.03 mg/l.

3.4.5 Steele Lane OC

Four groundwater samples were collected and submitted for analyses. TPHmo, O&G, PCBs, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limit. TPHg were reported in two samples (borings B-16 and S-2) at concentrations of 790 and 1,400 $\mu\text{g}/\text{l}$, respectively. TPHd were also reported in borings B-16 and S-2 at

concentrations of 140 and 3,400 µg/l, respectively. Ethylbenzene and total xylenes were reported in one groundwater sample (boring B-16) at concentrations of 2.8 and 5.8 µg/l, respectively. MTBE was reported in one groundwater sample (boring S-2) at a concentration of 4.06 µg/l. VOCs 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, and total xylenes were reported in groundwater at concentrations of 3.4, 7.7, and 2.5 µg/l, respectively. Barium was reported in all four groundwater samples at concentrations up to 0.35 mg/l. Zinc was reported in one sample at a concentration of 0.04 mg/l.

3.4.6 4th Street Viaduct

One groundwater sample was collected and submitted for analyses. TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, fuel oxygenates, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits. Tetrachloroethene (PCE) was reported in the groundwater sample at a concentration of 5.2 µg/l. Barium, copper and zinc were reported in the groundwater sample at concentrations of 0.72, 0.02, and 0.05 mg/l, respectively.

3.4.7 College Avenue OC

Two groundwater samples were collected and submitted for analyses. TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, VOCs, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits. MTBE was reported in both groundwater samples at concentrations of 0.63 and 0.96 µg/l. Barium and zinc were reported in both groundwater samples at concentrations of 0.82 and 0.54 mg/l, and 0.04 and 0.05 mg/l, respectively. Copper, lead, and mercury were reported at concentrations of 0.03, 0.015, 0.0004 mg/l, respectively.

3.4.8 Chevron Site

Two groundwater samples were collected and submitted for analyses. TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, VOCs, SVOCs, and metals were not reported at concentrations exceeding their respective analytical method reporting limits. MTBE was reported in both groundwater samples at concentrations of 2.40 and 280 µg/l. Tert-amyl methyl ether (TAME) was reported in a groundwater sample at a concentration 12 µg/l.

3.5 Asbestos Survey Results

Forty-four bulk samples were analyzed for ACM. Fibrous asbestos material was only reported in one bulk sample collected from the Olive Street bridge structure. The bulk sample, sample #35, was reported to have 10 percent chrysotile asbestos fibers. This sample was collected from joint material obtained from the Olive Street Bridge. Fibrous material was observed in the joint material that was obtained during the inspection of the West College Avenue Bridge. This sample, sample # 9, was reported to have 95 percent cellulose material, and tested negative for

asbestos fibers. For the most part, access to joint materials in the bridges was very limited. Only two joint material samples could be obtained; one from the West College structure and one from the Olive Street bridge. A summary of asbestos analytical results is presented in Table 3. ACMs were not detected in suspect material collected from the following bridge structures.

- Steele Lane UC (Bridge No. 20-0221)
- College Avenue OC (Bridge No. 20-0145)
- 9th Street UC (Bridge No. 20-0134)
- Santa Rosa Creek (Bridge No. 20-0034)
- Sonoma Avenue POC, Pedestrian Bridge (Bridge No. 20-0219)
- Santa Rosa OH, Railroad Bridge (Bridge No. 20-0204R)

4.0 Data Evaluation

4.1 ADL Soil Investigation

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).

Lead concentrations were compared to 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. Soil samples reported to contain total lead exceeding the TTLC or soluble lead exceeding the STLC would be considered a California hazardous waste, should the soil become a waste.

Thirteen soil samples were reported to contain total lead at a concentration in excess of the TTLC of 1,000 mg/kg. A total of 56 soil samples had soluble lead concentrations in excess of the STLC of 5.0 mg/l by WET analysis. Soil at 46 boring locations would be considered a California hazardous waste, should the soil become a waste based on the total and soluble lead results.

Soil sample results from the 0.3 meters (1 foot) sample interval from borings HA-036, BP-083, BP-103, and BP-111 had reported TCLP concentrations greater than 5 mg/l (STLC). Surface soil at these boring locations would be considered a RCRA hazardous waste, should the soil become a waste.

4.1.1 Lead Data Statistical Analysis and Evaluation

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 ROW 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 1,411 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 1,411 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 1,411 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.

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

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 resampling 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 sample populations were segregated based on the location of and the depth from which the soil was collected. 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. Nondetects have been handled using the principle of Maximum Entropy, which treats the nondetect as an unobservable random variable drawn from a population that is uniform on the interval from zero to the detection limit.

The nonparametric bootstrap was used to compute the 90% UCLs for the means within the median, shoulder, and ramp areas. 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 percent UCL for the mean for these data sets. All correlation coefficients for the total/WET lead data were above Caltrans' acceptable correlation value of 0.8 per Caltrans Contract No. 43A0078. Summaries of the statistical analyses are presented in Appendix F.

A histogram of the total lead results for the entire data set was constructed to evaluate the distribution of the total lead concentrations within the data set. The data was heavily skewed to lower concentrations (Appendix F). The data from all sample intervals were combined into one data set for analysis. Evaluation of the soil data for the entire sample population resulted in an arithmetic mean (average) concentration of total lead of 114.16 mg/kg (Appendix F).

4.1.1.1 Total Project Area, Parts I and II

An expected soluble (WET) lead concentration was 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 analysis, and the total lead versus soluble lead concentration plots are presented in Appendix F. The predicted soluble lead concentration for WET data corresponding to the total lead 90 percent UCL is 7.10 mg/l. The predicted soluble lead concentration for DI WET data corresponding to the total lead 90 percent UCL is 0.995 mg/l. A summary of the statistical data is outlined below.

Area	Total Lead Mean (mg/kg)	Total Lead 90% UCL (mg/kg)	Predicted WET Lead Concentration (mg/l)	Predicted DI WET Lead Concentration (mg/l)	Predicted TCLP Lead Concentration (mg/l)
SR 101	114.16	148.47	7.10	0.995	0.27

Soil at specific boring locations may be considered a California hazardous waste based on the soluble (WET) concentrations of lead reported in individual soil samples from the project limits. Soil at specific boring locations may be considered a RCRA hazardous waste based on the soluble (TCLP) concentrations of lead reported in individual soil samples from the project limits. Shaw conducted statistical analyses on the total and soluble lead data. The statistical analysis assumes that the soil will be handled as one waste stream. However, if the construction work is staged in a manner that segregates the excavated soil, waste soil from some areas may be considered a hazardous waste.

The excavated soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities, would likely require soluble lead analysis by the WET as the mean was greater than 50 mg/kg, a level that generally triggers WET analysis.

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 concentration is 7.10 mg/l. If TCLP analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations less than the STLC, as the predicted soluble lead concentration by TCLP is 0.27 mg/l. Based on the statistical analyses performed, the excavated soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities would be classified as a California hazardous waste. The soil could be re-used under condition 2 of the DTSC variance.

Based on the statistical analysis for the entire ADL soil data, the data set was segregated into Part I and Part II data sets, respectively. These evaluations are presented in the following sections.

4.1.1.2 Part I

The data from all sample intervals for the area designated Part I was combined into one data set for analysis. Evaluation of the soil data for the Part I sample population resulted in an arithmetic mean (average) concentration of total lead of 63.04 mg/kg (Appendix F).

An expected soluble (WET) lead concentration was 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 analysis, and the total lead versus soluble lead concentration plots are presented in Appendix F. The predicted soluble lead concentration for WET data corresponding to the total lead 90 percent UCL is 3.08 mg/l. The predicted soluble lead concentration for DI WET data corresponding to the total lead 90 percent UCL is 0.57 mg/l. A summary of the statistical data is outlined below.

Area	Total Lead Mean (mg/kg)	Total Lead 90% UCL (mg/kg)	Predicted WET Lead Concentration (mg/l)	Predicted DI WET Lead Concentration (mg/l)	Predicted TCLP Lead Concentration (mg/l)
Part I	63.04	99.08	3.08	0.57	Not enough data

Soil at specific boring locations may be considered a California hazardous waste based on the soluble (WET) concentrations of lead reported in individual soil samples from the project limits. Shaw conducted statistical analyses on the total and soluble lead data. The statistical analysis assumes that the soil will be handled as one waste stream. However, if the construction work is staged in a manner that segregates the excavated soil, waste soil from some areas may be considered a California hazardous waste.

The excavated soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities, would likely require soluble lead analysis by the WET as the mean was greater than 50 mg/kg, a level that generally triggers WET analysis. If WET analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations less than the STLC as the predicted soluble lead concentration is 3.00 mg/l. Based on the statistical analyses performed, the excavated soil from Part I, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities would not be classified as a California hazardous waste. As the soil would not be considered a hazardous waste, special handling and disposal procedures are not required, except as needed to protect worker health and safety.

4.1.1.3 Part II

The data from all sample intervals from the area designated Part II were combined into one data set for analysis. Soil sample results from the 0.3 meters (1 foot) sample interval from borings HA-036, BP-083, BP-103, and BP-111 were removed from the sample populations since their respective TCLP values were greater than 5 mg/l. The soil sample results from the 0.3 meters (1 foot) sample interval from boring BP-122 was also removed from the sample populations since this sample location had the highest reported concentrations of total lead (5,030 mg/kg) and soluble WET lead (287 mg/l). The associated TCLP was 4.77 mg/l.

An expected soluble (WET) lead concentration was 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 analysis, and the total lead versus soluble lead concentration plots are presented in Appendix F. The predicted soluble lead concentration for WET data corresponding to the total lead 90 percent UCL is 4.93 mg/l. The predicted soluble lead concentration for DI WET data corresponding to the total lead 90 percent UCL is 0.58 mg/l. A summary of the statistical data is outlined below.

Area	Total Lead Mean (mg/kg)	Total Lead 90% UCL (mg/kg)	Predicted WET Lead Concentration (mg/l)	Predicted DI WET Lead Concentration (mg/l)	Predicted TCLP Lead Concentration (mg/l)
Part II	82.64	105.04	4.93	0.58	0.09

Soil at specific boring locations may be considered a California hazardous waste based on the soluble (WET) concentrations of lead reported in individual soil samples from the project limits.

Soil at specific boring locations may be considered a RCRA hazardous waste based on the soluble (TCLP) concentrations of lead reported in individual soil samples from the project limits.

The statistical analysis assumes that the soil in the vicinity of borings HA-036, BP-083, BP-103, BP-111, and BP-122 will be excavated separately and handled as one waste stream. If the construction work is staged in a manner that segregates the excavated soil in the vicinity of borings HA-036, BP-083, BP-103, BP-111, and BP-122, waste soil from these areas may be considered a hazardous waste. Special handling and disposal procedures may be required, and special procedures may need to be implemented to protect worker health and safety.

The excavated soil from Part II, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities, would likely require soluble lead analysis by the WET as the mean was greater than 50 mg/kg, a level that generally triggers WET analysis. If WET analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations less than the STLC as the predicted soluble lead concentration is 4.93 mg/l. If TCLP analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations less than the STLC, as the predicted soluble lead concentration by TCLP is 0.09 mg/l. Based on the statistical analyses performed, the excavated soil from Part II, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities would not be classified as a California hazardous waste. As the soil would not be considered a hazardous waste, special handling and disposal procedures are not required, except as needed to protect worker health and safety.

4.1.1.4 Specific Layers

Under the direction of Caltrans, the data set was further segregated into specific layers for characterization. The 90% UCLs, as well as the predicted WET and DI WET results, and disposal characterization for the median, shoulder and ramp areas are presented on Table 3.

Under the direction of Caltrans, the data set was further segregated into specific layers for characterization. Based on the statistical analyses, the soil classified as a California hazardous waste could be reused under Condition 2 of the DTSC Variance. Summaries of the statistical analyses are presented in Appendix F. The areas where the soil can be considered a California hazardous waste are listed below:

- The soil collected from the upper 0.3 meter (1 foot) of the shoulder area in Part I, if it were to become a waste, would be considered California hazardous waste.
- The soil from the upper 0.3 meter (1 foot) of the shoulder areas in Part II, if it were to become a waste, would be considered a California hazardous waste.

Caltrans performed a statistical analysis of specific on-ramps and off-ramps (Appendix G). The soil collected from the upper 0.3 meter (1 foot) of the College Avenue on-ramp and off-ramp to and from southbound SR 101 would be considered a California hazardous waste. At the location of the Steele Lane on-ramp, northbound SR 101, the top 0.3 meter (1 foot) would be considered a California hazardous waste. All the excavated soil from northbound SR 101 on-ramp and off-ramp to and from College Avenue would be considered a California hazardous waste.

4.2 Deep Boring Soil and Groundwater Investigation

4.2.1 Soil Investigation

Soil sample analytical results are summarized on Tables 4 through 6. Soil results were compared to EPA, Region 9, Preliminary Remediation Goals (PRGs) for residential soil (EPA, 2002). The PRGs are risk-based tools for evaluation of soil analytical data and are based on generally accepted exposure pathways for specific land-use conditions. They do not consider impacts to groundwater or ecological receptors. PRGs have not been established for TPHg, TPHd, TPHmo, and O&G. As a result, analytical results were compared to environmental screening levels (ESLs) for residential land use. The ESLs (RWQCB, 2003) were developed by the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), to address environmental protection goals as set forth in the Water Quality Control Plan for the San Francisco Bay Basin (RWQCB, 1995).

4.2.1.1 Luther Burbank Elementary School Site

TPHmo were reported at concentrations of up to 140 mg/kg in surface soil, which is less than the ESL of 500 mg/kg. Soil samples collected at depths of 3 to 6 meters (10 to 20 feet) BGS reported non-detectable concentrations of TPHmo. Surface soil at the site has elevated levels of O&G.

Acetone, a VOC, and bis2-ethylhexylphthalate, a SVOC, were reported in one sample at concentrations well below their respective residential PRGs. The VOC 2-butanone was reported in one surface soil sample. There is no established PRG for 2-butanone.

Low concentrations of barium, cadmium, cobalt, copper, mercury, nickel, vanadium and zinc were reported in soil at concentrations well below their respective residential PRGs. Arsenic was reported at concentrations exceeding the residential PRG cancer endpoint of 0.39 mg/kg. The detected arsenic concentrations did not exceed the non-cancer endpoint of 22 mg/kg. Total chromium concentrations reported in soil were below the residential PRG of 210 mg/kg. Chromium and lead were reported at concentrations exceeding 10 times their respective STLC

values. Five samples analyzed for chromium by the TCLP were less than the method detection limit. One total lead concentration of 510 mg/kg from sample B-5-S-1 exceeded the residential PRG of 150 mg/kg. Three surface soil samples (B-2-S-1, B-3-S-1, and B-5-S-1) were reported to contain soluble lead concentrations that exceeded the STLC. One sample analyzed for lead by the TCLP was less than the STLC of 5 mg/l.

Soil at specific boring locations, B-2, B-3, and B-5, may be considered a California hazardous waste based on the soluble lead concentrations reported in individual soil samples collected at these three boring locations.

4.2.1.2 Shell Site

TPHg and benzene were reported in soil collected at the capillary fringe in boring B-9-S. The benzene concentration (0.025 mg/kg) was below the residential PRG of 0.044 mg/kg. The TPHg concentration (2.02 mg/kg) was well below the ESL of 100 mg/kg. MTBE was reported in all three samples collected at the capillary fringe, 3.0 meters (10 feet) BGS, at concentrations well below the residential PRG. TPHmo was reported at a concentration well below the ESL of 500 mg/kg. TPHmo was reported in surface soil only.

Acetone, a VOC, was reported in one sample at a concentration well below the PRG.

Low concentrations of barium, cobalt, copper, mercury, molybdenum, nickel, vanadium, and zinc were detected in soil at the site at concentrations below their respective residential PRGs. Total chromium concentrations reported in soil were below the residential PRG of 210 mg/kg. Total lead concentrations reported in soil were below the residential PRG of 150 mg/kg. Chromium and lead were reported at concentrations exceeding 10 times their respective STLC values. Three samples analyzed for chromium by the TCLP were less than the method detection limit. Two samples analyzed for soluble lead by the WET were less than the STLC of 5.0 mg/l. The concentrations of metals reported in soil do not appear to pose a threat.

4.2.1.3 Midas Site

Low concentrations of TPHg were reported in one surface soil sample (2.40 mg/kg) at a concentration well below the ESL of 100 mg/kg. TPHmo was reported at a concentration well below the ESL of 500 mg/kg.

Acetone, a VOC, was detected in one surface soil sample at a concentration (15 µg/kg) which was well below the residential PRG. The VOC, 4-isopropyltoluene, was reported in all three surface soil samples. There is no established PRG for 4-isopropyltoluene.

Low concentrations of barium, cobalt, copper, mercury, nickel, vanadium, and zinc were reported in soil at concentrations well below their respective residential PRGs. Total chromium concentrations reported in soil were below the residential PRG of 210 mg/kg. Total lead concentrations reported in soil were below the residential PRG of 150 mg/kg. Chromium and lead were reported at concentrations exceeding 10 times their respective STLC values. Three samples analyzed for chromium by the TCLP were less than the method detection limit. One sample analyzed for soluble lead by the WET was less than the STLC of 5.0 mg/l. The concentrations of metals reported in soil do not appear to pose a threat.

4.2.1.4 Mission Car Wash Site

TPHg was reported in soil from boring B-14 at concentrations well below the ESL of 100 mg/kg. Benzene and total xylenes concentrations reported in soil from sample B-14-S-1 were below their respective residential PRGs. Low concentrations of TPHmo were reported in surface soil samples at concentrations well below the ESL of 500 mg/kg.

The VOCs acetone, benzene, ethylbenzene, naphthalene, isopropylbenzene, n-propylbenzene, 1,3,5-trimethylbenzene, n-butylbenzene, sec-butylbenzene, and tert-butylbenzene, were detected at concentrations below their respective residential PRGs. The SVOCs anthracene, benzo (b) fluoroanthene, chrysene, fluoranthene, phenanthrene, and pyrene were reported in the surface soil sample collected from boring B-15 at concentrations below their respective residential PRGs where established. The SVOCs benzo (a) anthracene, benzo (a) pyrene, and benzo (k) fluoranthene were reported at concentrations of 853, 640, and 493 µg/kg, which exceeded the respective PRGs of 620, 62, and 380 µg/kg, respectively.

Low concentrations of barium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc were reported in soil at concentrations well below their respective residential PRGs. Arsenic was reported in one sample at a concentration exceeding the residential PRG cancer endpoint of 0.39 mg/kg; however, the reporting limit for arsenic analysis was 8 mg/kg. The detected arsenic concentration did not exceed the non-cancer endpoint of 22 mg/kg. Total chromium concentrations reported in soil were below the residential PRG of 210 mg/kg. Chromium was reported at concentrations exceeding 10 times the STLC value. Three samples analyzed for chromium by the TCLP were less than the method detection limit.

With the exception of arsenic, the concentrations of metals in soil were below their respective residential PRGs and do not appear to pose a threat.

4.2.1.5 Steele Lane OC

TPHg was reported in one soil sample collected at the capillary fringe (boring B-16-S) at a concentration well below the ESL of 100 mg/kg. Toluene was also reported at a concentration well below the residential PRG. TPHmo was reported in the surface soil sample from boring S-2 at a concentration of 170 mg/kg, which is less than the ESL of 500 mg/kg. TPHmo was reported in the soil sample obtained at a depth of 4.9 meters (16 feet) from boring S-2 at a concentration of 110 mg/kg, which exceeds the ESL of 100 mg/kg.

The VOCs acetone, ethylbenzene, 4-isopropyltoluene, isopropylbenzene, n-propylbenzene, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene, were reported at concentrations well below their respective residential PRGs, where established.

Low concentrations of barium, cobalt, copper, mercury, nickel, vanadium, and zinc were reported in soil at concentrations well below their respective residential PRGs. Arsenic was reported in one sample at a concentration of 36 mg/kg, which exceeds the residential PRG cancer endpoint of 0.39 mg/kg and the non-cancer endpoint of 22 mg/kg. Total chromium concentrations reported in soil were below the residential PRG of 210 mg/kg. Total lead concentrations reported in soil were below the residential PRG of 150 mg/kg. Chromium and lead were reported at concentrations exceeding 10 times the STLC values. One surface soil sample, S-2-1, was reported to contain a soluble lead concentration that exceeded the STLC. Four samples analyzed for chromium by TCLP were less than the method detection limit.

Soil in the vicinity of boring S-2-1, may be considered a California hazardous waste based on the soluble lead concentrations reported in the surface soil sample.

4.2.1.6 4th Street Viaduct

TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, fuel oxygenates, VOCs, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits in any of the samples.

Low concentrations of barium, beryllium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc were reported in soil at concentrations well below their respective residential PRGs. Arsenic was reported in one sample at a concentration (8.2 mg/kg) exceeding the residential PRG cancer endpoint of 0.39 mg/kg. The detected arsenic concentration did not exceed the non-cancer endpoint of 22 mg/kg. Total chromium concentrations reported in soil were below the residential PRG of 210 mg/kg. Chromium was reported at concentrations exceeding 10 times the STLC value in boring B-20-S. The sample analyzed for chromium by the TCLP was less than the method detection limit.

With the exception of arsenic, the concentrations of metals in soil were below their respective residential PRGs and do not appear to pose a threat.

4.2.1.7 College Avenue OC

Low concentrations of TPHmo were reported in soil at concentrations well below the respective ESLs. VOCs or SVOCs were not detected above the analytical reporting limit.

Low concentrations of cobalt, copper, mercury, nickel, vanadium, and zinc were reported in soil at concentrations below their respective PRGs. Arsenic was reported in one sample at a concentration exceeding the residential PRG cancer endpoint of 0.39 mg/kg. The reported arsenic concentration did not exceed the non-cancer endpoint of 22 mg/kg. Total barium, chromium, lead, and silver concentrations reported in soil were below their respective residential PRGs. Barium, chromium, lead, and silver were reported at concentrations exceeding 10 times their respective STLC values. Soluble metals concentrations for barium, lead, and silver were below their respective STLC values. The samples analyzed for chromium by the TCLP were less than the method detection limit.

With the exception of arsenic, the concentrations of metals in soil were below their respective residential PRGs and do not appear to pose a threat.

4.2.1.8 Chevron Site

TPHg, BTEX, TPHd, O&G, PCBs, fuel oxygenates, VOCs, and SVOCs were not reported at concentrations exceeding their respective analytical method reporting limits. TPHmo was reported in one surface soil sample (12.9 mg/kg) at a concentration well below the ESL of 500 mg/kg.

Low concentrations of barium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc were reported in soil at concentrations well below their respective residential PRGs. Arsenic was reported in one sample at a concentration exceeding the residential PRG cancer endpoint of 0.39 mg/kg. The detected arsenic concentration did not exceed the non-cancer endpoint of 22 mg/kg. The total chromium concentration reported in soil was below the residential PRG of 210 mg/kg. Chromium was reported at a concentration exceeding 10 times the STLC value in boring B-25-S. One sample analyzed for chromium by the TCLP was less than the method detection limit.

With the exception of arsenic, the concentrations of metals in soil were below their respective residential PRGs and do not appear to pose a threat.

4.2.2 Groundwater Investigation

Groundwater grab samples were collected from parcels that may be acquired by Caltrans as part of the proposed construction activities. Groundwater sample analytical results are summarized on Tables 7 through 9. Groundwater analytical results were compared to the following:

- The ESLs that have been developed for groundwater that is not a current or potential drinking water resource were used for comparison to the groundwater data.
- EPA Region 9 PRGs for tap water, where established.

4.2.2.1 Luther Burbank Elementary School Site

TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, fuel oxygenates, VOCs, and SVOCs were not reported in groundwater at concentrations exceeding their respective analytical method reporting limits.

Barium was the only metal detected in groundwater. Barium was reported in all five groundwater samples at concentrations ranging from 0.10 to 0.17 mg/l. The reported concentrations are well below the ESL of 1 mg/l.

Based on the limited groundwater sampling, shallow groundwater does not appear to be impacted by the compounds tested for during this investigation.

4.2.2.2 Shell Site

BTEX, TPHmo, O&G, PCBs, VOCs, and SVOCs were not reported in groundwater at concentrations exceeding their respective analytical method reporting limits.

TPHg was reported in one groundwater grab sample collected from the site at a concentration of 2,700 µg/l, which exceeds the ESL of 500 µg/l. The reported concentrations of TPHd (250 µg/l) and MTBE (45 to 430 µg/l) do not exceed their respective ESLs.

Low concentrations of barium were reported in all three groundwater samples, ranging from 0.18 to 0.34 mg/l, which are below the ESL of 1 mg/l. Concentrations of copper in all three samples ranged from 0.02 to 0.06 mg/l, which exceed the ESL of 0.0031 mg/l. A zinc concentration of 0.09 mg/l exceeds the ESL of 0.081 mg/l.

Petroleum hydrocarbons were detected in groundwater at the site. A degradation of groundwater quality has occurred at the site, and the primary contaminant is TPHg.

4.2.2.3 Midas Site

TPHg, BTEX, TPHd, TPHmo, O&G, PCBs, VOCs, and SVOCs were not reported in groundwater at concentrations exceeding their respective analytical method reporting limits.

The reported concentrations of MTBE (2.4 and 14 µg/l) do not exceed the ESL.

Barium and zinc were reported in all three groundwater samples at concentrations below their respective ESLs. Copper was reported in one groundwater sample at a concentration of 0.024 mg/l, which exceeds the ESL of 0.0031 mg/l.

A degradation of groundwater quality has occurred at the site, and the primary contaminant is MTBE.

4.2.2.4 Mission Car Wash Site

TPHg were reported in all three groundwater samples collected from the site. One TPHg result of 660 µg/l exceeded the ESL of 500 µg/l. Ethylbenzene (0.66 µg/l) and total xylenes (1.9 µg/l) were reported in one groundwater grab sample at concentrations well below their respective ESLs. MTBE was reported in one groundwater grab sample at a concentration of 5.5 µg/l, which does not exceed the ESL of 1,800 µg/l.

The VOCs n-butylbenzene (3.6 µg/l), n-propylbenzene (11 µg/l), and naphthalene (2.8 µg/l) were present in one sample at concentrations below their respective tap water PRGs.

Barium and zinc were reported in all three groundwater samples at concentrations below their respective ESLs. The reported concentrations of copper (0.03 mg/l) and lead (0.010 mg/l) exceed the ESLs of 0.0031 mg/l and 0.0025 mg/l, respectively.

A degradation of groundwater quality has occurred at the site, and the primary contaminant is TPHg.

4.2.2.5 Steele Lane OC

The reported TPHg concentrations were 790 and 1,400 µg/l, which exceed the ESL of 500 µg/l. The reported TPHd concentrations were 140 and 3,400 µg/l, the latter of which exceeds the ESL of 640 µg/l. Ethylbenzene (2.8 µg/l), total xylenes (5.8 µg/l), and MTBE (4.06 µg/l) were reported at concentrations below their respective ESLs.

The VOCs 1,3,5-trimethylbenzene (3.4 µg/l) and 1,2,4-trimethylbenzene (7.7 µg/l) were present in one sample at concentrations below the tap water PRG of 12 µg/l. Total xylenes were present at a concentration (2.5 µg/l) below the ESL of 13 µg/l.

Barium was reported in all four groundwater samples at concentrations below the ESL. Zinc was reported in one groundwater sample at a concentration below its ESL.

Petroleum hydrocarbons, TPHg and TPHd, were reported in groundwater. The fuel oxygenate MTBE and VOCs were reported in groundwater at concentrations below their respective ESLs. Based on the limited groundwater sampling, groundwater appears to be impacted by petroleum hydrocarbons.

4.2.2.6 4th Street Viaduct

Only one groundwater grab sample was collected at the 4th Street Viaduct location. Petroleum hydrocarbons were not detected in the groundwater sample.

The VOC tetrachloroethene (PCE), was detected in the groundwater sample at a concentration of 5.2 µg/l, which does not exceed the ESL of 120 µg/l.

Barium and zinc were reported in the groundwater sample at concentrations below their respective ESLs. Copper was reported in one groundwater sample at a concentration of 0.02 mg/l, which exceeds the ESL of 0.0031 mg/l.

Based on the limited sampling, the groundwater at the 4th Street Viaduct location has been impacted by PCE.

4.2.2.7 College Avenue OC

MTBE was reported in both groundwater samples at concentrations of 0.96 and 0.63 µg/l, which are less than the ESL of 1,800 µg/l.

Barium, mercury, and zinc were reported at concentrations below their respective ESLs. Copper was reported in one groundwater sample at a concentration of 0.03 mg/l, which exceeds the ESL of 0.0031 mg/l. Lead was reported in one groundwater sample at a concentration equal to the Action Level of 0.015 mg/l and exceeds the ESL of 0.0025 mg/l.

Based on the limited sampling, the groundwater at the College Avenue OC location appears to be impacted by lead and trace concentrations of MTBE.

4.2.2.8 Chevron Site

MTBE was reported in both groundwater grab samples at concentrations of 2.4 and 280 µg/l, which do not exceed the ESL of 1,800 µg/l. TAME was also reported in B-25 at a concentration of 12 µg/l. There is no established ESL or PRG for TAME.

A degradation of groundwater quality has occurred at the site, and the primary contaminant is MTBE.

4.3 Asbestos Survey

Fibrous asbestos material was reported in only one bulk sample. This sample was collected from joint material obtained from the Olive Street bridge structure and was reported to have 10 percent chrysotile asbestos fibers.

Fibrous joint material encountered in the Olive Street bridge structure should be considered to be Presumed Asbestos Containing Material (PACM) and suitable asbestos precautions should be implemented for worker health and safety and for debris disposal. Fibrous joint material that may be encountered in the retrofit of the bridges inspected should be considered to be PACM and suitable asbestos containment and precautions should be implemented when this material is handled. Other than the fibrous joint material, the bridge structures do not contain any detectable ACM by PLM.

A summary of asbestos results are presented in Table 10.

5.0 Conclusions and Recommendations

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

ADL Investigation

- Total lead concentrations ranged from less than 0.5 to 5,030 mg/kg in 426 soil samples analyzed. 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 TTLC and STLC values to evaluate whether the soil would be considered a hazardous waste should it become a waste.
- Thirteen soil samples were reported to contain total lead at a concentration in excess of the TTLC of 1,000 mg/kg. A total of 56 soil samples had soluble lead concentrations in excess of the STLC of 5.0 mg/l by WET analysis. Soil at 46 boring locations would be considered a California hazardous waste, should the soil become a waste, based on the total and soluble lead results.
- Soil sample results from borings HA-036, BP-083, BP-103, and BP-111 had reported TCLP concentrations greater than 5 mg/l (STLC). Surface soil at these boring locations would be considered a RCRA hazardous waste and would require disposal at a RCRA waste facility, should the soil become a waste.
- If the construction work is staged in a manner that segregates the excavated soil in the vicinity of borings HA-036, BP-083, BP-103, and BP-111 waste soil from these areas may be considered a hazardous waste. Special handling and disposal procedures may be required, and special procedures may need to be implemented to protect worker health and safety.
- *Total Project Area, Parts I and II:* Based on the statistical analyses performed, the excavated soil from the entire project area, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities would be classified as a California hazardous waste. The soil could be reused under condition 2 of the DTSC variance.
- *Part I:* Based on the statistical analyses performed, the excavated soil from Part I, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities would not be classified as a California hazardous waste.
- *Part II:* The statistical analysis for Part II assumes that the soil in the vicinity of borings HA-036, BP-083, BP-103, and BP-111 will be excavated separately and handled as one waste stream. Based on the statistical analyses performed, the excavated soil from Part II, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities would not be classified as a California hazardous waste.

- Based on the statistical analyses, surface soil profiled as a California hazardous waste could be reused under Condition 2 of the DTSC Variance.
- Based on the statistical analyses, the soil collected from the upper 0.3 meters (1 foot) of the shoulder area in Part I, if it were to become a waste, would be considered California hazardous waste.
- Based on the statistical analyses, the soil from the upper 0.3 meters (1 foot) of the shoulder areas in Part II, if it were to become a waste, would be considered a California hazardous waste.
- Caltrans performed a statistical analysis of specific on-ramps and off-ramps. The soil collected from the upper 0.3 meter (1 foot) of the College Avenue on-ramp and off-ramp to and from southbound SR 101 would be considered a California hazardous waste. At the location of the Steele Lane on-ramp, northbound SR 101, the top 0.3 meter (1 foot) would be considered a California hazardous waste. All the excavated soil from northbound SR 101 on-ramp and off-ramp to and from College Avenue would be considered a California hazardous waste.

Deep Boring Soil Investigation

- The site is mapped as being underlain by alluvium. Lithologies encountered during drilling consisted primarily of clay, interbedded with thin lenses of gravels, sands, and silts. Water-saturated sediments in the deep borings were initially encountered at depths ranging from 1.5 to 5.8 meters (5 to 19 feet) BGS depending on boring and site location.
- TPHmo was reported in a sample that exceeded the ESL at the Steele Lane OC site.
- Low concentrations of petroleum hydrocarbons were reported at concentrations less than the ESL or residential PRG at seven sites. These include the Luther Burbank Elementary School Site, Shell Site, Midas Site, Mission Car Wash Site, Steele Lane OC, College Avenue OC, and the Chevron Site.
- Low concentrations of VOCs were reported at concentrations less than the residential PRG at five sites. These include the Luther Burbank Elementary School Site, Shell Site, Midas Site, Mission Car Wash Site, and Steele Lane OC.
- The VOC 2-butanone was reported in one sample at the Luther Burbank Elementary School Site; however, there is no established PRG for 2-butanone.
- The SVOCs benzo (a) anthracene, benzo (a) pyrene, and benzo (k) fluoranthene were reported at concentrations that exceeded their respective PRGs at the Mission Car Wash Site.
- Low concentrations of SVOCs were reported at concentrations less than the residential PRG at two sites, the Luther Burbank Elementary School Site and the Mission Car Wash Site.
- Low concentrations of metals were reported at concentrations below their respective PRGs at all eight sites.

- Arsenic was reported at a concentration that exceeded the residential PRG cancer endpoint of 0.39 mg/kg and the non-cancer endpoint of 22 mg/kg at the Steele Lane OC site.
- Five sites reported arsenic at concentrations that exceeded the residential PRG cancer endpoint of 0.39 mg/kg but did not exceed the non-cancer endpoint of 22 mg/kg. These include the Luther Burbank Elementary School Site, Mission Car Wash Site, 4th Street Viaduct, College Avenue OC, and the Chevron Site.
- After considering background concentrations in a local area, EPA Region 9 has at times used the non-cancer residential PRG of 22 mg/kg to evaluate sites recognizing that this value tends to be above background levels, yet still falls within the range of soil concentrations (0.39 to 39 mg/kg) that equates to EPA's "acceptable" cancer risk range of 10E-6 to 10E-4 (EPA, 2002).
- One total lead concentration exceeded the residential PRG at the Luther Burbank Elementary School Site.
- Chromium was reported at concentrations exceeding 10 times the STLC value at all eight sites.
- Lead was reported at concentrations exceeding 10 times the STLC value at five sites. These include the Luther Burbank Elementary School Site, Shell Site, Midas Site, Steele Lane OC, and College Avenue OC.
- Barium and silver were reported at concentrations exceeding 10 times their respective STLC values at the College Avenue OC site.
- Soluble lead was reported at concentrations that exceeded the STLC value at the Luther Burbank Elementary School Site. Soil at specific boring locations at this site (borings B-2, B-3, and B-5) may be considered a California hazardous waste based on the soluble lead concentrations reported in individual soil samples collected at these three boring locations.
- Soluble lead was reported at a concentration that exceeded the STLC value at the Steele Lane OC site. Soil in the vicinity of boring S-2-1 at this site may be considered a California hazardous waste based on the soluble lead concentrations reported in the surface soil sample.

Groundwater Investigation

- TPHg was reported in groundwater samples at concentrations that exceeded the ESL at the Shell Site and the Mission Car Wash Site. Low concentrations of petroleum hydrocarbons were reported at three sites. These include the Shell Site, Mission Car Wash Site, and Steele Lane OC.
- Lead was reported in one groundwater sample at a concentration equal to the Action Level and exceeded the ESL at the College Avenue OC location. The reported concentration of lead exceeded the ESL at the Mission Car Wash Site. Low concentrations of copper were reported at concentrations above the ESL at five sites. These include the Shell Site, Midas Site, Mission Car Wash Site, 4th Street Viaduct, and

College Avenue OC. A low concentration of zinc was reported at a concentration above the ESL at the Shell Site.

- Based on the analytical results, a degradation of groundwater quality has occurred at seven sites. These include the Shell Site, Midas Site, Mission Car Wash Site, Steele Lane OC, 4th Street Viaduct, College Avenue OC, and the Chevron Site.

Asbestos Survey

- Forty-four bulk samples were analyzed for ACM.
- Fibrous asbestos material was reported in only one bulk sample. This sample was collected from joint material obtained from the Olive Street bridge structure and was reported to have 10 percent chrysotile asbestos fibers.
- Fibrous joint material encountered in the Olive Street bridge structure should be considered to be PACM and suitable asbestos precautions should be implemented for worker health and safety and for debris disposal.
- Fibrous joint material that may be encountered in the retrofit of the bridges inspected should be considered to be PACM and suitable asbestos containment and precautions should be implemented when this material is handled.
- Other than the fibrous joint material, the bridge structures do not contain any detectable ACM by PLM. Therefore, worker health and safety or disposal procedures related to asbestos are not necessary for the majority of the work that will be conducted.

6.0 References

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TABLES

TABLE 1
 MAINLINE LEAD ANALYTICAL DATA AND GPS COORDINATES
 Caltrans - SR 101
 Santa Rosa, Sonoma County, California
 Task Order No. 04-263900-CH
 EA Nos. 263900-245400

Boring	Sample Designation (Location Type-Boring ID-Depth ID')	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
1	BP - 001 - A	38.43026416	-122.71387492	158.6	0.3	1	8.61				
	BP - 001 - B				0.6	2	2.81				
	BP - 001 - C				0.9	3	21.0				
	BP - 001 - D				1.2	4	6.05				7.2
2	BP - 002 - A	38.43150667	-122.71423468	168.3	0.6	1	20.1				
	BP - 002 - B				0.6	2	63.8	0.452			
	BP - 002 - C				0.9	3	16.4				
	BP - 002 - D				1.2	4	6.72				
3	BP - 003 - A	38.43220061	-122.71449011	157.8	0.3	1	219	17.7	0.865		7.4
	BP - 003 - B				0.6	2	8.29				
	BP - 003 - C				0.9	3	8.14				
	BP - 003 - D				1.2	4	7.24				
4	BP - 004 - A	38.43302418	-122.71480474	162.8	0.3	1	7.25				
	BP - 004 - B				0.6	2	6.39				
	BP - 004 - C				0.9	3	5.77				7.9
	BP - 004 - D				1.2	4	6.80				
5	BP - 006 - A	38.44054473	-122.71894031	173.1	0.3	1	297	53.0	4.95		
	BP - 006 - B				0.6	2	3.3				
	BP - 006 - C				0.9	3	18.8				
	BP - 006 - D				1.2	4	3.7				
6	HA - 008 - A	38.44504503	-122.72205558	237.5	0.3	1	1,330	69.4	6.63	1.73	
	HA - 008 - B				0.6	2	260	15.6	3.24		
7	HA - 009 - A	38.44662435	-122.72314720	226.9	0.3	1	1,030	41.4	4.97	1.09	
	HA - 009 - B				0.6	2	114	3.94			
	HA - 009 - C				0.9	3	183	7.02	1.75		
8	BP - 010 - A	38.44889613	-122.72440359	213.1	0.3	1	601	22.7	5.44		
	BP - 010 - B				0.6	2	4.61				
	BP - 010 - C				0.9	3	5.04				
	BP - 010 - D				1.2	4	5.81				
9	HA - 011 - A	38.44993101	-122.72473928	217.3	0.3	1	318	15.3	2.46		
	HA - 011 - B				0.6	2	94.4	2.79			
	HA - 011 - C				0.9	3	39.6				
	HA - 011 - D				1.2	4	40.2				
10	HA - 012 - A	38.45162983	-122.724865	217.3	0.3	1	402	13.8	1.06		
11	HA - 013 - A	38.45343650	-122.72480649	149.4	0.3	1	213	13.5	0.80		
	HA - 013 - B				0.6	2	290	10.7	2.38		
	HA - 013 - C				0.9	3	231	12.8	3.60		7.5
12	BP - 014 - A	38.45523430	-122.72474175	146.0	0.3	1	121	6.90	0.74		
13	HA - 015 - A	38.45743050	-122.72479281	150.9	0.3	1	365	17.6	2.14		
	HA - 015 - B				0.6	2	6.84				
14	HA - 017 - A	38.46059618	-122.72503005	156.1	0.3	1	295	7.32	1.01		
	HA - 017 - B				0.6	2	313	20.4	1.47		
15	BP - 018 - A	38.46228123	-122.72513270	146.8	0.3	1	34.5				
	BP - 018 - B				0.6	2	8.18				
	BP - 018 - C				0.9	3	8.96				
	BP - 018 - D				1.2	4	5.64				
16	BP - 020 - A	38.46572507	-122.72596799	146.1	0.3	1	81.3	1.75			
	BP - 020 - B				0.6	2	10.4				
	BP - 020 - C				0.9	3	7.61				5.8
	BP - 020 - D				1.2	4	6.87				
17	BP - 021 - A	38.46745332	-122.72666744	140.4	0.3	1	59.6	2.53			
	BP - 021 - B				0.6	2	6.19				
	BP - 021 - C				0.9	3	17.2				
	BP - 021 - D				1.2	4	36.0				
18	BP - 022 - A	38.46895676	-122.72736250	146.7	0.3	1	403	18.8	5.14		
	BP - 022 - B				0.6	2	6.50				
	BP - 022 - C				0.9	3	7.91				7.0
	BP - 022 - D				1.2	4	7.81				
19	BP - 023 - A	38.46922422	-122.72800571	133.1	0.3	1	39.2				
	BP - 023 - B				0.6	2	28.8				
	BP - 023 - C				0.9	3	12.7				
	BP - 023 - D				1.2	4	9.28				
20	BP - 024 - A	38.46755261	-122.72718771	146.3	0.3	1	107	10.5	1.45		
	BP - 024 - B				0.6	2	82.5	2.16			
	BP - 024 - C				0.9	3	11.1				6.3
	BP - 024 - D				1.2	4	8.01				
21	BP - 025 - A	38.46587741	-122.72647291	158.2	0.3	1	9.27				
	BP - 025 - B				0.6	2	71.7	2.63			6.5
	BP - 025 - C				0.9	3	6.88				
	BP - 025 - D				1.2	4	8.09				

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 Caltrans - SR 101
 Santa Rosa, Sonoma County, California
 Task Order No. 04-263900-CH
 EA Nos. 263900-245400

Boring	Sample Designation (Location Type-Boring ID-Depth ID')	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
22	BP - 026 - A	38.46421837	-122.72581646	148.6	0.3	1	9.47				
	BP - 026 - B				0.6	2	17.0				
	BP - 026 - C				0.9	3	6.03				
	BP - 026 - D				1.2	4	7.21				
23	BP - 027 - A	38.46243965	-122.72547808	153.2	0.3	1	427	25.5	1.25		
	BP - 027 - B				0.6	2	6.98				
	BP - 027 - C				0.9	3	3.59				
	BP - 027 - D				1.2	4	3.67				
24	BP - 028 - A	38.46066043	-122.72534726	173.0	0.3	1	2,130	56.9	12.3	2.73	
	BP - 028 - B				0.6	2	7.05				
	BP - 028 - C				0.9	3	3.62				
	BP - 028 - D				1.2	4	5.32				
25	BP - 029 - A	38.45889637	-122.72522145	158.8	0.3	1	4.29				
	BP - 029 - B				0.6	2	8.00				
	BP - 029 - C				0.9	3	6.83				
	BP - 029 - D				1.2	4	7.30				
26	BP - 030 - A	38.45713975	-122.72509833	133.3	0.3	1	443	36.6	8.86		
	BP - 030 - B				0.6	2	3.30				
	BP - 030 - C				0.9	3	17.4				
	BP - 030 - D				1.2	4	4.95				7.7
27	HA - 031 - A	38.45533510	-122.72510048	150.9	0.3	1	2,040	97.1	5.97	1.15	
28	BP - 032 - A	38.45357263	-122.72512511	151.5	0.3	1	505	24.3	5.58		
	BP - 032 - B				0.6	2	4.54				6.9
	BP - 032 - C				0.9	3	5.16				
	BP - 032 - D				1.2	4	4.63				
29	BP - 033 - A	38.45179045	-122.72518029	159.7	0.3	1	2.77				
	BP - 033 - B				0.6	2	3.79				
	BP - 033 - C				0.9	3	14.0				
	BP - 033 - D				1.2	4	4.47				7.3
30	BP - 034 - A	38.45001190	-122.72510668	160.1	0.3	1	1,010	58.7	7.76	2.34	
	BP - 034 - B				0.6	2	17.5				
	BP - 034 - C				0.9	3	4.72				
	BP - 034 - D				1.2	4	3.75				
31	HA - 036 - A	38.44667465	-122.72360423	161.3	0.3	1	2,260	120.0	24.5	5.0	
	HA - 036 - B				0.6	2	875	42.2	8.68		
32	BP - 037 - A	38.44515385	-122.72253056	170.1	0.3	1	3.46				
	BP - 037 - B				0.6	2	2.77				
	BP - 037 - C				0.9	3	6.19				
	BP - 037 - D				1.2	4	7.02				
33	HA - 039 - A	38.44173796	-122.72018939	171.9	0.3	1	379	16.1	0.71		
	HA - 039 - B				0.6	2	59.3	2.74			
34	HA - 040 - A	38.44043766	-122.71927121	175.1	0.3	1	391	18.8	2.08		
35	BP - 041 - A	38.43506796	-122.71596585	160.9	0.3	1	401	21.1	3.45		
	BP - 041 - B				0.6	2	75.2	1.89			
	BP - 041 - C				0.9	3	8.91				8.0
	BP - 041 - D				1.2	4	6.39				7.9
36	BP - 042 - A	38.43402469	-122.71551687	152.3	0.3	1	97.7	7.02	1.31		
	BP - 042 - B				0.6	2	8.11				
	BP - 042 - C				0.9	3	6.22				
	BP - 042 - D				1.2	4	67.4	3.24			
37	BP - 045 - A	38.43176988	-122.71442866	162.6	0.3	1	28.0				
	BP - 045 - B				0.6	2	33.2				
	BP - 045 - C				0.9	3	7.15				
	BP - 045 - D				1.2	4	7.28				
38	BP - 046 - A	38.43258886	-122.71474479	165.6	0.3	1	10.6				7.7
	BP - 046 - B				0.6	2	3.34				
	BP - 046 - C				0.9	3	5.90				
	BP - 046 - D				1.2	4	4.23				
39	BP - 048 - A	38.43428616	-122.71538851	153.7	0.3	1	7.45				
	BP - 048 - B				0.6	2	3.71				
	BP - 048 - C				0.9	3	5.61				
	BP - 048 - D				1.2	4	< 1.0				7.3
40	BP - 049 - A	38.43512813	-122.71571329	156.7	0.3	1	6.32				
	BP - 049 - B				0.6	2	7.52				
	BP - 049 - C				0.9	3	7.36				
	BP - 049 - D				1.2	4	4.82				
41	BP - 051 - A	38.44009945	-122.71874083	173.1	0.3	1	5.87				
	BP - 051 - B				0.6	2	7.08				
	BP - 051 - C				0.9	3	5.82				
	BP - 051 - D				1.2	4	5.30				

TABLE 1
 MAINLINE LEAD ANALYTICAL DATA AND GPS COORDINATES
 Caltrans - SR I01
 Santa Rosa, Sonoma County, California
 Task Order No. 04-263900-CH
 EA Nos. 263900-245400

Boring	Sample Designation (Location Type-Boring ID-Depth ID')	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
42	BP - 052 - A	38.44076563	-122.71920203	172.6	0.3	1	8.48				
	BP - 052 - B				0.6	2	11.0				
	BP - 052 - C				0.9	3	6.16				
	BP - 052 - D				1.2	4	5.07				6.9
43	BP - 053 - A	38.44156724	-122.71975852	172.4	0.3	1	2.94				
	BP - 053 - B				0.6	2	6.0				
	BP - 053 - C				0.9	3	7.15				
	BP - 053 - D				1.2	4	5.74				
44	BP - 054 - A	38.44288208	-122.72067265	173.0	0.3	1	11.6				
	BP - 054 - B				0.6	2	16.5				
	BP - 054 - C				0.9	3	2.79				
	BP - 054 - D				1.2	4	1.67				
45	BP - 055 - A	38.44371093	-122.72124663	172.5	0.3	1	4.18				
	BP - 055 - B				0.6	2	2.61				
	BP - 055 - C				0.9	3	2.07				
	BP - 055 - D				1.2	4	3.29				
46	BP - 056 - A	38.44441978	-122.72173745	173.2	0.3	1	156	5.52	0.836		
	BP - 056 - B				0.6	2	10.3				
	BP - 056 - C				0.9	3	9.12				
	BP - 056 - D				1.2	4	5.06				
47	BP - 057 - A	38.44731469	-122.72374527	154.8	0.3	1	93.2	3.42			
	BP - 057 - B				0.6	2	7.91				7.8
	BP - 057 - C				0.9	3	8.04				
	BP - 057 - D				1.2	4	4.06				
48	BP - 058 - A	38.44879179	-122.72452531	143.0	0.3	1	5.98				
	BP - 058 - B				0.6	2	7.12				
	BP - 058 - C				0.9	3	5.25				
	BP - 058 - D				1.2	4	6.02				
49	BP - 059 - A	38.45050769	-122.72494299	144.4	0.3	1	41.1				
	BP - 059 - B				0.6	2	9.33				
	BP - 059 - C				0.9	3	8.02				
	BP - 059 - D				1.2	4	8.46				6.6
50	BP - 060 - A	38.45227565	-122.72494804	148.8	0.3	1	4.09				
	BP - 060 - B				0.6	2	5.20				
	BP - 060 - C				0.9	3	5.52				
	BP - 060 - D				1.2	4	4.33				
51	BP - 061 - A	38.45407084	-122.72489347	150.3	0.3	1	3.35				
	BP - 061 - B				0.6	2	5.77				
	BP - 061 - C				0.9	3	5.32				
	BP - 061 - D				1.2	4	4.10				
52	BP - 062 - A	38.45574710	-122.72484220	151.5	0.3	1	22.8				
	BP - 062 - B				0.6	2	5.59				
	BP - 062 - C				0.9	3	2.59				7.6
	BP - 062 - D				1.2	4	30.0				
53	BP - 063 - A	38.45754653	-122.72491758	154.2	0.3	1	18.3				
	BP - 063 - B				0.6	2	11.2				
	BP - 063 - C				0.9	3	17.9				
	BP - 063 - D				1.2	4	6.30				
54	BP - 064 - A	38.45924927	-122.72503816	164.6	0.3	1	29.7				
	BP - 064 - B				0.6	2	11.00				9.8
	BP - 064 - C				0.9	3	38.6				
	BP - 064 - D				1.2	4	5.73				
55	BP - 065 - A	38.46107120	-122.72516910	163.5	0.3	1	28.0				
	BP - 065 - B				0.6	2	12.3				
	BP - 065 - C				0.9	3	9.66				
	BP - 065 - D				1.2	4	7.64				
56	BP - 066 - A	38.46282624	-122.72529974	150.2	0.3	1	6.99				
	BP - 066 - B				0.6	2	11.0				7.9
	BP - 066 - C				0.9	3	2.70				
	BP - 066 - D				1.2	4	2.44				
57	BP - 067 - A	38.46451301	-122.72564565	149.0	0.3	1	19.1				
	BP - 067 - B				0.6	2	39.3				
	BP - 067 - C				0.9	3	5.97				
	BP - 067 - D				1.2	4	7.40				
58	BP - 068 - A	38.46625575	-122.72636288	147.7	0.3	1	2.94				
	BP - 068 - B				0.6	2	6.40				
	BP - 068 - C				0.9	3	5.43				
	BP - 068 - D				1.2	4	4.95				

TABLE 1
MAINLINE LEAD ANALYTICAL DATA AND GPS COORDINATES
 Caltrans - SR I01
 Santa Rosa, Sonoma County, California
 Task Order No. 04-263900-CH
 EA Nos. 263900-245400

Boring	Sample Designation (Location Type Boring ID-Depth ID)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
59	BP - 069 - A	38.46790290	-122.72705122	143.6	0.3	1	31.3				
	BP - 069 - B				0.6	2	7.63				
	BP - 069 - C				0.9	3	3.43				
	BP - 069 - D				1.2	4	7.98				
60	BP - 070 - A	38.46847568	-122.72738657	142.4	0.3	1	95.4	3.72			
	BP - 070 - B				0.6	2	5.09				
	BP - 070 - C				0.9	3	6.69				
	BP - 070 - D				1.2	4	9.61				
61	BP - 071 - A	38.46884270	-122.72670229	145.2	0.3	1	105	0.949			
	BP - 071 - B				0.6	2	8.70				
	BP - 071 - C				0.9	3	6.84				
	BP - 071 - D				1.2	4	6.91				
62	BP - 072 - A	38.46514181	-122.72598436	146.4	0.3	1	7.65				
	BP - 072 - B				0.6	2	21.3				
	BP - 072 - C				0.9	3	13.4				
	BP - 072 - D				1.2	4	38.4				
63	BP - 073 - A	38.46341200	-122.72545518	146.7	0.3	1	512	6.71	1.19		
	BP - 073 - B				0.6	2	12.7				
	BP - 073 - C				0.9	3	8.17				
	BP - 073 - D				1.2	4	7.29				7.0
64	BP - 074 - A	38.46167247	-122.72529502	158.3	0.3	1	7.88				7.0
	BP - 074 - B				0.6	2	12.6				
	BP - 074 - C				0.9	3	3.47				
	BP - 074 - D				1.2	4	3.66				
65	BP - 075 - A	38.45961360	-122.72515912	166.0	0.3	1	14.8				
	BP - 075 - B				0.6	2	41.6				
	BP - 075 - C				0.9	3	5.01				
	BP - 075 - D				1.2	4	6.34				
66	BP - 076 - A	38.45815995	-122.72505550	154.9	0.3	1	23.2				
	BP - 076 - B				0.6	2	57.1	1.64			
	BP - 076 - C				0.9	3	4.65				
	BP - 076 - D				1.2	4	6.51				
67	BP - 078 - A	38.45463265	-122.72497697	146.3	0.3	1	7.14				8.2
	BP - 078 - B				0.6	2	3.52				
	BP - 078 - C				0.9	3	5.17				
	BP - 078 - D				1.2	4	4.46				
68	BP - 079 - A	38.45287321	-122.72503841	145.2	0.3	1	23.4				
	BP - 079 - B				0.6	2	3.19				
	BP - 079 - C				0.9	3	6.19				
	BP - 079 - D				1.2	4	5.56				
69	BP - 080 - A	38.45116151	-122.72508975	144.1	0.3	1	35.1				
	BP - 080 - B				0.6	2	5.55				
	BP - 080 - C				0.9	3	9.33				
	BP - 080 - D				1.2	4	6.92				
70	BP - 081 - A	38.44937299	-122.72483211	147.7	0.3	1	221	16.8	3.83		
	BP - 081 - B				0.6	2	6.29				
	BP - 081 - C				0.9	3	5.81				
	BP - 081 - D				1.2	4	6.48				
71	HA - 082 - A	38.44769962	-122.72410376	154.5	0.3	1	723	42.7	3.36		
72	BP - 083 - A	38.44545904	-122.72262770	170.1	0.3	1	1,660	88.6	20.5	8.32	7.6
	BP - 083 - B				0.6	2	6.68				
	BP - 083 - C				0.9	3	44.8				
	BP - 083 - D				1.2	4	3.42				
73	BP - 084 - A	38.44421902	-122.72176861	170.2	0.3	1	4.94				
	BP - 084 - B				0.6	2	16.5				
	BP - 084 - C				0.9	3	13.5				5.4
	BP - 084 - D				1.2	4	22.6				
74	BP - 085 - A	38.44212078	-122.72031196	172.3	0.3	1	8.46				
	BP - 085 - B				0.6	2	18.6				
	BP - 085 - C				0.9	3	2.62				
	BP - 085 - D				1.2	4	3.01				
75	BP - 087 - A	38.43995603	-122.71880990	172.8	0.3	1	5.94				
	BP - 087 - B				0.6	2	3.07				
	BP - 087 - C				0.9	3	1.84				
	BP - 087 - D				1.2	4	1.35				
76	BP - 088 - A	38.43519838	-122.71586796	162.5	0.3	1	25.4				
	BP - 088 - B				0.6	2	15.9				
	BP - 088 - C				0.9	3	3.16				4.9
	BP - 088 - D				1.2	4	3.16				

TABLE 1
 MAINLINE LEAD ANALYTICAL DATA AND GPS COORDINATES
 Caltrans - SR I01
 Santa Rosa, Sonoma County, California
 Task Order No. 04-263900-CH
 EA Nos. 263900-245400

Boring	Sample Designation (Location Type-Boring ID-Depth ID)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
77	BP - 089 - A	38.43354199	-122.71521812	158.5	0.3	1	1,100	18.3	2.72	0.831	
	BP - 089 - B				0.6	2	12.6				
	BP - 089 - C				0.9	3	2.33				
	BP - 089 - D				1.2	4	3.22				
78	BP - 090 - A	38.43267749	-122.71535894	155.6	0.3	1	3.20				
	BP - 090 - B				0.6	2	45.6				
	BP - 090 - C				0.9	3	6.28				
	BP - 090 - D				1.2	4	6.03				
79	BP - 091 - A	38.43261038	-122.71542038	152.6	0.3	1	7.17				
	BP - 091 - B				0.6	2	6.42				
	BP - 091 - C				0.9	3	4.98				
	BP - 091 - D				1.2	4	6.48				
80	BP - 092 - A	38.43227202	-122.71506183	154.9	0.3	1	2.69				
	BP - 092 - B				0.6	2	3.01				
	BP - 092 - C				0.9	3	106				
	BP - 092 - D				1.2	4	6.37				
81	BP - 093 - A	38.43228184	-122.71516618	151.6	0.3	1	5.75				
	BP - 093 - B				0.6	2	4.55				
	BP - 093 - C				0.9	3	6.47				
	BP - 093 - D				1.2	4	4.41				
82	BP - 094 - A	38.43093168	-122.71452981	154.7	0.3	1	2.42				7.4
	BP - 094 - B				0.6	2	3.72				8.7
	BP - 094 - C				0.9	3	8.29				
	BP - 094 - D				1.2	4	5.82				
83	BP - 095 - A	38.43070631	-122.71473971	158.2	0.3	1	16.3				
	BP - 095 - B				0.6	2	3.21				
	BP - 095 - C				0.9	3	2.86				
	BP - 095 - D				1.2	4	7.32				
84	BP - 096 - A	No GPS Data			0.3	1	12.5				
	BP - 096 - B				0.6	2	27.2				
	BP - 096 - C				0.9	3	7.18				
	BP - 096 - D				1.2	4	4.72				
85	BP - 097 - A	No GPS Data			0.3	1	27.5				7.6
	BP - 097 - B				0.6	2	5.91				
	BP - 097 - C				0.9	3	3.45				
	BP - 097 - D				1.2	4	4.43				
86	BP - 098 - A	No GPS Data			0.3	1	71.9	1.39			
	BP - 098 - B				0.6	2	4.92				
	BP - 098 - C				0.9	3	4.66				
	BP - 098 - D				1.2	4	5.28				
87	BP - 100 - A	No GPS Data			0.3	1	329	9.42	1.50		
	BP - 100 - B				0.6	2	7.31				
	BP - 100 - C				0.9	3	5.49				
	BP - 100 - D				1.2	4	4.76				
88	BP - 101 - A	38.44759194	-122.72368219	150.6	0.3	1	912	51.6	5.94		
	BP - 101 - B				0.6	2	49.0				
	BP - 101 - C				0.9	3	1,980				
	BP - 101 - D				1.2	4	17.6				
89	HA - 102 - A	38.44724337	-122.72348642	151.1	0.3	1	613	40.2	3.46		
	HA - 102 - B				0.6	2	274				
	HA - 102 - C				0.9	3	216				
90	BP - 103 - A	38.44706999	-122.72325361	150.9	0.3	1	3,420	150.0	37.5	14.3	
	BP - 103 - B				0.6	2	29.7				
	BP - 103 - C				0.9	3	12.1				
	BP - 103 - D				1.2	4	7.32				
91	HA - 104 - A	No GPS Data			0.3	1	581	23.0	1.61		6.9
	HA - 104 - B				0.6	2	89.0				
	HA - 104 - C				0.9	3	208				
92	BP - 105 - A	No GPS Data			0.3	1	110	3.34			
	BP - 105 - B				0.6	2	6.62				
	BP - 105 - C				0.9	3	5.63				
	BP - 105 - D				1.2	4	6.27				
93	HA - 107 - A	No GPS Data			0.3	1	197	12.1	1.05		6.6
94	HA - 108 - A	38.44497632	-122.72186536	168.1	0.3	1	305	15.7	1.07		
95	BP - 109 - A	38.46040457	-122.72464282	154.4	0.3	1	5.61				
	BP - 109 - B				0.6	2	4.31				
	BP - 109 - C				0.9	3	4.54				
	BP - 109 - D				1.2	4	4.04				

TABLE 1
MAINLINE LEAD ANALYTICAL DATA AND GPS COORDINATES
 Caltrans - SR I01
 Santa Rosa, Sonoma County, California
 Task Order No. 04-263900-CH
 EA Nos. 263900-245400

Boring	Sample Designation (Location Type-Boring ID-Depth (D'))	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
96	BP - 110 - A	38.46080539	-122.72484076	155.8	0.3	1	321	15.8	1.47		
	BP - 110 - B				0.6	2	2.69				
	BP - 110 - C				0.9	3	< 1.0				
	BP - 110 - D				1.2	4	7.65				
97	BP - 111 - A	38.46118973	-122.72482792	156.7	0.3	1	3,640	150.0	23.2	6.54	
	BP - 111 - B				0.6	2	10.7				
	BP - 111 - C				0.9	3	6.57				
	BP - 111 - D				1.2	4	5.61				
98	BP - 112 - A	38.46148162	-122.72495353	157.3	0.3	1	25.2				7.0
	BP - 112 - B				0.6	2	13.8				
	BP - 112 - C				0.9	3	17.8				
	BP - 112 - D				1.2	4	60.7	1.26			
99	BP - 113 - A	38.46174321	-122.72492743	158.6	0.3	1	396	22.7	1.51		
	BP - 113 - B				0.6	2	2.93				
	BP - 113 - C				0.9	3	4.96				
	BP - 113 - D				1.2	4	21.4				
100	HA - 114 - A	38.46200141	-122.72504076	157.4	0.3	1	335	19.2	1.39		6.8
	HA - 114 - B				0.6	2	12.1				
	HA - 114 - C				0.9	3	5.36				
101	BP - 114 - A	38.46200141	-122.72504076	157.4	0.3	1	17.5				
	BP - 114 - B				0.6	2	4.62				
	BP - 114 - C				0.9	3	4.03				
	BP - 114 - D				1.2	4	6.33				
102	BP - 115 - A	38.45974128	-122.72456326	155.8	0.3	1	6.91				5.8
	BP - 115 - B				0.6	2	7.08				
	BP - 115 - C				0.9	3	5.80				
	BP - 115 - D				1.2	4	6.41				
103	BP - 116 - A	38.45936310	-122.72472921	153.2	0.3	1	42.9				
	BP - 116 - B				0.6	2	75.6	1.78			
	BP - 116 - C				0.9	3	3.27				
	BP - 116 - D				1.2	4	6.31				
104	BP - 117 - A	38.45888310	-122.72462062	154.4	0.3	1	24.2				
	BP - 117 - B				0.6	2	3.10				
	BP - 117 - C				0.9	3	6.29				
	BP - 117 - D				1.2	4	4.74				
105	BP - 118 - A	38.45853377	-122.72474630	157.2	0.3	1	11.9				
	BP - 118 - B				0.6	2	21.6				
	BP - 118 - C				0.9	3	13.1				
	BP - 118 - D				1.2	4	34.7				
106	BP - 119 - A	38.45981019	-122.72556797	144.2	0.3	1	12.6				
	BP - 119 - B				0.6	2	52.1	0.424			
	BP - 119 - C				0.9	3	35.7				
	BP - 119 - D				1.2	4	32.3				
107	BP - 120 - A	38.45945289	-122.72562387	147.2	0.3	1	11.4				
	BP - 120 - B				0.6	2	8.45				
	BP - 120 - C				0.9	3	10.1				
	BP - 120 - D				1.2	4	22.1				
108	BP - 121 - A	38.45900248	-122.72543619	144.5	0.3	1	78.2	1.77			
	BP - 121 - B				0.6	2	98.4	4.01			
	BP - 121 - C				0.9	3	90.1	1.01			
	BP - 121 - D				1.2	4	266	8.12	1.02		
109	BP - 122 - A	38.45854747	-122.72541798	166.7	0.3	1	5,030	287	23.8	4.77	
	BP - 122 - B				0.6	2	5.91				
	BP - 122 - C				0.9	3	7.09				
	BP - 122 - D				1.2	4	8.24				
110	HA - 123 - A	38.44795705	-122.72448121	152.9	0.3	1	526	24.0	1.86		
111	BP - 124 - A	38.44756244	-122.72436427	155.0	0.3	1	17.9				
	BP - 124 - B				0.6	2	4.18				
	BP - 124 - C				0.9	3	24.3				
	BP - 124 - D				1.2	4	30.4				
112	HA - 125 - A	38.44716084	-122.72406818	158.4	0.3	1	128	6.57	0.276		
113	BP - 126 - A	38.44670278	-122.72391893	152.8	0.3	1	16.4				8.0
	BP - 126 - B				0.6	2	19.7				
	BP - 126 - C				0.9	3	25.1				
	BP - 126 - D				1.2	4	24.0				
114	BP - 127 - A	38.44628195	-122.72356469	145.3	0.3	1	128	3.77			6.8
	BP - 127 - B				0.6	2	49.2				
	BP - 127 - C				0.9	3	5.01				
	BP - 127 - D				1.2	4	6.14				

TABLE 1
 MAINLINE LEAD ANALYTICAL DATA AND GPS COORDINATES
 Caltrans - SR 101
 Santa Rosa, Sonoma County, California
 Task Order No. 04-263900-CH
 EA Nos. 263900-245400

Boring	Sample Designation (Location Type Boring ID - Depth ID)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead				pH
							Total	WET	DI WET	TCLP	
115	BP - 128 - A	38.44545874	-122.72302241	156.2	0.3	1	1,010	39.3	2.32	0.243	
	BP - 128 - B				0.6	2	25.5				7.0
	BP - 128 - C				0.9	3	5.10				7.0
	BP - 128 - D				1.2	4	16.3				
116	BP - 129 - A	38.44504683	-122.72274679	165.8	0.3	1	4.51				
	BP - 129 - B				0.6	2	2.10				
	BP - 129 - C				0.9	3	2.47				
	BP - 129 - D				1.2	4	2.57				
117	BP - 130 - A	38.44475855	-122.72238044	176.2	0.3	1	4.04				
	BP - 130 - B				0.6	2	2.39				
	BP - 130 - C				0.9	3	2.53				
	BP - 130 - D				1.2	4	3.03				
TTLC							1,000				
STLC							5.0				
Reporting Limits							1.0	0.050	0.010	0.050	0.10

Notes:

1. Soil samples labeled as follows: Location Type - Boring ID - Depth ID. Location Type = Boring Point (BP) or Hand Auger (HA). Depth ID = A [1ft below ground surface (bgs)], B (2 ft bgs), C (3 ft bgs), or D (4 ft bgs).
2. Analyses conducted in general accordance with EPA Method 6010 for lead and EPA Method 9045 for soil pH.
3. Sample depths reported in approximate meters (m) / feet (ft) bgs
4. TTLC = total threshold limit concentration. STLC = soluble threshold limit concentration. WET = waste extraction test. DIWET = WET with deionized water extraction solution. TCLP = toxicity characteristic leaching procedure
5. WET conducted in general accordance with California Title 22 procedures.
6. Total metal results reported in milligrams per kilogram. WET and DI WET results reported in milligrams per liter. pH results reported in standard units.
7. For total results, bold results exceed 10 times the STLC.
8. For WET results, bold results exceed the STLC.
9. For DI WET results, bold results exceed 0.5 mg/L.
10. For TCLP results, bold results equal to or exceed 5 mg/L.
11. Latitude and longitude converted to decimal format.
12. MSL = Mean sea level

Table 2

**Summary of Deep Boring GPS Coordinates
Caltrans SR 101 Santa Rosa
Sonoma County, California
Task Order 04-263900-CH**

Sample Designation (See Notes)	Latitude	Longitude	MSL (feet)	Sample Depth (m)	Sample Depth (ft)
Luther Burbank Elementary School Site					
B-2-S-1	38.43374387	-122.71488960	170.07	0.3	1
B-2-S-10			161.07	3.1	10
B-3-S-1	38.43415560	-122.71503480	152.24	0.3	1
B-3-S-10			143.24	3.1	10
B-4-S-1	38.43453405	-122.71524460	156.52	0.3	1
B-4-S-20			137.52	6.1	20
B-5-S-1	38.43489815	-122.71541110	154.40	0.3	1
B-5-S-20			135.40	6.1	20
B-6-S-1	38.43524121	-122.71554670	154.21	0.3	1
B-6-S-20			135.21	6.1	20
Shell Site					
B-7-S-1	38.44576768	-122.72156830	214.13	0.3	1
B-7-S-10			205.13	3.1	10
B-8-S-1	38.44577646	-122.72165830	213.31	0.3	1
B-8-S-10			204.31	3.1	10
B-9-S-1	38.44578473	-122.72188990	214.55	0.3	1
B-9-S-10			205.55	3.1	10
Midas Site					
B-10-S-1	38.44610112	-122.72401130	212.34	0.3	1
B-10-S-10			203.34	3.1	10
B-11-S-1	38.44610403	-122.72412780	211.93	0.3	1
B-11-S-10			202.93	3.1	10
B-12-S-1	38.44612389	-122.72424010	213.85	0.3	1
B-12-S-10			204.85	3.1	10
Mission Car Wash Site					
B-13-S-1	38.44603430	-122.72166780	214.97	0.3	1
B-13-S-10			205.97	3.1	10
B-14-S-1	38.44606061	-122.72185000	214.30	0.3	1
B-14-S-10			205.30	3.1	10
B-15-S-1	38.44602419	-122.72202060	150.03	0.3	1
B-15-S-10			141.03	3.1	10
Steele Lane OC					
S-1-1	38.45988604	-122.72477500	147.91	0.3	1
S-1-16			132.91	4.9	16
S-2-1	38.46017987	-122.72556440	146.83	0.3	1
S-2-16			131.83	4.9	16
B-16-S-1	38.46023970	-122.72475920	145.93	0.3	1
B-16-S-10			136.93	3.1	10
B-17-S-1	38.45986276	-122.72554990	144.90	0.3	1
B-17-S-10			135.90	3.1	10

Table 2

Summary of Deep Boring GPS Coordinates
 Caltrans SR 101 Santa Rosa
 Sonoma County, California
 Task Order 04-263900-CH

Sample Designation (See Notes)	Latitude	Longitude	MSL (feet)	Sample Depth (m)	Sample Depth (ft)
4th Street Viaduct					
B-18-S-1	No GPS Data				
B-19-S-1	38.43810258	-122.71746000	155.82	0.3	1
B-20-S-1	38.43826738	-122.71760600	160.30	0.3	1
B-20-S-10			151.30	3.1	10
College Avenue OC					
B-21-S-1	38.44614721	-122.72344520	213.57	0.3	1
B-21-S-10			204.57	3.1	10
B-22-S-1	38.44573636	-122.72323940	214.34	0.3	1
B-22-S-10			205.34	3.1	10
Chevron Site					
B-23-S	38.44582365	-122.72400020	220.98		
B-25-S-1	38.44581892	-122.72427210	206.23	0.3	1
B-25-S-10			197.23	3.1	10

Notes:

Latitude and longitude converted to decimal format.

Sample Designation: Ex.: B-2-S-1 (Boring 2, Soil, 1 foot depth); Ex.: S-1-1 (Soil, Boring 1, 1 foot depth)

OC = Overcrossing

Summary of Lead in Soil Statistical Analyses
Caltrans - SR101
Santa Rosa, Sonoma County, California
Task Order No. 04-263900

PART I

LOCATION	BORINGS INCLUDED	DEPTH (FEET BGS)	MEAN TOTAL LEAD	90% UCL	PREDICTED WET	PREDICTED DIWET	DISPOSAL CHARACTERIZATION
PART I	All Borings in Part I Area ¹	0-4					Non-Hazardous
MEDIAN	BORING POINTS: 65, 66, 67, 68, 69, 70, 71, 72, 73, 74	0-1 1-4	81.63 9.97	153.14 12.01	2.11 -	- -	Non-Hazardous Non-Hazardous
SHOULDERS	HAND AUGER POINTS: 17 BORING POINTS: 18, 20, 21, 22, 23, 24, 25, 26, 27, 28	0-1 1-4 0-4 ¹	326.85 24.46 54.98	584.34 30.87 72.57	16.77 1.90 3.71	3.43 - 0.47	California Hazardous Non-Hazardous Non-Hazardous
ONRAMPS	HAND AUGER POINTS: 114 BORING POINTS: 109, 110, 112, 113, 114	0-4	52.02	80.71	4.42	0.33	Non-Hazardous

PART II

LOCATION	BORINGS INCLUDED	DEPTH (FEET BGS)	MEAN TOTAL LEAD	90% UCL	PREDICTED WET	PREDICTED DIWET	DISPOSAL CHARACTERIZATION
PART II	All Borings in Part II Area ¹	(Fee)					Non-Hazardous
MEDIAN	HAND AUGER POINTS: 82 BORING POINTS: 45, 46, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 75, 76, 78, 79, 80, 81, 84, 85, 87, 88, 89	0-1 1-4	88.41 8.92	148.25 10.01	4.57 -	0.53 -	Non-Hazardous Non-Hazardous
SHOULDERS	HAND AUGER POINTS: 8, 9, 11, 12, 13, 15, 31, 39, 40 BORING POINTS: 1, 2, 3, 4, 6, 10, 14, 29, 30, 32, 33, 34, 37, 41, 42	0-1 1-4 0-4	425.38 50.80 167.56	556.79 76.86 220.66	28.01 3.65 11.04	2.84 0.79 1.23	California Hazardous Non-Hazardous California Hazardous
ONRAMPS + HWY 12 INTERCHANGE	HAND AUGER POINTS: 102, 104 BORING POINTS: 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 101, 102, 104, 105, 119, 120, 121, 122, 128, 129, 130	0-1 1-4 0-4	421.20 61.30 150.21	782.1 104.73 243.88	43.92 4.20 13.18	3.66 0.70 1.21	California Hazardous Non-Hazardous California Hazardous
OFFRAMPS	HAND AUGER POINTS: 107, 108, 123, 125 BORING POINTS: 115, 116, 117, 118, 124, 126, 127	0-1 1-4 0-4	127.66 17.91 55.53	189.94 23.5 76.54	9.09 - 3.64	0.69 - 0.28	California Hazardous Non-Hazardous Non-Hazardous

Notes:

¹ = Samples HA-036, BP-083, BP-103, and BP-111 were removed from the sample populations and considered a RCRA waste.
 BP 28-A was removed from sample population and considered a California hazardous waste.
 Soil Classified as California hazardous waste meets the criteria for re-use under Condition 2 of the DTSC variance.

BGS = Below ground surface.

UCL = Upper confidence level.

Summary of Soil Analytical Results - Organics
Caltrans SR 101
Santa Rosa, Sonoma County, California
Task Order 04-263900-CH

Boring Designation	Depth (meters)	Depth (feet)	Date	TPHg mg/kg	BTEX			TPHd mg/kg	TPHmo mg/kg	O&G mg/kg	PCBs mg/kg	Fuel Oxygenates	
					Benzene mg/kg	Toluene mg/kg	Total xylenes mg/kg					MTBE ug/kg	
Luther Burbank Elementary School Site													
B-2-S-1	0.3	1	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	16.6	260	<0.03	<0.5	<0.5
B-2-S-10	3.0	10	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	60	<0.03	<0.5	<0.5
B-3-S-1	0.3	1	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	16	<50	<0.03	<0.5	<0.5
B-3-S-10	3.0	10	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	60	<0.03	<0.5	<0.5
B-4-S-1	0.3	1	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	320	<0.03	<0.5	<0.5
B-4-S-20	6.1	20	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	<50	<0.03	<0.5	<0.5
B-5-S-1	0.3	1	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	31	1,140	<0.03	<0.5	<0.5
B-5-S-20	6.1	20	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	<50	<0.03	<0.5	<0.5
B-6-S-1	0.3	1	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	140	940	<0.03	<0.5	<0.5
B-6-S-20	6.1	20	07/29/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	<50	<0.03	<0.5	<0.5
Shell Site													
B-7-S-1	0.3	1	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	51	260	<0.03	<0.5	<0.5
B-7-S-10	3.0	10	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	80	<0.03	1.0	1.0
B-8-S-1	0.3	1	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	22	60	<0.03	<0.5	<0.5
B-8-S-10	3.0	10	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	<50	<0.03	5.8	5.8
B-9-S-1	0.3	1	08/12/03	<1.0	<0.005	<0.005	<0.005	<1.0	11	<50	<0.03	<0.5	<0.5
B-9-S-10	3.0	10	08/12/03	2.02	<0.005	<0.005	<0.005	<1.0	<10	<50	<0.03	11	11
Midas Site													
B-10-S-1	0.3	1	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	60	<0.03	<0.5	<0.5
B-10-S-10	3.0	10	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	80	<0.03	<0.5	<0.5
B-11-S-1	0.3	1	08/11/03	2.40	<0.005	<0.005	<0.005	<1.0	<10	60	<0.03	<0.5	<0.5
B-11-S-10	3.0	10	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	27	<50	<0.03	<0.5	<0.5
B-12-S-1	0.3	1	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	240	<0.03	<0.5	<0.5
B-12-S-10	3.0	10	08/11/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	<50	<0.03	<0.5	<0.5
Mission Car Wash Site													
B-13-S-1	0.3	1	08/12/03	<1.0	<0.005	<0.005	<0.005	<1.0	13	<50	<0.03	<0.5	<0.5
B-13-S-10	3.0	10	08/12/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	<50	<0.03	<0.5	<0.5
B-14-S-1	0.3	1	08/12/03	3.80	0.019	<0.005	0.022	<1.0	<10	<50	<0.03	<0.5	<0.5
B-14-S-10	3.0	10	08/12/03	6.90	0.062	<0.005	<0.005	<1.0	<10	<50	<0.03	<0.5	<0.5
B-15-S-1	0.3	1	08/12/03	<1.0	<0.005	<0.005	<0.005	<1.0	24	<50	<0.03	<0.5	<0.5
B-15-S-10	3.0	10	08/12/03	<1.0	<0.005	<0.005	<0.005	<1.0	<10	<50	<0.03	<0.5	<0.5
PRG-Residential													
ESL (<3m depth)				ne	0.6	520	270	ne	ne	ne	0.22	17,000	17,000
ESL (>3m depth)				100	0.18	9.3	1.5	500	500	ne	0.22	2,000	2,000
ESL (>3m depth)				100	0.044	2.9	1.5	100	100	ne	6.3	23	23

Summary of Soil Analytical Results - Inorganics
Caltrans SR 101 Santa Rosa
Sonoma County, California
Task Order 04-263900-CH

Boring Designation	Depth (meters)	Depth (feet)	Date	Barium,			Chromium,			Lead,			Silver,			Zinc mg/kg	
				WET mg/l	mg/kg	mg/kg	TCLP mg/l	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg
Luther Burbank Elementary School Site																	
B-2-S-1	0.3	1	07/29/03														
B-2-S-10	3.0	10	07/29/03	<0.30	<0.30	<0.50	<0.05	79	7.33	57	21	<0.05	79	<0.05	<1.0	133	
B-3-S-1	0.3	1	07/29/03	<0.30	<0.30	<0.50	<0.05	71	4.7	14	14	<0.05	71	<0.05	<1.0	45	
B-3-S-10	3.0	10	07/29/03	<0.30	<0.30	<0.50	<0.05	75	10.3	38	21	<0.05	75	<0.05	<1.0	90	
B-4-S-1	0.3	1	07/29/03	<0.30	<0.30	<0.50	<0.05	63	6.6	30	17	<0.05	63	<0.05	<1.0	48	
B-4-S-20	6.1	20	07/29/03	<0.30	<0.30	<0.50	<0.05	82	2.75	38	20	<0.05	82	<0.05	<1.0	157	
B-5-S-1	0.3	1	07/29/03	<0.30	<0.30	0.6	<0.05	74	20.7	32	32	<0.05	74	<0.05	<1.0	52	
B-5-S-20	6.1	20	07/29/03	<0.30	<0.30	<0.50	<0.05	51	11	30	21	<0.05	51	<0.05	<1.0	169	
B-6-S-1	0.3	1	07/29/03	<0.30	<0.30	<0.50	<0.05	62	11	22	14	<0.05	62	<0.05	<1.0	50	
B-6-S-20	6.1	20	07/29/03	<0.30	<0.30	<0.50	<0.05	50	7.8	22	20	<0.05	50	<0.05	<1.0	44	
Shell Site																	
B-7-S-1	0.3	1	08/11/03	<0.30	<0.30	<0.50	<0.05	69	2.16	38	17	<0.05	69	<0.05	<1.0	97	
B-7-S-10	3.0	10	08/11/03	<0.30	<0.30	<0.50	<0.05	96	66	39	19	<0.05	96	<0.05	<1.0	72	
B-8-S-1	0.3	1	08/11/03	<0.30	<0.30	<0.50	<0.05	93	19	40	28	<0.05	93	<0.05	<1.0	82	
B-8-S-10	3.0	10	08/11/03	<0.30	<0.30	<0.50	<0.05	103	9.2	48	25	<0.05	103	<0.05	<1.0	77	
B-9-S-1	0.3	1	08/12/03	<0.30	<0.30	<0.50	<0.05	81	1.69	98	18	<0.05	81	<0.05	<1.0	111	
B-9-S-10	3.0	10	08/12/03	<0.30	<0.30	<0.50	<0.05	93	7.2	38	19	<0.05	93	<0.05	<1.0	66	
Midas Site																	
B-10-S-1	0.3	1	08/11/03	<0.30	<0.30	<0.50	<0.05	114	8.6	41	25	<0.05	114	<0.05	<1.0	77	
B-10-S-10	3.0	10	08/11/03	<0.30	<0.30	<0.50	<0.05	101	7.4	31	24	<0.05	101	<0.05	<1.0	62	
B-11-S-1	0.3	1	08/11/03	<0.30	<0.30	<0.50	<0.05	100	7.0	32	22	<0.05	100	<0.05	<1.0	66	
B-11-S-10	3.0	10	08/11/03	<0.30	<0.30	<0.50	<0.05	71	5.7	25	22	<0.05	71	<0.05	<1.0	58	
B-12-S-1	0.3	1	08/11/03	<0.30	<0.30	<0.50	<0.05	86	1.98	35	18	<0.05	86	<0.05	<1.0	106	
B-12-S-10	3.0	10	08/11/03	<0.30	<0.30	<0.50	<0.05	97	7.2	30	20	<0.05	97	<0.05	<1.0	60	
Mission Car Wash Site																	
B-13-S-1	0.3	1	08/12/03	<0.30	<0.30	<0.50	<0.05	60	0.098	30	15	<0.05	60	<0.05	<1.0	66	
B-13-S-10	3.0	10	08/12/03	<0.30	<0.30	<0.50	<0.05	101	6.5	36	15	<0.05	101	<0.05	<1.0	64	
B-14-S-1	0.3	1	08/12/03	<0.30	<0.30	<0.50	<0.05	114	9.2	46	24	<0.05	114	<0.05	<1.0	86	
B-14-S-10	3.0	10	08/12/03	<0.30	<0.30	<0.50	<0.05	98	7.5	42	21	<0.05	98	<0.05	<1.0	70	
B-15-S-1	0.3	1	08/12/03	<0.30	<0.30	<0.50	<0.05	88	38	35	18	<0.05	88	<0.05	<1.0	88	
B-15-S-10	3.0	10	08/12/03	<0.30	<0.30	<0.50	<0.05	107	8.7	50	26	<0.05	107	<0.05	<1.0	81	
TTL (mg/kg)																	
				500	500	10,000	500	2,500	1,000	8,000	2,500	1,000	3,500	2,000	100	500	5,000
STLC (mg/l)				15	5	100	100	0.75	1.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	7.0
PRG - Residential (mg/kg)				31	0.39/22	5,400	210	37	150	3,100	150	390	1,600	390	390	390	23,000

Table 7

Summary of Groundwater Analytical Results - Organics
Caltrans SR 101
Santa Rosa, Sonoma County, California
Task Order 04-263900-CH

Boring Designation	Depth (meters)	Depth (feet)	Date	TPHg ug/l	BTEX		TPHd ug/l	TPHmo ug/l	O&G ug/l	PCBs ug/l	Fuel Oxygenates		
					Ethylbenzene ug/l	Total xylenes ug/l					MTBE ug/l	TAME ug/l	Tertiary butanol ug/l
Luther Burbank Elementary School Site													
B-2-W	6	20	07/30/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
B-3-W	6	20	07/29/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
B-4-W	7.2	24	07/29/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
B-5-W	7.5	25	07/29/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
B-6-W	8.4	28	07/29/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
Shell Site													
B-7-W	4.8	16	08/11/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	63.0	<1.0	<10
B-8-W	4.8	16	08/11/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	45.0	<1.0	<10
B-9-W	4.8	16	08/12/03	2,700*	<0.5	<0.5	250**	<50	<5,000	ND	430	<1.0	750
Midas Site													
B-10-W	4.8	16	08/11/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	2.4	<1.0	<10
B-11-W	4.8	16	08/11/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	14	<1.0	<10
B-12-W	4.8	16	08/11/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
Mission Car Wash Site													
B-13-W	4.8	16	08/12/03	110	0.66	1.9	<50	<50	<5,000	ND	<0.5	<1.0	<10
B-14-W	4.8	16	08/12/03	660*	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
B-15-W	4.8	16	08/12/03	170*	<0.5	<0.5	<50	<50	<5,000	ND	5.5	<1.0	<10
Steele Lane OC													
S-1-W	4.8	16	07/30/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
S-2-W	4.8	16	07/30/03	1,400	<0.5	<0.5	3,400	<50	<5,000	ND	4.06	<1.0	<10
B-16-W	4.8	16	08/12/03	790	2.8	5.8	140*	<50	<5,000	ND	<0.5	<1.0	<10
B-17-W	4.8	16	08/12/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
4th Street Viaduct													
B-20-W	6	20	08/13/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	<0.5	<1.0	<10
College Avenue OC													
B-21-W	4.8	16	08/13/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	0.96	<1.0	<10
B-22-W	4.8	16	08/13/03	<50	<0.5	<0.5	<50	<50	<5,000	ND	0.63	<1.0	<10
Chevron Site													
B-23-W	4.8	16	09/02/00	<50	<0.5	<0.5	<50	<50	<5,000	ND	2.40	<1.0	<10
B-25-W	4.8	16	09/02/00	<50	<0.5	<0.5	<50	<50	<5,000	ND	280	12	<50
ESL (>3m depth)				500	290	13	640	640	640	0.014	1,800	ne	ne
PRG - Tap Water				ne	2.9	210	ne	ne	ne	0.034	6.2	ne	ne

Notes:

Only compounds detected in one or more samples are listed. See Certified Analytical Report for individual reporting limits.

Concentrations reported in micrograms per liter.

Bold results exceed drinking water standard levels.

TPHg = Total petroleum hydrocarbons as gasoline.

BTEX = Benzene, toluene, ethylbenzene, and total xylenes.

TPHd = Total petroleum hydrocarbons as diesel.

TPHmo = Total petroleum hydrocarbons as motor oil.

O&G = Oil and Grease.

PCBs = Polychlorinated Biphenyls.

MTBE = Methyl tert-butyl ether.

TAME = Tert-amyl methyl ether.

ND = Not detected.

ESL = Environmental Screening Level

PRG = EPA, Region 9, Preliminary Remedial Goal for tap water.

ne = not established

* = Non-typical TPH pattern in the gas range.

** = Non-typical TPH pattern in the diesel range.

OC = Overcrossing

Table 8

Summary of Groundwater Analytical Results - VOCs and SVOCs
Caltrans SR 101
Santa Rosa, Sonoma County, California
Task Order 04-263900-CH

Boring Designation	Depth (meters)	Depth (feet)	Date	Volatile Organic Compounds											
				Acetone ug/l	2-Butanone ug/l	n-Butylbenzene ug/l	Isopropylbenzene ug/l	n-Propylbenzene ug/l	Naphthalene ug/l	Tetrachloroethene ug/l	1,3,5-Trimethylbenzene ug/l	1,2,4-Trimethylbenzene ug/l	Total Xylenes ug/l	Semi-Volatile Organic Compounds ug/l	
Luther Burbank Elementary School Site															
B-2-W	6	20	07/30/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-3-W	6	20	07/29/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-4-W	7.2	24	07/29/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-5-W	7.5	25	07/29/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-6-W	8.4	28	07/29/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
Shell Site-A36															
B-7-W	4.8	16	08/11/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-8-W	4.8	16	08/11/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-9-W	4.8	16	08/12/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
Midas Site															
B-10-W	4.8	16	08/11/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-11-W	4.8	16	08/11/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-12-W	4.8	16	08/11/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
Mission Car Wash Site															
B-13-W	4.8	16	08/12/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-14-W	4.8	16	08/12/03	<2.0	<2.0	3.6	3.3	11	2.8	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-15-W	4.8	16	08/12/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
Steele Lane OC															
S-1-W	4.8	16	07/30/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
S-2-W	4.8	16	07/30/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-16-W	4.8	16	08/12/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.4	7.7	2.5	<2.0	ND
B-17-W	4.8	16	08/12/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
4th Street Viaduct															
B-20-W	6	20	08/13/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	5.2	<2.0	<2.0	<2.0	<2.0	ND
College Avenue OC															
B-21-W	4.8	16	08/13/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-22-W	4.8	16	08/13/03	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
Chevron Site															
B-23-W	4.8	16	09/02/00	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
B-25-W	4.8	16	09/02/00	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	ND
ESL (>3m depth)				1,500						120				13	
PRG - Tap Water				610	1,900	240	ne	240	6.2	0.66	12.0	12.0	210		

Notes:

Only compounds detected in one or more samples are listed. See Certified Analytical Report for individual reporting limits.

Concentrations reported in micrograms per liter.

Bold results exceed drinking water standard levels.

ND = Not detected.

ESL = Environmental Screening Level

PRG = EPA, Region 9, Preliminary Remediation Goal for tap water

ne = not established

OC = Overcrossing

Summary of Groundwater Analytical Results - Inorganics
Caltrans SR 101 Santa Rosa
Sonoma County, California
Task Order 04-263900-CH

Boring Designation	Depth (meters)	Depth (feet)	Date	Antimony mg/l	Arsenic mg/l	Barium mg/l	Beryllium mg/l	Cadmium mg/l	Chromium mg/l	Cobalt mg/l	Copper mg/l	Lead mg/l	Mercury mg/l	Molybdenum mg/l	Nickel mg/l	Selenium mg/l	Silver mg/l	Thallium mg/l	Vanadium mg/l	Zinc mg/l
Luther Burbank Elementary School Site																				
B-2-W	6	20	07/30/03	<0.060	<0.080	0.17	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
B-3-W	6	20	07/29/03	<0.060	<0.080	0.10	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
B-4-W	7.2	24	07/29/03	<0.060	<0.080	0.15	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
B-5-W	7.5	25	07/29/03	<0.060	<0.080	0.16	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
B-6-W	8.4	28	07/29/03	<0.060	<0.080	0.15	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
Shell Site																				
B-7-W	4.8	16	08/11/03	<0.060	<0.080	0.21	<0.0030	<0.0050	<0.010	<0.050	0.021	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.09
B-8-W	4.8	16	08/11/03	<0.060	<0.080	0.18	<0.0030	<0.0050	<0.010	<0.050	0.02	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.067
B-9-W	4.8	16	08/12/03	<0.060	<0.080	0.34	<0.0030	<0.0050	<0.010	<0.050	0.06	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.06
Midas Site																				
B-10-W	4.8	16	08/11/03	<0.060	<0.080	0.33	<0.0030	<0.0050	<0.010	<0.050	0.024	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.062
B-11-W	4.8	16	08/11/03	<0.060	<0.080	0.15	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.042
B-12-W	4.8	16	08/11/03	<0.060	<0.080	0.27	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.041
Mission Car Wash Site																				
B-13-W	4.8	16	08/12/03	<0.060	<0.080	0.47	<0.0030	<0.0050	<0.010	<0.050	0.03	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.04
B-14-W	4.8	16	08/12/03	<0.060	<0.080	0.22	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.04
B-15-W	4.8	16	08/12/03	<0.060	<0.080	0.32	<0.0030	<0.0050	<0.010	<0.050	<0.020	0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.04
Steele Lane OC																				
S-1-W	4.8	16	07/30/03	<0.060	<0.080	0.78	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
S-2-W	4.8	16	07/30/03	<0.060	<0.080	0.18	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
B-16-W	4.8	16	08/12/03	<0.060	<0.080	0.35	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
B-17-W	4.8	16	08/12/03	<0.060	<0.080	0.32	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.04
ESL (>3m depth)				0.03	0.36	1.0	0.027	0.022	0.18	0.003	0.031	0.025	0.000012	0.24	0.002	0.005	0.00019	0.02	0.019	0.081
California Action Level				1.3	0.015						1.3	0.015								
PRG - Tap Water				0.015	0.000045	2.6	0.073	0.018	0.73	0.73	1.5	0.011	0.18	0.18	0.73	0.18	0.18	0.0024	0.26	11

Summary of Groundwater Analytical Results - Inorganics
Caltrans SR 101 Santa Rosa
Sonoma County, California
Task Order 04-263900-CH

Boring Designation	Depth (meters)	Depth (feet)	Date	Antimony mg/l	Arsenic mg/l	Barium mg/l	Beryllium mg/l	Cadmium mg/l	Chromium mg/l	Cobalt mg/l	Copper mg/l	Lead mg/l	Mercury mg/l	Molybdenum mg/l	Nickel mg/l	Selenium mg/l	Silver mg/l	Thallium mg/l	Vanadium mg/l	Zinc mg/l
4th Street Viaduct																				
B-20-W	6	20	8/123/03	<0.060	<0.080	0.72	<0.0030	<0.0050	<0.010	<0.050	0.02	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.05
College Avenue OC																				
B-21-W	4.8	16	08/13/03	<0.060	<0.080	0.82	<0.0030	<0.0050	<0.010	<0.050	0.03	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.04
B-22-W	4.8	16	08/13/03	<0.060	<0.080	0.54	<0.0030	<0.0050	<0.010	<0.050	<0.020	0.015	0.0004	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	0.05
Chevron Site																				
B-23-W	4.8	16	09/02/03	<0.060	<0.080	<0.020	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
B-25-W	4.8	16	09/02/03	<0.060	<0.080	<0.020	<0.0030	<0.0050	<0.010	<0.050	<0.020	<0.010	<0.00020	<0.050	<0.040	<0.10	<0.010	<0.10	<0.050	<0.015
ESL (>3m depth)																				
California Action Level				0.03	0.036	1.0	0.0027	0.0022	0.18	0.003	0.0031	0.0025	0.000012	0.24	0.0082	0.005	0.00019	0.02	0.019	0.081
PRG - Tap Water				0.015	0.000045	2.6	0.073	0.018		0.73	1.5	0.011	0.011	0.18	0.73	0.18	0.18	0.0024	0.26	11

Notes:

Metals analyses conducted in general accordance with U.S. Environmental Protection Agency (EPA) Methods 601.0B and 7471A.

Concentrations reported in milligrams per liter.

Bold results equal or exceed drinking water standard levels.

ESL = Environmental Screening Level

PRG = EPA, Region 9, Preliminary Remedial Goals for tap water

Drinking water standard for chromium is for total chromium.

OC = Overcrossing

Table 10

**Summary of Asbestos Analytical Results
Caltrans SR 101
Santa Rosa, Sonoma County, California
Task Order 04-263900-CH**

Sample Id	Bridge Location	Appearance	Sample Treatment	ASBESTOS		NON-ASBESTOS			
				%	Type	%	Fibrous	%	Non-Fibrous
1	Steele Lane Cement Lower Horizontal	Gray Non-Fibrous Heterogeneous	Crushed		None Detected			100%	Other
2	Steele Lane Cement Up-Right Pillar	Gray Non-Fibrous Heterogeneous	Crushed		None Detected			100%	Other
3	Steele Lane Cement Drain Pipe	Black/Gray Non-Fibrous Heterogeneous	Crushed		None Detected			100%	Other
4	Steele Lane Cement Loose Chip	Gray Non-Fibrous Heterogeneous	Crushed		None Detected			100%	Other
5	Steele Lane Cement Chip from Cement	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
6	Steele Lane Cement Loose Debris	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
7	W. College Ave. Cement Bridge Base	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2%	Other	98%	Other
8	W. College Ave. Cement Bridge Base Curb	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
9	W. College Ave. Cement Joint Material	Gray/Brown Fibrous Heterogeneous	Crushed		None Detected	95%	Cellulose	5%	Other
10	W. College Ave. Cement Other Side	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
11	W. College Ave. Cement Center Support	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
12	W. College Ave. Cement North Side	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
13	W. College Ave. Cement Upper Surface	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
14	W. College Ave. Cement Powder	Gray Non-Fibrous Heterogeneous	Crushed		None Detected			100%	Other
15	9th Street Cement Upper Horizontal	Gray Non-Fibrous Heterogeneous	Crushed		None Detected			100%	Other
16	9th Street Cement Lower Horizontal	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2%	Other	98%	Other
17	9th Street Cement Fenced Area	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2%	Other	98%	Other
18	9th Street Cement Limiting Access	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
19	9th Street Cement Underside of Bridge	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
20	9th Street Cement Underside of Bridge	Gray Non-Fibrous Heterogeneous	Crushed		None Detected			100%	Other

Table 10

**Summary of Asbestos Analytical Results
Caltrans SR 101
Santa Rosa, Sonoma County, California
Task Order 04-263900-CH**

Sample Id	Bridge Location	Appearance	Sample Treatment	ASBESTOS		NON-ASBESTOS			
				%	Type	%	Fibrous	%	Non-Fibrous
21	9th Street Cement Sidewalk	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1%	Other	100%	Other
22	Santa Rosa Creek Bridge Horizontal	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	<1% 2%	Other Cellulose	98%	Other
23	Santa Rosa Creek Shored Slope Rocks/Bags	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2%	Other	98%	Other
24	Santa Rosa Creek Red Walk Ramp West Side	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	5% 2%	Other Cellulose	93%	Other
25	Pedestrian Walk Red Walk Ramp West Side	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	5% 2%	Other Cellulose	93%	Other
26	Pedestrian Walk Vertical Support	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	3% 2%	Other Cellulose	95%	Other
27	Pedestrian Walk Joint Compound	Brown Fibrous Heterogeneous	Teased- Crushed		None Detected	80%	Cellulose	20%	Other
28	Pedestrian Walk East Side	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2% 3%	Other Cellulose	95%	Other
29	Pedestrian Walk Walkway Under Bridge	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2% 3%	Other Cellulose	95%	Other
30	Pedestrian Walk Walkway Under Bridge	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2% 3%	Other Cellulose	95%	Other
31	Santa Rosa Creek Under Bridge Joint Compound	Brown/Gray Non-Fibrous Heterogeneous	Crushed		None Detected	5% 15%	Other Cellulose	80%	Other
32	Santa Rosa Creek Overpass	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2% 3%	Other Cellulose	95%	Other
33	Santa Rosa Creek Overpass	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2% 3%	Other Cellulose	95%	Other
34	Olive Street Underpass	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	3% 2%	Other Cellulose	95%	Other
35	Olive Street Underpass	Gray Fibrous Heterogeneous	Teased- Crushed		10% Chrysotile	5% 5%	Other Cellulose	80%	Other
36	RR Bridge Pillar	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2% 3%	Other Cellulose	95%	Other
37	RR Bridge Pillar	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2% 3%	Other Cellulose	95%	Other
38	RR Bridge Top Side	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	3% 5%	Other Cellulose	92%	Other
39	RR Bridge Top Side	Gray Non-Fibrous Heterogeneous	Crushed		None Detected	2% 3%	Other Cellulose	95%	Other

Table 10

**Summary of Asbestos Analytical Results
Caltrans SR 101
Santa Rosa, Sonoma County, California
Task Order 04-263900-CH**

Sample Id	Bridge Location	Appearance	Sample Treatment	ASBESTOS		NON-ASBESTOS		
				%	Type	%	Fibrous	%
40	Olive Street Top Side	Gray Non-Fibrous Heterogeneous	Crushed	None Detected	2% 3%	Other Cellulose	95%	Other
41	Olive Street Top Side	Gray Non-Fibrous Heterogeneous	Crushed	None Detected	5% 2%	Other Cellulose	93%	Other
42	Olive Street Top Side	Gray Non-Fibrous Heterogeneous	Crushed	None Detected	3% 2%	Other Cellulose	95%	Other
43	Olive Street Top Side	Gray Non-Fibrous Heterogeneous	Crushed	None Detected	2% 2%	Other Cellulose	96%	Other
44	RR Bridge Top Side	Gray Non-Fibrous Heterogeneous	Crushed	None Detected	2% 2%	Other Cellulose	96%	Other

Notes:

Asbestos analysis conducted in accordance with polarized light microscopy EPA 600/R-93/116 Method.

FIGURES

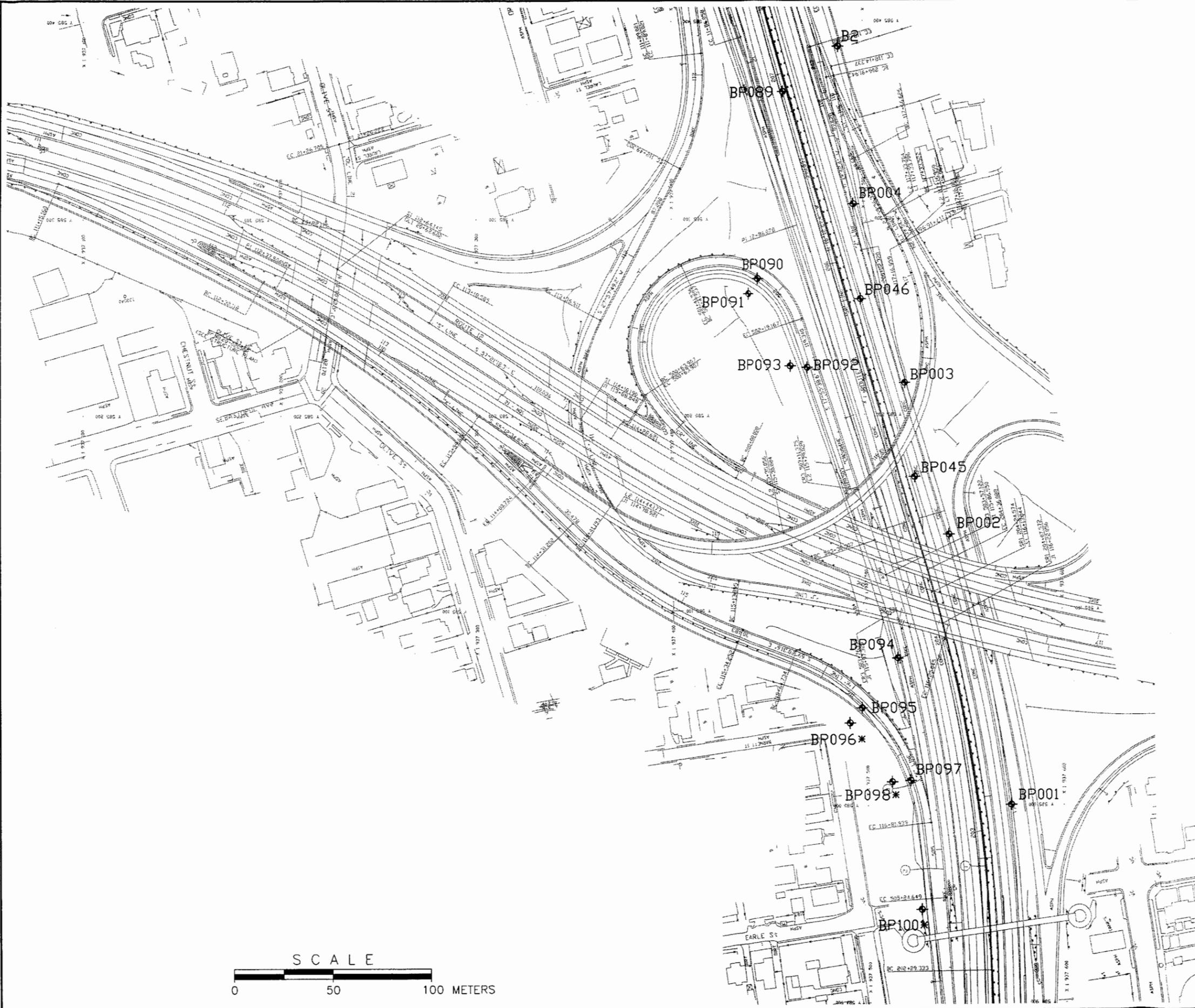
PROJECT NUMBER 832984

APPROVED BY

CHECKED BY

DRAWN BY

C Douglas 11-5-01



BP096* ◆ APPROXIMATE BORING LOCATIONS



CALTRANS - STATE ROUTE 101
 SOIL AND GROUNDWATER INVESTIGATION
 SANTA ROSA, SONOMA COUNTY
 CALIFORNIA

FIGURE 2
 SOIL BORING LOCATIONS

PROJECT NUMBER 832984

APPROVED BY

CHECKED BY

DRAWN BY
C Douglas
11-5-01



B18* ◆ APPROXIMATE BORING LOCATIONS



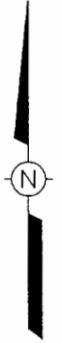
FIGURE 3
SOIL BORING LOCATIONS

PROJECT NUMBER
832984

APPROVED BY

CHECKED BY

DRAWN BY
C Douglas 11-5-01



CALTRANS - STATE ROUTE 101
SOIL AND GROUNDWATER INVESTIGATION
SANTA ROSA, SONOMA COUNTY
CALIFORNIA

FIGURE 4
SOIL BORING LOCATIONS

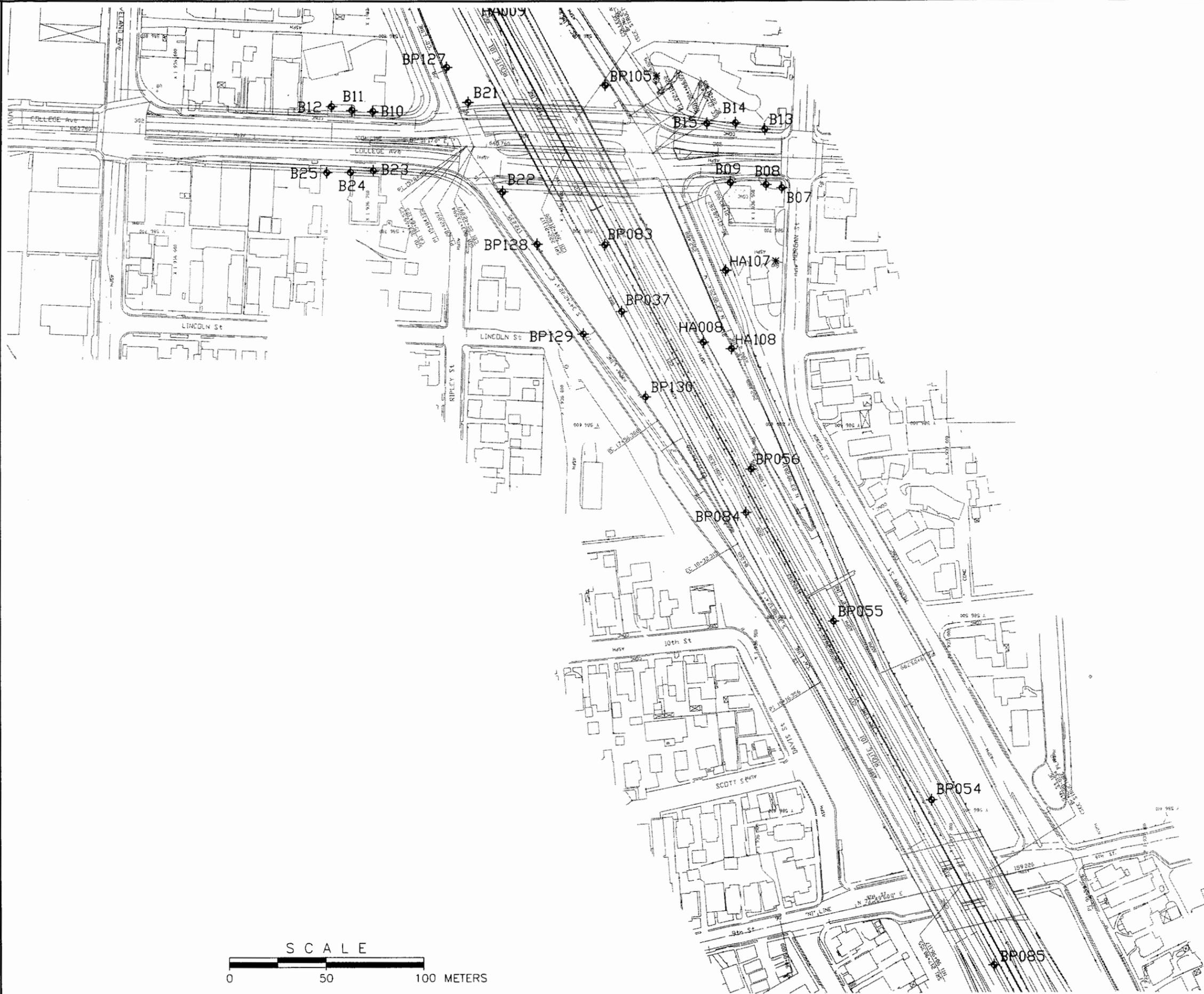
PROJECT NUMBER 832984

APPROVED BY

CHECKED BY

DRAWN BY

C Douglas 11-5-01



BP105* ♦ APPROXIMATE BORING LOCATIONS



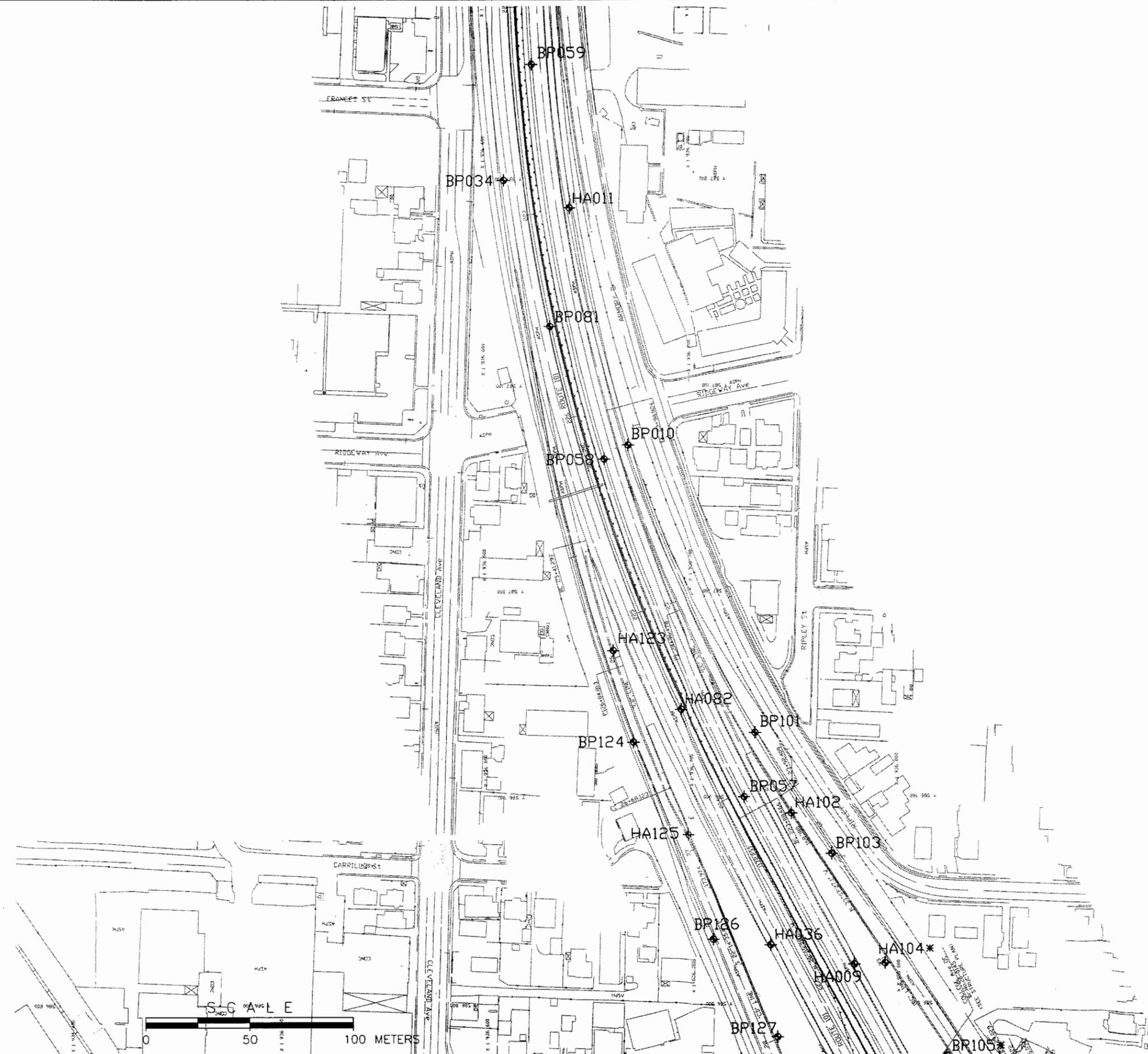
FIGURE 5
SOIL BORING LOCATIONS

PROJECT NUMBER 832984

APPROVED BY

CHECKED BY

DRAWN BY C. Douglas 11-5-01



HA104* ◆ APPROXIMATE BORING LOCATIONS



CALTRANS - STATE ROUTE 101
SOIL AND GROUNDWATER INVESTIGATION
SANTA ROSA, SONOMA COUNTY
CALIFORNIA

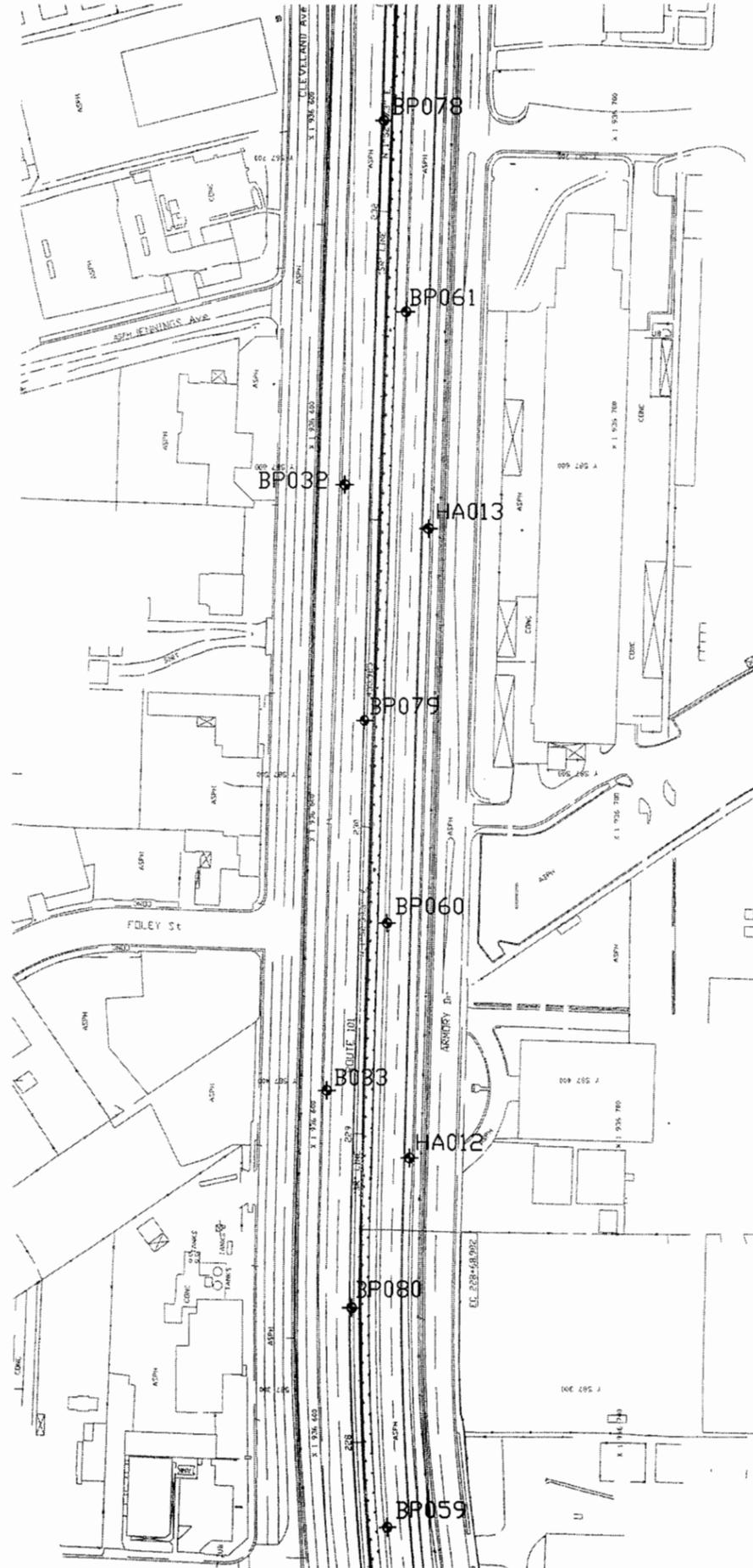
FIGURE 6
SOIL BORING LOCATIONS

PROJECT NUMBER
832984

APPROVED BY

CHECKED BY

DRAWN BY
C. Douglas 11-5-01



CALTRANS - STATE ROUTE 101
SOIL AND GROUNDWATER INVESTIGATION
SANTA ROSA, SONOMA COUNTY
CALIFORNIA

FIGURE 7
SOIL BORING LOCATIONS

PROJECT NUMBER 832984

APPROVED BY

CHECKED BY

DRAWN BY C Douglas 11-5-01

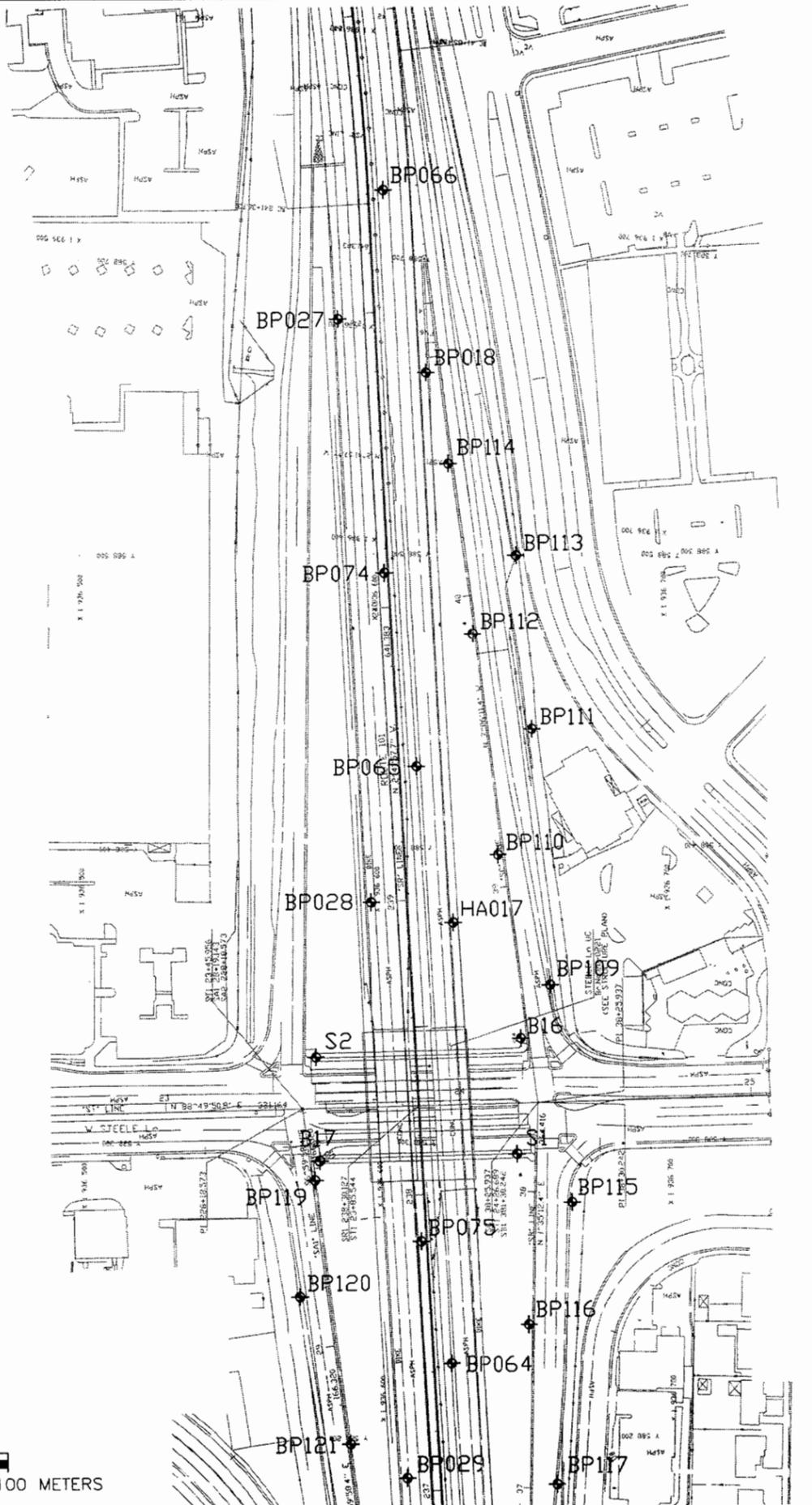


FIGURE 9
SOIL BORING LOCATIONS

PROJECT NUMBER 832984

APPROVED BY

CHECKED BY

DRAWN BY
C. Douglas 11-5-01

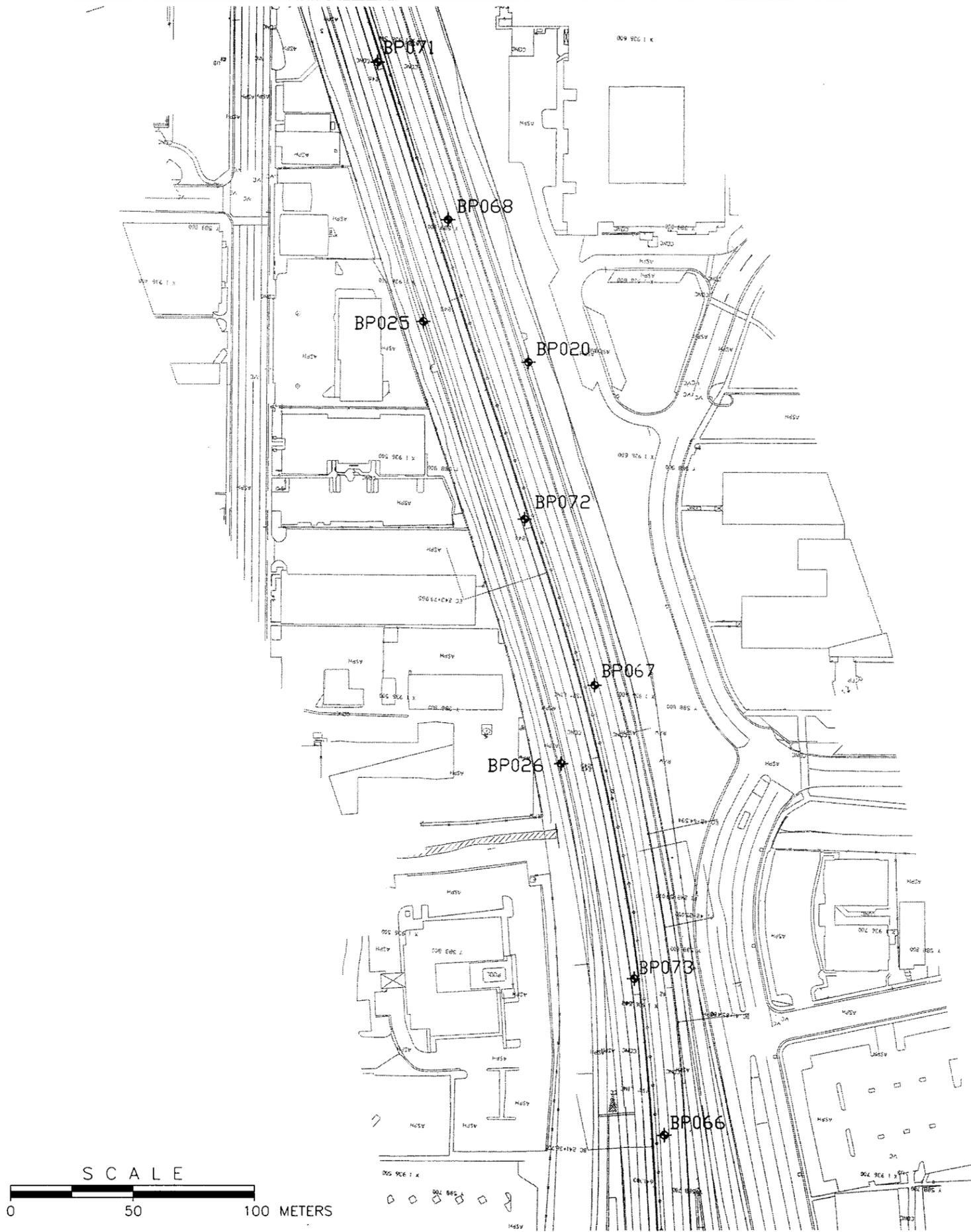


FIGURE 10
SOIL BORING LOCATIONS

PROJECT NUMBER 832984

APPROVED BY

CHECKED BY

DRAWN BY C Douglas 11-5-01

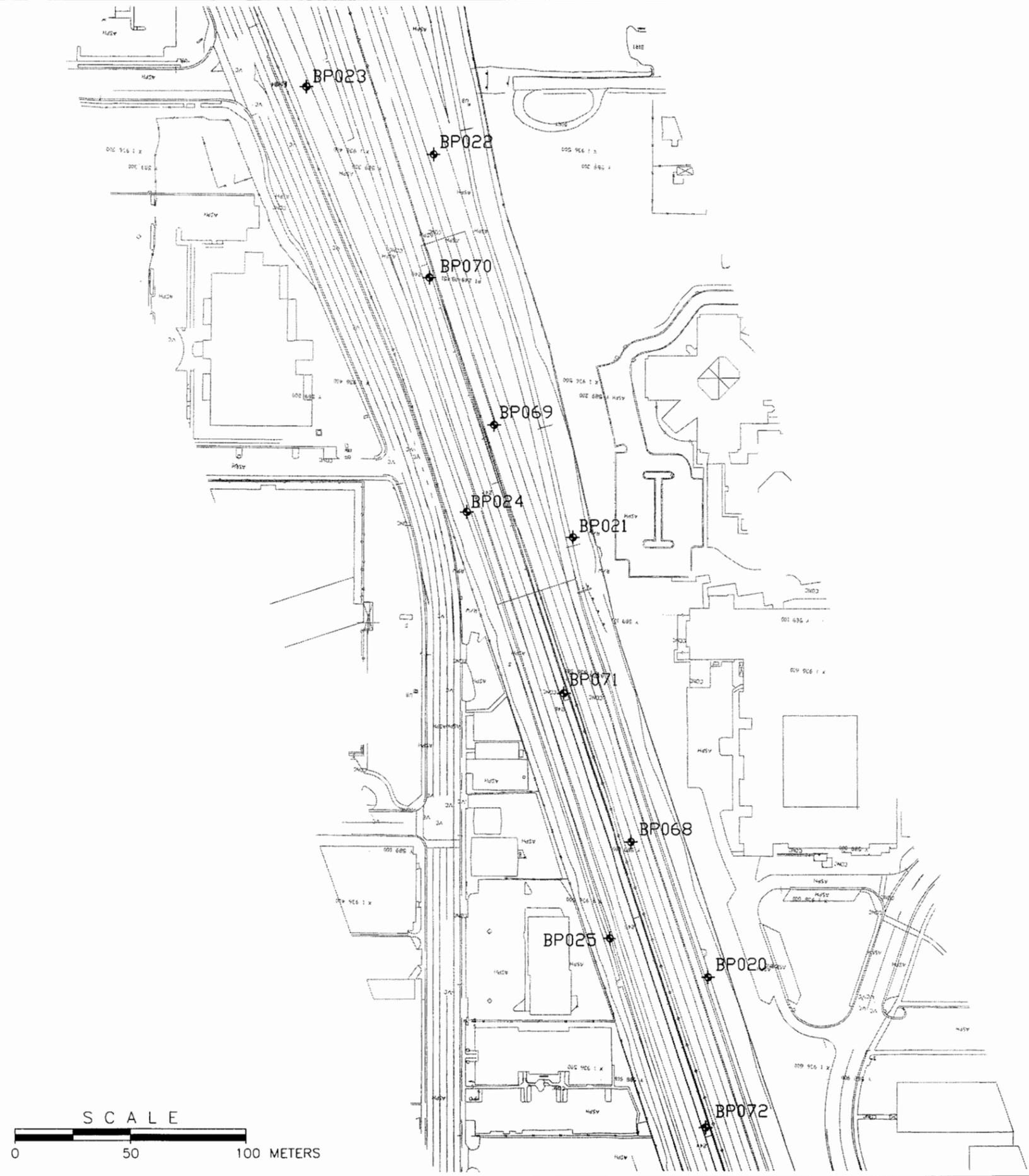


FIGURE 11
SOIL BORING LOCATIONS

**APPENDIX A
PERMITS**

COUNTY OF SONOMA — DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH DIVISION
273 Airway Drive, Suite D, Santa Rosa, CA 95403-2067
(707) 565-6565 www.sonoma-county.org

For Office Use Only

Amount paid \$588.00
Receipt number 988B
Payment date 7/24/03
Revenue code 1313

APPLICATION FOR MONITORING WELL PERMIT
Regional Board Lead/Environmental Assessment

Site ID # 24748 Permit # 4015

Well type: Monitoring well Recovery extraction well Boring Injection well
 Soil gas survey Hydropunch Air sparging/venting Other

Well depth _____ Boring depth 20-ft Hydro depth _____ Air sparging/venting depth _____

On-site well/boring _____ ID # _____ # Off-site well/boring _____ ID # _____

Submit legal right-of-entry/off-site well address/encroachment permit

On-site Address State Route 101 & vicinity. 4 Highway 101

On-site Owner see attached right to enter permits Phone _____

Address _____ AP# _____

Responsible Party California Department of Transportation Phone 510.286.4911

Address P.O. Box 23660, Oakland CA 94623-0660

Consultant Jhaw Environmental, Inc. Phone 916.565.4532

Address 1326 N. Market Blvd, Sacramento CA 95834 License #/Type _____

Drilling Contractor Precision Sampling, Inc. Phone 510.257.4575

Address 1400 S. 50th St, Richmond CA 94804 C-57 License # 636387

Type of work: Initial investigation _____ # Wells Subsequent investigation _____ # Wells Destruct _____ # Wells

Groundwater investigation due to: Underground tank Surface impoundment Assessment (Acquisition)

Surface disposal practice—specify involved industry _____

Other _____

Perforated intervals N/A Chemical constituents Metals, T-Hg, T-Pb, T-As, PCB's, VOC's, SVOC's

Disposal method for soil cuttings Drum, and to landfill Disposal method for development water N/A

Drilling method Direct Push Method of drill equip. rinsate containment Drum

If destroying a well, abandonment method N/A

Submit plot plan of wells in relation to all sewer or septic lines.

001343D
WELL PER 588.00
TTL AMT 588.00
CHECKS 588.00
CHANGE 0.00
988B H2 10:36

Is well to be constructed within: 100 feet of a septic tank or leachfield? Yes No
50 feet of any sanitary sewer line? Yes No
25 feet of any private sanitary sewer line? Yes No

07/24/03

In addition, all monitoring wells must include **identification system** affixed to interior surface:
1) Well identification 2) Well type 3) Well depth 4) Well casing diameter 5) Perforated intervals

Well identification number and well type shall be **affixed** to the **exterior surface** security structure.

RWQCB approval ENVIRONMENTAL ASSESSMENT Date _____

Address 4 Highway 101
Santa Rosa
Site ID# 24748
Permit # 4015

WORKERS COMPENSATION CERTIFICATE

I hereby agree to comply with all laws and regulations of the County of Sonoma and State of California pertaining to water well construction. I will telephone (707) 525-6565, 24 hours in advance, to notify the Environmental Health Specialist when completing or destroying a well. I will furnish the Director of Health Services and the owner a legible copy of the State Water Well Driller's Report within 15 days in order to obtain final approval on this well. I acknowledge that the application will become a permit *only* after site approval and payment of fee. I understand that this permit is not transferable and expires one year from date of issuance.

[] A currently effective certificate of Workers Compensation Insurance coverage is on file with this office, *made out in the name of the Sonoma County Department of Health Services.*

[Signature] Date 7/23/03
Signature of Well Driller—no proxies

Insurance Carrier Liberty Mutual Expiration Date 4/23/04

Once all wells/borings are installed, submit a "Letter of Completion" to complete permit process.

Indicate on attached plot plan the exact location of well(s) with respect to the following items: property lines, water bodies or water courses drainage pattern, roads, existing wells, sewer main and laterals and private sewage disposal systems or other sources of contamination or pollution. **INCLUDE DIMENSIONS.** The validity of this permit depends upon the accuracy of the information provided by the applicant.

Conditions of permit:

- ① MUST SUBMIT SUMMARY REPORT UPON COMPLETION OF WORK. INCLUDE ~~LOGS~~ BORING AND MAINTAINING WELL LOGS, ALSO SAMPLE RESULTS
- ② MUST OBTAIN RIGHT OF ENTRY OR ENCROACHMENT PERMIT PRIOR TO PERFORMING OFF-SITE WORK.



FOR OFFICE USE ONLY – ENVIRONMENTAL HEALTH DIVISION

Permit approved by [Signature] Date 7/21/03

Constr. approved by _____ Observed? [] Yes [] No Well # _____ Date _____

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
PERMIT TO ENTER

Date

7/18/03

4- Son-101 PM 19.5 / 21.6
EA 245400
APN (s) 010-201-009, 010-211-009,
010-211-011

State of California
Department of Transportation
111 Grand Avenue
Oakland, CA 94612

Gentlemen:

Permission is hereby granted to the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as STATE, to enter upon our lands, as outlined on the map attached hereto and by this reference made a part hereof for the purpose of conducting geotechnical field studies adjacent to the Caltrans right of way. Studies will include 5 borings 4 to 8 inches in diameter, up to 50 feet in depth. All borings will be back filled with concrete grout. All areas will be restored to their original condition. These studies are needed to gather data for the possible widening Highway 101. Work is to begin upon receipt of this Permit to Enter and will continue for four weeks. Actual work is expected to last no more than 4 days.

The rights and privileges hereby granted to STATE, may at the option of the STATE, be exercised by any authorized agent or contractor of STATE.

By acceptance of this Permit to Enter, it is expressly understood and agreed by and between the parties that STATE agrees to indemnify and save the undersigned OWNERS harmless against any and all loss, damage, and/or liability which may be suffered or incurred by OWNERS and against any and all claims, demands, and causes of action that may be brought against OWNERS caused by, or arising out of, or in any way connected with the use and/or occupancy of said lands of OWNERS by STATE, its agents, contractors or assigns. STATE further agrees to assume full responsibility for any and all damages caused by STATE'S operation under this Permit and STATE shall, at its option, either repair or pay for such damages.

Sincerely,



Douglas R. Bower, Associate Superintendent, Business

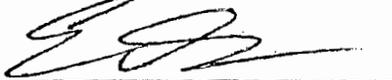
City of Santa Rosa School District
OWNER

Address: 211 Ridgway Ave.
Santa Rosa, CA 95401

SPECIAL INSTRUCTIONS:

Access to the Luther Burbank Elementary School site will be available the week
of July 28-August 1, 2003. The District contact for entry arrangements is
Mr. Wayne McNamee at 528-5124.

RECOMMENDED FOR APPROVAL:



ERIC DELAPA
Associate Right of Way Agent



Hooshmand Nikoui
District Branch Chief
Office of Geotechnical Design - West, Branch A

ACCEPTED:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION



BRIAN R. MORELLI
District Office Chief
R/W Acquisition/LPA Services

COPY



DEPARTMENT OF TRANSPORTATION
DIVISION OF RIGHT OF WAY
111 GRAND AVENUE
P. O. BOX 23440 – MS 11A
OAKLAND, CA 94623-0440
PHONE (510) 286-5381
FAX (510) 286-5379

*Flex your power!
Be energy efficient!*

July 30, 2003

04 Son-101 PM 19.5.21.6
E.A. 245400
APN(s) 010-122-022

Michael Trimbel
266 College Avenue
Santa Rosa, CA 95401

Dear Mr. Trimbel:

Attached is one copy of the Permit to Enter agreement which has now been executed on behalf of the State of California.

Your cooperation is appreciated.

Sincerely,

ERIC DELAPA
Associate Right of Way Agent
Acquisition Services

Attachment

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
PERMIT TO ENTER

Date _____
4- Son-101 PM 19.5 / 21.6
EA 245400
APN (s) 010-112-022

State of California
Department of Transportation
111 Grand Avenue
Oakland, CA 94612

Gentlemen:

Permission is hereby granted to the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as STATE, to enter upon our lands, as outlined on the map attached hereto and by this reference made a part hereof for the purpose of conducting hazardous waste field studies adjacent to the Caltrans right of way. Studies will include approximately 6 borings up to 20 feet in depth or until groundwater is found. All borings will be back filled with concrete grout. All areas will be restored to their original condition. These studies are needed to gather data for widening Highway 101. Work is to begin upon receipt of this Permit to Enter and will continue for four weeks. Actual work is expected to last no more than one day.

The rights and privileges hereby granted to STATE, may at the option of the STATE, be exercised by any authorized agent or contractor of STATE.

By acceptance of this Permit to Enter, it is expressly understood and agreed by and between the parties that STATE agrees to indemnify and save the undersigned OWNERS harmless against any and all loss, damage, and/or liability which may be suffered or incurred by OWNERS and against any and all claims, demands, and causes of action that may be brought against OWNERS caused by, or arising out of, or in any way connected with the use and/or occupancy of said lands of OWNERS by STATE, its agents, contractors or assigns. STATE further agrees to assume full responsibility for any and all damages caused by STATE'S operation under this Permit and STATE shall, at its option, either repair or pay for such damages.

Sincerely,

Brian TSE (BT)

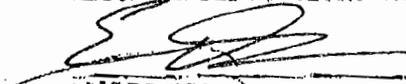
Equilon Enterprises LLC
OWNER

Address: PO Box 4369
Houston, TX 77210

SPECIAL INSTRUCTIONS:

OK'd TO DO THE BORINGS. BT 415) 760 7028

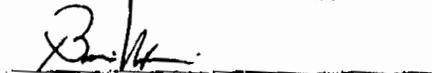
RECOMMENDED FOR APPROVAL:



ERIC DELAPA
Associate Right of Way Agent


Celia McCuaig
District Branch Chief
Environmental Engineering - Hazardous Waste

ACCEPTED:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION


BRIAN R. MORELLI
District Office Chief
R/W Acquisition/LPA Services

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
PERMIT TO ENTER

7/30/03

Date

4-Son-101 PM 19.5 / 21.6
EA 245400
APN (s) 180-740-053

State of California
Department of Transportation
111 Grand Avenue
Oakland, CA 94612

Gentlemen:

Permission is hereby granted to the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as STATE, to enter upon our lands, as outlined on the map attached hereto and by this reference made a part hereof for the purpose of conducting hazardous waste field studies adjacent to the California right of way. Studies will include approximately 6 borings up to 20 feet in depth or until groundwater is found. All borings will be back filled with concrete grout. All areas will be restored to their original condition. These studies are needed to gather data for widening Highway 101. Work is to begin upon receipt of this Permit to Enter and will continue for four weeks. Actual work is expected to last no more than one day.

The rights and privileges hereby granted to STATE, may at the option of the STATE, be exercised by any authorized agent or contractor of STATE.

By acceptance of this Permit to Enter, it is expressly understood and agreed by and between the parties that STATE agrees to indemnify and save the undersigned OWNERS harmless against any and all loss, damage, and/or liability which may be suffered or incurred by OWNERS and against any and all claims, demands, and causes of action that may be brought against OWNERS caused by, or arising out of, or in any way connected with the use and/or occupancy of said lands of OWNERS by STATE, its agents, contractors or assigns. STATE further agrees to assume full responsibility for any and all damages caused by STATE'S operation under this Permit and STATE shall, at its option, either repair or pay for such damages.

Sincerely,

[Signature]
Timothy A. Mitchell

Mission Ctr Wash 11
OWNER

Address: 59 Mission Cir
Santa Rosa, CA 95409

SPECIAL INSTRUCTIONS:

CALL owner - Tim Mitchell 24 hours prior
to drilling at (707) 849-0532. Do not
block access.

RECOMMENDED FOR APPROVAL:

[Signature]
ERIC DELAPA
Associate Right of Way Agent

[Signature]
Celia McCraig
District Branch Chief
Environmental Engineering • Hazardous Waste

Is it possible to do
this work on Tues, Wed, or
Thurs. ???

ACCEPTED:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

[Signature]
BRIAN R. MORELLI
District Office Chief
R/W Acquisition/LPA Services

DEPARTMENT OF TRANSPORTATION

DIVISION OF RIGHT OF WAY
111 GRAND AVENUE
P. O. BOX 23440 – MS 11A
OAKLAND, CA 94623-0440
PHONE (510) 286-5381
FAX (510) 286-5379



*Flex your power!
Be energy efficient!*

July 25, 2003

EA 245400
4-Son-101 PM 19.5 / 21.6
APN 012-062-032

Midas Auto Service
C/o Reuben Stenman
131 College Avenue
Santa Rosa, CA 95401

Dear Mr. Stenman:

Attached is one copy of the Permit to Enter agreement, which has now been executed on behalf of the State of California.

Your cooperation is appreciated.

Sincerely,

ERIC DELAPA
Associate Right of Way Agent
Acquisition Services

Attachment

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
PERMIT TO ENTER

Date 7/17/10

4- Son-101 PM 19.5 / 21.6
EA 245400
APN (s) 012-062-032

State of California
Department of Transportation
111 Grand Avenue
Oakland, CA 94612

Gentlemen:

Permission is hereby granted to the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as STATE, to enter upon our lands, as outlined on the map attached hereto and by this reference made a part hereof for the purpose of conducting hazardous waste field studies adjacent to the Caltrans right of way. Studies will include approximately 6 borings up to 20 feet in depth or until groundwater is found. All borings will be back filled with concrete grout. All areas will be restored to their original condition. These studies are needed to gather data for widening Highway 101. Work is to begin upon receipt of this Permit to Enter and will continue for four weeks. Actual work is expected to last no more than one day.

The rights and privileges hereby granted to STATE, may at the option of the STATE, be exercised by any authorized agent or contractor of STATE.

By acceptance of this Permit to Enter, it is expressly understood and agreed by and between the parties that STATE agrees to indemnify and save the undersigned OWNERS harmless against any and all loss, damage, and/or liability which may be suffered or incurred by OWNERS and against any and all claims, demands, and causes of action that may be brought against OWNERS caused by, or arising out of, or in any way connected with the use and/or occupancy of said lands of OWNERS by STATE, its agents, contractors or assigns. STATE further agrees to assume full responsibility for any and all damages caused by STATE'S operation under this Permit and STATE shall, at its option, either repair or pay for such damages.

Sincerely,


PAES. PETECOM INC
REUBEN STENMAN
Midas Properties INC
OWNER

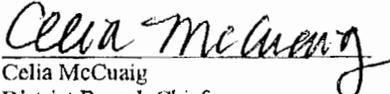
Address: 1300 N Arlington Heights RD
Itasca, IL 60143

SPECIAL INSTRUCTIONS:

ACCESS IS NEVER BLOCKED TO BUSINESS. CALL PRIOR
TO WORK BEING DONE. 24 HR NOTICE
CALL REUBEN STENMAN 707 5279310

RECOMMENDED FOR APPROVAL:


ERIC DELAPA
Associate Right of Way Agent


Celia McCuaig
District Branch Chief
Environmental Engineering - Hazardous Waste

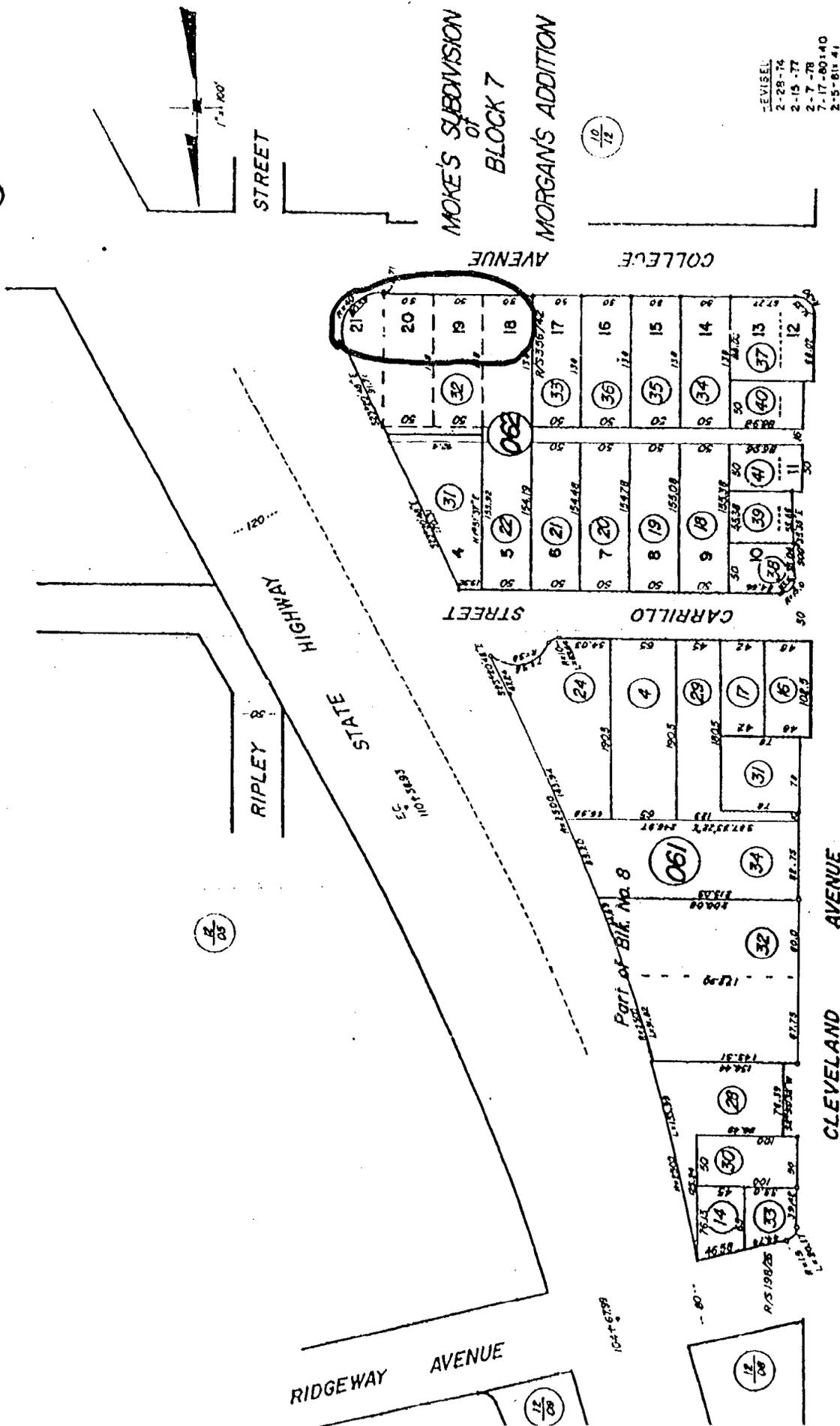
ACCEPTED:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION


BRIAN R. MORELLI
District Office Chief
R/W Acquisition/LPA Services

COUNTY ASSESSOR'S PAK & L MAP

TAX CODE AREA
4-001

12-06



MOKE'S SUBDIVISION
of
BLOCK 7

MORGAN'S ADDITION

- REVESEL
- 2-28-74
- 2-15-77
- 2-7-78
- 7-17-80:40
- 2-5-81:41
- 2-4-81:51
- 5-07-82:33
- 7-27-82:34

Assessor's Map Bk. 12 Pg. 6
Sonoma County, Calif.

R/S 185-18

12/06

Part of MORGAN'S ADDITION

NOTE: THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSES ONLY. NO LIABILITY IS ASSURED FOR THE ACCURACY OF THE DATA DELINEATED HEREON.

R/S 198/25

12/06

COPY

DEPARTMENT OF TRANSPORTATION

DIVISION OF RIGHT OF WAY
111 GRAND AVENUE
P. O. BOX 23440 – MS 11A
OAKLAND, CA 94623-0440
PHONE (510) 286-5381
FAX (510) 286-5379



*Flex your power!
Be energy efficient!*

July 30, 2003

04 Son-101 PM 19.5.21.6
E.A. 245400
APN(s) 010-122-022

Sykhbir Singh
136 West College Avenue LLC
Santa Rosa, CA 95401

Dear Mr. Singh:

Attached is one copy of the Permit to Enter agreement which has now been executed on behalf of the State of California.

Your cooperation is appreciated.

Sincerely,

ERIC DELAPA
Associate Right of Way Agent
Acquisition Services

Attachment

Date 7/24/03

4- Son-101 PM 19.5 / 21.6
EA 245400
APN (s) 010-122-022

COPY

State of California
Department of Transportation
111 Grand Avenue
Oakland, CA 94612

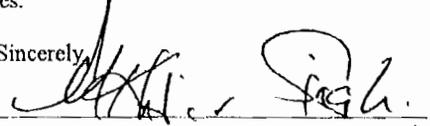
Gentlemen:

Permission is hereby granted to the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as STATE, to enter upon our lands, as outlined on the map attached hereto and by this reference made a part hereof for the purpose of conducting hazardous waste field studies adjacent to the Caltrans right of way. Studies will include approximately 6 borings up to 20 feet in depth or until groundwater is found. All borings will be back filled with concrete grout. All areas will be restored to their original condition. These studies are needed to gather data for widening Highway 101. Work is to begin upon receipt of this Permit to Enter and will continue for four weeks. Actual work is expected to last no more than one day.

The rights and privileges hereby granted to STATE, may at the option of the STATE, be exercised by any authorized agent or contractor of STATE.

By acceptance of this Permit to Enter, it is expressly understood and agreed by and between the parties that STATE agrees to indemnify and save the undersigned OWNERS harmless against any and all loss, damage, and/or liability which may be suffered or incurred by OWNERS and against any and all claims, demands, and causes of action that may be brought against OWNERS caused by, or arising out of, or in any way connected with the use and/or occupancy of said lands of OWNERS by STATE, its agents, contractors or assigns. STATE further agrees to assume full responsibility for any and all damages caused by STATE'S operation under this Permit and STATE shall, at its option, either repair or pay for such damages.

Sincerely,


Sukhbir Singh

136 West College Avenue LLC
OWNER

Address: 136 College Ave
Santa Rosa, CA 95401

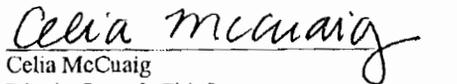
SPECIAL INSTRUCTIONS:

Please provide 48 hours notice at 707 328-6192.
Speak to Sukhbir Singh

RECOMMENDED FOR APPROVAL:



ERIC DELAPA
Associate Right of Way Agent


Celia McCuaig
District Branch Chief
Environmental Engineering - Hazardous Waste

ACCEPTED:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION


BRIAN R. MORELLI
District Office Chief
R/W Acquisition/LPA Services



Encroachment Permit Project Traffic Control Request Form

(Traffic control requests with incomplete information may be delayed.)

Requests for scheduling and approval of traffic control shall be submitted, through the designated State representative, on this form via facsimile at 510-286-3960, or E-mail: Permit Duty Engineer@DOT.CA.GOV, by Noon on the Monday preceding the proposed work week.

DO NOT SCHEDULE WORK ON A STATE DESIGNATED HOLIDAY, UNLESS PRIOR APPROVAL FROM STATE REPRESENTATIVE IS OBTAINED.

Permit No.: 04-263900-CH Expires: June 30/04 State Representative: Haveen Aachi Phone: 510-286-4914
Permit Work Hours: 0900 to 1500 Enter work hours, using 24 hour clock format. Requested hours MUST be consistent with permit or permit rider provisions, OR a permit rider MUST be requested in writing and submitted through State Representative for approval. FAX: 510-286-5639

Please use separate request (below) for different types of closures and locations. Make copies of this blank form for future use.

Lanes are numbered from left (center) to right in direction of travel - #1 = "fast lane". Fill in blanks or circle information that describes your closure request:

DATE(S)		DAYS		TIMES		Start "10-97"		End "10-98"		Circle any of the following if applicable		CLOSURE NO.
FROM	TO	FROM	TO	FROM	TO	FROM	TO	FROM	TO	Freeway Full	One-Way Traffic Control	W/ Pilot Car
7/14/03	7/18/03	Monday	Friday	0900	1500					Off Ramp Full	W/ Flagger	W/ Pilot Car
OTHER: <u>Shoulder Closure</u>												
POST MILES or KILO POST												
ROUTE	101		Description/Location		Street Names/on & off Ramps, etc.							
COUNTY	Sonoma		K.P. 34.8		12/101 Interchange							
CITY	Santa Rosa		K.P. 35.7		Bicentennial							

Description of work: Collecting soil samples from shoulder and median

Detour: (Required for full closure)

On-site CHP/PPD: No Yes (Check Yes, if CHP will be on-site during work per prior arrangement)

Comments/Contingency Plan: Nearby hospital located and identified in site health & safety plan.

PERMITTEE: Share Environmental

CONTACT PERSON*: Ben Charven/Martine Adams

Address: 1326 North Market Boulevard, Sacramento CA 95834

Telephone No. OFFICE: (916) 565-4183 CELL: (916) 425-4849 OTHER:

*INCLUDE ON-SITE CONTACT & TELEPHONE/PAGER NO. FAX: (916) 565-4356

While performing the approved traffic control, Permittee shall notify Caltrans, via telephone at 510-286-6359 (24-hour Communication Center), on a daily basis, of actual start time(10-97), finish time (10-98), or work cancelled (10-22).

ev Permit Request

AB CLOSURE NO. 6293

APPENDIX B
DRILLING AND SAMPLING PROCEDURES

Appendix B

Drilling and Sampling Procedures

The procedures used for drilling the borings and collecting soil samples are presented below.

- A drilling permit was obtained from the Sonoma County Public Works Agency.
- Caltrans obtained a “Permit to Enter” for work performed on the parcels outside the Caltrans right of way.

ADL Sample Collection

- Soil borings were advanced to depths up to 1.2 meters (4 feet) bgs using Geoprobe[®], direct-push sampling equipment. Locations that were not accessible to the drill rig were sampled by hand auger.
- ADL soil samples obtained using direct push equipment were collected directly from an acetate sleeve. Discreet samples were sectioned from the sleeve at the intervals described above.
- ADL soil samples obtained using hand auger equipment were collected in Ziploc[®] bags.
- Borings were backfilled with neat cement.
- Waste water generated during the drilling activities was placed into 208-liter (55-gallon) drums approved by the United Nations for transport of liquid and solid wastes. Excess soil cuttings were placed into 208-liter (55-gallon) drums approved by the United Nations for transport of liquid and solid wastes. The drums were labeled with the contents, date, and job number.

Soil Sample Collection

- Soil borings were advanced to depths to 4.0 meters (16 feet) bgs using Geoprobe[®], direct-push drilling and sampling equipment.
- Soil samples obtained using direct push equipment were collected directly from an acetate sleeve. Discreet samples were sectioned from the sleeve at the intervals described above.
- Soil descriptions, sample type and depth, and related drilling information were recorded on a boring log by a Shaw geologist. The soil was logged in the field in general accordance with the Unified Soil Classification System.
- Soil cuttings from the Geoprobe[®] borings were used to describe the lithology.

- Waste water generated during the drilling activities was placed into 208-liter (55-gallon) drums approved by the United Nations for transport of liquid and solid wastes. Excess soil cuttings were placed into 208-liter (55-gallon) drums approved by the United Nations for transport of liquid and solid wastes. The drums were labeled with the contents, date, and job number.

Groundwater Grab Sample Collection

- The groundwater grab samples were collected from temporary well casings inserted in the undeveloped borings. The well casing consisted of 2.5-centimeter (1-inch) diameter, Schedule 40, flush-threaded, 0.05-centimeter (0.020-inch), machine-slotted polyvinyl chloride (PVC) well screen.
- Groundwater grab samples were collected using new disposable polyethylene bottom-valve bailers. New nylon rope was used to lower any bailers into the wells.
- Groundwater grab samples were placed into laboratory-supplied containers containing preservatives, where appropriate.
- Groundwater was discharged from a bailer via a bottom emptying device. Discharge to the containers was conducted in a manner to minimize bubbling and agitation of the liquid. The container was filled to the top forming a meniscus to eliminate the headspace.
- Following all sampling activities, the borings were backfilled with neat cement grout.

Asbestos Sample Collection

- Samples were collected by using a cold chisel and sledge hammer at opportunistic and accessible points along the bridge structure.
- Five to eight samples were obtained from each structure.
- The chisel was dry decontaminated between samples by using a clean paper towel.
- The samples were immediately placed into plastic bags that could be hermetically sealed, labeled and delivered to the analytical laboratory.

Sample Retention and Analysis

- All soil and groundwater samples were placed on ice in an insulated chest cooled to a temperature of approximately 4 degrees Celsius.
- Chain-of-custody procedures, including the use of chain-of-custody forms, were used to document sample handling and transport from collection to delivery to the laboratory for analysis.

- The soil and groundwater samples were retained in the insulated chests preserved with ice overnight in the custody of a Shaw employee. The samples were delivered to the laboratory within approximately 24 hours of collection. The samples were transported to the laboratory in a motor vehicle.
- Soil samples were labeled with the boring number, and the sample collection depth. For example, "B-10-S-1 represents the boring 10, collected at a depth of 0.3 meters BGS.
- Laboratory quality assurance/quality control procedures are summarized below:
 - Method Blank Frequency = one per 10 samples
 - Matrix Spike/Matrix Spike Duplicate = one per 10 samples
 - Laboratory Control Sample/Laboratory Control Sample Duplicate = one per 10 sample

**APPENDIX C
BORING LOGS**



VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 845467.0101		PROJECT NAME: SR 101 SANTA ROSA	
BORING NUMBER: B-2		COORDINATES:	
ELEVATION:		GWL: Depth	Date/Time
ENGINEER/GEOLOGIST: BEN CHELLEN		Depth	Date/Time
DRILLING METHODS: DIRECT PUSH		PAGE 1	OF 1

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ()	RECOVERY ()	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
				FILL				
5				GRAVELLY CLAY, 5% GRAVEL, 95% FINES, VERY STIFF, DRY/DAMP, BLACKISH BROWN	CL			
10				BECOMES MOIST + SOFT SILTY SAND, 15% COARSE → FINE SAND, 25% FINES, WGT, COHESIVE, BROWN BECOMES 90% SAND	SM			- GW @ 11'
15				SANDY GRAVEL. 80% GRAVEL (L 1/2"), 20% SAND, TRACE FINES, SATURATED, BROWN	GM			
20				COARSE SAND. 95% SAND, 5% GRAVEL. COHESIVE, SATURATED, DARK BROWN	SW			

NOTES:

Drilling Contractor: PRECISION

Drilling Equipment: DIRECT PUSH

Driller: ROBERTO E.



VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 845467.0101	PROJECT NAME: SR 101 SANTA ROSA		
BORING NUMBER: B-3	COORDINATES:		DATE: 7/29/03
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7/29/03
ENGINEER/GEOLOGIST: BEN CHEVLEN	Depth	Date/Time	DATE COMPLETED: 7/29/03
DRILLING METHODS: DIRECT PUSH	PAGE		OF 1

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ()	RECOVERY ()	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
5				FILL CLAY. TRACE GRAVELS, FIRM, DAMP, BLACKISH-BROWN				
10				GRAVELLY CLAY, ~40% SUBANGULAR GRAVEL GRAVEL < 1/2", FIRM, DAMP, BLACKISH BROWN				
15				CLAY, PLASTIC, SOFT, WET, BROWN	CL			GW @ 11'
20				COARSE SAND TO A GRAVELLY SAND. 20% GRAVEL (< 1/2"), 55% MED TO COARSE SAND, 25% FINES, LOBBY, DARK BROWN	SW			

NOTES:
 Drilling Contractor: PRECISION
 Drilling Equipment: DIRECT PUSH
 Driller: ROBERTO E.

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 845467.0101		PROJECT NAME: SR 101 SANTA ROSA	
BORING NUMBER: B-4		COORDINATES:	DATE: 7/29/03
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7/29/03
ENGINEER/GEOLOGIST: BEN CHEVLEN	Depth	Date/Time	DATE COMPLETED: 7/29/03
DRILLING METHODS: DIRECT PUSH			PAGE 1 OF 1

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ()	RECOVERY ()	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
5				FILL CLAY, HIGH PLASTICITY, DAMP, STIFF, BLACKISH-BROWN	CL			STRENGTH: 2.2 kg/cm ²
10				SAND AS ABOVE, TRACE GRAVELS. 20% GRAVELS 18" 5"	CL			
15				SAME AS ABOVE, NO GRAVELS, YELLOWISH-BROWN, SAND SILT LENSES 18" 14+15' BECOMES MOIST @ 14'	CL			
20				CLAY, HIGH PLASTICITY, TRACE GRAVELS, OCCASIONAL SAND LENSES (L3"), MOIST, YELLOWISH-BROWN COLOR	CL			GW @ 18'
25				CLAY & GRAVEL, 65% SUBANGULAR → SUBROUND GRAVEL 1", 35% FINES, COHESIVE DAMP, BROWN BECOMES SATURATED @ 21', LENSE OF ABOVE MATERIAL 18" 22+23'	GC CL GC			

NOTES:

Drilling Contractor PRECISION
 Drilling Equipment DIRECT PUSH
 Driller: ROBERTO E.

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <u>845467.0101</u>		PROJECT NAME: <u>SR101 SANTA ROSA</u>	
BORING NUMBER: <u>B-5</u>		COORDINATES:	
ELEVATION:		GWL: Depth	Date/Time
ENGINEER/GEOLOGIST: <u>BEN CHEWEN</u>		Depth	Date/Time
DRILLING METHODS: <u>PRECISION</u>		DATE: <u>7/24/03</u>	
		DATE STARTED: <u>7/24/03</u>	
		DATE COMPLETED: <u>7/29/03</u>	
		PAGE <u>1</u> OF <u>1</u>	

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ()	RECOVERY ()	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
5				FILL CLAY, HIGH PLASTICITY, DAMP, STIFF, BLACKISH BROWN				STRENGTH: 1.75 kg/cm ²
10								
15				SAME AS ABOVE, BUT TRACE GRAVELS, BROWN COLOR	CL			
20								
25				CLAYEY GRAVEL. 75% GRAVEL, 10% SAND, 15% FINES. MODERATELY COHESIVE, SATURATED, BROWN COLOR.	GC			

NOTES:

Drilling Contractor PRECISION

Drilling Equipment DIRECT PUSH

Driller: ROBERTO E.



VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <u>845467.0101</u>		PROJECT NAME: <u>SR101 SANTA ROSA</u>	
BORING NUMBER: <u>B-6</u>		COORDINATES:	DATE: <u>7/29/03</u>
ELEVATION:		GWL: Depth Date/Time	DATE STARTED: <u>7/29/03</u>
ENGINEER/GEOLOGIST: <u>BEN CHEWEL</u>		Depth Date/Time	DATE COMPLETED: <u>7/29/03</u>
DRILLING METHODS: <u>DIRECT PUSH</u>			PAGE <u>1</u> OF <u>1</u>

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER ()	RECOVERY ()	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
5				FILL SILTY CLAY, HIGH PLASTICITY, DAMP, STIFF SOME OXIDATION PRESENT, DARK BROWN				STRENGTH: 1.4 kg/cm ² STRENGTH: 1.3 kg/cm ²
10				SAME AS ABOVE, BUT YELLOW-BROWN GRADES BACK TO DARK BROWN.	CL			
15								STRENGTH: 2.25 kg/cm ²
20				SILTY CLAY, HIGH PLASTICITY, MOIST, FIRM, DARK BROWN SAME AS ABOVE, BUT WET				- GW @ 19'
25				CLAYEY GRAVEL 50% GRAVEL, 20% SAND, 30% FINES. GRAVEL SUBROUNDED, 41" SAND COARSE FINES SHOW PLASTICITY, SATURATED, YELLOWISH BROWN	GL CL			
				SILTY CLAY, HIGH PLASTICITY, SATURATED, SOFT, DARK BROWN	GL			
				SAME AS 23-24' SAMPLE				

NOTES:

Drilling Contractor PRECISION

Drilling Equipment DIRECT PUSH

Driller: ROBERTO E.



FIELD LOG OF EXPLORATORY BORING

PROJECT No. 846467 DATE 8/11/03
 CLIENT CASTRAS
 LOCATION SR 101
 LOGGED BY Ben Charron

BORING No
B-8
 Sheet 1
 of 1

Field location of boring:

Drilling Co. PRECISION
 Drill rig model _____
 Drilling method DIRECT PUSH
 Hole dia. 2"

Boring completion data _____

Ground Elev. _____

Datum _____

Pocket Penetrometer (TSF)	Blows/6 in. and/or Pressure (PSI)	Type of Sampler	Recovery (ft/ft)	Sample Number and Container Type	Depth (ft)	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	Depth to ▽	Time	Date	Depth to ▽	Time	Date
										62 @ 2.4'					
										10 20					
										8/11/03					
										DESCRIPTION					
										0-1': FILL					
					2					CLAY: BLACK, PLASTIC, MED. STIFF, DAMP					
					4										
					6			CL							
					8					WET + VERY SOFT (B) 6+7'					
					10					BECOMES FIRM					
					12			CL		SANDY CLAY (B) 12+13' SATURATED.					
					14					SOFT, COHESIVE, NON PLASTIC					
					16			CL		NO RECOVERY (B) 13+16'					
					18										
					20					TOTAL DEPTH: 16'					



FIELD LOG OF EXPLORATORY BORING

PROJECT No. 846 467 DATE 8/1/68
 CLIENT CALTRANS
 LOCATION MIRAS STATION
 LOGGED BY _____

BORING N
B42
 Sheet 1
 of 1

Field location of boring:

Drilling Co. _____
 Drill rig model _____
 Drilling method _____
 Hole dia. _____

Boring completion data _____

Ground Elev. _____

Datum _____

Pocket Penetrometer (TSF)	Blows / 6 in. and/or Pressure (PSI)	Type of Sampler	Recovery (N/F)	Sample Number and Container Type	Depth	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	Depth to ▽	Depth to ▽	DESCRIPTION	
										Time	Time	Date	Date
					2								FILL
					4			CL					CLAY, NON PLASTIC, FIRM → HARD, DRY → DAMP BLACKISH-BROWN COLOR
					6								DRY CLAYEY-GRAVEL LENS 5.5-6' BECOMES DAMP + PLASTIC @ 6'
					8			CL					BECOMES MOIST @ 9'
					10								BECOMES BECOMES WBT @ 11'
					12								CLAYEY GRAVEL, GRAVEL SUBROUNDED (1/2"), SATURATED, BROWN, LOW PLASTIC
					14								
					16								NO RECOVERY 12-16' TOTAL DEPTH: 16'



FIELD LOG OF EXPLORATORY BORING

PROJECT No. 845467 DATE 8/12/03
 CLIENT CACTRANS
 LOCATION SR 101 CAR WASH
 LOGGED BY BEN CHELSEN

BORING No. B-13
 Sheet 1
 of 1

Field location of boring:

Drilling Co. PRECISION
 Drill rig model _____
 Drilling method DIRECT PUSH
 Hole dia. 2"

Boring completion data _____

Ground Elev. _____ Datum _____

Pocket Penetrometer (TSF)	Blows/6 in. and/or Pressure (PSI)	Type of Sampler	Recovery (ft/ft)	Sample Number and Container Type	Depth (ft)	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	Depth to ▽	Time	Date	Depth to ▽	Time	Date	DESCRIPTION	
										64@7.2'		8/12/03					FILL
					3												CLAY, VERY PLASTIC, MOD. FIRM, MOIST, BLACKISH BROWN
					4												
					6												CL SILTY CLAY, PLASTIC, SOFT, MOIST, BLACKISH BROWN
					8												CLAY, VERY PLASTIC, STIFF, MOIST/DAMP, BLACKISH BROWN
					10												BETWEEN 10+12' CLAY GRAPES INTO BROWN COLOR AND BECOMES WET
					12												CL INTERBEDDED SANDY CLAY AND LAYER SAND, SATURATED, CLAY IS PLASTIC , SOFT, BROWN. SAND IS SLIGHTLY COARSE, SOFT, BROWN.
					14												
					16												NO RECOVERY 15 TO 16' TOTAL DEPTH: 16'



FIELD LOG OF EXPLORATORY BORING

PROJECT No. 845467 DATE 8/12/03
 CLIENT CALTRANS
 LOCATION CAS WASH
 LOGGED BY BEN CHAMEN

BORING No. B-14
 Sheet 1
 of 1

Field location of boring:

Drilling Co. PRECISION
 Drill rig model _____
 Drilling method DIRECT PUSH
 Hole dia. 2"

Boring completion data _____

Ground Elev. _____

Datum _____

Pocket Penetrometer (TSF)	Blows/6 in. and/or Pressure (PSF)	Type of Sampler	Recovery (ft/ft)	Sample Number and Container Type	Depth	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	Depth to ▽	Time	Date	Depth to ▽	Time	Date	DESCRIPTION
					2					6.2 @ 7.2'	1:45	8/12/03				FILL CLAY, VERY PLASTIC, MOD. FIRM, DAMP, BLACKISH BROWN
					4											
					6											BECOMES SOFT + WET @ 6'
					8			CL								AT 8', BECOMES MOD. FIRM + MOIST. 1B/ 8+10' GRADUALLY INTO BROWN COLOR
					10											
					12											
					14			SL								CLAY SAND. SAND FINES TO COARSE, ~20% FINES SATURATED, COHESIVE, BROWN
					16			CL								14-15' CLAY, SATURATED, PLASTIC, SOFT, LIGHT BROWN
																SAMPLE REFUSAL 15-16', TOTAL DEPTH: 16'



FIELD LOG OF EXPLORATORY BORING

PROJECT No. 845467 DATE 8/12/03
 CLIENT CALTRANS
 LOCATION CAR WASH
 LOGGED BY BEN CHEVLEN

BORING No. B-15
 Sheet 1
 of 1

Field location of boring:

Drilling Co. PRECISION

Drill rig model _____

Drilling method DIRECT PUSH

Hole dia. 2"

Boring completion data _____

Ground Elev. _____

Datum _____

Pocket Penetrometer (TSF)	Blows/6 in. and/or Pressure (PSI)	Type of Sampler	Recovery (ft/ft)	Sample Number and Container Type	Depth (ft)	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	Depth to ▽	Time	Date	Depth to ▽	Time	Date	DESCRIPTION
					2					6" @ 1.8'	1305	8/12/03				FILL
					4											CLAY. VERY PLASTIC, FIRM, DAMP, BLACK
					6											BECOMES WET AND MOD. STIFF @ 6'
					8				CL							BECOMES DAMP AND FIRM @ 8.5'
					10											BECOMES SATURATED @ 11'
					12											SAND @ 11.5'
					14											SW SAND IS SATURATED. FINE TO COARSE GRAINED. SLIGHTLY COHESIVE. BROWN COLOR
					16											NO RECOVERY 14-16'
																TOTAL DEPTH: 16'



FIELD LOG OF EXPLORATORY BORING

PROJECT No. 845467 DATE 7/30/03
 CLIENT CALTRANS
 LOCATION SR 101 SANTA ROSA
 LOGGED BY BEN CHEVREN

BORING No. S-1
 Sheet 1
 of 1

Field location of boring:

Drilling Co. PRECISION
 Drill rig model _____
 Drilling method GEO PROBE
 Hole dia. 2"

Boring completion data _____

Ground Elev. _____

Datum _____

Pocket Penetrometer (TSF)	Blows/6 in. and/or Pressure (PSI)	Type of Sampler	Recovery (ft/ft)	Sample Number and Container Type	Depth FT	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	Depth to ▽	Depth to ▽	DESCRIPTION
										Time	Time	
3.6					2							FILL
					4							CLAY, VERY STIFF, DRY/DAMP, BLACKISH-BROWN
					6			CL				BECOMES FIRM, DAMP, PLASTIC, GREENISH-BROWN
					8							BECOMES BLACKISH-BROWN
					10							
					12			GC				CLAYBY GRAVEL. 55% SUBROUNDED GRAVEL (1/2").
					14							45% FINEG. VERY MOIST, COHESIVE, GREYISH BROWN
					16			CL				CLAY, SOFT, SATURATED, NON PLASTIC. BROWN
												GRAVEL LENS PRESENT 13' 12.5' + 13.5'



FIELD LOG OF EXPLORATORY BORING

PROJECT No. 845467 DATE 8/12/03
 CLIENT CALTRANS
 LOCATION SR101 N STEELE LANE ANDRAMP
 LOGGED BY BEN CHAMBERLAIN

BORING No. B-16
 Sheet 1
 of 1

Field location of boring:

Drilling Co. PRECISION

Drill rig model _____

Drilling method DIRECT PUSH

Hole dia. 2"

Boring completion data _____

Ground Elev. _____

Datum _____

Pocket Permeometer (TSF)	Blows/6 In. and/or Pressure (PSF)	Type of Sampler	Recovery FT (ft/ft)	Sample Number and Container Type	Depth	Sampled Interval	Well Detail	Soil/Rock Symbol	Graphic Log	Depth to ▽	Time	Date	Depth to ▽	Time	Date	DESCRIPTION
										6' @ 7.4'	1440	8/12/03				FILL
					2											CL
					4											CL
					6											SW
					8											←
					11											CL
					12											←
					14											CL
					16											SW

CL CLAY. PLASTIC, ~~VERY~~ COHESIVE, MOD. HARD, DRY, BROWN

SW SAND. COHESIVE, WBT, SAND IS FINE GRAINED, BROWN

← CLAY. VERY PLASTIC, STIFF, MOIST, BLACKISH BROWN

CL GRAPES INTO BROWN BY 10'

WBT BY 11'

(SEM) SATURATED BY 12'

CL COARSE SAND, 70% FINES, COHESIVE, SATURATED, OLIVE GRAY COLOR

← CLAY. VERY PLASTIC MOD. SOFT, SATURATED, YELLOWISH BROWN

SW FINE SAND, COHESIVE, SOFT, SATURATED, GRAYISH-BROWN

APPENDIX D
LABORATORY ANALYTICAL REPORTS AND CHAIN OF CUSTODY FORMS
(SEE VOLUME II OF III AND VOLUME III OF III BINDERS)

APPENDIX E
BRIDGE STRUCTURE SAMPLING LOCATION PHOTOGRAPHS



Photo 1. West Steele Lane Bridge overpass.



Photo 2. West Steele Lane Bridge overpass.



Photo 3. Typical horizontal spanning member for bridges.



Photo 4. Typical base support cross member for bridges.



Photo 5. Base support for bridge span.

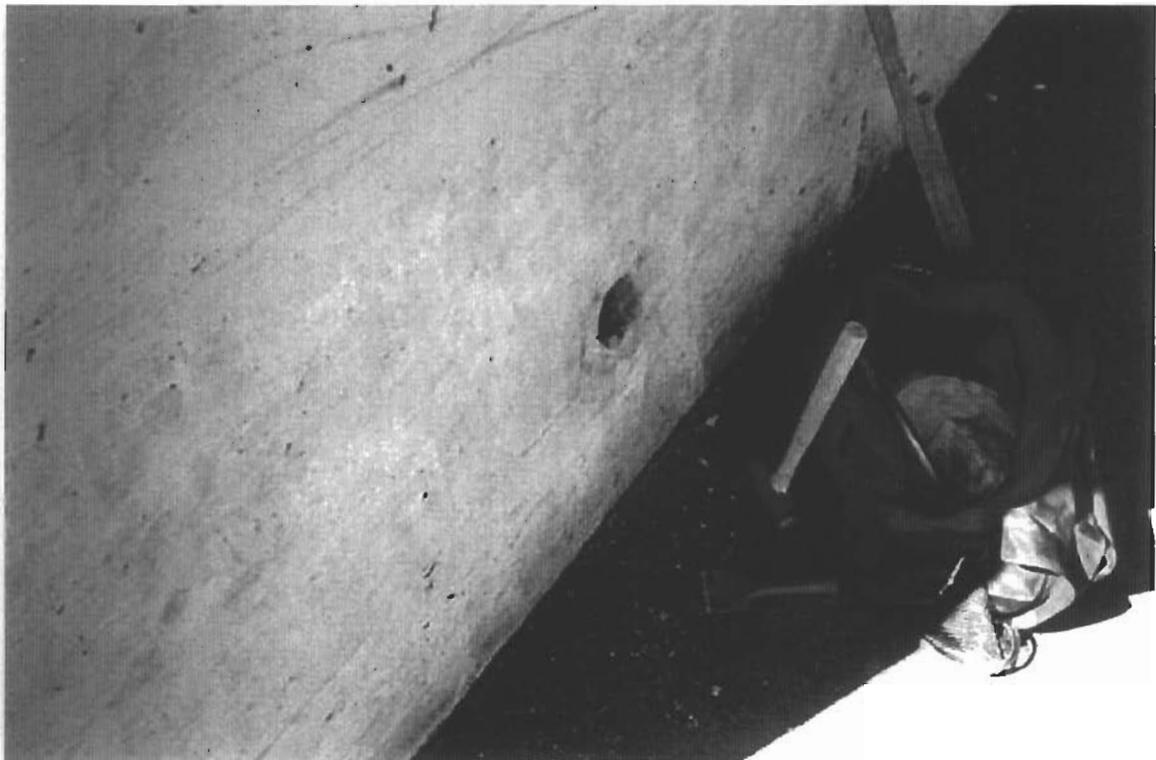


Photo 6. Drain pipe in West Steele Lane Bridge.



Photo 7. West College Ave. overpass.



Photo 8. West College Ave. base support.



Photo 9. West College Ave. center support pillar.



Photo 10. 9th Street Bridge.

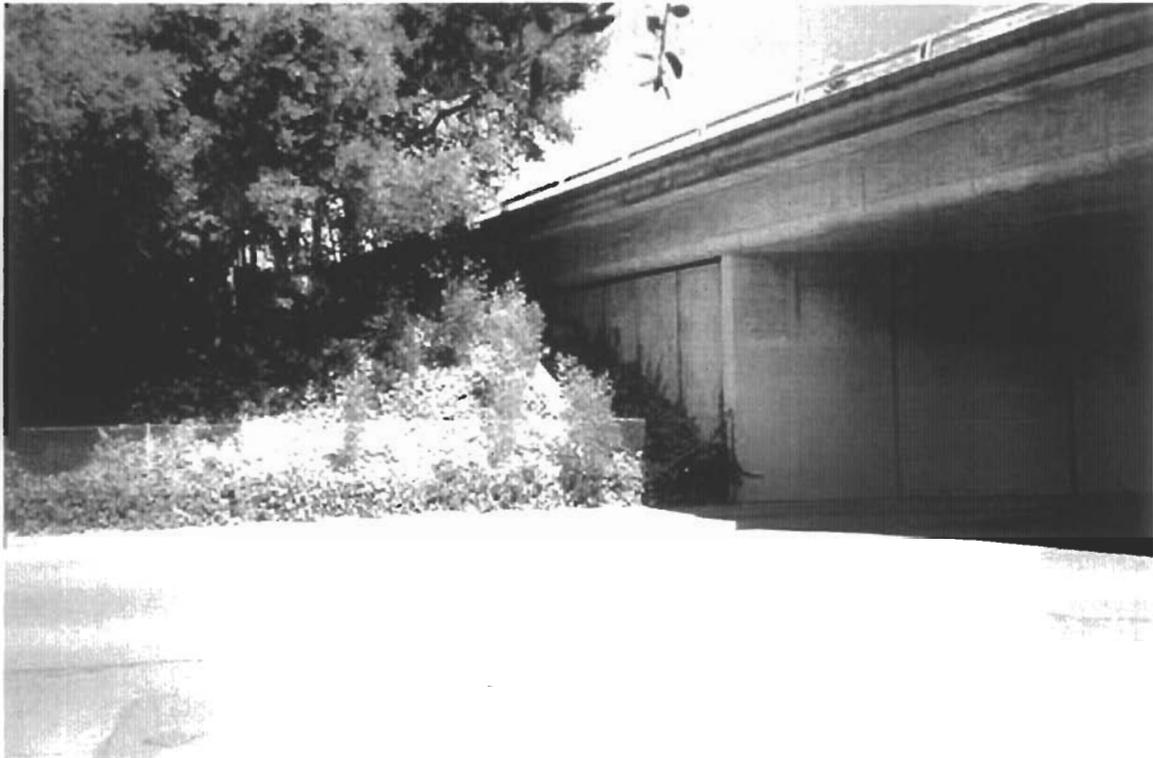


Photo 11. 9th Street Bridge underpass.

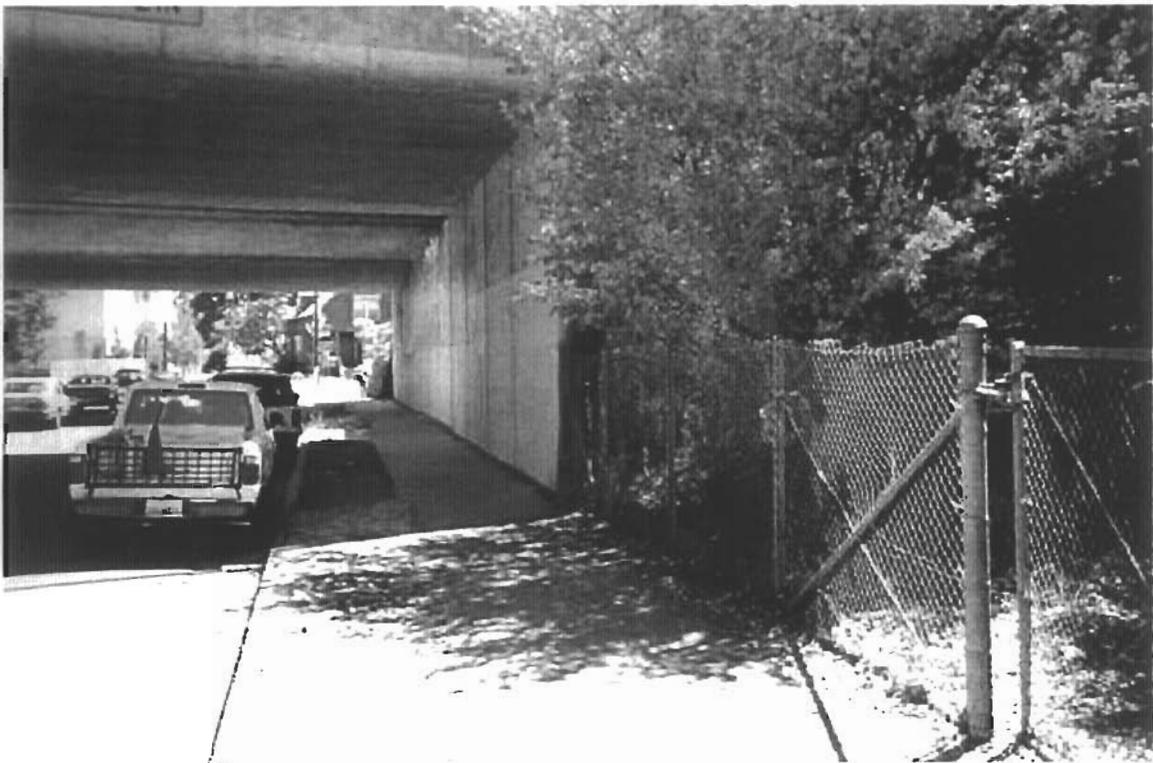


Photo 12. 9th Street Bridge and fencing prohibiting access.



Photo 13. Textured surface of 9th St. Bridge.

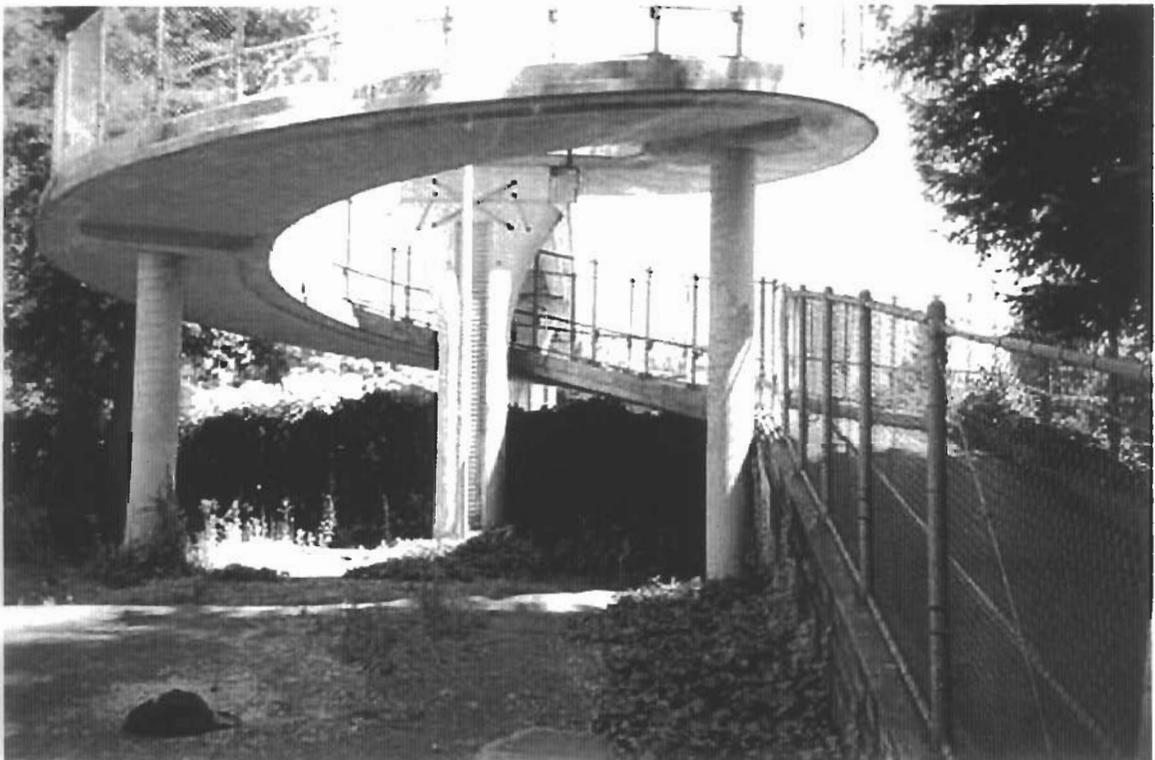


Photo 14. Santa Rosa Creek pedestrian walk –west side.



Photo 15. Santa Rosa Creek pedestrian walk – east side.



Photo 16. Santa Rosa Creek pedestrian walk and vehicle overpass bridge.



Photo 17. Santa Rosa Creek underpass walkway.



Photo 18. Santa Rosa Creek underpass walkway sampling site.



Photo 19. Santa Rosa Creek vehicular bridge showing slope shoring bags.



Photo 20. Santa Rosa Creek vehicular bridge showing rock shoring for slope.

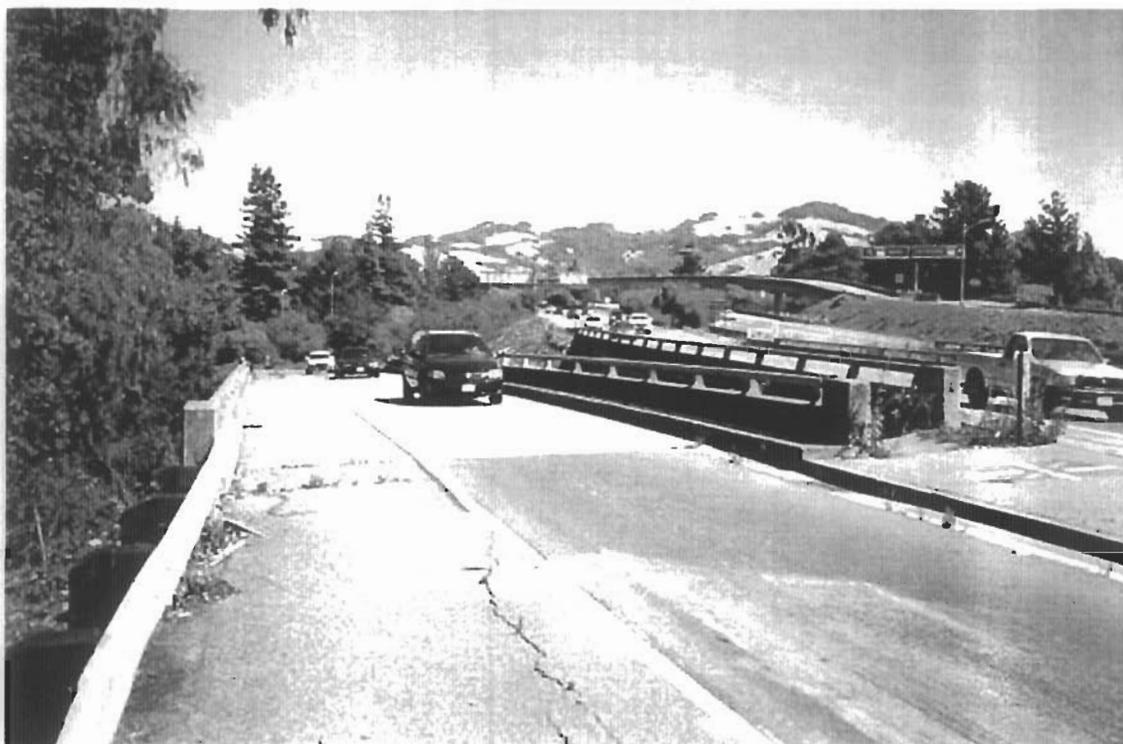


Photo 21. On ramp to south bound lane for Santa Rosa Creek overcrossing. Samples were obtained from vertical and horizontal structures seen on the left side of this picture.



Photo 22. Olive Street Bridge.



Photo 23. Railroad bridge overcrossing.



Photo 24. Support pillars for Railroad Bridge.

APPENDIX F
STATISTICAL ANALYSES

STATISTICS
TOTAL PROJECT AREA, PARTS I AND II

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	426	81	56	13	45
LO 90% CI	79.838	18.145	3.5983	1.9411	6.9923
MEAN	114.16	26.066	5.2337	3.9000	7.2000
UP 90% CI	148.47	33.987	6.8692	5.8589	7.4077
MINIMUM	0.5000	0.4200	0.2800	0.2400	4.9000
MAXIMUM	5030.0	287.00	37.500	14.300	9.8000

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL
WET	0.9756
DIWET	0.9168

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-11.265	LOWER FITTED BOUND	6.8046
PREDICTED VALUE	7.1022	FITTED VALUE	7.1022
UPPER PREDICTED BOUND	25.469	UPPER FITTED BOUND	7.3998
SE (PREDICTED VALUE)	11.037	SE (FITTED VALUE)	0.1788
UNUSUALNESS (LEVERAGE)	0.0003		
PERCENT COVERAGE	90.0		
CORRESPONDING T	1.66	PREDICTOR VALUES: TOTAL =	148.47

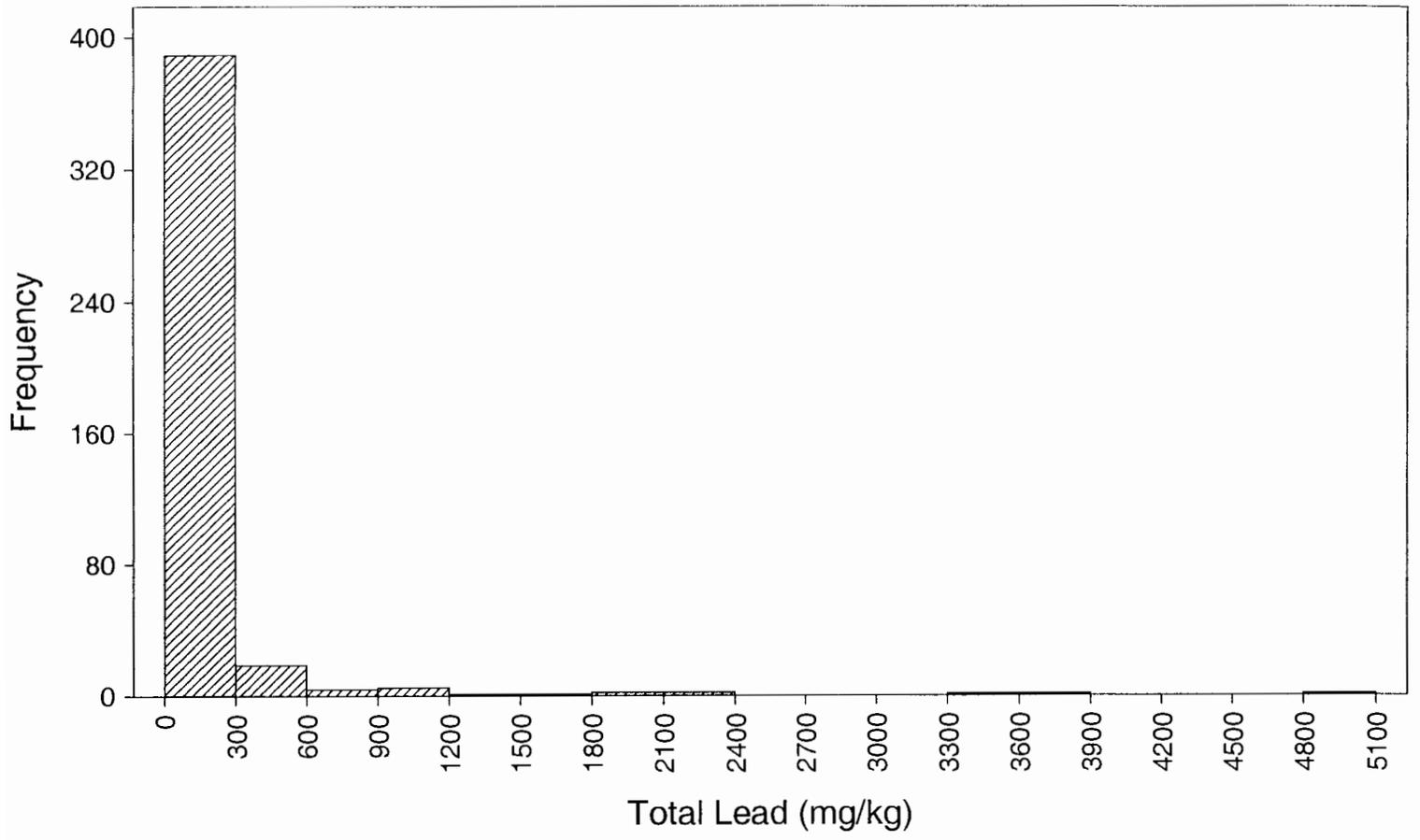
PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-5.0321	LOWER FITTED BOUND	0.8974
PREDICTED VALUE	0.9952	FITTED VALUE	0.9952
UPPER PREDICTED BOUND	7.0224	UPPER FITTED BOUND	1.0929
SE (PREDICTED VALUE)	3.6026	SE (FITTED VALUE)	0.0584
UNUSUALNESS (LEVERAGE)	0.0003		
PERCENT COVERAGE	90.0		
CORRESPONDING T	1.67	PREDICTOR VALUES: TOTAL =	148.47

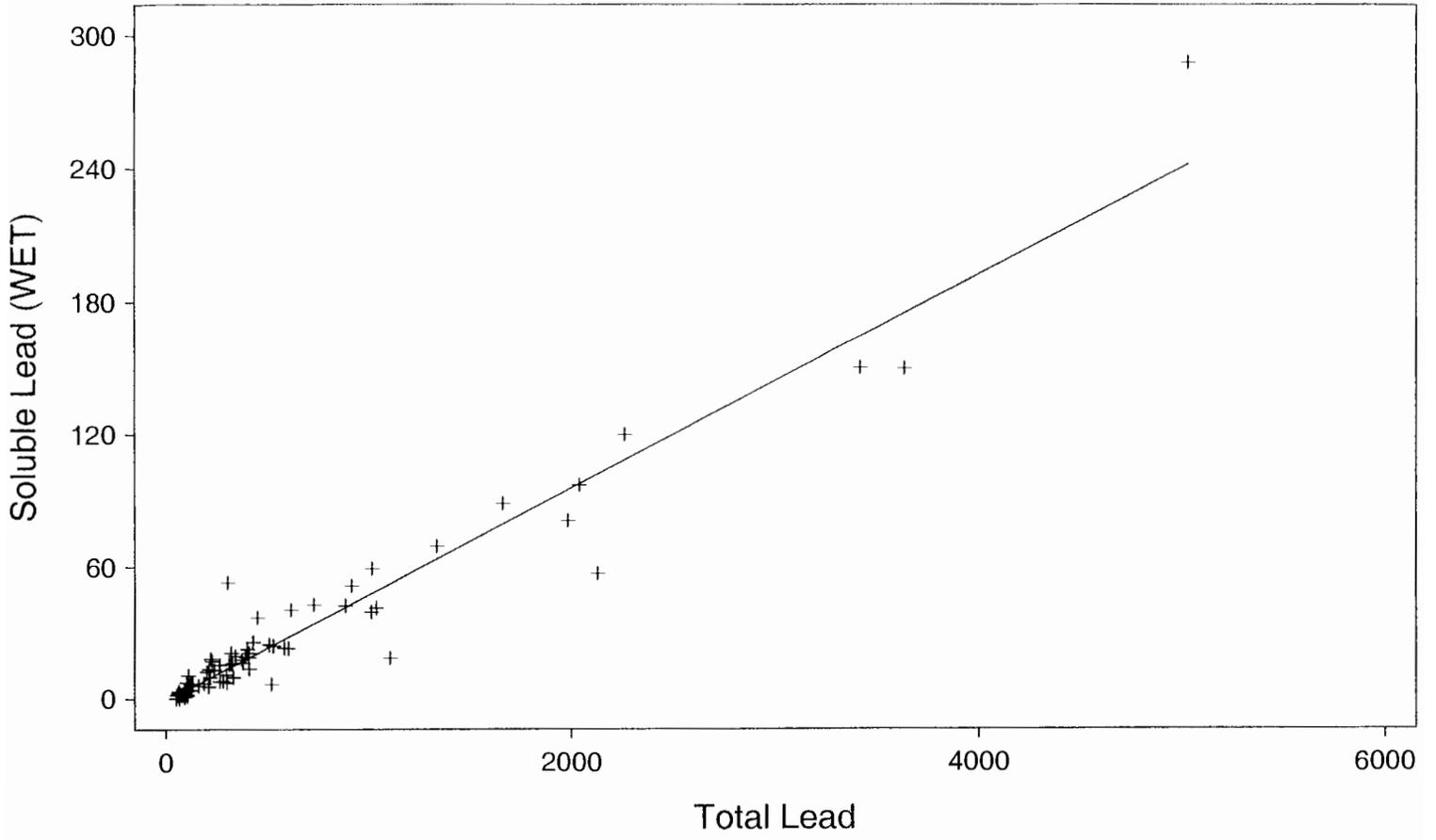
PREDICTED/FITTED VALUES OF TCLP

LOWER PREDICTED BOUND	-5.6015	LOWER FITTED BOUND	0.1715
PREDICTED VALUE	0.2710	FITTED VALUE	0.2710
UPPER PREDICTED BOUND	6.1435	UPPER FITTED BOUND	0.3705
SE (PREDICTED VALUE)	3.2949	SE (FITTED VALUE)	0.0558
UNUSUALNESS (LEVERAGE)	0.0003		
PERCENT COVERAGE	90.0		
CORRESPONDING T	1.78	PREDICTOR VALUES: TOTAL =	148.47

Histogram SR 101, Santa Rosa, CA



Scatter Plot of Soluble vs Total Lead



**STATISTICS
PART I**

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	107	17	10	1	11
LO 90% CI	27.002	6.8650	0.7646	M	6.5629
MEAN	63.041	12.872	2.8180	2.7300	6.8545
UP 90% CI	99.080	18.880	4.8714	M	7.1461
95%UCL, Bootstrap	101.77				
MINIMUM	0.5000	0.9500	1.0100	2.7300	5.8000
MAXIMUM	2130.0	56.900	12.300	2.7300	7.9000

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

WET TOTAL
0.9356

DIWET TOTAL
0.9612

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.03030	0.00286	10.60	0.0000

R-SQUARED 0.8754 RESID. MEAN SQUARE (MSE) 47.0121
ADJUSTED R-SQUARED 0.8676 STANDARD DEVIATION 6.85653

SOURCE	DF	SS	MS	F	P
REGRESSION	1	5285.07	5285.07	112.42	0.0000
RESIDUAL	16	752.193	47.0121		
TOTAL	17	6037.26			

CASES INCLUDED 17 MISSING CASES 90

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-8.8983	LOWER FITTED BOUND	2.5755
PREDICTED VALUE	3.0832	FITTED VALUE	3.0832
UPPER PREDICTED BOUND	15.065	UPPER FITTED BOUND	3.5909
SE (PREDICTED VALUE)	6.8627	SE (FITTED VALUE)	0.2908

UNUSUALNESS (LEVERAGE) 0.0018
PERCENT COVERAGE 90.0
CORRESPONDING T 1.75

PREDICTOR VALUES: TOTAL = 101.77 (95% UCL, Bootstrap)

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00558	5.333E-04	10.46	0.0000
R-SQUARED	0.9240	RESID. MEAN SQUARE (MSE)		1.62489
ADJUSTED R-SQUARED	0.9155	STANDARD DEVIATION		1.27471

SOURCE	DF	SS	MS	F	P
REGRESSION	1	177.721	177.721	109.37	0.0000
RESIDUAL	9	14.6240	1.62489		
TOTAL	10	192.345			

CASES INCLUDED 10 MISSING CASES 97

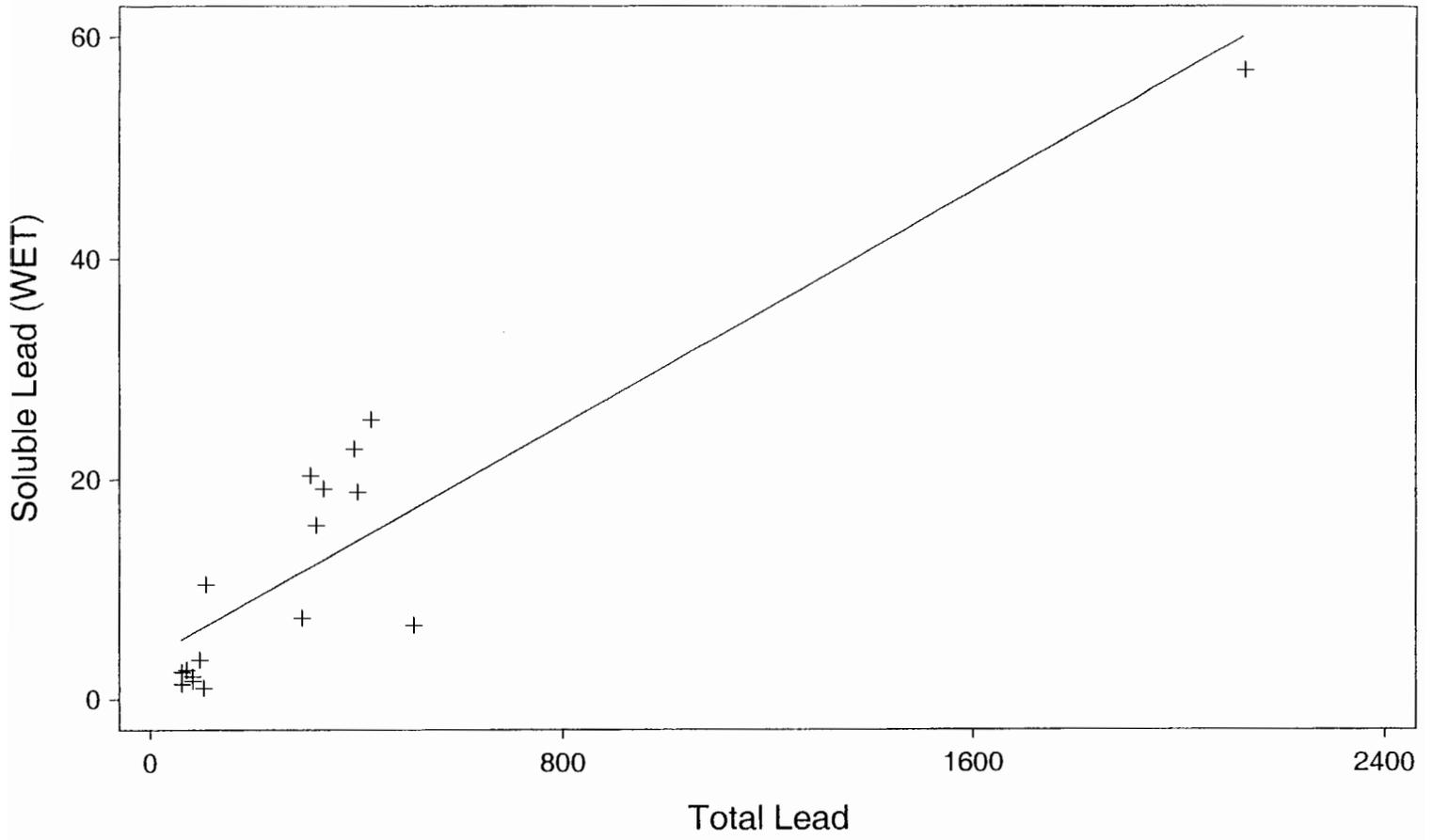
PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-1.7712	LOWER FITTED BOUND	0.4682
PREDICTED VALUE	0.5677	FITTED VALUE	0.5677
UPPER PREDICTED BOUND	2.9065	UPPER FITTED BOUND	0.6672
SE (PREDICTED VALUE)	1.2759	SE (FITTED VALUE)	0.0543

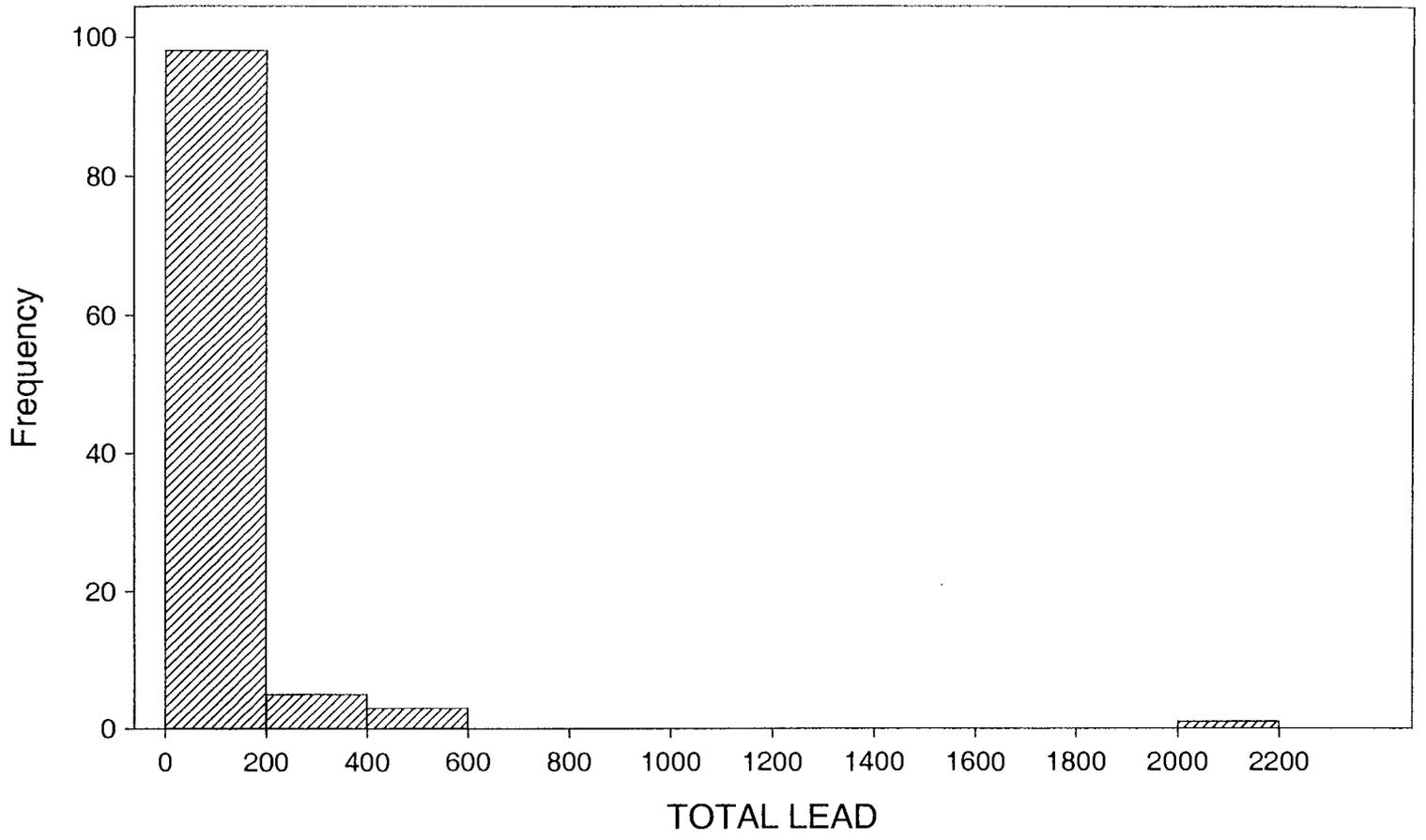
UNUSUALNESS (LEVERAGE)	0.0018
PERCENT COVERAGE	90.0
CORRESPONDING T	1.83

PREDICTOR VALUES: TOTAL = 101.77 (95% UCL, Bootstrap)

Scatter Plot of Soluble vs Total, Part I



Histogram, Part 1



STATISTICS
PART II
Surface Samples Removed
Borings HA-036, BP-083, BP-103, BP-111, and BP-122

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	313	59	41	7	33
L.O 90% CI	60.246	14.003	2.5752	0.7891	7.0393
MEAN	82.643	18.592	3.3027	1.2914	7.3030
UP 90% CI	105.04	23.182	4.0302	1.7938	7.5667
95%UCL, Bootstrap	107.53				
MINIMUM	0.5000	0.4200	0.2800	0.2400	4.9000
MAXIMUM	2040.0	97.100	13.200	2.3400	9.8000

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

WET TOTAL
0.9558

DIWET TOTAL
0.8795

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P	
TOTAL	0.04584	0.00185	24.75	0.0000	
R-SQUARED	0.9135	RESID. MEAN SQUARE (MSE)		68.8686	
ADJUSTED R-SQUARED	0.9120	STANDARD DEVIATION		8.29871	
SOURCE	DF	SS	MS	F	P
REGRESSION	1	42199.5	42199.5	612.75	0.0000
RESIDUAL	58	3994.38	68.8686		
TOTAL	59	46193.9			

CASES INCLUDED 59 MISSING CASES 254

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-8.9468	LOWER FITTED BOUND	4.5961
PREDICTED VALUE	4.9290	FITTED VALUE	4.9290
UPPER PREDICTED BOUND	18.805	UPPER FITTED BOUND	5.2618
SE (PREDICTED VALUE)	8.3011	SE (FITTED VALUE)	0.1991
UNUSUALNESS (LEVERAGE)	0.0006		
PERCENT COVERAGE	90.0		
CORRESPONDING T	1.67		

PREDICTOR VALUES: TOTAL = 107.53 (95 % UCL, Bootstrap)

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00540	4.625E-04	11.69	0.0000
R-SQUARED	0.7735	RESID. MEAN SQUARE (MSE)		4.26641
ADJUSTED R-SQUARED	0.7678	STANDARD DEVIATION		2.06553

SOURCE	DF	SS	MS	F	P
REGRESSION	1	582.706	582.706	136.58	0.0000
RESIDUAL	40	170.657	4.26641		
TOTAL	41	753.363			

CASES INCLUDED 41 MISSING CASES 272

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-2.8979	LOWER FITTED BOUND	0.4974
PREDICTED VALUE	0.5812	FITTED VALUE	0.5812
UPPER PREDICTED BOUND	4.0602	UPPER FITTED BOUND	0.6649
SE (PREDICTED VALUE)	2.0661	SE (FITTED VALUE)	0.0497
UNUSUALNESS (LEVERAGE)	0.0006		
PERCENT COVERAGE	90.0		
CORRESPONDING T	1.68		

PREDICTOR VALUES: TOTAL = 107.53(95 % UCL, Bootstrap)

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF TCLP

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	8.880E-04	1.975E-04	4.50	0.0041
R-SQUARED	0.7711	RESID. MEAN SQUARE (MSE)		0.55250
ADJUSTED R-SQUARED	0.7329	STANDARD DEVIATION		0.74330

SOURCE	DF	SS	MS	F	P
REGRESSION	1	11.1662	11.1662	20.21	0.0041
RESIDUAL	6	3.31500	0.55250		
TOTAL	7	14.4812			

CASES INCLUDED 7 MISSING CASES 306

PREDICTED/FITTED VALUES OF TCLP

LOWER PREDICTED BOUND	-1.3495	LOWER FITTED BOUND	0.0542
PREDICTED VALUE	0.0955	FITTED VALUE	0.0955
UPPER PREDICTED BOUND	1.5404	UPPER FITTED BOUND	0.1368
SE (PREDICTED VALUE)	0.7436	SE (FITTED VALUE)	0.0212
UNUSUALNESS (LEVERAGE)	0.0008		
PERCENT COVERAGE	90.0		
CORRESPONDING T	1.94		

PREDICTOR VALUES: TOTAL = 107.53 (95 % UCL, Bootstrap)

STATISTIX 7.0

10/23/2003, 8:26:07 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	10	3	1	0	1
LO 80% CI	13.567	0.6564	M	M	M
MEAN	81.626	3.7930	1.1900	M	7.0000
UP 80% CI	149.69	6.9296	M	M	M
MINIMUM	2.9400	0.9490	1.1900	M	7.0000
MAXIMUM	512.00	6.7100	1.1900	M	7.0000

STATISTIX 7.0

10/23/2003, 8:26:39 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.01378	0.00330	4.17	0.0529
R-SQUARED	0.8970	RESID. MEAN SQUARE (MSE)		3.07653
ADJUSTED R-SQUARED	0.8456	STANDARD DEVIATION		1.75401

SOURCE	DF	SS	MS	F	P
REGRESSION	1	53.6100	53.6100	17.43	0.0529
RESIDUAL	2	6.15307	3.07653		
TOTAL	3	59.7631			

CASES INCLUDED 3 MISSING CASES 7

STATISTIX 7.0

10/23/2003, 8:27:03 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-1.3316	LOWER FITTED BOUND	1.1571
PREDICTED VALUE	2.1105	FITTED VALUE	2.1105
UPPER PREDICTED BOUND	5.5525	UPPER FITTED BOUND	3.0638
SE (PREDICTED VALUE)	1.8254	SE (FITTED VALUE)	0.5056

UNUSUALNESS (LEVERAGE)	0.0831
PERCENT COVERAGE	80.0
CORRESPONDING T	1.89

PREDICTOR VALUES: TOTAL = 153.14

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	30	0	0	0	2
LO 80% CI	7.8710	M	M	M	M
MEAN	9.9687	M	M	M	7.4500
UP 80% CI	12.066	M	M	M	M
MINIMUM	2.4400	M	M	M	7.0000
MAXIMUM	39.300	M	M	M	7.9000

P1 SHOULDER 1FT

STATISTIX 7.0

10/23/2003, 8:21:51 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	11	7	5	1	0
LO 80% CI	71.205	7.0933	0.9251	M	M
MEAN	326.85	17.614	4.2300	2.7300	M
UP 80% CI	582.49	28.135	7.5349	M	M
MINIMUM	9.2700	1.7500	1.0100	2.7300	M
MAXIMUM	2130.0	56.900	12.300	2.7300	M

STATISTIX 7.0

10/23/2003, 8:23:20 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9651	
DIWET	0.9708	0.9494

CASES INCLUDED 5 MISSING CASES 6

STATISTIX 7.0

10/23/2003, 8:23:38 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P	
TOTAL	0.02870	0.00318	9.02	0.0001	
R-SQUARED	0.9313	RESID. MEAN SQUARE (MSE)	50.5302		
ADJUSTED R-SQUARED	0.9199	STANDARD DEVIATION	7.10846		
SOURCE	DF	SS	MS	F	P
REGRESSION	1	4111.41	4111.41	81.37	0.0001
RESIDUAL	6	303.181	50.5302		
TOTAL	7	4414.60			

CASES INCLUDED 7 MISSING CASES 4

STATISTIX 7.0

10/23/2003, 8:24:13 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	6.1938	LOWER FITTED BOUND	14.095
PREDICTED VALUE	16.773	FITTED VALUE	16.773
UPPER PREDICTED BOUND	27.351	UPPER FITTED BOUND	19.450
SE (PREDICTED VALUE)	7.3476	SE (FITTED VALUE)	1.8594
UNUSUALNESS (LEVERAGE)	0.0684		
PERCENT COVERAGE	80.0		
CORRESPONDING T	1.44		

PREDICTOR VALUES: TOTAL = 584.34

P1 SHOULDER 1FT

STATISTIX 7.0

10/23/2003, 8:24:31 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00587	7.265E-04	8.09	0.0013
R-SQUARED	0.9424	RESID. MEAN SQUARE (MSE)		2.62836
ADJUSTED R-SQUARED	0.9279	STANDARD DEVIATION		1.62122

SOURCE	DF	SS	MS	F	P
REGRESSION	1	171.881	171.881	65.39	0.0013
RESIDUAL	4	10.5135	2.62836		
TOTAL	5	182.395			

CASES INCLUDED 5 MISSING CASES 6

STATISTIX 7.0

10/23/2003, 8:24:40 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	0.8634	LOWER FITTED BOUND	2.7820
PREDICTED VALUE	3.4329	FITTED VALUE	3.4329
UPPER PREDICTED BOUND	6.0024	UPPER FITTED BOUND	4.0838
SE (PREDICTED VALUE)	1.6759	SE (FITTED VALUE)	0.4245

UNUSUALNESS (LEVERAGE)	0.0686
PERCENT COVERAGE	80.0
CORRESPONDING T	1.53

PREDICTOR VALUES: TOTAL = 584.34

STATISTIX 7.0

10/23/2003, 8:30:04 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	30	3	1	0	4
LO 80% CI	10.683	-2.9231	M	M	5.9933
MEAN	24.460	8.3967	1.4700	M	6.4000
UP 80% CI	38.237	19.716	M	M	6.8067
MINIMUM	3.5900	2.1600	1.4700	M	5.8000
MAXIMUM	313.00	20.400	1.4700	M	7.0000

STATISTIX 7.0

10/23/2003, 8:30:44 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.06143	0.00768	7.99	0.0153
R-SQUARED	0.9697	RESID. MEAN SQUARE (MSE)		6.48991
ADJUSTED R-SQUARED	0.9545	STANDARD DEVIATION		2.54753

SOURCE	DF	SS	MS	F	P
REGRESSION	1	414.763	414.763	63.91	0.0153
RESIDUAL	2	12.9798	6.48991		
TOTAL	3	427.742			

CASES INCLUDED 3 MISSING CASES 27

STATISTIX 7.0

10/23/2003, 8:31:11 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-2.9282	LOWER FITTED BOUND	1.4490
PREDICTED VALUE	1.8963	FITTED VALUE	1.8963
UPPER PREDICTED BOUND	6.7207	UPPER FITTED BOUND	2.3436
SE (PREDICTED VALUE)	2.5586	SE (FITTED VALUE)	0.2372

UNUSUALNESS (LEVERAGE) 0.0087
 PERCENT COVERAGE 80.0
 CORRESPONDING T 1.89

PREDICTOR VALUES: TOTAL = 30.870

PI SHOULDER

STATISTIX 7.0

10/23/2003, 9:16:19 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	40	9	5	0	4
LO 80% CI	32.853	5.9073	0.8781	M	5.9933
MEAN	54.978	10.177	2.0640	M	6.4000
UP 80% CI	77.103	14.446	3.2499	M	6.8067
MINIMUM	3.5900	1.7500	1.0100	M	5.8000
MAXIMUM	427.00	25.500	5.1400	M	7.0000

STATISTIX 7.0

10/23/2003, 9:16:42 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9610	
DIWET	0.8292	0.7891

CASES INCLUDED 5 MISSING CASES 35

STATISTIX 7.0

10/23/2003, 9:16:55 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.05112	0.00543	9.41	0.0000
R-SQUARED	0.9171	RESID. MEAN SQUARE (MSE)		16.6211
ADJUSTED R-SQUARED	0.9068	STANDARD DEVIATION		4.07690

SOURCE	DF	SS	MS	F	P
REGRESSION	1	1471.76	1471.76	88.55	0.0000
RESIDUAL	8	132.969	16.6211		
TOTAL	9	1604.73			

CASES INCLUDED 9 MISSING CASES 31

STATISTIX 7.0

10/23/2003, 9:17:08 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-2.0118	LOWER FITTED BOUND	3.1588
PREDICTED VALUE	3.7094	FITTED VALUE	3.7094
UPPER PREDICTED BOUND	9.4307	UPPER FITTED BOUND	4.2601
SE (PREDICTED VALUE)	4.0959	SE (FITTED VALUE)	0.3942

UNUSUALNESS (LEVERAGE)	0.0093
PERCENT COVERAGE	80.0
CORRESPONDING T	1.40

PREDICTOR VALUES: TOTAL = 72.570

P1 SHOULDER

STATISTIX 7.0

10/23/2003, 9:17:21 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00650	0.00219	2.97	0.0413

R-SQUARED	0.6876	RESID. MEAN SQUARE (MSE)	2.59789
ADJUSTED R-SQUARED	0.6095	STANDARD DEVIATION	1.61180

SOURCE	DF	SS	MS	F	P
REGRESSION	1	22.8740	22.8740	8.80	0.0413
RESIDUAL	4	10.3916	2.59789		
TOTAL	5	33.2656			

CASES INCLUDED 5 MISSING CASES 35

STATISTIX 7.0

10/23/2003, 9:17:31 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-2.0114	LOWER FITTED BOUND	0.2280
PREDICTED VALUE	0.4718	FITTED VALUE	0.4718
UPPER PREDICTED BOUND	2.9550	UPPER FITTED BOUND	0.7156
SE (PREDICTED VALUE)	1.6196	SE (FITTED VALUE)	0.1590

UNUSUALNESS (LEVERAGE)	0.0097
PERCENT COVERAGE	80.0
CORRESPONDING T	1.53

PREDICTOR VALUES: TOTAL = 72.570

STATISTIX 7.0

10/23/2003, 8:32:38 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	25	4	3	0	4
LO 80% CI	22.032	7.0280	1.3901	M	6.8352
MEAN	52.018	14.740	1.4567	M	6.9750
UP 80% CI	82.004	22.452	1.5232	M	7.1148
MINIMUM	2.6900	1.2600	1.3900	M	6.8000
MAXIMUM	396.00	22.700	1.5100	M	7.2000

STATISTIX 7.0

10/23/2003, 8:33:07 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9978	
DIWET	0.9971	0.9905

CASES INCLUDED 3 MISSING CASES 23

STATISTIX 7.0

10/23/2003, 8:33:20 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.05474	0.00285	19.18	0.0003
R-SQUARED	0.9919	RESID. MEAN SQUARE (MSE)		3.06094
ADJUSTED R-SQUARED	0.9892	STANDARD DEVIATION		1.74955

SOURCE	DF	SS	MS	F	P
REGRESSION	1	1125.97	1125.97	367.85	0.0003
RESIDUAL	3	9.18282	3.06094		
TOTAL	4	1135.16			

CASES INCLUDED 4 MISSING CASES 22

STATISTIX 7.0

10/23/2003, 8:33:42 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	1.5280	LOWER FITTED BOUND	4.0408
PREDICTED VALUE	4.4181	FITTED VALUE	4.4181
UPPER PREDICTED BOUND	7.3081	UPPER FITTED BOUND	4.7953
SE (PREDICTED VALUE)	1.7647	SE (FITTED VALUE)	0.2304

UNUSUALNESS (LEVERAGE)	0.0173
PERCENT COVERAGE	80.0
CORRESPONDING T	1.64

PREDICTOR VALUES: TOTAL = 80.710

P1 ONRAMP

STATISTIX 7.0

10/23/2003, 8:33:57 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00413	2.218E-04	18.61	0.0029
R-SQUARED	0.9943	RESID. MEAN SQUARE (MSE)		0.01830
ADJUSTED R-SQUARED	0.9914	STANDARD DEVIATION		0.13527

SOURCE	DF	SS	MS	F	P
REGRESSION	1	6.33650	6.33650	346.29	0.0029
RESIDUAL	2	0.03660	0.01830		
TOTAL	3	6.37310			

CASES INCLUDED 3 MISSING CASES 23

STATISTIX 7.0

10/23/2003, 8:34:05 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	0.0758	LOWER FITTED BOUND	0.2993
PREDICTED VALUE	0.3331	FITTED VALUE	0.3331
UPPER PREDICTED BOUND	0.5904	UPPER FITTED BOUND	0.3668
SE (PREDICTED VALUE)	0.1365	SE (FITTED VALUE)	0.0179

UNUSUALNESS (LEVERAGE)	0.0175
PERCENT COVERAGE	80.0
CORRESPONDING T	1.89

PREDICTOR VALUES: TOTAL = 80.710

STATISTIX 7.0

10/23/2003, 8:35:53 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	30	5	4	1	2
LO 80% CI	32.379	6.6275	1.6098	M	M
MEAN	88.411	17.348	2.6865	0.8310	7.9500
UP 80% CI	144.44	28.069	3.7632	M	M
MINIMUM	2.9400	3.4200	0.8360	0.8310	7.7000
MAXIMUM	1100.0	42.700	3.8300	0.8310	8.2000

STATISTIX 7.0

10/23/2003, 8:39:17 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.8320	
DIWET	0.8158	0.9039

CASES INCLUDED 4 MISSING CASES 26

STATISTIX 7.0

10/23/2003, 8:39:29 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.03080	0.01024	3.01	0.0396
R-SQUARED	0.6935	RESID. MEAN SQUARE (MSE)		190.216
ADJUSTED R-SQUARED	0.6169	STANDARD DEVIATION		13.7919

SOURCE	DF	SS	MS	F	P
REGRESSION	1	1721.72	1721.72	9.05	0.0396
RESIDUAL	4	760.864	190.216		
TOTAL	5	2482.59			

CASES INCLUDED 5 MISSING CASES 25

STATISTIX 7.0

10/23/2003, 8:39:47 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-16.707	LOWER FITTED BOUND	2.2394
PREDICTED VALUE	4.5665	FITTED VALUE	4.5665
UPPER PREDICTED BOUND	25.840	UPPER FITTED BOUND	6.8937
SE (PREDICTED VALUE)	13.875	SE (FITTED VALUE)	1.5178

UNUSUALNESS (LEVERAGE)	0.0121
PERCENT COVERAGE	80.0
CORRESPONDING T	1.53

PREDICTOR VALUES: TOTAL = 148.25

P2 MEDIAN 1FT

STATISTIX 7.0

10/23/2003, 8:43:12 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00354	0.00145	2.44	0.0922

R-SQUARED	0.6656	RESID. MEAN SQUARE (MSE)	3.79598
ADJUSTED R-SQUARED	0.5541	STANDARD DEVIATION	1.94833

SOURCE	DF	SS	MS	F	P
REGRESSION	1	22.6679	22.6679	5.97	0.0922
RESIDUAL	3	11.3879	3.79598		
TOTAL	4	34.0558			

CASES INCLUDED 4 MISSING CASES 26

STATISTIX 7.0

10/23/2003, 8:43:44 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-2.6850	LOWER FITTED BOUND	0.1732
PREDICTED VALUE	0.5252	FITTED VALUE	0.5252
UPPER PREDICTED BOUND	3.7355	UPPER FITTED BOUND	0.8772
SE (PREDICTED VALUE)	1.9601	SE (FITTED VALUE)	0.2149

UNUSUALNESS (LEVERAGE)	0.0122
PERCENT COVERAGE	80.0
CORRESPONDING T	1.64

PREDICTOR VALUES: TOTAL = 148.25

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	89	1	0	0	8
LO 80% CI	7.5875	M	M	M	6.2798
MEAN	8.9242	1.6400	M	M	7.0375
UP 80% CI	10.261	M	M	M	7.7952
MINIMUM	1.3500	1.6400	M	M	4.9000
MAXIMUM	57.100	1.6400	M	M	9.8000

P2 SHOULDER 1FT

STATISTIX 7.0

10/23/2003, 8:47:47 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	24	18	18	4	1
LO 80% CI	293.19	22.923	2.8190	1.0988	M
MEAN	425.38	30.612	3.6542	1.5775	7.4000
UP 80% CI	557.58	38.301	4.4893	2.0562	M
MINIMUM	2.7700	6.9000	0.7100	1.0900	7.4000
MAXIMUM	2040.0	97.100	8.8600	2.3400	7.4000

STATISTIX 7.0

10/23/2003, 8:48:12 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9618	
DIWET	0.8457	0.8970

CASES INCLUDED 18 MISSING CASES 6

STATISTIX 7.0

10/23/2003, 8:48:25 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.05031	0.00348	14.48	0.0000
R-SQUARED	0.9250	RESID. MEAN SQUARE (MSE)		119.359
ADJUSTED R-SQUARED	0.9206	STANDARD DEVIATION		10.9251

SOURCE	DF	SS	MS	F	P
REGRESSION	1	25014.2	25014.2	209.57	0.0000
RESIDUAL	17	2029.10	119.359		
TOTAL	18	27043.3			

CASES INCLUDED 18 MISSING CASES 6

STATISTIX 7.0

10/23/2003, 8:48:50 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	13.218	LOWER FITTED BOUND	25.432
PREDICTED VALUE	28.012	FITTED VALUE	28.012
UPPER PREDICTED BOUND	42.806	UPPER FITTED BOUND	30.592
SE (PREDICTED VALUE)	11.095	SE (FITTED VALUE)	1.9350

UNUSUALNESS (LEVERAGE)	0.0314
PERCENT COVERAGE	80.0
CORRESPONDING T	1.33

PREDICTOR VALUES: TOTAL = 556.79

P2 SHOULDER 1FT

STATISTIX 7.0

10/23/2003, 8:49:08 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00511	7.817E-04	6.53	0.0000
R-SQUARED	0.7151	RESID. MEAN SQUARE (MSE)		6.03910
ADJUSTED R-SQUARED	0.6984	STANDARD DEVIATION		2.45746

SOURCE	DF	SS	MS	F	P
REGRESSION	1	257.723	257.723	42.68	0.0000
RESIDUAL	17	102.665	6.03910		
TOTAL	18	360.388			

CASES INCLUDED 18 MISSING CASES 6

STATISTIX 7.0

10/23/2003, 8:49:19 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-0.4844	LOWER FITTED BOUND	2.2630
PREDICTED VALUE	2.8433	FITTED VALUE	2.8433
UPPER PREDICTED BOUND	6.1710	UPPER FITTED BOUND	3.4237
SE (PREDICTED VALUE)	2.4957	SE (FITTED VALUE)	0.4352

UNUSUALNESS (LEVERAGE)	0.0314
PERCENT COVERAGE	80.0
CORRESPONDING T	1.33

PREDICTOR VALUES: TOTAL = 556.79

STATISTIX 7.0

10/23/2003, 8:50:55 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	53	11	5	0	8
LO 80% CI	27.173	4.4578	2.0428	M	7.3535
MEAN	50.803	9.3975	3.9300	M	7.5500
UP 80% CI	74.433	14.337	5.8172	M	7.7465
MINIMUM	2.7700	0.4520	1.7500	M	6.9000
MAXIMUM	875.00	42.200	8.6800	M	8.0000

STATISTIX 7.0

10/23/2003, 8:51:22 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9944	
DIWET	0.9893	0.9956

CASES INCLUDED 5 MISSING CASES 48

STATISTIX 7.0

10/23/2003, 8:51:39 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.04751	0.00198	23.94	0.0000
R-SQUARED	0.9829	RESID. MEAN SQUARE (MSE)		4.10919
ADJUSTED R-SQUARED	0.9811	STANDARD DEVIATION		2.02711

SOURCE	DF	SS	MS	F	P
REGRESSION	1	2355.81	2355.81	573.30	0.0000
RESIDUAL	10	41.0919	4.10919		
TOTAL	11	2396.90			

CASES INCLUDED 11 MISSING CASES 42

STATISTIX 7.0

10/23/2003, 8:52:19 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	0.8619	LOWER FITTED BOUND	3.4421
PREDICTED VALUE	3.6513	FITTED VALUE	3.6513
UPPER PREDICTED BOUND	6.4407	UPPER FITTED BOUND	3.8606
SE (PREDICTED VALUE)	2.0328	SE (FITTED VALUE)	0.1525

UNUSUALNESS (LEVERAGE)	0.0057
PERCENT COVERAGE	80.0
CORRESPONDING T	1.37

PREDICTOR VALUES: TOTAL = 76.860

P2 SHOULDER 1+FT

STATISTIX 7.0

10/23/2003, 8:52:42 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.01024	7.566E-04	13.53	0.0002

R-SQUARED	0.9786	RESID. MEAN SQUARE (MSE)	0.57478
ADJUSTED R-SQUARED	0.9733	STANDARD DEVIATION	0.75814

SOURCE	DF	SS	MS	F	P
REGRESSION	1	105.228	105.228	183.07	0.0002
RESIDUAL	4	2.29913	0.57478		
TOTAL	5	107.527			

CASES INCLUDED 5 MISSING CASES 48

STATISTIX 7.0

10/23/2003, 8:52:51 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-0.3790	LOWER FITTED BOUND	0.6976
PREDICTED VALUE	0.7868	FITTED VALUE	0.7868
UPPER PREDICTED BOUND	1.9526	UPPER FITTED BOUND	0.8759
SE (PREDICTED VALUE)	0.7604	SE (FITTED VALUE)	0.0581

UNUSUALNESS (LEVERAGE)	0.0059
PERCENT COVERAGE	80.0
CORRESPONDING T	1.53

PREDICTOR VALUES: TOTAL = 76.860

STATISTIX 7.0

10/23/2003, 9:12:35 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	77	29	23	4	9
LO 80% CI	117.50	16.986	2.9932	1.0988	7.3607
MEAN	167.56	22.565	3.7141	1.5775	7.5333
UP 80% CI	217.61	28.145	4.4350	2.0562	7.7060
MINIMUM	2.7700	0.4520	0.7100	1.0900	6.9000
MAXIMUM	2040.0	97.100	8.8600	2.3400	8.0000

STATISTIX 7.0

10/23/2003, 9:12:59 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9643	
DIWET	0.8511	0.8901

CASES INCLUDED 23 MISSING CASES 54

STATISTIX 7.0

10/23/2003, 9:13:12 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.05004	0.00261	19.20	0.0000
R-SQUARED	0.9294	RESID. MEAN SQUARE (MSE)		74.2004
ADJUSTED R-SQUARED	0.9269	STANDARD DEVIATION		8.61397

SOURCE	DF	SS	MS	F	P
REGRESSION	1	27362.6	27362.6	368.77	0.0000
RESIDUAL	28	2077.61	74.2004		
TOTAL	29	29440.2			

CASES INCLUDED 29 MISSING CASES 48

STATISTIX 7.0

10/23/2003, 9:13:38 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-0.2890	LOWER FITTED BOUND	10.287
PREDICTED VALUE	11.042	FITTED VALUE	11.042
UPPER PREDICTED BOUND	22.373	UPPER FITTED BOUND	11.797
SE (PREDICTED VALUE)	8.6331	SE (FITTED VALUE)	0.5750

UNUSUALNESS (LEVERAGE)	0.0045
PERCENT COVERAGE	80.0
CORRESPONDING T	1.31

PREDICTOR VALUES: TOTAL = 220.66

P2 SHOULDER

STATISTIX 7.0

10/23/2003, 9:13:49 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00558	7.338E-04	7.60	0.0000

R-SQUARED	0.7244	RESID. MEAN SQUARE (MSE)	5.86155
ADJUSTED R-SQUARED	0.7119	STANDARD DEVIATION	2.42106

SOURCE	DF	SS	MS	F	P
REGRESSION	1	338.961	338.961	57.83	0.0000
RESIDUAL	22	128.954	5.86155		
TOTAL	23	467.915			

CASES INCLUDED 23 MISSING CASES 54

STATISTIX 7.0

10/23/2003, 9:13:57 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-1.9747	LOWER FITTED BOUND	1.0173
PREDICTED VALUE	1.2312	FITTED VALUE	1.2312
UPPER PREDICTED BOUND	4.4372	UPPER FITTED BOUND	1.4452
SE (PREDICTED VALUE)	2.4265	SE (FITTED VALUE)	0.1619

UNUSUALNESS (LEVERAGE)	0.0045
PERCENT COVERAGE	80.0
CORRESPONDING T	1.32

PREDICTOR VALUES: TOTAL = 220.66

STATISTIX 7.0

10/23/2003, 8:54:14 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	21	9	6	2	3
LO 80% CI	102.58	8.6117	1.2189	M	6.7455
MEAN	421.20	50.780	6.4383	2.5065	7.7333
UP 80% CI	739.82	92.948	11.658	M	8.7212
MINIMUM	2.4200	1.3900	1.5000	0.2430	6.9000
MAXIMUM	5030.0	287.00	23.800	4.7700	8.7000

STATISTIX 7.0

10/23/2003, 8:54:48 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9970	
DIWET	0.9918	0.9966

CASES INCLUDED 6 MISSING CASES 15

STATISTIX 7.0

10/23/2003, 8:55:01 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P	
TOTAL	0.05615	0.00157	35.70	0.0000	
R-SQUARED	0.9938	RESID. MEAN SQUARE (MSE)		69.2571	
ADJUSTED R-SQUARED	0.9930	STANDARD DEVIATION		8.32209	
SOURCE	DF	SS	MS	F	P
REGRESSION	1	88272.0	88272.0	1274.55	0.0000
RESIDUAL	8	554.057	69.2571		
TOTAL	9	88826.0			

CASES INCLUDED 9 MISSING CASES 12

STATISTIX 7.0

10/23/2003, 8:55:18 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	32.164	LOWER FITTED BOUND	42.197
PREDICTED VALUE	43.915	FITTED VALUE	43.915
UPPER PREDICTED BOUND	55.666	UPPER FITTED BOUND	45.633
SE (PREDICTED VALUE)	8.4125	SE (FITTED VALUE)	1.2301
UNUSUALNESS (LEVERAGE)	0.0218		
PERCENT COVERAGE	80.0		
CORRESPONDING T	1.40		

PREDICTOR VALUES: TOTAL = 782.10

P2 ONRAMP+HWY 1FT

STATISTIX 7.0

10/23/2003, 8:55:30 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00468	2.705E-04	17.31	0.0000
R-SQUARED	0.9836	RESID. MEAN SQUARE (MSE)		2.04717
ADJUSTED R-SQUARED	0.9803	STANDARD DEVIATION		1.43079

SOURCE	DF	SS	MS	F	P
REGRESSION	1	613.684	613.684	299.77	0.0000
RESIDUAL	5	10.2358	2.04717		
TOTAL	6	623.920			

CASES INCLUDED 6 MISSING CASES 15

STATISTIX 7.0

10/23/2003, 8:55:40 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	1.5285	LOWER FITTED BOUND	3.3509
PREDICTED VALUE	3.6632	FITTED VALUE	3.6632
UPPER PREDICTED BOUND	5.7978	UPPER FITTED BOUND	3.9754
SE (PREDICTED VALUE)	1.4464	SE (FITTED VALUE)	0.2116

UNUSUALNESS (LEVERAGE)	0.0219
PERCENT COVERAGE	80.0
CORRESPONDING T	1.48

PREDICTOR VALUES: TOTAL = 782.10

STATISTIX 7.0

10/23/2003, 8:57:43 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	64	10	5	1	5
LO 80% CI	20.670	1.3752	0.4849	M	7.0812
MEAN	61.295	12.024	4.0300	1.6600	7.2600
UP 80% CI	101.92	22.674	7.5751	M	7.4388
MINIMUM	2.1000	0.4240	1.0200	1.6600	7.0000
MAXIMUM	1980.0	80.700	13.200	1.6600	7.6000

STATISTIX 7.0

10/23/2003, 8:58:02 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9981	
DIWET	0.9945	0.9946

CASES INCLUDED 5 MISSING CASES 59

STATISTIX 7.0

10/23/2003, 8:58:21 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.04007	0.00110	36.52	0.0000
R-SQUARED	0.9933	RESID. MEAN SQUARE (MSE)		5.05084
ADJUSTED R-SQUARED	0.9926	STANDARD DEVIATION		2.24741

SOURCE	DF	SS	MS	F	P
REGRESSION	1	6736.39	6736.39	1333.72	0.0000
RESIDUAL	9	45.4575	5.05084		
TOTAL	10	6781.85			

CASES INCLUDED 10 MISSING CASES 54

STATISTIX 7.0

10/23/2003, 8:58:42 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	1.0841	LOWER FITTED BOUND	4.0375
PREDICTED VALUE	4.1964	FITTED VALUE	4.1964
UPPER PREDICTED BOUND	7.3087	UPPER FITTED BOUND	4.3553
SE (PREDICTED VALUE)	2.2503	SE (FITTED VALUE)	0.1149

UNUSUALNESS (LEVERAGE)	0.0026
PERCENT COVERAGE	80.0
CORRESPONDING T	1.38

PREDICTOR VALUES: TOTAL = 104.73

P2 ONRAMP+HWY 1+FT

STATISTIX 7.0

10/23/2003, 8:58:53 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00669	3.517E-04	19.03	0.0000
R-SQUARED	0.9891	RESID. MEAN SQUARE (MSE)		0.51404
ADJUSTED R-SQUARED	0.9863	STANDARD DEVIATION		0.71697

SOURCE	DF	SS	MS	F	P
REGRESSION	1	186.072	186.072	361.98	0.0000
RESIDUAL	4	2.05616	0.51404		
TOTAL	5	188.128			

CASES INCLUDED 5 MISSING CASES 59

STATISTIX 7.0

10/23/2003, 8:59:02 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-0.4000	LOWER FITTED BOUND	0.6443
PREDICTED VALUE	0.7008	FITTED VALUE	0.7008
UPPER PREDICTED BOUND	1.8015	UPPER FITTED BOUND	0.7572
SE (PREDICTED VALUE)	0.7179	SE (FITTED VALUE)	0.0368

UNUSUALNESS (LEVERAGE)	0.0026
PERCENT COVERAGE	80.0
CORRESPONDING T	1.53

PREDICTOR VALUES: TOTAL = 104.73

STATISTIX 7.0

10/23/2003, 10:30:42 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	85	19	11	3	8
LO 80% CI	66.081	10.282	2.4241	-0.2966	7.1483
MEAN	150.21	30.382	5.3436	2.2243	7.4375
UP 80% CI	234.34	50.483	8.2631	4.7453	7.7267
MINIMUM	2.1000	0.4240	1.0200	0.2430	6.9000
MAXIMUM	5030.0	287.00	23.800	4.7700	8.7000

STATISTIX 7.0

10/23/2003, 10:31:09 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9923	
DIWET	0.9833	0.9694

CASES INCLUDED 11 MISSING CASES 74

STATISTIX 7.0

10/23/2003, 10:31:22 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.05405	0.00163	33.12	0.0000
R-SQUARED	0.9839	RESID. MEAN SQUARE (MSE)		85.7322
ADJUSTED R-SQUARED	0.9830	STANDARD DEVIATION		9.25917

SOURCE	DF	SS	MS	F	P
REGRESSION	1	94064.7	94064.7	1097.19	0.0000
RESIDUAL	18	1543.18	85.7322		
TOTAL	19	95607.9			

CASES INCLUDED 19 MISSING CASES 66

STATISTIX 7.0

10/23/2003, 10:31:44 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	0.8530	LOWER FITTED BOUND	12.653
PREDICTED VALUE	13.183	FITTED VALUE	13.183
UPPER PREDICTED BOUND	25.512	UPPER FITTED BOUND	13.712
SE (PREDICTED VALUE)	9.2677	SE (FITTED VALUE)	0.3980

UNUSUALNESS (LEVERAGE)	0.0018
PERCENT COVERAGE	80.0
CORRESPONDING T	1.33

PREDICTOR VALUES: TOTAL = 243.88

P2 ONRAMP+HWY

STATISTIX 7.0

10/23/2003, 10:31:58 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00494	2.892E-04	17.09	0.0000
R-SQUARED	0.9669	RESID. MEAN SQUARE (MSE)		2.68724
ADJUSTED R-SQUARED	0.9636	STANDARD DEVIATION		1.63928

SOURCE	DF	SS	MS	F	P
REGRESSION	1	785.176	785.176	292.19	0.0000
RESIDUAL	10	26.8724	2.68724		
TOTAL	11	812.048			

CASES INCLUDED 11 MISSING CASES 74

STATISTIX 7.0

10/23/2003, 10:32:06 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-1.0459	LOWER FITTED BOUND	1.1088
PREDICTED VALUE	1.2056	FITTED VALUE	1.2056
UPPER PREDICTED BOUND	3.4571	UPPER FITTED BOUND	1.3024
SE (PREDICTED VALUE)	1.6408	SE (FITTED VALUE)	0.0705
UNUSUALNESS (LEVERAGE)	0.0019		
PERCENT COVERAGE	80.0		
CORRESPONDING T	1.37		

PREDICTOR VALUES: TOTAL = 243.88

STATISTIX 7.0

10/23/2003, 9:03:06 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	11	5	4	0	4
LO 80% CI	60.276	6.9641	0.5344	M	6.0555
MEAN	127.66	12.428	1.0640	M	6.8000
UP 80% CI	195.03	17.892	1.5936	M	7.5445
MINIMUM	6.9100	3.7700	0.2760	M	5.8000
MAXIMUM	526.00	24.000	1.8600	M	8.0000

STATISTIX 7.0

10/23/2003, 9:03:50 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.04786	0.00296	16.16	0.0001
R-SQUARED	0.9849	RESID. MEAN SQUARE (MSE)	3.87015	
ADJUSTED R-SQUARED	0.9811	STANDARD DEVIATION	1.96727	

SOURCE	DF	SS	MS	F	P
REGRESSION	1	1010.80	1010.80	261.18	0.0001
RESIDUAL	4	15.4806	3.87015		
TOTAL	5	1026.28			

CASES INCLUDED 5 MISSING CASES 6

STATISTIX 7.0

10/23/2003, 9:04:19 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	5.9535	LOWER FITTED BOUND	8.2282
PREDICTED VALUE	9.0906	FITTED VALUE	9.0906
UPPER PREDICTED BOUND	12.228	UPPER FITTED BOUND	9.9530
SE (PREDICTED VALUE)	2.0461	SE (FITTED VALUE)	0.5625

UNUSUALNESS (LEVERAGE) 0.0818
 PERCENT COVERAGE 80.0
 CORRESPONDING T 1.53

PREDICTOR VALUES: TOTAL = 189.94

STATISTIX 7.0

10/23/2003, 9:04:36 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00364	3.448E-04	10.56	0.0018

R-SQUARED	0.9738	P2 OFFRAMP 1FT	
ADJUSTED R-SQUARED	0.9651	RESID. MEAN SQUARE (MSE)	0.05050
		STANDARD DEVIATION	0.22473

SOURCE	DF	SS	MS	F	P
REGRESSION	1	5.63167	5.63167	111.51	0.0018
RESIDUAL	3	0.15151	0.05050		
TOTAL	4	5.78318			

CASES INCLUDED 4 MISSING CASES 7

STATISTIX 7.0

10/23/2003, 9:04:50 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	0.3082	LOWER FITTED BOUND	0.5843
PREDICTED VALUE	0.6915	FITTED VALUE	0.6915
UPPER PREDICTED BOUND	1.0749	UPPER FITTED BOUND	0.7987
SE (PREDICTED VALUE)	0.2341	SE (FITTED VALUE)	0.0655

UNUSUALNESS (LEVERAGE)	0.0849
PERCENT COVERAGE	80.0
CORRESPONDING T	1.64

PREDICTOR VALUES: TOTAL = 189.94

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	21	1	0	0	2
LO 80% CI	12.620	M	M	M	M
MEAN	17.906	1.7800	M	M	7.1500
UP 80% CI	23.192	M	M	M	M
MINIMUM	3.1000	1.7800	M	M	6.7000
MAXIMUM	75.600	1.7800	M	M	7.6000

STATISTIX 7.0

10/23/2003, 9:19:00 AM

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	TCLP	PH
N	32	6	4	0	6
LO 80% CI	30.727	5.6232	0.5344	M	6.4462
MEAN	55.633	10.653	1.0640	M	6.9167
UP 80% CI	80.538	15.684	1.5936	M	7.3871
MINIMUM	3.1000	1.7800	0.2760	M	5.8000
MAXIMUM	526.00	24.000	1.8600	M	8.0000

STATISTIX 7.0

10/23/2003, 9:19:28 AM

CORRELATIONS (PEARSON)

ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL	WET
WET	0.9952	
DIWET	0.9868	0.9928

CASES INCLUDED 4 MISSING CASES 30

STATISTIX 7.0

10/23/2003, 9:19:40 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.04755	0.00290	16.39	0.0000
R-SQUARED	0.9817	RESID. MEAN SQUARE (MSE)	3.76330	
ADJUSTED R-SQUARED	0.9781	STANDARD DEVIATION	1.93992	

SOURCE	DF	SS	MS	F	P
REGRESSION	1	1010.63	1010.63	268.55	0.0000
RESIDUAL	5	18.8165	3.76330		
TOTAL	6	1029.45			

CASES INCLUDED 6 MISSING CASES 28

STATISTIX 7.0

10/23/2003, 9:19:56 AM

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	0.7576	LOWER FITTED BOUND	3.3117
PREDICTED VALUE	3.6394	FITTED VALUE	3.6394
UPPER PREDICTED BOUND	6.5212	UPPER FITTED BOUND	3.9672
SE (PREDICTED VALUE)	1.9526	SE (FITTED VALUE)	0.2221

UNUSUALNESS (LEVERAGE) 0.0131
 PERCENT COVERAGE 80.0
 CORRESPONDING T 1.48

PREDICTOR VALUES: TOTAL = 76.540

P2 OFFRAMP

STATISTIX 7.0

10/23/2003, 9:20:08 AM

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.00364	3.448E-04	10.56	0.0018
R-SQUARED	0.9738	RESID. MEAN SQUARE (MSE)		0.05050
ADJUSTED R-SQUARED	0.9651	STANDARD DEVIATION		0.22473

SOURCE	DF	SS	MS	F	P
REGRESSION	1	5.63167	5.63167	111.51	0.0018
RESIDUAL	3	0.15151	0.05050		
TOTAL	4	5.78318			

CASES INCLUDED 4 MISSING CASES 30

STATISTIX 7.0

10/23/2003, 9:20:17 AM

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-0.0919	LOWER FITTED BOUND	0.2354
PREDICTED VALUE	0.2787	FITTED VALUE	0.2787
UPPER PREDICTED BOUND	0.6492	UPPER FITTED BOUND	0.3219
SE (PREDICTED VALUE)	0.2263	SE (FITTED VALUE)	0.0264

UNUSUALNESS (LEVERAGE)	0.0138
PERCENT COVERAGE	80.0
CORRESPONDING T	1.64

PREDICTOR VALUES: TOTAL = 76.540

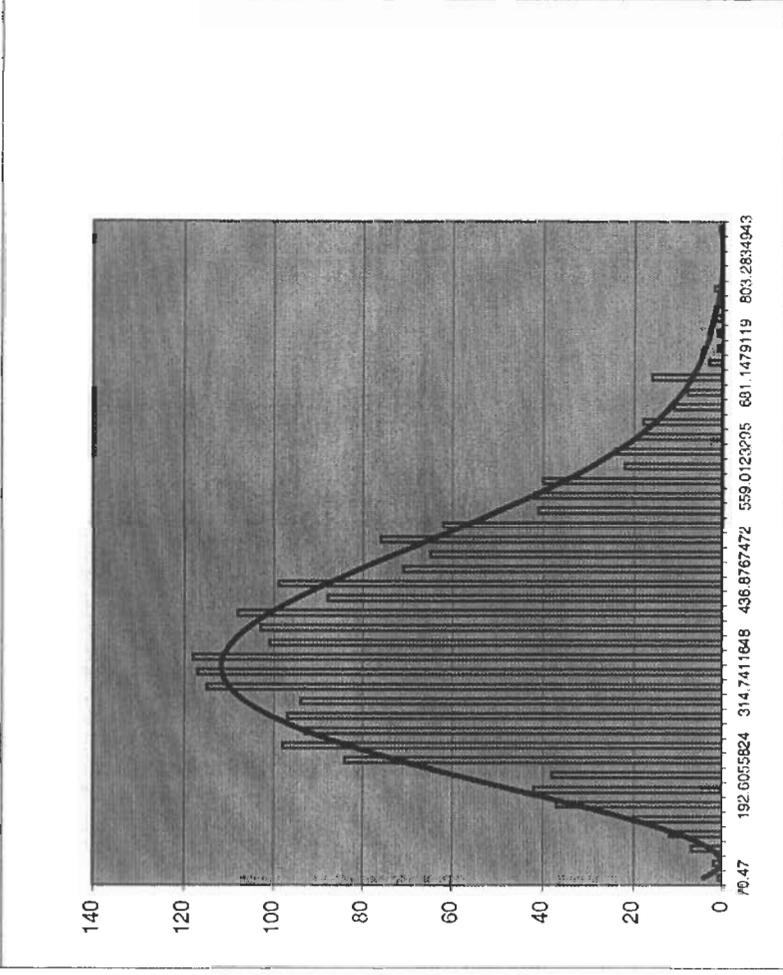
APPENDIX G
STATISTICAL ANALYSES PERFORMED BY CALTRANS

101NB on and off ramps to and from College Avenue (0-4 ft)

Iterations: 2000
 No. of Samples: 16

912
49.0
1.980
17.6
613
274
216
581
89.0
208
110
6.62
5.63
6.27
197
305

Bin	Frequency
70.47	1
87.91794	2
105.3659	7
122.8138	12
140.2618	20
157.7097	37
175.1576	42
192.6056	38
210.0535	84
227.5015	98
244.9494	93
262.3973	97
279.8453	94
297.2932	115
314.7412	117
332.1891	118
349.637	101
367.085	103
384.5329	108
401.9809	88
419.4288	99
436.8767	71
454.3247	65
471.7726	76
489.2206	62
506.6685	41
524.1164	42
541.5644	40
559.0123	22
576.4603	24
593.9082	19
611.3562	18
628.8041	11
646.252	8
663.7	16
681.1479	3
698.5959	1
716.0438	1



Iteration = 2000

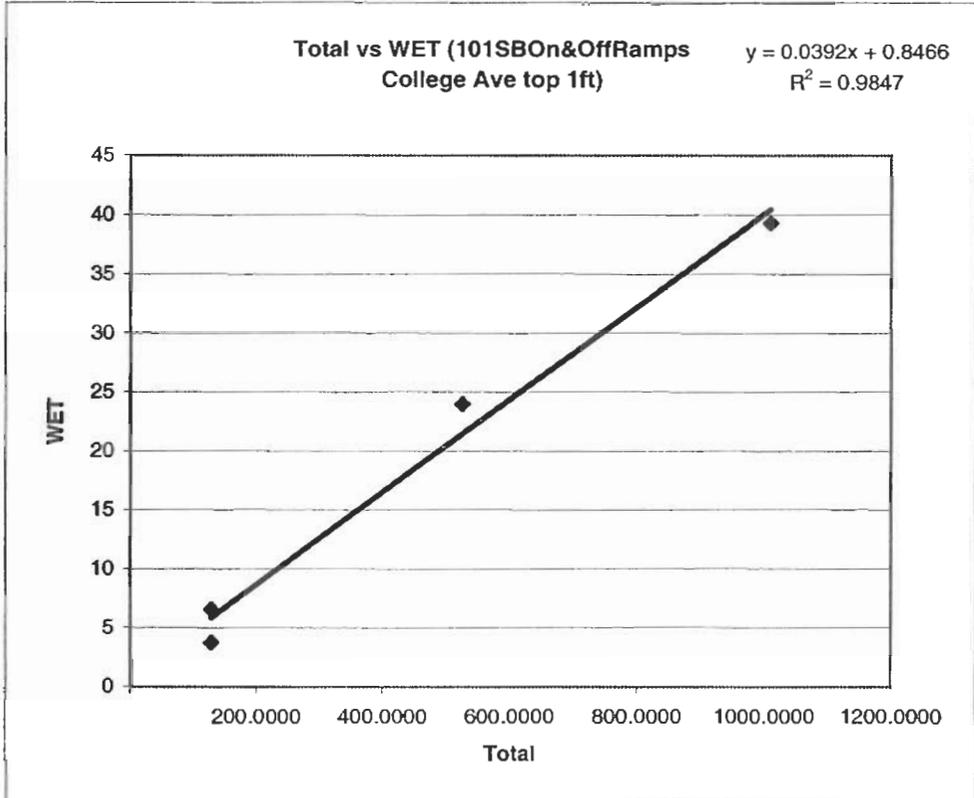
Average = 347.2085

Standard Deviation = 120.3091

95% UCL = 545.7185

90% UCL = 501.2042

Total	WET
526.0000	24
128.0000	6.57
128.0000	3.77
1010.0000	39.3



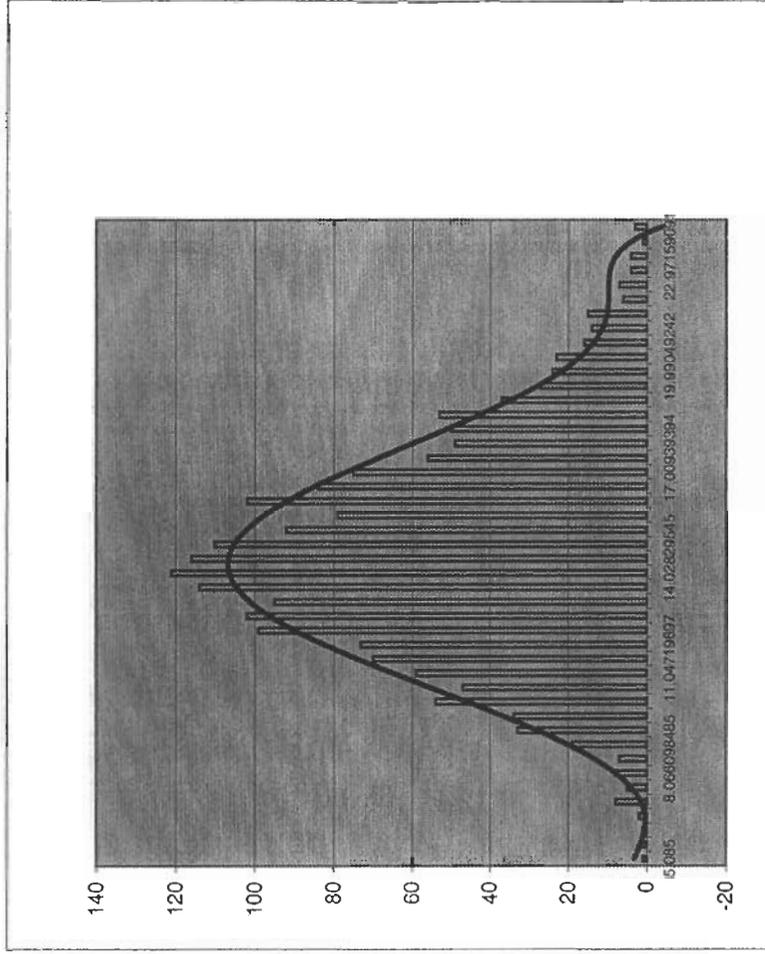
WET = 15.74

101 Southbound On and Offramp to and from College Ave (Below 1 feet)

Iterations: 2000
No. of Samples: 18

4.18
24.3
30.4
19.7
25.1
24.0
49.2
5.01
6.14
25.5
5.10
16.3
2.10
2.47
2.57
2.39
2.53
3.03

Bin	Frequency
5.085	1
5.510871	1
5.936742	1
6.362614	2
6.788485	8
7.214356	5
7.640227	8
8.066098	7
8.49197	19
8.917841	33
9.343712	34
9.769583	54
10.19545	47
10.62133	59
11.0472	70
11.47307	73
11.89894	99
12.32481	102
12.75068	95
13.17655	114
13.60242	121
14.0283	116
14.45417	110
14.88004	92
15.30591	79
15.73178	102
16.15765	84
16.58352	75
17.00939	56
17.43527	49
17.86114	50
18.28701	53
18.71288	37
19.13875	27
19.56462	24
19.99049	23
20.41636	16
20.84223	14



Iteration = 2000

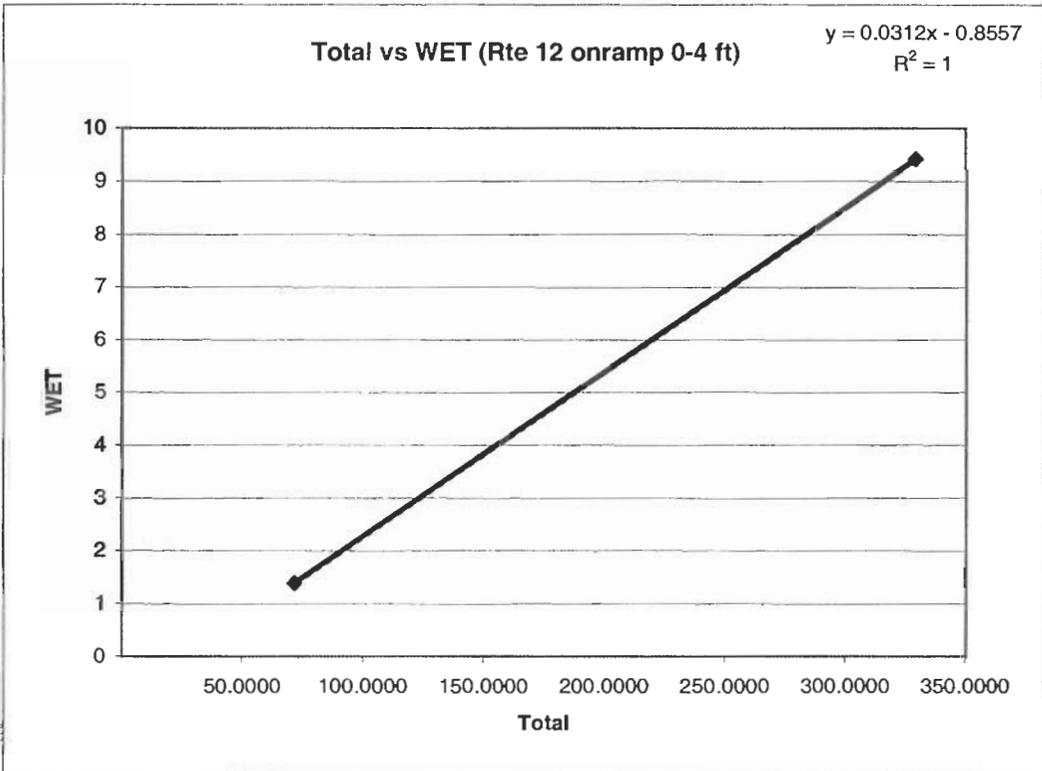
Average = 13.96766

Standard Deviation = 3.101023

95% UCL = 19.08435

90% UCL = 17.93697

Total	WET
71.9000	1.39
329.0000	9.42

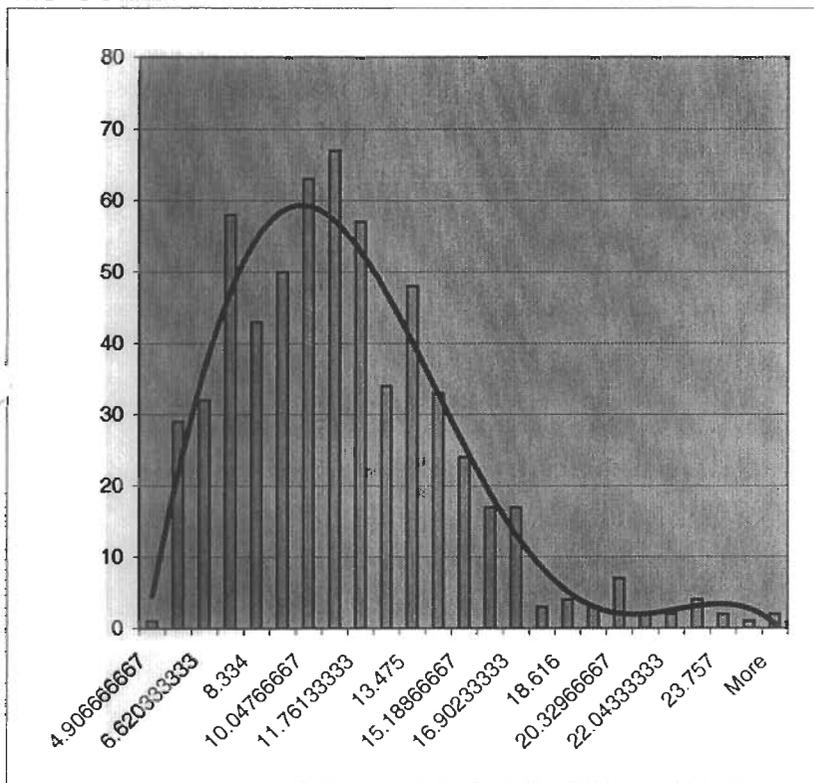


WET=2.72

Task Order Description: Task Order Description
 Task Order Number: XX-XXXXXX-XX
 Prime Contractor: Prime Contractor
 Subcontractor: Subcontractor
 Sample Date: XX/XX/XX
 Laboratory: Laboratory
 Test Date: XX/XX/XX
 Project EA: XXXXXX
 Co-Rte-KP: Co-Rte-KP
 Project Description: Project Description
 Senior: Senior
 Staff: Staff
 Run Date: XX/XX/XX

Number of Iterations:

HISTOGRAM



<i>Bin</i>	<i>Frequency</i>
4.906667	1
5.7635	29
6.620333	32
7.477167	58
8.334	43
9.190833	50
10.04767	63
10.9045	67
11.76133	57
12.61817	34
13.475	48
14.33183	33
15.18867	24
16.0455	17
16.90233	17
17.75917	3
18.616	4
19.47283	3
20.32967	7
21.1865	2
22.04333	2
22.90017	4
23.757	2
24.61383	1
More	2

Iteration = 1000

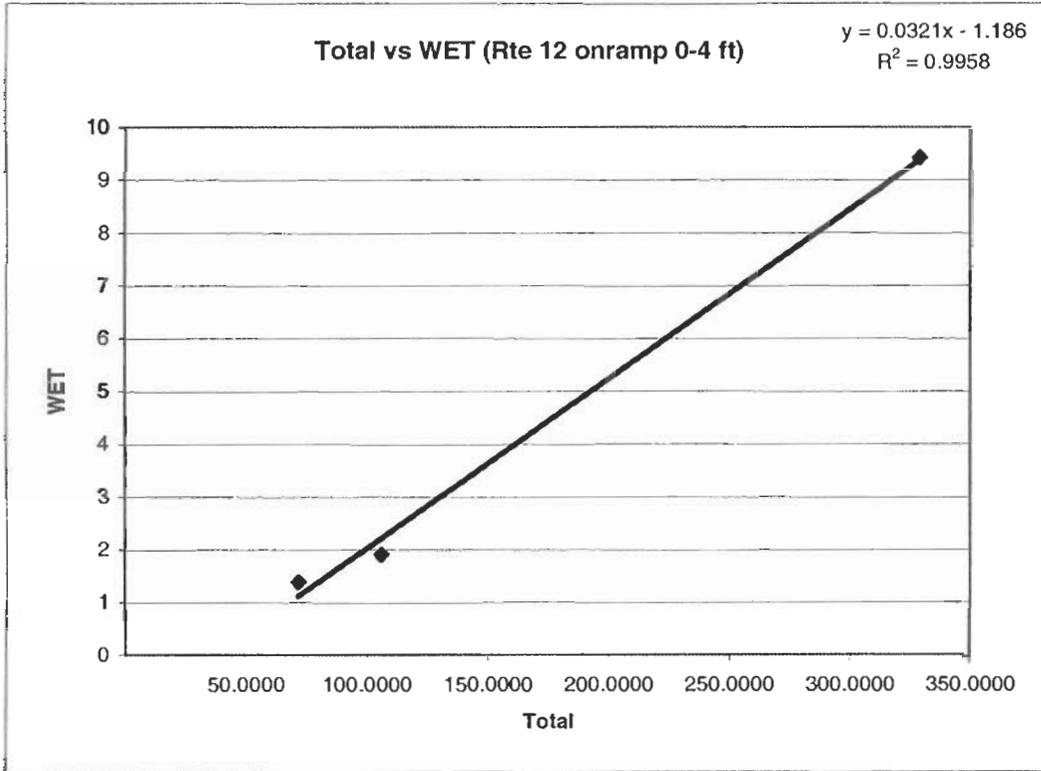
Average = 10.7345

Standard Deviation = 3.636293832

95% UCL = 16.73438482

90% UCL = 15.46168198

Total	WET
106.0000	1.91
71.9000	1.39
329.0000	9.42



WET = 1